February 2000

Presentation on "Contaminated Land and Environmental Protection" by Jonathan Barber and Deborah Todd, Senior Environmental Scientists with Laing Technology Group.

Construction Chairman Warwick Adams welcomed the speakers to the meeting and said that they would deal with different aspects of this very important subject. Jonathan started by outlining his topics as follows: -

- What is contamination?
- Its Implications!
- How is it assessed?
- Remedial Works
- Health Risks

In addressing this problem, he said, it was useful to start off by defining what was '**Contaminated Land**' by referring to the Environmental Act 1995 which stated:-

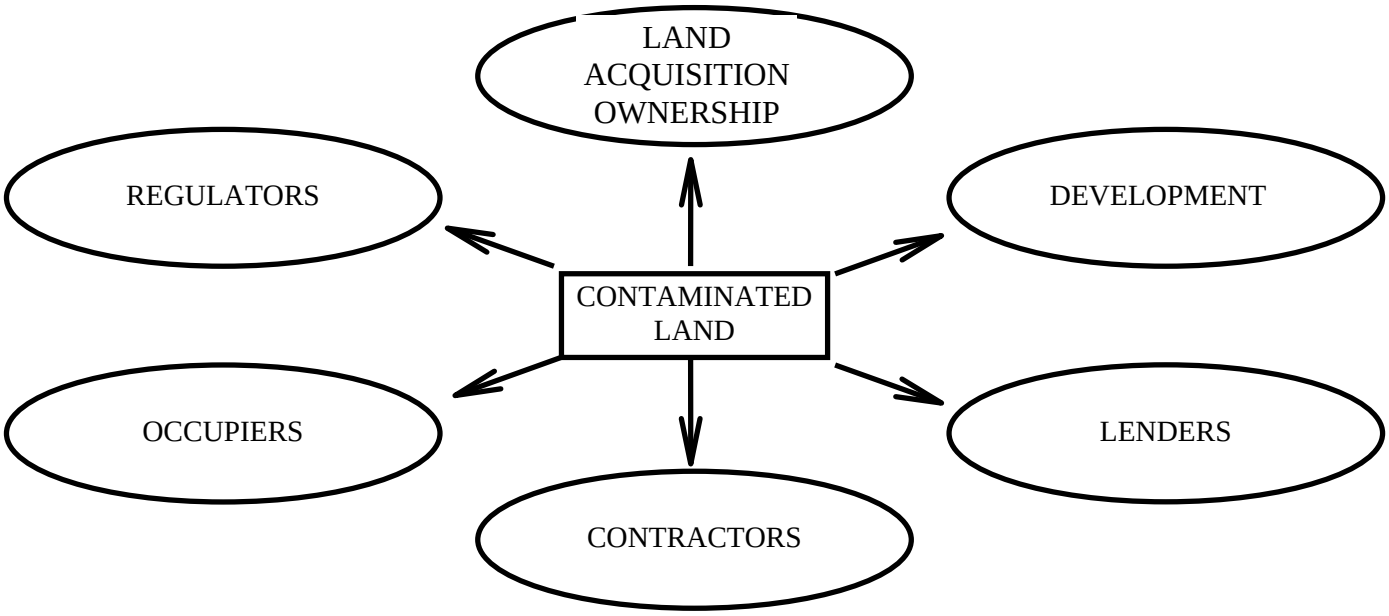
> **"Contaminated Land" is any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that -**
>
> **(a) significant harm " is being caused" or there is "significant possibility of such harm being caused"; or**
>
> **(b) "pollution of controlled waters is being, or is likely to be caused"**

He commented that this was not a really comprehensive definition because it did not directly link contamination and the impact it would have on the health of the surrounding population.

He went on to describe why is Contamination an important issue and offered the following reasons:-

- Health and Safety impacts on employees and the local community through exposure to contaminants (dust, gases, volatiles, etc).
- There is a liability for the cost of disposal or remediation of contamination.
- There are liability costs arising from unexpected cross-contamination.
- Delays to work programmes through unexpected or accidental contamination,
- Pollution of groundwater and / or surface waters
- Pollution of surrounding land.

