JOINT STANDARD PROJECT FICHE

1. Basic Information

- 1.1.
 CRIS Number:
 2004/016-783.01.02 (BG)

 2004/016-784.01.03 (RO)
 2004/016-784.01.03 (RO)
- 1.2. Title: Integrated Management of Transboundary Groundwater between Bulgaria and Romania in Dobrudja/Dobrogea Area
- 1.3. Sector: Environment
- 1.4. Location: Dobrudja/Dobrogea Area in Bulgaria and Romania; Dobrogea/Dobrudja Plateau (total surface area: about 10,000 sqkm) Administrative areas: Dobrich, Silistra (BG); Constanta (RO) River Basin: Parts of the International Danube River Basin and Black Sea River Basin District.
- 1.5. **Duration:** 24 months

2. Objectives

2.1. Overall Objective

• Integrated Management of Transboundary Groundwater.

2.2. Project purpose

• Definition and implementation of the basic transboundary waters management tools including: a joint monitoring programme of transboundary aquifers in Dobrudja/Dobrogea area, water resources evaluation tools and establishment of the Border Groundwater Committee.

2.3. Accession Partnership (AP) and NPAA priority

2.3.1. Accession Partnership (2003)

- Implement of framework legislation in the water sector, prepare and implement detailed EU Directive specific approximation programmes at the regional level.
- Strengthen the capacity of implementation structures
- Ensure progress with the implementation of the transposed acquis, including through securing the necessary financial resources

2.3.2. NPAA priorities

• Promotion of cross-border co-operation

Short-term priority:

Bulgaria:

• Amendment of the present Water Law/1995 in order to attain compliance with the provisions of Water Framework Directive 2000/60/EEC

Romania:

• Amending the Water Law 107/1996 in order to attain compliance with the provisions of Water Framework Directive 2000/60/EEC

Medium-term priority

- Establishing action programs regarding all the sensitive zones, certain sensitive areas or parts of sensitive areas, and, if necessary, the measures for the implementation of this programme
- Official Document issued by National environmental authorities regarding the information exchange in the field of water management for the transposition of Council Decision establishing a common procedure for the exchange of information on the quality of surface fresh water in the Community
- Establishing a computerized system and a database for water management in accordance with the requests of Water Framework Directive

2.4. Contribution to National Development Plan

Bulgarian National Development Plan:

The good knowledge of the groundwater resources in the Dobrudja Area will represent an information background for integrated quantitative and qualitative management. This will promote the sustainable planning of groundwater utilization and will ensure the economic development of the rural settlements.

Romanian National Development Plan (2004-2006):

The objectives of the project reflect priorities of NDP for the period 2004-2006, which state as the overall objective for the second priority "Improving and developing transport and energy infrastructure and ensuring environmental protection". The rationale for this priority is to improve the national infrastructure in these sectors to address their main needs and exploit existing opportunities.

The Strategy is based on a better-integrated management of water resources through investment in water supply and water sewerage, including the identification and exploitation of new water sources and the improvement of water sources quality. Developing management systems for water resources should result in an overall increase of the number of the population having regular access to good quality water and an increased volume of black waters undergoing treatment before re-entering the water cycle.

2.5. Cross Border Impact

The project is in line with the Joint Programming Document 2003-2006 for Romania-Bulgaria CBC Programmes, namely with Priority 3, "Environmental Protection and Management". Under this Priority, Measure 2 "Flood Management and Erosion Control" is aiming at protecting and promoting the environmental quality of the eligible area, safeguarding and improving the natural endowments of the area through joint initiatives. The following activities are eligible under this measure:

- Common water management, research on hydrological, hydro-geographical, ground water, surface water etc. and the management of rivers
- Creation of a system for quick reporting of accidents between both countries, as well as the exchange of information for measuring emissions by the national bodies controlling the quality of the atmospheric air.

