

## Why should you be at Geotechnica?

An in depth look at this year's Geotechnica event, and the reasons why everyone involved in the geotechnical industry should be there

### CDM 2015 - Implementation

Tom Phillips and Julian Lovell clarify questions asked about CDM2015

### BDA Audit - The Relaunch

A fresh and detailed look at the relaunch of the BDA's Audit scheme

### TPH Results

David Bowen of Terra Tek looks at TPH results and how they are more than just a number

**GEOTECHNICAL COURSE DATES:**  
Rock Description Workshop  
17th June 2015, 12th August 2015  
Geotechnical Foundation Design - 6th July 2015

**SEMINAR DATES:**  
CPT in Geotechnical Practice -  
23rd + 24th June 2015

Geotechnica 2015 Conference -  
8th + 9th July 2015

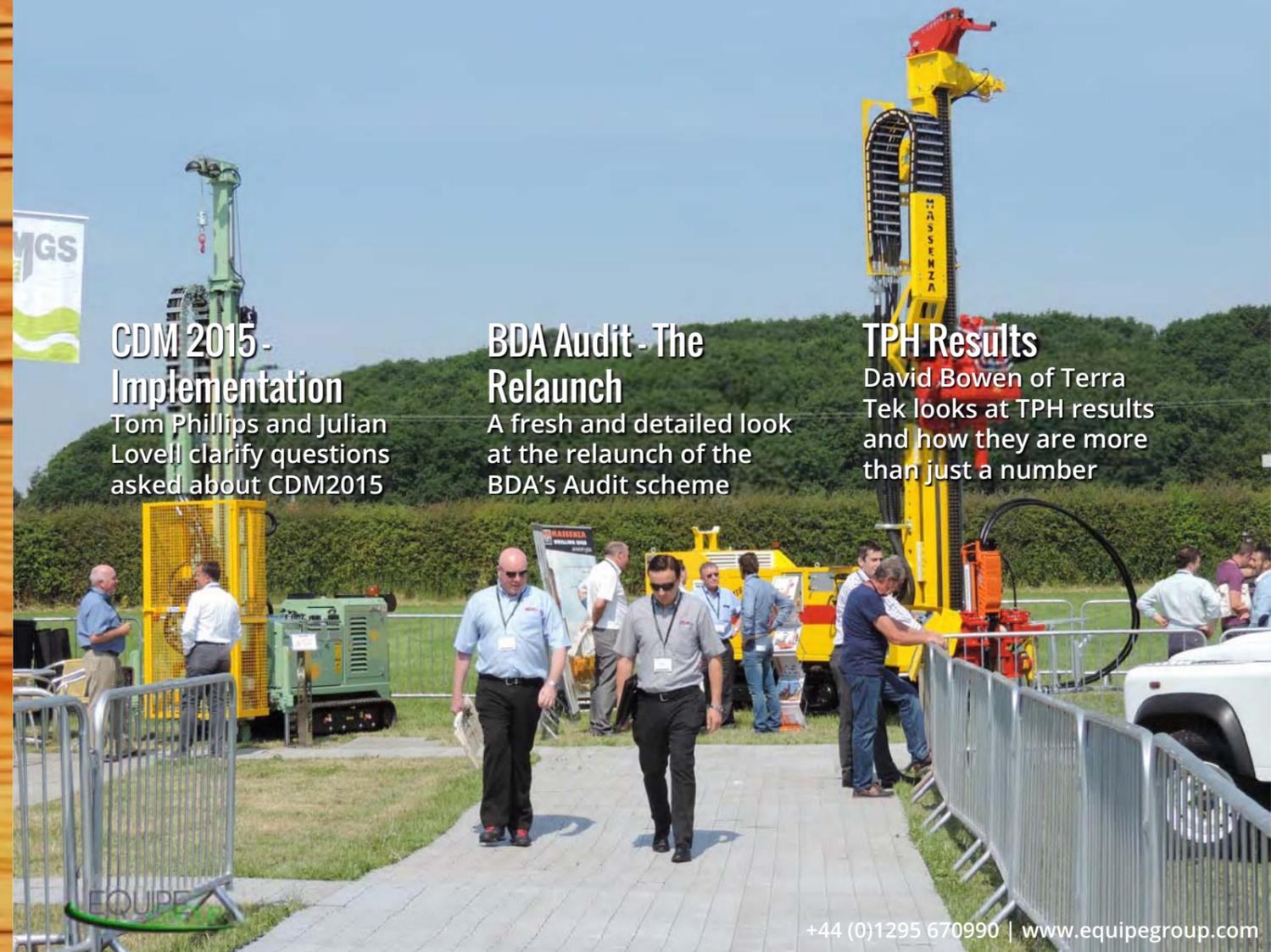
**H&S COURSE DATES:**  
IOSH Avoiding Danger from Underground Services  
26th June 2015  
IOSH Safe Supervision of Geotechnical Sites:  
16th - 18th June 2015

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## Seminar Date: 23rd - 24th June 2015

An essential comprehensive training course and refresher for geotechnical and geo-environmental practitioners involved in Cone Penetration Testing for Onshore and Offshore Geotechnics. The course is devoted to raising awareness of current test procedures, advances, data derived from the tests and the importance of quality control.

### What delegates will learn

- Have an understanding of the importance of using CPT specialists
- Advantages and limitations of CPT tools and techniques
- Have an understanding of how CPT data can be used for soil interpretation
- Have an understanding of how CPT data can be used for design
- Have an appreciation of recognising suspect/erroneous data

### Who should attend?

Onshore and offshore specifiers, procurers and users of Cone Penetration Testing. Geotechnical Engineers, Engineering Geologists, Consulting Engineers, Civil Engineers, Designers, Developers and Clients involved in onshore and offshore ground investigations.

### Seminar Programme

#### Day 1

08:45 – 09:00	Registration – Tea/Coffee
09:00 – 09:15	Introduction
09:15 – 10:00	Historic overview, equipment and procedures, data acquisition
10:00 – 10:45	Standards and guidelines. Data processing and corrections
10:45 – 11:10	Quality control – with examples offshore and onshore
11:10 – 11:30	Morning Break
11:30 – 12:15	Soil profiling and soil identification
12:15 – 13:00	Interpretation in terms of soil parameters in sand
13:00 – 14:00	Buffet Lunch
13:30 – 14:30	Demonstrations
14:30 – 15:15	Interpretation in terms of soil parameters in clay
15:15 – 15:30	Afternoon Break
15:30 – 16:15	Question and answer session
16:15 – 16:30	Summary and Close

#### Day 2

08:45 – 09:00	Tea/Coffee
09:00 – 09:30	Interpretation in other soil types (silt, chalk, peat --)
09:30 – 10:00	Full flow penetrometers in very soft clays
10:00 – 10:45	Advantages of other sensors (seismic cone, electrical resistivity, nuclear density etc)
10:45 – 11:00	Morning Break
11:00 – 11:35	Direct application of CPT data (pile design, compaction control, correlation to SPT)
11:35 – 12:10	Sampling with CPT equipment
12:10 – 13:00	Case histories onshore and offshore
13:00 – 14:00	Buffet Lunch
13:30 – 14:30	Demonstrations
14:30 – 15:30	Work shop on CPT interpretation
15:30 – 15:45	Afternoon Break
15:45 – 16:00	Summary and Close

In collaboration with



#### Speakers:

Dr John Powell,  
Technical Director,  
GEOLABS Ltd

Tom Lunne,  
Expert Advisor, NGI

Darren Ward  
Managing Director, In  
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## [BDA Audit: The Relaunch](#)

One of the most exciting pieces of news broken recently was the relaunch of the BDA Audit. This month Max Soudain of Blackcap Communications takes a closer look at the new audit for the Geotechnica, including the history of the scheme itself, but also what changes will be coming into place in the future.

