In association with:

CL:AIRE Conference

Asbestos in Soil: Developments in Legislation, Policy and Practice

1st November 2011

Manchester Conference Centre

Acknowledgments

CL:AIRE would like to personally thank Steve Forster of IEG Technologies UK Ltd, Richard Bennett of Derwentside Environmental Testing Services and Hazel Davidson of ALcontrol Laboratories for their help in the development and planning of this conference.

This event has been developed in association with the following organisations:

AGS - The Association of Geotechnical & Geoenvironmental Specialists (AGS) is an organisation that is primarily composed of consultants, contractors and laboratories engaged in the assessment, analysis and remediation of contaminated land and ground engineering.

The AGS provides a focus for the promotion of good commercial and professional practice in the Geotechnical and Geoenvironmental Industry and has established an Asbestos In Soil working group as a sub-committee of its Contaminated Land Working Group. This AGS Asbestos group published an initial position paper in August 2011.

BOHS - The British Occupational Hygiene Society (BOHS) is one of the biggest occupational hygiene societies in the world, and is both a learned body, promoting professional and public awareness of occupational hygiene and the underpinning medical, scientific and engineering issues, and a professional membership organisation representing occupational hygienists. The BOHS Faculty of Occupational Hygiene sets, develops and maintains the professional standards of occupational hygienists, and is also the internationally recognised, and only UK-based, examining board for qualifications in occupational hygiene and related subjects. These include the industry standard range of Asbestos Proficiency Modules, P401 through to P407, which cover bulk sampling, surveying, fibre counting, air sampling and clearance testing, removal and disposal, and management.

CIRIA - CIRIA is a leading guidance provider for the construction and related industry in the UK. CIRIA's award winning contaminated land programme has produced over 40 good practice publications. Via our two contaminated land networks, we also deliver over 25 training courses every year. More recently CIRIA has started a project which aims to produce some good practice guidance for clients on how to assess and manage asbestos risk generated from the ground. This project is expected to finish by the end of 2012.

EIC - The Environmental Industries Commission (EIC) was launched in 1995 to give the UK's environmental technology and services (ETS) industry a strong and effective interface with Government. With over 200 Member companies EIC has grown to become the largest trade association for the ETS sector in Europe, and enjoys the support of leading politicians from all three major parties, as well as industrialists, green NGOs, environmentalists and academics. The EIC and its Members work to provide solutions that meet or surpass the environmental standards set by Government legislation, and work in partnership with government to strengthen the UK's environmental policy framework.

EIC's Contaminated Land and Environmental Laboratories Working Groups have been, and continue to be, leading proponents in calling for the development of practical, comprehensive, non-statutory practitioner guidance on asbestos in soil that provides a consistent approach for UK industry, stakeholders and regulators.

CL:AIRE - CL:AIRE is a respected independent not-for-profit organisation established in 1999 to stimulate the regeneration of contaminated land in the UK by raising awareness of, and confidence in, practical and sustainable remediation technologies. CL:AIRE is now a trusted agent for progressing initiatives and frameworks linking government and industry, designed to promote a more sustainable and progressive future.

CL:AIRE is working closely with EIC and other industry bodies to develop practical, comprehensive, non-statutory practitioner guidance on asbestos in soil that provides a consistent approach for UK industry, stakeholders and regulators.

Programme

09:00-09:30 Registration & Coffee

Morning Session 1: Legislation & Policy (Chair - Richard Boyle, HCA/SAGTA)

09:30-09:45 Welcome and Introduction

09:45-10:00 DEFRA review of Part 2A/DCLG review of planning - implications for owners of property contaminated by asbestos ***Richard Boyle, Homes & Communities Agency/Soil & Groundwater Technology Association***

10:05-10:20 HSE policy & practice - regulation of works on land contaminated with asbestos ***Martin Gibson, HSE***

10:25-10:40 Remediation and re-use of asbestos-contaminated soil - implications of the REACH regulation and relationship to the Definition of Waste: Development Industry Code of Practice ***Nicholas Willenbrock, CL:AIRE***

10:40-10.55 Q&A

11:00-11:20 Coffee & Networking

Morning Session 2: Exposure and Risk (Chair - Andrew Darnton, HSE)

11:25-11:40 Health risks and mortality arising from exposure to low levels of asbestos ***Andrew Darnton, HSE***

11:45-12:00 Part 2A determinations - a legal perspective ***Andrew Wiseman, Stephenson Harwood***

12:05-12:20 Reflection on the Supreme Court judgement - an insurance industry perspective ***Mathew Hussey, Tysers***

12:25-12:45 Q&A

12:45-13:45 Lunch & Networking

Afternoon Session 3: Sampling & Analysis - Soils and Air (Chair - Garry Burdett, HSL)

13:50-14:05 Current issues with soil samples/asbestos - a laboratory perspective ***Hazel Davidson, ALcontrol***

14:10-14:25 New sampling and analytical method for asbestos in soil ***Garry Burdett, HSL***

14:30-14:45 Monitoring low level exposures to asbestos in air ***Robin Howie, Robin Howie Associates***

14:50-15:05 Q&A

15:05-15:25 Coffee & Networking

Afternoon Session 4: Case Studies (Chair - Steve Forster, IEG)

15:30-15:45 From laboratory scale to field scale: Issues of representativeness ***Paul Nathanail, University of Nottingham and Land Quality Management Ltd***

15:50-16:05 Risk assessment/determination of SPOSH under Part 2A - a problem holder perspective ***Alan Jones, IOM and Anna Spinks, Wolverhampton City Council***

16:10-16:25 Investigation and remediation of asbestos in soil - a case study ***Steve Edgar, VertaseFLI***

16:30-16:45 Q&A

16:45-17:00 Closing remarks

Reason for Event

CL:AIRE in association with EIC, British Occupational Hygiene Society, AGS and CIRIA, have organised this one day conference with a broad range of presentations from key invited figures from the regulatory, asbestos management, land contamination management communities, the Health & Safety Executive, and the Health & Safety Laboratory.

The aim of this unique event is to share existing knowledge and expertise in asbestos management and to identify and present emerging developments in UK guidance on the investigation, assessment and remediation of land contaminated with asbestos.

The day will consist of a series of presentations which will provide a detailed insight into a number of the key technical issues, including:

- Forthcoming developments in the statutory contaminated land guidance regime ("Part 2A") and changes to the planning framework as applied to contaminated land
- HSE regulation of land contaminated with asbestos
- Asbestos and the reuse of excavated materials
- Health risks and mortality from low level exposure during site investigation and remediation
- Legal perspectives of the Part 2A regime applied to determined sites
- Risk assessment and the determination of sites under Part 2A
- An insurance industry perspective post-Supreme Court ruling on liability for mesothelioma
- Key issues with sampling and analysis of soils for asbestos containing materials and free fibres
- Development of HSE guidance on soil sampling and analytical methodology
- Monitoring exposures to low levels of asbestos fibres in ambient air
- A selection of case studies - Part 2A and non-Part 2A

It is hoped that the event will not only raise awareness of the key issues and forthcoming developments, but that it will generate significant cross-sectoral interest in working with the EIC, CL:AIRE, BOHS, AGS and other key stakeholders towards the development of practical and robust non-statutory industry guidance in keeping with the Government's Better Regulation initiative.

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ERITH

Erith have nearly half a century of complex demolition and civil engineering experience. We are the enabling specialists. Our reputation for completing technically demanding assignments has been secured on trust, service and delivery. Erith's approach has seen turnover exceed £60m per annum and our organisation grow to over 250 members of staff.

Erith provides a complete range of development Enabling Services from the very earliest planning and budgetary advice through initial surveys remediation advice to temporary works, demolition and civil engineering. We are also able to bring these together to provide a fully co-ordinated Single Source Solution. We have an excellent track record across the full range of these services and this is supported by our Clients.

Our specialist engineering practice, Swanton Consulting, is based in Erith in offices adjacent to our head office and specialises in temporary works, engineering, remediation consultancy, surveys and investigation. We also carry a high level of expertise in planning, methodology and sequencing to assist clients and project teams with early advice.

At Pre-contact stage we specialise in: Temporary works engineering •Programme, sequencing and methodology • Reviews with local authorities • 2D and 3D simulations • Surveys and investigations • Asbestos • Unexploded ordnance • Utilities • Archaeology • Ecology • Geotechnical • Remediation strategy • Liaison and planning with utility providers

We have the expertise, knowledge and experience across a wide range of demolition activities, from congested central London sites to heavy industrial facilities in ecologically sensitive and heritage environments where maintaining close relationships with the public, neighbours and special interest groups is of paramount importance.

In addition to Demolition activities we also facilitate: Asbestos removal • Soft strip • Temporary works installation • Demolition and de-construction • Traditional construction • Pre-stressed concrete • Bridges and viaducts • Heavy industrial / pharmaceutical facilities • Explosives and steeple jacking • Protection of listed / heritage elements • Facade retention

Erith will take control of the site from day one; ensure it is safe and secure and provide a single point of responsibility for all enabling activities. Erith can either undertake these activities directly or support and co-ordinate specialists appointed by the Client.

As the Enabling Specialists we can offer to • Secure site • Haul roads and enabling works • Develop traffic proposals with local authorities • Intrusive structural surveys • Asbestos removal • Pile probing and obstruction removal • Services diversions including liaison with utilities companies • Ground remediationand recycling of nuclear and fossil fuel generating facilities • Ecological enabling works • Utilities diversions

Erith frequently undertakes the construction of permanent basement works for the follow on development to provide programme advantage and single point responsibility for the client. This can also assist by providing the client with more flexibility in the timing of the appointment of the contractor for the main build.

Civil Engineering activities include : Basement excavation • Secant, contiguous and anchor pile walls • Sheet piling • Piling ,and mini piling • Underpinning and ground anchors • Tower crane bases • Pilecaps • Foundation construction • Permanent utilities re-instatement

Erith take a family pride in setting its objectives to be recognised by its peers and clients as the leading contractor in all areas of its business on a National scale, always providing its clients a first class and cost effective service, based upon a full understanding of their needs.

Whatever the task, Erith deliver a safe, innovative and professional service, 24 hours a day, 7 days a week, within budget and on time.

Riverside Consulting

Asbestos | Legionella | Noise | Air | COSHH

Asbestos in Soil: Developments in Legislation, Policy and Practice.

We are proud sponsors of this 'Asbestos in Soil' event, as providers of asbestos consultancy services with a great deal of contaminated land experience, we were very happy to support an event raising awareness of this important issue.

You will find below a brief summary of who we are and what we can do for you.

Asbestos consultancy...

We have provided asbestos consultancy nationwide since 2002, including:

- Asbestos Air Testing
- Asbestos Contaminated Land
- Asbestos Project Supervision
- Asbestos Surveys
- Asbestos Bulk Analysis
- Asbestos Awareness Training

Our Experiences...

We have worked extensively in supporting clients with asbestos contaminated land issues. One project of note would be a National Grid project on the Isle of Grain.

This project is based around infrastructure works being carried out on a large asbestos contaminated site in Kent.

We have been employed to provide advice on how to deal with the hazard to ensure safety and minimise disruption to the project.

Air Testing | Advice | Training | Analytical Support

Quality is central to everything we do...

We would always recommend that only experienced companies with the correct training are employed to assist you in the potentially complicated issues around contaminated land.

We hope you enjoy this event...

UKAS INSPECTION 296 | UKAS TESTING 4087 | Affiliate Member British Occupational Hygiene Society | atac | NFDC Associate

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ALcontrol Laboratories

ALcontrol provides accredited testing and analytical services for soil, water, food, oil, asbestos and air to help clients demonstrate compliance with regulations and achieve their health, safety and environmental goals.

Providing millions of tests per year, with over 2000 employees in 30 laboratories and Customer Service centres across 11 European countries supporting a global customer base, ALcontrol is Europe's largest independent provider of environmental analytical services.

Speed, accuracy, reliability and efficiency are all key to the successful delivery of analytical services, so ALcontrol provides all of its customers with live access to their laboratory data through the web-based '**@mis**' scheduling and reporting service.

Further information on ALcontrol's full range of testing and analytical services is available at www.alcontrol.com

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dets
Derwentside Environmental Testing Services

Derwentside Environmental Testing Services (DETS)

Derwentside Environmental Testing Services (DETS), established in 1999, has developed into one of the most respected analytical testing facilities in the UK. The team has grown the business through reputation and quality and are proud to say they are still the laboratory of choice for their original customers.

The laboratory, based in Consett, has reached this enviable position by having a philosophy of listening and forming honest and transparent relationships with its clients, providing quality data in a timely fashion and going that 'extra mile' to provide added value.

Regarded as a centre of excellence for asbestos testing, the laboratory holds full UKAS accreditation for the identification of asbestos fibres in bulk materials and soils, the identification and quantification of asbestos in soils, aggregates and ballast to 0.001% and water absorption of asbestos materials. In addition DETS offers a full range of environmental testing methods for contaminated land investigation and clean up, top soil and PAS100 compost analysis, waste characterisation and Waste Acceptance Criteria testing, waste water analysis of effluents and landfill monitoring, and has a strong reputation with Geotechnical & Civil Engineers with analysis to BS 1377, BRE SD1 and TRL 447 standards. Recent developments and expansion of the laboratory has resulted it being able to offer a comprehensive analytical service for conventional and waste derived fuel, anaerobic digestion and biomass potential.

To fulfil its commitment to work in partnership with its clients, DETS also provide experienced site chemists for in situ site testing and the provision of a range of sampling and analysis equipment.

Over the years the laboratory has gained both UKAS and MCERTS accreditation for the majority of its analytical methods and effluent sampling, resulting in it being one of the most accredited environmental testing facilities in the UK.

Following the principle that a laboratory is only as good as the staff employed, DETS have built a team based on experience and enthusiasm, with its chemists actively involved in national committees such as The Standing Committee of Analysts, Landfill Regulation Groups, Environmental Industry Commission Working Groups and so on. This commitment enables the laboratory to be at the forefront of method development, addressing the requirements of emerging legislation, typically demonstrated with its method for speciation of mercury, full accreditation of asbestos in soil quantification and analysis of waste derived fuels.

Derwentside Environmental Testing Services are here to work with you.

Institute of Occupational Medicine (IOM)

The Institute of Occupational Medicine (IOM) is an internationally recognised independent organisation under its own Board of Governors and with charitable status, established in 1969. As well as our Edinburgh HQ, we have offices in London, Stafford and Chesterfield. The IOM is the major UK independent centre of research, consultancy and training in occupational and environmental health, hygiene and safety. The IOM's business encompasses the full range of occupational health, hygiene and safety. We have over 120 staff with a wide range of expertise including occupational hygienists, physicians, nurses, chemists and other physical scientists.

The IOM's consultancy work is almost wholly concerned with occupational and environmental health, hygiene and safety. Our substantial expertise relating to brownfield sites includes assessing occupational and environmental risks associated with asbestos contamination. In particular, we are at the forefront of identifying, sampling and analysing asbestos contamination in soils and estimating associated risks to those involved in the remediation and to future residents. We measure the nature and extent of contamination and undertake site specific risk assessments that involve exposure modelling and risk assessments that take account of the site use, activities on the site and weather conditions as well as the soil contamination.

IOM are collaborating with Johnson, Poole and Bloomer in several investigations of health risks associated with asbestos contamination in soil, including a very major investigation of asbestos in gardens in a housing estate in Wolverhampton. By working together, we can provide the full range of advisory services required to assess and remediate land contaminated by asbestos and a wide range of chemicals.

For further information go to www.iom-world.org or contact alan.jones@iom-world.org

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Johnson Poole & Bloomer (JPB)

Johnson Poole & Bloomer (JPB) is a UK wide independent specialist multi-disciplinary consulting practice, established in 1844, providing objective advice and practical solutions based upon a unique depth of expertise and experience gathered over its 167 year history.

JPB offers in-depth specialist co-ordinated consultancy services in Environmental Risk Management, Site and Contaminated Land Reclamation, Asbestos Management, Ground Investigation, Geotechnics and Mining; all aimed at addressing the many issues raised by the redevelopment of land and the environmental imperatives introduced by such activities. We employ specialist qualified staff including Environmental Scientists, Chemists, Geotechnical Engineers, Geologists, Mining Engineers and Surveyors; all complementing one another in providing practical solutions to environmental, ground condition and other related technical problems.

Our client base has become increasing diverse, ranging from individuals to banks, developers, insurers and a wide range of public sector bodies. We were one of the first consultants to identify the need to provide asbestos related assessment and management advice to our Clients, and have been at the forefront of asbestos risk management services provision in relation to property portfolios for many years.

We were uniquely placed to do so on a major investigation requirement on a Wolverhampton housing estate and to recommend the use of IOM to our client as an internationally renowned expert advisor. We have successfully teamed with the IOM on several other projects, and together can provide investigations, risk assessments and remediation services for land contaminated by asbestos, and a wide range of other chemicals.

For further information go to: www.jpb.co.uk or contact: Neil.Moorby@jpb.co.uk

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REC Asbestos Ltd was established in 2002 and has offices throughout the UK including Scotland, Wales and Northern Ireland. We hold UKAS accreditation to ISO 17020 and ISO 17025 and also hold an HSE supervisory license for work with asbestos.

REC Asbestos Ltd offers complete Asbestos Consultancy Services including the following:

- Asbestos Management Surveys
- Demolition / Refurbishment Surveys
- Analysis of Asbestos in Soils, Textured Coating and Bulk Samples
- Management of Asbestos Removal
- Air Testing for Clearances and Reassurances following asbestos removal.
- Asbestos Awareness Training Courses
- Expert Witness

With over 50 members of staff including 6 qualified as CCP (Asbestos), REC Asbestos Ltd can work on both large and small contracts for both Public and Private Sector clients. For more information, please contact Dave Goodwin regarding any of the above services.

RSK is one of the world's largest environmental, health, safety and engineering consultancies, and has its headquarters in the UK and more than 700 employees. Over the past two decades, we have built up a network of international offices across continental Europe, the Middle East and North Africa, and we are proud to work for local and international blue-chip clients in the industrial, commercial, property and governmental sectors.

The range of customers we support and the diversity of our projects reflect the breadth of RSK service offerings and expertise. RSK is certified by DNV to ISO 9001, ISO 14001 and OSHAS 18001 for quality, environmental and health and safety management. Our laboratories are UKAS-accredited.

In the areas of asbestos, water hygiene and occupational health, we offer a complete range of services, including

Asbestos risk assessment and management
Legionella risk assessment and management
Occupational hygiene
Water system monitoring and analysis
Water system chemical treatment.

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Website: www.rsk.co.uk

CONFIDENCE YOU CAN BUILD ON!

The Sirius Group is a specialist design and build Remediation and Land Development contractor.

Established in 2003, in response to market requirements for integrated management of Risk, Costs and Programme; our model has always been to combine the design and delivery of projects within one integrated team.

Over this period, we have grown and diversified ahead of the market and now offer the full spectrum of services required to deliver soil and groundwater remediation projects across the UK. Using our own plant and equipment we deliver world class design and build contracting using our delivery capability across:

Site Characterisation and Assessment;
Remediation Design and Management;
Soil & Groundwater Remediation;
Asbestos surveying and removal;
Demolition & Decommissioning
Earthworks and;
Infrastructure Construction;

www.thesiriusgroup.com

info@thesiriusgroup.com

Design and Build remediation contracting is at the heart of Sirius. It was a founding principle of the company, and all staff, whether working within site characterisation, remedial design, operations or commerce embrace this concept.

The discipline of design and build contracting in terms of managing risk and accessing opportunity aligns the interests of the whole internal team together with those of the client and their partners, delivering value at each stage of project.

Vertase F.L.I.

www.vertasefli.co.uk

VertaseFLI is one of the UK's leading brownfield and contaminated land remediation contractors and environmental contracting specialists.

From our four offices, we deliver brownfield and contaminated land remediation solutions to clients across the development, home building, construction, industrial and public sectors. We possess genuine in-house capability for all in-situ and ex-situ soil and groundwater treatments. We also have extensive experience and expertise in the management and delivery of all associated works such as demolition, earthworks and enabling works.

As a true design and build remediation specialist, we are amongst a select group of companies able to offer a comprehensive in-house service for all types of contamination. We have significant and recent experience in the remediation of large technically complex sites as well as the remediation of many Part IIa sites. We have lead the way in the use of the CL:AIRE Definition of Waste: Development Industry Code of Practice and have been at the forefront of communicating sensitive contaminated land issues to the public.

