



The National Groundwater
and Contaminated Land Centre

**Annual Report
1997 - 1998**

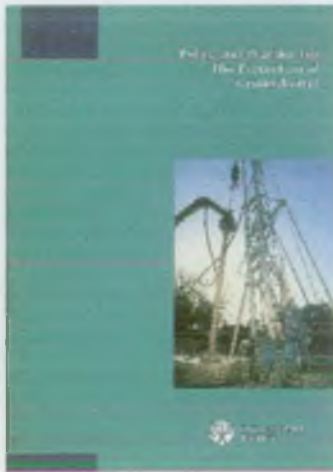


ENVIRONMENT AGENCY

“The National Groundwater and Contaminated Land Centre business plan and this Annual Report are both intended to be widely available, public documents. We hope that they will engage and inform and we welcome constructive feedback”.



- Bob Harris, Head of Centre



Underground

From the National Groundwater and Contaminated Land Centre
Environment Agency



Groundwater Festival for the Millennium



The largest 10th year anniversary groundwater festival ever... The festival will celebrate the 10th anniversary of the Centre's establishment in October 2001.

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- Celebrate the Centre's 10th anniversary
- Celebrate the Centre's achievements
- Celebrate the Centre's future

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Groundwater Festival for the Millennium

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Foreword

The National Groundwater and Contaminated Land Centre was formed in 1997 as one of the National Centres established as a fundamental part of the Environment Agency's organisational structure. The formation of the National Centres recognised the essential need for a major regulatory body to have a firm science base underpinning its decision-making processes if it is to be credible and accepted by industry, other land users and the public. The need is particularly critical in the existing and emerging regulatory areas of groundwater and contaminated land where the issues on which decisions are made are largely below ground and out of sight. Decisions therefore have to be made within a conceptual framework but their impact on the land user or groundwater abstractor can be large.

The NGWCLC has spent a significant part of its first year in set-up activities and yet at the same time has carried out a substantial programme of technical work. The set-up period has been challenging but a good group of people are now in place and networks of key external contacts have been established.

The Centre has a demanding programme of work facing it as we start to enter a new era of legislation for the regulation of groundwater and contaminated land. The Centre has a vital role to play in bringing scientific understanding to the decision-making process in the field. One of the key challenges will be to inform and educate Regional and Area staff who have little prior experience of these topic areas, so that they are in a position to make appropriate operational decisions. The Centre has an ambitious programme and looks forward with anticipation to being judged on how well this work is delivered to the Agency.

Paul Leinster, Director of Environmental Protection

1. Summary

The Centre business case was approved by Directors in February 1997 and senior staff were appointed over the spring and summer of 1997. The senior management group produced a vision to:

"...be a national centre of technical expertise in groundwater and contaminated land issues and to promote well informed, consistent regulation by the development and dissemination of effective methods based on sound science and a principle of sustainability."

The Centre carried out a very full programme of work during 1997 alongside establishing itself and recruiting staff into post. Service level agreements were established with the Water Resources Function and developed with Land Quality and Water Quality. Regular liaison arrangements with other National Centres and National Services were established.

Centre staff have been active in advising Head Office and DETR on new policy issues and individual Regions for operational projects. Centre staff have also been involved in a wide range of high profile external events and presentations. R&D projects with a cost of £2M and a value of £4.9M are underway or planned, most managed within the Centre.

The work of the Centre directly addresses five key themes of the Agency's work: *Managing water resources, Conserving the land, Managing waste, Delivering integrated river basin management, Regulating major industries* whilst influencing to a lesser degree the remaining four themes. The work programme is strongly influenced by impending new regulatory regimes for both groundwater and contaminated land and the EU Water Framework Directive has provided the basis for groundwater resources activity.