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## [There is more to a TPH result than just a number](#)

Writing for the Geotechnica this month is David Bowen Senior Supervisor at Terra Tek Birmingham. In this excellently informative article, David provides a geo-environmental appraisal of a former railway line and sidings required chemical and geotechnical testing as part of the intrusive investigation.

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# Welcome

Welcome to the 41st Edition of **theGeotechnica** - the UK's fastest growing online geotechnically focussed e-magazine.

This month, once again, we have a fantastic line-up of insightful and informative articles that make for a must-read.

The first article of this month's issue features two of our regular contributors. In conversation with the Health and Safety Executive, Tom Phillips of RPA Safety Services and Julian Lovell, Managing Director of Equip and Chair of the AGS Safety Working Group attempt to clarify some of the questions consultants and contractors are raising regarding the implementation of CDM2015.

The second article of this month's issue is also the cover article. In this issue of theGeotechnica, we look forward to this year's Geotechnica and outline exactly why you should be attending 2015's event. Whether it is to attend the always excellently received geotechnical conference featuring speakers from high profile clients such as HS2 Ltd and Network Rail; discover the latest product developments and innovations; meet prospective clients, contractors and suppliers, or to catch up with friends new and old - Geotechnica offers something for everyone.

One of the most exciting pieces of news broken recently was the relaunch of the BDA Audit. In the third article of this month's issue, Max Soudain of Blackcap Communications takes a closer look at the new audit for theGeotechnica, including the history of the scheme itself, but also what changes will be coming into place in the future.

The final article this month comes from David Bowen, Senior Supervisor at Terra Tek Birmingham. In this excellently informative article, David provides a geo-environmental

appraisal of a former railway line and sidings required chemical and geotechnical testing as part of the intrusive investigation.

As with every new edition of the magazine, the Editorial Team here at **theGeotechnica** will be on the lookout for even more new, original and interesting content from all corners of the sector, and would actively encourage all readers to come forward with any appropriate and relevant content - whether it be a small news item or a detailed case study of works recently completed or being undertaken. If this content is media rich and interactive, then all the better. We are looking to increase the already large readership of the magazine through better social media integration and promotion, as well as improving content month on month.

Finally, for any content that is submitted we will ensure that an advertising space, proportionate to the quality of content provided, is reserved should you wish to place an advert in that single edition of the magazine. We hope you enjoy this month's edition of the magazine and are inspired to contribute your own content for the coming editions of **theGeotechnica**.

**Editorial Team,  
theGeotechnica**

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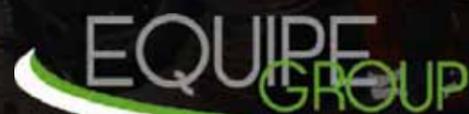


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# CONSTRUCTION DESIGN & MANAGEMENT REGULATIONS 2015 - IMPLEMENTATION

CDM2015 came into effect on the 6th of April 2015 and duty holders within the geotechnical sector are starting to grapple with the reality of implementation. With an increased emphasis on Client responsibilities, in an industry sector where the Client is rarely directly involved in the ground investigation phase, questions about how the regulations will be applied are being asked.

In conversation with the Health and Safety Executive, Tom Phillips of [RPA Safety Services](#) and Julian Lovell, Managing Director of [Equipe](#) and Chair of the AGS Safety Working Group

attempt to clarify some of the questions consultants and contractors are raising.

Q. The definition of 'construction' in regulation 1, excludes site survey and in many cases our clients see ground investigation as site survey. Could you clarify the limits of site survey?

*Site survey is restricted to non-intrusive works so taking levels, making measurements, site walkovers, gas monitoring and visually examining structures for faults would all be typical examples. If the works involve penetrative works, even with*

*hand tools, the work is classed as construction and the regulations apply.*

**"We are keen to stress though, that the regulations should be applied proportionally to the level of risk involved."**

*We are keen to stress though, that the regulations should be applied proportionally to the level of risk involved. A shallow, hand dug trial hole will require minimal paperwork in terms of a construction phase*

*plan, as the risk is low, but duty holders will still need to consider the risks associated with such things as underground services, contaminants, ground stability, preventing falls into the excavation and they must plan how the work will be carried out, kept safe and made good.*

**"In many cases, simple repetitive work will be based on standard company procedures but these will need tailoring for the site and locality in question and the prevailing conditions."**

*In many cases, simple repetitive work will be based on standard company procedures but these will need tailoring for the site and locality in question and the prevailing conditions.*

Q. Consultants and contractors are finding it difficult to get clients to accept and fulfill their duties under regulation 15 (1), which states: 'A contractor must not carry out construction work in relation to a project unless satisfied that the client is aware of the duties owed by the client under these Regulations.' In many cases they are not employed directly by the client and have no contact with them at all.

To what extent does this prevent contractors from starting work and will they be held liable for client's failures to make the correct appointments and satisfy their duties?

*The regulations do not prevent geotechnical contractors working, even if the client has*

*not fully complied with their duties. Key for the contractor, is to ensure they have made the client aware of the client's duties under CDM. This can be done as part of the tendering process, or following appointment.*

*In such instances, the contractor still needs to make wider arrangements to manage the site for the duration of their attendance (appropriate to the role they are carrying out) despite a lack of formal appointment.*

*The contractor should therefore ensure the site is secure, ensure suitable welfare arrangements are in place and comply fully with their part 4 duties under the regulations. They should also prepare (or contribute to an existing) Construction Phase Plan which will deal with how they intend to arrange the work and how they will manage foreseeable hazards both at and adjacent to the site.*

**"The construction phase plan should also identify any additional information that the contractor needs before starting work."**

*The construction phase plan should also identify any additional information that the contractor needs before starting work. If the client is not able to provide that information (e.g. services location, intrusive asbestos survey, ordnance assessment, etc.) then the contractor should arrange with the client for the work to be carried out as a separate part of the contractor's contract.*

*Where the contractor is the main contractor on all or part of the site*

**"Where the contractor carries out design work they should ensure they follow the principle of avoid the hazard or use a suitable control measure to minimise risk."**

*they should manage all work in the area they are responsible for unless a principal contractor is appointed and active. Where the contractor carries out design work (e.g. temporary works including perimeter fencing, arranging traffic management routes, ground conditions assessment and alterations, excavation support arrangements, etc.) they should ensure they follow the principle of avoid the hazard or use a suitable control measure to minimise risk.*

Q. When a geotechnical contractor is appointed as Principal Contractor (PC) or Principal Designer (PD), in the early stages of a GI phase, or they pick up those duties by default, is there a danger they could be deemed PC and PD for subsequent phases?

