Working with CL:AIRE: A Guide to Undertaking Technology Demonstration Projects (TDPs)

CL:AIRE
CONTAMINATED LAND: APPLICATIONS IN REAL ENVIRONMENTS

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What We Do

CL:AIRE is a not-for-profit public-private partnership created with the backing of the UK Government in March 1999 to encourage the demonstration and research of practical solutions for the remediation of contaminated land.

CL:AIRE is one of the leading organisations within the UK contaminated land sector fulfilling a need for objective, scientifically sound appraisals of remediation technologies and effective methods for monitoring and investigating sites. Fundamental to CL:AIRE's objectives is the way in which these project demonstrations are reported back to the sector, which is in need of guidance and confidence in new technologies. Our unique Technology and Research Group (TRG) draws on some of the foremost professionals and academics within the field to carry out independent appraisals of remediation technologies through Technology Demonstration Projects (TDPs).

Benefits of running a CL:AIRE Project

The principal benefit of having a project approved by CL:AIRE is the profile associated with having passed CL:AIRE's rigorous, independent and objective TRG appraisal, demonstrating to the marketplace a level of scientific and technical credibility, in the projects' reported outcome. Dissemination of your project in CL:AIRE TDP format through our dissemination programme guarantees that this branding of quality is recognised throughout the contaminated land community.

CL:AIRE Project Reports are widely respected for their quality and thoroughness, having been through the TRG peer-review process which assesses the performance of individual technologies in the specific conditions they were demonstrated. In addition to remediation technologies, TDPs also encompass projects demonstrating site investigation tools or monitoring techniques. CL:AIRE is particularly focussed on boosting the numbers of Technology Demonstration Projects passing through our appraisal system which, in time will help to define the best operating conditions for a particular remediation technology. CL:AIRE reports are requested throughout the world, collected in consultant's libraries, used as teaching aids for University courses and feature on the US-EPA's Tech-Direct website.

CL:AIRE's dissemination of information, particularly of our approved projects, is crucial to improving best practice and confidence in sustainable remediation. CL:AIRE has developed a comprehensive dissemination programme for approved projects to take advantage of, comprising our:

- database targeted at more than 4,500 individuals each with a special interest in contaminated land, at the national and international level
- monthly eAlerts providing news and views of the contaminated land industry including project updates
- on-line CL:AIRE Projects Directory and dedicated CL:AIRE project web pages
- one-page PDF 'snapshot' publications, summarising the results of the project
- series of four page bulletins on various aspects of projects or other contaminated land information which CL:AIRE believes warrants special attention - Case Study Bulletins; Technical Bulletins; Research Bulletins; Site Bulletins; and Guidance Bulletins
- presentation of your project at our CL:AIRE Annual Project Conference
- arrangement of public site visits during site remediation if required
- promotion of your project through talks and presentations at industry functions
- feature articles in industry magazines, journals and the technical press
- promotion of project operators for potential business opportunities, through ad hoc enquiries and trade missions.

How to apply for a CL:AIRE Project?

The first stage is to read this guide or look up the project application section on the CL:AIRE website and then call one of the project team to discuss details and eligibility further. Additional information can be found in CL:AIRE's *Priorities for Technology Demonstration and Research* document and from our application form, which are both available on the CL:AIRE website. The application form shows the types of information which would be required for the TRG appraisal. The CL:AIRE project team will advise on and help complete this process. The formal application process is shown in Figure 1 on the far right.

Frequently Asked Questions

What is the Technology & Research Group (TRG)?