2. Report of the Client Board

The Client Board met once during the year on the 28-Nov-97 to agree the Centre business plan and review progress. During the year, the composition of the Board changed with the departure and arrival of senior Agency staff. The membership of the Board (at March 1998) was:

Paul Leinster	Director, Environmental Protection – Chairman (from Feb-98)
Martin Griffiths	Head, Water Quality
Sue Herbert	Head, Land Quality (to Dec-97 was Judith Denner)
John Seager	Head Environmental Quality
Andrew Skinner*	Regional EP Manager, Midlands Region
Mike Eggboro*	Water Resources Manager, NW Region
Simon Read*	Regional EP Manager, Thames Region
Geoff Bateman*	Area Manager, Devon
Andy Bell*	Project Accountant, Midlands
Stephen Foster	Assistant Director, British Geological Survey
Simon Pollard	Policy Advisor, Contaminated Land, SEPA
Bob Harris	Manager, National Groundwater and Contaminated Land Centre
Mary Goldsworthy (secretariat)	Business Support Officer, National Groundwater and Contaminated Land Centre

* Board members representing the Operations Directorate as well as their own specialist technical area.

In addition to the Client Board meetings there were regular, quarterly reviews of the Centre by the Regional General Manager of Midlands Region (to which the Centre is attached).

The Client Board approved the Centre's Business Plan for 1998/9 which had been developed through close consultation with the relevant Functions: Water Resources Managers, Water Quality and Land Quality national groups. The Board also approved the Centre's budget for 1998/9 with no reductions in the previously planned level. The Board noted the impending arrival of new regulation and legislation particularly the Groundwater Regulations and Part IIA of the Environmental Protection Act. Both of these will be key drivers for the Centre workload in the future.

Minutes of the Client Board meetings and papers submitted are included in Appendix 2.

3. Summary of the year

3.1 Staffing

The latter three months from December 1997 to April 1998 saw a second round of recruitment into the Centre; skilled staff from a wide variety of backgrounds were appointed and most arrived to take up their posts in late February 1998. Of the full complement of 14 posts, 13 were filled. The backgrounds of the staff members were:

- Internal transfer – 7 people
(6 from National Rivers Authority, 1 from Dorset waste regulation authority)
- Environmental consultancy – 2 people
- Industry – 2 people
- Academia – 1 person
- Seconded from British Geological Survey – 1 person

Recruitment of high quality technical staff was difficult reflecting the small external market, lack of internal Agency expertise and the uncertainty across the Agency caused by the re-organisation. Despite repeated attempts to fill the remaining place no suitable candidates were identified and alternative arrangements were explored. However, additional effort was obtained through contracts with consultants:

Environmental Simulations Limited (Laurence Brown) used to support groundwater resources projects
 Aspinwall and Company (Tony Marsland) used to co-ordinate Agency activity on Groundwater Regulations
 Professor Ken Rushton (formerly with University of Birmingham) used for groundwater modelling advice.

3.2 Centre accommodation and resources

The Centre is established in the Olton Court Office of the Midlands Region. Complete refurbishing of the office accommodation plus the purchase and installation of sufficient computing and other hardware was completed by January 1998 utilising set-up funds.

3.3 Operating in an open and business-like way

The Centre has identified and established a number of management systems to promote efficient delivery of work. Computer based systems have been adopted where possible. An "Enquiries" database has been established to track all requests for assistance and to ensure that responses are delivered in line with the Agency's Customer Charter. We have instigated the use of an electronic system for recording effort "Timesheet Professional" will provide detailed cost breakdowns to inform future work programmes and aid planning.

The Centre's work methods and structures will continue to be developed to establish the Centre as a focus for Agency as a whole in its particular areas of business. Centre staff, with external assistance, have undertaken a review of working practices to continue development of the Centre's work methods and structures. As a result, a project-based method of working has been established and a more integrated organisation for the Centre has been created.

The Centre workload is organised through execution and delivery of particular projects. These are particular parcels of work carried out for identified customers. New projects are initially proposed in the Centre's business plan for agreement with the Client Board on a regular basis. Projects arise in many forms, the Centre has defined projects for its own purposes as pieces of work with a defined start and end point which also include a defined budget for direct (cash) expenditure or incur more than 5 days FTE effort (major project). Temporary, project-based, reporting lines will be established for each new piece of Centre work. The project manager may be anyone within the Centre (or outside) and may call upon other Centre staff to join a project team specific to that piece of work. A definition of the Centre operational structure is shown below.