3. Description

3.1. Background and justification

Current situation

The groundwater aquifers of the Dobrogea/Dobrudja region belong to the International Danube River Basin and Black Sea River Basin District and are stretching to both sides of the RO/BG border. On both side the groundwater is the main water resource for drinking water and irrigation and both are facing problems in the field of water quantity and quality. The BG-RO border region is quite long - about 150km. The predominant direction of the flow at the border region is to the north, across the border, because the water body is in Bulgaria at higher elevation than in Romania. The common aquifers are mostly recharging in Bulgaria, while discharging in Romanian territory. It should be noted that effective evaluation of water balance, groundwater flows modelling and establishing various water management and decision support tools might be done involving the whole Dobrudja area, where the common aquifers are located. Some general information about the region as well as some preliminary needs assessment is given below. It is known that the density of the monitoring network depends on the spatial variability of the physical and chemical characteristics of groundwater and the water bearing systems. This and some requirements of the EC WFD are used for the preliminary needs assessment, together with some data on the available facilities, given in Annex 8.

Current situation in Bulgaria

The project area, with a surface area of more than $4,600 \text{ km}^2$, is located in the NE of Bulgaria. The geographical and political boundaries are: to the north, the border with Rumania; to the east and southeast, the Black Sea; to the south, the Batova River valley; and to the west, the Suha River valley. The area is shared mostly between administrative region of Dobrich and administrative region of Silistra.

The groundwater aquifers are the major source of water supply (including drinking water) and irrigation in North-eastern Bulgaria (Dobrudja area) and have been used since the 1950's. The water quality of the main aquifers in Dobrudja area has deteriorated significantly as a consequence of agricultural and industrial activities. There is also evidence for seasonal overexploitation of the aquifers, together with a tendency of decreasing the annual volume of precipitation. This has been to issues associated with nitrate pollution, seawater intrusion (salinisation), and depletion of the groundwater resources. High losses of water, due to infiltration and influation, caused that all rivers in Dobrudja area became dry during summer/autumn periods. Dobrich is the largest town in the area and is the main water consumer of groundwater resources.

The quantitative monitoring of groundwater in the region is in very bad conditions; no investments were made in the field during the last 30 years. The groundwater tables and spring discharges are measured mostly manually with obsolete instruments produced in the former USSR. The monitoring of recharge parameters like precipitation and the flow of the few temporal rivers are in the same conditions. The density of the observation points is fare below the required basic one: 10 for the Upper and Lower aquifers, instead of at least 50. Only 7 springs and one river are observed instead of at least 20 significant ones in both aquifers. Those are inmost cases monthly observations, which in many cases do not correspond to the dynamics of the phenomena. Significant investments for the improvement of those observations, as well as for the precipitation and evaporation is urgently required, as proposed in the 3.3.2 - Results and 3.4.3 – Activities sections. The above is explicitly needed for the evaluation of the water balance components, evaluation of the resource and establishment of decision support flow modelling activities, which do not exist at present, but are obviously required to avoid water shortages across the border and allow effective and sustainable joint management of the trans-boundary waters.

The qualitative monitoring also do not meet the requirements needed for basic evaluation of the status of groundwater bodies. The number of sampling points in the Upper and Lower Aquifers are in total 20 and they are not well distributed, while at least 50 points should be sampled at both aquifers. The hydro-chemical evaluations types are not sufficient as well. Important on-site evaluations should be introduced (like hydrogen-sulphide, carbon dioxide, other gases) and trace elements as well.

Current situation in Romania

The project area has a surface area of more than 3,750 km² and is situated in the SE part of Romania.

The surface streams in this area are featured by very scarce flows and during a long dry season there are difficulties in ensuring the necessary water supply. Thus, the groundwater aquifers are the major source of water supply for the inhabitants and for economic activities in the area.

