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1. INTRODUCTION AND BACKGROUND INFORMATION

1.1 Catchment-Based National Strategy

The Department of the Environment and Local Government has been actively promoting a catchment-based strategy to combat eutrophication in rivers and lakes. In May 1997, the Department published its strategy document *Managing Ireland’s Rivers and Lakes – A Catchment Based Strategy against Eutrophication*, which was followed in July 1997 by the establishment of the Lough Derg and Lough Ree river basin management project. Work is also underway in developing a river basin management system for the Rivers Boyne, Liffey and Suir, and for Lough Leane.


The Department is now promoting the establishment of new, more-broadly-based, catchment management projects for the establishment of river basin management systems. It is envisaged that the relevant authorities will appoint Consultants to undertake these projects. This document sets out guidelines for the establishment of River Basin Management Systems and includes a model specification for a Consultancy contract.

1.2 Growing Water Management Challenges

The existing river basin management projects have focused on the eutrophication of rivers and lakes as the chief task facing water pollution control agencies in Ireland. However, there is also need to address other sources of pollution, to give further effect to the requirements of EU Directives such as the Nitrates Directive (91/676/EEC) and the Urban Waste Water Treatment Directive (91/271/EEC), and to undertake a more comprehensive evaluation of groundwater and of estuarine/coastal waters.

The Minister will shortly make regulations setting environmental quality standards for a number of additional substances to provide for broader implementation of the Dangerous Substances Directive (76/464/EEC), and consequently there is need to establish widespread baseline conditions, and to determine compliance for these substances in the Irish aquatic environment.

The draft EU Water Framework Directive will demand a more comprehensive and integrated approach to water management, and will have significant resource implications in view of its wide scope and ambitious targets. The approach taken in future river basin management projects will be substantially wider in scope than earlier projects. The draft Directive has the following key aims:
- expanding the scope of water protection to all waters, including surface water, groundwater, transitional water and coastal waters;
- achieving at least ‘good status’ for all waters by a set deadline;
- water management based on river basin districts;
- ‘combined approach’ of emission limit values and quality standards;
- getting citizens more directly involved.

Final adoption of the Water Framework Directive is foreseen for 2000 under joint decision by the European Parliament and the Council, following a conciliation procedure following the rules of the Amsterdam Treaty.

1.3 Establishment of new River Basin Management Projects

The Department of the Environment and Local Government is promoting the establishment, in the short to medium-term, of river basin management projects in relation to all inland and coastal waters that will facilitate participation by all stakeholders, and lead to the identification and implementation of effective measures for improved water management.

The overall objective of these projects is to develop a River Basin Management System, including a programme of measures designed to maintain and/or achieve at least good water status for all waters.

Local authorities will have the primary role in promoting, establishing and implementing these projects.

New projects will include inland surface waters, groundwater, and transitional and coastal waters.

In anticipation of the requirements of the proposed Water Framework Directive, it is proposed that new projects will be established on the basis of a small number (e.g. six or seven) of areas to be known as River Basin Districts. In practice, River Basin Districts in Ireland will be determined by a natural grouping of hydrometric areas into water resource regions already familiar to local authorities and other public bodies.

Projects established on this basis will provide for:

- the monitoring of water quantity and quality and the establishment of baseline conditions;
- the classification of water status;
- the identification of all sources of pollution, and the impacts of such pollution;
- the identification of significant water abstractions, and their impact;
- the establishment of clear objectives for improved water management and the identification and initiation of appropriate measures to achieve these objectives;
- the formulation of indicators of performance, state and impact for the River Basin District;

- the monitoring of the effects of expenditure on wastewater treatment infrastructure and other pollution abatement measures

- the development of River Basin Management Systems in order to establish appropriate and comprehensive long-term monitoring and management procedures on behalf of the relevant statutory agencies within the River Basin District.

Statutory provision already exists for the RBD approach in relation to water quality through the Local Government (Water Pollution) Acts, 1977 and 1990, which provide that two or more local authorities may jointly make a water quality management plan in relation to waters, part of which are in or adjoin the functional area of each local authority.

However, additional legislative measures may be necessary in due course to give full effect to the requirements of the draft Water Framework Directive.

1.4 Overall Objective of River Basin Management Projects

The overall objective of river basin management projects is to establish an integrated monitoring and management system for all waters within a RBD, to develop a dynamic programme of management measures and to produce a River Basin Management Strategy, which will be continually updated in order to:

(a) prevent further deterioration and protect / enhance water quality and quantity of aquatic ecosystems and groundwater;

(b) promote sustainable water use based upon long-term protection of available water resources;

(c) to provide enhanced protection of the aquatic environment through specific measures aimed at eliminating and/or mitigating the impacts of pollutants;

(d) to assist in compliance with EU Directives and national legislation, extending where applicable the measures already in place, in particular:

- Surface Water Directive 75/440/EEC
- Bathing Water Directive 76/160/EEC
- Dangerous Substances Directive 76/464/EEC (and daughter directives)
- Groundwater Directive 80/68/EEC
- Sewage Sludge Directive 86/278/EEC
- Nitrates Directive 91/676/EEC
- Phosphorus Regulations S.I. No. 258 of 1998
- Prescribed water quality standards and emission limit values
The programme of measures will take account of all significant sources of impact on aquatic ecosystems and groundwater. It is envisaged that the River Basin Management Strategy will serve as a major input to the development of a River Basin Management Plan for the purposes of the proposed Water Framework Directive.

These management systems are seen as a step towards implementation of the proposed Water Framework Directive, which will provide for the ongoing co-ordination and implementation of measures to include the general protection and improvement of aquatic ecology, unique and valuable habitats, drinking water resources, and bathing water.

2. **FINANCIAL ASSISTANCE TOWARDS ESTABLISHING RIVER BASIN MANAGEMENT SYSTEMS**

Consultants will be appointed by a nominated lead local authority (ies) to undertake development of River Basin Management Systems within a defined project period, which will normally extend up to a maximum of four years. Funds will be made available in the Department’s Vote for 2000 and subsequent years in the context of the National Development Plan 2000-2006 to support expenditure by local authorities at a rate of up to 85% of approved costs (refer Circular Letter WQ/9/99).