*Absolutely. Without clear arrangements to the contrary, there is every danger that a geotechnical contractor could be assumed to be responsible for following phases of works. It is therefore important that where a geotechnical contractor is appointed, or by default is expected to carry out the duties of the Principal Contractor and Principal Designer (a requirement on any project where there is likely to be more than one contractor), they clearly limit their role to their phase* ►►



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**NEXT COURSE DATES:** 16th - 18th June 2015  
21st - 23rd July 2015

## IOSH Avoiding Danger from Underground Services

This one day geotechnically focussed health and safety course follows the requirements and guidance set out within HSG47 and includes the four chapters; identifying and managing the dangers; planning the work; detecting, identifying and marking and safe excavation. Important aspects include the use of real examples from the geotechnical industry and delivery by chartered advisors who are from within the industry.

**NEXT COURSE DATES:** 26th June 2015  
31st July 2015

## IOSH Working Safely (on Geotechnical Sites)

This one day geotechnically focussed health and safety course has been developed by industry specialists as a foundation to site safety for all personnel involved in projects in the drilling and geotechnical industry. Its aim is to impart the core safety skills required of those working on geotechnical sites by building on their existing specialist technical skills and making it relevant to their place of work.

**NEXT COURSE DATES:** N/A - Contact Equipe for details.



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of works only. This will include limiting the Construction Phase Plan to the geotechnical phase.

**“Where the existing contract paperwork is not clear on this issue the contractor should write to their client to confirm the extent of the contractor’s role.”**

Where the existing contract paperwork is not clear on this issue the contractor should write to their client to confirm the extent of the contractor’s role.

Q. Regulation 2 defines a contractor as ‘any person (including a non-domestic client) who, in the course or furtherance of a business, carries out, manages or controls construction work’. Does this

definition mean consultants may be classed as contractors?

The duty holder ‘contractor’ relates to those who: determine the manner in which the work is being done (this may also include a design element so they may hold dual roles), provide supervision or engage other contractors. This can include ‘consultancies’ in many instances.

As an example, where a consultant engages a drilling contractor and determines the nature and type of works or supplies supervision, they would both be deemed contractors and it will be the consultancy’s responsibility to ensure the client is aware of their duties. The client would then need to make the necessary appointments. Where a domestic client is involved, the consultancy (as a contractor) may be deemed to be principal

contractor and principal designer by default, even if the client fails to make formal appointments. Where a commercial client is involved, any failure to appoint will result in the client carrying the role of principal designer and/or principal contractor. ■

### Further reading:

HSE Publication L153 - Managing health and safety in construction - Construction (Design and Management) Regulations 2015 - <http://www.hse.gov.uk/pubns/books/l153.htm>

CITB Guidance on CDM - <http://www.citb.co.uk/health-safety-and-other-topics/health-safety/construction-design-and-management-regulations/cdm-guidance-documents/>



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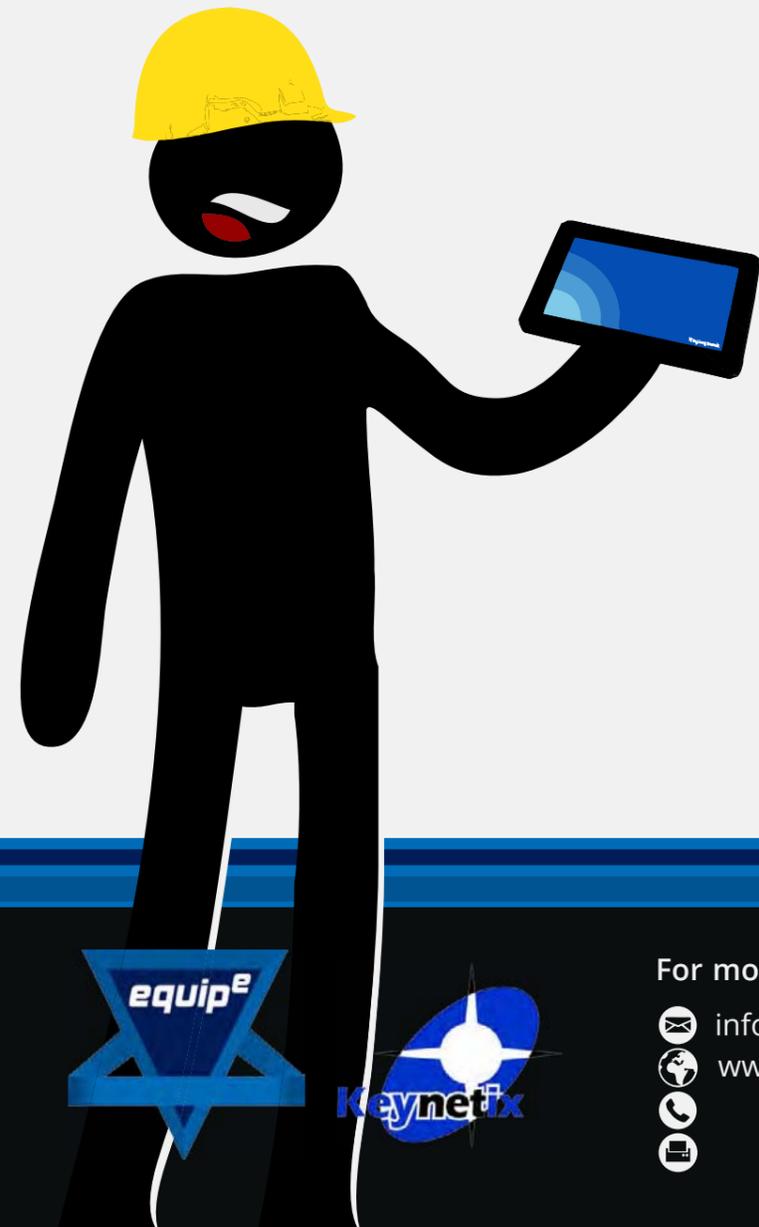
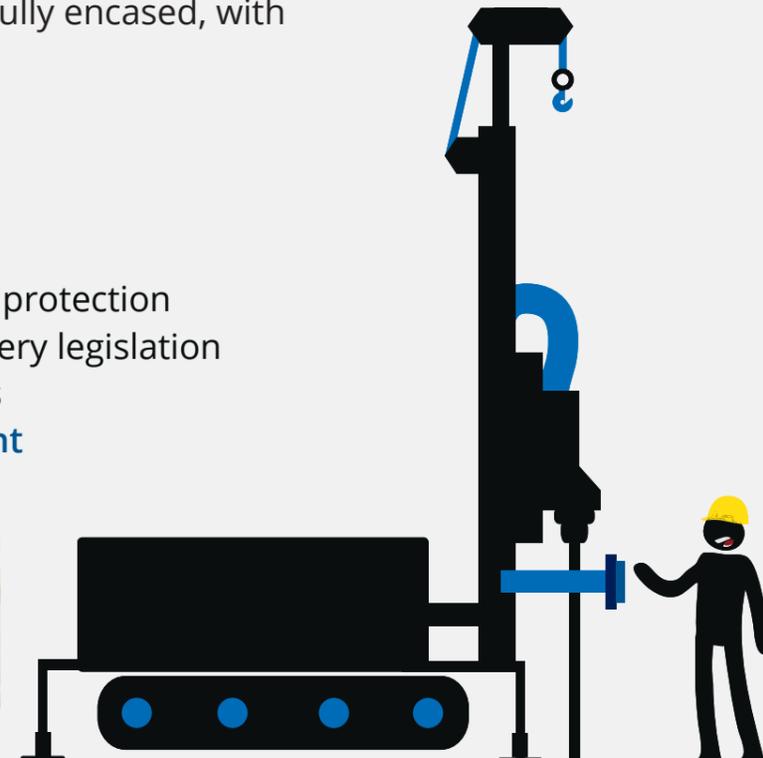


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# WHY SHOULD YOU BE AT GEOTECHNICA?



