



# **REPORT OF THE NICOLE WORKSHOP**

**Brownfields: How to change a potential  
threat into an asset**

**9 and 10 November 2000**

**IJmuiden, The Netherlands**



**Ministry of Economic Affairs**



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## 1 Introduction

NICOLE (*Network for Contaminated Land in Europe*) was set up in 1995 as a result of the CEFIC "SUSTECH" programme which promotes co-operation between industry and academia on the development of sustainable technologies. NICOLE is the principal forum that European business uses to develop and influence the state of the art in contaminated land management in Europe. NICOLE was created to bring together problem holders and researchers throughout Europe who are interested in all aspects of contaminated land. It is open to public and private sector organisations. NICOLE was initiated as a Concerted Action within the European Commission's Environment and Climate RTD Programme in 1996. It has been self-funding since February 1999.

NICOLE initiated a meeting about brownfields remediation and redevelopment as part of its ongoing conference series, which is outlined in Table 1, as a result of members' intense interest in the brownfields debate. The two other principal European contaminated land networks took part in the workshop: ANCORE and CLARINET. NICOLE and CLARINET have a long standing working relationship, which has recently been expanded to encompass the new network ANCORE. A feature of NICOLE's relationship with ANCORE and CLARINET is an open invitation to their participants to attend NICOLE meetings.

The meeting was intended to serve three purposes, to:

- promote an exchange of information,
- serve as a platform for debate, and
- stimulate research proposal ideas and collaborations for the a call for proposals for the 5th Framework Programme, FP5<sup>1</sup>, released on November 15<sup>th</sup> 2000, in the programme Energy, Environment and Sustainable Development (EESD)<sup>2</sup>.

The programme included a series of expert presentations in parallel sessions and sessions for proposal development:

- Status reports for ANCORE, CLARINET and NICOLE
- Brownfields papers from DGXII and Michigan, USA
- Parallel sessions on brownfields (each comprising given papers and discussions)
  - Industry and service providers
  - Regulators and service providers
  - Academics and service providers
- Report back and plenary
- Development of project proposals

This meeting is the second NICOLE conference for 2000. The previous conference (Finland, May 2000) focused on the problems of source management. Further information on this meeting is available as a meeting report, outlined in Annex 3. Recent and forthcoming NICOLE meetings in general are summarised in Table 1.

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<sup>1</sup> Web link: [www.cordis.lu/fp5/home.html](http://www.cordis.lu/fp5/home.html)

<sup>2</sup> Web link: [www.cordis.lu/eesd/calls/a\\_200001.htm](http://www.cordis.lu/eesd/calls/a_200001.htm)

## 2 Status reports for ANCORE, CLARINET and NICOLE

### 2.1 ANCORE

There is a need for a better information exchange and co-ordination within the scientific community working in the field of contaminated land in Europe to solve complex environmental problems in an ecological acceptable and cost-effective manner, as demanded by several EU directives. This should lead to an improvement in participation within EU projects and should also help the EU in the definition of future research needs.

After numerous discussions between different research groups within the last couple of months, an Academic Network on Contaminated land Research within Europe (ANCORE) was initiated by the Centre for Applied Geosciences at the University of Tübingen ([www.uni-tuebingen.de/geo/zag/](http://www.uni-tuebingen.de/geo/zag/)).

ANCORE should provide a platform for an exchange of ideas and the dissemination of results (new technologies, methods etc.). Based on its independent structure and its scientific focus. ANCORE will interact closely with other already existing networks like NICOLE and CLARINET. ANCORE has the potential to become an important source of know-how for the problem owners and regulators

