European Topic Centre on Inland Waters

ANNUAL SUMMARY REPORT 1995

By

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Note

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1. BACKGROUND

The Water Research centre (WRc) has been appointed the lead organisation of the Topic Centre. This consists of a consortium of several European organisations which each have a representative on a Management Committee. This agrees the allocation of tasks and budget and members are accountable to the Chairman for the satisfactory prosecution of the Work Programme.
The Management Committee is chaired by Dr Tim Lack of WRc who also provide the services of a Technical Coordinator (Steve Nixon). The organisations represented on the Management Committee are:

- Austrian Working Group on Water (AWW - Austria)
- Centro de Estudios y Experimentacion de Obras Publicas (CEDEX - Spain)
- Flemish Environment Agency (VMM - Belgium, Flanders)
- Instituto da Agua (INAG - Portugal)
- International Office for Water (IOW - France)
- National Environmental Research Institute (NERI - Denmark)
- Norwegian Institute for Water Research (NIVA - Norway)

There are a number of supporting organisations throughout Europe who also contribute to the Topic Centre's work programme carried out on behalf of the Agency. These include:

- Bundesanstalt für Gewässerkunde (BfG - Germany)
- Danish and Greenland Geological Survey (DGGU - Denmark)
- Environmental Protection Agency (EPA - Ireland)
- Faculdade de Ciências/Universidade de Lisboa (FC/UL - Portugal)
- Finnish Environment Agency (FEA - Finland)
- Institute of Hydrology (IH - UK)
- Institute for Inland Water Management and Wastewater Treatment (RIZA - Netherlands)
- Instituto para o Desenvolvimento de Novas Tecnologias (UNINOVA - Portugal)
- Instituto Superior Técnico/Centro de Valorização dos Recursos Minerais (IST/CVRM - Portugal)
- Instituto Tecnológico Geominero de España (ITGE - Spain)
- Laboratório Nacional de Engenharia Civil (LNEC - Portugal)
- Societe Wallone de Distribution d'Eau (SWDE - Belgium, Wallonia)
- CEDEX/ITGE provide the Deputy Leader of the Topic Centre (Alfredo Iglesias).

An international team of specialists coordinating the Topic Centre's work programme is based at WRc Medmenham including delegates from IOW, Jean Claude Nöel, and CEDEX, Conchita Marcuello who will be replaced at the end of December 1995 by Concha Lallana (also from CEDEX).

2. WORK PROGRAMME

Three projects (MW1-3) were initially identified by the EEA to be undertaken by the ETC/IW during 1995 and subsequently two additional projects (MW4-5) were brought forward from the 1996 programme for an earlier start.

2.1. Project MW1 - Water Resources Quality and Quantity. General Approach to Assessment

This project will establish the detailed requirements of European Union legislation and International Conventions in terms of:

- water types (surface, groundwater, coastal and marine)
- matrix (water, sediment or biota)
- determinands
- methodologies
- frequency of monitoring
- location and density of monitoring sites
- quality control procedures
- data treatment and storage

2.2. Project MW2 - Inventory of Water Resources Monitoring Networks

This project will determine the extent and structure of current monitoring networks and practices across the EEA area and assess how well they meet the identified requirements and how individual countries may differ reflecting the national priorities.

2.3. Project MW3 - Design of a Freshwater Monitoring network for the EEA Area.

This project will use the findings of MW1 and MW2 and will address the design and development of a European-wide water quality and quantity network based wherever possible on existing networks to provide high quality, reliable and comparable data for the purposes of the EEA's objectives and work programme.

2.4. Project MW4 - Development and Establishment of the European Water Quality Monitoring Network and Databases.

The initial work on this project has focused on reservoirs, their usage and associated water quality problems .

2.5. Project MW5 - Key Water Resource Issues

This project is starting with a review of the issues in arid and semi-arid areas. Within this programme there are a number of products required which need to be consistent with the Agency's requirements for aggregated information, ready for use by policy makers, planners, developers and reformers. The Agency is committed to producing sound environmental information, analysing and assessing environmental data from all available sources and making the results known through many, various outlets. The partners in the consortium forming the European Topic Centre on Inland Waters support the Agency in achieving its objectives.

3. PROGRESS DURING THE YEAR

3.1. Project MW1 - Water Resources Quality and Quantity. General Approach to Assessment.

This project has the overall objective of describing the detailed monitoring requirements prescribed by existing and proposed EU legislation arising from the European Commission and from International agreements bearing in mind that the EEA Member States comprise those of the EU15, Norway and Iceland. Possible approaches to coordinate and improve the monitoring are identified.

3.1.1. Monitoring requirements

Four types of directive have been employed by the EU to control the pollution of water:

- use-related directives
- industry sector directives
- substance directives
- product directives.

With the exception of the product directives, most require the implementation of monitoring, either routine programmes or preliminary investigations. The extent to which monitoring requirements overlap depends on commonalities between the national implementation of directive requirements and the monitoring undertaken for this purpose will therefore vary from country to country.

The requirements made in the directives have been designed largely independently from each other. The Commission has, however, taken some initiatives to harmonise monitoring and reporting requirements in the Exchange of Information Decision (77/795/EEC as amended by Decision 86/574/EEC) and to harmonise reporting on the implementation of certain directives via questionnaires as specified in Council Decision (92/446/EEC) and laid down in the Reporting Directive (91/692/EEC).

In total, four directives and one proposed directive make requirements for groundwater monitoring (the requirements made in the Dangerous Substances Directive (76/464/EEC) have been superseded by the Groundwater Directive (80/68/EEC)) and there is no overlap in the current monitoring requirements. With regard to surface waters, all monitoring requirements made in EU legislation which apply to rivers, also apply to lakes and reservoirs. Most directives which apply to freshwaters also apply to salt waters. The Shellfish Directive (79/923/EEC) is the only directive which applies to estuaries and coastal waters but not freshwaters.

Of the 15 directives that require monitoring of fresh surface waters, all require water column monitoring. The Dangerous Substances Directives and the Titanium Dioxide

Directive (82/883/EEC) also require monitoring of sediment and biota. The Exchange of Information Decisions make the only requirements for flow measurements. There are eight international agreements which also require monitoring of water quantity - flows and levels.

Barriers to the harmonisation of monitoring can be introduced at the sampling, analysis, and reporting stages, and can arise either because requirements differ (i.e. conflicts) or because requirements are not clearly specified (i.e. weaknesses).

3.1.2. Sampling location

The most specific requirements in terms of named water bodies and measuring stations are in the Exchange of Information Decisions. These water bodies are nationally significant rivers and lakes and, as such, are quite likely to be sampled for other national and international obligations (e.g. Rhine and Elbe Conventions). Generally, directives require monitoring in waters designated for specified uses or affected by specified discharges. Thus the scope for overlap in terms of sampling locations is dependent on the degree to which areas where designated use and the presence of specified discharges overlap, which is probably a limited circumstance in many states. Many of the directives allow the competent authority of each Member State to make decisions on such aspects as the exact sampling point, the distance from this point to the nearest point where pollutants are discharged and the depth at which the samples are to be taken but the same sites and depths should be used in all surveys, in relation to physical and temporal conditions.

As the choice of sampling location in some directives is related to areas designated by the Member States rather than by the European Commission, it is unlikely that a comparison of quality across Europe of these designated waters will give a complete picture. The degree of comparability will depend on the interpretation of the designation rules and national differences of how these are implemented. Therefore, the degree of coverage that water quality data encompasses within each country will be determined by national designations and the prevalence of the industries that are required to be regulated.