To list just a few projects, this year alone saw us delivering projects dealing with asbestos in soils, chlorinated solvents in water, hydrocarbons in soils, a major fuel tank de-commissioning project, large scale demolition, mine stabilisation, Part IIa garden remediations, pesticide and herbicide bio-treatment, sewage sludge stabilisation design, gas protection and all for a diverse range of clients including developers, home builders, local authorities, the Environment Agency and major supermarket companies. This year also saw the completion of the very challenging remediation works at the former Bayer Chemicals site in Hauxton.

VertaseFLI has been managing and remediating asbestos in soils for many years using a combination of in-house suitably qualified individuals as well as external licensed sub contractors.

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ATAC – the leading trade association in the UK for the asbestos management services sector

ATAC's members can offer independent impartial advice on all aspects of asbestos management which include:

Remediation, Removal, Encapsulation, Management Plans, Surveys,Air Testing, Database Management

For further information please visit www.atac.org.uk or contact Ian Stone ian.stone@atac.org.uk

HARROW ESTATES plc

Harrow Estates are one of the UK's leading land and property solutions companies. We are experts in land acquisition, problem solving, remediation, regeneration and commercial development. Harrow Estates buy land unconditionally anywhere in the UK and work together with landowners by way of joint ventures and other agreement structures, leading the planning and technical resolution of the site, adding value for the benefit of both parties. Please see our website www.harrowestates.co.uk for further information.

IEG has over 25 years of hands-on experience of delivering effective sustainable solutions for the remediation of contaminated soil and groundwater using innovative patented *in situ* technologies and processes, whose effectiveness has been demonstrated by hundreds of successful applications across Europe, Asia and the USA. In addition, IEG is able to deliver expert, practical and cost effective advice and solutions designed to minimise health & safety, environmental, commercial and financial liabilities associated with the assessment and management of asbestos on land.

For further information please visit www.iegtechnologies.co.uk or contact Steve Forster steveforster@iegtechnologies.co.uk

Speaker Biographies
Session 1: Legislation & Policy

Dr Richard Boyle
Homes and Communities Agency

Richard has a varied background starting within academia, where he gained a BSc, MSc and PhD in earth and environmental sciences and remediation, which has been followed with nearly 8 years experience in environmental consultancies. Richard joined English Partnerships in 2007 to work on the implementation of the National Brownfield Strategy for England. English Partnerships became the Homes and Communities Agency on 1 December 2008. Richards major work streams are based on the inter-relationship of planning and contaminated land, including assessing brownfield sites for their most appropriate future use, aiming to appropriately use the sites taking account of all constraints and opportunities and creative masterplanning. Richard advises Central Government Departments and Agencies and Local Authorities on associated issues. Richard also works on addressing technical issues on HCA sites.

Dr Martin Gibson
HSE

Dr Martin Gibson is a Principal Specialist Inspector in Occupational Hygiene with the Health and Safety Executive based in Edinburgh. He has been with HSE since 1986. He has a national responsibility for asbestos in HSE and is involved in many aspects of asbestos work including policy development, operational inspection and enforcement, production of expert statements, appearances as expert witness and production of guidance documents including the New Survey Guide in 2010. He is also responsible for training in HSE and has presented many papers on asbestos at conferences and seminars.

Mr Nicholas Willenbrock
CL:AIRE

Nicholas has professional experience in both contaminated land consultancy and remediation contracting. One of his principle roles at CL:AIRE is the project management of The Definition of Waste: Development Industry Code of Practice, a nationwide initiative which allows for the reuse of materials onsite and through direct transfer to other sites. Further, Nicholas has worked most recently in the development of the Code of Practice Register of Materials which has been gaining momentum since its launch back in March 2011. He is an active member of the Geological Society of London, and has further interests in the development of standards for Contaminated Land Skills, Training and Qualifications.

CL:AIRE is the UK's independent body promoting sustainable remediation of contaminated land and groundwater. CL:AIRE's goal is to return these t resources to good health, ready for effective social and economic use. Working with industry, academia and government, CL:AIRE appraises innovative technologies and provides research and training for the regeneration sector.

The Proposed New Contaminated Land and Planning Regimes

Potential implications for property contaminated by asbestos

Dr Richard Boyle, Senior Technical Manager

Land & Regeneration Technical Team
Homes and Communities Agency

CL:AIRE, EIC and BOHS
"Asbestos in Soil: Developments in Legislation, Policy and Practice"

Tuesday 1st November 2011
Manchester

Thriving communities, affordable homes

Outline

- Proposed Localism Agenda
- Proposed New Planning Regime
- Proposed New Contaminated Land Regime
- What are the likely effects on redevelopment and land quality sectors?
  - What are the particular potential implications for property contaminated by asbestos?

Outline

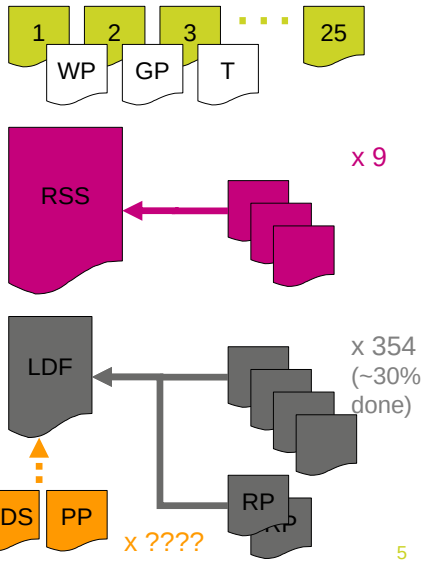
- Proposed Localism Agenda
- Proposed New Planning Regime
- Proposed New Contaminated Land Regime
- What are the likely effects on redevelopment and land quality sectors?
  - What are the particular potential implications for property contaminated by asbestos?

Localism Agenda

- Driving force in Coalition:
  - Localism – Conservatives
  - Liberalism – Liberal Democrats
- This is ***THE*** National Vision
- What does it mean?
  - "a term we use to include villages, towns, estates, wards or other relevant local areas"
  - Transfer away from 'Big Government' to 'Big Society'
  - If considered nationally, it is 'failing'
  - If considered at Local Authority level, it could be failing
  - Therefore, decisions taken and delivered at Parish Council or Community level?
- Localism Bill scheduled for Autumn 2011 and is certain to be the largest and most wide-ranging piece of legislation to go through Parliament ever!
  - 113 pages of explanatory notes!

English Planning Regime

- Central Government
  - PPS/PPG
  - Policies (White & Green Papers) and Targets
- Government Office for the Regions
  - Regional Spatial Strategy
  - Evidence base
  - All consulted on
- Local Planning Authority
  - Local Development Framework (Core Strategy)
  - Evidence base
    - SHLAA, ELR, OSR, etc
    - Retained policies
  - Consulted on
- Village Design Statements, Parish Plans, etc
- Planning Applications



5

So What's Wrong With This?

- Some quotes:
  - David Cameron, Prime Minister:
    - *"Town hall officials who take forever with those planning decisions that can be make or break for a business – and the investment and jobs that go with it"*
  - Eric Pickles, Secretary of State for Communities and Local Government
    - *"If I am being completely frank … it's the drag anchor to growth"*
  - Vince Cable, Business Secretary
    - *"We want local communities to benefit from growth, and the standard answer to be yes, not no"*
- Central Government should offer Planning Policy, Local Government should deliver, so:
  - Withdrawal of guidance, including all PPS, PPG, etc
  - Replace with a short overarching policy, would like it to be ~25 pages long
- Was due "Autumn 2011" now due "early in 2012"

Thriving communities, affordable homes

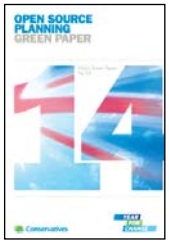
6

Is Planning The "Drag Anchor To Growth"?

- Planning has been blamed for second lowest number of Planning Permissions for the last 5 years
  - ~25,000 residential properties was granted in Q2 2011
- But, we've had this "recession", therefore, developers aren't building because:
  - Not many people are buying:
    - Mortgages are more difficult to obtain requiring much larger deposits
    - Residential properties still considered to be at least 10% overvalued
    - Still a lot of properties of the wrong type
  - Developers also are finding it difficult:
    - Loans to businesses are still significantly down
    - Loss of staff means it is difficult to respond quickly to opportunities
    - Overextended on sites and are waiting for values to increase
- However, developers are sitting on land with Planning Permission for ~280,000 residential properties
- Arguably waiting for NPPF opportunities for easier / cheaper projects

7

Stems from 'Open Source Planning'



- Open Source Planning (Conservative 'Green Paper' No 14) being followed:
  - "Free" LAs from top down central control & encourage local authorities to work together to resolve issues
  - Give neighbourhoods much greater ability to determine the shape of the places in which their inhabitants live:
    - Community develops "Neighbourhood Development Plan" to shape area. When done LAs will have to honour
    - Vote to give permission to develop without formal PP
    - Developers consult before planning application and show how "substantially taken into consideration" views
- So far been blamed (along with RSS withdrawal) for planning applications for some ~85,000 houses being withdrawn
- Been called a NIMBYs charter, but could actually be:
  - BANANA - Build Absolutely Nothing Anywhere Near Anything (or Anyone).
  - NOPE - Not On Planet Earth (or England)

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Some 'Details' on New Planning Regime

- Speech by Chancellor in Budget 2011 in section called 'Planning for Growth':
  - "The planning system has a key role to play … ensuring that the sustainable development needed to support economic growth is able to proceed as easily as possible"
  - "The Government's top priority in reforming the planning system is to promote sustainable economic growth and jobs. Government's clear expectation is that the answer to development and growth should wherever possible be "yes", except where this would compromise the key sustainable development principles set out in national planning policy."
  - "SoS for Communities and Local Government … will attach significant weight to the need to secure economic growth and employment."
  - "[so will the] SoS for Culture, Olympics, Media and Sport, the SoS for the Environment, Food and Rural Affairs, the SoS for Energy and Climate Change and the SoS for Transport."
    - What does this mean?!

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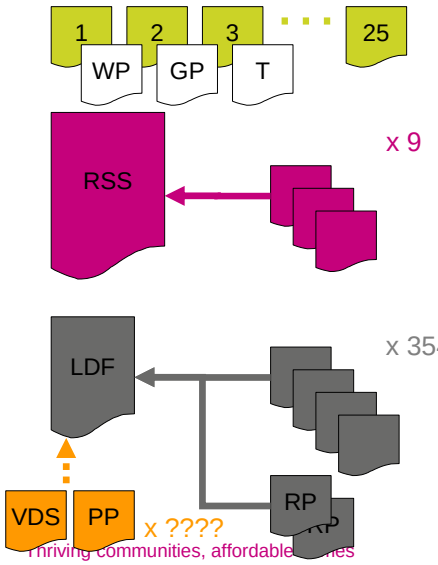
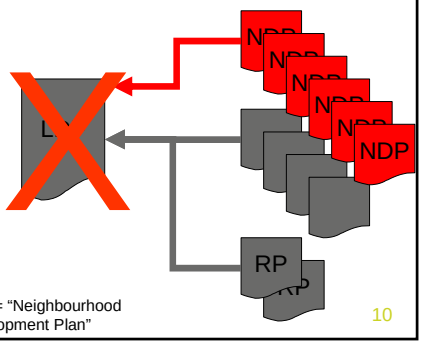
Comparing Planning Regimes



- "National Planning Policy Framework"



NDP = "Neighbourhood Development Plan"

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Some More Quotes

- Some other quotes on what the Planning Regime must do:
  - *"Deal the growing complexity and urgency of planning problems;"*
  - *"Be concerned not only with the use of land, but also to other matters which are vital to the proper planning of an area"*
  - *"With its positive approach will facilitate the creation of a good environment."*
  - *"All of which requires a broader and more flexible arrangement of plans."*
  - These were all in the blurb accompanying the … 1947 Town and Country Planning Act!
    - Planning regime has been changed ~20 times since then
    - Problem is, planning is a WIN-LOOSE game, which is why it is difficult

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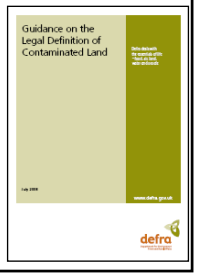
Part 2A & Statutory Guidance

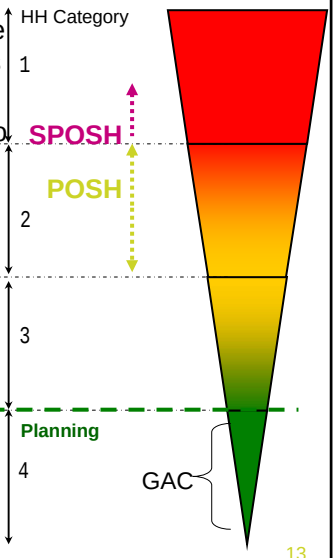
- Contaminated land a devolved function, so all that follows relates to just England & Wales
- A draconian regime in a free, democratic and capitalist society and not many countries have anything like this:
  - Blame now for doing something that wasn't wrong/illegal at the time it was done
  - Blame can fall on you for just owning land
  - Blame for 'knowingly permitting'
- SG is 3rd tier of legislation and assists in understanding the legislation so that "holders" can abide by the law, whilst regulators can bring prosecutions
- "Not terribly clear", so "clarification document" issued:
  - "Guidance on the Legal Definition of Contaminated Land" (July 2008)
  - Essential need to have a clear separation of Part 2A level and "planning" level



Part 2A & Statutory Guidance

- SG due December 2011 (January 2012)
- Reminder that regime was designed to target the worst land and as a last resort when all else fails is unlikely
- Fundamental re-write, clarify & shorten (~200p to ~70p, SG not in Annex), radioactivity separated with separate SG (unchanged)
- Introduce 4 "categories" of land:
  - Obviously CL
  - Obviously not CL

  ← 2 x Unsure if CL or not
- POSH seen as defining point, then decide SPOSH
- CW significance outlined for first time, same 4 category split
  - SPOSPOCoW is defining point



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Part 2A Statutory Guidance

- Liabilities unchanged for both Class A and Class B Persons
  - Past & present landowners; consultants and Local Authorities can also be liable
- 'Normal' contamination (was 'background' in consultation)
  - Natural and anthropogenic (guidance on this just commissioned, BGS lead)
- More precedent setting than before
- Short, non-technical, plain-English Risk Summary sites LA thinking about Determining
  - Include remediation practicalities with aim just to reduce risk, not make pristine
  - Include sustainability and risks from doing remediation as well as those in present situation
    - If sustainability and risks from remediation greater than present situation, don't remediate and possibly don't Determine
    - First time sustainability must be considered before, during and afterwards
- Possible to 'un-Determine' sites, e.g. when more information comes to light

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Outline

- Proposed Localism Agenda
- Proposed New Planning Regime
- Proposed New Contaminated Land Regime
- What are the likely effects on redevelopment and land quality sectors?
  - What are the particular potential implications for property contaminated by asbestos?

Possible Effects on Land Quality Sector

- Vast majority of soil quality issues will still be assessed and remediated through the Planning Regime
- Land quality remains a Material Planning Consideration
- New National Planning Policy Framework (consultation) has:
  - (New) Assume other regimes work, so LAs not to stray into those areas
  - (New) Soil quality should be considered more / earlier during site Allocations
  - (Same) Aim still to prevent new soil quality issues
  - (Same) Conditions will still be able to be prescribed, if necessary, on soil quality
  - (Same) After development, land still should not be able to be able to be Determined under Part 2A
  - (Change?) Has the responsibility changed?
  - (Same) "suitable for use" and "safe" contradiction remains
- So theoretically not changed that much. However, the detail has gone
  - PPS23 RIP, but most not needed and not followed in its entirety anyway
- Will Localism mean community decisions on CL RA and ROA?
  - No, as Part 2A provides "hook" to "answer" to what is acceptable

Possible Effects on Regeneration

- The NPPF has been argued to be:
  - By Government:
    - For communities to shape their area to how they want it to be
    - To be overwhelmingly focussed on economic and growth issues, with the default answer being "yes", especially where no LDF is in place
  - By developers, HBF and BPF:
    - As a NIMBYs charter
    - As common sense and welcomed
  - By campaign groups (esp. National Trust and CPRE):
    - As a developers charter that will ruin our landscape and communities for short term economic gain simply encouraging greenfield sprawl
  - By Government:
    - To have more protection for the environment than ever before
    - To actually be brownfield focussed, although worded oddly
  - Everyone
    - Likes the idea of simplification
- Simplification and shortening prevailed over clarity, so numerous interpretations possible and actual emphasis of NPPF is unknown

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Conclusions?

- Things are changing!
- Part 2A Statutory Guidance will hopefully:
  - Target the correct sites that are considered to present most risk
  - Enable and 're-frame' the:
- NPPF for soil quality issues:
  - But how will sector cope without PPS23?
- NPPF for regeneration:
  - How will NPPF work? Will it be balanced? Will it be clear?
  - Will it encourage brownfield redevelopment? Or greenfield sprawl?
    - Will apparent obvious raising of Part 2A bar (also planning?) encourage brownfield redevelopment? (Lessens potential future liability worries.)
    - If brownfield remains, change in the emphasis towards the worse sites? And not just 'hard' / 'physical' development led?
- What does Localism mean? How will it work? What will it consider?
- Trying to turn planning into WIN-WIN – will it?
  - Is it truly "Open Source Planning"?

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Conclusions?

- Uncertainty in the short to medium term … but it offers opportunities:
  - Enables industry to work together to tackle the problems where we haven't been able / allowed to in the past
    - Proper and balanced guidance can be developed
    - Land Forum **MUST** lead on this
      - Only truly wide ranging, cross disciplinary group, that must be made to work
      - In terms of what the Part 2A SG says, it is the only authoritative group
  - Encourage 'Better Regulation'
    - NOT REPLACING REGULATOR
    - Heavy and light handed approach under planning, give time for regulator to focus on Part 2A
  - Promotion of individuals skills and technical competencies
    - Provides clear and reasoned motivation for individuals to progress and gain qualifications/Chartership?
- Soil Framework Directive still being developed …

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Thank you for Listening
Any Questions?

