



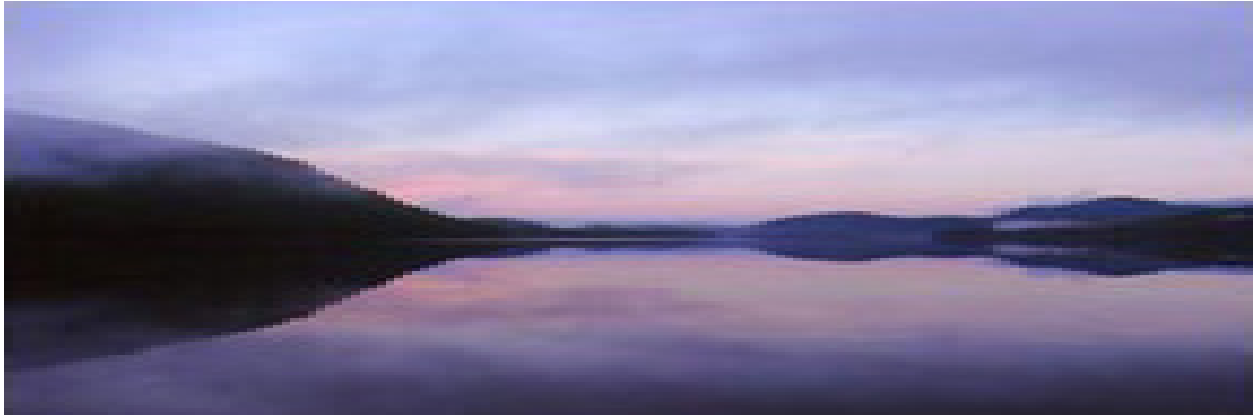
GeoEnviron

A New Environmental Health Data Management System



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Company Profile

GeoEnviron UK has been developed in a collaboration between STM Environmental Ltd and a Danish company called Geokon EDB A/S.

Both companies are independent environmental software development companies specialising in environmental data management and GIS systems for local authorities.

Our Philosophy

Our objective is to develop highly focused and functional applications that allow environmental officers to manage not only their routine work more efficiently, but also to enable them to carry out more effective strategic analysis of environmental problems within their areas.

We recognize that Local Authority Environmental Health Officers work in an industry where change occurs frequently and consequently we try to design our systems such that they are able to rapidly adapt to these changes. To this end we are continuously developing our systems to ensure that they remain in line with the latest legislative and technological developments.

We are committed to delivering a high quality service. We realize above all, that the continuation of our success is dependent upon developing and sustaining relationships with our clients.

To this end, we try to ensure that the services we offer, provide a high degree of flexibility for the client at all stages of the project design and implementation. In addition to this we strive to ensure that our support services provide the highest degree of responsiveness.

We employ staff who have substantial experience of working within both local authority environmental departments and consultancies.

This ensures that we are fully able to understand the needs of our clients. We are fully aware of the current pressing requirements upon local authorities to implement Best Value for their own clients and design our systems so that they contribute to ensuring that these targets are met.

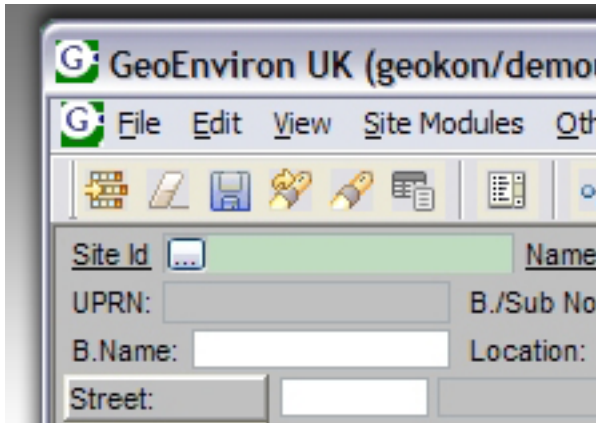
References

The GeoEnviron system is used extensively by local authorities across the world. including over 50 (approx. 10%) local authorities in England and Wales and over 95 (approx. 95%) local authorities in Denmark. The GeoEnviron Pollution Prevention and Control module has been implemented on a national basis in Lithuania. GeoEnviron is also being used in Spain and a number of countries in Asia including Malaysia, Borneo and Thailand. Below is a sample of some of the local authorities using the system in England and Wales. A full list of references is available

