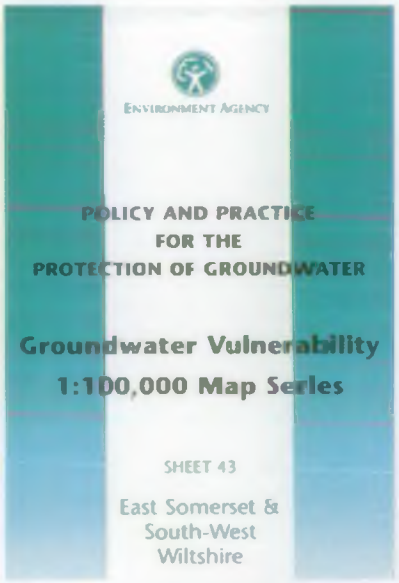
Box 6

National Groundwater and Contaminated Land Centre

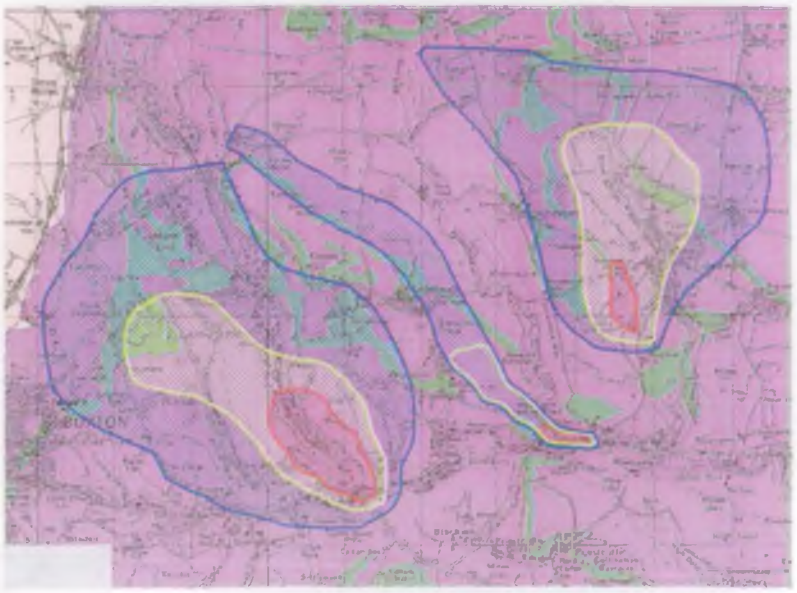
Annual Report

1998/9



National Groundwater and Contaminated Land Centre

Decommissioning Redundant Boreholes



ENVIRONMENT

Key outputs for the year

Groundwater Vulnerability Maps (7 Paper and CD Versions)	The outputs of this project are colour-coded maps that identify the vulnerability of groundwater to contamination. There is now full coverage in paper and on CD Rom for all of England and Wales.
Policy and Practice for the protection of groundwater –revision and reprint	The original NRA document has been revised and reprinted. This Agency document incorporates new legislation on groundwater protection.
Fractures and Hydrology of Permotriassic Sandstone	The report summarises available information concerning the effects of fractures in the Permo-Triassic sandstone aquifer and makes recommendations for future work
Groundwater Tracer Tests: a review and guidelines for their use in British aquifers	The report has brought together current experience and knowledge of tracer tests and provided detailed guidance to facilitate and stimulate future tests.
Major Aquifer Properties Manual	This report takes the form of a manual of knowledge, maps and data, in hard copy and on CD ROM, of the physical properties of major aquifers in England and Wales to provide Agency staff with a source of knowledge for groundwater modelling studies.
Application of LandSim to Contaminated Land (ConSim Computer Programme)	The output of this project is a model which can quantitatively assess the risk posed to controlled water (particularly groundwater) by contaminated land
Impact of Cities on the Quality and Quantity of Groundwater	The report details the results of an investigation into the quality of groundwater in an urban catchment.
Review of the Impact of Microbiological Contaminants in Groundwater.	The report reviews current knowledge on microorganisms in the environment.
Integration of Clean-Up Standards for Soil	The report is a guidance document that gives a standard, practical and reasonable approach to soil and groundwater remediation for the protection of water resources that can be applied on a site-by-site basis.
Processing and Presentation of Groundwater Data	The report reviews available computer software packages for groundwater data analysis and presentation. It makes recommendations about the packages most suitable for the Agency's needs.
Modelling of Leachate through the Unsaturated Zone	This report describes models that have been developed to predict the attenuation of leachate from existing landfills.
Nottingham Cemeteries project	This report presents analysis interpretation of sample data from a field investigation to examine the pollution potential from a old cemetery in Nottingham
Nitrate Database	Production of a Database for nitrate data
Guidelines & Protocols for Assessing Site - Specific GW Vulnerability	The out will be guidance on a tested method of assessing groundwater vulnerability and satisfying the requirements for prior investigation under the groundwater regulations.
Groundwater training	Training Seminars for area staff on the Agency's groundwater protection policy
Impact of groundwater on river flows	The output is a project record and user guide for the application of methods (selected to represent best practice) to calculate the impact of groundwater abstractions on river flows.
Small licensed exempt groundwater sources	The output is a project record and report that evaluates the various means by which the Agency can identify and keep up to date records of small licence exempt groundwater sources.
Feasibility of insitu bioremediation of nitrate in sandstone aquifer	A report and seminar detailing the finding of a laboratory study investigating the breakdown of nitrate contained in a sandstone matrix.
Natural Attenuation of petroleum hydrocarbon and chlorinated solvents in groundwater	A report reviewing the research & practical application of (monitored) Natural Attenuation of petroleum hydrocarbons & chlorinated solvents in aquifer systems, particularly in North America & the Netherlands and comparing this to the UK situation.
The Stour Catchment project	This report presents the results of a small scale investigation of groundwater and surface water chemistry within two small contrasting catchments and the interpretation of these data in terms of geochemistry land use and other influencing factors.