Dr Richard Boyle
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Asbestos Work on Contaminated Land: Legal Requirements

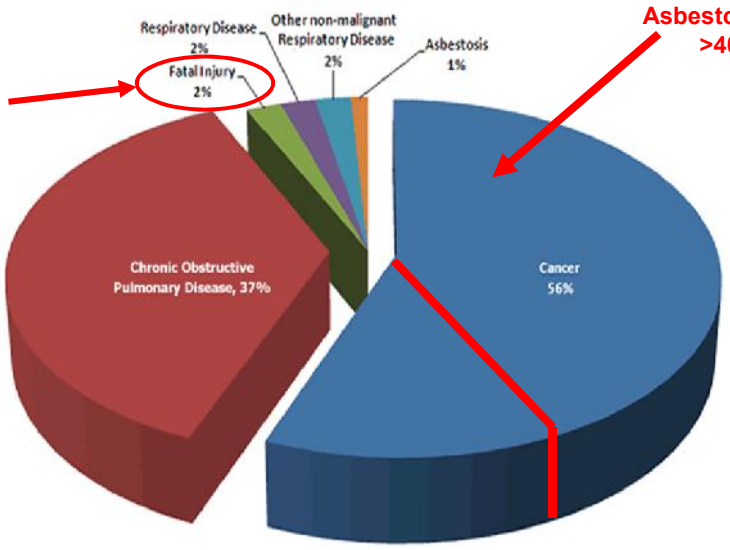
Dr Martin Gibson
HSE, Edinburgh

Agenda

- Introduction
- Asbestos contamination
- Legal duties
- Principles of control
- Managing asbestos in contaminated land
- "CAR 2012": "Reasoned Opinion"

Annual work-related deaths (estimated 8000-12000)

HSE



New Research 2009: Prof. Julian Peto Mesothelioma cases

HSE

Highest exposure category	Males					Females				
	Cases			Controls	OR (95% CI)	Cases			Controls	OR (95% CI)
	Attributed to this exposure					Attributed to this exposure				
	Yes	No[1]	Total			Yes	No[1]	Total		
Occupational exposure										
Non-construction high risk	144.3	8.7	153	138	17.5 (10.3,29.8)	4.0	1.0	5	5	4.8 (1.3, 17.7)
Carpenters	86.4	2.6	89	42	34.2 (18.7,62.6)	-	-	0	0	-
Plumbers, electricians & painters	105.0	7.0	112	114	[illegible]	-	-	0	2	-
Other construction	[illegible]				5.9 (3.3, 10.5)	-	-	0	1	-
Medium risk industrial	51.4	16.6	68	263	[illegible]	18.7	13.3	32	63	2.4 (1.3, 4.3)
Other substantial exposure	5.3	1.7	7	26	4.2 (1.6, 10.9)	1.8	0.2	2	1	9.6(0.8,112.3)
Non-occupational exposure										
Domestic exposure before age 30	6.8	6.2	13	98	[illegible]	17.5	19.5	37	86	1.9 (1.1, 3.2)
None of the above (reference)	-	**18.0**	**18**	**289**	**1.0**	-	**34.0**	**34**	**150**	**1.0**
TOTAL	**442.4**	**69.6**	**512**	**1112**	[illegible][2]	**42.0**	**67.8**	**110**	**308**	**1.6**[2]

Asbestos Contamination

- Asbestos dumped
- Fire damaged property where debris has spent onto land
- Derelict land
- Formal waste disposal sites
- Buried as waste
- Intentionally spread
- Asbestos from factory waste or manufacturing sites
- Underground asbestos

Condition of Asbestos

- Disturbance of items or soil could cause fibres to be released into atmosphere
- Fibre release depends on
  - Type of material (insulation, lagging other loose materials..higher potential
  - Condition eg damaged/well broken up
  - Wet/damp or dry
  - Buried or not

Condition of Asbestos

Groups at Risk

- Surveyors/Analysts
- “Construction” workers
- Off-site people

Legal Duties

- **Control of Asbestos Regulations (CAR) 2006**
  - **Duty-to-Manage Asbestos**
  - **Requirements for work with asbestos, identification, training etc**
- **Construction, Design & Manageme (CDM) Regulations 2007**
- **Health & Safety at Work etc Act 1974**
- **Management Regulations 1999**

Legal Duties

- **CAR Regulation 4 "Duty to Manage"**

Duty-to-Manage Asbestos

Applies to “non-domestic” premises

Premises – Quoted in the HSE guidance not buildings

Guidance L1 gives its definition as follows:-

Premises *Any place, including buildings, open-air sites, vehicles, vessels, aircraft, hovercraft, tents, movable structures and installations on land or offshore or anywhere else and whether floating or fixed.*

Other Reasons for an Asbestos Survey to be carried out

- **To meet the requirements of other legislation:**
  - **CAR Regulation 5 “Identification of Asbestos”**
  - **Construction, Design & Management (CDM) Regs 2007**

CAR 2006: Regulation 5 Identification of the presence of asbestos

- *Employers have duty to identify asbestos before work starts*
- *No demolition, maintenance or other work to be carried out which is liable to expose employees to asbestos unless there is an assessment to identify asbestos*
- *If info from client not available or not in a reliable form, employer should establish if asbestos is present and form (or assume)*
- *Employer should not simply rely on client information*

CDM 2007 Requirements

- *CDM Regulation 10: client must provide designers and contractors (who are bidding for work or whom they intend to engage) with:*
  - *project specific information about the presence of asbestos*
  - *provide in advance*

Principles of Control

- Avoid/prevent exposure where reasonable practicable
- Work methods to minimise exposure and spread
- Use of PPE/RPE
- Trained/competent work force
- Management systems in place

Control Regime (Risk Assessment and Plan of Work)

- Establishing site is contaminated
  - Will hear from others on sampling strategies
- Procedures for Analysts/Surveyors
- Avoid exposure: Planned inspection/sampling routes (avoiding contamination)
- Control at source: eg wetting techniques
- PPE/RPE
- Decontamination procedures
- Cleaning of equipment

Management of Site

- Segregation
- Access
  - Vehicle
  - Personnel
- Respirator zone
- Lay-out and design
  - Location of equipment/facilities
  - Decontamination Unit/wheel washes
  - Skip/Lorry
- Site Monitoring

Control Regime

- Competent/trained workers
- Avoid exposure
- Work methods to minimise exposure and spread (wetting/mechanical handling)
- Dedicated travel routes
- PPE/RPE
- Decontamination procedures including for vehicle cabs, external parts of vehicles and equipment
- Covered skip
- Personal Monitoring

Legal Considerations

- Work may be licensed or non-licensed
- Depends on types of material and to some extent on condition of material
- AC items: non-licensed
- AIB, lagging, insulation: licensed

European “Reasoned Opinion”

- **The EC has delivered a "reasoned opinion" that CAR 2006 does not satisfactorily implement some measures of Asbestos Directive.**
- **The argument is that the exemptions in the Directive are not fully transposed in the Regulations.**

European "Reasoned Opinion"

(Two omitted terms in green below)

Article 3(3) (a) and (b) of the Directive say;

- **Provided that worker exposure is SALI, and…. the exposure limit will not be exceeded, Articles 4, 18 and 19 (covering notification, health surveillance and emergency plans) may be waived where the work involves:**
  - **(a) short, non-continuous maintenance activities *in which only non-friable materials are handled*;**
  - **(b) removal *without deterioration of non-degraded* materials in which the asbestos fibres are firmly linked in a matrix;**

CAR 2006 states……

- **(i) short, non-continuous maintenance activities,**
- **(ii) removal of materials in which the asbestos fibres are firmly linked in a matrix,**

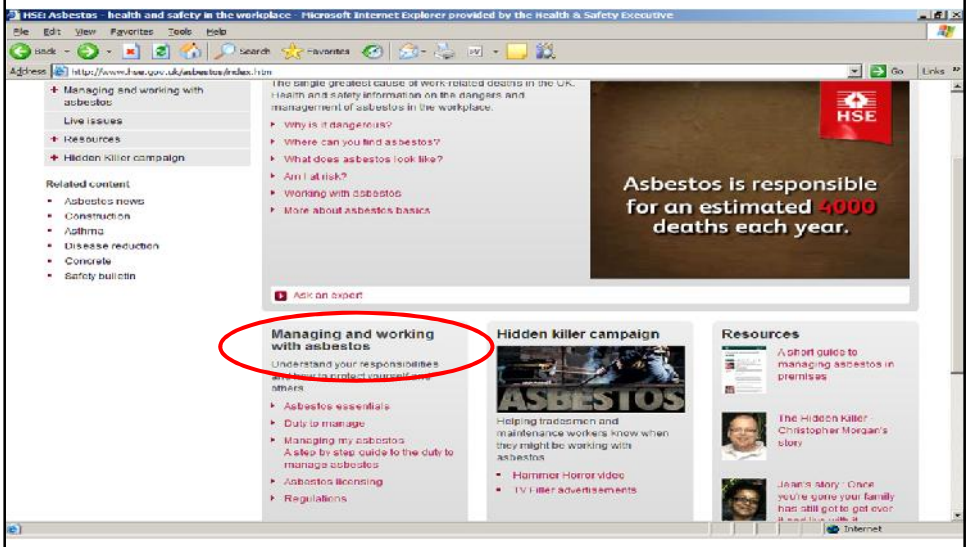
Proposed Changes to Regulations ie "CAR2012"

Non-licensed work requires:	NNLW requires:	Licensed work requires:
-compliance with risk assessment -control of exposure -training requirements	- notification before work starts - medical examinations every 3 years -health records - compliance with risk assessment -control of exposure -training requirements	- licensing - notification 14 days in advance - emergency arrangements - designation asbestos areas - medical examination every 2 years -health records - compliance with risk assessment -control of exposure -training requirements

Implications of New Regulations

- What do the changes to the Regulations mean?
- Not completely sure at this stage
- Licensed work…..no change
- Non-licensed work…may be some changes

Finally…keep up-to-date/more information:
HSE website: www.hse.gov.uk/asbestos



Remediation and re-use of Asbestos Contaminated Soil – Implications of the REACH Regulation and Relationship to the Definition of Waste: Development Industry Code of Practice (DoWCoP).

Nicholas Willenbrock

www.claire.co.uk

1

CL:AIRE

Financial supporters of the new version.

Homes & Communities Agency

DEC UK Environmental Contractor

Hydrock

2

CL:AIRE

For Excavated Materials – 4 Factors

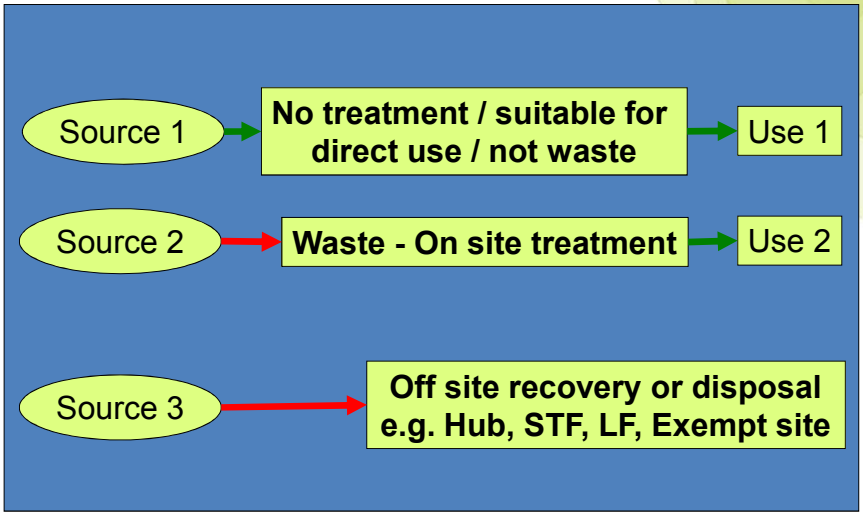
In all cases:

1. Does not undermine the aims and objectives of the Waste Framework Directive.
   - ➢ Prevent harm to human health
   - ➢ Prevent pollution of the environment
2. Suitable for use.
3. Certainty of use.
4. Quantity – that is absolutely necessary.

3

CL:AIRE

Version 1 - Use on Site of Origin



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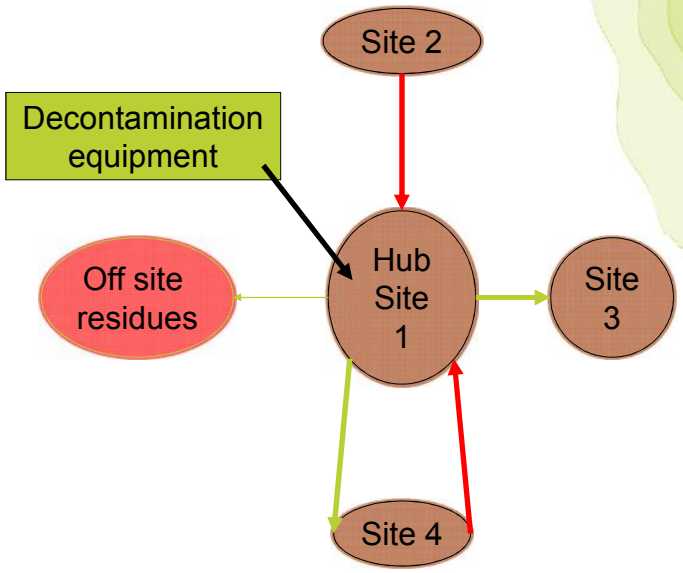
CL:AIRE

Version 1 - Complex Cluster



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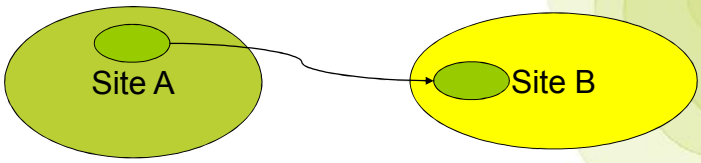
CL:AIRE

Version 2 - Direct Transfer - Greenfield

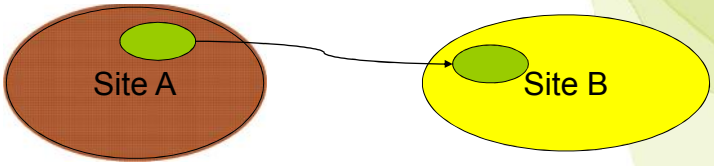


- Naturally occurring materials - No need for treatment
- Desk Top Study – If low confidence - Consider Site Investigation
- Visual & olfactory confirmation upon excavation
- Risk Assessment – likely to be Qualitative
- Dispatch as non-waste - Delivery tickets system only
- Confirm material is as expected
- Clean soils with elevated naturally occurring substances.

6

CL:AIRE

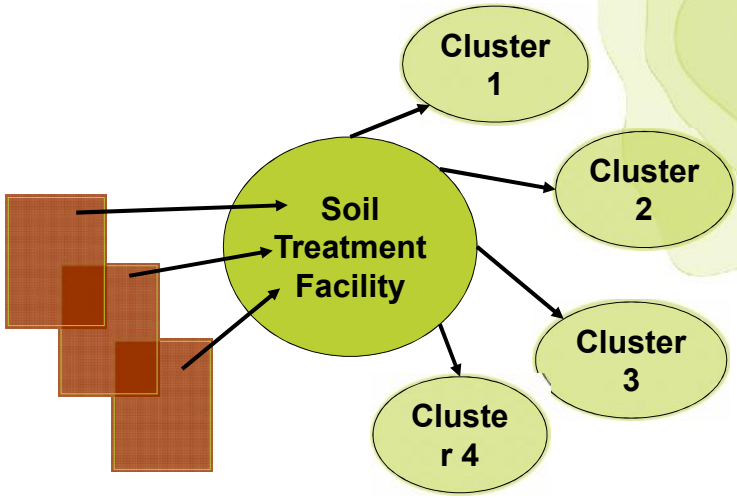
Version 2 - Direct Transfer - Brownfield



- Clearly defined areas of naturally occurring soils
- Site Investigation – Clear delineation
- Visual and olfactory inspection
- Dispatch as non-waste – Delivery ticket system
- Confirmatory testing

7

Fixed Soil Treatment Facilities



1 MMP structured so that it can be simply amended
4 Declarations
4 Verification reports completed

8

Materials Transfer In the DoWCoP

- Scenario's involving direct transfer – naturally occurring, clean materials. Naturally occurring contaminants - no new hazards.
- Watch Point 15 – Page 31-
- "The hazards to human health and the environment must not be increased beyond those which already exist at the Receiver site, by importing materials with elevated concentrations of potentially harmful substances."
- "The importation of materials at receiver sites **must not introduce any new hazards** beyond those that already exist at the Receiver site, by importing materials containing new contaminants present at problematical levels."
- "In any case this includes the importation and use of materials containing new contaminants present above **hazardous waste thresholds**."
- Current as well as future use of Site – no degradation of land quality – contrary to the Waste Framework Directive.

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REACH Regulations & Waste

- Lays down provisions on substances and preparations within the meaning of Article 3. These provisions shall apply to the **manufacture**, placing on the market or use of such **substances** on their own, in preparation or in articles and to the placing on the market of preparations.
- **Substance**: means a chemical element and its compounds in the natural state or obtained by any manufacturing process
- 8) **Manufacturing**: means production or extraction of substances in the natural state;
- Annex XVII – Restrictions on Manufacture

6. Asbestos Fibres. 1. The placing on the market and use of these fibres and of articles containing these fibres **added intentionally** shall be prohibited.

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REACH Regulations & Waste cont.

- (11) To ensure workability and to **maintain the incentives for waste recycling and recovery**, wastes should not be regarded as substances, preparations or articles within the meaning of this Regulation.
- Link to DoWCoP – confusion - the 4 factors disprove waste status.

- So do REACH Regs apply again?
- Is this the scenario for which the REACH Regs were designed?

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Confusion

- UK REACH – Leaflet 14 – Substances Recovered from Waste.
- "where waste is recovered back into **substances** that are placed on the market for further commercial use REACH applies ..... from the point a recovered substance ceases to be waste and waste management controls no longer apply"
- Registration of contaminated excavated materials may be required under REACH as a UVCB substance (unknown or variable composition, complex reaction products or biological materials). Impurities [e.g. asbestos] **do not** require separate registration - if they are **not intended** to be present in the final preparation & present at **less than 20%.**
- Haz Waste threshold is 0.1% - Watch point 15 - DoWCoP

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Health & Safety – Control of Asbestos Regs 2006

- Prohibition of the Use of Asbestos

29. –(1) Subject to Paragraphs (2) and (6), no person shall use, except in the course of any activity in connection to its disposal, asbestos or any product to which asbestos has been **intentionally added**"

- So they don't apply right?
- And then someone hands you the HSE Control of Asbestos Regulations 2006 - Approved Code of Practice & Guidance.
  - Ancillary work?
  - License required?
  - Exemption specifics – Sporadic low intensity
  - Risk assessments, Work Plans, Notification,

13

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Conclusion

- Main area of confusion – CAR2006, less so REACH?
- DoWCoP = already protecting against issues, live document, welcomes further comment.
- Clearly a complex issue – time, ability to read all Regulations.
- DoWCoP – use of existing frameworks e.g. CLR11 – DoWCoP would expect use of new best practice approaches - could be amended if required.
- My interpretation only – evidence of issues welcomed – directed to steering group.

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Speaker Biographies
Session 2: Exposure & Risk

Andrew Darnton
HSE

Andrew Darnton, MSc. is a statistician working within the UK Health and Safety Executive, the national independent watchdog for work-related health, safety and illness. Since 1996 he has worked in the field of occupational epidemiology, with a focus on ill-health due to chemical exposures in the workplace, especially occupational respiratory diseases including those caused by asbestos. His current role is to use statistical and epidemiological evidence to identify occupational hazards and quantify risks in order to inform the development of effective policies to prevent future cases of occupational disease. This has led to active engagement in a number of research areas, including, meta-analyses of studies of asbestos-related disease to produce quantitative risk models, research to estimate the burden of asbestos-related lung cancer, statistical modelling to project future mesothelioma mortality trends in the UK, and a large scale case-control and asbestos-lung burden study to identify the sources of mesothelioma risk in the UK. Andrew has also worked on the investigation of occupational cancer clusters, and is currently involved in work to produce updated estimates of the burden of occupational cancer and Chronic Obstructive Pulmonary Disease (COPD) in the UK, as well as long term follow-up studies to monitor disease risks among a large cohort of British asbestos workers.

Andrew Wiseman
Stephenson Harwood

Andrew is listed in the Chambers Guide as one of the country's leading environmental lawyers which referred to him *"as being without question a leader on Contaminated Land", "admired for his ability to explain issues …. in a calm and clear fashion"* and having *"won praise from clients for his impressive knowledge … and ability to understand the technical issues involved as well as political pressures"*.

The latest edition's editorial says he." *is widely renowned as one of the most seasoned and experienced environment specialists in the sector. … he is "highly regarded and tremendously respected in the profession.*".

He is listed as a leading individual in the Legal 500 which says he has "*outstanding knowledge of environmental law and excellent business acumen*".

Andrew is a former chair of the UK Environmental Law Association. He has also acted as a specialist advisor to the Local Government Association on environmental law and is a Vice Chair of EP UK's Land Quality Committee. He is a trustee of CL:AIRE.

Andrew is a joint editor of the Law Society's Environmental Law Handbook (7th edition 2010) and a trustee of EP UK and UKELA. He has written for various publication and been interviewed on television and radio including BBC News 24, the 6 and 10 O'clock news, Watchdog, Radio 4 and 5 in relation to land contamination issues.

He had advised numerous local authorities around the country on Part 2A including providing specialist support and training.

Mathew Hussey
Tysers

Mathew's focus is on contaminated land and environmental insurance projects ranging from regeneration/redevelopment sites through to landfill, waste recycling sites, renewable energy projects and property transactions.

Mathew has previously worked as a consultant on a wide range of contaminated land projects and with an environmental insurance underwriter transferring environmental liability with insurance. He has a degree in Earth Science (BSc Hons) and MSc from Imperial College on Environmental Management and Technology.

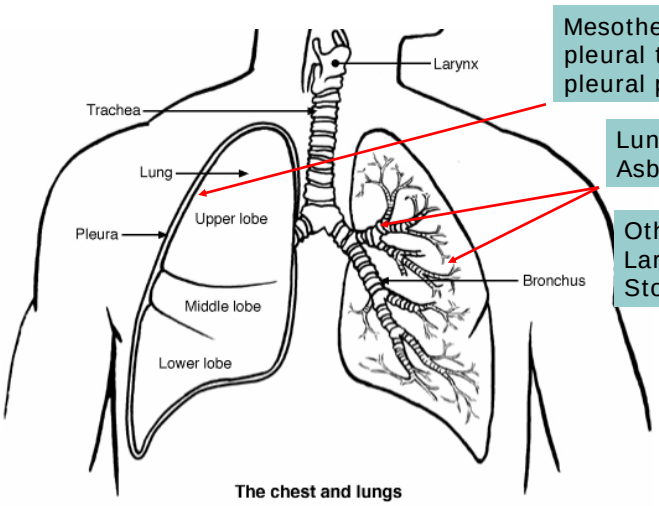
He is currently co vice chair of the EIC Working Group for contaminated land.