**Table 1: Recent and Forthcoming NICOLE Events and Publications**

Date	Event / Report
October / November 2001	Workshop on ICT/Computing applied to contaminated land characterisation/remediation, Rotterdam, the Netherlands (Port of Rotterdam) in conjunction with the Network on Natural Attenuation in Groundwater and Soil (NNAGS).
17-18 May 2001	Workshop: “ <b>Cost effective remediation: quality &amp; sustainability</b> ” - best practice examples / how to reduce costs, Paris, France (TotalFinaElf)
January 2001	Special Issue of <i>Land Contamination and Reclamation</i> , outlining NICOLE and CLARINET work and supporting proposals to the second call of FP5. Web link: <a href="http://www.btinternet.com/~epppublications/">www.btinternet.com/~epppublications/</a>
September 2000	<i>Consoil 2000</i> EU dimension workshop
October 2000	NICOLE News, Web link: <a href="http://www.nicole.org">www.nicole.org</a> Information gateway: NICOLE News Service – Announcement 120
September 2000	Joint Statement of NICOLE, CLARINET, ETCA and SENSPOL: Sustainable Management of Contaminated Land for the Protection of Water Resources, Web link: <a href="http://www.nicole.org">www.nicole.org</a> Information gateway: NICOLE News Service – Announcement 112
21-23 June 2000	EU Workshop on The Protection of European Water, Resources, Contaminated Sites, Landfills and Sediments, Venice. Web link: <a href="http://www.etcenet.org/">www.etcenet.org/</a>
22-23 May 2000	Report of the NICOLE Workshop on Source Management, Helsinki, Web link: <a href="http://www.nicole.org">www.nicole.org</a> Information gateway: NICOLE News Service – Announcement 121 also published in <i>Land Contamination and Reclamation</i> <b>8</b> (4) 67-78

working in the field of contaminated land. ANCORE will focus its activities not only to today's EU member states, but will also be open for members from East Europe.

ANCORE includes currently about 50 research institutes from 16 European countries and covers a broad range of scientific disciplines involved in the field of contaminated land research (e.g. hydrology, geology, geochemistry, microbiology, biotechnology, geo-ecology, geophysics).

## 2.2 CLARINET

The Concerted Action, CLARINET (*Contaminated Land Rehabilitation Network for Environmental Technologies in Europe*), started in July 1998 and will continue until mid-2001. CLARINET is a network of 16 European countries, co-ordinated by the Austrian Environmental Agency and supported by the European Commission's Environment & Climate Programme. CLARINET brings together the combined knowledge of academics, government experts, consultants, industrial landowners and technology developers. It provides an interdisciplinary network on the sustainable management of contaminated land in Europe, analyses key-issues in decision-making processes and identifies priority research needs on technical, environmental and socio-economic topics. Overall, CLARINET focuses on the underlying scientific basis of risk-based methodologies and aims to stimulate RTD collaboration in Europe on identified research needs. CLARINET is the successor to the previous Concerted Action CARACAS (Concerted Action on Risk Assessment for Contaminated Sites in Europe) which completed its work in October 1998. Web link: [www.clarinet.at](http://www.clarinet.at)

The goals of CLARINET are to identify how contaminated land (soils, groundwaters, surface waters) can be managed effectively and sustainably, to ensure (a) the safe (re-)use of land, and (b) to abate resulting water pollution to maintain the functionality of soil and (ground) water ecosystems. CLARINET has four main themes:

- Soil and groundwater protection
- Risk assessment
- Remedial technologies
- Decision support issues (including socio-economic and political aspects)

CLARINET aims are to develop technical recommendations for the sound decision-making in the rehabilitation of contaminated sites in Europe, to assess current approaches to contaminated land management, to identify priority research needs and to stimulate co-ordinated R&D at EU and national levels.

An international CLARINET conference will be held in Vienna on 21<sup>st</sup> and 22<sup>nd</sup> June 2001. The major objective of this conference will be to present and discuss conclusions from recent and recommendations for future work with a broad spectrum of participants. Further information on this conference is available on [www.clarinet.at](http://www.clarinet.at). All researchers and practitioners in the field are cordially invited to register.