Foreword

This was the first fully staffed and operating year for the National Groundwater and Contaminated Land Centre (NGWCLC). It proved to be a year of major challenges in preparing for new and forthcoming legislation (Groundwater Regulations, Part IIA contaminated land regime, Works Notices) and in dealing with reinterpretation of existing regulation (Nitrate Vulnerable Zone definition for groundwater).

The Centre provided a key resource with the ability to foresee the likely impacts of these changes and provide the technical advice to both Head Office and Government. Centre staff have played a vital part in readying the Agency for these new areas of work. In particular, the anticipated powers from Groundwater Regulations and the associated new income stream were developed and led by the Centre. The Centre has also led a significant and growing portion of the Agency's Research and Development efforts in these areas.

Over the year the Centre has demonstrated a strong desire to work with Operational staff, assisting with complex technical projects in areas of groundwater modelling, land remediation projects and Capital Fund projects and using both formal and informal mechanisms to agree Centre work with Region and Area contacts. Significant efforts have been made in training both internal Agency and external staff (especially Local Authority staff) in groundwater and land regulatory issues and use of new tools.

The intellectual and technical lead provided by Centre staff has been matched by a professional approach to managing work programmes to time, quality and cost. The report which follows provides a small taste of all the work undertaken and the benefits which this brings to the wider Agency.

Paul Leinster, Director of Environmental Protection
and Chair of Centre's Client Board

1. Summary

The Centre 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."*

continues to drive and inform the work undertaken.

The Centre grew in size during the year with the transfer of 2 staff from Head Office Land Quality Function (Bill Baker and Shaun Robinson). This brought an important new area of work in the technical management and appraisal of Local Authority Applications to DETR.

Centre staff have been active in advising Head Office and DETR on new policy issues and individual Regions for operational projects. Much of the detailed advance preparation for the new Groundwater Regulations was carried within the Centre. Similarly, staff have provided detailed technical support to Head Office in the preparation of policy and guidance for Part IIA Contaminated Land Regulations.

Projects managed within the Centre have delivered a wide range of products and benefits to the Agency and the wider community. Highlights include:

- A collated set of source protection zone maps
- Completion of the groundwater vulnerability mapping programme
- Centre staff have also been involved in a wide range of high profile external events and presentations.
- 35 R&D projects with a cost of £1.51M have been managed from the Centre. Use of collaborative funds of £2.89M increased the total value of these projects to £4.4M

The policy and guidance documents and the datasets such as groundwater vulnerability maps produced by or through the Centre represent a significant portion of the Agencies external data sales.

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 on three occasions during the year (22-May-98, 12-Oct-98, 20-Jan-99) to review progress and to agree future plans. During the year, the composition of the Board changed with the departure and arrival of senior Agency and external staff. The membership of the Board (at March 1999) is included in Appendix A.

In addition to the Client Board meetings there were regular, quarterly reviews of the Centre performance by the Regional General Manager of Midlands Region (to which the Centre is attached) and Midlands Environmental Protection Manager and business planning staff.

In October '98 the Client Board accepted the Centre's annual report for the previous year and commended the Centre for full delivery of the programme during the set-up period.

At the October meeting the Client Board received the first draft of the Centre business plan for the coming financial year ('99/00) and beyond. The board requested that the plan highlight any key legislative drivers for the Agency early on within the wider business planning framework established by Head Office. The revised business plan for '99 and beyond was endorsed by the Board at the January meeting with no further amendments. The business plan itself was commended by Head Office Corproate Planning for its high quality. This included Centre funding at the same level as '97/98 and scenarios based on the likely requirements from new legislation (particularly Groundwater Regulations and Part IIA contaminated land regime).