- Royal Borough of Kensington & Chelsea
- London Borough of Hounslow
- London Borough of Tower Hamlets
- London Borough of Ealing
- London Borough of Haringey
- London Borough of Brent
- London Borough of Richmond
- Kingston Upon Hull City Council
- Lancaster City Council
- West Lindsey Borough Council
- Powys County Council, Wales
- Carmarthenshire County Council, Wales
- Pembrokeshire County Council, Wales
- Bridgend County Council, Wales
- Angelsey County Council, Wales
- West Oxfordshire District Council
- Portsmouth City Council
- Newark and Sherwood District Council
- London Borough of Camden
- Waverley District Council

The GeoEnviron Concept

GeoEnviron is an Environmental database management system dedicated to managing data gathered from routine inspections, complaint investigations and monitoring activities.



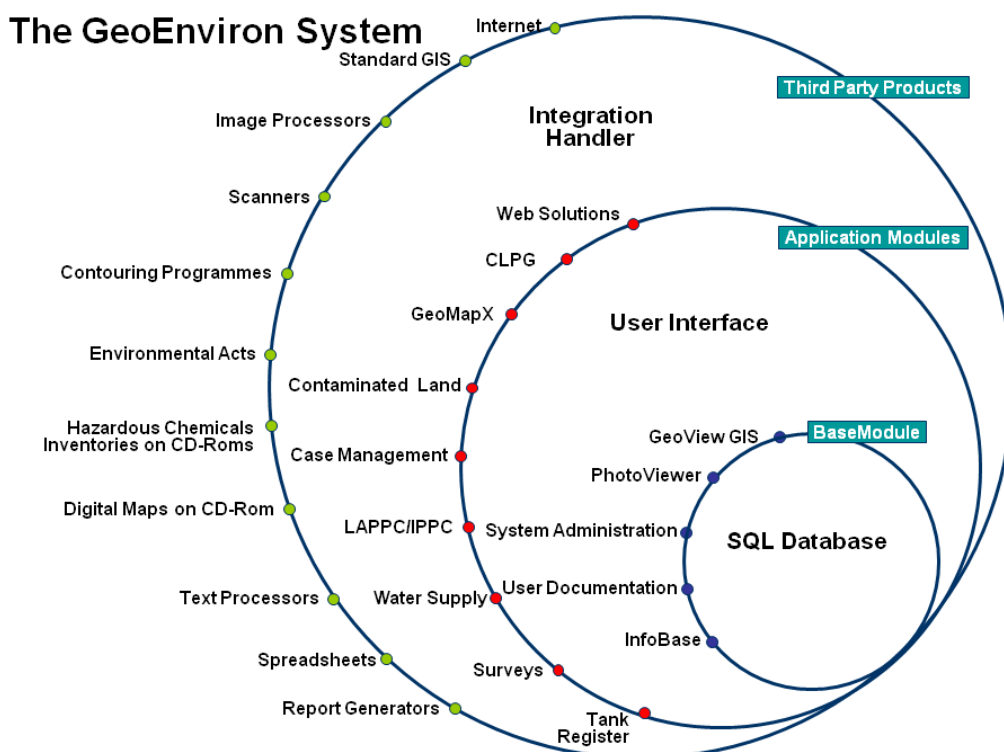
The system is modular in design, giving the user the flexibility to implement the system selectively.

As well as storing data directly within the database, GeoEnviron also gives you the opportunity to easily manage externally located data in different formats (i.e. text documents, spreadsheets, digital and scanned photos, maps, drawings, video etc).

The idea of the 'site' is central in the GeoEnviron system concept. A site is essentially a location where activities with the potential to have an impact on the environment and/or health have either occurred or are occurring. In many cases, sites are locations that have attracted the attention of the Environmental Authorities because of issues related to compliance with environmental legislation.



Sites are registered within specific application modules depending on the type of environmental problem being investigated (i.e. nuisance complaint addresses, food outlets, industrial processes, contaminated sites etc.). Once the site is registered and a case has been created, the application module is used to keep a track of the progress of investigations related to the premises. A conceptual diagram of the GeoEnviron system is shown in the figure below.