## 2.3 NICOLE

NICOLE's overall objectives are to:

- Provide a European forum for the dissemination and exchange of knowledge and ideas about contaminated land arising from industrial and commercial activities;
- Identify research needs and promote collaborative research that will enable European industry to identify, assess and manage contaminated sites more efficiently and cost-effectively; and

- Collaborate with other international networks inside and outside Europe and encompass the views of a wide a range of interest groups and stakeholders (for example, land developers, local/regional authorities and the insurance/financial investment community).

NICOLE currently has 118 members. Membership fees are used to support and further the aims of the network, including: technical exchanges, network conferences, special interest meetings, brokerage of research and research contacts and information dissemination via a web site, newsletter and journal publications. NICOLE's forthcoming programme was outlined in Section 1.

NICOLE includes an Industry Subgroup (ISG) – with 29 company members. The Industry Subgroup objectives are to:

- move from problem identification to solution generation;
- find ways to implement identified cost-effective solutions;
- improve communication and co-operation with all stakeholders;
- broaden the focus to include 'brownfields'.

NICOLE also includes a Service Providers Subgroup (SPG) which currently has 16 company members including small and medium enterprises (SMEs). The SPG represents the varied interests of consultants, contractors and materials/equipment providers.

NICOLE also includes 75 individual members from the academic sector/research community and 16 members from other organisations, including research planners, non-profit making organisations, other networks, funding organisations.

### 3. The City of Tomorrow and Cultural Heritage

Dr David Miles of the DG12 (Research) of the European Commission outlined the current Third Call for proposals for the Framework 5 programme (FP5) as regards the Key Action “City of Tomorrow and Cultural Heritage”. Two proposal deadlines and budgets are in this call.

<b>First Deadline</b>	<b>Second Deadline</b>
Opens 15 November 2000 Closes 15 February 2001 Budget approximately 43 Million EURO Pre-proposal check from 15 November 2000 to January 2001	Opens 15 November 2000 Closes 15 October 2001 Budget approximately 26 Million EURO

The call and budgets extend over four themes:

- 4.1 Sustainable city planning and rational resource management
- 4.2 Protection, conservation and enhancement of European cultural heritage
- 4.3 Development and demonstration of technologies for safe, economic, clean, effective and sustainable preservation, recovery, renovation, construction, dismantling and demolition of the built environment, in particular for large groups of buildings.
- 4.4 Comparative assessment and cost effective implementation of strategies for sustainable transport systems in an urban environment

The first and second calls cover different sub themes, several of which relate to specific topics for brownfields regeneration. These sub themes are summarised in Table 2. Those suggested as having relevance to brownfields remediation are highlighted in bold. NICOLE recommends closest scrutiny is paid to the February 2001 deadline themes.

Those interested in proposing projects should check the detailed wording of the call. Proposals that are out of scope will not be considered. The types of proposals that are possible include RTD (research, technology development) projects and concerted actions (networks). Complete information on the call and the types of possible projects is provided via the FP5 home page, web link: [www.cordis.lu/fp5/home.html](http://www.cordis.lu/fp5/home.html)

**Table 2 Sub themes in the Third Call for Proposals for “The City of Tomorrow and Cultural Heritage”.**

February 2001 Deadline	October 2001 Deadline
4.1.1 Improving urban governance and decision making <b>4.1.3 Improving economic development, competitiveness and job creation in city centres and neighbourhoods</b> 4.2.1 Improving damage assessment on cultural heritage 4.2.2 Development of innovative conservation strategies <b>4.3.2 Optimum use of urban land and rehabilitation of brownfield sites</b> 4.4.1 Strategic approaches and methodologies in urban planning towards sustainable urban transport 4.4.2 Comparative assessment and demonstration of novel transport forms and related infrastructure	4.1.2 Improving the quality of urban life <b>4.1.3 Improving economic development, competitiveness and job creation in city centres and neighbourhoods</b> 4.2.2 Development of innovative conservation strategies <b>4.2.3 Foster integration of cultural heritage in the urban setting</b> 4.3.1 Sustainable construction and reconstruction of large groups of buildings and urban infrastructure

There is a pressure towards larger projects (>500,000 EURO EC contribution), which are seen as more likely to have a visible European research presence. Mr Miles also emphasised a particular interest in involving local authorities in proposals and that the benefits for the citizens should be evident in the proposal. His suggestion was that research/experiments on remediation should not cover more than 40% of the whole project. His preference was for integrated proposals including planning, re-use of demolition/soil waste, full re-use of the brownfield (e.g. also bringing improvement to surrounding areas) and developing full stakeholders/end user involvement.