On completion of projects, local authorities will be required jointly to finance the subsequent operational costs of the monitoring and other management measures, as part of their ongoing responsibilities for water services and pollution control.

3. **GENERAL SCOPE OF RIVER BASIN MANAGEMENT PROJECTS**

3.1 **Water Qualitative Status**

The approach of the draft EU Framework Directive on Water Policy is to require at least ‘good status’ for all waters, where surface water status may be classified as high, good, moderate or poor when measured against relevant type-specific reference conditions, which include biological, hydromorphological, and chemical / physico-chemical elements for surface waters. Surface water status is ‘good’ when both its ecological status and its chemical status are at least ‘good’ (as defined by the draft Directive). Groundwater status is either good or poor, based on compliance with specified quantitative and chemical criteria.

There is also the requirement to comply with standards and objectives relating to ‘protected areas’ (appendix 1), which *inter alia* include designated bathing and recreational waters, abstraction waters, nutrient sensitive areas, areas designated for the protection of habitats or species etc, and which have specific and additional requirements beyond the ‘normal’ definition of ‘good status’.
Monitoring methodologies to define ‘ecological status’ are not yet sufficiently developed to allow the water classification approach of the Framework Directive be fully incorporated into the development of river basin management systems, at this stage. The Environmental Protection Agency is supporting a number of research projects as part of its Environment RTDI Programme 2000-2006 aimed at developing the methodologies for the purpose of the EU Water Framework Directive, and at establishing reference conditions for Irish rivers and lakes. It is anticipated that these methodologies will be adopted by River Basin Management Systems, as they are developed and validated.

Pending elaboration by the EU Commission and national authorities, water quality assessment for current projects will be based upon established biological, chemical and physico-chemical parameters, keeping in mind the requirements of relevant EU Directives and National standards.

3.2 Water Quantitative Status

The aim of the draft Water Framework Directive is to maintain and/or improve the aquatic environment. Whilst this is primarily concerned with the quality of aquatic ecosystems and their waters, control of quantity has obvious implications for water quality and ecosystems, and for securing a sustainable water resource.

Quantity is also a major issue for groundwater. There is for example only a certain amount of recharge into a groundwater each year, and of this recharge, some is needed to support connected ecosystems, whether by surface water bodies or terrestrial systems such as wetlands.

Therefore, river basin management projects will:

- identify those surface and groundwater bodies where the ecological, chemical and/or quantitative status may be at risk, or may at some future date be at risk, due to current or projected abstractions;

- identify those groundwater bodies for which there are directly dependent surface water ecosystems or terrestrial ecosystems, determine abstraction rates and annual average rate of overall recharge with the view to maintaining the long-term annual rate of flow to achieve the ecological quality objectives for associated surface waters and protected areas;

They will also provide a reliable means of estimating river flow in order to quantify pollutant loads (in particular nutrient loads), to identify land areas within the River Basin District giving rise to various levels of pollutants and to provide an assessment of the sectoral contribution to pollution load.

An extended quantitative monitoring network for surface waters and groundwater is therefore required for the identification and implementation of measures for effective water management, and these requirements will be established through river basin management projects.
3.3 **Groundwater**

Groundwater characterisation and monitoring will be included in new projects. Much of the data required in relation to the location and boundaries of groundwater bodies, the general character of the overlying strata, and the susceptibility of groundwater bodies to pollution will be provided by the Groundwater Protection Schemes prepared, or in preparation, on an individual county basis by the Geological Survey of Ireland and local authorities. It is envisaged that this work will be brought within the remit of the new projects, where Groundwater Protection Schemes are not available.

River basin management projects provide significant opportunity to improve knowledge and understanding of groundwater in Ireland, and for ensuring that high quality groundwater information is available for decision-making. It is envisaged that the Geological Survey of Ireland, the National geosciences body within the Department of Public Enterprise, will have a important role along established practices in delivering the required data, in association with appointed Consultants.

In addition, river basin management projects will expand existing groundwater monitoring networks to provide a coherent and comprehensive overview of groundwater chemical and quantitative status, to detect the presence of long-term antrophogenically induced upward trends in pollutants, and to propose appropriate management measures according to the principle of minimum anthropogenic impact.

3.4 **Transitional and Coastal Waters**

River Basin Management Systems will address requirements arising in relation to the status of, and impacts on, transitional and coastal waters, and for the purpose of establishing specific management measures required by the Nitrates Directive (91/676/EEC) and the Urban Waste Water Treatment Directive (91/271/EEC), and to meet Ireland’s obligations under the OSPAR Convention.

Key considerations in determining whether estuarine or coastal waters may be identified as vulnerable or sensitive include:

- the occurrence of (or potential for) eutrophication;
- the magnitude and source (whether point or diffuse) of the discharge(s);
- determination of whether or not the removal of point source nutrients would affect the level of eutrophication;
- the dispersing nature (or otherwise) of the water body receiving the effluent.

OSPAR adopted a Common Procedure for the Identification of the Eutrophication Status of the Maritime Area of the OSPAR Convention in September 1997 (OSPAR 97/15/1). This procedure comprises two steps. The first step is a screening ("broad brush") procedure to identify areas, which in practical terms are likely to be non-problem areas with regard to eutrophication. The second step is the comprehensive procedure, which should enable a classification of the maritime area in terms of problem areas, potential problem areas and non-problem areas with regard to eutrophication.
The Environmental Protection Agency screened Irish coastal waters in 1999 and has identified the locations and extent of water bodies that might not be classified as ‘non problem areas’ for the purpose of the OSPAR Convention (Screening Procedure for Irish Coastal Waters with regard to Eutrophication Status, EPA 1999).

The screening procedure forms the initial phase of the Common Procedure for the Identification of Eutrophication Status of the Maritime Area of the Oslo and Paris Commissions (OSPAR).