In consequence the Centre is better placed to respond to all its various customers and build on the natural synergies in groundwater and contaminated land issues



3.4 Operational support

The Centre works closely with Regional and Area colleagues, the items below give a flavour of the work undertaken for each Region:

North East

Technical advice for 2 contaminated sites

Midlands

Assistance with aquifer model

Assistance with selection of Capital Fund projects

Seminar to Hydrometric staff

Wales

Assistance with selection of Capital Fund project

Anglian

Assistance with Capital Fund projects

Thames

Assistance with major landfill redevelopment

Assistance with natural attenuation site

Assistance with Enfield munitions site redevelopment – major test for Agency approach

Assistance with groundwater training

Southern

Assistance with petrol filling stations assessment.

Assistance with major WML application

Assistance with Capital project

South West

Attended artificial recharge project meeting

Advice for former gasworks

3.5 Water Resources Function (managing our water resources)

The ongoing work on the review of Nitrate Vulnerable Zones culminated in delivery of a revised list of zones and candidate zones to DETR. Existing zones were reviewed in line with the requirements of the EC Nitrate Directive and several additional zones were proposed for inclusion. The Centre also carried out a review of external work on the implementation of EC Nitrate Directive to date.

The Centre organised a national seminar on groundwater modelling and pump test softwares. This led to the adoption of Groundwater Vistas as the *Best Interim System* for use in Agency modelling work.

The Centre is continuing to carry out important work at the request of Head Office to explore and define the groundwater aspects of the EU Water Framework Directive. This has included discussions with the Commission and attending the EU Expert Group during the UK presidency.

3.6 Water Quality Function (delivering integrated river basin management)

The Centre, in collaboration with Regional colleagues, revised and re-published the previous NRA document "*Policy and Practice for the Protection of Groundwater*" (PPPG). After more than six years this was over due for revision. However, the new version itself can only be expected to have a lifetime of less than two years. The introduction of major pieces of legislation (Water Framework Directive, Groundwater Regulations) will undoubtedly necessitate a fundamental redesign of the policy and this document over the next planning period.

A significant effort has been made to co-ordinate the Agency response to the Groundwater Regulations and to clarify the likely workload and potential impacts on the Agency. A number of

discussion and information papers were prepared and submitted to the Function and thereafter to DETR. A Director of a major consultancy was contracted to work in the Centre to assist this work.

Further groundwater vulnerability maps have been produced extending the coverage at 1:100,000 scale and coverage will be completed in the coming year. Originally published as paper maps they have also been produced electronically on CD-ROM, the first Agency publication in this format. Copies of the digital maps were distributed to every Region. The paper maps and the PPPG have long been one of the "best-sellers" of Agency and former NRA publications. In all, through both The Stationery Office and this Centre, paper maps with a combined face value of £28k were sold. In addition, CD-ROM sales had a face value of £58k. *Total groundwater related sales were approximately £90K (face value) over half the total Agency/TSO sales value.*

3.7 Land Quality Function (conserving the land)

The government extended the use of the Supplementary Credit Approval scheme utilised by Local Authorities to obtain money for remediation of problem "orphan" sites, to include the Environment Agency. The Centre provided a technical review stage for those Capital Fund projects proposed by Regions. This is an on-going activity with an annual bidding process for both Local Authorities and the Agency.

Staff from the Centre contributed to the contaminated land workshops held in North West Region and Environment Agency Wales under the auspices of Head Office. Further workshops are planned for other Regions, incorporating more topics as the anticipated introduction of Part IIA approaches.

3.8 Furthering the science base

The Centre is heavily involved with a wide range of research and development projects. Three topics, each in different programme areas, are led from the Centre and a range of projects are actively managed by staff. Six R&D projects costing £344k were completed at the end of March 1998, representing a total project cost of £655k. Fourteen further projects continued into 1998/9.