For international agreements sample location will generally be related to the purpose of the agreement, often being at designated or fixed sites. Other agreements are less specific about sampling location perhaps being determined by the needs of the signatories or monitoring programme objectives.

3.1.3. Sampling frequency and period

The sampling frequency specified in directives and in international agreements is very variable. For some directives, once the fate and behaviour of an effluent is known and the effects have been established, and as long as there is no deterioration, Member States may use a lower sampling frequency than specified in the directive. Sampling period is not usually specified or, if it is, the interpretation of its definition can give rise

to differences between countries (for example: bathing season). These imprecise requirements can give rise to different interpretations.

It is not apparent from most of the published directives whether there have been any, or if so, what, statistical considerations when defining the required sampling frequencies or numbers. These aspects have a significant effect on the statistical precision and confidence of the monitoring data produced. The required frequency should be derived with reference to the quantified risks that some waters will be misclassified (against compliance criteria). Furthermore for fairness of comparison the frequency of sampling should be uniform throughout Europe.

3.1.4. Analysis

Sources of error in the overall assessment of a determinand in a water body would include sampling and analytical errors. The analytical requirements made in directives and in international agreements are generally very basic. Most directives stipulate analytical requirements in terms of performance criteria (i.e. limits of detection, precision and accuracy) and/or by the method. The degree of definition, however, varies greatly from directive to directive. Many directives make very broad requirements to use '*appropriate methods*' for pre-treatment and analysis. The performance criteria are the key requirements with regard to analysis. Despite this, several directives, (the Titanium Dioxide Directive and all the use-related directives except the Surface Water through the Sampling Analysis Directive) fail to establish performance requirements for analysis. In addition, the laboratories concerned with applying the directives should be free to use '*appropriate methods*' providing they satisfy performance criteria. By comparison, analytical requirements in international agreements are rarely defined in terms of performance criteria.

Probably the most significant omission in requirements for analytical technologies is a requirement for analytical quality control (AQC). Increasingly AQC is being recognised as essential for data from monitoring programmes to be reliable and comparable. Microbiological methods should be standardised for efficiency of recovery and performance (accuracy, specificity, precision) and, for securing harmonisation of results between Member States, single reference procedures should be agreed for each determinand.

3.1.5. Compliance Assessment

Another important aspect of directives, particularly when a comparison of quality across Member States is expressed as a comparison of compliance against limits and standard values (e.g. as in the Bathing Waters Directive), is how the compliance requirements in the directives are expressed, calculated and interpreted. Differences in interpretation of these requirements is another significant barrier to harmonisation of monitoring and the derivation of comparable data across Europe.

3.1.6. Interpretations

As well as the aspects described above, another significant barrier to obtaining valid and quantitative temporal and spatial comparisons of water quality across Europe may arise from differences in how directives are implemented and interpreted at the Member State level. This issue has not been addressed in this project, but it is recommended that such an assessment is undertaken.

3.1.7. Recommendations arising from MW1

A number of deficiencies have been described in the preceding sections which are barriers to obtaining valid and comparative data on a pan-European basis. The primary recommendation arising therefore from this survey would be to focus attention on elimination of these barriers through a systematic approach to removing conflicts between the requirements of the different directives and by introducing clearer, unambiguous, specifications within the directives themselves.
However, we are aware that there are proposed European policy initiatives and possible new directives that will potentially change the needs for national and Europe-wide monitoring. The changes will be aimed at obtaining greater coherence and consistency, the interaction between the quality standards approach and the emission limit values approach, and the links between quality and quantity leading to a greater emphasis on sustainability. The possibility arises of a Framework Water Resource Directive to address these issues through four main elements:

- set quality objectives for all parts of the aquatic environment accounting for the different uses of water. These would be used to complement existing emission controls
- more effective water quality monitoring to assess whether or not policy objectives are being met
- water management plans in place to achieve the water quality objectives
- establish a control system for abstraction of all water resources.

With the baseline reviews arising from projects MW1 and MW2, the Agency, through its Inland Waters Topic Centre, will be well placed to support the Commission and the Environment Committee of the European Parliament in its future deliberations on water policy improvements paying particular attention to the absolute necessity for Member States to deliver high quality, comparative data. The outputs from MW1 and MW2 are also to be used for the basis of monitoring networks to satisfy the needs of the Agency and this is the subject of Project MW3. This is particularly important bearing in mind that the main duties of the EEA are :

- to provide objective, reliable and comparable information for those concerned with framing, implementing and further developing European environmental policy
- in support of the European Commission, to identify, prepare and evaluate suitable environmental measures, guidelines and legislation

- to ensure the broad dissemination of reliable environmental information.

The role of the EEA is seen as crucial in relation to the evaluation and dissemination of information, drawing the distinction between real and perceived risks and the provision of a scientific and rational basis for decisions and actions affecting the environment and natural resources. The Agency acts as an interface between scientists, policy makers and the public.

An example of the Agency's role is afforded by the main findings on inland waters reported in the recently published "Europe's Environment - The Dobris Assessment" and further supported by the recently published report "Environment in the European Union 1995" which is the Agency's contribution to the review of the 5th Environmental Action Programme:

- On average across Europe 15% of the total renewable resource is abstracted per year.
- Abstraction for domestic and agricultural purposes continues to increase.
- Overexploitation of groundwater is a serious problem in nearly 60% of European industrial and urban centres bearing in mind that 65% of public water supply is derived from groundwater.
- Nitrate concentrations in the soil water exceed the EU guideline value in 85% of agricultural land and the total pesticides level is exceeded in 75% of agricultural land.
- River and lake quality is degraded by nitrogen and phosphorus from agriculture and the domestic sector.

The drive towards sustainability through initiatives such as the 5th Environmental Action Programme and the Groundwater Action Programme bring together policy and research spanning the agricultural, industrial, regional planning sectors and emphasise the necessity to focus on water quantity as well as quality.

Monitoring activities carried out at national level and assessments at the pan-European level such as those carried out by the EEA provide the necessary feedback on the success or otherwise of integrated policy initiatives. At this point it is worth considering the conclusions of the Agency's review of the 5th Environmental Action Programme which was cited earlier in this section:

"The European Union is making progress in reducing certain pressures on the environment, although this is not enough to improve the general quality of the environment and even less to progress towards sustainability. Without accelerated policies, pressures on the environment will continue to exceed human health standards and the often limited carrying capacity of the environment. Actions taken to date will not lead to full integration of environmental considerations into economic sectors or to sustainable development."

Above all, the Dobris Assessment and the Report on the Environment in the European Union, 1995 have demonstrated that although environmental data have increased in

availability as monitoring and research have developed there are significant and serious discrepancies in quality.

Much information that is available is inadequate to provide the basis for a rigorous assessment of the state of Europe's environment. Improving the quality and comparability of information on the environment is now a major priority to ensure that actions and decisions being taken by policy makers and all sectors of society are in response to the actual rather than the perceived needs. This pressure should provide the stimulus for far greater integration of various policy areas than we have hitherto seen.

3.2. Project MW2 - Inventory of Water Resources Monitoring Networks

Through Project MW1 we have established the monitoring requirements required by EU legislation and international agreements and made some recommendations for improvement and rationalisation. Project MW2 has the objective of determining the extent and structure of current monitoring networks and practices throughout the EEA area and to judge how well they meet the identified requirements. The work was divided into four main tasks:

- surface water quality
- surface water quantity
- groundwater quality
- groundwater quantity

3.2.1. Inventory of surface water quality monitoring networks

This work was carried out by NERI as a cost-shared project with the Commission of the European Community (DG XI) who have kindly made available the results of the project to the Inland Waters Topic Centre. The task provided an overview of the existing water quality monitoring activities in the EU15 countries plus Norway and Iceland. The study covered all surface waters i.e. rivers, lakes and reservoirs, coastal and open marine waters and provides a description of activities of interest at European, Euro-regional, national and large-regional levels.
The results from these national and large regional monitoring programmes could be the basis for the evaluation of the state and trends in water quality at the EEA level. On the basis of the current report and additional analyses, a European surface water information system could be elaborated, including criteria for incorporating national monitoring sites into the EEA network, proposals for harmonisation and sampling procedures and determinands to be measured, and ideas for information processing from national level to the EEA level.