NICOLE has been provided with a **full set of the presentation slides** and a **check list** for those wishing to make proposals. Both have been made available on its web site, web link: [www.nicole-org](http://www.nicole-org) Information gateway: NICOLE News Service – Announcement 127.

#### **4. Brownfield Initiation in Michigan USA**

Lynn Buhl (Michigan Department of Environmental Quality) provided an interesting case study of brownfields approaches in the USA. In Michigan a “brownfield” is defined as “an abandoned, idle or under-utilised property whose redevelopment is complicated by real or perceived environmental contamination.” These are not just urban sites. Brownfield redevelopment can strengthen communities by:

- Improving tax base
- Increasing employment and recreational opportunities
- Reducing urban sprawl/conserving green space

- Avoiding costs of infrastructure expansion
- Combating negative perceptions about urban centres
- Being a catalyst for change in neighbourhood.

In 1998, votes passed the Clean Michigan Initiative, which awarded \$335 million for remediation, primarily of those sites with redevelopment potential. Additional tax incentives were approved by the state legislature in 2000. Michigan's approach has tackled three major obstacles to brownfield redevelopment:

- Liability standards
- Clean up standards
- Funding needs

In addition remediation can be self-implementing, so a liable party has great control over the timing of its remedial efforts. A survey of 33 cities in April 2000 revealed the following results from changes in liability, standards & funding:

- Private investment in brownfield sites: \$1.7 billion
- Job creation: 8,100

Issues remaining to be resolved include:

- Inconsistent liability standard with federal statute
- Air quality standards
- Environmental justice (based on the Federal Civil Rights Act).

The Michigan liability standard is different to the Federal version, which is more stringent. It is unlikely that a Public Sector organisation could successfully make a case for the Federal Liability Section to be applied, but a private group (e.g. site neighbour) could take action based on Federal law. An emerging environmental justice issue is that a disproportionate number of industrial areas are near minority population areas, which could be seen as discriminators. Hence, a person in one of these areas could challenge the permit for a company operating near it.

Weblink: information on the Michigan program can be obtained at:

[www.deq.state.mi.us/erd/brownfields](http://www.deq.state.mi.us/erd/brownfields).

## 5. Industry and Service Providers Session

The industry and service providers discussion identified two key issues for brownfields regeneration:

- the need for *communication* between stakeholders, and also with the public as a platform for confidence and
- the need to *convince stakeholders that their interests and desires have been satisfied*.

Dealing with brownfield remediation is, by its nature, multi-stakeholder and interdisciplinary. Society has taken a political decision to encourage brownfield re-use. However, like it or not, the profit motive is the usual driver for redevelopment. One approach to reconciling competing priorities and the need to secure returns on investment, is to take a view from the desired targets, looking back at what is necessary to move forwards these targets. It is also useful to take a realistic view of what constitutes the boundaries to any particular project, i.e. what are assumed as givens. Typically these givens are: the pollution problem, law, regulations and economics. However, not all of these "givens" are absolutely fixed. Sometimes an innovation can change the project boundaries and make a brownfields redevelopment far more attractive. Some examples are:

- out of town opportunities for brownfields on the outskirts of towns, where space and transport may allow a greater range of final uses, particularly for retail and leisure;
- use of innovative insurance approaches for example to protect investors from possible remediation cost overruns;
- triggers for redevelopment like prestige projects – for example a new stadium, can often serve as a flagship for a far broader urban renaissance.