The GeoEnviron Concept

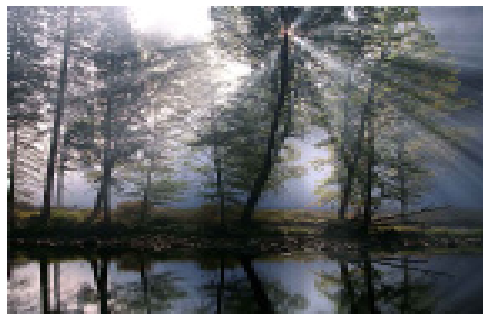
The GeoEnviron system includes an 'Address Gazetteer' designed for holding local address data centrally in a form compliant with the British standard BS7666.

The gazetteer is linked to all application modules giving users the opportunity to set up new cases directly from it. This ensures that addresses of premises are accurate and consistent throughout the entire system.

The gazetteer can also be used to interrogate the entire database to see whether or not there have been any cases related to a particular address or to carry out radius searches around an address to determine if for example there are contaminated sites within a specified distance of the address.

The ability to visualize data spatially is crucial to strategic environmental planning and management. To this end, GeoEnviron has been integrated with standard geographical information systems (GIS) including MapInfo, ESRI (ArcView), Cadcorp, GGP and Microsystem.

In the case of MapInfo, ESRI, Cadcorp and GGP GIS systems, the user has the opportunity to choose between an embedded mapping solution or an integration to the standalone product.



The embedded solution has the advantage of giving you the possibility of providing direct GIS access to officers at low cost and with little effort.

Many Local Authorities are making their services and the information they possess more available electronically using the internet. In recognition of this, the GeoEnviron system also offers a series of web browser based solutions that give you the opportunity to efficiently share data contained in the database with both internal colleagues and the public.

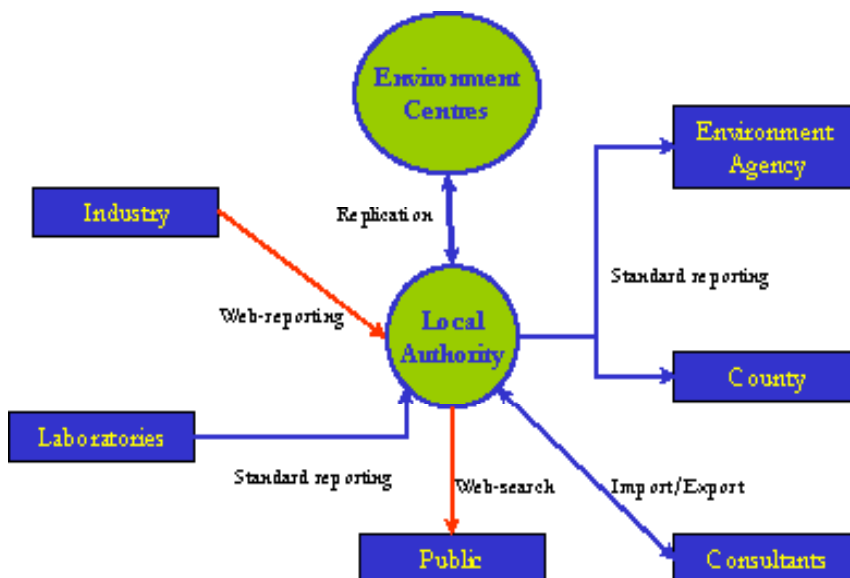


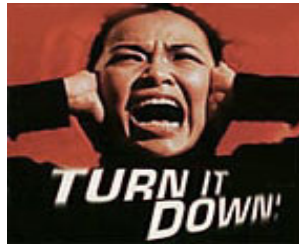
Figure: GeoEnviron is designed for capturing data at a local level and facilitating its communication to regional and central authorities and the public.

Summary of GeoEnviron Modules

The core applications that make up the GeoEnviron system are briefly described below.