Links to a wide range of internal and external groups have been established. Key national and international academic contacts such as the Groundwater Protection Group at the University of Sheffield and the Environmental Biotechnology Centre at the University of Oxford are complemented by technical research organisations such as British Geological Survey, industry and trade groups such as the Soil and Groundwater Technology Association (SAGTA), large environmental consultancies, and major industrial companies such as Shell, ICI and BP. In addition, the Centre has established links with colleagues in the US Environmental Protection Agency and the Dutch research organisation TNO.

The Centre co-sponsored two key international seminars aimed at exploring the possibilities for future regulatory practice on natural attenuation of contaminants and on risk assessment in the environment. Both sell-out events attracted intense interest from regulators and practitioners.

3.9 Education and dissemination

The Centre produced a series of national issues leaflets highlighting its work and roles in the Agency and in regulation in England and Wales. A bi-monthly, circular "Underground" was initiated which aims to *"inform and engage staff working in any of the complex inter-related fields of groundwater resource management, groundwater pollution prevention and remediation, and contaminated land remediation. To provide an internal Agency focus to promote these sub-surface issues."* It has a circulation within the Agency of around 500 and we hope to extend this. The Centre has also been keen to access the Agency internet web-site and gain the ability to publish items relating to groundwater or contaminated land through this growing medium. The Centre will have one of the first site "modules" as soon as these become available later in the year.

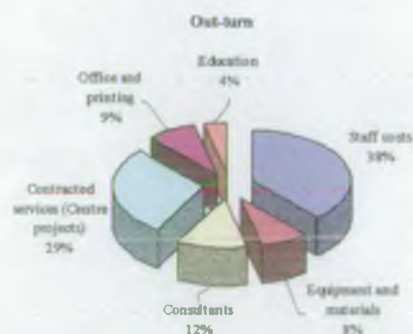
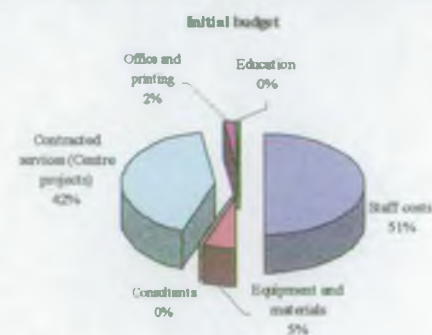
The Centre has sponsored a number of general education and information publications including the Groundwater Forum book "Groundwater: our hidden asset" which was written with contributions from a wide range of Agency staff including some from the Centre. The book and a supporting video was distributed to 2,000 sixth forms and colleges across England and Wales.

4. Resource summary

The net budget approved for 1997/8 was £802k after recharge of £264k from the Regions. However, delays in recruiting suitably qualified staff led to an under-spend in the staff costs.

The original forecast for the Centre budget was based on rapid appointment of new staff into the Centre. At the start of the period there were only 2 permanent FTE in post out of a planned 14. Recruitment proved difficult and it was not until February 1998 that most of the staff were in post (13 out of 14). This was offset, in part, by the use of short term contract support from environmental consultants. A total of £70k were spent in set up costs including the purchase of computers for all staff and the relocation of staff appointed to the Centre.

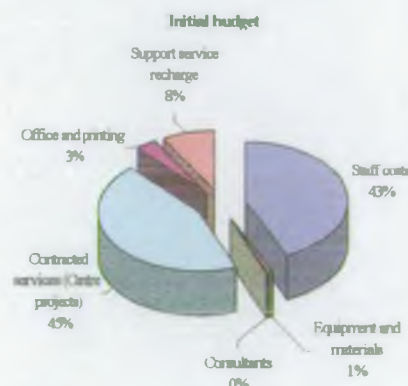
		Initial budget	Out-turn
Costs	Staff	401.25	307.24
	Equipment & maintenance	43	60.8
	Consultants	0	94.1
	Contract services	339.15	235.22
	Office & printing	16.6	68.15
	Education	2	29.6
	TOTAL	802	795
Recharges	Regional	264	222.42
	Head office	0	6.23
	Other income	2	1.96
	TOTAL	266	230.61
	NET TOTAL	536	565



4.1 Budget for 1998/9

The Client Board approved the following budget for the current financial year. This is a significant increase over the previous years budget and reflects the staffing in place and the impending introduction of new powers and responsibilities for the Agency.