Actions, with respect to measures required following the identification of the eutrophication status of the maritime area, are specified within the OSPAR Strategy to Combat Eutrophication. The Common Procedure thus identifies those parts of the Maritime Area for which actions are needed as follows:

a. in the case of non-problem areas with regard to eutrophication, the status of the area with regard to eutrophication will be reassessed by applying the Common Procedure if there are grounds for concern that there has been a substantial increase in the anthropogenic nutrient load;

b. in the case of potential problem areas with regard to eutrophication, preventive measures should be taken in accordance with the Precautionary Principle.

Furthermore, there should be urgent implementation of monitoring and research to enable a full assessment of the eutrophication status of each area concerned within five years of its being characterised as a potential problem area with regard to eutrophication;

c. in the case of problem areas with regard to eutrophication:
   (i) measures must be taken to reduce or to eliminate the anthropogenic causes of eutrophication;
   (ii) reports must be provided on the implementation of such measures;
   (iii) assessments must be made of the effectiveness of the implementation of the measures on the state of the marine ecosystem.

Enhanced monitoring regimes will be developed and implemented for potential problem areas so that water status can be accurately determined, appropriate management measures established, and so that the effectiveness of these measures can be evaluated. The modelling of estuaries will be undertaken, where necessary for this purpose.

River Basin Management Systems will in addition provide for the monitoring of coastal amenity/recreation areas, and identify the impact of point and diffuse pollution sources.

3.5 Water Abstraction and Source Protection

Bodies of waters used for the abstraction of drinking water (which provide more than 100 m$^3$ a day as an average) will be monitored in accordance with the Drinking Water Regulations, for priority/dangerous substances and other substances discharged in
significant quantities which could affect the status of these bodies of water. Management measures will be developed to ensure the necessary protection of their qualitative and quantitative status.

The requirement to establish safeguard zones such as groundwater source protection zones should be assessed and determined as necessary, through projects establishing River Basin Management Systems.

3.6 **Priority/Dangerous Substances**

Projects establishing River Basin Management Systems will include the monitoring of waters for the presence of priority/dangerous substances discharged either directly or indirectly within the River Basin District. Monitoring for these substances should be prioritised on the basis of an audit undertaken to establish potential sources (point and diffuse), and have regard to:

- prescribed water quality standards;
- EU List of priority substances in the field of water policy;
- Dangerous Substances Directive 76/464/EEC (and daughter directives);
- Groundwater Directive 80/68/EEC.

In addition to monitoring for priority/dangerous substances at locations where such substances might be found in waters, monitoring will also be undertaken at suitably selected sites throughout the River Basin District in order to:

(a) establish background levels in waters for priority / dangerous substances on the basis of the EU priority list (appendix 2)

(b) establish compliance with prescribed national quality standards for dangerous substances in water (appendix 2)

All steps will be taken to comply with analytical methods and detection limits in keeping with the project objectives, the requirements of relevant EU Directives and national standards, and internationally accepted good practice.

3.7 **Special Investigations**

Investigations are underway as part of existing projects (Derg/Ree, Three Rivers, and Lough Leane) to develop and evaluate measures aimed at reducing agricultural pollution. Similar investigations may be appropriate for new projects, in particular to provide wider national characterisation of farming and land-use ‘types’ giving rise to various levels of pollution, in particular N and P loss to waters.

In developing any such proposals, consideration might for example be given to monitoring the effectiveness of proposed action programmes implemented under the Nitrates Directive (91/676/EEC) for nitrate vulnerable zones, in areas where nitrate pollution is identified.
As water bodies can take a long time to respond to nitrate reduction measures, the mere monitoring of nitrate concentrations in water may not be sufficient for management purposes, in particular to discover the effectiveness of management measures. A combination of other types of ‘monitoring’ might be proposed provided it is possible to:

- establish the changes in agricultural practice through the use of surveys of representative farms and global surveys;

- assess the extent to which action programmes, through changing agricultural practice, reduce nitrate loss to groundwater and surface waters, and the extent to which they reduce eutrophication of surface waters.

The latter may require a modelling approach combined with empirical studies at specific experimental sites where it is possible to understand the interaction between agricultural practices, nutrient inputs and losses to waters. These may typically be representative micro-catchments with short response times.

Other special studies may be required to address specific issues of particular importance within a given River Basin District, such as forestry plantation, urban runoff, etc.

In addition, the Environmental Protection Agency as part of its Environmental RTDI Programme 2000-2006 has initiated a large-scale integrated project in relation to eutrophication from agricultural sources, and every attempt should be made to co-ordinate efforts between the work undertaken in river basin management projects and these EPA research projects.

4. INTER-AGENCY AND CROSS-SECTORAL COOPERATION

An essential ingredient of successful catchment management is good cooperative working relationships between the various stakeholders involved and the development of a consensual approach to decision making. Stakeholders can broadly be identified as those who are either contributing to water status problems and therefore need to be involved as part of the solution, and those that are beneficiaries of improvements in water status, as well as statutory bodies with responsibilities for protection and improvement of water quality. The development and maintenance of good working relationships between stakeholders will be an important part of the successful management of a River Basin District and its catchments. These projects will assist in this process, as their success to a large extent is dependent on inter-Agency and cross-sectoral co-operation and building consensus.
5. USE OF ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS) FOR CATCHMENT MANAGEMENT PURPOSES

Environmental objectives can best be achieved through a dynamic process which involves periodic auditing in order to assess the relative success of measures chosen to meet objectives. Auditing, in turn, provides information that can be used for reviewing and fine-tuning of management systems, so that changes or modifications can be made where necessary. The EMS approach towards catchment management is consistent with the requirements of the draft Water Framework Directive, which requires the realisation of set objectives by set deadlines.

The principles of an Environmental Management Systems (EMS) approach (appendix 3) will be developed through river basin management projects in order to implement the various actions required to develop the River Basin Management System and to implement the programmes of measures.