In October and January the Client Board discussed suitable performance measures for the Centre and agreed a trial period of 12 months after which these would be reviewed and amended as necessary. The measures are included in Appendix B

3. Summary of the year

The highlights below are categorised broadly by environmental theme based on the major contributor or customer for the work. The reality of much of the Centre's work is one of cross-cutting projects and results which relate to several Functions. The year was remarkable for the extent and pace of change which was evident in all areas of the Centres work particularly through preparatory work for new or forthcoming legislation including:

- Section 161A Works Notices
- Groundwater Regulations
- IPPC Directive
- Part IIA of the Environmental Protection Act 1990 (contaminated land regime)
- Water Framework Directive

And re-interpretation of existing legislative drivers:

- Nitrate Directive

- Waste Management Licensing for contaminated site remediation

Much of our work covers technically complex areas, which are new and unfamiliar topics for many in the Agency and outside. Over the year the Centre has provided a lead for the relatively small pool of groundwater and contaminated land operational staff through technical discussions, liaison events and training initiatives.

The Centre hosted a number of visits during the year including over 20 visitors from overseas representing countries including China, Yemen, Gemany, Colombia and Bulgaria. The Chief Executive, Ed Gallagher, visited during February and a seminar about the Centre was held with invitees from across the Agency including 3 Board Members as well as Region and Area staff.

3.1 Managing Water Resources

Many of these projects have arisen from consideration of the ways in which the Water Framework Directive will impact on Agency work. The biggest change is likely to be the much greater emphasis placed upon "good groundwater status". One of the measures of this will be an assessment as to whether abstraction from a groundwater body has significantly adversely affected dependent surface water bodies and highlights the links with another Agency theme *integrated river basin management.*

Nitrate Directive. Centre staff have provided, at short notice, considerable support to DETR and MAFF in the light of potential infraction proceedings taken against the UK by the European Commission for inadequate implementation of the Nitrate Directive. The Centre assembled Regional water quality monitoring networks into a national dataset and suggested ways in which this extended monitoring network could be used to define vulnerable areas of aquifers. This is a major area of concern for DETR and MAFF with potentially enormous implications for the future of the rural environment and farming practice in the UK.

Water Framework Directive. Centre staff in collaboration with the Groundwater Resources Group have reviewed the likely impacts of the forthcoming Water Framework Directive on the Agency. This has been presented internally to Head Office and Regional staff and externally to government and industry and has received wide acclaim for its unification of surface and groundwater into one system. The recommendations are being used to inform future business planning of the Groundwater Resources Group, the National Centre programme and the R & D programme. Staff have continued to support Head Office and DETR on the overall implications for the UK and on the wording of the Directive.

Water Resources Convergence. The convergence strategy addresses the need to implement a single, robust, system by rationalising the array of existing packages in place in Regions and Area. One software package "Hydrolog 3" was identified as a *best interim system* for groundwater level data by the Groundwater Resources Group. The Centre has been the focus for much of the development phase of the software and its beta testing. This included full evaluation of the functionality, features and performance of the system co-ordinated by Centre staff and involving Regional representatives. A National dataset is now being compiled at the Centre for subsequent work on development of piezometric maps, one of the building blocks for the Framework Directive.

Groundwater Yield Methodology. This was originally intended as a trial of previous methodologies but became a more radical review of the whole subject and developed a new methodology following discussions with Regional representatives. Although the resulting methodology is complex, it fits in well with the need for bulk water balance figures. It utilises current SWALP concepts to try to unify high and low storage hydrogeological environments and surface and groundwater approaches – for example; there is an explicit acceptance that for any groundwater body, there is no groundwater yield or surface water yield but rather a yield for the system. This produces a bulk figure for yield that depends upon a good conceptual understanding of the aquifer system and which also aids use of SWALP as a more detailed licensing tool.

Subsidence and Desiccation. This project is aimed at cataloguing cases of either subsidence or desiccation largely within Agency experience. It is intended to collate and catalogue cases that the Agency feels may be connected with the abstraction of groundwater. The reported cases will be analysed to determine what hydrogeological conditions may give rise to either subsidence or desiccation. This will act as a baseline to indicate to licensing staff those circumstances where issuing an abstraction licence might lead to a higher than normal chance of causing these phenomena. The Abstraction Licensing Group may need to consider in due course how subsidence and desiccation should be considered in licensing terms, whether any results from the project require more detailed investigation or what form guidance should take.

Small Licence exempt Groundwater Sources. The work identified ways in which the Agency could develop and manage databases of small groundwater abstractions. Although such installations greatly outnumber the licensed sources there is little known about their locations. Hence it is difficult to protect such sites.

Impact of Groundwater Abstractions on River Flows. Cost savings made on the rewriting of the National Nitrate Database through collaboration with the National Centre for Environmental Data and Surveillance enabled a preliminary appraisal of current practice or developed methodologies. This project produced a guidance document detailing the selection and application of the most appropriate methods within the context of Agency duties. The project will assist in the rapid application of consistent methodologies across the Agency and be a lead in to the more accurate physically based methodologies envisaged for next years R & D project

R&D. The Groundwater Resource Topic is led from the Centre. Estimation of Recharge, this project produced costed options for a new national system for estimating groundwater recharge. These were appraised and subsequently the Centre has been asked by Water Resources Managers to cost a further staged method.