Jonathan added that it was important to understand the pattern of relationships between various agencies involved in contaminated land issues on brownfield sites and illustrated the following:-



On the ways by which land became contaminated, Jonathan said that it is generally present as a result of previous uses of the site, or adjacent land. Examples of these include:

- Gas Works,
- Chemical Works,
- Railways,
- Manufacturing Processes, etc...

Depending on ground conditions; geology, hydrogeology, etc contamination can be either transported off site or within the site e.g. via: groundwater migration, previous groundworks etc.

Ground contamination can also be the result of uncontrolled demolition of buildings on the site, for example:

Demolition of buildings without removal of hazardous materials such as:

- Asbestos
- MMMF
- Radioactive smoke detectors

It is important, first-of-all, to determine whether the ground is contaminated. The first tell-tale signs may be that you see something which looks odd, or strangely coloured, or makes your eyes water! Or - you could smell something unusual or unpleasant or which makes you cough or sneeze. Formal systems of investigation are usually divided into two types:-

PHASE I	Site History Present Use Potential for ground contamination
PHASE II	Intrusive site investigation providing environmental data to evaluate risks to the environment and to health. It may also involve an intrusive hazardous materials survey of any buildings on site.

If contaminants are present on site, the process to follow is:-

- Determine the contaminants.
- Delineate contamination
- Determine the risks to
    - Ground/Groundwater/Air
    - Environment
    - Health of site workers and end users.
- Identify relevant legislation e.g.
    - Environmental Protection Act 1990
    - COSHH

The next stage is to apply the Remedial Works required, which could be

- 'Strip and Tip' and/or 'In-situ Treatments (e.g. Bio-degredation. Lime stabilisation, etc,)

All leading to:-

- Exposure to Contaminants
- Health and Safety Implications

Requiring:-

- Health and Safety Plan
- Environmental Management Plan
- In-situ Monitoring e.g. dust, gas, groundwater.
- Medical Surveillance (if necessary)
- PPE (if necessary)

In assessing the risks associated with Remedial Work it is necessary to

- Identify the Sources - any substance or group of substances with the potential to cause harm.
- Identify the Pathways - a route by which the **Source** could reach a **Target**
- Identify the Receptors - a **Target** which could be significantly harmed by the Source.

Common types of contamination and associated health risks are:-

- Hydrocarbons, e.g. Coal Tars, Oils etc., - Carcinogenic
- Heavy Metals, e.g. Lead, Cadmium, Mercury - Acute and Chronic poisoning
- Asbestos - Asbestosis, Mesothelioma, Lung Cancer.
- Solvents e.g. Benzene - Carcinogenic
- Biological e.g. Anthrax
- Radiation
- Dusts

Deborah followed on from Jonathan by saying that she would be talking about:-

- Controlling the Risks
- Documentation
- Health & Safety
- PPE
- Conclusion

She started by explaining that **Site Management** was achieved by means of an **Environmental Management Plan (EMP)** comprising the twin elements **of Quality Assurance** and **Health and Safety**. The overall objective is to ensure **the Health and Safety of Site Workers (and others)** and to **Minimise the Environmental Impact.**

Site Management includes:-

- The EMP
- Remediation Methodology
- Method Statements
- Health & Safety Plan
- Site Inductions/Tool Box talks
- Control Measures

The EMP identifies crucial aspects affecting the environment and necessary control measures in the following way:-

- **Identify the Environmental Aspects**
  - Activities which interact with the environment
    e.g. Spillages, Incorrect disposal of waste
- **Identify the Environmental Impacts**
  - Contamination of the environment
    e.g. pollution of groundwater, air pollution (dust, gases)
- **Identify and install controls**
  e.g. allocate responsibility for waste on site.

The **Remediation Methodology** documents the works with respect to **Delineation** of the contamination, **Recommended Procedures** for dealing with it and the **Waste Class** concerned

The **Method Statements** are site-specific **safe working procedures** for activities like excavation methods or Asbestos removal. Following the assessment of the risks, a site specific **Health and Safety Plan** is compiled to document all the relevant procedures to protect the Site Workers.

The Health and Safety Plan is implemented by means of **Site Induction Training & 'Tool Box Talks'** to:-

- Introduce Site Workers to the site and to appropriate site procedures &documentation (e.g. H&S plan) etc...
- Increase Awareness of hazards and risks associated with remedial works on contaminated land e.g.hydrocarbons in soil, asbestos fibres in air, etc.
- Educate in use of control measures, e.g. dust suppression, decontamination units, PPE, etc..