CL:AIRE's TRG is a panel of independent land remediation experts from industry, consultancy and academia who voluntarily review all technical projects. The TRG members are signed up to confidentiality agreements with CL:AIRE so projects containing sensitive issues can still be reviewed. The TRG comprise:

- Mr Mike Summersgill - SEnSe Associates (TRG Chairman)
- Dr Brian Bone - Bone Environmental Consultant (TRG Deputy Chairman)
- Mr Steve Edgar - Vertase FLI Ltd (TRG Deputy Chairman)
- Mr Bob Barnes - Environment Agency
- Dr John Campbell - SA Campbell Associates
- Professor Max Coleman - Caltech, California
- Professor Mark Hodson - University of Reading
- Dr Theresa Kearney - Department of Environment, Northern Ireland
- Professor Phil Morgan - Sirius Geotechnical and Environmental Ltd
- Mr Mike Pearl - Babcock International Group
- Dr Mike Rivett - University of Birmingham
- Professor Jonathan Smith - Shell Global Solutions
- Dr Steve Thornton - University of Sheffield

What project characteristics make for a good CL:AIRE Project?

CL:AIRE is interested in proving all types of remediation technology, site investigation tool or monitoring technique. Repeat technology projects only serve to better define their performance envelope. Novel applications are particularly good for pushing forwards the awareness of available technologies and will be well received. A list of all the approved CL:AIRE TDPs to date, is displayed in Table 2 (see overleaf). Some project characteristics that make for a good CL:AIRE Project are displayed in Table 1.

Table 1: CL:AIRE Project Characteristics

Project Characteristic	Crucial	Preferred	Less Crucial
Site contamination is well characterised	✔		
Post-remediation (validation) sampling is thorough	✔		
Applicant is happy to explain the entire remediation process	✔ 1		
Undertaken in the UK		✔	
The project has undertaken treatability studies/trials		✔	
A contaminant mass balance will be attempted		✔	
The project is not yet initiated		✔	
Must be "demonstration" scale			✔ 2
Must be "innovative" or "sustainable"			✔ 3
"Successful" remediation (i.e. remedial targets met)			✔ 4

Notes:

1) A method using a proprietary step or substance can remain confidential provided the TRG are provided with sufficient general technical information to understand the general scientific principle being applied.

2) The project need not be the principal remediation for the site. Provided that it is a reasonable scale, pilot project testing a technology in specific conditions, would be eligible as a Technology Demonstration Project.

3) CL:AIRE is interested in proving any technologies which offer improvements in site assessment practice or remediation that offers an alternative to "dig and dump" and "pump & treat" methodologies.

4) CL:AIRE aims to prove technology in different conditions, and lessons learned are vital for improved understanding. Achievement of remedial targets is peripheral to our aim of demonstrating performance envelopes for technologies.

How long does a project take to be approved?

Once a sufficiently detailed application has been received by the TRG, they aim to provide a review in 3 weeks. If it is approved, the application is then sent to the CL:AIRE Board for ratification before being assigned a TDP number. The CL:AIRE project team will help advise throughout. The application process is displayed in Figure 1.

