



environmental technology

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r³ is a consultancy and research company specialising in the re-use of wastes (particularly, AD, MBT and composting), contaminated land remediation (particularly using bioremediation, and for biomass production), river basin management, and sustainability assessment. It carries out consultancy feasibility studies, research (including experimental work) and information management via networks, databases and web systems.

Technical consultancy and product development, for example:

- re-use of brownfield land for renewables and other services (various locations in Europe, China and Colombia)
- compost / soil improver standards and audit development (various clients);

Research and development, for example:

- development of sustainable remediation tools and concepts (SuRF-UK)
- use of composts and mechanical biological treatment outputs (Grantscape)
- use of nanotechnologies in land remediation (Defra and EC projects)
- soft end uses for brownfield sites (EC Project)
- low input remediation techniques (EC)

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Feasibility studies, for example:

- the *Markham Willows* project (linkage of biomass, remediation / risk management, compost re-use and land regeneration with job creation and economic and social regeneration) with exSite Research Limited, Groundwork UK and others,
- feasibility study for the UK CL:AIRE contaminated sites demonstration network - www.claire.co.uk

Information management, for example:

- EUGRIS the European portal for contaminated land and water information – www.soilandwater.info
- EURODEMO EC project co-ordinating demonstration projects – on line project and funding databases - www.eurodemo.info
- Compost Bibliography web site (Phase 1) – www.compostinfo.info
- 1998- 2011: NICOLE web site, reports and newsletter (Network for Contaminated Land in Europe) - www.nicole.org

Commercial support e.g. product entry, service development – various clients

where

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Some Current and Recent Projects

Strategies for rehabilitating mercury-contaminated mining lands for renewable energy and other self-sustaining re-use strategies, Prosperity Fund Colombia (current)

NANOREM: Taking nanotechnological remediation processes from lab scale to end user applications for the restoration of a clean environment (current)

HOMBRE: Holistic management of brownfield regeneration (completed 2015)

Development and application of soil and water remediation products derived from agricultural crop residues (completed 2015)

Market expectations and requirements for digestate - what are the options? (completed 2012)

Annotated bibliography: Evidence for digestate use in different UK markets (completed 2013)

EUGRIS European Contaminated Land and Groundwater Information Service, a web based portal (current)

Crop based systems for sustainable risk based land management for economically marginal degraded areas (completed 2012)

Technical guidance to support the reporting and verification of bioremediation projects (Completed 2012)

Guidance document on managing contaminated sediments – sustainability aspects (completed 2011)

Some Recent Publications

Bardos, R.P., Bone, B.D., Boyle, R., Evans, F., Harries, N., Howard, T. and Smith, J.W.N. (2016) The rationale for simple approaches for sustainability assessment and management in contaminated land practice. *Science of the Total Environment* 563-564 pp 755-768 DOI 10.1016/j.scitotenv.2015.12.001

Frederic Coulon, Paul Bardos, Nicola Harries, Kate Canning, Mengfang Chen, Quing Hu, Kevin Jones, Fasheng Li, Hong Li, Diogo Gomes, Ming Liu, Rongxia Liu, Xia Yang (2016) Land contamination and brownfield management policy development in China: learning from the UK experience. Report from the China UK Partnership for Contaminated Land Management March 2016. <http://cnukcontaminatedland.com/uk/downloads>

CL:AIRE, (2011) The SuRF-UK Indicator Set for Sustainable Remediation Assessment London, UK. ISBN 978-1-905046-1292-5 www.claire.co.uk/surfuk (co-author)

Environment Agency (2009) Assessment of MBT input and output quality. Report: SC030144/R4. Product Code: SCHO1209BRQG-E-P. ISBN: 978-1-84911-161-4, Environment Agency Bristol, UK. (report contributor with Geoff Warren) <http://publications.environment-agency.gov.uk/PDF/SCHO1209BRQG-E-E.pdf>

Nathanail, J. Bardos, P. & Nathanail, P. (2002 and 2007) Contaminated Land Management Ready Reference. EPP Publications/ Land Quality Press. Available from: EPP Publications, 6 Eastbourne Road, Chiswick, London, W4 3EB. E-mail enquiries@epppublications.com ISBN 1900995069. www.readyreference.co.uk

Nathanail, C.P. and Bardos, R.P. (2004) Reclamation of Contaminated Land Wiley and Sons. ISBN 0471985600 <http://www.wileyurope.com/WileyCDA/WileyTitle/productCd-0471985619.html>