3.2.1.1.Conclusions

The report presents summary descriptions of the monitoring activities in each country based on the supplied national descriptions. Generally, the countries have several national monitoring programmes focused on assessment of the environmental state of surface waters. Some countries have a long tradition for national coordination of their monitoring programmes, however, in most of the countries the monitoring of surface waters has traditionally been performed by regional or local organisations. During the 1980s and 1990s the growing need for national information on the environmental state

of surface waters made it necessary to work out national coordinated monitoring programmes. In most cases these national programmes are based on the information collected by regional organisations.

Nearly all countries in the EEA area have a national monitoring programme for the purpose of assessing the chemical water quality of rivers. The networks consist generally of more than 100 sampling sites located in all major river systems and rivers in each country. In most of the programmes basic determinands (eg. water flow, temperature, pH, conductivity), organic pollution indicators (eg. BOD5, dissolved oxygen, ammonium), nutrients (nitrogen and phosphorus), specific ions (eg. chloride, sulphate, potassium, calcium) are measured. Heavy metals and organic micropollutants are generally measured at a reduced number of sampling sites the sampling and measuring frequency are generally monthly or more frequent. Most of the countries also have monitoring programmes for the purpose of estimating the riverine loading into coastal areas, or the loading by transboundary rivers. In the Nordic countries programmes have been established for the purpose of monitoring water quality and loading from small catchments. These monitoring programmes generally consist of up to 20 relatively small stream catchments with detailed integrated studies of both river water quality and of the catchment (eg. land use and soil type), the main purpose being to follow reference areas, loading from agricultural land or impact of acid precipitation.

Most European countries have a long tradition for local assessment of river quality based on studies of macroinvertebrates. In some countries these activities have developed into national surveys/classifications of the biological quality of the main rivers. These national surveys are generally based on the results collected by the local organisations and made possible through national harmonisation and standardisation. In some countries (eg. Austria, Germany, Ireland, Luxembourg and the United Kingdom), the national classification has been performed since the 1970s and the countries are generally assessing river quality at two to five year intervals. Some of southern European countries and the Nordic countries have no national programmes for the assessment of biological river quality.

Fewer countries in the EEA area have national monitoring programmes for the assessment of water quality of lakes. Some countries have, however, local monitoring of lakes. The Nordic countries with their many natural lakes generally have one or several lake monitoring programmes. Generally, a "survey-type" monitoring programme including a large number of lakes, which are sampled with intervals of several years (5 -10 years), is supplemented with more intensive programmes with a sampling frequency of several times per year and typically covering a small number of lakes. The lake monitoring programmes usually include measurement of basic determinands (eg. temperature, pH, conductivity, dissolved oxygen), nutrients (nitrogen and phosphorus), specific ions (eg. chloride, sulphate, potassium, calcium). In addition, assessment of biological determinands, especially phytoplankton is also included in many of the lake monitoring programmes.

Norway, Sweden and Finland each have nation-wide surveys in order to assess the extent of acidification. The surveys include national sampling of 200 to more than 1000 water bodies, primarily lakes, and are generally performed at intervals of five to ten years. The Nordic countries and the United Kingdom and Ireland have monitoring programmes involving detailed studies of a few catchments for the purpose of understanding the process of acidification and to analyse trends.

Information about marine monitoring programmes has been received from ten out of the seventeen countries. Most countries have one general marine monitoring programme, which may be divided into sub-programmes (eg. one programme concentrating on coastal waters and one programme focused on open marine waters). Most of the marine monitoring programmes include measurement of chemical and physical determinands in the water column (basic determinands (eg. temperature and salinity), oxygen condition, and nutrients) and many of the programmes include studies of the biota (phytoplankton, zooplankton, zoobenthos etc.). The sampling networks consist generally of a number of intensive sampling sites, typically less than 20 sites, with frequent sampling (>12/yr) of the water column supplemented with an extensive network including several sampling sites and less frequent sampling (1-4/yr).

Reliable high quality information on the environmental quality of surface waters is essential for water management and the implementation of optimal measures that will improve environmental quality. Greater knowledge of water quality at the regional and European level is essential if the management of surface waters at the European level is to be improved. The considerable information on the state of surface waters collected and reported by various large regional and national authorities may be a valuable input to a European Surface Water Information System. Consistency and comparability of the information processed by the information system would require some harmonisation and standardisation of the regional and national monitoring programmes.

3.2.2. Inventory of surface water quantity monitoring networks.

This work was carried out by IH who issued questionnaires to national institutes (with the kind assistance of National Focal Points) in the 17 countries of the EEA area. All countries provided information with the exception of Belgium, Germany, Norway, Luxembourg and Iceland. A relational database of the information has been constructed. Where possible, maps showing the extent of the monitoring networks have been produced. A technical description of the database is provided including a list of the tables that constitute the database and an entity diagram showing how each table is related.

3.2.2.1.Conclusions

This report presents a summary of both the extent and quality of surface water quantity monitoring across Europe. The widespread adoption of continuously recording equipment, largely compatible databases and availability of data on floppy disks and magnetic tape encourages transfers of data between countries and between researchers in the same country. This meta-database will facilitate this process by providing:

- a first reference point on the data available in each country and on the organisations responsible for administering the monitoring network.
- a summary of current water quantity monitoring practices in EU member states, with the exception of Germany, Belgium, Luxembourg, Iceland, and Norway for which no information was available. Information is provided on the extent of the monitoring network, observed determinands, monitoring equipment, sampling strategies and storage of data.
- information on quality control procedures adopted in each country. All respondents operate routine quality control of data, although methods used vary between countries. Methods most commonly used include making nearest neighbour comparisons, checking the time series for extreme values and with results from hydrological models.
- comparisons of the monitoring practices adopted in each of the member states, with each aspect of the monitoring procedure examined in turn.
- evidence that almost all member states have taken steps to harmonise their water resource monitoring strategy for water quantity, with normally one central organisation coordinating the programme and having responsibility for maintaining the national database.

This meta-database**,** which will be introduced into the European Topic Centre on Catalogue of Data Sources (ETC/CDS) as a matter of priority, will underpin the efforts of the Agency and the European Commission in bringing together water quantity and quality issues in the drive towards sustainability in resource management.

3.2.3. Inventory of groundwater quality and quantity monitoring networks

This task was led by the Austrian Working Group on Water (AWW). Information was gathered by questionnaires from EEA Member States with the assistance of the National Focal Points. Information was proved by all countries with the exception of Belgium, Iceland and Luxembourg. The information is held as a relational database of meta-data or meta-information rather than the raw numbers. It consists of a number of tables describing: contact names and addresses of responsible and collaborating organisations, information on groundwater regions and the determinands measured and their frequency. The inventory covers both quality and quantity aspects and in a similar way to the surface water inventories described above provides a description of the fundamental sources of data that are essential for the derivation of an effective pan-European network aimed at bringing groundwater quality and quantity issues together in a systematic and managed way.

3.3. Project MW3 - Design of a freshwater monitoring network for the EEA area.

This project uses the findings of Projects MW1 and MW2 to address the design and development of a pan-European water quality and quantity monitoring network based where possible on existing programmes in order to provide high quality, representative, reliable and comparable data relevant at the European level aimed at sustaining the EEA's objectives and needs.