3.2 Integrated River Basin Management

Much of the effort has been spent on helping operational activities either through the delivery of decision support tools and methods or in the preparation for new regulation.

Groundwater Regulations. In a major piece of work the Centre has led the Agency response to the Groundwater Regulations for most of the year. Without this input the current implementation project, now led by Head Office, would not have been possible.

Groundwater protection tools. The final batch of ***groundwater vulnerability maps*** were produced, completing the coverage of England and Wales.

A major project to collate and validate a national dataset of groundwater ***source protection zone maps*** began. Over 2,000 zones in England and Wales were identified and collated from Regional and Area offices. The zones are being redrawn in a common format and mapped onto a national grid. Increased demand and useage of this data has clearly demonstrated the value of the tool and this development of a standard geographically seamless map product will provide an improved decision support tool. A strategy for maintenance and update of zones is also being developed and when complete (in summer 1999) the project will deliver consistent paper and digital maps to Operational staff. The maps will also be made available externally to inform planning and development.

A methodology for the ***derivation of remedial targets for soil and groundwater*** to protect water resources was a major synthesis of earlier R&D work. Together with ***CONSIM*** (a risk based decision support software for remediation design which was developed and rolled-out to Operational staff) this

will aid in the assessment of polluted soils impact on groundwater and in the derivation of remedial standards.

Training on the Agency's ***Groundwater Protection Policy*** was delivered to Areas across England and Wales, 15 seminars have been held and educational packs delivered to the remaining Areas.

Groundwater sampling. The Centre has developed and gained national approval for a revised procedure for groundwater sampling. This in turn has been used for the preparation of the UK submission to the International Standards Organisation (ISO) and British Standards Institution (BSI) as the draft international method written by Centre staff.

Cemetaries and groundwater. The related issues of sites for new cemeteries and increasing public desire for "green" burials has produced increasing requests for information to Operational staff and to the Centre. An R&D review project was managed by the Centre plus an opportunity arose to collaborate (with BGS) on investigation, during redevelopment of a cemetery, to address a lack of site specific data. Boreholes were drilled following exhumation of the graves to study the long-term impact of the burial ground on the quality of water in the Triassic Sandstone aquifer. The results of the study have shown that there is little evidence of contamination that can be related to the cemetery. These results will be used to assess the impact of cemeteries elsewhere and assist in the development of Environment Agency guidance.

The Stour Catchment project. This report presents the results of a small scale investigation of groundwater and surface water chemistry within two small contrasting catchments and the interpretation of these data in terms of geochemistry land use and other influencing factors.

R&D. The Topic is led from the Centre and a draft R&D strategy for the area has been prepared. A scoping report on microbiological contaminants of groundwater was a timely production in the light of the new DWI report on Cryptosporidium in drinking water which highlighted the importance of contaminated groundwater as a potential transmission route for infection.

3.3 Conserving the Land

Contaminated land policy. The NGWCLC continues to provide technical support to Head Office and the Part IIA and Groundwater Regulations Project on the preparation of technical-policy and guidance for the implementation of the new regime. Activities including the preparation of an "issues" paper in July (with Regional colleagues) to focus efforts in preparing guidance; preparing and reviewing the Process Handbook and supporting Guidance Notes; reviewing the availability of existing guidance to identify needs; and supporting training seminars on the technical aspects of risk assessment and remediation.

Capital fund projects. This was the first year that the Agency, through this Centre, provided a technical review and assessment of Local Authority bids to DETR for funding under the Supplementary Credit Approval process. Over 100 full Local Authority bids were assessed and the total value of the successful projects was £14M. The assessment also extended to Agency bids under the Capital Projects fund. This was the second year that this capital funding was available to the Agency with 20 projects to a value of £2M carried out by Regions assessed and supported by the Centre. The Centre has been also instrumental in the development of several partnership projects between Agency Regions and Local Authorities where both parties apply for funding and carry out the site works together.

Joint training initiative. The agreement between the Agency and the Local Government Association on a Joint Training Initiative led to the development of a series of one-day technical seminars on aspects of dealing with land contamination. Thus far, a total of 22 seminars have been given to over

2,000 Agency and Local Authority staff with a further 28 planned for the coming year. These events, led and co-ordinated by Centre staff also involved Regional and Area staff.

Guidance on the use of digital land quality data. The increasing use of Geographic Information Systems (GIS) for the management of environmental data and to aid decision support requires well disciplined use of digital data. One potential statutory duty which will impact on a wide range of data suppliers, managers, users and decision makers is Part IIA of the Environment Act with its implications for Local Authorities and the Environment Agency to operate a new contaminated land regime *and work in partnership*. The guidance developed will recognise the wide range of data sources, the variability in data types and the limit of technical expertise of the end user. The project is in collaboration with British Geological Survey.

R&D. Within the Land Quality R&D Programme the Remedial Treatment topic is led from the Centre. Centre staff also manage 11 of the projects including guidance on the verification and validation of remedial techniques, housing for brownfield developments, measuring the wider environmental impact of land remediation, and assessing the cost and benefits of different remedial approaches.