Health risks and mortality arising from exposure to low levels of asbestos exposure

Andrew Darnton
Health and Safety Executive
Epidemiology Unit

HSE

Asbestos-related diseases



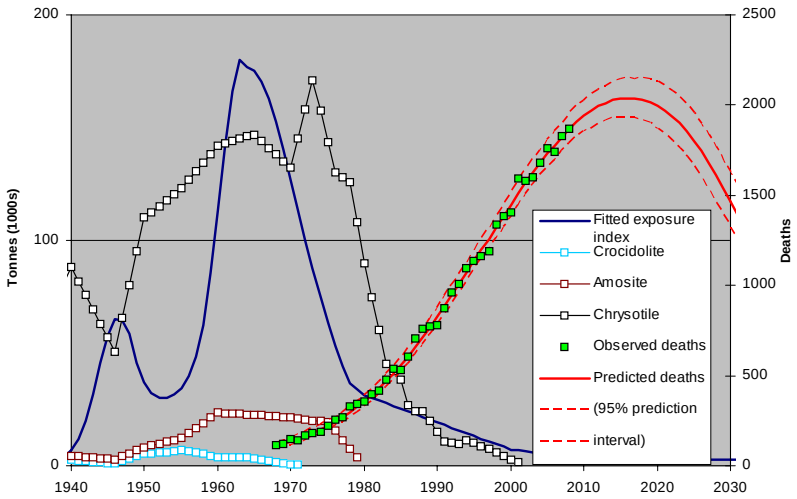
Mesothelioma, pleural thickening, pleural plaques

Lung cancer, Asbestosis

Other cancers: Laryngeal Stomach

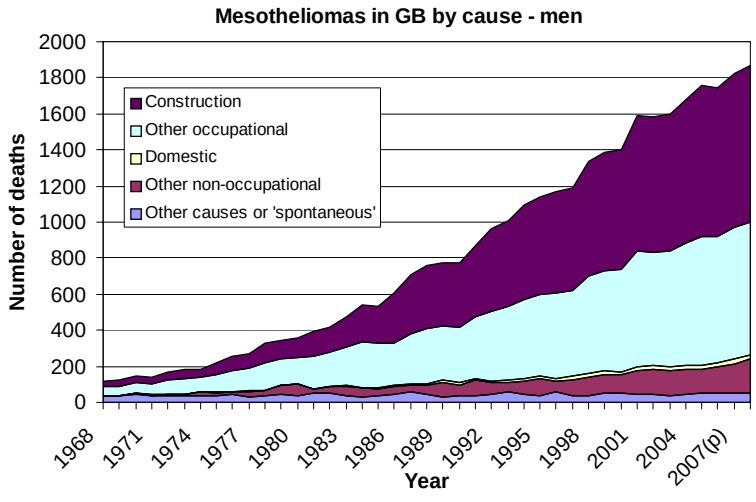
HSE

Mesothelioma in Great Britain – male deaths and projections, and asbestos imports



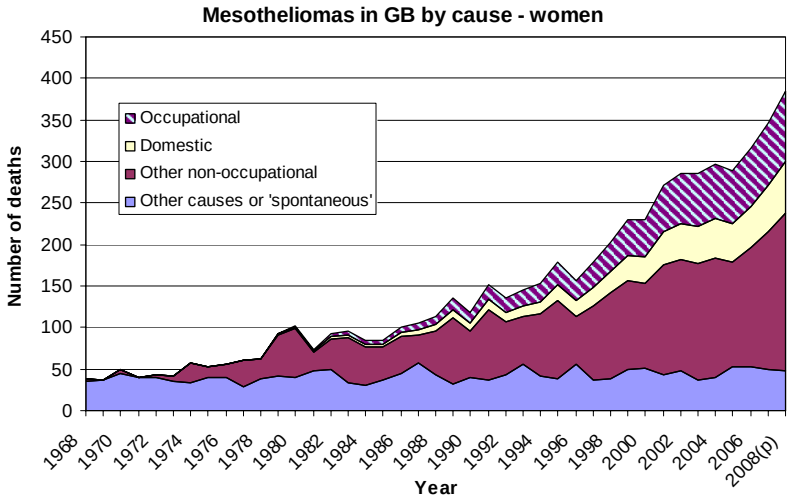
HSE

Sources of exposure: British mesothelioma case-control study



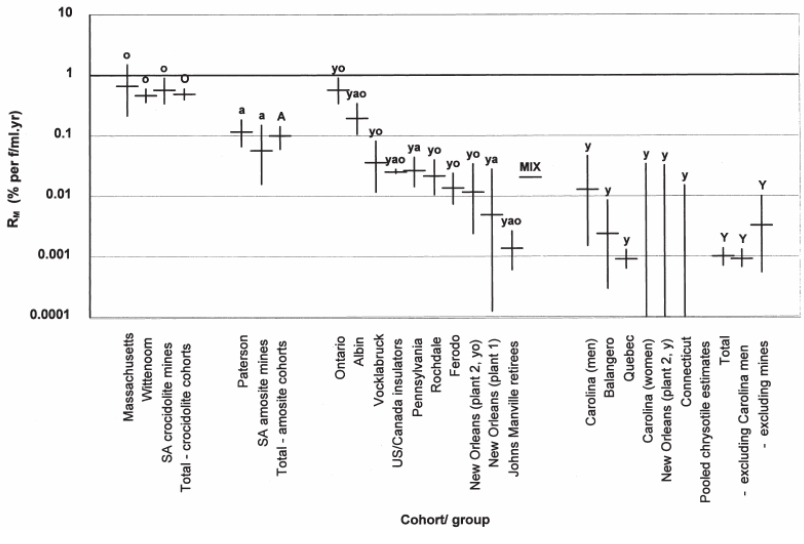
HSE

Sources of exposure



HSE

Can we predict the individual risk of future disease arising from specific asbestos exposures?



HSE

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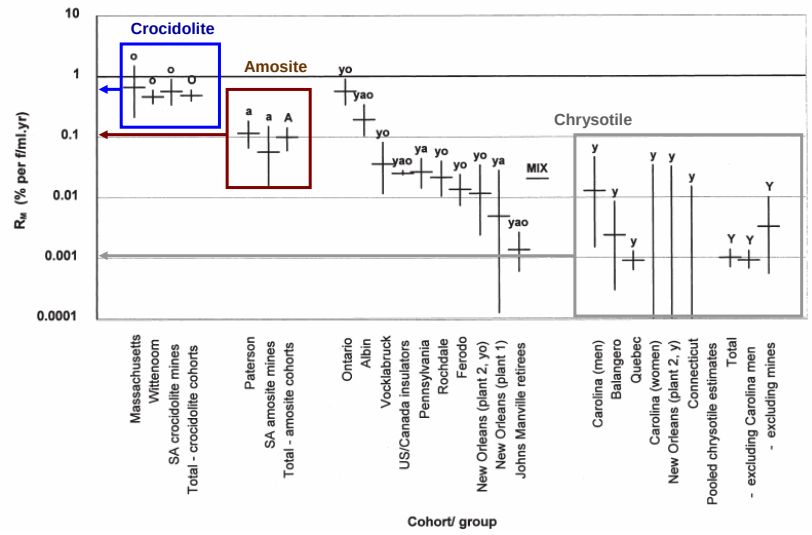


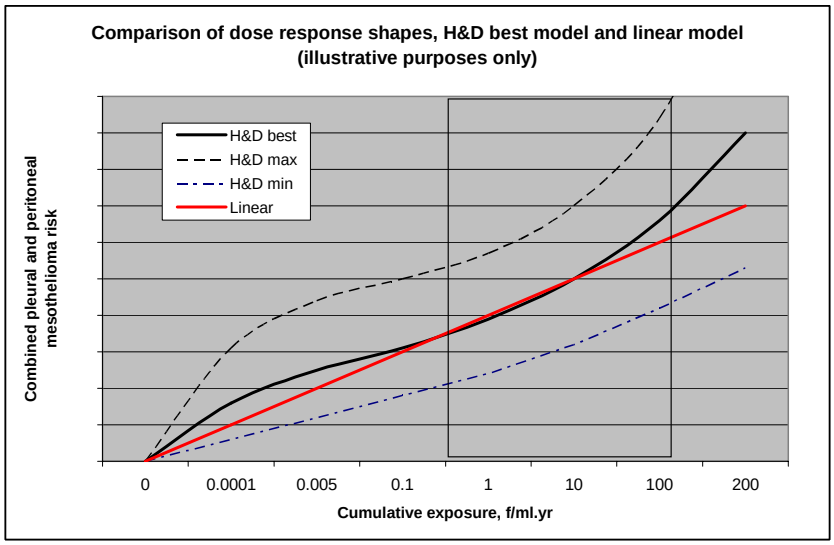
HSE

What we know about risk from studies of various groups of workers exposed to asbestos in the past:

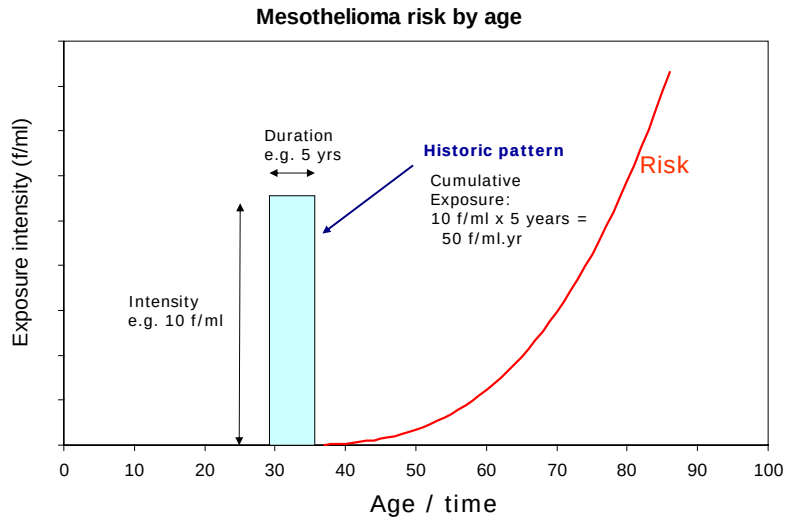
- Lifetime chance of developing mesothelioma depends on:
  - How many asbestos fibres were inhaled (cumulative exposure)
  - The time period over which they were inhaled
  - What type of asbestos fibres they were
  - The age at which fibres were first inhaled
- Reducing cumulative exposure (holding other factors constant) will reduce the risk
- There is no known threshold cumulative exposure below which there is no mesothelioma risk – though at some point risks become “negligible”
  - e.g. for some exposures the risk may only be a small fraction of the risk of developing mesothelioma spontaneously in the absence of any asbestos exposure
  - But, note that even where the individual risk is small, large populations subjected to such risks can result in an appreciable number of cases of disease occurring.
- In this context we cannot specify exposure limits which can be regarded as safe levels
- The regulatory approach is for exposures to be reduced to the minimum within the constraints of what is practicable

HSE

Uncertainty and extrapolation



Additional uncertainty due to the pattern of exposure



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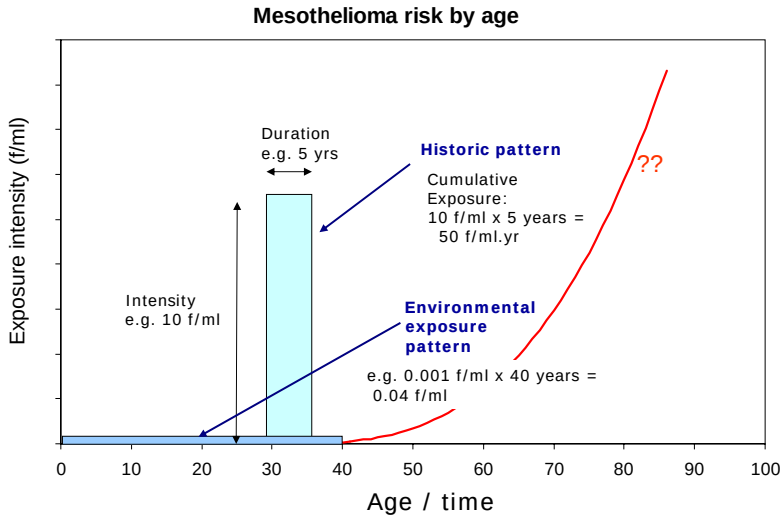

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WATCH committee conclusions

- Predictions of risk from available models are uncertain
- Extrapolations of risk models should not be regarded as reliable absolute risk values
- Limitations on reliability of predictions become more pronounced at low exposures
- Extrapolated risk estimates…are useful as rough indicators of the magnitude of risk…in different situations
- No consensus view about how appropriate to present risk estimates in numerical form
- Risks are associated with exposures below 0.1 f/ml.yr; safe thresholds are not identifiable
- Shouldn't be complacent even for low exposures (e.g. 0.01 f/ml.yrs) but active risk management is required

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Where does that leave us?

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Where does that leave us?

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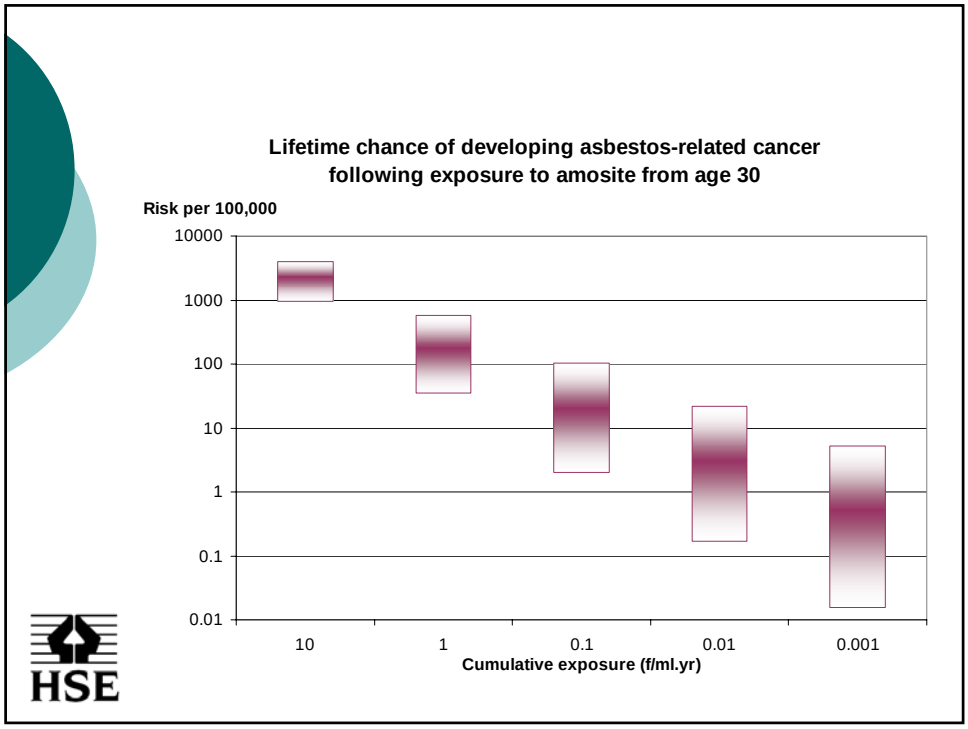

Where does that leave us?

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Asbestos Part 2A determinations – a legal perspective

CL:AIRE
Manchester November 2011

Andrew Wiseman

Head of Environmental Law

STEPHENSON HARWOOD

Asbestos & Part 2A

STEPHENSON HARWOOD

- Introduction
- Part 2A
  - The legislation
  - Statutory Guidance
  - Non statutory
- Where next?

Asbestos & Part 2A

STEPHENSON HARWOOD

- The legislation
  - Environmental Protection Act 1990 Part 2A
  - Environment Act 1995 s78A(2)

"…. any land which appears to the local authority …. to be in such a condition, by reason of substances in, on or under the land, that .... significant harm is being caused or there is a significant possibility of such harm being caused"

Asbestos & Part 2A

STEPHENSON HARWOOD

- Statutory Guidance
  - DEFRA Circular 01/2006
    - Table A (Annex 3 Para A.26)
      - What harm is regarded as significant (in relation to human beings)

        "Death, disease, serious injury …."

        The SH of SPoSH

Asbestos & Part 2A

STEPHENSON HARWOOD

- Statutory Guidance
  - DEFRA Circular 01/2006
    - Annex 3 Para A.28
      - The Local Authority should take into account the following when looking at whether PoSH is SPoSH:
        - Nature & degree of harm
        - Susceptibility of the receptors
        - Timescale the harm may occur
    - Table B sets out conditions for SPoSH
    - An unacceptable intake

Asbestos & Part 2A

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- Non Statutory Guidance
  - Guidance on the Legal Definition of Contaminated Land (July 2008)

"*.. Local Authorities must …. Conduct a science-based risk assessment which takes account of toxicological information, and site-specific and local circumstances"* (Para 23)

Part 2A –where next?

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- Government consultation
  - Responses currently being analysed
  - Revised Statutory Guidance shortly?
    - Potentially in force January 2012
  - Will it make a difference for these sites?

Category 1 - 4

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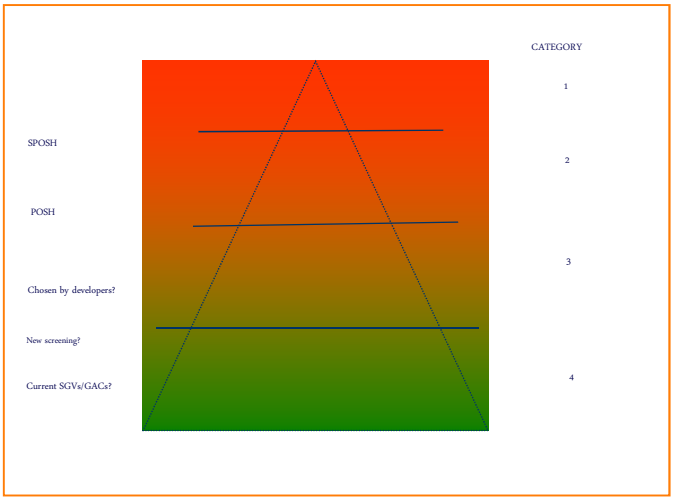

Part 2A

- Capital grant scheme
  - Less money
  - More focussed
  - Environment Agency run

Contact details

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Asbestos an Insurance Prospective

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CL:AIRE

November 2011

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Tysers

- Oldest independently owned Lloyd's Broker (1820)
- Specialise in Environmental, Property & Construction
- Foremost independent Broker in Environmental Risk
- Clients –
  - Property Owners, Developers
  - Funding Institutions
  - Pension Funds
  - Consultants
  - Contractors
  - Environmental Management
  - Industrial

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Willmore v Knowsley Metropolitan Borough Council 2011 UKSC10

The Supreme Court dismissed the defendant local authority's appeal against a finding that it was liable for the claimant's mesothelioma.

Background

Mrs Wilmore alleged that her mesothelioma had been caused by negligent exposure to asbestos whilst a pupil at a school in Knowsley from 1972-1979. The trial judge held the defendant, Knowsley Metropolitan Borough Council (Knowsley), liable. An appeal was mounted to the Court of Appeal on the basis that:

(i) The findings of fact were unsupported by the evidence; and
(ii) No analysis had been undertaken to determine whether any exposure was more than minimal.

The Court of Appeal dismissed the appeal, holding that there had been sufficient evidence to support the judge's findings in relation to two of the three situations in which culpable exposure had been alleged. Also, such exposure needed only to be more than minimal, trivial or inconsequential to become "material" and hence causative.

Willmore v Knowsley Metropolitan Borough Council 2011 UKSC10

It is disappointing that the Supreme Court failed to seize this opportunity to provide clarity as to the interpretation in practice of 'material' and more fundamentally to rein in adoption of the relaxed rule of causation to the quintessential *Fairchild* scenario, namely where a claimant's mesothelioma was probably attributable to occupational asbestos exposure but he cannot pinpoint which of a number of defendants was responsible. This rule uniquely benefits mesothelioma claimants, and by failing to require them to prove on the balance of probabilities that some culpable act or omission has caused injury – a hurdle which all other classes of claimant such as victims of medical accidents have to overcome – the court has reinforced this anomaly.