The Project was divided into 3 Sub-projects:

- The design of the monitoring network (including the organisation of a workshop to allow feedback and discussion on the design - to be held in Copenhagen in June 1996)
- The development of an EEA database
- Analysis of data from large rivers

There were a number of Tasks associated with these Sub-projects and these have been reported to the Agency:

- Analysis of the need for different types of monitoring stations
  - Surface water quality
  - Surface water quantity
  - Groundwater quality
  - Groundwater quantity
- Evaluate the representativeness of existing monitoring networks
  - Surface water quality
  - Surface water quantity
  - Groundwater quality
  - Groundwater quantity
- Identify gaps in current national and international monitoring networks
  - Surface water quality
  - Surface water quantity
  - Groundwater quality
  - Groundwater quantity
- Determine requirements for density, sampling frequency, analytical methods, quality assurance schemes, data storage and estimate costs
  - Surface water quality
  - Surface water quantity
  - Groundwater quality
  - Groundwater quantity
- Design of a monitoring network for the EEA area
  - Surface water quality
  - Surface water quantity
  - Groundwater quality
  - Groundwater quantity
- Identify commonality between EEA's requirements and current databases
- Develop appropriate procedures, formats and software applications for the EEA database
- Development of a European literature review on surface water and groundwater interaction
- A comparison of existing monitoring activities with national and international requirements
- Review of monitoring databases associated with international programmes within the EEA area

3.3.1. The design of a freshwater monitoring network for the EEA area

The overall objective of the monitoring network is defined as:
"To obtain timely, quantitative and comparable information on the status of inland waters (groundwater, lakes/reservoirs, rivers and estuaries) from all EEA member states so that valid temporal and spatial comparisons can be made, and so that key environmental problems associated with Europe's inland waters can be defined, quantified and monitored".

To meet this objective there is an explicit need to try and relate differences in water quality and quantity to human activities in catchments, and thereby try to demonstrate cause/effect relationships. The addition of the supportive information on catchment characteristics and human activities will add a further layer of difficulty to implementing the network. There will, therefore, be determinands (primary and secondary) that will provide the information to address the questions. There is potential for collaboration with work to be undertaken by other Topic Centres, for example those on 'Catalogue of Data Sources' and on 'Land Cover'. Because of this, certain aspects of the monitoring and reporting network have not been finalised until feedback can be obtained from these sources.

The clear understanding is that the monitoring network will be based where possible on existing national and international networks, use existing sources of monitoring information and create, only if necessary, an EEA database of meta-data rather than of non-aggregated data.

There will clearly be danger in the Agency taking monitoring information at face value. There will need to be validation on key aspects such as statistical confidence, sampling windows and frequencies, sampling methodologies and analysis (e.g. performance, quality assurance, limits of detection), so that judgements can be made on the validity of comparisons and differences. These aspects have been addressed in this report. Guidance is also given on how stations (and hence information) might be selected from current national monitoring programmes so that a representative view of water resources can be obtained. To this end water bodies/stations might be stratified in terms of the information required such as on reference or baseline conditions, fluxes and the impact of human activities.

There are a number of options on how the network can be developed:

- Use of information from stations used in current international monitoring requirements and programmes such as, in the case of rivers, the Exchange of Information Decisions (77/95/EEC and 86/574/EEC) which aim to provide surveillance type information. This database has now been merged with the rivers database created by the Agency's Task Force for the Dobříš assessment report.
- Use sampling sites and monitoring information obtained nationally to demonstrate compliance with EC Directives such as the Freshwater Fish Directive.

- Current national classification schemes, where they exist, could perhaps (in theory) be translated to a unified European scale.
- An ambitious option is to sample and measure all water bodies in a consistent and comparable way which would clearly be very expensive to undertake and co-ordinate, and difficult to manage, interpret and report.
- Sub-sample a representative portion of the total water resources. This would be aided by stratifying the total population (e.g. all rivers) into relatively homogenous sub-strata.

The first three options would not necessarily give a representative view of Europe's water resources, and method and data comparability would be an important issue to address. The latter option is the preferred one and is recommended for acceptance by the EEA Member States.

There is a need for different types of monitoring stations to be included in the networks. In rivers these would be:

- reference stations located on rivers in natural catchments with little or no human activity and with greater than 90% natural landscape;
- representative stations that can give a spatial and temporal general assessment of quality across Europe;
- impact stations that could form part of the representative network with the collection of supportive and interpretative information or form a separate network;
- flux stations established where rivers discharge into sea, or cross national boundaries, or there is interchange between surface and groundwater;
- baseline stations to characterise the generality of run-off behaviour of the region or country.

Similarly the network for lakes and reservoirs would comprise reference, representative and impacted lakes. The largest and most important rivers and lakes in the EEA area should also be included.

For groundwater there should be a reference network that would deliver general information about the quality and quantity of groundwater and cover the entire area of each Member State. Reference stations should be established in areas not influenced by groundwater pumping and other anthropogenic activities. All major national aquifers should be included. In some areas within the EEA (small countries or in densely populated areas) it will not be possible to establish such stations. There should also be an impact network with stations selected in areas with different types and sources of contamination for example with different land use. Even though sample station density should be based on national geological conditions and variability in measured determinands, it is proposed that for the implementation/testing stages the impact network should consist of on average 1 station per 25 km^2 of aquifer, with the reference stations representatively selected from all major national aquifers that meet the required criteria. It will be important to confirm that the monitoring wells, which are chosen for the EEA network, should have been designed and constructed in a similar way so it will be possible to compare the results from the network in all the member states.

In summary, it is recommended that the sampling stations to be included into the EEA network should be selected from the sampling stations in national monitoring programmes supplemented by additional stations to meet specific requirements of the EEA. In cases where no national monitoring programmes exist, the stations to be included will, if possible, be selected from regional sampling stations. The network should be a representative sub-sample of the inland water bodies of the EEA area and the sampling stations to be included in the network should be selected so that they are representative of:

- the size/numbers/types of water bodies in the EEA area (e.g. lake surface area);
- the variation in human pressures (e.g. population density and land use);
- and should include a number of reference and flux stations.

Sampling frequency should be based on an assessment of determinand variability and the desired level of precision in the information. These aspects will be looked at in the pilot project and during the subsequent progressive implementation of the network.

In the interim it is recommended that the summary information for rivers should, where possible, be based on an annual assessment of at least monthly samples, for lakes 8 samples a year, and for groundwater two samples a year, (one each during high and low ground water levels) should be adequate. When deeper groundwater reservoirs occur at the same sampling station they should be sampled at the same time as the shallower ones.

Groups of primary and secondary determinands have been identified for surface and groundwater. Substances such as pesticides, other synthetic organic substances and heavy metals should be selected on the basis of their use in the catchment of interest. In addition supportive data on catchment characteristics and land use will be required and should be collected in comparable ways.

The Topic Centre on Catalogue of Data Sources is currently working on many aspects of the environmental information network and there will need to be close liaison with the Topic Centre on Inland Waters. For example, there must be a common language for determinands, sampled media and units, usually codified in a data dictionary. Details of analytical procedures, methods, limits of detection, quality control may also have to be transferred to the Agency. Monitoring meta-data should also be made available to the Agency in the form of summary statistics and measures of data variability to allow assessments of data quality and comparability.