		Initial budget
Costs	Staff	521.1
	Equipment & maintenance	10
	Consultants	0
	Contract services	535
	Office & printing	40
	Support services	100
	TOTAL	1206



Key work areas for the year 1998/9 which will consume significant resources will be:

- co-ordination and production of groundwater protection zone maps – *managing our water resources*
- develop and co-ordinate response to Groundwater Regulations – *integrated river basin management*
- further development of the Agency's approach to the Water Framework Directive and the planning of groundwater resource management – *integrated river basin management and managing our water resources*
- prepare for the implementation of Part IIA contaminated land provisions – *conserving the land*

5. Health, safety and environment

This report covers the Centre's set-up and first period of operation. There have been no incidents on health and safety matters. Environmental impacts of the Centre such as annual car mileage are being monitored to establish baseline data for comparison in the future. Simple steps such as paper recycling are already in place through working with Midlands Region staff on environmental initiatives.

Appendix 1. Publications and presentations not covered elsewhere

Papers in open scientific literature

Harris, RC. Setting goals for the protection and remediation of groundwaters in industrial catchments. In "Groundwater in the Urban Environment" Ed Chilton et al ISBN 90 5410 837 1

Harris, RC. Protection of groundwater quality in the UK: present controls and future issues. In "Groundwater contaminants and their migration" Geol Soc. 128 p3-13.

Evers, S and Lerner, D. How uncertain is our estimate of a wellhead protection zone. *Groundwater* 36 (1) p.49-57.

Morris R, Hunt E, Jones S and Hart AJ. Landfarm bioremediation of polycyclic aromatic hydrocarbons. *Land contamination and reclamation* 6 (1) p.17-27

Ward, R S, Harrison, I and Leader, R U L. Fluorescent polystyrene microspheres as tracers of colloidal and particulate materials: examples of use and developments in analytical techniques. In: *Tracer Hydrology 97* (Ed. Kranjc, A). Proc. 7th Int. Symp. Water Tracing, Slovenia 26-31 May 1997.

Ward, R S, Chadha, D S and Williams A T. The use of groundwater tracers for assessment of source protection zones. In: *Tracer Hydrology 97* (Ed. Kranjc, A). Proc. 7th Int. Symp. Water Tracing, Slovenia 26-31 May 1997.

Centre staff have led and participated in a wide range of events, this including those below.

Co-sponsor Natural attenuation – 2 day international workshop. University of Sheffield
Risk assessment in the environment - 2 day international workshop. University of Sheffield
Seminar to US Air Force (Europe)

Presentation of groundwater videos and booklet to Council for Environmental Education

Yemen, National Water Department visit to UK

Sponsor World Water Day – Groundwater Festival

Nottingham Trent University – Contaminated Land MSc course

Nottingham Trent University – Environmental Health BSc course

DTI, Biotechnology Means Business Bioremediation Roadshows

Maintaining the flow – Water Environment '98 with John Prescott MP

Groundwater Forum workshop on Water Framework Directive

Seminars to University College London, University of Birmingham

Visits and discussions with:

Major companies (Shell UK, BP, BG, Total, BNFL),

Universities or Research Institutes (Birmingham, Coventry, Oxford, Southampton, Sheffield, Loughborough, Nottingham Trent, BGS, IVEM, IFE)

Trade associations (Groundwater Forum, SAGTA, EIC, CIRIA)

Climate change workshop.

Discuss standard data format with Association of Geotechnical Specialists

University of Coventry summer placement student MSc Environmental Monitoring

Supporting establishment of the University of Sheffield National Contaminated Land Research Centre.

Represented DETR at NICOLE workshop