At present, Dobrogea Littoral Water Department has a database containing geological and geomorphologic information of the area, 15 sampling points for groundwater chemical analysis, which provide a lot of quantitative information in connection with the groundwater. As well, at the moment there are available a list with the water users and a list with the pollution sources in the area which both need to be assessed and revised. In

addition, there is available GIS equipment. INMH (National Institute for Meteorology and Hydrology) will provide the existing available data as a basis for starting the project implementation.

The economic development of the area will have as result a bigger water request and the increased ecological pressure, including increased chances for accidental pollution. Currently, the impact of the pipelines and of accidental oil splits into the aquifers is not monitored. It is necessary to make an inventory of all sources of risk and to evaluate the possible impact onto the groundwater.

Therefore, it is necessary to establish a system designed for preventing and fighting against accidental pollution.

Joint aspects

In the view of accession into the European Union structures, an important objective is the implementation of the Water Framework Directive 2000/60/EEC, the Council Directive 80/68/EEC of December 1979 on the protection of Groundwater against pollution caused by certain dangerous substances and to be prepared for the new proposal regarding the Groundwater directive.

Other international agreements require a list of supplementary measures which Bulgaria and Romania have to implement in the fields of Transboundary cooperation, monitoring and assessment (UN/ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 1992; Danube River Protection Convention; Convention on Protection of Black Sea against Pollution).

Seen the importance of the Dobrudja/Dobrogea groundwater aquifers and its threats, Bulgaria and Romania have given priority to this region for development of sustainable use of groundwater and sustainable management of natural terrestrial resources, as indicated in the Recommendation of the European Parliament and of the Council of 30 May 2002 concerning the implementation of (Integrated Coastal Zone Management) ICZM in Europe.

The proposed Border Groundwater Coordination Committee and monitoring programme should be seen as a step towards development of the Joint River Basin Management, a requirement of the WFD. The outcomes of the project will be used in the Common monitoring and management project for the Danube.

The lack of sufficient and harmonized institutional, legal and administrative capacity at national and local levels may considerably hamper the international cooperation. This is the main reason, why a serious assessment of the administrative management capacity needs to be carried out. As a final result a considerable strengthening in the capacity of the relevant organizations to realize cross border sustainable groundwater management, monitoring and assessment will be expected.

The activities foreseen within this project should be considered as an important step in solving cross-border problems via effective water management, improvement the groundwater quality using the WFD as major guideline, as agreed under the DRPC and further improvement the cooperation between Romania and Bulgaria.

3.2. Sector rationale N/A

3.3. Results

Component 1: Technical assistance to ensure improved transboundary groundwater management using the WFD and Groundwater Directive:

- 3.3.1. Identified and characterized groundwater bodies and aquifers between Bulgaria and Romania including chemical status, quantitative status, human pressure, and impact in accordance with the requirements of the EC WFD2000/60/EC;
- 3.3.2. Approved joint transboundary groundwater monitoring Programme;
- 3.3.3. Established a Border Groundwater Coordination Committee between Bulgaria and Romania in compliance with the requirements of the EC WFD 2000/60/EC and Convention on the Protection and Use of Transboundary Watercourses and International Lakes;
- 3.3.4. Information system including data processing, analysis and visualization with incorporated basin oriented GIS approach, ensuring effective decision support and transboundary water management
- 3.3.5. Trained groundwater management experts.

Component 2: Equipment acquisition for monitoring and maintenance activities

- 3.3.6. Equipped basic monitoring posts and local hydrometric groups and laboratories based on the needs assessment and in compliance with the EC WFD requirements to determine relevant hydrometric and hydro-chemical parameters, including appropriate equipment for sampling, field measurements, sample pre-treatment, sample handle and transportation; GIS facilities, software;
- 3.3.7. Operational monitoring system of groundwater bodies including quantitative and qualitative aspects, data transmission, processing, visualization and GIS based analysis tools.