The Court's failure to align – even in a modest way – the evidential burden facing mesothelioma claimants with that facing claimants generally is particularly disappointing for local authorities. It remains permissible to argue that fleeting exposure in schools, swimming baths, or libraries for example is 'material', a term open to interpretation by the trial judge. Having refused to impose on mesothelioma claimants the additional requirement of proving that the risks from such exposure outweigh those from ambient exposure affecting the general population (not an onerous burden and one which only arises in cases involving extremely slight exposure), local authorities and indeed the occupiers of buildings generally will continue to be vulnerable to speculative claims such as those which led to these appeals.[1]

[1] Berrymans Lace Mawer LLP Case Summary

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In the United Kingdom over 2000 people a

year are diagnosed with mesothelioma

TYSERS
SINCE 1620

- Research from the actuarial profession asbestos working party suggests that people who are suffering from mesothlioma related illnesses and made a claim for compensation has doubled since 2004 – 2008
- The previous estimate was £4.9 billion for claims covering the period to 2040 now this estimate has doubled for the period to 2050
- Only around one third of people who are suffering from asbestos related illnesses made a claim in 2004 and this increased to two thirds in 2008.
- In 2006, the criteria for compensation changed to include individuals that had been exposed to asbestos, not just cases where there was evidence of asbestosis.

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The data was collected from 12 companies that participated in the survey and looked at claims for the following conditions:

- Pleural plaques
- Pleural thickening
- Mesothelioma
- Asbestosis
- Asbestos related lung cancer

Employers Liability Insurance

Employers Liability Insurance is required by law for any UK business that employs staff or uses labour only sub contractors

Employers Liability Insurance provides you with indemnity should an employee sustain an injury or disease during the course of his employment and seek compensation from his/her employer

Legal Definition

In the event of accidental injury sustained by any employee of the insured caused during the period of insurance and arising out of and in the course of their employment by the insured in the course of the trade or business, and within the territorial limits, the Insurance Company will indemnify the insured in respect of all sums which they become legally liable to pay as compensation and claimant's costs and expenses, for such injury.

Public Liability Insurance

Public Liability Insurance is sometimes referred to as third party liability cover and provides protection to you or your business in the event of a claim being brought against you for damage that you cause to someone elses' property or for injury to a member of the public caused by your negligence.

Who needs public liability insurance?

Public Liability insurance is not legally required in the UK for tradesmen but it is advisable to arrange cover. As a sub contractor you may need to provide proof of cover to a main contractor before you can work for them. The main contractor's insurance policy will contain a clause that they check that all sub contractors have cover in place on a regular basis.

Legal Definition

The Insurance Company will indemnity the insured against all sums which the insured shall become legally liable to pay as damages and claimants costs and expenses arising out of accidental;

- Injury to any person
- Physical loss of or physical damage to material property
- Obstruction, trespass, nuisance, wrongful arrest or interference with any right of way, light, air or water occurring within the territorial limits and resulting directly from the trade or business during the Period of Insurance

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Contractors Pollution Liability

Contractor Pollution Liability is also generally known as "CPL" cover. On some remediation projects Tysers recommend this cover is acquired as part of the main Long Term insurance program.

CPL is a specialist form of pollution liability insurance designed specifically to protect the pollution risks facing remediation or construction contractors that are working on sites which are potentially contaminated.

Such operations present an ongoing risk of pollution or contamination, as a result of disturbing or remobilising existing contaminants or following unanticipated discharge, leakage or spillage for example.

Increasingly many project specifications require adequate pollution liability insurance to be in place. Contractors can arrange this on a portfolio basis or on a project by project basis.

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Historical Contamination Cover

Insurance can be arranged for liabilities associated with pre-existing historic contamination. Cover can also be arranged for contingent liability exposures associated with previous divestments by the target company. It is possible to combine both operational and historic pollution cover into a single policy.

The policies can be extended to cover consequential losses such as business interruption or economic loss associated with contamination (e.g. loss in rental income, costs of relocation, diminution in property values etc).

In particular, the cover generally extends to the following:

- Third party claims for property damage or bodily injury
- Regulatory clean up costs - on or off site
- Legal defence costs, costs of investigation etc
- Change in law

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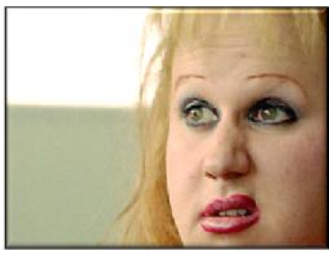
Professional Indemnity Insurance

Similar to Vicky Pollard.....

"Yeah but, no but, yeah but, no but..."



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Conclusion

- Claims increasing not decreasing
- See www.asbestosclaims.co.uk
  Personal injury claims are now big business for lawyers
- Awareness - A catalyst for change across the board
- Insurance purchased to "fit risk" not to "tick a box"
  Do not take cover for granted

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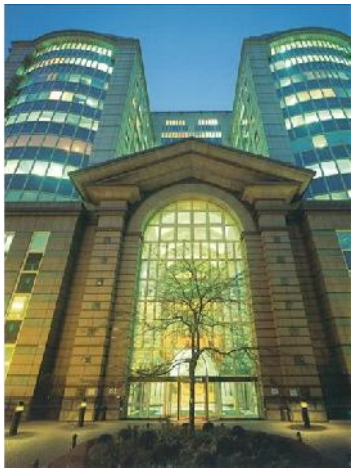

Speaker Biographies
Session 3: Sampling & Analysis – Soil and Air

Hazel Davidson
ALcontrol Laboratories
Technical Marketing Manager

Hazel Davidson has worked for ALcontrol Laboratories for thirty years, initially as an analyst, but then in a series of managerial roles. Special projects included the integration of several laboratory acquisitions, relocation of the laboratories from Chester to Hawarden, a Phare project in Bulgaria and Romania (implementing quality systems), and a UN project involving training for Iraqi environmental scientists in Jordan.

Hazel participates on several industry committees (BSi, MCERTS, SCA and EIC), is a frequent speaker at conferences, and runs several seminars each year for ALcontrol clients, as well as providing general technical support, both internally and externally.

She is a council member for BMTA and participates in the Land Quality forum for EPUK.

Dr Garry Burdett
HSL

Dr Burdett is an internationally recognised specialist in fibre/asbestos sampling and analysis. Over the last 20 years he has authored numerous reports and papers, relating to the assessment of environmental asbestos levels. He has worked extensively on international specialist committees dealing with asbestos; such as the World Health Organisation, the International Programme on Chemical Safety and the International Standards Organisation. He is currently the chair of HSE's WG2 of the Committee of Fibre Measurement. He has been involved in the development of various methods and strategies for asbestos monitoring; ranging from the contamination of pharmaceutical drugs to the assessment of asbestos contaminated land and releases from waste sites.

Robin Howie
Robin Howie Associates

Robin Howie has been involved in occupational hygiene since 1974 and has specialised in the asbestos area since the late 1970s. During the early 1990s he designed and led a project to determine the actual performance of respirators in the asbestos removal industry. The results of this study, which demonstrated that the powered respirators used in the industry provided protection factors of about 40 as against the 2000 indicated by HSE guidance such as HSG53, led to the revision of BS4275 and the adoption of Assigned Protection Factors in HSE guidance. Over the past 20 years he has prepared over 300 legal reports for compensation cases, mainly for asbestos-induced diseases, and is therefore well aware of the increasing number of such cases arising. The nature of many such cases over past 6-7 years has changed from claimants who were "heavily" exposed to asbestos to claimants whose exposures were relatively "light" and/or intermittent. This has highlighted his concerns about the consequences of low-level exposures to asbestos.

Robin gained a Diploma in Occupational Hygiene in 1982 and was President of the British Occupational Hygiene Society in 1997/98.

Analysis of Asbestos in Soil

Hazel Davidson
Technical Marketing Manager

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Asbestos in Soil

- **Diversity of asbestos materials**
- **Methods of analysis**
- **Problems and issues**
- **The way forward**

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Asbestos in Soil

- Types of asbestos: Chrysotile (white), Amosite (brown), Crocidolite (blue), Fibrous anthophyllite, tremolite and actinolite
- Chemically, they are fibrous forms of mineral silicates, chrysotile formula is $Mg_3Si_2O_5(OH)_4$, with the amphiboles including other elements such as iron in their structures
- Pre 1999, used in wide range of building and manufacturing products: roofing, lagging, insulation board, engine components
- Fibres are crystalline, non-biodegradable and split to form very fine fibres
- Proven link with respiratory diseases: asbestosis, mesothelioma, bronchial carcinoma, pleural plaques (and recently ovarian cancer)
- Can remain latent for 15 – 40 years

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Asbestos in Soil

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Asbestos in Soil

Definitions:

- ACM = asbestos containing material (anything between 0.1 – 90% asbestos)
- AC = asbestos cement (assumed to contain 10 – 15% asbestos)
- FA = fibrous asbestos (> 7 mm)
- AF = asbestos fines (< 7 mm)

So what is analysed when an asbestos test is requested?

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Asbestos in Soil

Common methods of analysis:

- Gross visual screening for ACM only
- Basic screening, magnification x 2 - 5, ACM and fibre clumps
- Detailed screening, magnification x 10 – 40, for fibres
- Identification – polarising or phase contrast microscopy (PLM or PCOM)
- Quantification: gravimetric (LoD 0.1%), sedimentation and fibre counting (LoD = 0.001%)

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Asbestos in Soil

Other methods:

- **Transmission electron microscopy (TEM)**
  LoD 0.0001%
- **Dust emission/fibre counting**
  LoD 0.002 fibres/ml
  (0.015 fibres/ml is the limit for buildings)

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Asbestos in Soil

Case Study

Sample 1 - contained cement, with a mass % asbestos above the waste limit, was calculated to have 22,356 respirable fibres/g.

Sample 2 - containing insulation (chrysotile only) was below the hazardous waste limit, but was calculated to have 265,937 respirable fibres/g.

Sample 3 - from a power station contained only loose fibres, was calculated to contain over 120 million respirable fibres/g.

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Test	Units			
Total Mass% Asbestos (i+ii)	Mass %	**0.117**	**0.088**	**2.880**
Quantification by PCOM (i)	Mass %	<0.001	0.002	2.880
Gravimetric Quantification (ii)	Mass %	0.117	0.086	
Breakdown of Gravimetric Analysis				
Mass of Sample	g	12133.40	9259.82	
ACMs present*		Cement	Insulation	
Mass of ACM in sample	g	94.73	9.39	
% ACM by mass	%	0.78	0.10	
% asbestos in ACM	%	15	85	
% asbestos in sample	%	0.12	0.09	
Potentially Respirable Fibres	**fibres/g**	**22,356**	**265,937**	**120,435,951**

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Asbestos in Soil

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These results show that:

- **Risk is not necessarily correlated to the amount of asbestos present**
- **Sample 3 is the most hazardous by far, and gravimetric analysis would have been unable to provide a result**
- **Respirable fibres are more useful in comparing relative risk**

Therefore a gravimetric quantification result is not enough to assess risk

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Asbestos in Soil

The big dichotomy…

- **> 0.1% w/w ACM in soil (all asbestos cement fragments)**
  - **hazardous waste**
  - **Low (potential) risk**
- **< 0.01% w/w ACM & free fibres in soil**
  - **Non-hazardous waste**
  - **High (potential) risk**

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Asbestos in Soil

- **What detection limit should be considered safe?**
- **Addison et al (1988) 'The Release of Dispersed Asbestos Fibres from Soils' showed that airborne fibre concentrations could be very high (> 20 f/ml) and even 0.001% of asbestos in a dry loose mixture was capable of producing airborne respirable asbestos concentrations in excess of the 0.01 f/ml clearance limit, while at the same time the respirable dust concentration remained below the nuisance dust OEL of 5 mg m~3.**

In view of recent court cases, this may not be appropriate

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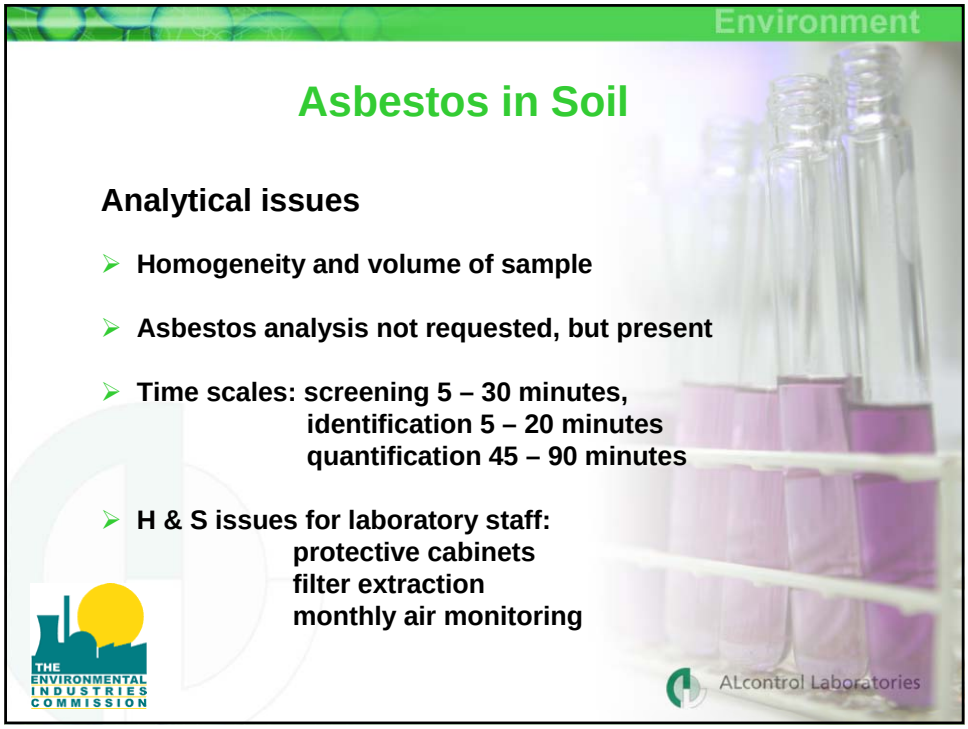
Environment
Asbestos in Soil
Analytical issues
Homogeneity and volume of sample
Asbestos analysis not requested, but present
Time scales: screening 5 – 30 minutes,
identification 5 – 20 minutes
quantification 45 – 90 minutes
H & S issues for laboratory staff:
protective cabinets
filter extraction
monthly air monitoring
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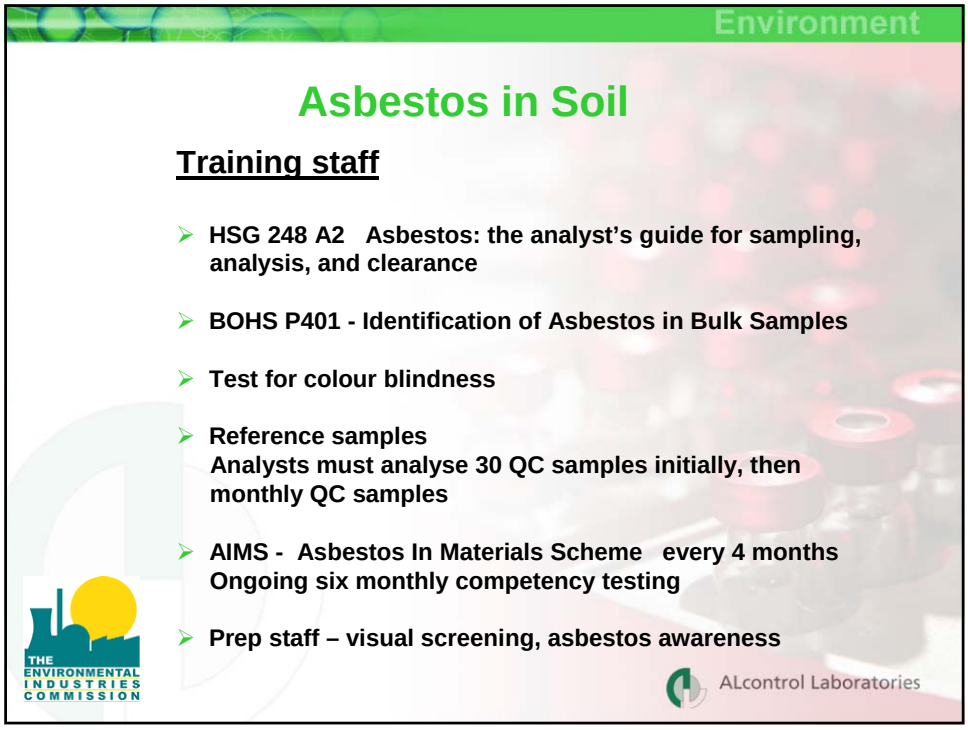
Environment
Asbestos in Soil
Training staff
HSG 248 A2 Asbestos: the analyst's guide for sampling, analysis, and clearance
BOHS P401 - Identification of Asbestos in Bulk Samples
Test for colour blindness
Reference samples
Analysts must analyse 30 QC samples initially, then monthly QC samples
AIMS - Asbestos In Materials Scheme every 4 months
Ongoing six monthly competency testing
Prep staff – visual screening, asbestos awareness
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Asbestos in Soil

Identification difficulties:

Asbestos fines are difficult to see,

both soils contain > 0.1% asbestos

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Asbestos in Soil

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From January to May 2011 at ALcontrol:

- **23,144 soil samples received**
- **5,440 scheduled for asbestos analysis (screen or ID) by the client = 23.5%**
- **1,517 additional samples scheduled for screening due to matrix type (concrete, brick, etc)**
- **289 of these found to be positive = 19.1%**
- **Of all asbestos tests (6957), 1879 were positive = 27.1%**

But what about the samples we don't test?