6. MODEL SPECIFICATION FOR CONSULTANCY CONTRACT

6.1 Definitions

Employer means the ‘Lead Local Authority’

Contractor means the company or organisation whose tender is accepted in writing by the Lead Local Authority.

Completion Date means the date calculated from the project duration submitted with the works programme and the date of acceptance in writing of the tender by the lead local authority.

River Basin Co-Ordinator means the Officer appointed by and authorised in writing to act on behalf of the constituent local authorities.

Steering Committee means the committee consisting of representatives of the lead local authority (ies), Department of the Environment and Local Government, Environmental Protection Agency, Geological Survey of Ireland, Department of the Marine and Natural Resources / Central Fisheries Board and any other organisation as appropriate. The role of the Steering Committee is to oversee and direct the quality of the contractors works programme, to provide policy and technical advice, and to prioritise and agree project expenditure.

River Basin Management Group means the group consisting of representatives from local authorities within the River Basin District, Regional
Authorities, Department of the Environment and Local Government, Department of Agriculture, Food and Rural Development, Department of the Marine and Natural Resources, Environmental Protection Agency, Geological Survey of Ireland, Central Fisheries Board, regional fishery board(s), Teagasc, Coillte, Dúchas, Office of Public Works, relevant stakeholders and any other organisation as appropriate. The Group’s role is to oversee and advise on (a) development of the project (b) implementation of the works relating to their organisations that are necessary for the successful establishment and implementation of the River Basin Management System, in particular the Programme of Measures, and (c) preparation and implementation of the River Basin Management Strategy.

6.2 Assignment and Subletting

The Contractor shall not assign or sublet the contract or any part or any benefit or interest in the contract without the prior written consent of the Lead Local Authority.

6.3 Confidentiality and Ownership

All reports, research and other material prepared or produced as part of this project shall be the property of the Lead Local Authority. No part of the project, reports, other material or outputs shall be reproduced without the permission of the Lead Local Authority. Copyright to the project reports shall belong to the Lead Local Authority.

Information supplied by intending contractors in their tender submissions may be disclosed in response to a request under the Freedom of Information Act, 1997. If intending tenderers consider that any such information is either confidential or commercially sensitive, they should identify this information when submitting their tender and specify the reasons for its sensitivity. The Lead Local Authority will consult with tenderers before making a decision on any Freedom of Information request received.

6.4 Nature of the Contract

The contract is for the completion of work set out in the Scope of Contract, and as otherwise described in the General Scope of River Basin Management Projects (Section 3).

The Lead Local Authority may publish the completed documents. They should therefore include all necessary figures, charts and diagrams required, illustrating and communicating the contents.
The contract is for professional services and the duration of the contract (which shall not be greater than four years) should be set out in the works programme submitted, together with proposed commencement (assuming appointment two weeks after tender date) and completion dates.

6.5 **Overview and Main Deliverables**

The overall objective is to develop, establish and during the period of the contract implement a River Basin Management System including a programme of measures, and develop a River Basin Management Strategy in order to achieve at least good status for all waters in the River Basin District.

The contract will consist of the following main tasks:

- A report on policy and legislation
- An initial characterisation of the River Basin District
- The establishment of a River Basin Management System consisting of
  - A Monitoring System consisting of water status, facilities and strategic monitoring subsystems
  - A Geographical Information System and associated databases and analysis modules
  - A Programme of Measures
  - A Public Awareness and Consultation Programme
  - An Environmental Management System (EMS)
- Interim and Final Reports on implementation of the River Basin Management System
- A River Basin Management Strategy

6.6 **Scope of Contract**

6.6.1. **Task 1: Background Information – Policy and Legislation**

The contractor will provide a report on background information relating to all relevant legislation at national and EU level, including the draft Water Framework Directive.

The report will include a description of the statutory arrangements for water management within the River Basin District, including terrestrial ecosystems dependent on water. It will identify all competent authorities and their areas of responsibility, and will serve to guide and inform the various tasks of the project.

*Indicative Timescale – within three months of commencement*

6.6.2. **Task 2: Characterisation of the River Basin District (RBD)**

The initial characterisation will include within its scope the waterbodies (including aquifers, wetlands, estuaries and coastal waters) and lands within the RBD. The contractor will undertake a study of all available information so
as to provide as complete as possible a description of the River Basin District in terms of:

- extent, demography, geology, climate, etc;
- water quality (biological, hydromorphological, and chemical characteristics);
- land use;
- protected areas;
- details of all known point and diffuse discharges;
- details of all flow controls and abstractions;
- estimates of pollution load by sector, generally and at key locations;
- an overview of current management practices.

Based on an assessment of the above information, the contractor will provide a report detailing:

- the adequacy of existing monitoring regimes (qualitative and quantitative);
- an overview of existing water quality within the River Basin District;
- an assessment of point and diffuse source controls;
- an assessment of compliance with national regulations and EU Directives;
- the main issues in summary format affecting water quality and an estimation of the principal contributors to pollution load;
- the effectiveness of current water management practices;
- information gaps identified and proposals for filling these gaps during the lifetime of the project.


6.6.3. Task 3: Development of a River Basin Management System

Sub-Task 3.1: Develop and Implement a Monitoring System for the River Basin District.

The contractor will develop an integrated monitoring system for the River Basin District to provide a cost-effective and efficient monitoring regime, which will be consistent with the overall needs of the project and the long-term requirements of the various statutory agencies.

Monitoring arrangements will address the monitoring requirements for the RBD including water status monitoring, facilities monitoring and strategic monitoring. Facilities monitoring will include treatment plants (industrial and urban wastewater treatment plants), land-use including agriculture and forestry, extraction operations (quarries and mines) waste management facilities and other significant activities that may impact on water status (appendix 4).