Over the last 6 years, Geotechnica has become the biggest and best geotechnically-dedicated conference and exhibition that the UK has to offer. From humble beginnings in marquees in a field on The Upton Estate in rural Oxfordshire, to the excellent purpose-built facilities of the Warwickshire Exhibition Centre, Geotechnica has become a staple in any and all geotechnical stakeholder's calendars.

In this issue of **theGeotechnica**, we look forward to this year's Geotechnica and outline exactly why you should be attending 2015's event. Whether it is to attend the always excellently received geotechnical conference featuring speakers from high profile clients such as HS2 Ltd and Network Rail; discover the latest product developments and innovations; meet prospective clients, contractors and suppliers, or to catch up with friends new and old – Geotechnica offers something for everyone.

## Growth in the sector – tackling the challenges

The Geotechnica 2015 conference and exhibition

provides a unique opportunity for the geotechnical industry, its clients and the supply chain, to discuss how best to meet the challenges of the UK

**“The dramatic rise in UK infrastructure and building projects following the recession has created skills shortages across the construction industry...”**

construction's growing order book.

The dramatic rise in UK infrastructure and building projects following the recession has created skills shortages across the construction industry. For the geotechnical

sector, this upturn in work presents significant challenges. High Speed 2, for example, is set to swallow almost 40% of the sector's capacity when ground investigations start later this year.

The urgent need to tackle the issues of capacity and skills, while maintaining quality and safety standards, will be the focus of Geotechnica 2015. On the first morning of the event the conference will bring clients, consultants, contractors, suppliers and manufacturers together to discuss how best to meet the challenges ahead.

The morning session will be



chaired by Professor David Norbury who will provide critical information of the soon to be published BS 5930

**“Jonathan Gammon, High Speed 2's Head of Ground Investigations, and Mike Brown from Network Rail, will then outline work plans, plus their needs and expectations.”**

revision. Jonathan Gammon, High Speed 2's Head of Ground Investigations, and Mike Brown from Network Rail, will then outline work plans, plus their needs and expectations. The talks will not only outline current requirements but the Client's will also discuss future requirements and aspirations and ask how the Community can meet these.

## Remote monitoring advances

The Wednesday afternoon at the geotechnical conference will see a series of presentations looking at how the field instrumentation is advancing and how emerging technologies can be used to efficiently monitor geotechnical structures remotely. The session will look at a few of these technologies but also

discuss how the data can be used more efficiently and possibly in the future be shared with the Community.

Talks from Dr Andrew Ridley of Geotechnical Observations and Dr Neil Dixon of Loughborough University will head up the session, with case studies and technical discussions from Dr David Gunn and Dr Jonathan Chambers of the BGS. Short presentations from Martin Clegg of Geosense, Heba Bevan of Utterberry, James Preston of Monitoring Optics and Roger Hazelden of TRW Conekt will round up the day's talks with insights into the emerging technologies which are likely to take the industry by storm.

## Health and Safety Updates

Over the last 12 months, we have all been discussing forthcoming changes to the Construction Design and Management Regulations. These have now been laid before parliament and came into effect on the 6th of April earlier in the year. On the Thursday morning of the conference there will also be a session sponsored by the British Drilling Association on health and safety, with discussions on changes brought about by the new CDM 2015 Regulations lead by John Underwood, Construction Inspector at the Health

and Safety Executive.

The CDM 2015 regulations have been discussed at length in **theGeotechnica** in the last few issues, however Geotechnica 2015 will provide an opportunity for contractors to hear directly from the HSE on how these new regulations will directly affect day-to-day tasks on working sites.

Other topics discussed on the Thursday morning include the rising issue of asbestos in soil (also covered in [Issue 40](#) of the magazine by Derwentside Environmental Testing Services' Hazel Davidson), with a presentation from expert Seamus Lefroy-Brooks, Managing Director of LBH Wembley.

**“Finally there is the exciting news of the re-launch of the BDA Audit which has recently been revised in order to improve levels of assessment and competency.”**

Finally there is the exciting news of the re-launch of the BDA Audit which has recently been revised in order to improve levels of assessment and competency which will complement the launch of a Level III NVQ for Land Drilling planned later this year. Delivering this update will be Peter Redford who is a director of BDA and chaired the working group which carried out the review of the auditing process. He will present these changes to attendees at Geotechnica 2015, outlining the changes to non-conformance, an updated

and digitised audit format and alteration of base-rate auditing fees.

### **AGS Data efficiencies**

The final conference session is sponsored by AGS and will be focussed on digital (AGS) data and how it can help to make organisations more efficient. The afternoon of presentations and discussions offers engineers and clients an opportunity to learn how others are using digital data and the AGS Data Format for managing geotechnical information within their organisations. The session will consist of a series of inspirational and practical presentations with plenty of discussion time that will help you make better use of the AGS Data Format.

Whether you are; an experienced user of AGS Data, someone wanting to learn more about using or specifying AGS Data, or an early-career engineer looking for an introduction to data management, this afternoon will provide you with a valuable learning opportunity.

Speakers in this session include Chairman of the AGS Data Management Working Group Jackie Bland, General Manager of Ground Technology Services Ben Armstrong, Simon Miles of Atkins, and also Dr Roger Chandler, Managing Director of Keynetix.

Each 30 minute session consists of a 15 minute practical application presentation by the speaker(s) followed by a panel and audience discussion about the topics with advice from the AGS Data Management Committee and other



**“This session is a must for any handlers of AGS Data, and also for anyone wishing to gain a greater grasp of what AGS Data can offer you...”**

practitioners.

This session is a must for any handlers of AGS Data, and also for anyone wishing to gain a greater grasp of what AGS Data can offer you in terms of improving your organisations efficiency from site to final report.

### **Latest product innovations – demonstrations and launches**

One way the geotechnical sector can meet the increasingly growing demand is by improving efficiency through innovation, a theme running through the two days at Geotechnica, both at the

conference and also at the exhibition. Conference sessions on advances in digital data capture and remote monitoring on the Wednesday afternoon will be complemented by product launches and live demonstrations in the exhibition area running throughout both days of the event.