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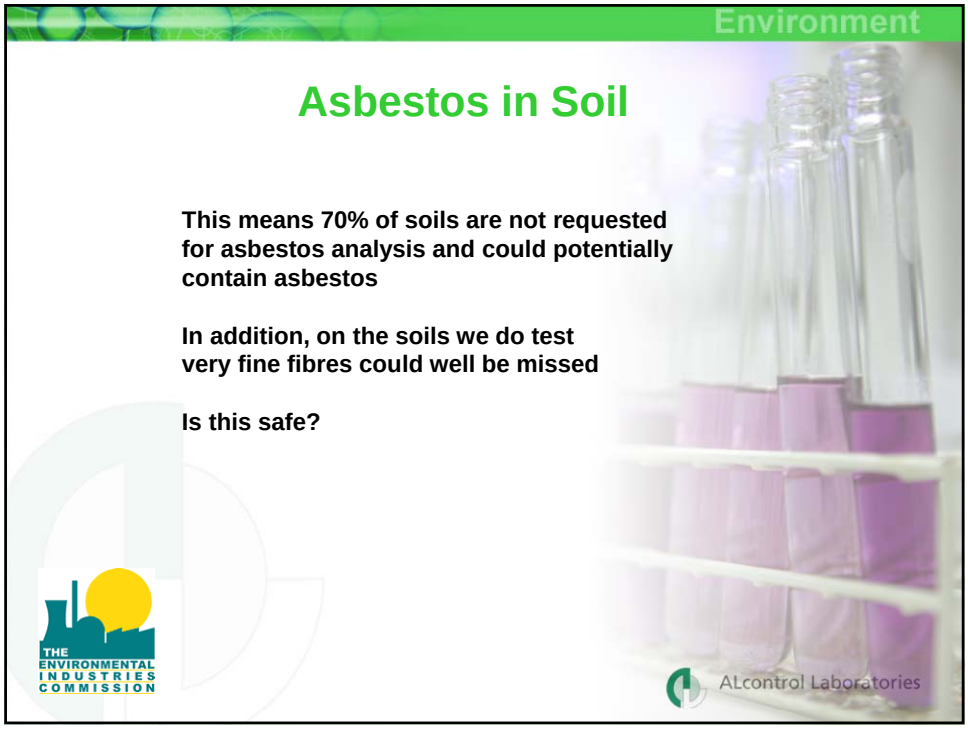
Environment
Asbestos in Soil
This means 70% of soils are not requested for asbestos analysis and could potentially contain asbestos
In addition, on the soils we do test very fine fibres could well be missed
Is this safe?
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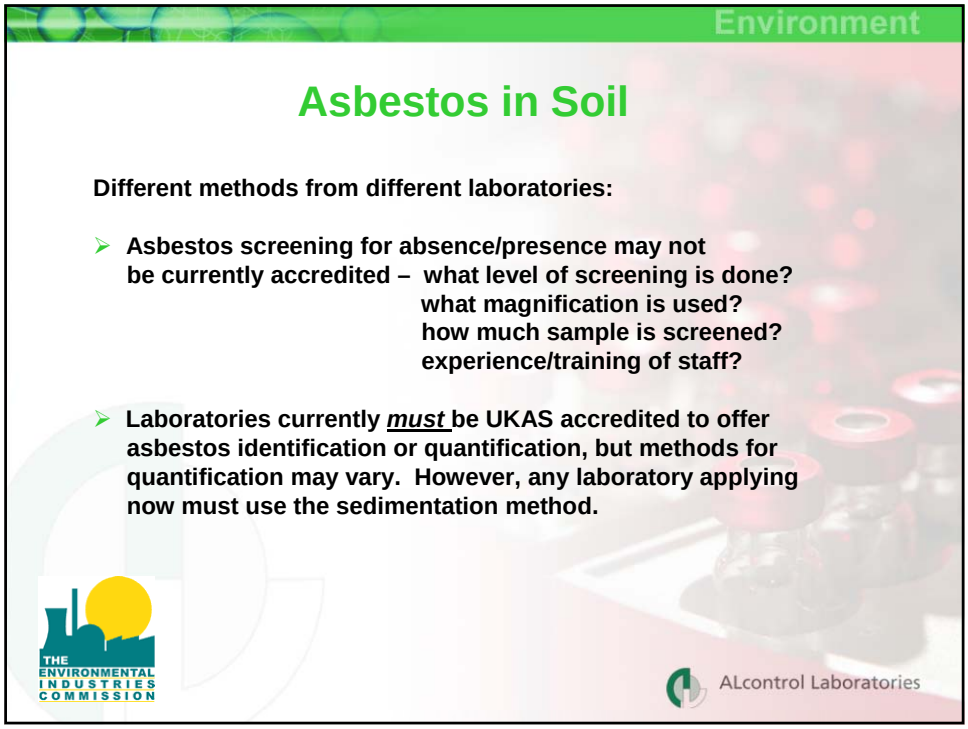
Environment
Asbestos in Soil
Different methods from different laboratories:
Asbestos screening for absence/presence may not be currently accredited – what level of screening is done?
what magnification is used?
how much sample is screened?
experience/training of staff?
Laboratories currently must be UKAS accredited to offer asbestos identification or quantification, but methods for quantification may vary. However, any laboratory applying now must use the sedimentation method.
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Environment

Asbestos in Soil - the way forward

- UKAS are working to ensure all labs offer consistent methods and are accredited
- The HSL are revising HSG 248 to hopefully reflect these methods
- CLAIRE are working on training modules for site staff
- CIRIA are working on a Guideline document

- EIC have set up a subgroup to lobby the EA/DEFRA - soil SGV document not released so far
- EIC/CL:AIRE organised asbestos technical event
- EIC produced survey on asbestos awareness – results under review

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Environment

Thank you

hazel.davidson@alcontrol.com

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Sampling and analytical methods for asbestos in soil

Garry Burdett
Health and Safety Laboratory, HSL, Buxton, SK17 9JN

www.hsl.gov.uk
An Agency of the Health and Safety Executive

Initial thoughts

- Regulatory authorities ask for a risk assessment.
- Big bits become little bits over time.
- Keep it simple better to take more samples to survey the site than carry out a very detailed analysis on a single sample to the nearest 0.0001 %.
- Build on existing methods and accreditation.
- Use a tiered approach - How many samples need quantification- this talk is about the lower tiers?

Hazard:- The potential to cause harm due to the presence of asbestos.

- Start:A vein of asbestos in host rock

- End: debris of asbestos products on soil surface or buried underneath.

Procedure for investigation 1

- **Hazard identification** – establishing contaminant sources;

e.g. Is asbestos present? Type and forms?

- **Hazard assessment** – analysing the potential for unacceptable risks,
- what pathways and receptors could be present,
- what pollutant linkages and effects could result

e.g. human exposure from working on, or disturbing soil with unbound asbestos leading to mesothelioma some 30-40 years later;

Procedure for investigation 2

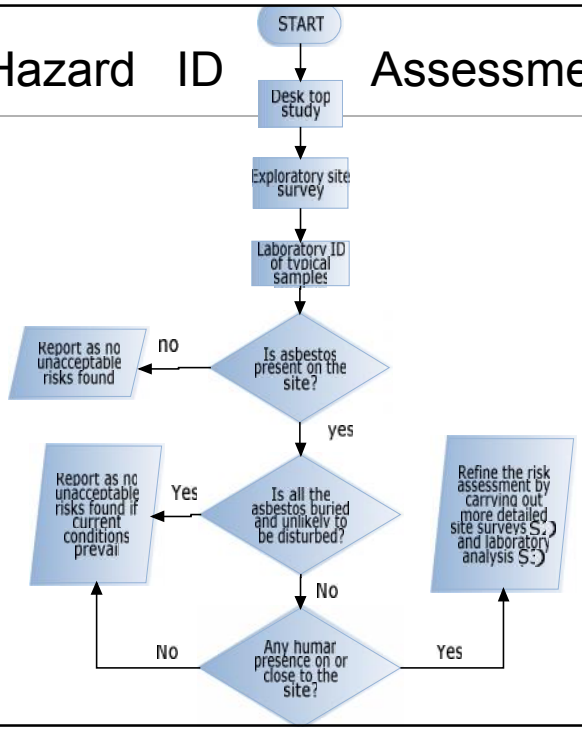
- **Risk estimation** – predicting the magnitude and probability of the possible consequences that may arise as a result of a hazard;

e.g. releasibility / cumulative exposure of humans to airborne asbestos fibres

- **Risk evaluation** – deciding whether a risk is unacceptable.

e.g. ALARP, appropriate use, dose-response extrapolation, societal decision.

Hazard ID Assessment



Regulatory assessment of hazard are based on the weight percent in soil.

- 0.0001% ?
- 0.001% UK ICRCL, RIVM (Amph), WA
- 0.01% RIVM (Chrysotile)
- 0.1% EU &UK Hazardous waste
- 0.25% US OWSER 2004
- 1% US EPA asbestos material

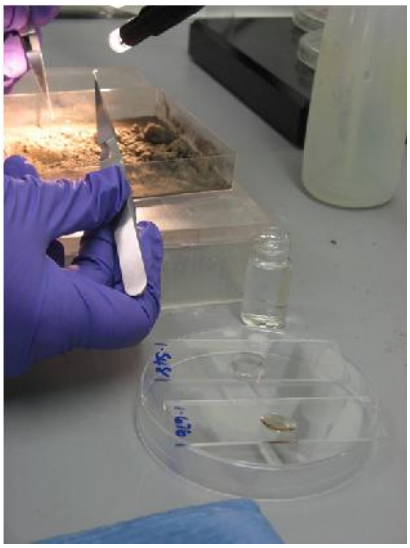
RIVM, 2003: Summary of airborne fibre measurements at 100 sites

- For less heavily contaminated soils, in which principally *bound* materials *<0.1% dry weight* and in one single instance unbound products *<0.01% dry weight* are present, no asbestos fibres are encountered in the air in any of the instances, even in respect of activities such as digging, tipping and sifting.

RIVM, 2003: Summary of airborne fibre measurements at 100 sites (2)

- Increased fibre concentrations in the air in excess of the maximum permissible release (MPR) level (0.1 f/ml) are only measured in respect of heavily contaminated soils with unbound asbestos (at least 10,000 mg/kg_{dw} *(>1% dry weight)*).
- In such situations even minor soil activity combined with dry weather (not *worst case* conditions) is sufficient for fibre concentrations in the air in excess of the NR level (1,000 fibre equivalents per m^3 of air (*0.001 f/ml*).

HSG 248 annex 1



- Searches bulk samples to identify asbestos.
- Typically if followed carefully will detect unbound asbestos down to ~0.001 %
- Requires representative sub-sample

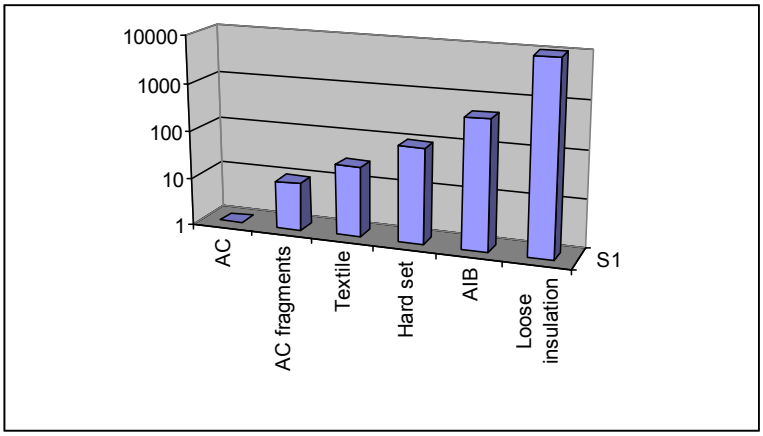
Analysis of bound asbestos

- Suspected bound asbestos materials can be picked up on site and weighed and approx. weight % concentration calculated.
- Requires a combination of experience (surveyors guide HSG 264) and/or laboratory identification (analysts guide HSG 248 appendix 2.)

Further assessment

- Different types of bound asbestos will release different amounts of fibres, so the type of asbestos products present will affect how readily asbestos airborne is released “Dustiness”.
- Also the type of asbestos is important for risk assessment.
- Strategies to assess the types and amounts of products present may be needed at some sites.

Relative release of fibres from products by dustiness testing



Summary

- HSG 248 (appendix 2) has wide use and identifies whether asbestos is present.
- It is a multistage process:
  - Examination by eye (macroscopic)
  - Stereomicroscopic examination / search for asbestos fibre bundles.
  - Extraction and identification of fibre bundles.
  - High magnification search of representative sub-sample (if no fibres found).

Extended HSG 248 analysis

- Minor changes at the start to pick through a tray of soil or a sieved fraction by eye for asbestos pieces.
- Changes at the end for better separation of unbound fibres if no asbestos found by the stereomicroscope examination after careful search.
- Simple water release and settlement time method with analysis of drop mounts in RI liquids to confirm asbestos.

MONITORING LOW LEVEL EXPOSURES TO ASBESTOS IN AIR

Robin Howie,
Robin Howie Associates,
Edinburgh

Causes for concern

Over the period 1999-2008 there were 2933 female mesothelioma deaths and annual deaths increased from 229 in 1999 to 384 in 2008; a 68% increase.

See Table meso02 on HSE website

Causes for concern

Over the period 2002-05 nine female occupations that one would not expect to have caused exposure to asbestos at work (e.g. teachers, nurses, office workers, cleaners) had mesothelioma rates about 7 times higher than the idiopathic mesothelioma rate.

HSE (c2007)

Causes for concern

Why?

Asbestos levels in buildings

Massey et al (1997) concluded that a mean airborne level of 0.0005 f/ml was typical in buildings containing asbestos materials which were in good condition.

Risk levels in buildings

From Hodgson & Darnton (2000) an occupational exposure to 0.0005 f/ml of amosite at about age 20 would generate a mesothelioma risk of about 6/million/year.

Risk levels in buildings

If such an exposure were experienced by 5 year-olds for a year in school, the mesothelioma risk would be about 10/million/year.

Risk levels in buildings

If such an exposure were experienced by new-born babies in the home for 140 hours per week for a year, the mesothelioma risk would be about 70/million/year.

"Acceptability" of risk

HSE has defined the "Acceptable" level of risk as being 1/million/year.

HSE (1987, 1992, 2001)

"Acceptability" of risk

All the above levels exceed the "acceptable" criterion.

What is meant by "low level"

"Low level" is herein taken as the airborne fibre concentrations at which the risk will exceed the "Acceptable" level.

Current sampling technique

The current sampling technique is often described as having a sensitivity limit of 0.01 f/ml.

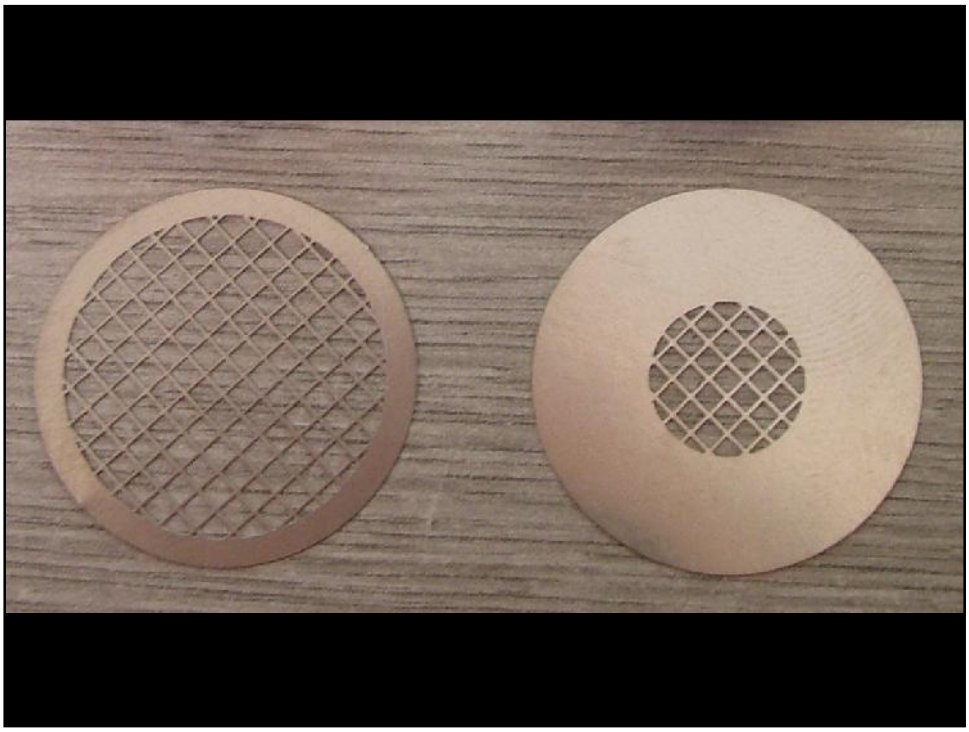
Current sampling technique

The actual sensitivity limit is a minimum count of 20 fibres.

Only if 200 areas are counted an about 23 mm diameter of the filter and the sample volume is 480 l, the sensitivity limit is 0.01 f/ml.

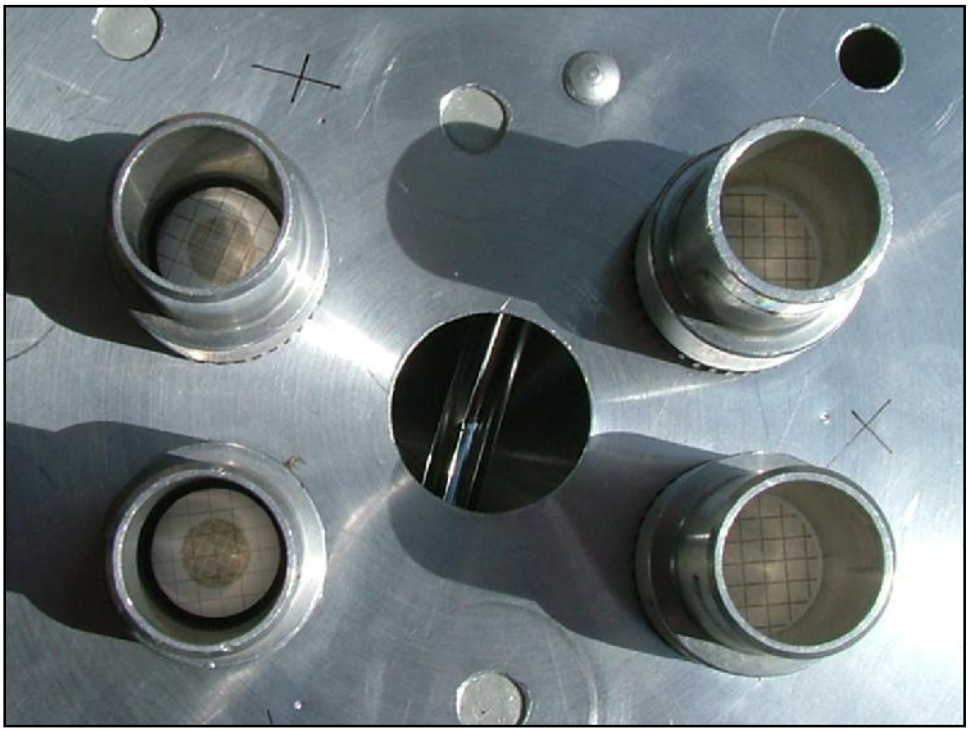
Improved sampling technique

If the filter area is decreased, if the sample volume is increased and/or more than 200 areas are counted, the sensitivity limit for 20 fibres counted can be reduced.



Improved sampling technique

For example, if the effective area of the filter is reduced to 78.5 mm^2 from about 400 mm^2 and the sampling volume is increased to 2 m^3, the sensitivity limit is reduced to 0.0005 f/ml. If 400 areas are counted the sensitivity limit can be reduced by a further factor of 2.



Improved sampling technique

From experience, the use of such reduced area filters in dusty environments can give an obscuration problem for sample volumes above about 2 m^3.

Improved sampling technique

Personal sampling cyclones can be used to minimise the number of non-fibrous particles collected on the filter.

However, the Higgins-Dewel cyclone has been found to give a more uniform deposition over a 10 mm diameter than the current cyclones.

Improved sampling technique

Note that operating the cyclone at 2.2 l/min with a 10 mm diameter support plate gives a sample density that would require a flow of 11 l/min with a standard 22.4 mm diameter support plate.

Improved sampling technique

Cyclones or elutriators can minimise obscuration for sample volumes up to about 5 m^3 with reduced area filter: so giving sensitivities down to about 0.0002 fibres/ml for 200 areas counted.

Improved sampling technique

Evaluation of size selectors with reduced cut sizes may further reduce obscuration.

Improved sampling technique

Note that WHO (1997) foresees the use of reduced area filters to improve sensitivity and the use of size selecting samplers to reduce the disturbance from large particles.

Future work

We need to build up a library base of high sensitivity samples so that the relationship between current and improved sensitivity sampling can be assessed.

If anyone wishes to test the reduced area support plates I can supply samples.

Speaker Biographies
Session 4: Case Studies

Paul Nathanail
University of Nottingham and Land Quality Management Ltd

Paul is Professor of Engineering Geology at the University of Nottingham (www.nottingham.ac.uk) and Managing Director of Land Quality Management Ltd (www.lqm.co.uk). His research, teaching and consultancy interests span the spectrum of risk based contaminated land management and sustainable brownfield regeneration.

LQM use sound science to help their clients make defencible decisions. LQM were pioneers in the use of bioaccessibility in human health risk assessment and worked with CIEH to publish generic assessment criteria some 82 common contaminants. Their Dose-Response Roadmaps promise to revolutionise and speed up the evaluation of SPOSH under Part 2A.

Paul runs the University of Nottingham's unique vocational masters program which over the past decade has helped many consultants and regulators hone their skills in risk based contaminated land management. The course is delivered entirely online meaning delegates can study from the comfort of their own homes or offices anywhere in the world.

Dr Alan Jones
IOM

Dr Alan Jones is widely involved in consultancy and research at the Institute of Occupational Medicine. He is currently a senior consultant and his main focus is now on assessing asbestos risks in the workplace and general environment. In recent years, he has acted as expert witness in over 60 civil litigation cases and has worked with many clients helping assess the significance of asbestos contamination in soils in connection with both planning approvals and determination of contaminated land. Alan has published over 100 papers and reports, including work for the European Commission and the UK Health and Safety Executive. Information about the IOM's work and publications can be obtained from www.iom-world.org.