Case Management module

The Case Management module is a generic module designed for managing data and documents generated from service requests and the associated inspection and investigation routines. The module can also be used for organising programmed inspections such as those undertaken under Food, Health and Safety or Housing and Licencing regulations



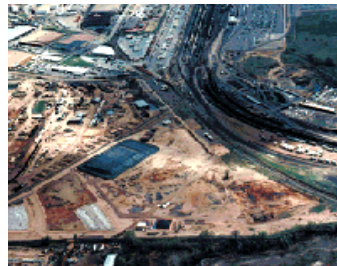
Contaminated Land module

The Contaminated Land module is intended for managing information on potentially contaminated sites. The module includes a site prioritisation system designed to ease the task of risk assessment. It also includes a seamless integration to various GIS systems and offers the possibility to link to the Site Survey Manager module (described below).



Site Survey Manager and Water Supply modules

These modules are for managing data from field investigations and monitoring programmes. Data that can be managed includes reports, photographs, site plans, borehole profile schematics, soil, water and air quality data.



Pollution Prevention and Control

The Pollution Prevention and Control module (PPC) has been designed to manage data on industrial processes. The module includes facilities for risk assessing installations to allow officers to create targetted inspection plans based on the polluting potential of each industrial process.



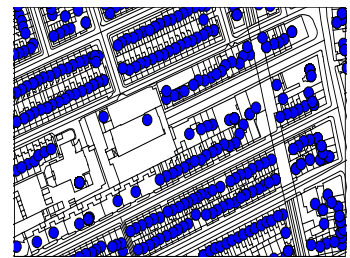
Private Water Supplies

The Private Water supplies module allows officers to register and manage both administrative and sampling data associated with all the supplies in their area.



Address Gazetteer module

The Address Gazetteer is a BS7666 compliant land, street and property data management system. It is tightly integrated with the various modules and GIS solutions available with GeoEnviron.



GeoEnviron Web

GeoEnviron Web is the name given to the range of web browser based solutions for sharing information contained within the database on either an intranet or the internet. These solutions are flexible and easy to use.

GeoEnviron Modules

GeoMap

GeoMap refers to the GIS that is embedded within the GeoEnviron system. Its relatively low cost allows you the opportunity to roll out fully functional GIS capability to all your staff. GeoMap is currently available for MapInfo, ESRI, Cadcorp and GGP users.

GeoEnviron/ArcView Integration

The GeoEnviron/ArcView integration consists of software that allows GeoEnviron to communicate with the ESRI's ArcView 9.x. This integration gives ESRI users the ability to combine the power of GeoEnviron with the full functionality of ESRI's ArcGIS products.