**“New product launches are due from a number of companies including three large rig manufacturers.”**

New product launches are due from a number of companies including three large rig manufacturers. Firstly Geotechnica 2015's Gold Sponsors Casagrande UK will be launching the new C5XP, as well as a new vibro-rotary head by Eurodrill. Bronze Sponsors MGS will also be exhibiting a FRASTE SL G rig and a new Mud Cleaning Shaker. Not to miss out on the rig launch party,



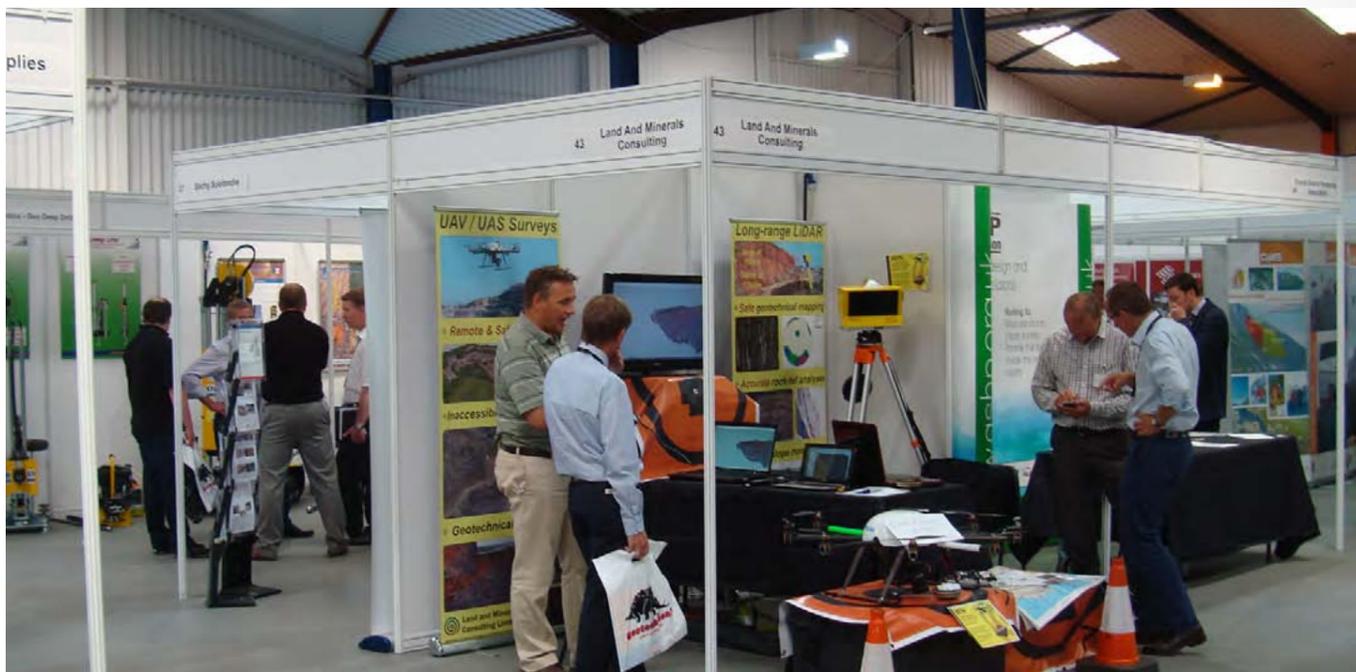
Rockbit UK will be launching the new Massenza MI 3 and a new Wildbore De-sander unit and EK bag system, as well as demonstrating the Pagani CPTu penetrometer throughout both days on request. The Equipe Group will also be officially launching there SAFER-G Sensor-based rotary rig guarding system to the UK market, as well as a new KeyLogbook update release.

The laboratories present at Geotechnica will also be getting in on the act, with Derwentside Environmental Testing Services introducing there new asbestos in soil test – the fibre release

test. ALS Environmental will also be demonstrating some of their OnSite tools including XRF, UVF and PetroFLAG.

### **The Geotechnical Academy**

The Geotechnical Academy will again be at Geotechnica to demonstrate how it provides a unique learning experience for young geo-professionals. The training is designed to be fundamentally vocational, with many opportunities throughout the modules to participate in practical activities such as rig audits, insitu testing, laboratory testing, site visits and production of a ▶



**“An important aspect of The Geotechnical Academy is to allow delegates to gain knowledge through a shared learning experience...”**

ground model. An important aspect of The Geotechnical Academy is to allow delegates to gain knowledge through a shared learning experience with delegates from different facets of the geotechnical industry. We frequently bring together main contractors, specialist contractors and geo-environmental and geotechnical consultants, all with very different experiences of the industry.

This year at Geotechnica, The Geotechnical Academy stand will perform the traditional service of providing information. Academy staff will be there to discuss module content and practical activities and to welcome new enquiries. However, in addition we will also be presenting the

new Geotechnical Academy Conference on Thursday 9th July. This will be an afternoon conference session offering an innovative learning experience for all geo-professionals as well as providing an opportunity to experience first-hand the type of experience delegates can expect if they attend The Geotechnical Academy. The event is being supported by Alcontrol, Lankelma, Keynetix, Equipe and Geotechnical Engineering Ltd who, along with other companies, all contribute to individual Academy modules throughout the year.

Come along and experience The Geotechnical Academy Conference on Thursday 9th July and contribute to enabling your geo-professionals to provide a quality service to the construction industry.

#### **Packed exhibition line-up**

The exhibition line-up for this year's event is stellar. Geotechnica has always boasted the most varied and robust line-up of exhibitors in the UK, however the offering in 2015 may be the best yet.

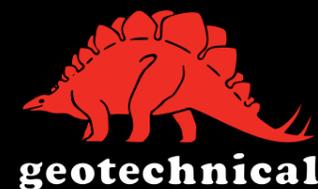
**“Companies from all areas and corners of the industry will be represented...all out to impress the hundreds of attendees.”**

Companies from all areas and corners of the industry will be represented, with the very best in geophysics, ground investigation specialists, civil engineering, environmental and geotechnical laboratories, drilling rig, plant and equipment suppliers, instrumentation and geothermal specialists all out to impress the hundreds of attendees.

Geotechnica 2015 will be held on 8th and 9th July at the Warwickshire Exhibition Centre, Royal Leamington Spa. To register for your free place and for more information, visit [www.geotechnica.co.uk](http://www.geotechnica.co.uk); follow us on Twitter [@equipgroup](https://twitter.com/equipgroup) and visit the [Equipe Group LinkedIn page](#). ■

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# Geotechnical Conference

Wednesday 8th July 2015



## Morning Session

### Meeting the challenges and future requirements of geotechnical Clients

A series of presentations from leading procurers of geotechnical work including HS2 and Network Rail, in which they outline their requirements and expectations from the geotechnical and drilling community. The talks will not only outline current requirements but the Client's will also discuss future requirements and aspirations and ask how the Community can meet these.

#### Speakers include:

- Jonathan Gammon, Head of Ground Investigations, HS2 Ltd
- Mike Brown, Senior Engineer, Network Rail
- Professor David Norbury, David Norbury Ltd

## Afternoon Session

### Remote monitoring of geotechnical assets

A series of presentations looking at how the use of field instruments and technologies have advanced and how they can be used to efficiently monitor geotechnical structures remotely. The session will look at a few of these technologies but also discuss how the data can be used more efficiently and possibly in the future be shared with the Community.