A preliminary assessment of the differences between current national and international monitoring networks and the requirements of the EEA network has been undertaken. One difference identified is that many of the river quality stations in national monitoring programmes are not located at or near gauging stations, and the requirement for water flow data may reduce the number of possible stations, especially in the case of small rivers and reference stations. In terms of water quality determinands in surface waters, the Nordic countries measure COD instead of BOD, and dissolved oxygen is not routinely measured. In addition, BOD and COD are analysed by many different methods. Some standardisation will be necessary to ensure that these data are

comparable at an EEA level. In addition, in some countries total nitrogen is measured instead of nitrate, especially in the Nordic countries with relatively low nitrate levels and relatively high organic nitrogen levels. In some countries soluble reactive phosphate (SRP) is measured instead of total phosphorus.

In several countries there is no national lake/reservoir monitoring programme. However, in some of these countries local authorities monitor the water quality of lakes/reservoirs, and it should be possible to select the required number of water bodies for the EEA network from the local networks.

It is recommended that the suggested networks are piloted in a few selected countries during the first half of 1996, and subsequently, progressively implemented throughout the EEA area in a planned and programmed way later in 1996 and in subsequent years.

For the pilot project, station selection will be undertaken using the proposed criteria and procedures, and non-aggregated data will be needed to test and assess intra- and inter-strata variability, and to investigate optimum sample station densities and sample frequencies. In addition, probably in the second half of 1996 and in subsequent years, analytical and sampling methodology will be examined in detail to identify further potential barriers to harmonisation. Finally, the meta-data transfer process to the Agency will be tested once data dictionaries and formats have been developed and finalised. Support will also be required from other Topic Centres on the catchment and human activity information that will be required. All these activities are scheduled into the work programme of the Agency under the control of the Project and Programme Manager.

3.3.2. The development of an EEA database

A number of databases have been identified in the review carried out by the Topic Centre (MW3-Task11). A meta-database is under construction. Programmes fall into 3 main categories:

- Those produced from monitoring schemes to support EU legislation
- Those related to international conventions based in Europe
- Those related to international programmes based outside Europe (e.g. GEMS/WATER which is a global monitoring network).

Four different sources of information were used to compile the database:

- Data relating to EU legislation and international conventions identified on Project MW1
- Published reports of different programmes (e.g PARCOM Reports, Helsinki Commission Reports, Dobris Report, UNEP Reports etc.)
- Information available on Internet/World Wide Web
- From information obtained by responses to questionnaires to key European organisations.

This activity is supplemented by the databases built up in Projects MW2 and MW3 by the partners of the ETC/IW involved in specific tasks. We are currently awaiting guidance from the EEA and collaboration with the ETC on Catalogue of Data Sources on the appropriate standardised format for these databases.

3.3.3. Analysis of data from large rivers

This work was carried out by NERI and WRc under a contract from the Commission of the European Community (DG XI). With the agreement of DG XI and the EEA the Project was assimilated into the work programme of the Topic Centre and its scope was enlarged.

For DG XI, the work focused on Council Decision 77/795/EEC. According to this Decision the Member States measured 18 specified determinands at 126 stations, located mainly in the large rivers of Europe. This information is to be provided to the Commission on an annual basis who publish summaries of the data every three years. The project assessed the degree to which Member States have complied with the requirements of the Decision in the period 1990 - 1992 and describes, as far as the data allows, temporal and spatial trends in water quality.

The report is divided into two main parts. The first part describes the reporting of Member States and the compliance in relation to the Decision. The second part is an assessment of water quality reported at 126 stations. This section describes for each of the 18 determinands summary statistics and frequency distribution, and for selected determinands, the temporal trend in annual average concentrated is evaluated.
For the Agency, a database of the Exchange of Information data was established in fulfilment of MW3 Task 12. The database was a merging of the DG XI data with data from the EEA Task Force database on rivers. Task 15 of MW3 required an evaluation and analysis of data and a report relating water quality in large rivers to the dominating human activities in their catchments. This report has been produced and is divided into two parts. First, a general characterisation of the major rivers in the EEA area including size of catchment areas, water flow, population density and land-use. The second part is an assessment of water quality at downstream stations in the large rivers (water quality data from around 35 of the 126 EU stations as well as water quality data from stations in Norway, Sweden and Finland are used). In addition, the water quality data were related to human activities in the catchments of the major rivers from information provided by the Topic Centre partners and collated by NERI.

3.3.3.1.Conclusions

There are 15 rivers with a catchment area greater than 50,000 km^2 draining the EEA area. The largest of these, the Danube, discharges into the Black Sea and only a small part of its catchment lies within the EEA area. Of the other 14, the most noticeable feature is the dominance of a westerly or northwesterly flow direction with only three of the major rivers, the Rhône, the Ebro and the Po discharging into the Mediterranean. In total the study covers around 50 large rivers in the EEA area (the majority of rivers

with catchments greater than 20,000 km^2 although some smaller ones are included because of their great significance nationally).

Large regional variations in the annual run-off were found. Large rivers with their source in the Alps and rivers draining the north and Northwest Europe generally have an annual run-off greater than 500mm, while the rivers draining the southern part of Iberia have an annual run-off less than 200mm.

The catchment area of the large rivers in Norway, Sweden and Finland generally have a population density of less than 10 inhabitants per km^2. Several of the large rivers in the south-western part of the region have population densities between 40 to 100 inhabitants per km^2. In the central part of the EEA area the rivers generally have population densities greater than 100 inhabitants per km^2, with the highest densities being observed in the rivers draining northern France and the Benelux countries, in Italian rivers, the Rhine and the large rivers in the southern part of England. The amount of water per inhabitant ranges from less than 1000 m^3 per inhabitant per year in the most densely populated rivers to more than 20,000 m^3 per inhabitant per year in the most sparsely populated rivers in the northern part of the EEA area.

The large rivers in Norway, Sweden and Finland generally have less than 10% agricultural land in their catchment, with most of the catchment dominated by natural landscape and forest. In the central and southern parts of the EEA area the large rivers generally have between 40 to 50% agricultural land in their catchments and the percentage of forest and natural land (eg mountains, wetlands, arid land) varies between 10% to 50%. A more detailed categorisation of the agricultural land (eg in arable land, rough grassing and permanent crops) has not been possible at this stage.

The large rivers have been divided into three regions: The northern region: large rivers draining Norway, Sweden, Finland and Scotland; the central region: large rivers draining Northern France, Denmark, Germany, the Benelux countries, Ireland and the UK; and the southern region; large rivers draining Southern France, the Iberian Peninsula, Italy and Greece. The annual average water temperature was generally between 11-14^oC in the large rivers in the central region and between 14-18^oC in the rivers in the southern region. The pH was markedly lower in the northern rivers, while most of the rivers in the central and southern regions had annual average pH levels between 7.5 and 8. The conductivity levels were lowest in the northern rivers, medium in the southern rivers and highest in the rivers in the central region.

The level of organic matter (BOD5) was quite similar in the central and southern large rivers (there were no BOD5 data from the northern region). The ammonium level is an order of magnitude lower in the northern rivers, medium in the southern rivers and highest in the rivers draining the central part of the EEA area. An increasing ammonium concentration was found with increasing population density in the river catchments. During the last 15-20 years biological treatment of domestic and industrial waste waters has intensified, and organic matter loading has consequently decreased in many parts of Europe. This reduction in organic loading of the rivers is reflected in a similar reduction in the concentration of BOD5 in many of the large rivers. A comparison of organic

matter levels (BOD5) at 101 river stations in large rivers in the EU12 Member States (no BOD5 data from Norway, Sweden and Finland) reveals signs of improving conditions. From the period around 1980 to 1990-1992, the organic matter concentration decreased at almost 72% of the river stations. The improvement was greatest in the rivers in the north-western Member States, while in the southern Member States 15 stations had decreasing concentrations and 16 stations increasing BOD5 levels. A similar reduction in the ammonium concentration was observed. The ammonium concentration decreased at 65% of the 130 river stations at large rivers in the EEA area between the beginning of the 1980s and 1990-92.