Monitoring will consist of:
(a) Surveillance Monitoring to provide an assessment of all waters within the River Basin District, to assess long-term changes in natural conditions and to assess long-term changes resulting from widespread anthropogenic activity;

(b) Operational Monitoring to provide more detailed assessment of water bodies identified as being at risk of failing to meet their environmental objectives and to assess any changes in the status of such bodies resulting from the programmes of measures;

(c) Investigative Monitoring in order to ascertain the causes of a water body or water bodies failing to achieve the environmental objectives or to ascertain the magnitude and impacts of accidental pollution;

(d) Monitoring of protected areas

In relation to water quality and quantity, the system will take account of existing monitoring regimes and will allow the following to be produced on an on-going basis:

(a) a determination of the qualitative (biological and chemical) and quantitative status of waters within the River Basin District;

(b) an estimation of point source pollution and an assessment of the impacts of point source discharges of pollutants on waters;

(c) characterisation and estimation of diffuse-source pollution and an assessment of its impacts on waters;

(d) the identification of land areas within the River Basin District giving rise to various levels of pollutants and an assessment of the sectoral contribution to pollution load (industrial, domestic, agricultural and other);

(e) the identification of nutrient sensitive and vulnerable areas, and other areas in need of special protection;

(f) an evaluation of anthropogenic impacts on the status of waters, including those waters identified as requiring special protection under specific Community legislation for the protection of their surface water or groundwater;

(g) a review of the impact of groundwater and surface water abstractions on the quantitative and qualitative status of waters, including areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection.

The Contractor will provide detailed proposals for agreement with the Steering Committee in relation to:
- the qualitative monitoring needs for surface waters and groundwater, including the network of sites, parameters to be measured and sampling frequency;

- the quantitative monitoring needs for surface waters and groundwater, including proposals for enhancement of the existing hydrometric network and establishment of a monitoring network for groundwater levels, including the network of sites and systems to be employed;

- the qualitative and quantitative requirements for significant point and diffuse sources of pollution;

- investigations necessary for the identification of sensitive and vulnerable areas for the purposes of the urban waste water directive and nitrates directive;

- other specialist investigations necessary to characterise pollution sources, and to monitor and determine the effectiveness of management measures, and the need for new measures;

- the formulation of indicators of performance, state and impact for the River Basin District.

- procedures for data capture management and reporting.

The Contractor will be responsible for devising, setting up and maintaining the monitoring system and approved specialist investigations (including specification, quality control, data capture, and data evaluation and reporting) for the duration of the project.

Indicative Timescale – developed within eighteen months of commencement of the contract and maintained for the duration of the project.

Sub-Task 3.2: Develop a Geographical Information System and associated databases for the River Basin District

The contractor will develop a Geographical Information System (GIS) for the River Basin District which will be capable of presenting key information for analysis, modelling and environmental management purposes. The GIS will be compatible with local authority systems, and the requirements of the Environmental Protection Agency.

Local authorities within the River Basin District will be responsible for maintaining and updating the GIS on completion of the project. With this in mind, the GIS must be:

- dynamic;
- flexible and rapidly responsive to new data;
- easy to use;
- capable of presenting key relationships, management information, land-use data and indicators of water status in map format;
- an open system available to all users.

It must have:

- established protocols for updating;
- established reporting protocols;
- a protected database core.

It is envisaged that a single local authority within a River Basin District will be responsible for maintaining and updating the GIS on completion of the project. A dedicated technical manager will be appointed by the River Basin Management Group in order to provide ongoing technical support, and to undertake data collation, data input, distribution and reporting for the River Basin District on completion of the project. It is envisaged that the technical manager will be appointed during the early stages of the project in order to maintain GIS skills on completion of the project.

In addition, each local authority within a River Basin District will require access to the GIS and to update it with data from their own administrative areas. The system will therefore have to be capable of allowing individual local authorities:

- perform their own functions and maintain their own information independently;
- access and use common databases subject to agreed protocols on updating.

GIS development will include (appendix 5):

- data collection;
- data purchase;
- data transformation and input;
- establish the structure of the database files;
- collation and input of information to the data bases;
- geographical referencing of information for display and spatial analysis;
- development of spatial modelling and analysis techniques;
- protocols for data updating, management and reporting;
- GIS and database training;
- successful implementation of the GIS across agencies within the RBD.

The GIS will be developed at an early stage in the project, and used for analysis, modelling, reporting and consultation purposes during the project. The GIS will in so far as possible be used for preparation of the River Basin Management Strategy.

The task will involve collation of the relevant data-sets required, operation of the system during the period of the contract in association with the constituent
local authorities and training of personnel of the constituent local authorities in the operation and maintenance of the system

Indicative Timescale – developed within eighteen months of commencement and maintained for the duration of the project

Sub-Task 3.3: Preparation of a Programme of Measures

The contractor will:

(a) propose objectives for each waterbody within the River Basin District consistent with maintaining and/or achieving at least ‘good status’ for all waters and protected areas.
(b) develop a programme of measures designed to achieve the objectives by a set deadline.

The programme of measures (appendix 6) will as a minimum ensure compliance with all statutory regulations and relevant EU directives for all waters, and facilities. The minimum requirements to be complied with will include:

- those measures required to implement national and Community legislation for the protection of waters, including the control of all discharges to surface waters according to the combined approach, the protection of drinking water supplies, controls over the abstraction of surface freshwaters and groundwater and controls to prevent the input of anthropogenic substances.

- other measures appropriate to achieve the environmental objectives.

It is intended that the River Basin Management Group will initiate the programmes of measures on a phased basis within the project period. In keeping with the approach of continual improvement and the objective of achieving set targets by set deadlines, the contractor will ensure early delivery of the various measures, and, during the period of the project provide support to the River Basin Management Group in their implementation. It is envisaged that the Environmental Management Systems (Task 3.5) approach will be used to initiate implementation of the programme of measures within the timeframe of the project so that the process of implementation at river basin district level, local authority level and individual catchment level is well underway by the time the project has drawn to a conclusion.

Sub-Task 3.4: Public Awareness and Consultation Programme

Public consultation and awareness, and participation by all stakeholders are considered key requirements for the successful implementation of River Basin Management projects.
On commencement of the project the Contractor will initiate consultation with all relevant regulatory agencies and stakeholders immediately with the view to establishing their individual requirements and objectives/concerns. Consultation will continue throughout the project, as necessary.