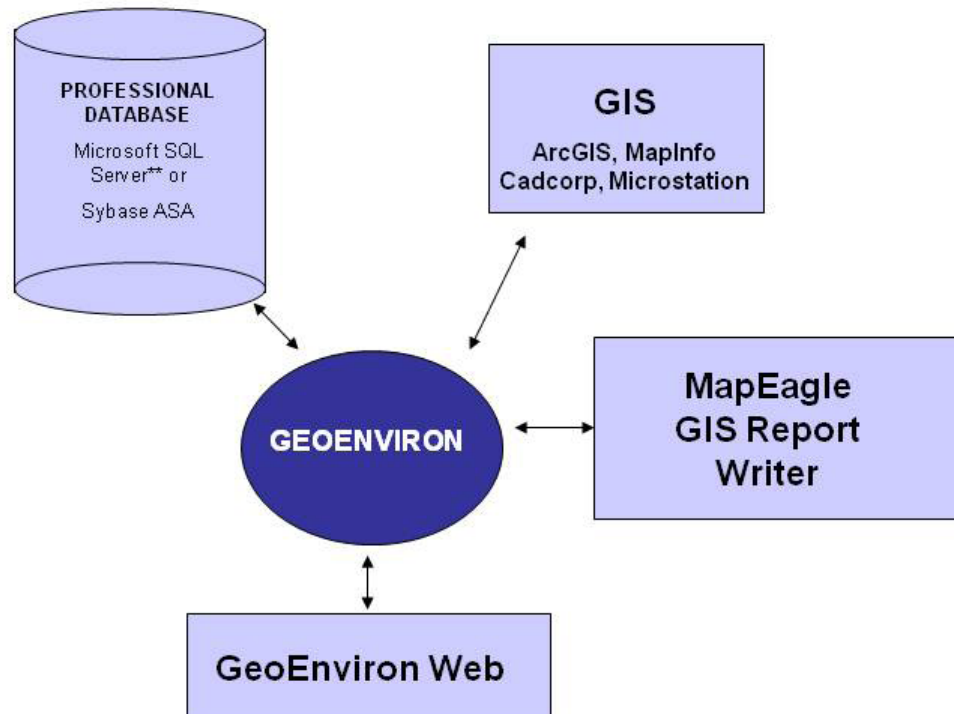
MapEagle GIS Report Writer

MapEagle is GIS based Report Writer that provides an easy and convenient way for carrying out site sensitivity analysis. It allows you to automatically carry out buffer searches around a site and outputs the results (maps and the data) directly to Microsoft Word or PDF. MapEagle is an invaluable tool for any professional who needs to analyse and report on data contained within a GIS as a routine part of their job.

InfoBase

Infobase is a knowledge database containing detailed information on over 1000 hazardous chemicals, remediation technologies and industrial profile information.

Components and data flow for the GeoEnviron System



NOTES

* GeoEnviron application modules are developed using Sybase Inc's Powerbuilder

** You will be responsible for supplying, installing and licencing SQL Server components should opt for MS SQL Server database. Software and licencing for the Sybase database is included in the quotation.

*** Access Runtime is supplied with Microsoft Office

Case Management Module

Case Management is a generic module designed as a data management tool for Environmental Health Officers involved with complaint investigation, pest control, private sector housing standards, licencing, health and safety at work and food safety. All information related to a case can be accessed from a single graphical user interface (GUI).

The module is integrated with the BS7666 compliant GeoEnviron Gazetteer, which speeds up the administrative process of registering new cases and cross referencing data between departments.

The module has been designed such that every stage of the case investigation process is catered for. Officers can be allocated specific system privileges dependent on their function within the team. All officers would use the same module, but have access only to the functionality they require, ensuring that the system is as secure and user friendly as possible.

Administrative Officers for example can be set up to have access privileges that restricts their use of the system to recording and updating case details. Team Leaders can be given additional access rights that allow them to allocate cases and set response targets. In addition, case monitoring facilities make it easy to check the progress of on going cases.

The module is also designed such that it can be used by Case Officers as their primary mode of reporting on cases they are dealing with. The system includes facilities for linking related cases and a seamless integration to word processors eases the task of standard letter writing. The built-in GIS has numerous features that help improve case response efficiency. The GIS can for example, help to reduce the time Case Officers spend searching for the location of a complaint or inspection address. Again, it can give a Case

Officer the ability to quickly ascertain the area likely to be affected by loud music from a noisy party or a food borne disease outbreak. In summary, the module helps to free up more Case Officer time allowing them to focus on actually dealing with cases.

The Case Management module includes document facilities that allow for a record of all in and out going mail to be generated. Links to document imaging systems can be created if the mail is electronically archived.

Each Officer has thier own diary that allows them to maintain an overview of appointments, cases they are dealing with and inspections that are programmed for the period. The diary also warns officers when they are in danger of not meeting case action deadlines.

The modules powerful reporting facilities also give Team Leaders the ability to quickly generate and extract statistics for performance monitoring and reporting. Additional user defined reports can be created using the Infomaker report generator tool that is also available with GeoEnviron.



In recognition of moves towards e-government, GeoEnviron Web solutions give you the opportunity of publishing Case Management information to the intranet or the internet. These solutions allow customers to log service requests and keep up to date with the progress of their request.

Contaminated Land Module

Implementation of a contaminated land management system will for most authorities, result in the generation of large amounts of data. This information will be used for a variety of purposes including prioritising sites, informing colleagues (i.e. Planners), reporting to the Environmental Agency and communicating risk to the professional and general public. The data resource will also form the basis of an historical land use archive which will be used for many years to come. It is therefore important that a robust and flexible information management system (IMS) is employed for managing this data.



What kind of IMS do I need?

The UK Department of Environment, Transport and the Regions (DETR) issued a technical advice note on how L.A.'s should formulate and implement their contaminated land strategies. The advice note lays down the foundation of what is considered good practice. Section 4.9 of the note is devoted to the subject of information management and gives recommendations on the basic requirements for an IMS. These are summarised below.