The levels of nutrients were an order of magnitude lower in the large rivers of the northern region compared to the other large rivers in the EEA area. The phosphorus concentrations were generally higher in the more densely populated central region than in the large southern rivers. There is a positive correlation between the population density and annual average river water phosphorus concentration.

A markedly higher nitrate concentration was observed in the large rivers of the central region compared to the large rivers of the southern region. The nitrate concentration is significantly correlated to the percentage of farmland in the river catchments. In rivers with the percentage of agricultural land greater than 40%, the nitrate level was about double in the large rivers draining the central part of the EEA area compared to the large rivers in the southern part. These regional differences in the nitrate levels can be explained by differences in agricultural intensity. In both the central and the southern region the percentage of farmland is around 60%, however, in the central region the usage of nitrogen fertilisers is about double the usage in the southern region.
The concentration of phosphorus decreased from the beginning of the early 1980s to 1990-1992 in the majority of the large rivers. In contrast, the nitrate level in the large rivers has generally been increasing the last 10-15 years. Thus, the nitrate levels increased between the beginning of the 1980s and 1990-92 in nearly three quarters of 120 river stations.

3.4. Project MW4 - Development and Establishment of the European Water Quality Monitoring Network and Databases.

The initial work on this project has focused on reservoirs, their usage and associated water quality problems The work has been carried out by IOW with the support of IFEN (Institut Français de l'Environnement). The objectives were as follows:

- To compile a database of important reservoirs in the EEA area
- To provide an overview of the physical characteristics, locations, and development over time of reservoirs
- To produce an overview of reservoir use and construction in relation to water resource availability and control policies
- To overview the environmental and water quality problems affecting reservoir usage
- To overview the environmental and water quality changes effected by reservoirs and dams during their construction and normal operation.

The project has initially concentrated attention on reservoir issues most prominent in semi-arid areas with water scarcity problems. Original data were based on the information held by the International Committee on Large Dams (ICOLD) but an important feature was the gathering of data using questionnaires with the assistance of National Focal Points.

3.4.1.1.Conclusions

At this stage, the lack of available data means that no definite conclusions can be drawn. However, this report has been able to outline the main issues concerning major reservoir monitoring. Two of the most important issues are discussed below.
Firstly, the availability of reservoir data and the mobilisation of existing data within a short timespan are both very limited. With the exception of Portugal and Ireland, none of the National Focal Points has been able to complete the questionnaires within the originally-proposed timescale. These two countries were able to provide almost all of the requested data, since the information was already organised into national databases or because of previous comprehensive surveys of a reduced set of reservoirs.

In France, the absence of a centralised survey organisation and the large number of independent dam owners required that a questionnaire survey be dispatched by post, which yielded a good questionnaire response rate, but demonstrated a significant lack of water quality monitoring. The situation is similar in Norway, but for different reasons. Amongst the five other countries with large numbers of dams (>100), it appears that three of them (Great Britain, Germany and Sweden) are not able at present to provide data about their dams and reservoirs, nor carry out a validation of the initial data taken from the ICOLD World Register of Dams. It is understood that Italy and Austria will be in a position to provide data in the next few months.

However, the problem is not necessarily the large number of dams included in the questionnaire: data has not been received from several countries with small numbers of dams (Belgium, Greece, the Netherlands and Luxembourg).
One of the main results of this project is, therefore, that substantial time lags between the questionnaire and its response are unavoidable in data collection. This should lead to a more realistic timetabling of future surveys related to still waters. In practice, closer co-operation between the European Topic Centre on Inland Waters and the National Focal Points should be initiated to evaluate which data sources can be mobilised in each country, including privately-owned, ‘unofficial’ sources of data.

With regard to the objectives of the EEA, it should be noted that the choice of a standard nomenclature for rivers, catchments and administrative bodies is still pending. In the meantime, a data conceptual model is being developed in order to provide the EEA with a sound data description which will serve for the continuation of the project. This conceptual model and the associated software development will be available in the coming months.

Last but not least, the data obtained revealed a wide range of situations which have been used to develop an approach to environmental issues concerning dams across Europe.

The following points are for discussion purposes and should be considered as purely tentative, since insufficient data is currently available.
Dam construction has a very long history, dating back to periods when environmental considerations were not foremost. So, most works lack the facilities which would permit their operation in an environmentally-friendly way. This should be evaluated when sufficient data concerning dam equipment are available (sluices, bottom outlets, fish ladders etc.).

Roughly speaking, reservoirs devoted to water supply are principally distributed to the west of a diagonal Northwest-Southwest line across Europe. Two main groups of water bodies are of interest:

- Numerous medium sized water bodies, usually rather shallow (France, Great Britain, Germany and Italy) and damming large numbers of tributaries of European rivers
- Numerous or scarce, very large water bodies, which are deep and usually damming major river systems.

Both types can suffer from eutrophication phenomena partly due to long renewal times and nutrient accumulation, but their evaluation could be approached differently. Eutrophication of the largest reservoirs can be considered by aerial surveys, for the others only an analytical approach is suitable. In both cases, the main issue is the requirement for a high standard of water quality.
In the rest of the considered part of Europe, most reservoirs are used for hydropower production. The environmental effects suspected are principally related to flow regime. The evaluation of such effects requires a merging of data from different sources, in particular river-related data.

3.5. Project MW5 - Key Water Resource Issues

This project has started with a review of the issues in arid and semi-arid areas carried out by CEDEX, INAG and ITGE. The objectives were to review the key water resource issues in arid and semi-arid/water scarcity regions of the EEA area.

3.5.1.1.Conclusions

Final conclusions and proposed future technical activity will be made in the final report, where it is expected to incorporate data from Greece and other regions of Italy and also comments the present draft from other countries.
However, some recommendations for possible future technical activities can be anticipated:

- In order to harmonise data it would be suitable to map the mean annual values for precipitation, potential evapotranspiration and runoff on a pan-European scale, with the same methodologies for all the countries.
- Synthesis studies of hydrological regimes (quantity and quality) with the same methodology on a pan-European scale will also improve our understanding of the different problems associated to water resources.

- Erosion is an important issue in southern Europe and it would be important to know the most affected areas and relate them with hydrological changes (increase of peak flows and decrease of time of concentration).
- It is important to characterise water quality problems and the main sources of contamination in southern Europe and its relationships with the potential water resources.
- The development of guidelines for environmental impact analysis, management tools, etc for the conjunctive use of surface and groundwater resources should be made.
- The setting up of criteria for the determination of ecological flows for semi-arid areas of EEA is considered to be of paramount importance.
- It is necessary to characterise drought affected areas in southern Europe and to map some of the drought qualifiers as drought risk, resilience and vulnerability. Analysis of long series of precipitation and river discharges would clarify these drought studies.
- Studies on a pan-European scale related to the social, economical and environmental impacts of extremes events (droughts and floods) would give a good idea of the scope of these problems.
- The possible effects of climate change upon the quantity and quality of water resources, especially in the semi-arid regions where the effects can be more adverse, should be investigated.