The Contractor will in addition undertake appropriate public awareness programmes with the view towards mobilising public support and cooperation in order to encourage improved water management by the various sectors. These programmes will normally be undertaken in association with the local authorities and other statutory bodies.

Attendance at local authority and regional authority meetings will also be required at various stages during the project, for the purpose of promoting the project objectives, findings and recommendations.

The Contractor will prepare all publicity material, brochures, intermediate and final reports relating to the project. The contractor will publish Project Reports as approved by the Steering Committee to disseminate information on the project at eighteen months after commencement of the project, and annually thereafter until the conclusion of the contract.

A provisional sum of £50,000 should be provided towards the printing costs of approved publicity material and reports.

*Timescale: From commencement of contract and maintained until completion of contract*

**Sub-Task 3.5: The Formulation of an Environmental Management System (EMS) for the River Basin District**

Environmental objectives can best be achieved through a dynamic process subject to periodic audit and review in order to assess the relative success of measures chosen to meet objectives. Such an approach provides for the review and fine-tuning of management systems, so that changes or modifications can be made where necessary. The approach is fully consistent with the requirements of the proposed Water Framework Directive, which requires the realisation of set objectives by set deadlines.

This task will consist of devising a system that will be used for managing the RBD (appendix 3) so that the River Basin Management System complies with legal requirements and provides for continual improvement in water status. The system should provide for the planning of activities, assigning of responsibilities, development and control of practices and procedures, and allocation of resources for developing, implementing, achieving and reviewing the system objectives. In designing the system, the contractor should assess the relevance of international EMS standards to river basin management and where appropriate, adapt elements of these standards for the River Basin Management System.
On completion of the system's infrastructure, project operations including those developed under Sub-Tasks 3.1, 3.2, 3.3 and 3.4 should be carried out in accordance with the requirements of the EMS. Audits should be carried out at regular intervals during the period of operation of the project.

*Indicative Timescale – within 18 months of commencement and maintained until completion of Contract*

**6.6.4 Task 4: Implementation of the River Basin Management System**

The Contractor shall, under the direction of the Steering Committee and the River Basin Management Group, co-ordinate the implementation of the River Basin Management System on a trial basis for the remainder of the contract. It is envisaged that the Steering Committee and the River Basin Management Group would take over the operation of the system when the contract is completed. This implementation period should be used to iron out problems associated with the system and to place the system on a sure footing following completion of the contract and handover of the system.

The Contractor will be responsible for the hand over of the system to the local authorities and relevant agencies within the RBD on completion of the contract, and arranging for any training required to ensure that all elements of the system can be operated and maintained. Interim reports and a final report on implementation of the system will be required.

*Indicative Timescale - ongoing*

**6.6.5 Task 5: River Basin Management Strategy**

The Contractor will prepare A River Basin Management Strategy, which will include at least the following information:

- A description of the characteristics of the River Basin District;

- A description of the significant pressures and impact of human activity on the status of surface water and groundwater, including:
  - a general description of the main issues;
  - estimation of point source pollution;
  - estimation of diffuse source pollution, including summary of land use;
  - estimation of pressures on the quantitative status of waters, including abstractions;
  - analysis of other impacts of human activity on the status of waters;

- Identification and mapping of protected areas identified as requiring special protection under specific Community legislation for the protection of their surface water or groundwater, and shall include:
- all bodies of water used for the abstraction of water intended for human consumption providing more than 10 m³ as an average or serving more than 50 persons, and those bodies of water intended for such future use;
- areas designated for the protection of economically significant aquatic species;
- bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC;
- nutrient sensitive areas, including areas identified as sensitive areas under Directive 91/271/EEC and areas identified as vulnerable zones under Directive 91/676/EEC, and;
- areas designated for the protection of habitats or species where the maintenance or improvement of the qualitative and/or quantitative status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC and Directive 79/409/EEC.

- A map of the monitoring networks established for surface waters, groundwater and areas identified as requiring special protection, and presentation in map form of the results of the monitoring programmes undertaken for the status of:
  - surface water (biological, chemical and quantitative data);
  - groundwater (chemical and quantitative)
  - transitional waters;
  - coastal waters;
  - areas identified as requiring special protection

- A list of the environmental objectives established in order to:
  - prevent deterioration and pollution of surface waters and to restore surface waters with the aim of achieving at least good surface water status for all surface waters;
  - prevent deterioration of groundwater chemical and quantitative status and to ensure a balance between abstraction and recharge of groundwater and to restore groundwater with the aim of achieving at least good chemical and quantitative groundwater status in all bodies of groundwater;
  - achieve compliance with any standards relating to areas requiring protection under specific Community legislation.

- A summary of the Programme of Measures required to achieve the above objectives including those required:
  - in order to implement Community legislation for the protection of water;
  - to ensure the necessary protection for bodies of water used for the abstraction of water for human consumption which provide more than 100 m³ a day as an average, with the aim of moving towards a
reduction of the purification and pre-treatment needed in the production of drinking water;
- to manage point and diffuse source discharges and other activities with an impact on the status of waters;
- to prevent significant leakage of pollutants and reduce the likelihood of pollution incidents from facilities in the River Basin District

- An Outline of the Implementation Plan for Programme of Measures with timescale
- A summary of public consultation measures.

*Indicative Timescale – 36 months from commencement of contract*

6.7 **Administrative Arrangements**

6.7.1 **Appointment Of Consultants**

It is proposed to appoint Consultants to undertake the project for the development and implementation of a River Basin Management System.

The Consultant will be appointed using either the Restricted Procedure or the Negotiated Procedure of Directive 92/50/EEC, as amended by Directive 97/52/EEC. The suitability and selection criteria used for shortlisting applicants are those set out in detail in the contract notice published in the Official Journal of the European Communities.

6.7.2 **Conditions of Appointment**

The successful Consultant shall, prior to appointment, provide declarations of conformance with the requirements of Articles 30.3 and 31.1 (a) and (c) of Council Directive 92/50/EEC.