#### Speakers include:

- Dr Neil Dixon, Professor of Geotechnical Engineering, Loughborough University
- Dr David Gunn and Dr Jonathan Chambers, British Geological Survey
- Dr Andrew Ridley, Managing Director, Geotechnical Observations Ltd
- Heba Bevan, UtterBerry Ltd
- James Preston, Business Development Manager, Monitoring Optics Ltd
- Roger Hazelden, Technical Specialist, Sensors & Optoelectronics, TRW Conekt
- Martin Clegg, Director, Geosense Ltd

## Thursday 9th July 2015

## Morning Session

### Keeping on the right side of Health and Safety legislation

A series of short presentations from the HSE and industry leaders to update the community on Health and Safety topics and concerns. Topics covered will include an update from HSE, Asbestos in Soil, new BDA audit and CDM 2015.

#### Speakers include:

- John Underwood, Construction Inspector - Construction Sector Safety Team, Health and Safety Executive
- Seamus Lefroy-Brooks, Managing Director, LBH Wembley
- Peter Redford, Director, British Drilling Association

Session sponsored by:



## Afternoon Session

### How AGS data makes organisations more efficient

A series of short presentations about advances in the use of capturing and using Geotechnical Data from site, through the laboratories to report and beyond. The talks will discuss the use of AGS through the process and will include a number of case studies to show how it works for real projects.

#### Speakers include:

- Jackie Bland, AGS Data Management Chairman, Association of Geotechnical and Geoenvironmental Specialists
- Ben Armstrong, General Manager, Ground Technology Services
- Greg Adamson, Account Manager, ALcontrol Laboratories
- Dr Roger Chandler, Managing Director, Keynetix Ltd
- Simon Miles, Principal Geotechnical Engineer, Atkins
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### Specifying Site Investigations

This one day course will look at the various methods available to carry out intrusive and non intrusive investigation. Whilst the course will concentrate on geotechnical methods some geo-environmental methods will be briefly discussed. The course will look at the aims of SI and categorise the various stages in an investigation.

### Soil Description Workshop

From 2007 new European Standards have started replacing the British Standards (Codes) under which investigations in the UK have been carried out. UK working practice will have to change to meet these new requirements but few practitioners are aware of the changes or the timetable. The workshop will comprise a series of lectures on the changes, and lectures on soil description followed by practical sessions describing soil samples.

### Rock Description Workshop

From 2007 new European Standards have started replacing the British Standards (Codes) under which investigations in the UK have been carried out. UK working practice will have to change to meet these new requirements but few practitioners are aware of the changes or the timetable. The workshop will comprise a series of lectures on the changes, and lectures on rock description followed by practical sessions describing rock and compiling mechanical logs of rock core.

### In Situ Testing

The course will cover both the theory and the practice of various In Situ Testing techniques used on typical geotechnical projects. In addition the courses will consider the effect that Eurocodes will have on the UK's current practice. This course provides an overview of in situ tests used in common practice and some of the more specialist tests together with their advantages and limitations.

### Field Instrumentation and Monitoring

The course comprises a comprehensive one day appreciation of the complete process involved in Instrumentation and Monitoring in the geotechnical environment. The course provides an overview of the current guidance documents and their requirements. The course will consider the design of both individual installations and the installation of suites of instruments in the wider site context.

### Geotechnical Foundation Design

This one day course will provide a general overview of foundation design. It will include an assessment of the use and choice of shallow foundations and piles. It will cover the derivation of bearing capacity formula and their use. Exercises will be carried out to calculate the working loads and settlement of simple foundations. The methods used to calculate these will be in accordance with those described in Eurocode.

### IOSH Working Safely (on Geotechnical Sites)

This one day course is developed by industry specialists within RPA Safety Services and Equipe Training as a foundation to site safety. Its aim is to impart the core safety skills required of those working on geotechnical sites by building on their existing specialist technical skills. After attending the course, candidates should be able to identify hazards on site, understand basic safety legislation, participate fully and confidently in site safety consultation and manage priority risks to a sufficient standard.

### IOSH Avoiding Danger from Underground Services

Partnering with RPA Safety Services once again, Equipe provide another IOSH certified health and safety course. This one day course is aimed at anybody involved in specifying, instructing, managing, supervising or actually breaking ground and really addresses the problems and risks related to underground services, which may be encountered during both planning and execution of geotechnical projects.

### IOSH Safe Supervision of Geotechnical Sites

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# BDA AUDIT: THE RELAUNCH



One of the most exciting pieces of news broken recently was the relaunch of the BDA Audit. This month Max Soudain of [Blackcap Communications](#) takes a closer look at the new audit for **theGeotechnica**, including the history of the scheme itself, but also what changes will be coming into place in the future.

The British Drilling Association will relaunch its auditing scheme in June. Peter Redford, who will present the new audit at this year's Geotechnica conference, says changes will help ensure operator competency is maintained across the sector.

When it was launched in 1990, the British Drilling Association (BDA) Driller Accreditation Scheme, aimed primarily at the site investigation sector, was the only measure of competence in an industry beset with quality issues.

At its peak, the BDA scheme was auditing well over 300 drillers annually and was recognised and specified by many clients, including the Department of Transport and Network Rail.

Towards the end of the 1990s, the construction industry was focused on introducing formal qualifications for trades through the National Vocational Qualifications (NVQs) and the Construction Skills Certification Scheme. And, in 2000, the Land Drilling NVQ Level II qualification for Lead Drillers and Drillers (Support Operatives) was introduced.

**“BDA recognised this was a major step forward, requiring all its contractor members to have NVQ-qualified drillers...”**

BDA recognised this was a major step forward, requiring all its contractor members to have NVQ-qualified drillers but also realised that, as a ‘qualification for life’, the NVQ needed to be linked to on-going assessment. In fact, the requirement for annual audits of trade qualifications are now laid down in European Standards and is included in the British Standards for site investigation.

So, in 2005, the BDA Audit

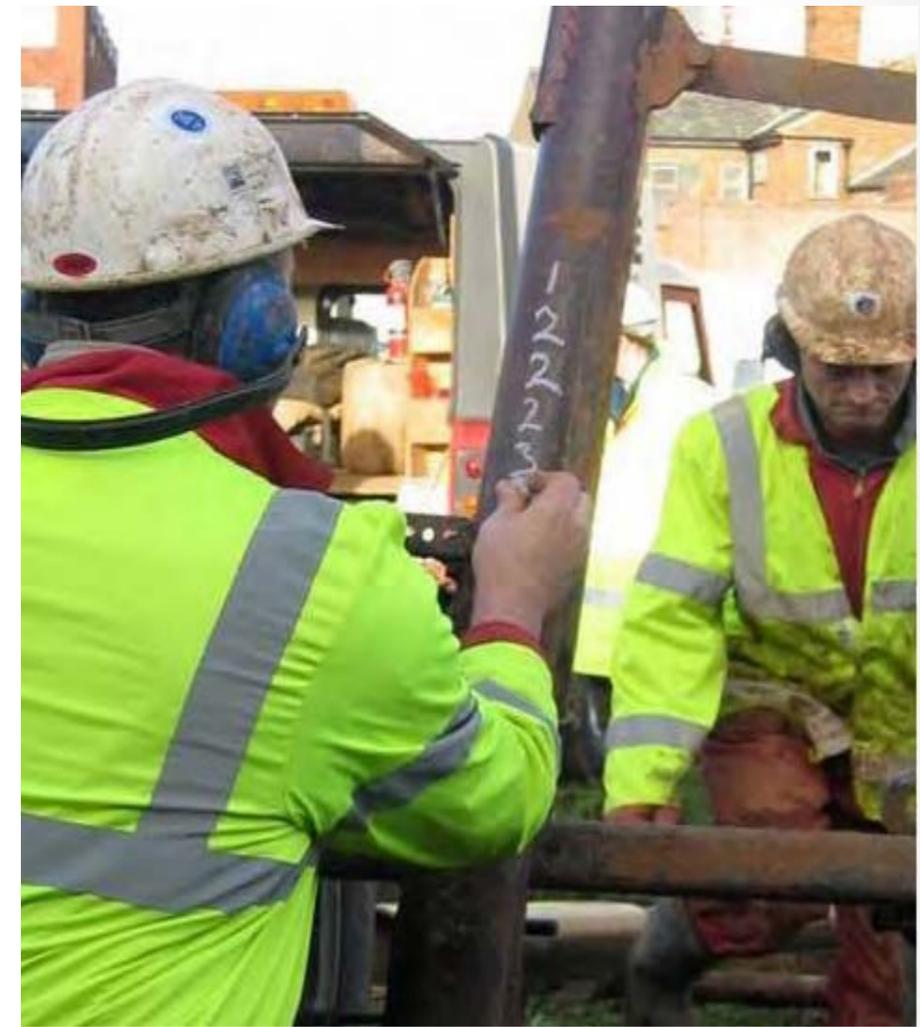
Scheme was born, assessing competence against that measured by the NVQ: primarily around safe operation of the drilling plant and knowledge of the legislation behind this safe operation, with a limited measure of drilling to specification.