4. AD HOC SUPPORT TO THE AGENCY

During the year the Topic Centre has been asked by the Agency to carry out a number of tasks which were not covered by the original work programme. These have ranged from answering letters of enquiry to the Agency on water topics, commenting on draft scoping studies and other documents (especially that concerned with the review of the 5th Environmental Action Programme), attending meetings and writing technical papers on behalf of the Agency or in the Topic Centre's own right (e.g. at EEA meetings such as Integrated environmental Assessment, proposed new Topic Centre discussion meetings, Information Technology and Telematics Advisory Group ITTAG, and its working sub-groups, and at non-EEA meetings such as those concerned with the Ecological Directive, Urban Wastewater Treatment Directive, European Directives and policies generally). Meetings for the purposes of contact and liaison have been held with Eurostat, UN-ECE Task Force on Monitoring, the Oslo and Paris Commissions and the European Court of Auditors.

The partners of the Topic Centre are pleased to cooperate in this provision of ad hoc support to the Agency. It is regarded as a valuable role for the Topic Centre and is a recognition by the Agency and the European Community at large that the ETC/IW is a European centre of excellence in all matters relating to inland waters.
The Topic Centre takes satisfaction that it has achieved the objectives of the 1994 work programme especially in terms of its programmed outputs despite the extra support it has been asked to provide. There is no doubt however that this support has been a drain on the subvention funds of the Topic Centre and that most, if not all partners have exceeded the funds that were assigned to them.

5. PRODUCTS/OUTPUTS PRODUCED

5.1. Products/Outputs from the Work Programme

Report	Title
P01/95	International requirements for monitoring surface and groundwaters
P02/95	Design of a freshwater monitoring network for the EEA area
P03/95	Review of monitoring databases within the European Environment Agency area
P04/95-6A.	An analysis of the need for different types of monitoring stations, Surface Freshwater-Quality. UNINOVA / INAG Portugal.
P04/95-6B	An analysis of the need for different types of monitoring stations, Surface Freshwater - Quantity. Institute of Hydrology, UK.
P04/95-6C	An analysis of the need for different types of monitoring stations, Groundwater - Quality. Geological Survey of Denmark and Greenland (DGGU).
P04/95-6D	An analysis of the need for different types of monitoring stations, Groundwater - Quantity. Austrian Working Group on Water (AWW)
P04/95-7A	Evaluate representativeness of existing monitoring networks. Surface Water - Quality. National Environmental Research Institute, Denmark
P04/95-7B	Evaluate representativeness of existing monitoring networks. Surface Water - Quantity. LNEC/INAG. Portugal
P04/95-7C	Evaluate representativeness of existing monitoring networks. Groundwater - Quality. Austrian Working Group on Water Austria.
P04/95-7D	Evaluate representativeness of existing monitoring networks. Groundwater - Quantity. INAG groundwater working group (CVRM/IST, FCL, LNEC)
P04/95-8A	Identify gaps in current national and international monitoring networks. Surface Water - Quality. National Environmental Research Institute. Denmark
P04/95-8B	Identify gaps in current national and international monitoring networks. . Surface Water - Quantity. LNEC/INAG. Portugal
P04/95-8C	Identify gaps in current national and international monitoring networks. Groundwater - Quality. Austrian Working Group on Water (AWW). Austria
P04/95-8D	Identify Gaps In Current National And International Monitoring Networks. Groundwater - Quantity. INAG groundwater working group (CVRM/IST, FCL, LNEC)
P04/95-9C	Determine requirements for density, sampling frequency analytical methods, quality assurance schemes, data storage and estimate costs. Groundwater - Quality. Austrian Working Group on Water. (AWW) Austria
P04/95-9D	Determine requirements for density, sampling frequency analytical methods, quality assurance schemes, data storage and estimate costs. Groundwater - Quantity. INAG. Portugal

Report	Title
P04/95-10C	Design of a freshwater monitoring network for the EEA area. Groundwater - Quality. Austrian Working Group on Water. Austria
P04/95-10D	Design of a freshwater monitoring network for the EEA area. Groundwater - Quantity. INAG groundwater working group (CVRM/IST, FCL, LNEC).
P04/95-13	Identify Commonality Between EEA's Requirements And Current Databases. Austrian Working Group on Water (AWW). Austria.
P04/95-14	Develop appropriate procedures formats and software applications for the EEA database. Austrian Working Group on Water. Austria
P04/95-18	Development of an European literature review on surface water and groundwater interaction. LNEC. Portugal
P04/95-5	A Comparison of existing monitoring activities with national and international requirements
NERI/ WRc report /DGXI	Quality of surface freshwaters. Common procedure for the exchange of information. 1990-1992. Synthesis Report. August 1995. CEC (1995)
NERI report /DG XI	Inventory of surface water quality monitoring activities in the European Environment Agency area.
P05/95-4c	Inventory of water resources monitoring networks - ground water quality monitoring
P05/95-4d	Inventory of water resources monitoring networks - ground water quantity monitoring
P05/95-4c/d	Inventory of water resources monitoring networks - quality/quantity monitoring supplementary volume Germany and Greece
P05/95-4e	Inventory of water resources monitoring networks - Surface water quantity monitoring
P06/95	Synthesis Report on importance of reservoirs, usage, environmental conditions, trends and causes
P07/95	Overview report on the key water resources issues in semi-arid/water scarcity regions of the EEA area.
P08/95	Annual summary report 1995

5.2. Products/Outputs from the Ad Hoc Support Programme

OR1/95	Proposed Directive on Ecological Quality of Surface Waters. Dr T.J. Lack Report of a meeting at Strasbourg 29-30 May 1995, 2 June 1995
OR2/95	The Integration of water policy with other policy areas and the role of research and development. Dr T.J. Lack. presentation to the Club de Bruxelles Conference 'Water in Europe'. Brussels 22-23 November 1995
WRc CP 744	EC Directives for Environmental Water Quality Management. Dr T.F. Zabel and Dr T.J. Lack. Paper prepared for EWPCA Workshop on Urban Wastewater Treatment Directive, Hamburg 21-22 August 1995.
OR3/95	Report of 2nd meeting of the Inputs group OSPAR commission. 21 November 1995

5.3. Other Products

- Quarterly progress reports to the agency
- ETC/IW Background Leaflet
- ETC/IW Newsletters
- ETC/IW Homepage on World Wide Web
- Set of acetates “Introduction to the ETC/IW”

5.4. Statement of missions, meetings by ETC/IW (WRc staff)

Date	Name	Mission	Comments
19-20 Dec	Lack	Copenhagen	Contract signing mtg
9-11 Jan	Lack	Copenhagen	ETC/IW Mgt Comm Mtg
3 Feb	Nixon	Brussels	Urban WWT Dir mtg
20 Feb	Lack	Copenhagen	ETC proj leaders mtg
20-22 Feb	Nixon	Luxembourg	EUROSTAT mtg
21 Mar	Lack, Noel	London	Meeting with Sec of State
13 Apr	Lack	London	UK ITTAG mtg
20-21 Apr	Lack, Nixon	Silkeborg	Meeting with NERI/Harremoes
2-3 May	Lack	Copenhagen	ITTAG mtg
9-12 May	Lack	Brussels	Ecol Directive mtg
16-17 May	Lack	Ispra	JRC Ispra visit
29-30 May	Lack	Strasbourg	Ecol Directive mtg
15 Jun	Lack	London	Mtg with NFP - EIONET
18-21 Jun	Lack, Nixon	Madrid	ETC/IW Mgt Comm Mtg
21-23 Jun	Lack	Copenhagen	Integrated Env assessment and NFP mtg
26-27 Jun	Lack	Copenhagen	ITTAG/ETCs mtg
4-5 Jul	Lack	Medmenham	Visit of Thyssen and Manzella to WRc
7 Jul	Lack	Copenhagen	Meeting with DG XI
12 Jul	Lack	London	Mtg with NFP-EIONET
24 Jul	Lack	Medmenham	Technical mtg on MW3
20-22 Aug	Lack	Hamburg	EWPCA mtg
5-7 Sep	Lack	Copenhagen	Sci Comm Follow-up mtg
16-20 Sep	Lack, Nixon, Ashley	Vienna	ETC/IW Mgt Comm mtg
11-13 Oct	Lack	Copenhagen	Court of Auditors mtg
17-18 Oct	Lack	Paris	Mtg with IOW-96 program
18-19 Oct	Lack	Brussels	Mtg with Thyssen/DG XI