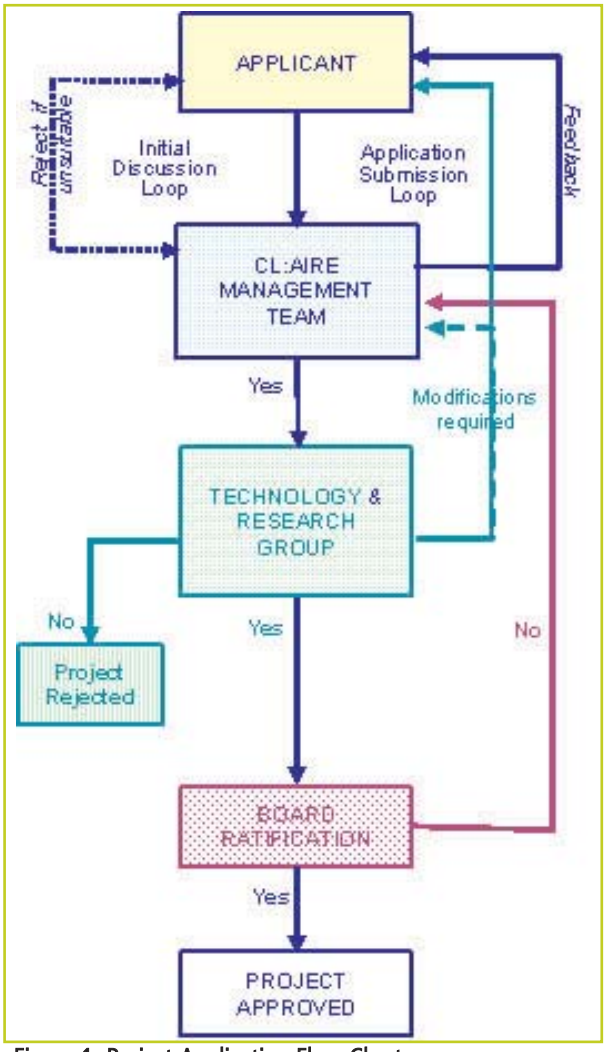

Figure 1: Project Application Flow Chart

What is the cost of running a CL:AIRE Project?

Running a CL:AIRE project involves a fee which is used to contribute to the costs of the printing, promotion, review and staff time required by your project. The fee is typically £10,000+VAT but can be less than this depending on the size of your project, so if you have a potential project we would recommend you talk to us. CL:AIRE is a not-for-profit organisation and promotes TDPs to fulfil its objectives. Often an arrangement can be made by the applicant to share the cost across the team who will gain benefit (e.g. client, contractor, consultant, technology vendor). The fee is only required once an application is approved and the project gets underway, when a contract is drawn up to acknowledge this engagement and the reporting requirements.

Testimony to the cost-benefit of running a CL:AIRE Project, one recent CL:AIRE project operator gave the following feedback:

"We are very pleased with the final document - it is clear and well presented, and we feel it does justice to the project, and the effort involved from personnel involved.

As a result of the CL:AIRE TDP document we have received several expressions of interest for our technology plus invitations to talk at several high profile environmental events later this year.

We would definitely submit further applications, as and when we feel they are suitable, and would recommend this process to other organisations."

Can my project, site, or client, be assured of confidentiality?

In addition to the confidentiality of the TRG, a project can be published without naming the site, its geographical location or the client, should this be preferred. A number of CL:AIRE project reports have already been published in this way.

What rights would CL:AIRE have over my project?

None. The project remains yours including any Intellectual Property Rights (IPR). On approval a contract would state the requirements to provide a report, following CL:AIRE format and reporting guidelines. All full CL:AIRE reports are issued with an ISBN number and registered with The British Library and Nielsen Book Services.

What happens if my project does not go to plan once approved?

Following project approval and contractual agreement it is still possible for a remediation to fail to reach its required remedial objectives or for something unexpected to occur. In this case we would work with the operator to help provide a dissemination output which focuses on the positives of the demonstration and reports the lessons learned with which the operator is comfortable.