3.4 Managing Waste

Waste Management Licensing. As the licensing issue for contaminated soils and groundwater developed over the year the Centre provided technical support to Head Office Land Quality and Waste Functions in developing a pragmatic and workable position. A survey of Area Offices was carried out to evaluate the existing practice. In July, the Centre became a "customer centre" for enquiries on the Agency's enforcement position and assisted the preparation of operational guidance. Following the appointment of a Project Manager within North-West Region for the issue in the autumn, the Centre continued to give support on the interpretation of different remedial techniques.

LandSim. Centre staff took over support to LandSim development and advice on use to Operational staff.

3.5 Education and dissemination

The Centre continued to promote groundwater issues and land contamination issues through key internal and external dissemination events. A list of the major papers and presentations delivered during the year is included in the Appendix

Seminars and conferences. The Centre sponsored or contributed to a number of keynote events during the year all of which attracted large and influential audiences. This included:

- *Co-operating to manage contaminated land* (co-sponsor British Geological Survey) was attended by 300 people over 2 days.
- *Sustainable land re-use investigation* (co-sponsor Urban Renewal Foundation and Midlands Environment Business Club)
- *World Water Day* (focus on Groundwater) provided educational support and booklets to all 6th form schools.
- *Low flows, groundwater and wetland interactions* (with Groundwater Forum)

There were also a number of important internal training events led by the Centre including:

- Joint Training Initiative on land contamination (joint with Local Government Association)
- Natural Attenuation workshop (joint with ICI) for Agency and industry staff
- *CONSIM* roll-out and training
- Groundwater monitoring workshop

Print medium. The Centre continued to produce the bi-monthly, circular "Underground" and demand for copies grew steadily over the year including a request from the Chief Executive ! A range of Agency and external authors have contributed to make the circular more than just a Centre vehicle.

The Centre have produced three A5 sized booklets to inform staff and customers on key issues:

- Decommissioning redundant boreholes and wells
- Microbiological contaminants of groundwater
- MTBE contamination of groundwater
- A fourth booklet "Groundwater Pollution in Perspective" was purchased from BGS and distributed to Regions.

Internet. The Centre presence on the Agency internet web-site has grown through the year. The site now includes short descriptions of Centre work including current and planned projects. Site statistics for February (latest available) show the Groundwater and Contaminated Land pages generate more hits (987 in February) than any of the other equivalent modules. Search records show that "contaminated land" is the fifth most common search term after "employment", jobs", "vacancies" and "air quality".

Library. Books and reports in the Centre have been catalogued onto the national OLIB library management database and classified by subject. This means that the Centre's documents, many of which are unique within the Agency, will become more accessible across the Agency.

Priced publications. A number of groundwater publications are sold through The Stationery Office (TSO) including vulnerability maps, Policy and practice for Protection of Groundwater and supporting documents. Total face value sales amounted to £105k in 1998, approximately 63% of ALL Agency publications via this route. Note that sales revenues go to the Publications and Editorial National Service (PENS).

Groundwater vulnerability data is now supplied to a number of value-added-resellers (e.g. Landmark Information Group). This is managed by the Scientific and Technical Information Service (SATIS) who supplied an estimate of revenues at £3,000 for the last 3 months of the year.

3.6 Operating in an open and business-like way

The Centre continues to use a number of management computer systems to promote efficient delivery of work

- "Enquiries" database (*developed in-house*) tracks all requests for assistance and ensures that responses are delivered in line with the Agency's Customer Charter.
- "Project database" (*developed in-house*) holds details of all Centre projects.
- "*Timesheet Professional*" provides detailed cost breakdowns to inform future planning and to report to customers.

A detailed set of operational performance measures were agreed with the Client Board in January 1999 to provide a regular benchmark for comparing Centre work.

3.7 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. In all, Centre staff were thus responsible for 54 R&D projects worth £3.15M of Agency money during the year. Many of these projects are collaborations with external organisations giving a total value of £6.69M of R&D.

Formal and informal links to a wide range of other groups are maintained and studentships leading to PhDs in relevant areas are underway at the Universities of Sheffield, Birmingham and East Anglia. Collaborative events such as seminars and workshops have been held. Centre staff liaise regularly with key academic and technical groups as well as industry and trade groups.

4. Resource summary

The Centre works on a project by project basis; resources, both staff effort and finance are deployed according to the needs of each project and the agreed budget.

4.1 Staffing

- The Centre began the year with a complement of 14 full time equivalent (FTE) posts. The transfer of Bill Baker and Shaun Robinson from Land Quality Head Office brought this to a total of 16 FTE in September 1998. An organogram of the Centre is included in the Appendix A.