The IMS must be:

- secure
- capable of logging all information provided with respect to individual areas of land able to tag information type (e.g. commercially confidential, subject to national security constraints, etc.)
- capable of being audited to ensure that any information held is both accurately recorded and up to date

In addition, the guidance note stresses that L.A.'s will need to consider how they will give all relevant departments and third parties (i.e. Environment Agency, members of the public, etc) access to the data, as well as whether their public registers will be in electronic or paper form.

The GeoEnviron Contaminated Land module fulfils all the requirements for an IMS as laid out in the DETR Technical Advice Note.

Facilities in the GeoEnviron System

- The ability to store a wide range of contaminated land related practical information.
- The ability to link to a wide range of external electronic file formats.
- A user friendly built-in GIS as well as the ability to link to an external GIS (Mapinfo, ArcView).
- A built-in Site Prioritisation System. Powerful decision support in the form of
- detailed information on hazardous chemicals, remediation technologies and DOE industry profiles. The ability to create user accounts for anyone who needs access to the database.
- Data contained within each individual
- table can be tagged to indicate its level of confidentiality and each user given appropriate access privileges.

GeoEnviron is ideal for use as a public register. GeoEnviron Web applications can be used to output data contained in the database to an intranet/internet. This not only removes the worries associated with arrangements for public access to the register by giving you more control over the information that is accessed, but also saves you time. The public benefit from 24 hour remote access to information presented in an easy to use application while you meet your e-government targets!

The Site Survey Manager Module

The Site Survey Manager is designed for managing data gained from field investigations and environmental monitoring programmes.

The module can hold a wide range of data including details of:

- Project events and notes
- Survey reports and other text documents
- Photographs (digital or scanned)
- Map sheets and site plans
- Descriptions of borings and profile schematics
- Soil, water, air and noise sample data

Structure

The Survey Manager package comes complete with the Samples, Boreholes and Tank Register modules.

The Samples module is used for managing monitoring data while the Boreholes module is used for storing data related to borehole geology and structure.

The Survey Manager provides an interface for linking together the information in the Samples and Borehole sub-modules with that in the main application modules (i.e. contaminated land).

The Tank Register is used for recording information on chemical and petrol storage tanks including their location, type, inspection/renovation and authorisation status.

The Survey Manager GUI consists of a site registration casement (SRC) where the details of the survey are registered (see overleaf).

Below is a series of tab folders where links to sites, boreholes and samples related to the survey can be created.



In addition to the above mentioned, there are three tab folders that can be used to register miscellaneous information concerning the survey.

An events tab folder is provided for registering details of major events that may have occurred during the survey period. A text document can be linked to each event.

The 'Addresses' tab folder is for registering details of relevant contacts (i.e. contractors, occupiers, etc).

The 'Notes' tab is analogous to a 'note to file'. This can be used for recording notes of telephone conversations, agreements and meetings, etc. The user can define and create as many different note types as required. Links to external documents can also be created.

Surveys, like sites, boreholes and samples can also be mapped on a GIS and the information can be displayed on an intranet/internet.

Pollution Prevention & Control

Industrial activities are subject to increasingly rigorous environmental regulation.

This, combined with the performance monitoring that many governments have now initiated, means that the task of managing industrial processes has become extremely demanding and time consuming.

Monitoring potentially polluting industrial activities invariably results in the generation of substantial amounts of technical and administrative data.



The issue is further complicated by the fact that this data often needs to be handled by a variety of interested parties (i.e. environmental authorities, environmental managers within industries, consultants and even the general public) and therefore often needs to be presented in different formats.

The GeoEnviron Pollution Prevention and Control module (PPC) has been designed to allow Environmental Officers to easily fulfill these responsibilities.

Data that can be managed is summarised below.

- Fees
- Personnel
- Case Management
- Inspections
- Raw materials
- Resource consumption
- Wastewater discharge
- Air emissions
- Noise emissions
- Plant and equipment details

Data from monitoring programmes can be displayed as tables or time series or exported to other programs such as Excel for further treatment.

The module includes facilities for risk assessing installations to allow officers to create targeted inspection plans based on the polluting potential of each industrial process.