Date	Name	Mission	Comments
23 Oct	Lack	London	Mtg with NFP-EIONET
26-27 Oct	Ashley	Copenhagen	ITTAG mtg
6-7 Nov	Nixon	Dusseldorf	Ecol Directive mtg
7-10 Nov	Lack	Copenhagen	Mtg of ETC/LC and NFPs
21 Nov	Ashley	London	OSPARCOM mtg
19-23 Nov	Lack	Bratislava Brussels	Mtg of UN-ECE taskforce Mtg of Club de Bruxelles
4-5 Dec	Lack, Nixon	Medmenham	ETC/IW Mgt Comm mtg

6. VISITORS TO THE ETC/IW COORDINATING OFFICE

Date	Company		Visitor
28/01/95	Washington D.C. Law	Sheila Hollis	Environmental Attorney
15/02/95	Eurostat	David Heath	Divisional Director
17/02/95	Logica	Duncan Ferns	Systems engineer
07/03/95	DoE London	Mr A Turnbull	Permanent Secretary
17/03/95	HMIP	David Price	Head Corporate Information Systems
22/03/95	General Utilities & National Farmers Union	Oliver Doubleday Jiggy Lloyd	
10/04/95	Finnish Environment Agency	Dr Ari Mäkelä	
22/05/95	Buckland Communications	Ms Tamara Strapp	Journalist
01/06/95	NRA	Mr Miles Wilson	Director External Affairs
07/06/95	Shell UK ltd	Geoffrey Warren	Safety and Environment Officer
12/06/95	Raytheon	R K Westfahl T Trevithick	Vice President Vice President
13/06/95	Cabinet Office	Prof Sir William Stewart	Chief Scientific Adviser to Cabinet
18/06/95	NRA - HO	Ed Gallagher Mervyn Bramley	Chief Executive R&D Co-ordinator
29/06/95	Inter Agence	Dr Ambroise	Laboratoire d'Hygiène de Santé Publique
		Mr Bogusz	AE Artois Picardie
		Mr Pereira-Ramos	AE Seine-Normandie
		Mr Babut	AE Rhin-Meuse
		Mr Simonet	AE Adour Garonne
05/07/95	Anglian Water	Robin Gourlay	Chief Executive
20/07/95	DoE	Jock Martin	National Focal Point
03/08/95	Scotland & N Ireland Forum for Environmental Research	Philip Wright Willie Halcrow David Mackay Roy Ramsay Beth Corcoran	SoEnD Director Forth RPB Director North East RPB DoE (NI) Secretary
15/08/95	Worshipful Company of Plumbers	Edward Hopkinson	
06/09/95	Vituki	Ödön Starosolszky	Director General
10/11/95	EEA	Derek Osborn	Chairman, Management Committee
15/11/95	Water Services Association	Julie Hesketh	
16/11/95	Danube Programme Coordination Unit	David Rodda Alan Tetlow	Team Leader Consultant
28/11/95	Anglian Water PLC	John Green	Technical Director
11/12/95	Techware	Alan Bruce	Bureau Manager

7. MANAGEMENT COORDINATION AND CONTROL

7.1. The Present Situation

According to the Memorandum of Understanding on the Principles of Team Collaboration which forms part of the contract documentation between the Agency and WRc, and WRc and its partners in the Topic Centre the consortium will be managed by a Management Committee comprising one representative from:

AWW
CEDEX
IOW
INAG
NERI
NIVA
VMM
The Deputy Project Manager (nominated by CEDEX/IOW)
One Observer(from the CEDEX/IOW former consortium)
The Project Manager (Dr Tim Lack)
The Technical Coordinator (Steve Nixon)

This consists of 11 members, of whom all but the Observer and Technical Coordinator have a vote.

The Management Committee attracts considerably more than 11 participants (sometimes around twice that number) because of the desire to involve other partners and because the board agenda contains technical issues requiring the attendance of technical specialists to support the board members.

At a meeting of the Management Committee at WRc in early December 1995 it was agreed that the Management Committee should remain small (i.e. no larger than at present but with an agreed plan to significantly reduce the representation). The technical details should be considered by a Technical Committee which would refer back to the Management Committee for advice and ratification. In this way funds at present being allocated to meetings and travel can be directed into project tasks (i.e. direct work).

7.2. A Method for Maintaining Future Technical Control of the Work Programme

It was agreed that the Management Committee should be concerned only with management and control and should delegate the technical responsibility to a Technical Committee consisting of a smaller number of partners who have the desire and the resources to participate actively in the technical work of the Topic Centre.
The composition of the Management Committee and Technical Committee were agreed as follows:

Management Committee	Technical Committee
AWW	WRc (Chaired by the Technical Coordinator)
CEDEX	AWW
IOW	CEDEX
INAG	INAG
NERI	IOW
NIVA	NERI
VMM	
Deputy Project Leader (IOW and CEDEX will nominate alternately)	
Project Leader (WRc)	
Technical Coordinator (Non-voting - to give the link to the technical Committee)	
Observer (Non-voting - will be decided by the full board at each meeting - to give recognition to other countries such as Ireland, Finland)	
The EEA Project Manager	
Representatives from JRC (Ispra) and other ETCs as appropriate	

It was agreed that the frequency of meetings should be two times per year for the Management Committee (probably 1 day meetings) and four times per year for the Technical Committee on the understanding that ad hoc meetings of either committee could be convened should the need arise and with the agreement of the EEA Project Manager. It was also agreed that the Technical Committee could co-opt other members on an ad hoc basis depending on the needs of the agenda and that the EEA Project Manager should be invited to attend the Technical Committee meetings at his discretion. The Topic Centre partners believe that this improved management and technical control structure will allow it to function in a more efficient and cost effective manner in keeping with the wishes of the Agency and reflecting the proposed structures for new Topic Centres.

The Management Committee have formally met during 1995 at the following dates and locations:

9-10 January	Copenhagen (EEA)
10-11 April	Medmenham (WRc)
19-20 June	Madrid (CEDEX)
18-19 September	Vienna (AWW)
4-5 December	Medmenham (WRc)

Full minutes have been provided for all partners and copied to the Agency. The Management Committee meetings also provided the basis for the scheduled Quarterly Progress Reports to the Agency.

8. PROPOSED WORK PROGRAMME ITEMS FOR 1996

8.1. From the 1995 Subvention (ecu)

Workshop for Project MW3	50,000
Completion of Projects MW2 and MW3	50,000
Reservoirs and Issues in Arid Countries (Projects MW4 and MW5 Brought Forward)	100,000
Piloting Project MW4	25,000
Human Interventions in the Hydrological Cycle (Project MW5)	25,000
Ad Hoc Support to the Agency	50,000
Support to EU Reporting Directive	100,000
Data and information Collection and Dissemination Using EIONET	50,000
Increasing the Efficiency of Water Use	75,000
TOTAL	525,000

8.2. From the 1996 Subvention (ecu)

MW4: To Implement Progressively the Water Monitoring Network and Databases Developed During 1995	300,000
MW5: To Evaluate Water Resources Across Europe in Terms of Quantity, Availability and Sustainability	200,000
SW1: Development of Guidelines for Inventories of Emissions to Water	100,000
TOTAL	600,000