It shall be a condition of appointment that the successful applicant and all sub-consultants or sub-contractors, domestic or otherwise, shall produce for inspection either a valid C2 Taxation Certificate, a Tax Clearance Certificate or, in the case of consultants resident outside the state, a statement from the Revenue Commissioners in Ireland, as to their suitability for appointment on tax grounds. The consultants, sub-consultants and sub-contractors, domestic or otherwise, shall continue to hold, in good standing, current issues of all such Certificates for the duration of the contract.

6.7.3 **Time-scale**

The time-scale for completion of the Project is 48 months.
6.7.4 **Contract Award**

The Steering Committee is responsible for the conduct of the award process. The appointment of the Consultant will be by ******* County Council.

The contract will be awarded to the most economically advantageous proposal, having regard to the following criteria in descending order of importance:

a) Technical Merit (to include project management, project appreciation, methods proposed and skills of dedicated project staff)
b) Delivery Dates
c) Current Workload
d) Price

The contracting authority will inform tenderers of decisions taken on contract awards, including reasons why it may decide not to award to a contract for which there has been an invitation to tender, or to start the procedure again.

6.7.5 **The Project Fee**

Consultants are required to:

1) quote a price for each of the services described in this brief:

2) provide a breakdown of any other costs and expenses, (including all labour, secretarial services, handling charges, travel, overheads and all sub-consultants’ fees),

3) submit a schedule of daily rates in IR£ for each member of the Project Team.

Consultants are expected to provide a full description of how each of the project requirements will be met. A statement to the effect that the requirement will be met will not be sufficient.

An overall project fee for the final contract will be agreed between the contracting authority, the Department of the Environment and Local Government and the Consultant based on the prices quoted for each of the services and the schedule of daily rates as indicated above.

No other amount over and above the agreed contract amount will be paid to the appointed Consultant.

If during the term of the contract, the Consultant is asked by the contracting authority to carry out additional work which is beyond the scope of work contained in this brief and which could not have been reasonably foreseen by the Consultant, the Consultant shall submit a quotation for that work, based on
the original schedule of costs. If this quotation is deemed reasonable, a request to carry out the work will be made by the contracting authority.

6.7.6 **Other Requirements**

The Project shall be deemed to be carried out in the Republic of Ireland and shall be governed by the laws of the Republic of Ireland. Particular reference should be made to the Safety Health and Welfare at Work Act and Regulations. Before commencement of the project the consultant shall take out insurance policies completely indemnifying the client from any claims by the Consultant’s employees or by any third parties.

Under the Finance Act, 1987 a withholding tax must be deducted from payments for professional services. This tax, which is at a rate of 22%, will be deducted from payments made to the Consultant in respect of the project and will be remitted to the Irish Tax Authorities. A non-national Consultant can reclaim this tax by making application on Form F 45/1 to the Revenue Commissioners, Claims Branch, Dublin Castle, Dublin 2.

Any irreconcilable dispute arising during the project shall be referred to the arbitration of a person to be mutually agreed upon or, failing agreement, to some person appointed by the President for the time being of the Institution of Engineers of Ireland and any such reference shall be deemed to be a submission to arbitration within the meaning of the Arbitration Act, 1954 or any statutory re-enactment thereof for the time being in force.

The Consultant shall establish and maintain an adequately staffed office at an agreed location from which the project will be undertaken.

6.7.7 **Termination or Restructuring**

The client may terminate the services of the Consultant appointed to carry out the project at any time. Fees and expenses to the date of termination will be payable by the client.

Should the Consultant, prior to the commencement of or during the course of the project, wish to:

1) change the membership of the project team relating to individual staff members and/or their input to the project; or

2) restructure the project team relating to firms forming part of a consortium or firms providing sub-contracting services to the consultant and/or to the input of those firms to the project,

he shall seek the prior written approval of the client, which shall not be unreasonably withheld.
APPENDIX 1

PROTECTED AREAS

1) Areas designated for the abstraction of water intended for human consumption

2) Areas designated for the protection of economically significant aquatic species

3) Bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC

4) Nutrient sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC and areas designated as sensitive areas under Directive 91/271/EEC

5) Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including Natura 2000 sites designated under Council Directive 92/43/EEC and Directive 79/409/EEC
<table>
<thead>
<tr>
<th>CAS number</th>
<th>EU number</th>
<th>Name</th>
<th>EU Priority List</th>
<th>Substances with prescribed National Standards for Water</th>
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<td>15972-60-8</td>
<td>240-110-8</td>
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<td>58-89-9</td>
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<td>(gamma-isomer, Lindane)</td>
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<td>34123-59-6</td>
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<td>Isoproturon</td>
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<td>Nonylphenols</td>
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<td>104-40-5</td>
<td>203-199-4</td>
<td>(4-(para)-nonylphenol)</td>
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<td>1806-26-4</td>
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<td>Octylphenols</td>
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<td>(para-tert-octylphenol)</td>
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<td>205-916-6</td>
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<td>Fluoranthene</td>
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<tr>
<td>193-39-5</td>
<td>205-893-2</td>
<td>Indeno(1,2,3-cd)pyrene)</td>
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<td>608-93-5</td>
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<tr>
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<td>106-42-3</td>
<td></td>
<td>Zinc</td>
<td></td>
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APPENDIX 3

INDICATIVE ENVIRONMENTAL MANAGEMENT SYSTEMS APPROACH

1. Environmental Management System For RBMS
   Systems Infrastructure including Geographic Information System, Associated Databases, Monitoring Protocols and Action Protocols