The module is equipped with a selection of standard reports. Additional custom (user defined) reports can be created using the Info-maker tool.

As with all GeoEnviron modules, data from PPC can be visualised spatially using the built-in mapping facilities or the integration to an external GIS.



Private Water Supplies Module

Water quality monitoring programmes usually involve taking large numbers of samples and analysing them for a wide range of parameters over a long period of time. This invariably results in the generation of large amounts of data which often need to be presented in different formats for a variety of interested parties.



The Water Supply module has been designed to help Officers risk assess the private water supplies in their areas and to handle the data gathered from the administrative and technical routines associated with the management of treated and untreated water from water treatment works, private water works and internal and external water distribution systems.

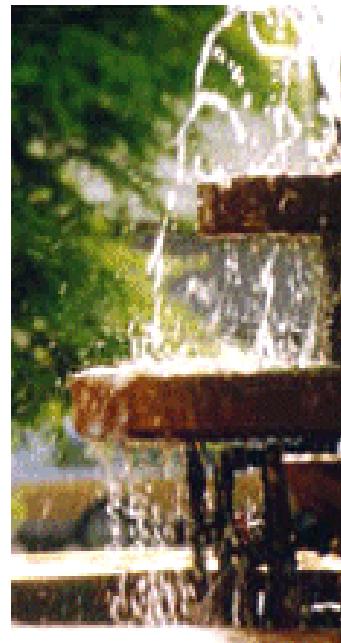
Using the system it is possible to receive your data electronically so that it can be directly imported into the system.

As with other GeoEnviron modules, the Water Supply module is tightly integrated with Geo-Map, the built in GIS as well as with a variety of external GIS programs (MapInfo, ArcView, GeoMedia etc). This gives you the ability to analyse your data spatially, allowing you to quickly locate areas where pesticides or point source pollution may be an issue.

As with all the GeoEnviron modules, all the data stored within the module is accessible from a single User window. This is shown in the figure below.

The types of data that can be managed within the module is summarised below.

- Water Supply Area
- Sampling & Monitoring Data
- Personnel Information
- Treatment Plant Data
- Licence Permits
- GIS Data
- Resource Consumption
- Wastewater Discharge
- Emissions Data
- General Purpose Notes



GIS Integration

We have long recognised the advantages of spatially indexed data in environmental planning and management. This recognition has culminated in the recent decision to become a MapInfo development partner.

We are now working hard to ensure that our software offers not only the best in database technology, but also the best of the latest technological advances in GIS.

Functionality

GeoEnviron's GIS solutions are designed to provide practical mapping capabilities that are useful on a daily basis. We recognise that 'one size does not fit all' (especially when it comes to GIS) and therefore offer solutions that utilise a range of the standard GIS technologies available (MapInfo, ESRI and Geomedia) as well as cater for the novice and experienced GIS user.

The solutions come in three forms - an embedded GIS or a link to an external GIS, or both of the former. All the solutions allow users to create layers using data from the database. These layers can be used to display the locations and extent of premises, boreholes and samples as well as addresses from the CLPG.

Different operations can be performed on these database layers. For example clicking on a premises on a database layer causes the premises information (i.e. case history etc) to be displayed within the application module in which it is registered. Additional functionality such as for example, carrying out a search to determine if there are any contaminated sites lying within a specified distance of a specific address is also available. The layers can also be used to create interesting thematics that can be used in reports.

GeoMap

GeoMap is GeoEnviron's built-in GIS solution that uses MapInfo, ESRI, Cadcorp or GGP technology. The GIS is embedded within GeoEnviron meaning that mapping facilities are available to every user that has GeoEnviron installed on their computer.

This embedded solution offers a low cost method for providing mapping facilities to an entire group of Officers. The type of access (i.e. read or write access) to the maps can be configured for each user giving the opportunity for further sav-

GeoEnviron/MapInfo Integration

The GeoEnviron/MapInfo integration works by using dynamic data exchange (DDE) to provide a linkage between GeoEnviron and MapInfo Professional. This solution is suitable for the experienced MapInfo Professional User who requires access to a fully functional GIS on a daily basis.