3.4. Activities (including Means)

3.4.1. For Bulgaria, a Technical Assistance contract will be developed within the PPF 2002 aiming at preparing the ToRs for component 1, a draft general scheme of groundwater monitoring and the specifications ensuring prompt supply in component 2.

For Romania, the Tender Dossiers for both components within the Present Phare 2004 Programme will be designed when possible with the support of the team of experts contracted within the Framework Contract RO 2002/000-625-05.02 "Project Preparation Facility for Environmental projects". The current project will comprise two components, which apply, as far as relevant, both to Romania and Bulgaria:

3.4.2. Component 1: Technical assistance to ensure improved transboundary groundwater management using the WFD and Groundwater Directive (budget $1.1+0.1M \in$)

The specific objective of this component is to strengthen the capacity of relevant institutions to establish a sustainable groundwater management, including the development of a common assessment and monitoring programme.

The activities within this component will be performed by both countries as follows:

- The Phare budget for Romania (0.100 M€) will cover activity 3.4.2.1
- The Phare budget for Bulgaria (1.1 M€) will cover activities 3.4.4.2-3.4.2.9

The activities can be grouped in the following categories:

Groundwater Assessment and Monitoring

- <u>3.4.2.</u>1. Collection of data and inventories on RO territory; Groundwater bodies' further characterization in a common approach with BG;
- <u>3.4.2.</u>2. Collection of data and inventories on BG territory; Groundwater bodies' identification and characterization including economic analysis of groundwater uses;
- <u>3.4.2.</u>3. Developing of joint model of the aquifers. Review of modeling needs, general modeling concept, applicable modeling platforms, design and preparation of specific common database for future models calibration and validation;
- <u>3.4.2.</u>4. Based on the above, evaluation of water balance components at the Bulgarian, and Romanian territory, generalizing the water balance for the whole water bearing system. Special attention should be given to the filtration at the BG-RO state boundary region including quantification of the flow.
- <u>3.4.2.</u>5. Definition and implementation of a joint groundwater monitoring Programme;
- <u>3.4.2.</u>6. Definition and implementation of a joint information system between Bulgaria and Romania in the field of Transboundary groundwater, integrating the data flows created by the supply component and including GIS data-base, and web sites;

Institutional capacity building

- <u>3.4.2.</u>7. Assistance in the establishment and initial operation of a Border Groundwater Coordination Committee between Bulgaria and Romania will be done;
- <u>3.4.2.8.</u> Developing a Program (Action Plan) for joint transboundary management of groundwater bodies between Bulgaria and Romania in Dobrudja area.
- <u>3.4.2.9</u>. Training of identified BG and RO institutions in respect of groundwater issues focusing on monitoring and assessment; integrated management including economic analysis will be implemented.

A Joint Steering Committee will be established with an equal representation of both Romanian and Bulgarian partners, in order to coordinate activities foreseen under this component. It will gather representatives of all stakeholders: local/regional authorities and line ministries. Before the works start, it will be identified the institution which will ensure the Secretariat of the Joint Steering Committee on the BG and RO side.

All the requirements of EC legislation (WFD) and international agreements (Convention on the Protection and Use of Transboundary Watercourses and International Lakes) will be considered.

This first Technical assistance component will define a priority action plan to ensure the proper functioning of the joint information and the joint monitoring systems. First priority training needs will be covered under component 1 and the priority in terms of equipment will be covered under component 2.

Component 2: Equipment acquisition for establishing joint monitoring and information systems (budget 2.133 M \in , 1.6 M \in Phare contribution and 0.533 M \in co-financing from both countries)

The specific objective of this component is to purchase qualitative and quantitative monitoring equipment in order to unify all the monitoring objectives, sampling techniques, monitoring standards, methods and parameters, quality control/quality assurance system, data assessment and interpretation.

The tender process will be separate for Romania and Bulgaria, and the Technical Specification and the Tender Dossier for procurement will be designed as follows:

For Bulgaria:

The Tender Dossier with needs assessment and detailed lists of the equipment to be supplied will be prepared under the PPF 2002 - project activity 3.4.1.