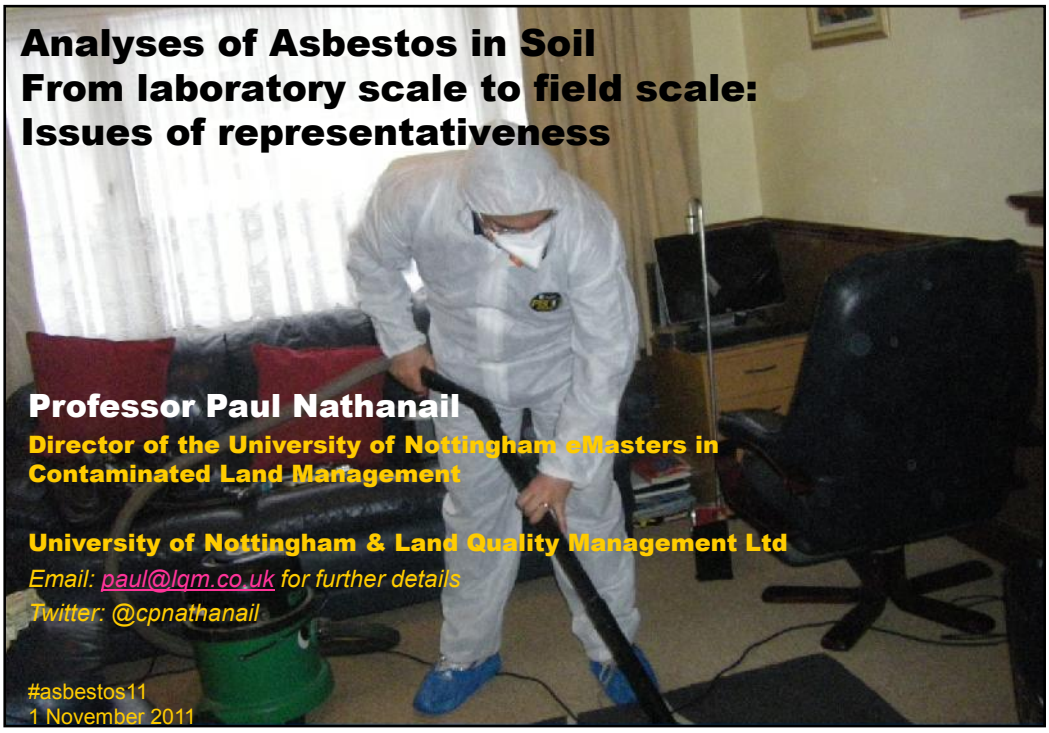
Anna Spinks
Wolverhampton City Council

Anna Spinks is the Principal Environmental Health Officer at Wolverhampton City Council responsible for contaminated land issues. She has a master's degree in Environmental Technology and over ten years experience of working with a wide range of contaminated land issues.

Steve Edgar
VertaseFLI

Steve is part of the CL:AIRE Technology and Research Group (TRG) and is a geologist whom has worked in the brownfield and contaminated land sector since the mid 1990's. He started his career in environmental consultancy before joining a technology based remediation contractor where he worked on a variety of projects and technologies many in their early stages of development. As a Director at VertaseFLI he oversees offices in Sheffield and Manchester as well as managing some of the most challenging remediation projects from a "hands on" perspective. He has played a pivotal role in the development of the business and establishing VertaseFLI as one of the largest, leading and most well respected, technically qualified remediation contractors in the UK.

Steve has experience of remediating and managing many different contaminants in both soil and groundwater including in recent times a significant amount of work with pesticides, herbicides, chlorinated solvents, radioactive materials and asbestos. VertaseFLI is a specialist remediation contractor and a true design and build remediation specialist, amongst a select group of companies able to offer a comprehensive in-house service for all types of contamination.


Analyses of Asbestos in Soil
From laboratory scale to field scale:
Issues of representativeness
Professor Paul Nathanail
Director of the University of Nottingham eMasters in Contaminated Land Management
University of Nottingham & Land Quality Management Ltd
Email: paul@lqm.co.uk for further details
Twitter: @cpnathanail
#asbestos11
1 November 2011


Start with the end in mind
Samples are rarely representative
Analysis is not sufficient
Visual inspection provides increased volume of support at low cost
Competency in field based visual inspection is essential
Describe
Inspect
Sample
Test
Assess
Look again
2
BABEL FISH
THE BABEL FISH IS SMALL, YELLOW, LEECHLIKE,
AND PROBABLY THE ODDEST THING IN THE UNIVERSE.
IT FEEDS ON BRAIN WAVE ENERGY, ABSORBING ALL
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Risk based contaminated land management

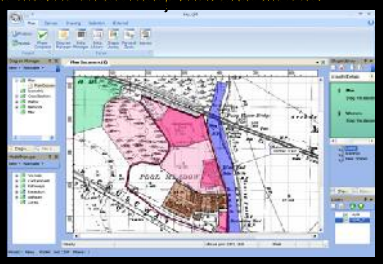
The process

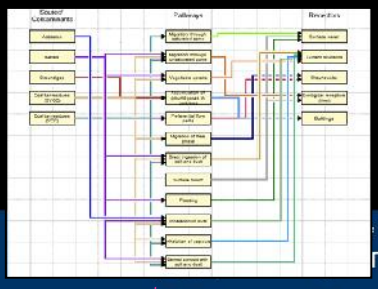
Step 1	**Determine Legislative Context**
Step 2	**Hazard Identification** What is it?
Step 3	**Hazard Assessment** What is the context?
Step 4	**Risk Estimation** How much?
Step 5	**Risk Evaluation** Decision on acceptability

Uncertainty Magnitude and consequences

Sustainability appraisal ???

The methodology conceptual site model





After McCaffrey, Street & Nathanail 2007
SNIFFER UK CCO 2

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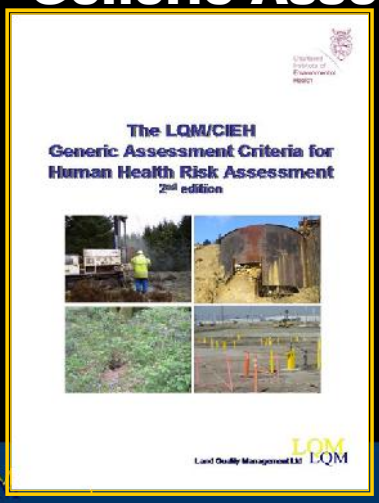
Policy drives science
Developing the LQM/CIEH Generic Assessment Criteria



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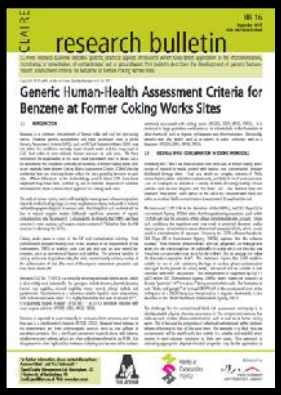
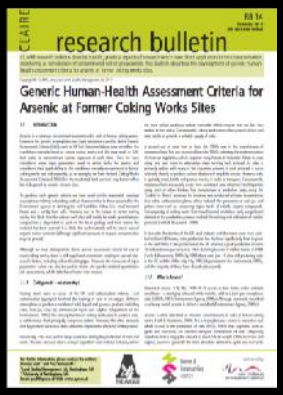
Coking works assessment criteria: As, Benzene, BaP





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Detailed Risk Assessment: Bioavailability

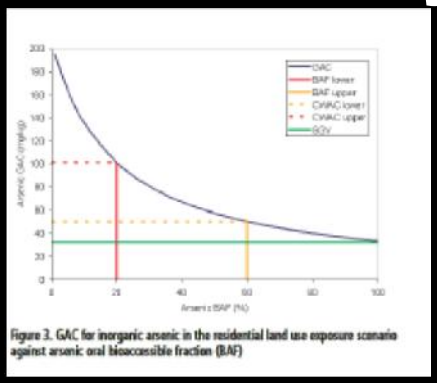

Figure 3. GAC for inorganic arsenic in the residential land use exposure scenario against arsenic oral bioaccessible fraction (BAF)

Variation of Arsenic assessment criterion with bioavailability

Date for your diaries:

September 2013
#bioavailability13
Nottingham

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16 November 2011

Investigation and Inspection of Land Affected by Asbestos

- What types of asbestos are of concern?
- What are the health risks associated with asbestos?
- Can you predict risk from soil concentration data?
- Is there any UK guidance on asbestos in soils?
- What policies and guidance exist in other countries relating to asbestos in soils?
- What tests are available for asbestos and are they relevant to Part 2A inspection?
- What approaches have been adopted to asbestos related Part 2A inspections in the UK?
- How can you assess if SPOSH may exist?
- What remedial options are available?

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Representative

"One that serves as an example or type for others of the same classification."

1. Representing, depicting, or portraying or able to do so.
2. Authorized to act as an official delegate or agent.
3. Of or characteristic of government by representation.
4. **Like or typical of others of the same class.**

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Representative sample

- **– one that to all intents and purposes is identical to a volume of material**

Maximum size of material present in substantial quantities (mm)	Weight to be taken for test (kg)
75	60
40	25
25	13
19	6.5
12.5	3.5
10	1.5
6.6	0.75
4.75	0.4

Table 6.1 Sample size necessary for particle size distribution tests

Soil type	Maximum soil particle size (mm)	Minimum sample dimension (mm)	Minimum sample mass
Silt/clay	0.06	0.3—0.6	<0.1g
Sand	2	10—20	2—15g
Fine gravel	6	30—60	50—400g
Medium gravel	20	100—200	2— 16 kg
Coarse gravel	60	300—600	50—400 kg
Cobbles	200	1000—2000	2—15t

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0.1%

- 1m3 = 1,000,000cm3 = 1000 litres
- 0.1% = 1,000cm3 = 1 litre
- So for ca. two tonnes of soil we can have 1 litre of asbestos

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volume

1m^3

- ca 4 standard wheelie bins
- ca 20 Ford Focus fuel tanks
- ca 12 70kg adults

1 litre

- Petrol
- Water
- Wine
- Beer
- milk

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The Basics of Bayesian Statistics

- **Bayes' Rule:**
- **$p(\theta|y) = p(y|\theta)p(\theta)/p(y)$**
- **where θ are our parameters and y is our data.**
- **We have a posterior density, sampling density (or likelihood), prior density, and a normalizing constant (which we typically do not need to find).**

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- **Given a lab result of greater than 0.1% and a non detect visual screen, what is the real soil asbestos concentration?**

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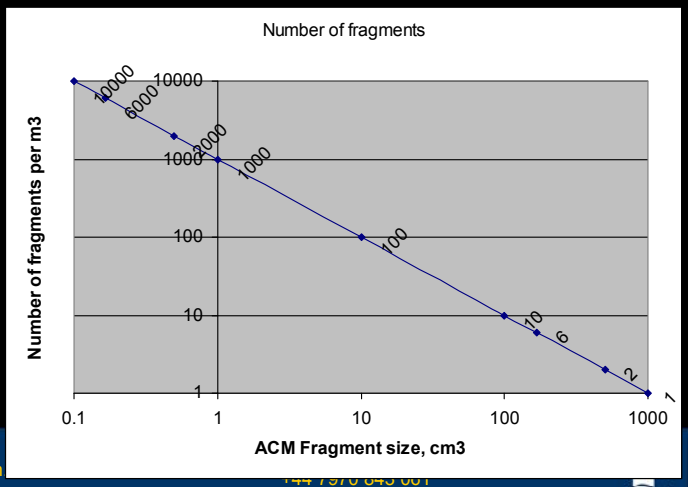
Number of ACM fragments per cubic metre of soil as a function of fragment size at 0.1%



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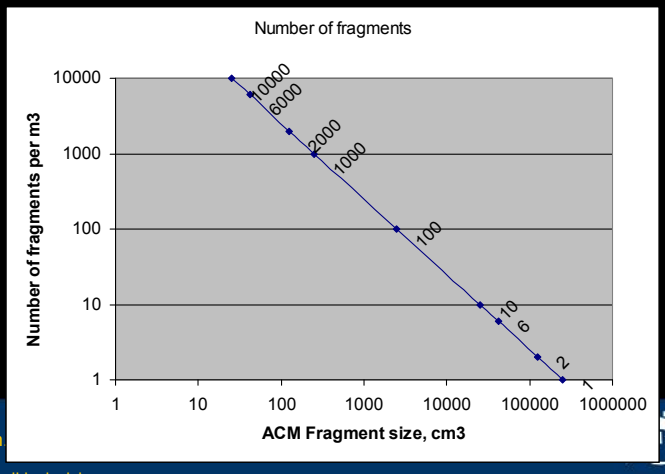
Number of ACM fragments per 250m³ of soil as a function of fragment size at 0.1%



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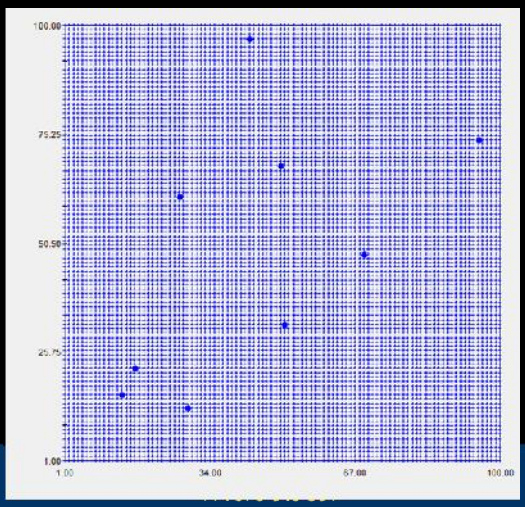
So how well would we do? What percentage of the dots are LARGE dots?



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Combined estimate of ACM content

- **Function of:**
  - **Lab analysis & confidence**
  - **Visual inspection & confidence**

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The relevance of the lab analysis depends on the confidence in the visual inspection

- Begin with the training of lab operatives
- Roll out to harsher site environments
- Continual programme of callibration
- Feedback

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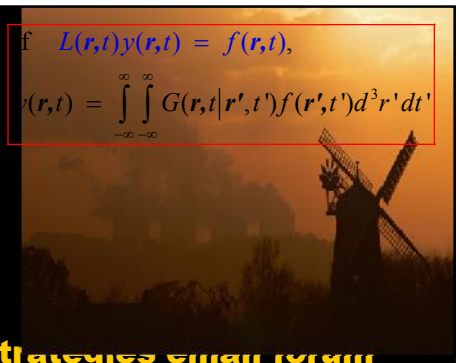
Thanks for your attention...



Questions and discussion?

- paul@lqm.co.uk
- @cpnathanail
- #asbestos11

Invitation to join:

Join the contaminated-land-strategies email forum by sending an email to jiscmail@jiscmail.ac.uk containing the following text in the main message:

join contaminated-land-strategies FirstName Surname

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Risk Assessment/Determination under SPOSH – a problem holder's perspective

Alan Jones, Anna Spinks

WORKING FOR A HEALTHY FUTURE

Introduction

- Asbestos was discovered during an investigation into chemical contamination on a housing estate in Wolverhampton
- In excess of 800 houses
- Early screening revealed a problem but not the extent
- No UK guidance on acceptable levels for asbestos in soils was available
- Engaged consultants JPB and the IOM to look at the issue

Outlining the Situation

- **Not** asbestos cement sheeting
- **Mostly** amosite lagging
- Plus a range of other industrial ACMs

Outlining the Situation (cont.)

- These materials are in the top and shallow soils of people's gardens
- Where owners garden and children play and can inhale the disturbed fibres

What We Did (1)

- WCC launched an estate wide investigation into the presence of asbestos in soils
- We designed methodology that was robust and reliable

What we did (2)

- Soil Investigations
  - The more we looked, the more asbestos we found
  - 307 properties sampled – effort focussed on the more contaminated areas of the estate
  - Almost 2500 samples (16 tonnes!)

What We Did (3)

- Ambient air monitoring
  - 5 weeks during summers of 2008 & 2009
  - Around 90 samples, SEM analysis
- Indoor Air sampling
  - In 3 houses
  - Chose three houses with significantly contaminated gardens

Investigation Results 1

- Contamination affected the whole estate
- Some areas worse than others
- Asbestos in 249 of the 307 gardens
- Most common asbestos: Amosite (84% of samples containing asbestos)
- Most Common ACM: loose insulation
- Free fibres common but at low concentrations

Investigation Results 2

- Highest average garden concentration: 1.2% asbestos in soil
- 8 gardens over 0.1% asbestos in soil
- 86 gardens over 0.01%

In a small 50 m^2 garden:

0.1% in the top 40 cm is almost 50 Kg asbestos

Investigation Results 3

Ambient air:

<0.00003 f/ml

Indoor air:

one airborne fibre detected: <0.0002 f/ml

Other samples:

<0.00007 f/ml

Risk assessment

- Route of exposure
  - Inhalation, outdoor activities
- Playing, gardening
  - Dry weather
- 90 hours per year
- Estimated conc^{n} in air @ 0.1% asbestos in soil

  = 0.01 f/ml

Risk Assessment 2

- HEI model of exposure-response
- Risk: 1 in 100,000 at around 0.02% amosite in soil
- Risk: 1 in 100,000 at around 0.06% chrysotile in soil
  - Assumed no risk from asbestos cement in garden soil

Conclusions (1)

- WCC have declared 82 properties as contaminated under Part 2a on the basis of this risk assessment process
- Confident of SPOSH as have followed the general approach to risk assessment indicated in the statutory guidance
- Confident in the scientific and technical assessment of the individual risks arising from the site specific pollutant linkages presented on this site

Conclusions (2)

- Lack of UK guidance
  - made the situation more challenging both for technical reasons and for communications with residents
  - gives no reassurance or backing to decisions a LA has to make
- WCC still have no timescales as to when the gardens will be remediated
- The residents continue to live with the asbestos in their gardens and the worry associated with it

More Information

- If you would like more information about what we have done contact us!

- Anna Spinks – Wolverhampton City Council – anna.spinks@wolverhampton.gov.uk
- Alan Jones – Institute of Occupational Medicine – alan.jones@iom-world.org or Alastair Robertson – alastair.robertson@iom-world.org
- Neil Moorby – Johnson Poole & Bloomer – Neil.Moorby@jpb.co.uk

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Investigation and Remediation of Asbestos in Soils

Practical Experiences in Contaminated Land

Steve Edgar
VertaseFLI Limited

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Presentation Contents

- Background
- Investigation: What We See As Contractors
- Assessment of Asbestos Both During and Post Remediation
- Remediation Case Studies
- Food For Thought