A GeoEnviron menu and toolbar are added to MapInfo Professional allowing the user to create and manage database layers as well as navigate between the two programs.

GeoEnviron/ArcView Integration

The GeoEnviron/ArcView integration also uses DDE to provide a linkage between the GeoEnviron database and ArcView 8.1. Again this solution is suitable for the experienced ArcGIS User who requires access to a fully functional GIS on a daily basis.

The integration adds a toolbar to the ArcView window which can then be used to create and manage database layers as well as navigate between the GIS and the database.

GeoEnviron Web

Local authorities are increasingly delivering their services electronically by means of the internet. This acknowledges that the ability of the public sector to deliver high quality services depends upon the effective use and sharing of knowledge and information.

In terms of information sharing, this means that data held within Environmental Departments should be accessible to local authority Officers as well as to external agencies (i.e. Environment Agency) and the interested public (residents, surveyors, etc).

Many local authorities are already using intranets and the internet to share information as well as to market their services. However few have gone so far as to web-enable the environmental information they hold.

GeoEnviron Web is the name given to the web browser based solutions for sharing the data stored in the GeoEnviron database on either the Intranet or the Internet. Being web browser based means that GeoEnviron Web solutions are extremely easy to use. They offer a flexible and cost effective way of giving controlled access to the information in the database to an unlimited number of people.

A good example is the GeoEnviron Web solution for contaminated land module, which allows the user to view information on the location of contaminated sites via a simple address based search.

The solution also allows the user to carry out a radius search around a specific address to find out if there are contaminated sites within a specified distance from the address. The locations of the sites and other relevant details can then be displayed on a map. All this information can be printed out directly or exported from the browser to Microsoft Word.

This solution can be used by planners (via an intranet) to quickly ascertain whether it is likely that a planning application for a housing development should be referred to the Environmental Health Department.

Furthermore, environmental aspects are increasingly being considered as part of the routine conveyancing process. GeoEnviron Web can be set up on the internet so that these searches can be carried out on-line.

The website can be made secure so that users of the service can pay for the information on line.

The benefits of GeoEnviron Web:

- improve service delivery
- save time Officers spend responding to information requests
- help meet targets for e-government
- improve communication between different local authority departments
- comply with freedom of information regulations and the Aarhus Convention

Technical Overview

GeoEnviron is a relational database management system. It is a client\server system and utilises either Sybase's SQL Anywhere or Microsoft's SQL server as databases.

These databases are designed for tasks that require a full-featured SQL database. They operate in varied environments taking advantage of available memory and CPU resources. They provide good performance in environments with ample resources but also operate well in environments with more limited physical and database administration resources.

GeoEnviron System hallmarks

Full SQL transaction-processing relational database management system with:

- full recovery capabilities
- online backup
- referential integrity actions
- stored procedures
- triggers
- row-level concurrency control
- a rich SQL language

Economical hardware requirements - the system requires relatively little memory and disk resources compared to other database management systems.

Easy to manage - GeoEnviron can be used without the extensive database administration efforts usually associated with relational database management systems.

Standalone and network use - GeoEnviron can be used in a standalone or in a multi-user client/server environment.

High performance - while GeoEnviron is designed with simple administration and modest resource requirements in mind, it is a scalable, high-performance DBMS.

System Requirements

Operating System - GeoEnviron supports Microsoft Windows (XP, 2000, NT, 95/98) and Novell NetWare version 4.1 operating systems.

CPU - a Pentium or similar is recommended on both server and client machines.

Memory - a minimum of 256MB is recommended on the server. A minimum of 128MB is recommended on a client PC.

Hard Disk - approximately 500MB of hard disk space is required for the entire system. The database as well as GeoEnviron's program files are placed centrally on the server in the case of a client/server installation.

General Information

Back up - the system is installed with a back up procedure that can be called from an existing back up procedure.

System Recovery - the database is capable of automatic roll back meaning only unsaved transactions will be lost in the event of system failure.

Database Connectivity - utilises Open Database Connectivity for ASA. Native Driver is used for MS SQL server.

GeoEnviron Web applications - utilise classic ASP and run under browser versions IIS4 and upwards. The major requirements are that the browser should support frames and JavaScript. No server side dlls or client side ocx or java components are required to enable the applications to function.