The discussions also highlighted two important lessons from past experience. Firstly, marketing is a vital activity that can significantly increase land values, and so profitability. Marketing may need to be accompanied by measures that might not directly return a proportion of a land area for sale, for example providing a new access road. Secondly, it is important to consider a range of land uses, not just a single end use, to maximise the flexibility of a project and its overall marketability.

An important end use is green space. This is not a redundant land use, but is the ‘green lung’ of a brownfields regeneration, increasing its attractiveness as a place to live and work. Green space often also decisively marks a break with the past. It can be worth considering a more holistic approach. In the UK the concept of “master planning” has been developed. In this concept remediation, redevelopment and landscaping are planned as integrated rather than sequential processes.

**Note:** This section is based on the report given by Wenter Gevaerts (the Netherlands) Annex 1 lists the papers presented in this section.

## 6. Regulators and Service Providers Session

The regulators and service providers session agreed that brownfields remediation is not purely a technical or scientific problem, but it is an issue for society in general.

Despite the widely recognised need to focus development on brownfield as opposed to greenfield land, barriers remain to brownfields re-use. These barriers are often cultural and related to risk perception. Investors are likely to be averse to financial risk, such as the risk of land seeming still tainted in some way; and of a remediation not working properly or over-running on time and or costs. The attitude of regulators can be a problem, in particular if they are in a “rule following” as opposed to a “problem solving” frame of mind. Most importantly, it is the attitudes of people in general, that shape what may or may not be feasible for brownfield sites re-use.

Solutions to brownfield site problems are far wider than those addressed by remediation. They encompass a wide range of regeneration issues, for example, job creation, fostering new businesses, supporting landscapes and involving and assisting communities. For most large projects these different activities need to be planned and considered in an integrated way (master-planning).

*Stakeholders, partnerships and ownership* are key words to any brownfields project. Partnerships need communication. This communication has to be open, honest and clear. Communication may also need to include education to enable an equal dialogue. The regulator is often the ‘ring-holder’ who sets the boundaries for the available solutions. These boundaries have to be made clear, but they do not necessarily dictate the choice of the route taken to reach them, i.e. the remedial approach.

“Ownership” of brownfield problems, and the route to their solution, is wider than the “technical” stakeholder (the regulator, consultant etc). It is local people who have to live with the consequences of a brownfields project, good or bad. They should be involved in decision making.

The session made a number of further statements of belief:

- Regarding local communities: “we cannot impose technical solutions on these people’s lives;”
- “Parts of the *cities of tomorrow* will be built on the brownfields of today. This should not result in second class soil for second class people”.
- “New research from the FP5 may be wonderful in theory, but its findings are unlikely to be taken up, unless backed by a large educational effort”.

**Note:** this section is based on the report given by Joop Vegter, the Netherlands. Annex 1 lists the papers presented in this session.

## 7. Academics and Service Providers

The academics and service providers session identified a series of research needs as a precursor to the call for *City of Tomorrow*, and for the workshop in general. Research needs may arise at a national level, at a bilateral level between countries, or as a broader EU need. The EC FP5 is not the only platform for European collaborative research, development and demonstration. The EUREKA programme is also a platform for research between countries in the European Economic Area (EEA) and other partner countries. Within EUREKA a specific programme “EUROENVIRON” addressed environmental technologies, including remediation technologies. Weblink: [www.euroenviron.com](http://www.euroenviron.com).

Across the five papers presented at this session the following research needs have been distilled:

- better *in situ* remediation technologies.
- better *ex situ* environmental infrastructure to deal with material taken off site, a large proportion of brownfields development still depends on "excavate and remove" approaches.
- technology transfer and information exchange gateways.
- predictive modelling, for example for bio availability and time dependent leachability – particularly an issue for inorganic contamination problems.
- ecological risk criteria development
- risk communication
- brownfields prevention
- understanding the relative cost and benefits of different levels of site characterisation.
- developing alternatives to point based site investigations
- prediction of long term performance of systems such as barrier walls.