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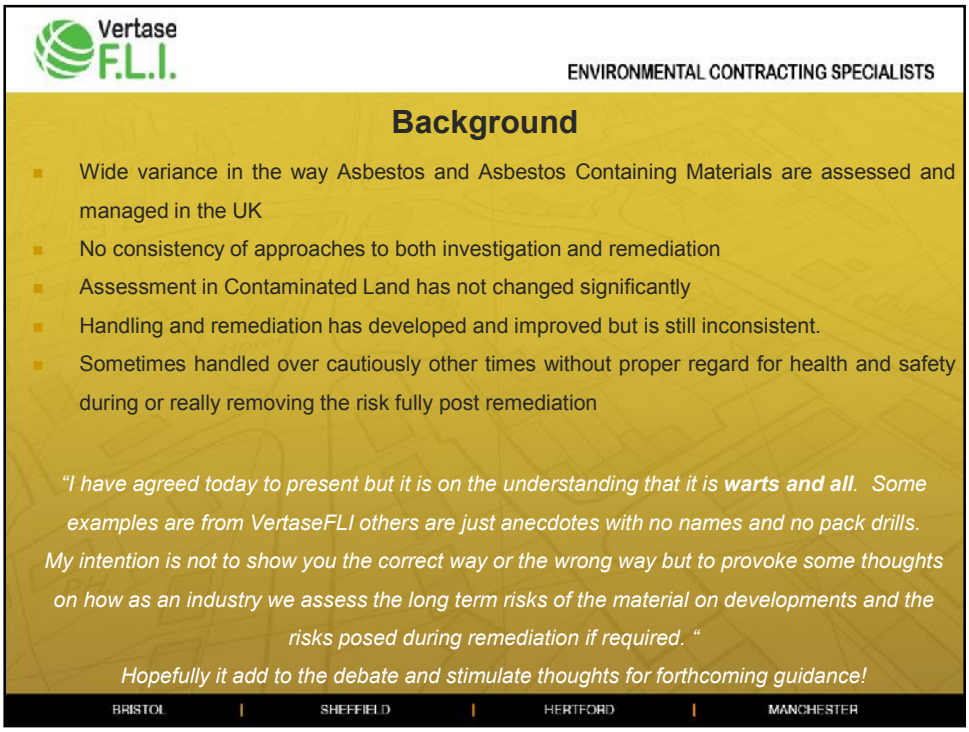
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Background
Wide variance in the way Asbestos and Asbestos Containing Materials are assessed and managed in the UK
No consistency of approaches to both investigation and remediation
Assessment in Contaminated Land has not changed significantly
Handling and remediation has developed and improved but is still inconsistent.
Sometimes handled over cautiously other times without proper regard for health and safety during or really removing the risk fully post remediation
"I have agreed today to present but it is on the understanding that it is warts and all. Some examples are from VertaseFLI others are just anecdotes with no names and no pack drills. My intention is not to show you the correct way or the wrong way but to provoke some thoughts on how as an industry we assess the long term risks of the material on developments and the risks posed during remediation if required. "
Hopefully it add to the debate and stimulate thoughts for forthcoming guidance!
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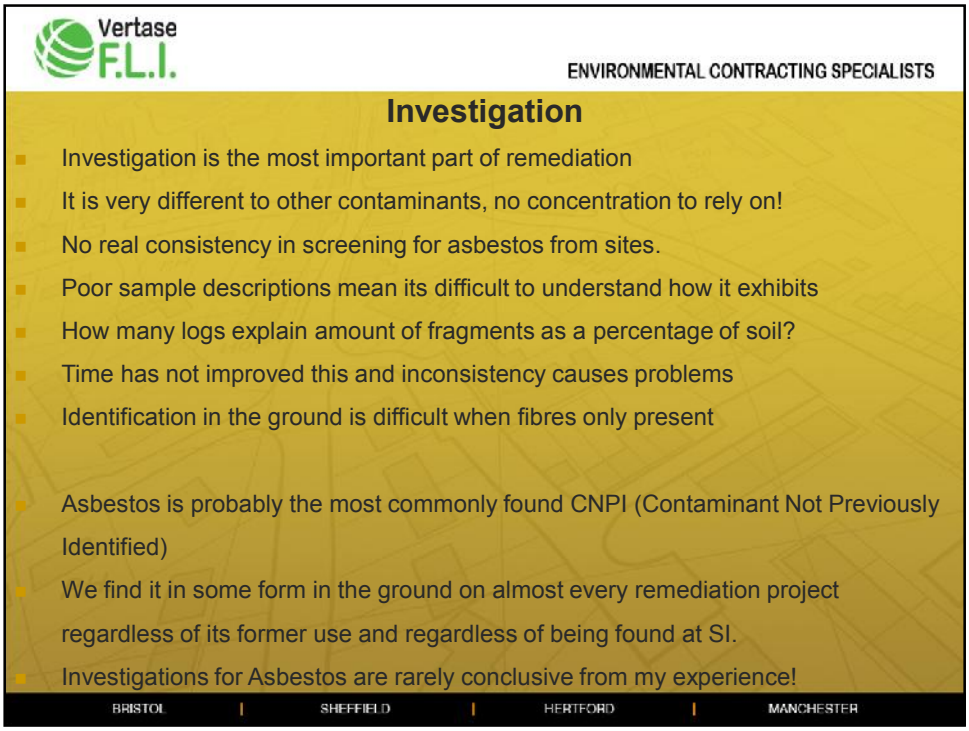
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Investigation
Investigation is the most important part of remediation
It is very different to other contaminants, no concentration to rely on!
No real consistency in screening for asbestos from sites.
Poor sample descriptions mean its difficult to understand how it exhibits
How many logs explain amount of fragments as a percentage of soil?
Time has not improved this and inconsistency causes problems
Identification in the ground is difficult when fibres only present
Asbestos is probably the most commonly found CNPI (Contaminant Not Previously Identified)
We find it in some form in the ground on almost every remediation project regardless of its former use and regardless of being found at SI.
Investigations for Asbestos are rarely conclusive from my experience!
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Reliable Sample Method?

Do the vagrancies of SI mean we are limited in our assessment?

Can we make a risk based decision from this?

Do we need better Investigation & sampling protocols?

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Hit or Miss?

Did we get the fragment in the sample?

Is the matrix full of fibres?

Was it even tested at all?

Does it matter?

Above all we need to be sure we have checked

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Fully Considered?

How much risk does this fragment present?

Does deterioration matter in short and long term exposures?

Does anyone consider condition in risk assessments?

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Case Study 1:

Former Tile Works

The Problem

- Site buildings contained asbestos
- Significant SI completed no asbestos noted in logs. None scheduled for testing
- Other remediation and earthworks required
- Demolition by others
- During pre-start walkover + SI engineer noted asbestos in demo arisings and in trial pits.
- Expanded works to delineate asbestos
- Employed consultant
- Assessed risks and materials
- Resulted in £ significant additional costs
- 6 weeks delay to agree methodology with regulators
- Alarmingly, recent enough to matter!!

Actions and Observations

- Sampling done on a regular grid below ground and from all stockpiles
- Samples screened on site and described. Fragments separated and identified assessment of fragment condition
- Matrix screened for fibres
- Selected excavation and disposal.
- Monitoring during works via dust sampling and lab screening
- PPE and RPE worn during works but were precautions taken by others at SI given the lack of consideration?

Message: Poor investigation costs serious money and programme. Also puts people at risk during works.

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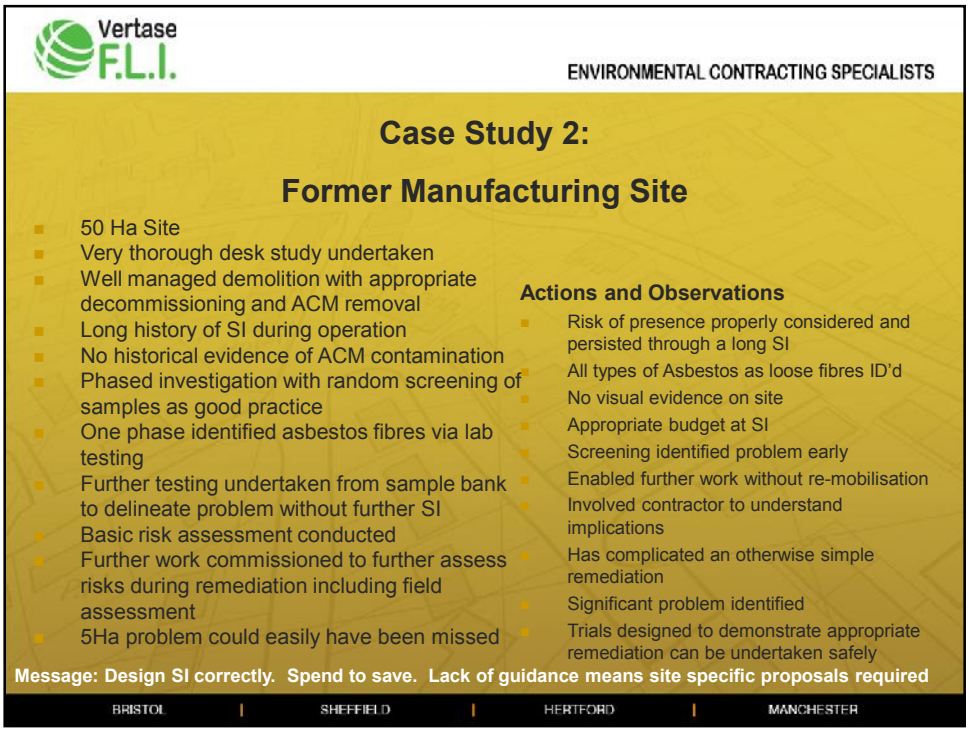
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Case Study 2:
Former Manufacturing Site
50 Ha Site
Very thorough desk study undertaken
Well managed demolition with appropriate decommissioning and ACM removal
Long history of SI during operation
No historical evidence of ACM contamination
Phased investigation with random screening of samples as good practice
One phase identified asbestos fibres via lab testing
Further testing undertaken from sample bank to delineate problem without further SI
Basic risk assessment conducted
Further work commissioned to further assess risks during remediation including field assessment
5Ha problem could easily have been missed
Actions and Observations
Risk of presence properly considered and persisted through a long SI
All types of Asbestos as loose fibres ID'd
No visual evidence on site
Appropriate budget at SI
Screening identified problem early
Enabled further work without re-mobilisation
Involved contractor to understand implications
Has complicated an otherwise simple remediation
Significant problem identified
Trials designed to demonstrate appropriate remediation can be undertaken safely
Message: Design SI correctly. Spend to save. Lack of guidance means site specific proposals required
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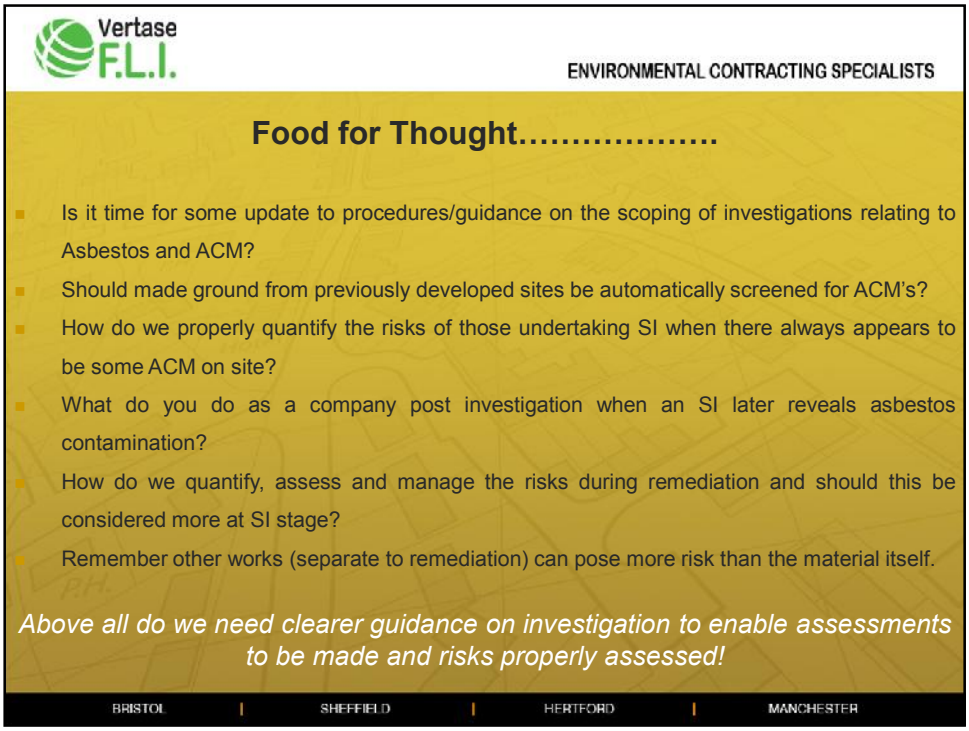
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Food for Thought……
Is it time for some update to procedures/guidance on the scoping of investigations relating to Asbestos and ACM?
Should made ground from previously developed sites be automatically screened for ACM's?
How do we properly quantify the risks of those undertaking SI when there always appears to be some ACM on site?
What do you do as a company post investigation when an SI later reveals asbestos contamination?
How do we quantify, assess and manage the risks during remediation and should this be considered more at SI stage?
Remember other works (separate to remediation) can pose more risk than the material itself.
Above all do we need clearer guidance on investigation to enable assessments to be made and risks properly assessed!
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Assessment
I have never seen what I would call a comprehensive fully considered quantitative risk assessment relating to long term exposure to asbestos from soils
I have seen and been involved with some good assessments for managing risks during works and in order to reduce risks post remediation
Its emotional, poorly understood and possibly the most difficult Contaminated Land issue to communicate.
What's worse 100mg/kg BaP or 1 asbestos fibre per sample!
THE TOXICOLOGY BASIS NEEDS TO BE ABSOLUTELY CRYSTAL CLEAR TO ALL WITHOUT AMBIGUITY
Message: Few truly understand and the industry needs clear unambiguous guidance on toxicology and assessment.
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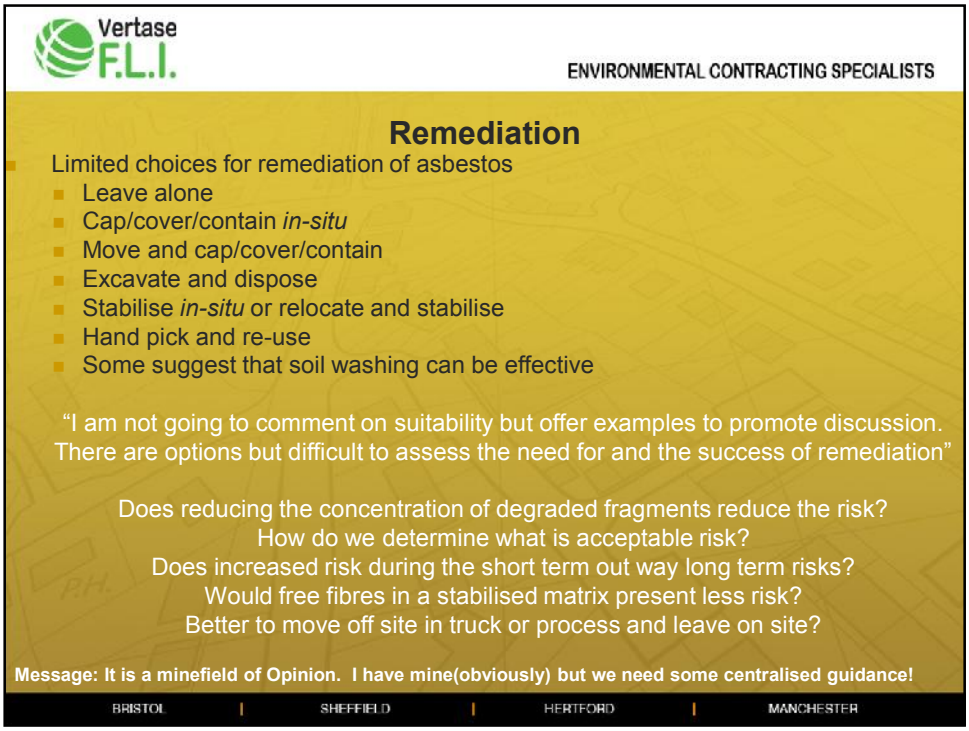
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Remediation
Limited choices for remediation of asbestos
Leave alone
Cap/cover/contain in-situ
Move and cap/cover/contain
Excavate and dispose
Stabilise in-situ or relocate and stabilise
Hand pick and re-use
Some suggest that soil washing can be effective
"I am not going to comment on suitability but offer examples to promote discussion. There are options but difficult to assess the need for and the success of remediation"
Does reducing the concentration of degraded fragments reduce the risk?
How do we determine what is acceptable risk?
Does increased risk during the short term out way long term risks?
Would free fibres in a stabilised matrix present less risk?
Better to move off site in truck or process and leave on site?
Message: It is a minefield of Opinion. I have mine(obviously) but we need some centralised guidance!
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Remediation Case Study 1

Typical picking station used to reduce the concentration of asbestos fragments in recycled soils.

- Cement Bonded Asbestos in soils.
- Determined that it should be reduced in concentration to enable re-use on site under a cover system to reduce long term liabilities
- Un-bonded materials segregated and disposed off site
- By picking the fragments risk during other works seen to be reduced
- Recognised that it could NOT be considered asbestos free due to limitations of picking

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Remediation Case Study 2

Dust Suppression, Decontamination Facilities and Control Zones controlling access along with area specific plant are essential when undertaking works with asbestos in soils

- Cement Bonded ACM in soils.
- Materials had to be moved to remove structures and enable Civils works
- First proposal to excavate and dispose. Project Team felt that this was moving the problem and commercially not acceptable
- Excavations undertaken by VFLI with materials hand picked and materials relocated on site in controlled cell. All at risk areas proved and validated

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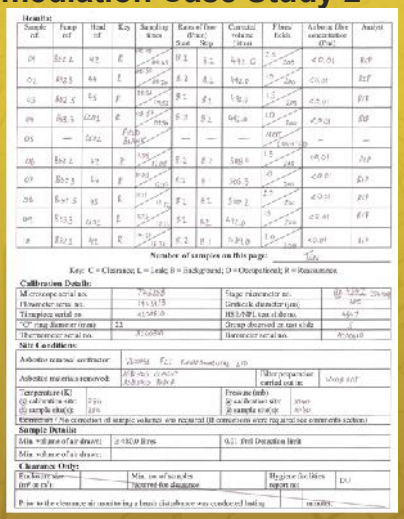
Remediation Case Study 2



Excellent qualified and experienced staff (P407?) and appropriate re-assurance monitoring for both dust and fibres are also important.

There is no guidance for this relating to our sort of work and it is always difficult to explain to clients

- Risk assessments and developed method statements require verification
- Dust monitoring to demonstrate control essential
- Re-assurance sampling with analyst on site
- Technically competent and experienced individuals whom understand remediation and asbestos
- Discuss and agree scope of works, control and monitoring with regulators

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Remediation Case Study 2

- Tenting and enclosures almost always inappropriate
- Works must be undertaken
- Most appropriate way forward needs to be found

Controlled practices on site and good verification. Thorough work essential to clear an area for safe working by others.

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Remediation Case Study 2

- Cleared areas to enable others to work safely without restriction
- Problems relocated on site but long term risks reduced
- Re-assurance monitoring and PPE all in place

Controlled practices on site and good verification. Thorough work essential to clear an area for safe working by others.

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More Food for Thought…….

- When do you stop looking for ACM in Soils?
- Should there be an assumption of presence?
- How do we balance the short term risks for workers against longer terms risks in-situ and during construction?
- Are technology based solutions appropriate and feasible. Do they address risks?
- How do we assess exposure from the works. Is there room for some best practice guidance?
- Should it be left in place if at all possible?
- Or should we actively seek to remove and control the material for the future?

"Above all do we need clearer guidance on investigation to enable more accurate assessments to be made and risks properly assessed before remediation is undertaken and for during remediation?"

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THANK YOU.
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Membership

The CL:AIRE Membership Scheme consists of two Membership types: Technical and Corporate, which provide different services, and are outlined in more detail in this brochure and at www.claire.co.uk/membership. Nevertheless, both Technical and Corporate Member organisations are encouraged to feed problems, concerns and needs through CL:AIRE to be tabled, prioritised and tackled for resolution – the more information provided, the sooner sector problems can be addressed.

The key principles of CL:AIRE's Membership are to:

- Collect and share intelligent market information to enable the development of better regulation that can maintain and improve standards
- Provide increased visibility of organisations operating at the highest levels in the redevelopment sector
- Listen to and act on sector problems, concern and needs
- Help sustain CL:AIRE

Members will be asked to provide CL:AIRE with relevant sector information which, when analysed collectively, will support the development of the industry initiatives and allow the production of a State of the Market Report to which all contributors will be given access.

Technical Membership

The overriding concept of the Technical Membership Scheme is to ***work in partnership with industry*** and provide a trusted home for sector information which would be shared with its contributors to provide market intelligence and be used to develop better regulation and increase business efficiency.

Benefits

Technical Member organisations will receive:

- A copy of CL:AIRE's annual State of the Market Report
- Exclusive fees for attending CL:AIRE events and training courses
- The opportunity to carry out CL:AIRE demonstration projects/bulletins
- Access to the CL:AIRE Register of Projects
- Invitations to regular Business Networking events
- Automatic sign up to CL:AIRE's twice monthly eAlerts containing industry information on news and events
- Personalised PDF Membership certificate
- Access to the online publications library which includes 'Easy Access' versions written for individuals from a non-technical background:
  - Technology Demonstration Project (TDP) Reports
  - Research Project (RP) Reports
  - Snapshot PDFs providing essential summaries, conclusions and lessons learned from CL:AIRE projects
  - Articles, perspectives and survey summaries
  - Past event and training presentations

CL:AIRE Technical Membership is available for an annual contribution of **£500** per organisation and Technical Member organisations are also asked to agree to a Memorandum of Agreement which acknowledges the goodwill between the Technical Member and CL:AIRE.

Corporate Membership

In addition to the benefits offered to Technical Member organisations, Corporate Members will receive:

- Your organisation's logo, website URL and 100 word profile on the CL:AIRE website
- Use of the CL:AIRE Corporate Member logo as evidence of your commitment to sustainable regeneration
- Profile in CL:AIRE News eAlert
- A shared voice on how CL:AIRE is run
- Hotline for general Contaminated / Brownfield land enquiries
- Exclusive Member fees for access to the Tender Support Scheme
- Access to the CL:AIRE Register of Projects
- Exclusive Member fees when using the Definition of Waste: Development Industry Code of Practice Support Service
- Priority branding options to gain presence and show evidence of support for environmental concerns through sustainable regeneration.

CL:AIRE Corporate Membership is available for an annual contribution of **£3,000** per organisation.

Further information regarding membership, including FAQs, can be found at www.claire.co.uk/membership

Email: enquiries@claire.co.uk
Website: www.claire.co.uk

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