In addition, a number of contractors were used to support project work in various areas including:

- Groundwater resources projects
- Co-ordinate Groundwater Regulations
- Groundwater modelling advice.
- A Centre library with National Library and Information Service staff.
- Land Quality and DETR site database work

4.2 Finance

The Centre budget and end of year out-turn is presented below. During the year the budget was revised to take account of the addition of 2 new members of staff and the associated project work

Item	Budget	Revised Budget *	Out – turn
Manpower Costs	**521076**	**625256**	**595366**
Other Costs	**685000**	**677544**	**707861**
Income	0	4000	4450
GRAND TOTAL	**1206076**	**1298800**	**1298777**

The final out-turn for the year was within our performance target of 2½ % of budget, indeed it was within £25 of budget. The Centre budget was revised with the addition of 2 new staff. The desire to reapportion contract services to better identify environmental consultancy costs highlighted areas where better value for money could be obtained through use of Agency standard contracts and direct contracting for services.

4.3 Effort and priority planning

The Centre instituted a time recording system in April 98 which was almost immediately suspended due to harmonisation, it was finally re-instated in September 1998. Nevertheless, the time recording provides an important mechanism for assessing the cost of projects, allocation of resources and hence better planning of new work.

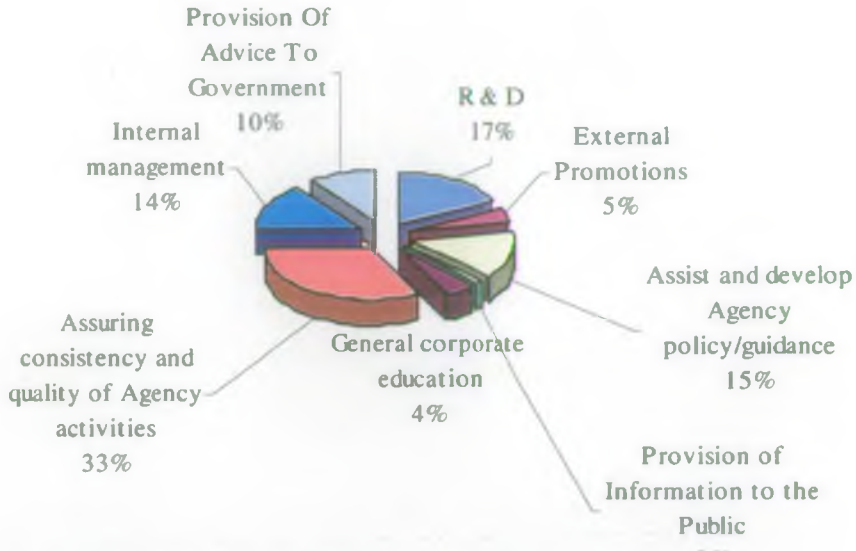
Centre projects and staff have a wide range of customers, both within and external to, the Agency. Internal customers (mostly EP

Functions) and water resources managers. A breakdown of the workload by customer is shown in the attached chart. However, it is important to recognise that this is only a partial reflection of the beneficiaries of Centre projects. For in truth much of our work is multifunctional, for example advice on Waste Management Licensing to Land Quality and Waste functions.
Note also that R&D projects managed within the Centre are viewed as work done on behalf of the commissioning Function rather than the R&D service per se.

The work done within the Centre may be compared with the Environmental Protection Directorate's Priority Planning exercise and the activity categories described therein. Doing so provides the breakdown of activities opposite.

The Centre has an important role through its ability to bring together operational staff from different Regions and Areas. This is reflected in the category of *"assuring consistency of Agency activities"* and includes work such as collation of a national set of source protection zone maps and advice on Waste Management Licensing.

Centre work activities - EP priority planning



The Centre also has a role in dissemination of best practice both within the Agency and externally and in influencing important external groups. This is reflected in the education and promotion work above. In many cases this work represents the culmination of other project work through roll-out of new operational tools and appropriate training of Agency staff.

4.4 Budget for 1999/00

The Client Board approved the following budget for the current financial year (1999/00). This is a significant increase over the previous budget and reflects the addition of staff in 1998 and the intended addition of further staff for Part IIA and Groundwater Regulations.