Large brownfield areas such as Bitterfeld pose particular problems. Research is needed on the optimisation of remedial solutions for such areas. Phyto remediation is seen as a particularly promising technology.

Three issues were felt to be of particular importance. Firstly, a common platform for considering the economic, environmental and social criteria in decision making is needed. This has to be inclusive and facilitate stakeholder involvement in decision making. One approach to this is to develop systems for assigning monetary values to ALL benefits and impacts. Secondly, a better understanding of time dependent bioavailability and mobility of heavy metals and organics for specific materials is urgently needed, to refine current techniques for risk assessment and risk management. Thirdly, international benchmarking and comparison studies for risk assessment, risk management and decision support approaches might greatly assist international harmonisation, and identify general underpinning research needs.

Web link: [www.clu-in.org/intup](http://www.clu-in.org/intup) where a report of a special session on decision support of the NATO/CCMS Remediation Pilot Study will be made available in 2001.

**Note:** This section is based on the report given by Paul Nathanail, UK. Annex 1 lists all papers presented in this session.

## 8. Plenary Discussion

The focus of the plenary discussion was on the application of the current state of the art in dealing with contaminated land to brownfields problems, given the diverse range of stakeholders and their interests. It is quite clear that there is a broad consensus amongst what might be called the “technical stakeholders”, that the best approach to decision making is the risk based approach. Web link: [www.nicole.org](http://www.nicole.org), Information Gateway, NICOLE News Service, Publications. Number 16

However, it is not clear that this approach is as widely accepted by all other stakeholders involved in brownfields projects. To a lesser or greater extent, this lack of acceptance is probably due to the following:

- that not all of the stakeholders who should be involved *are* involved, or involved at an early enough stage.
- that clearer explanation, and perhaps education, is needed, and that some technical terms such as “residual risk” are likely to be seized upon in an emotive way.

The three sessions produced complementary and matching discussions. Risk based decision making is clearly a powerful tool. However, there are two limitations. Firstly, it cannot be assumed that all stakeholders necessarily immediately accept the principle, even if we believe that given time and adequate explanation they will come to see its value. Secondly, risk based decision making addresses only one of many strands important in brownfields decision making. It does seem very hard to consider these different strands in a holistic way at present, and in a way that is inclusive of all stakeholders.

Three broad project development discussions followed as a result of this plenary.

1. Cost-effective rehabilitation
2. Innovative land management: innovative risk assessment for the efficient use of underground and surface space
3. Decision support tools (DSTs) including social/economic items and risk communication.

Reports have been prepared by the reporters of each discussion and will be made available on the NICOLE web site via the NICOLE News Service.

The project development discussion on DSTs has resulted in the initiation of a proposal for the Third Call of *City of Tomorrow and Cultural Heritage*. The project under development is called LUCAS “Land Use Cycle Appraisal System”. Its aim is to achieve integration in time, space and decision elements (i.e. economic, environmental and social) and so support holistic decision making. The intention is to produce an operating decision support tool. Contacts for further information: Dr Chris Zevenbergen, Dura Vermeer, the Netherlands, e-mail: [c.zevenbergen@vermeer.nl](mailto:c.zevenbergen@vermeer.nl) and Dr Paul Nathanail, University of Nottingham, UK, e-mail [paul.nathanail@nottingham.ac.uk](mailto:paul.nathanail@nottingham.ac.uk)

## **Annex 1 Papers Presented at the NICOLE WORKSHOP on Brownfields: *How to change a potential threat into an asset.***

### **Introduction**

1. Status report NICOLE Paolo Cortesi
2. Status report CLARINET Harald Kasamas
3. Status report ANCORE Georg Teutsch
4. Brownfield initiatives: the Michigan Programme  
*Lynn Buhl*, Michigan Dept. of Environmental Quality, USA.
5. Brownfield in the 5<sup>th</sup> Framework Programme *David Miles* - Head of Unit – DG Research/City of Tomorrow and Cultural Heritage.