**“Unfortunately, despite the BDA’s best efforts, the scheme was very slow in gaining momentum.”**

Unfortunately, despite the BDA’s best efforts, the scheme was very slow in gaining momentum. This was not helped by the recession in 2008, which halved capacity in the site investigation industry. Undeterred, the BDA continued to promote the scheme and, by 2010, the number of audited drillers had settled at around 70 to 75; representing about a quarter of the industry.

This number remained static until 2013, when BDA persuaded its major site investigation contractor members to ‘encourage’ their subcontractors to become audited. This was linked to an offer of reduced audit fees for smaller contractors. This approach proved very successful, nearly doubling audited drillers to 140 by the end of 2014.

Despite this success, the auditing scheme still had its critics. Frequent criticisms were that it did not test in-depth technical knowledge and that no-one failed. (It should be noted that like all auditing schemes, the BDA audit highlights non-conformance



with the required corrective actions and a close-out period. In reality there were plenty of these. The ultimate sanction was to withdraw candidates’ BDA Audit card.)

Also, sections of the audit focused on drilling plant being used at the audit. Not only was this plant largely out of the control of some ‘employee’ drillers, but concerns were growing among the auditors that different drillers employed by a company were being audited on the ‘good’ rig.

In response to these criticisms and problems, toward the end of 2014, the BDA decided to carry out a major review of the auditing scheme, with a view to a relaunch in 2015. This review was completed earlier in the year and coincidentally linked

with the five-yearly review of the National Occupational Standards (NOS) behind the NVQ in Land Drilling.

**“The new auditing process underwent field trials in the spring and should go live in June.”**

The new auditing process underwent field trials in the spring and should go live in June. Every question within the audit has been tested and reviewed against the revised NOS. The way in which non-conformance is dealt with has also been addressed.

Non-conformance is now split into ‘minor’, ‘major’ and ‘safety critical’ categories. ►



Minor non-conformances will have to be resolved within 28 days and major ones within seven days. Safety critical issues will either be resolved immediately, while operations are suspended or the audit stopped, and the Health and Safety Executive informed. Evidence of the “close-out” of any non-conformance will be logged rigorously.

One of the biggest changes is that the audit is now fully digitised, using specialist auditing software, and can now be carried out using tablet computers on site. The process is more consistent, is timed and given a location. It also allows photographs and videos to be taken during the audit and the results to be emailed to BDA and other stakeholders almost immediately.

This will be much smoother process than the current mix of paper, photos and emails. More importantly, using this digital format will make updating the audit process faster and simpler.

Auditors will also be paid on a more equitable basis. Unfortunately this has meant having to increase auditing fees, although costs can be minimised if two audits are carried out on the same site, on the same day. The intention is also to have a better spread of auditors – one in the south, one in the north and one in Scotland – to make the service more responsive. As before, the scheme is also open to non-BDA companies.

**“The BDA will also be developing a Level III NVQ Advanced Lead Driller qualification in the second half of 2015...”**

The BDA will also be developing a Level III NVQ Advanced Lead Driller qualification in the second half of 2015, with the audit extended as a result. In the future, the audit may move away from reviewing competence purely against the

requirements of the NVQ, in an effort to improve the level of technical competence tested. This could potentially be done using a touch screen test for the driller being audited. BDA is also exploring independent certification of the auditing process.

Ever since its formation in 1976, one of the guiding principles of the BDA has been to raise and maintain levels of competence within the drilling sector. The changes to the auditing process should ensure that this goal is maintained, and help steer the drilling sector in the ever increasing drive for competence across the construction industry.

Peter Redford is a director of BDA and chaired the working group which carried out the review of the auditing process. He will present the changes at Geotechnica 2015, being held at the Warwickshire Exhibition Centre, Royal Leamington Spa on 8 and 9 July. ■

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# THERE IS MORE TO A TPH RESULT THAN JUST A NUMBER



Writing for **theGeotechnica** this month is David Bowen Senior Supervisor at [Terra Tek Birmingham](#). In this excellently informative article, David provides a geo-environmental appraisal of a former railway line and sidings required chemical and geotechnical testing as part of the intrusive investigation.

On review of the analytical data, the petroleum hydrocarbons found on the site were of particular interest, and the subsequent chromatographic fingerprint and interpretation produced an unexpected finding.

The contaminated land assessment was conducted by Anthony Curtis of DTS Raeburn in accordance with the methodologies described in CLR11 'Model Procedures for the Management of Land Contamination' and British

Standard BS10175:2011 'Investigation of Potentially Contaminated Sites - Code of Practice'. This included a Preliminary Risk Assessment (PRA), followed by an Intrusive Investigation. Based on the findings of the Geoenvironmental Appraisal, the site was not deemed to pose a risk to long-term human health or controlled waters. Remediation of soils and/or groundwater was not therefore required.

**PRA - History of the site,**

**"Based on the findings of the Geoenvironmental Appraisal, the site was not deemed to pose a risk to long-term human health or controlled waters."**

**and potential sources of contamination**

The site was a former London North Western Region (LNWR) railway yard for the Stockport and Buxton line, between the 1870's to late 1950's. The goods sheds within the yard were used for the storage of cotton and coal.

Following demolition of the majority of the railway yard in the 1950s, a remaining goods shed was converted into a warehouse until 2005, when it was removed, and subsequently used as a storage yard. The site is now to be developed for commercial use.

The more recent use of this site posed the lowest risk of contamination, and therefore the main focus of the intrusive investigation was on its former use as a railway line and sidings.

## Intrusive Investigation

The Department of the Environment's Industry Profile of Railway Land covers the potential environmental contamination of land

**"The Department of the Environment's Industry Profile of Railway Land covers the potential environmental contamination of land associated with railways..."**

associated with railways, and tabulates the main groups of contaminants at particular locations.