For Romania:

The Tender Dossier including the Technical Specifications for acquisition of the monitoring equipment will be designed when possible with the support of the team of experts contracted within the Framework Contract RO 2002/000-625-05.02 "Project Preparation Facility for Environmental projects".

Component 2.1: Procurement of the necessary equipment for Bulgaria (budget 1.6 M€-1.2 M€ Phare and 0.4 M€ co-financing)

Some preliminary information about the needs is given in 3.1 and the indicative list (Annex 7) of equipment for qualitative and quantitative monitoring equipment, including IT equipment for data recording and processing needed to cover joint monitoring Programme and in compliance with the WFD 2000/60/EC, will be purchased regarding the following types:

QUANTITATIVE MONITORING (Phare BG contribution 0.45 M€)

- 3.4.3.1. Delivery and installation of equipment for quantitative monitoring of groundwater and more specifically for:
- 3.4.3.1.1 Operational monitoring of groundwater levels, springs flows and the related to groundwater recharge precipitation and surface flows.
- 3.4.3.1.2 Field measurements of water columns, parameters of location and elevation, establishing cross-sections profiles, implementing pumping tests to evaluate filtration characteristics, perform maintenance activities, including off-road laboratory cars, able to carry equipment and experts for those works.

QUALITATIVE MONITORING (Phare BG contribution 0.35 M€)

3.4.3.2. Delivery and installation of equipment for qualitative monitoring of groundwater including equipment for on-site and laboratory evaluation of relevant macro and micro components and other parameters characterizing groundwater status, including offroad laboratory car to carry people and instruments for field evaluations and maintenance activities.

JOINT INFORMATION SYSTEM (Phare BG contribution 0.4 M€)

- 3.4.3.3. Information system with data collection, processing and dissemination facilities for decision support including:
- 3.4.3.3.1 Supply, installation and beginning the exploitation of equipment, software and supplementary database for: raw data pre-processing and validation, operational database.
- 3.4.3.3.2 Information system for long term data storage, analysis and management including hydro geologically oriented GIS layers summarizing the results of the services, WEB based data and products dissemination system

Component 2.2: Procurement of the necessary equipment for Romania (budget 0.533 M€ - 0.4 M€ Phare contribution and 0.133 M€ co-financing)

For Romania specific equipment is needed for groundwater monitoring and modeling for interpretation of the data collected. Equipment for surface water and meteorology is already brought up to date to a firm extends. National Administration Apele Romana - DADL, the responsible organization for water management in the Dobrogea region, is already in the possession of laboratory equipment for the major chemical and physical parameters of water. Every 3 months for 22 groundwater sampling points samples are

taken. Too, 2 GIS licenses are available used for digitized storage and visualization of the data.

To understand the groundwater characteristics real time data flow is needed for a limited number of points. Therefore 4 sampling points are selected. USAID financed automatic stations with the real time/online water level sensors. They will be purchased in near future. To this physical/chemical sensors should be added.

The existing GIS software will be used to integrate the data in digital format. This together with the necessary digital 3D model, this will allow operational intervention for regional water management, adaptation of the use of the groundwater and to a certain extend early warning on accidental pollution. Up to now no software for groundwater modeling is available.

To build the model more detailed information needs to be made available on a limited number of parameters, digitized and build with the old data into one database. This will be done by the NIHWM and combined and interpreted with existing data

The qualitative monitoring equipment needed to cover the joint monitoring Program and in compliance with the Water Framework Directive 2000/60/EC will be purchased regarding the following types:

- Automatic groundwater stations with sensors for the physical-chemical measurements and detectors of the accidental pollution (DADL);
- Groundwater Sampling equipment, field measurements, sample preliminary processing, handling, and transportation; (DADL and NIHWM)
- Equipment for field measurements with GPS equipment (DADL and NIHWM)
- GIS software to digitize existing and coming field data (for NIHWM)
- Software for the 3-D groundwater modeling of the data regarding the groundwater bodies and flows, for the modeling of three-dimensional transport model for the simulation of advection, dispersion, and chemical reactions of dissolved constituents in groundwater systems (DADL).