Common **Control Measures** in use on sites include:

- Dust suppression
- Vehicle Wheel Wash / Sheeting
- Air / Noise Monitoring
- PPE / RPE
- Hygiene Facilities
- Health Surveillance

Dust Suppression measures involve the use of

- Road Sweepers
- Vehicle Speed Limits on site
- Controlled Demolition
- Fine Mist Sprays
- Dust suppression at Source
- Vehicle Wheel Washers and Sheeting Gantry to prevent impact and dispersal of contamination off and on site

Air monitoring is used to measure the levels of airborne contaminants to ensure that the controls are effective and to see if Personal Protective Equipment (PPE) is needed and the most appropriate type. The instruments used might be:-

- Hand held Gas Monitors
- Automatic Gas Detectors
- Personal Monitors
- Environmental Monitoring

The use of PPE is a last resort and the choice is determined by the nature of the contaminant and the most likely route of entry i.e. **Inhalation, Ingestion or Absorption.** It can range from simple disposable overalls and gloves to full face positive pressure respirators.

The **hygiene facilities** may include:-

- Simple hand washing facilities
- Designated eating / smoking areas
- Decontamination unit.

The **Health Surveillance** strategy could include:-

- Site Worker Health Check Questionnaire
- Lung Function Tests
- Medicals
- Chest X-Rays
- Biological Monitoring, e.g.
    - Blood/Urine test for Lead levels
    - Urine test for Cadmium
    - Urine test for Trichloroethylene
    - Breath test for Benzene

Some key guidelines & legislation, to name but a few, are:-

- DD175 'Code of practice for investigation of potentially contaminated land'
- UK ICRCL 59/83 'Guidance on the assessment and redevelopment of contaminated land '
- Environmental Hygiene Series- HSE
- HASAWA
- EPA 1990
- COSHH 1994)
- Control of Asbestos at Work Regulations 1987 (amended 1998)

Deborah concluded by saying that Contaminated Land can result in extensive liability and cost if not dealt with correctly.

HOWEVER - provided a risk assessment and appropriate site management are implemented…… the health and safety of site workers, reduced costs/liabilities and protection of the environment can be achieved.

Members' Questions

Andy O'Shea of **Costain** asked if there was a role for a Planning Supervisor in the early stages. **Jonathan Barber** agreed that there was but said that it did not happen very often. He added that it was common that Phase I of the appraisal was not done

properly and that piling could be done before any sampling to find out if a problem existed!

Barry Wilkes of Sandwell Area Health Authority asked if Health Surveillance could be specified for Contractors. **Deborah Todd** said that you could advise, only, as **employers** were responsible for their **own employees**.

Andy O'Shea asked about the existence of a Land Register of contaminated land. Jonathan replied that this had been delayed but was reintroduced by the EPA 1995, Part 2a. He added that it would lead to a clean up of land which was badly needed because it was becoming a problem.

Michelle Sneyd of Metal Treatments Birmingham asked about the treatment of naturally occurring contaminants versus imported contaminants from industrial processes. Jonathan replied that the limits were set for each material with no alteration because of background values. The levels were built in to the risk assessment.

Peter Evans of CGU Insurance asked if land could be sold without measurement of contamination. Jonathan said that questions about contamination would be asked on a property search questionnaire. In addition, Laing Technology Group would conduct tests before the contract stage and carry out record searches as well. He also said that if contamination came from an adjacent site, the 'polluter would pay' for the remedial works.

Roy Gill of Laing asked if it was necessary to register a site as a Transfer Station if materials were being moved internally. Jonathan said that if materials were moved, say, to underneath a car park on the same site then that would be acceptable. If the waste was moved to another (landfill) site, then a Waste Management Licence must be applied for, unless exemption was sought with protocols in place for monitoring.

The Association Chairman, **Harry Jakeman** brought the question time to an end and thanked Roy Gill for organising the speakers through his company. Harry also reminded members that we were anxious to encourage networking between members and wanted them to communicate with Council or Management Committee members if they wished to raise any issues. He also said that that we would organise any extra meetings or briefings, possibly with lunch, on any topic which might suddenly become topical throughout the year. He added that the annual seminar this year would be on 13th June at the National Motorcycle Museum.