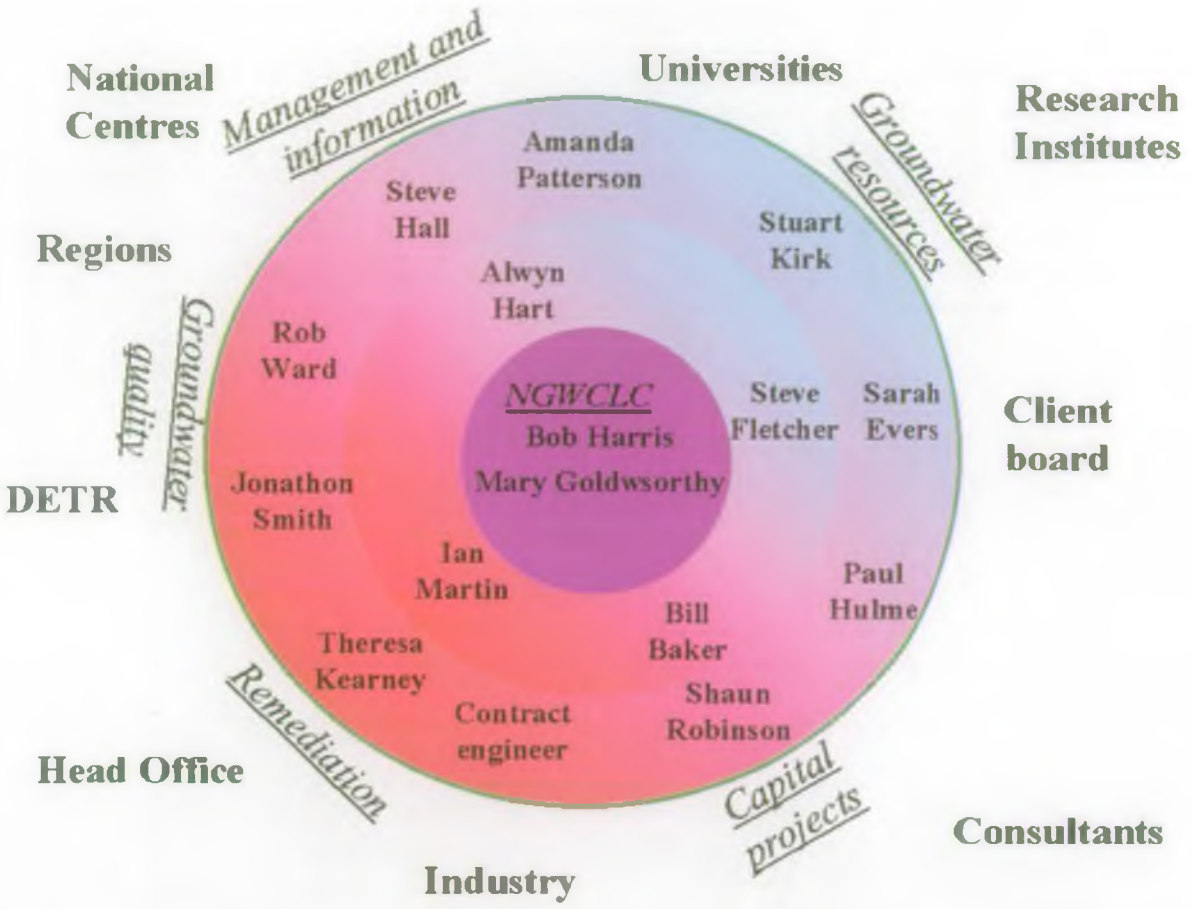
Cost breakdown for 1999/00	
Item	**Budget £K**
Staff and associated costs	669
Other costs	**728**
TOTAL	**1397**

5. Health, safety and environment

This report covers the Centre's first year of full operation. There have been no incidents on health and safety matters. Environmental impacts of the Centre such as annual car mileage were monitored to establish baseline data for comparison in the future. Over the year, 13 Centre staff completed 81,760 business miles. Allowing for the addition of 2 staff and recruitment of additional staff in the coming year leads to a revised total of 113,206 miles. The Centre has committed to reducing this total by 9% in 1999/00 to 103,017.

Simple steps such as paper recycling are already in place through working with Midlands Region staff on environmental initiatives.

APPENDIX A ORGANOGRAM, PUBLICATIONS AND PRESENTATIONS



Williams G M, Ward R S and Noy D J. 1999. Dynamics of gas migration in unconsolidated sands. *Waste Management & Research* (submitted).
Kierney, T and Martin, I 1999 "Sustainable Remediation of Land Contamination" In situ and on-site bioremediation Batelle San Diego
Ward, R S et al. 1999 Pathogen transport in the chalk aquifer: An assessment of the risk to chalk groundwater sources. BGS technical Report. WD/96/48.
Hart AJ 1998. Verification of remedial treatment. Co-operating to Manage Contaminated Land Workshop Keyworth.
Harris RC 1998 Groundwater Regulations. Co-operating to Manage Contaminated Land Workshop Keyworth.
Baker B 1998. Managing land contamination. Co-operating to Manage Contaminated Land Workshop Keyworth.
Harris RC 1998 Groundwater regulations. Agency national seminar on Groundwater Regulations
Fletcher S 1998 UK experience with Land Zoning – 8th Stockholm Water Symposium
Harris RC 1998 Keynote presentation at Polluted and Marginal Land Conference, Uxbridge

Contributions to University courses
Nottingham Trent – Contaminated Land MSc
Reading – Environmental Science MSc
Imperial College MSc course – Water Management lecture
Sheffield University Natural Attenuation course - Presentation

APPENDIX B Operational Performance Measures for 1998/9

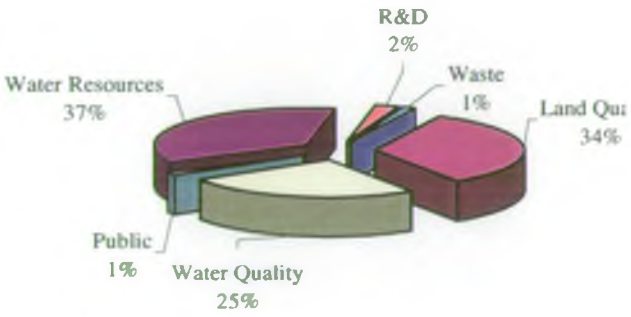
1. Deliver the approved business plan to agreed time, within budget and to a high quality.