### **INDUSTRY & Service Providers Session** (*Chairman/reporter: Steve Wallace/Wouter Gevaerts*).

6. Trading brownland  
Stewart MacIntyre – Lattice plc.UK
7. Redevelopment of derelict land: Greenwich Peninsula/Millennium Village  
Joint presentation by *Ian Parish*, Nuttall and *Ian Heasman*, Taywood, UK.
8. Standardising Risk Assessment to Facilitate Re-Development Processes; an Australian Case Study.  
*Karen Cerneaz*, Shell Global Solutions, The Netherlands
9. Profitable site remediation and redevelopment, *Rolf Henkler et al*, ICI Points.
10. The resolution project: a Decision Support System for Brownfields redevelopment *Giovanna Landi*, FEEM/ENI Group, Italy.

### **REGULATORS & Service Providers Session** *Chairman/reporter: Mike Summersgill/Joop Vegter*

11. Regenerating Brownfields – Working in Partnerships *Judith Lowe*, Parkman, UK
12. The Brownfields redevelopment in India, Chris Zevenbergen, DuraVermeer Group, the Netherlands.
13. Implementation of sustainable development principles in industrial regions by means of environmental management procedures on example of mining regions  
*Wlodzimiers Sokol*, Central Mining Institute, Poland.
14. UK White Paper on Land Reclamation Policy and Practice  
*Jon Rouse*, Commission for Architecture and the Built Environment, UK.
15. Citizen participation in the Nord-Pas de Calais Brownfield  
*Catherine Bertram*, Mission “Bassin minier”, France

## **ACADEMICS & Service Providers Session** (*Chairman/reporter: Georg Teutsch/Paul Nathanail*)

16. The Senter-programme for support of technological cooperation in Europe *Marco Schwegler*, Senter, The Netherlands.
17. The environmental behaviour of heavy metals in iron and steel wastes *Donna Hepple*, University of Paisley, UK.
18. Bitterfeld case: Solutions for the Spittelwasser Pollutions  
*Bert Satijn*, SKB, The Netherlands.
19. Case of redevelopment in Germany  
*Rüdiger Hotten*, Hochtief, Germany
20. Environmental merit of Brownfield redevelopment – Balancing the value of land  
*Detlef Grinski*, UBA, WG1 on Brownfields CLARINET

## **Plenary Session**

21. Brownfields: Managing the subsurface  
*Ed de Mulder*, TNO-NITG, The Netherlands
22. Experiences with Brownfield remediation from Vancouver  
*Kim Forchhammer*, Golder Grundteknik KB, Norway
23. Back to the future, *Sytze Keuning*, Bioclear, the Netherlands

## **Annex 2 NICOLE WORKSHOP ON BROWNFIELDS: *How to change a potential threat into an asset*, Delegate List**

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**L.Y. (Lynn) Buhl**

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**I. (Ian) Heasman**  
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BioSoil BV

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## **Annex 3: Source Management - Findings of the May 2000 NICOLE Workshop**

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### **Abstract**

This paper sets out an overview of what constitutes "source management" based on papers submitted to a workshop held by NICOLE, the Network for Industrially Contaminated Land, held in Finland in May 2000. The principal conclusions of this workshop are that:

- Risk based decision making is the best available paradigm for dealing with the problems posed by land contamination. Its advantages are that it is systematic and objective, and it provides a consistent and defensible basis for considering uncertainties, discussing options and making decisions. However, a number of challenges face practitioners and users of risk assessment and risk management, in particular: public acceptability; dealing with uncertainty; validation and the development of practical robust and agreed tools.
- In addition to risk management, sustainable development should be explicitly considered in all remediation decision making for source management.
- Early and effective communication with all legitimate stakeholders is recommended to ensure the earliest and widest acceptability of any decisions reached.