2. Initial River Basin District Characterisation Study

3. Objectives and Targets

4. Action Plan

5. Implementation and Operation

6. Management Review
# APPENDIX 4

**INDICATIVE LIST OF FACILITIES MONITORING REQUIREMENTS**

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Parameter Type</th>
<th>Parameters</th>
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</thead>
<tbody>
<tr>
<td>Industrial Plants</td>
<td>Effluents</td>
<td>Flow (continuous measurement)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BOD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Suspended Solids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ortho P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ammonia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxidised N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ecotoxicity</td>
</tr>
<tr>
<td></td>
<td>Location</td>
<td>Location</td>
</tr>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td>Area served and potential contamination risks</td>
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</tr>
<tr>
<td></td>
<td>Location of fill points and discharge points</td>
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</tr>
<tr>
<td></td>
<td>Firewater Storage capacity</td>
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<tr>
<td></td>
<td>Firewater retention capacity</td>
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<td></td>
<td>Farm Profile</td>
<td>Stock numbers and type</td>
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<tr>
<td></td>
<td>Housing system (slatted sheds or straw based)</td>
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<tr>
<td></td>
<td>REPS or non REPS</td>
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</tr>
<tr>
<td></td>
<td>Silage system type (bale or pit) and quantity cut per annum</td>
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</tr>
<tr>
<td></td>
<td>Type of sheep dip utilised (OP or pyrethroid)</td>
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<tr>
<td></td>
<td>Slurry Storage Capacity (m3)</td>
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<tr>
<td></td>
<td>Calculated required slurry and FYM storage capacity (m3)</td>
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<tr>
<td></td>
<td>Dirty water storage</td>
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</tr>
<tr>
<td></td>
<td>Diesel storage tanks and bunds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Silage effluent storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pesticide storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spent Sheep dip storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condition of farmyard</td>
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<td></td>
<td>Degree of storm water separation</td>
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<td></td>
<td>Remedial Works needed</td>
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<td>Storm water separation in farm yard</td>
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<td>Field parameters</td>
<td>Soil type</td>
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<td>Soil P levels information</td>
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<tr>
<td></td>
<td>Details of water courses and drainage</td>
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<td></td>
<td>Location of ring feeders</td>
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<td></td>
<td>Assessment of any direct watering of animals at watercourses</td>
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<tr>
<td></td>
<td>Dirty water disposal systems and methods employed  (eg automated sprinkler systems )</td>
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<tr>
<td></td>
<td>Pesticide disposal methods</td>
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<td>Spent Sheep dip disposal</td>
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<td>Facility Type</td>
<td>Parameter Type</td>
<td>Parameters</td>
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<td>UWWTPs Management</td>
<td>parameters</td>
<td>Inflow and outflow rates from plant (continuous measurement) Design and existing Plant PE Design and existing volumetric load Treatment Processes Frequency of storm overflows at plant inlet</td>
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<td>Effluent Quality</td>
<td>Parameters</td>
<td>BOD COD Total Suspended Solids Ortho P Total P Ammonia load Nitrate load Maximum daily concentrations of above Average daily concentrations of above</td>
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<tr>
<td>Planned upgrades</td>
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<td>At what planning stage its at Likely commissioning date</td>
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<tr>
<td>Quarries and mines</td>
<td>Surface Water</td>
<td>Surface water runoff volume and suspended solids load Presence or absence of settling ponds</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>Groundwater level reduction</td>
</tr>
<tr>
<td>Landfills</td>
<td></td>
<td>Quantification of leachate generation rates Chemical composition and ecotoxicity of leachate</td>
</tr>
<tr>
<td>Peatland Developments</td>
<td></td>
<td>Present/Absence of settling ponds Suspended solid concentration post-settling</td>
</tr>
<tr>
<td>Urban developments</td>
<td>Surface Water</td>
<td>Run off from impermeable urban, suburban areas Soakaways or outfalls to waterbodies</td>
</tr>
<tr>
<td>Roads</td>
<td>Surface Water</td>
<td>Run off composition Location of run off outfalls Engineering estimates of volumetric run off loads</td>
</tr>
</tbody>
</table>

**APPENDIX 5**

**GEOGRAPHICAL INFORMATION SYSTEM (GIS) and DATABASES**

The GIS shall contain at least the following layers:

- 1:50,000 vector and raster maps of the river basin district
- digital terrain model
- hydrometric area boundaries
- county boundaries
- catchment and sub-catchment boundaries
- district electoral divisions
- townlands (OS townlands and CSO townlands if available)
- bedrock geology
- quaternary geology
• aquifer map
• aquifer vulnerability map
• soils map
• waterbodies
• monitoring points for surface water, groundwater, estuarine waters and coastal waters
• hydrometric gauging stations
• Met Eireann synoptic stations
• Location of rainfall gauges and evapotranspiration monitoring stations
• water supply abstraction points
• source protection areas
• physical planning zones
• protected areas (including areas of local, National and International conservation importance)
• industrial plants, their waste water treatment plants and outfalls
• urban wastewater treatment plants and their outfalls
• location of landfills
• other waste management facilities
• surface water runoff outfalls from urban areas
• designated waters or zones under the Nitrate directive, urban wastewater treatment directive, shellfish directive or freshwater fish directive
• land use and land cover including peat extraction lands
• forestry development and their age profiles
• potential contaminated sites
• quarries
• hydroelectric schemes

The associated databases shall include at a minimum:

• groundwater monitoring data
• surface water monitoring data (chemical and biological)
• estuarine monitoring data (hydrodynamic, chemical and biological)
• lake and estuary hydromorphological information
• soil Phosphorus levels data
• agronomic information (preferably at townland level)
• rainfall
• evapotranspiration rates
• hydrometric data for rivers, lakes, aquifers and coastal zones
• data on urban wastewater discharges and urban waste water treatment plants (including data on untreated discharges)
• landspreading of organic wastes including biosolids
• effluent data from industrial plants
• frequency of combined sewer overflow events
• forestry age(establishment, mid rotation or harvesting) and rotation stage
• demographic information (preferably at townland level)
APPENDIX 6

MINIMUM LIST OF MEASURES TO BE INCLUDED IN THE PROGRAMMES OF MEASURES

Measures required under the following Directives:

4) The Major Accidents (Seveso) Directive 96/82/EC
7) The Urban Waste Water Treatment Directive 91/271/EEC
10) The Habitats Directive 92/43/EEC
11) The Integrated Pollution Prevention Control Directive 96/61/EC