Item: Final expenditure to be within 2½ %
Performance: Out-turn £1,280k on £1,280k
Item: 90% of projects completed to time.
Performance: 16 projects have delivered outputs and completed within the year.
All other projects are on track to deliver, most in early 99/00.
Exception is Pump Test training project which has been postponed

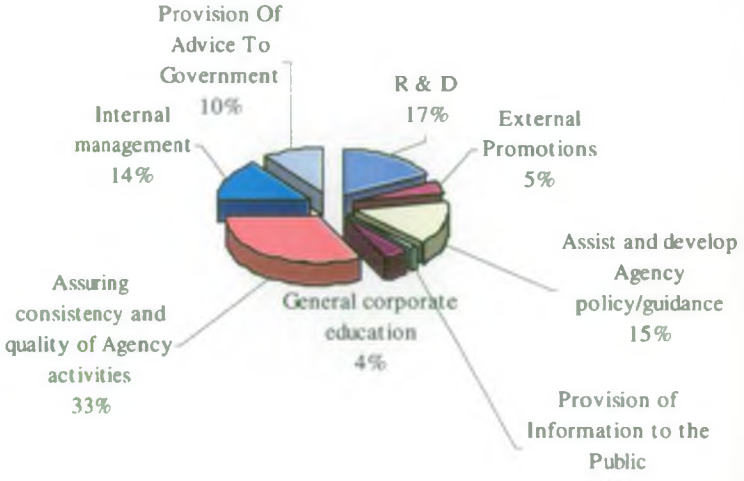
2. Deliver a quality service to customers and maintain high external regard.

Item: Customer satisfaction survey
Performance: To be carried out after year end (May)
Item: Distribution of work done: national and operational issues

Work done for Centre customers



Centre work activities - EP priority planning



Item: Numbers of Capital Fund and SCA sites reviewed
Performance: 20 Agency Capital Fund sites reviewed with a total cost of £2m.
Over 100 Local Authority SCA bids reviewed – total budget directed by Centre staff £14M. Main influx of project (seasonal) now underway for 99/00
Item: Business impacts of Centre work, improved cost/benefits due to Centre efforts.
Performance: To be carried out after year 3.

3. Play a leading role in internal and external education and dissemination of Agency policy and best practice.

Item: Numbers of guidance and policy papers produced or with significant contribution.
Performance: 27
Item: Numbers of internal seminars carried out and uptake by Operational staff
Performance: 52 seminars to Operational staff including the
Joint Training Initiative series to combined Ops
Local Authority staff on forthcoming Part IIA issues.
Natural attenuation seminar for Agency and industry
National Centre seminar
Item: Numbers of key national events led by Centre
Performance: 5.

Joint Training Initiative 2,000 staff and EHOs
Comacol, joint Agency/BGS workshop 300 attended over 2 days
Testing of Hydrolog 3
Preparation for Groundwater Regulations and seminar
Groundwater sampling Agency, BSI and ISO policy/standards written

Item: Numbers of technical enquiries and requests for assistance
Performance: Database revised in October 879 enquiries recorded.
Item: Numbers of publications (leaflets, journal papers, invited lectures, etc)
Performance: 3 A5 size booklets in production (via PENS).
Underground bi-monthly circular to Agency staff 6 produced.
NGWCLC most hits on Agency web-site modules (987 in February alone)

4. External value and popularity of Centre products.

Item: Numbers and face value of publications or data distributed through PENS, The Stationery Office
Performance: Stationery Office - 1890 items sold with face value of £105k
This out of total for all TSO/Agency sales. 4275 items and £167k
VARs (Landmark etc) Groundwater vulnerability maps – Value approx £3k

5. Development of R&D programmes.

Item: Value of R&D projects cf total Agency R&D. Target - 5% of total
Performance: 54 projects : total cost to Agency £3.15M 8% of on-going programme
Item: Collaborative funding for Centre managed R&D projects. Target - >50% matching funds
Performance: £6.69M external funds on £3.15M Agency
Item: Proportion of projects completed to time and on budget. Target - 90%
Performance: All on target, 6 complete.

6. Continuous improvements and conformance with Agency policies.

Item: Achievement of environmental targets,
Performance: Car mileage baseline established at 113,000 miles. Target for coming year 9% reduction to 103,000
Item: External requests shall be dealt with in accordance with the Agency Customer Charter.
Performance: Enquiries database revised, 3 requests (of 100 in period) currently overdue.

7. Links with other Centres, Services and Agencies.

Item: Number of collaborative projects with Centres, Services and externals. Target - 10% of total
Performance: 23 out of 169 = 14%
Item: Number of collaborative projects with Regions/Areas. Target - 20 per annum
Performance: 32