For railway sidings and freight yards, the chemical groups most likely to be found are: Fuels Oils, Lubricating Oils, Polynuclear Aromatic

Hydrocarbons, and Ethylene Glycol.

The Railway Land profile was used as the primary source for establishing the chemical testing requirements and together with the additional findings of the PRA, proved valuable in designing the intrusive investigation.

## Analysis

Total Petroleum Hydrocarbon (TPH) analysis is a well established routine test to assess for the presence of hydrocarbons in the range C5-C40. This total includes the Volatile Petroleum Hydrocarbons (VPH) determined by head space GC/MS, and the Extractable

Petroleum Hydrocarbons (EPH) by GC/FID.

Typical contaminants include Coal Tar, Diesel, Fuel Oils, Gasoline, and Lubricating Oils.

To further classify the nature of the hydrocarbons present, a TPH-CWG Criteria Working Group fractionation was requested, to separate these hydrocarbons into Aliphatic and Aromatic groups.

**“The chromatographic fingerprints of these hydrocarbons create a “picture” of the type / source of the contaminant present...”**

The chromatographic fingerprints of these hydrocarbons create a “picture” of the type / source of the contaminant present, and can be compared to library standards for a match of best fit. The chemistry department at Terra Tek have developed an extensive range of hydrocarbon fingerprinting standards, which was used to identify the hydrocarbons present at the former railway line and sidings site.

As the site was used by steam locomotives, and coal was stored in the sidings, it was anticipated that the source would be either coal related, and / or lubricating oil, rather than fuel oils (diesel), since the railway sidings were closed before the use of diesel engines became widespread across the UK.

**Results**

Following the chromatographic fingerprint interpretations however, it appeared that the predominant contaminant was a Fuel Oil #6 (Bunker C), contrary to the anticipated findings. So where did this come from?

From the latter stages of World War two, coupled with an extremely cold winter of 1947, fuel shortages became a major problem in the UK. This, in addition to the austerity measures taken after the war and the export of available coal, led the government at the time to sponsor a large scale program to convert coal fired steam locomotives to burn heavy fuel oil # 6 as an alternative. In 1948 when the railways were nationalised, there were ninety three oil burning steam engines across

**“However, due to the cost of importing fuel oil, all of these locomotives were eventually converted back into coal fired engines, and the age of the fuel oil burning steam locomotive in the UK came to an end.”**

the network. However, due to the cost of importing fuel oil, all of these locomotives were eventually converted back into coal fired engines, and the age of the fuel oil burning steam locomotive in the UK came to an end.

The fuel Oil # 6 found at the former railway line and sidings

can therefore be attributed to the presence of these oil burning steam locomotives during the late 1940’s, and the sidings may have been extensively used by these types of engines during this period.

**Conclusion**

Using this project as a case study, highlights the importance of the relationship between the PRA (historical use of the site), and the intrusive investigation, particularly when unexpected chemical results may occur.

A TPH chromatographic interpretation can further assist in understanding the nature of the results found in relation to the history of the site. This can also be useful for other similar projects in addressing the occasional question to the analyst of, “Where did that result come from?” ■

*This year Terra Tek is celebrating its 25th anniversary of providing geotechnical, on-site, and chemistry testing services. We will be exhibiting at the Geotechnica exhibition in July on stand #4, and look forward to meeting you there.*

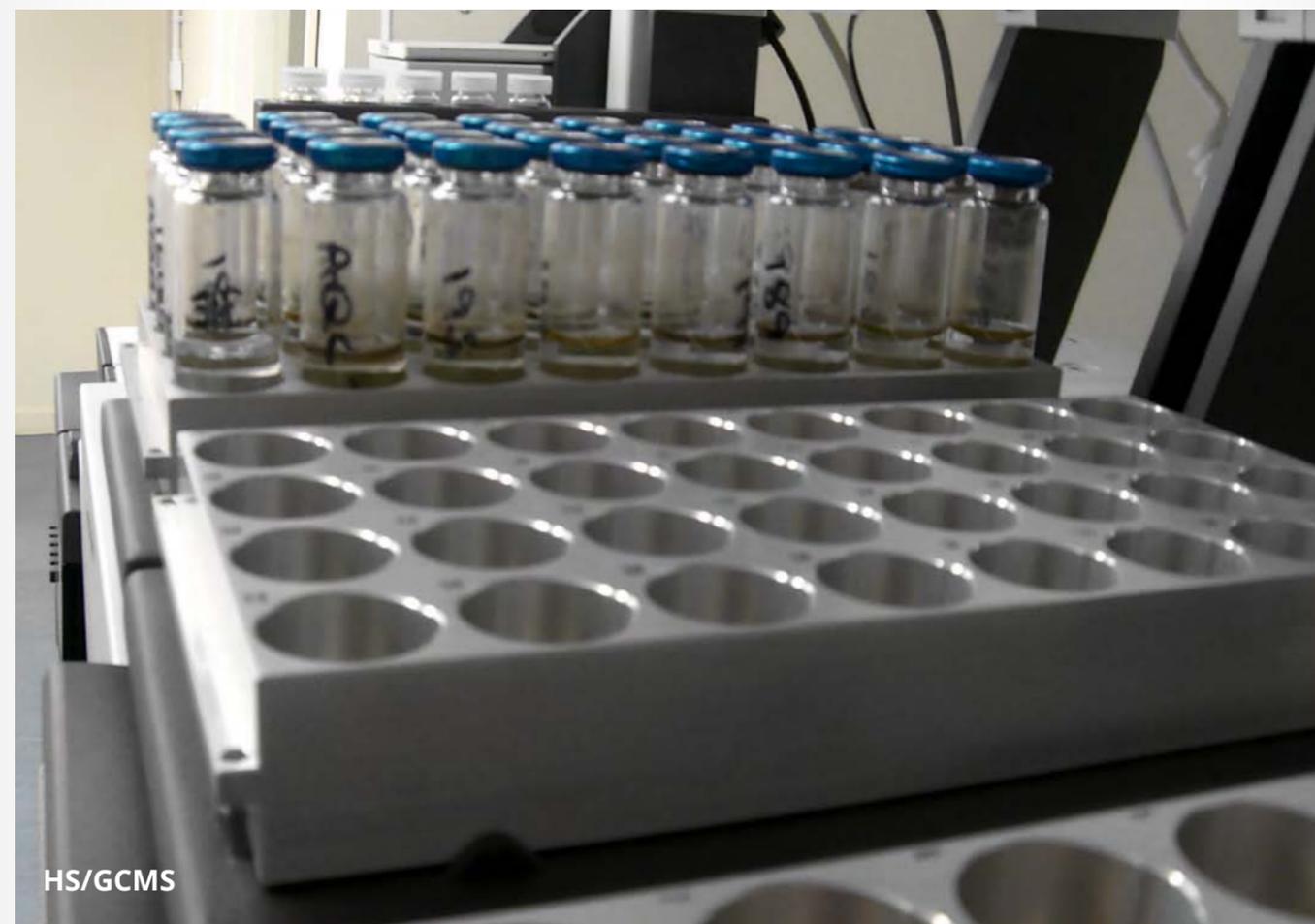


**Acknowledgements:**

Anthony Curtis of DTS Raeburn

**References:**

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