Table 2: List of CL:AIRE Technology Demonstration Projects to date

	TDP Technology Description	TDP Project Partners
TDP 1	Thermal (*Ex Situ* Low Temperature Thermal Desorption)	British Aerospace Systems
TDP 2	Soil Washing	National Grid Property/VHE
TDP 3	Permeable Reactive Barrier (Zero Valent Iron)	Nortel Networks/Golder Associates/Queen's University Belfast/Keller Ground Engineering Ltd
TDP 4	*Ex Situ* (Enhanced) Bioremediation (Slurry-Phase Bioreactor)	Parsons Brinckerhoff/National Grid Property
TDP 5	Permeable Reactive Barrier (RAPS System)	University of Newcastle/Durham County Council
TPD 6	*Ex Situ* (Enhanced) Bioremediation (Biopiling)	DEC NV/Jacobs/East Midlands Development Agency/English Partnerships (HCA)
TDP 8	Stabilisation/Solidification (*Ex Situ* Accelerated Carbonation Technology)	Jacobs/East Midlands Development Agency/English Partnerships (HCA)
TDP 9	Soil Vapour Extraction (plus Air Sparge Curtain)	WorleyParsons Komex/National Grid Property
TDP 10	Thermal (*Ex Situ* Enhanced Thermal Conduction/Desorption)	MEL Ltd/Jacobs/East Midlands Development Agency/English Partnerships (HCA)
TDP 11	Soil Washing	DEC NV/Jacobs/East Midlands Development Agency/English Partnerships (HCA)
TDP 12	*Ex Situ* (Enhanced) Bioremediation (Biopiling)	Ecologia Environmental Solutions Ltd/Carillion Civil Engineering/Yorkshire Forward
TDP 13	Permeable Reactive Barrier (RAPS System)	University of Newcastle upon Tyne and Northumberland County Council
TDP 16	*Ex Situ* Soil Vapour Extraction	RemedX and ABB
TDP 17	Permeable Reactive Barrier (SEquenced REactive BARrier: SEREBAR)	Queen's University Belfast/National Grid Property/Parsons Brinckerhoff
TDP 18	*In Situ* (Enhanced) Bioremediation (UK *In Situ* Source BioREmediation: SABRE)	Akzo Nobel/Archon Environmental/British Geological Survey/Celanese Acetate/ Chevron/DuPont/ESI/General Electric/Environment Agency/GeoSyntec/Golder Associates/Honeywell/Scientifics/Strategic Environmental Research and Development Program (SERDP)/Shell Global Solutions/Terra Systems/University of Edinburgh/University of Sheffield//US Environmental Protection Agency
TDP 20	Permeable Reactive Barrier (Zero Valent Iron for CS_2)	CEL International Ltd/ESI/Akzo Nobel
TDP 21	Permeable Reactive Barrier (for Nitrate Polluted Waters: NITRABAR)	University of Oxford/University of Strathclyde/Environment Agency/Ecomesh Ltd (N. Ireland)/PGRW (Poland)/Zenenzo bvba (Belgium)/APCO Ltd (Malta)
TDP 22	Monitoring Technology (IRP-IGM Remote Soil Gas Probe)	Salamander/Urban Vision/University of Manchester
TDP 23	Thermal (*Ex Situ* Low Temperature Thermal Desorption)	National Grid Property/White Young Green/Bilfinger Berger/I&H Brown
TDP 24	Thermal (*In Situ* Conductive Heating enhancing SVE)	UK AEA, Provectus Group Ltd, The Nuclear Decommissioning Authority (NDA)
TDP 25	Decision Support Tool (for *In Situ* Groundwater Technology Selection)	WorleyParsons Komex/National Grid Property/Environment Agency/Bradford City Council/Imperial College
TDP 26	Thermal (*In Situ* Six Phase Electrical Resistive Heating, with Dual Phase Extraction)	Terra Vac (UK) Ltd/Taylor Wimpey Plc
TDP 28	Thermal (*In Situ* Radiofrequency Heating enhancing SVE)	Ecologia Environmental Solutions Ltd/Total UK
TDP 29	Site Investigation (On-site Quantification of Oil: ROSQUO)	National Grid, Cranfield University and WSP Remediation
TDP 30	Chemical Reduction (Calcium polysulphide to treat chromium (VI))	Clyde Gateway Urban Regeneration Company/Glasgow City Council/South Lanarkshire Council/Scottish Enterprise/URS Corporation Ltd/MWH
TDP 31	Chemical/Electrochemical Treatment (Adsorption and electrochemical degradation of organic contaminants)	Arvia Technology Ltd, Vertase F.L.I. Ltd and Geo^2 Remediation Ltd

Project Contact

To discuss undertaking a CL:AIRE Project or anything else in this brochure, please contact the Project Team on 020 7592 1151 or enquiries@claire.co.uk.

Other Reference Documents (available on the website or through the Project Team)

- Priorities for Technology Demonstration and Research
- TDP Application Form
- TDP Report Format Guide

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www.claire.co.uk