An indicative list with the equipment necessary to be purchased is attached in Annex 7.

The first priority of the project is to have operational joint monitoring and information systems in place on an agreed list of issues of common interest. Under this second component, priority will be given to investments directly linked to the establishment of these joint monitoring and information systems.

This project will contribute to both countries fulfilling requirements of the Water Framework Directive but cannot cover all necessary activities to ensure full compliance.

Additional complementary activities will be necessary to achieve full compliance, with the financial support secured under other programmes, including the Phare national programmes.

3.5. Linked Activities

For Bulgaria:

- EC COPERNICUS, Project CIPA-CT93-0139 Ecological problems of karst waters caused by overexploitation and contamination (on the example of North-East Bulgaria), 1994 1997.
- The Netherlands Senter Internationaal Pre-accession Programmes. Ref. PPA02/BG/7/1 "Strengthening of the capacity and enhancement of the National Groundwater Monitoring System of Bulgaria towards implementation of the Water Framework Directive 2000/60/EC".

For Romania:

- "Strengthening the Institutional and Administrative Capacity to Manage Environmental Policy in Romania in conformity with the Acquis Communautaire" (1998 National Phare Programme) - twinning project for the water sector, which developed a strategy for transposition for all water directives involved, including Council Directive 80/68/EEC concerning the protection of groundwater against pollution cause by certain dangerous substances.
- "Implementation of the New Water Framework directive on pilot basins" (2001 Phare National Programme) – beneficiary: the Ministry of Environment and Water Management. The project, currently under implementation, aims at:
 - Developing the methodologies for Management Plans of the Hydrographic Basins in accordance with the provisions of the Water Framework Directive;
 - Implementation in a pilot basin of the methodologies for costs assessment of water quality monitoring for implementation of the EU water Directives.
- "Establishment of an information system and a database for water management field according to the requirement of the Water Framework Directive" (2002 Phare National Programme). The project aims at: assessment of the main needs of information and the available data, development of the Action Plan for Cadastre numeration (data bases, GIS for data and cadastre maps), establishment of the thematic expert groups which will co-ordinate data production, products elaboration and unification of the joint technical language and particularly data dictionaries, establishment of the Technical Unit responsible for the implementation of the Action Plan and defining and implementation of the quality assurance procedures.
- "Implementation of the Water Framework Directive (WFD) and Integrated Coastal Zone Management (ICZM) in transitional and coastal water in Romania" - bilateral project with The Netherlands, implemented in the Romanian coast area, aiming at identifying transitional and coastal water bodies, improving the institutional structure of ICZM, improving the management of the coastal and transitional zone regarding Open Plan Process and Public Participation as well as implementation of a monitoring system in line with the WFD

• "Technical Assistance for the economic analysis of water use and recovery of cost for water services related to the programme of measures (River Basin Management Plan) of the National Administration Romanian Waters"- The Department of Waters Dobrogea Littoral", bilateral project with The Netherlands aiming at performing an economic analysis needs and ensure on-the-job training for its staff will start in January 2005

Joint Projects

• "Integrated Monitoring of the Romanian Black Sea Coast between Midia-Vama Veche", 2001 Phare CBC Programme, having a mirror project in the sectors Durankulak and Rezovo (Bulgaria), ensures the integrated monitoring of the coastal water. Both projects will ensure prevention and a warning in time of the accidental pollution in the seacoast, and establish the vulnerable points all along the seaside. They will provide instruments for an integrated monitoring of the Black Sea both for Romanian and Bulgarian sectors. It will improve the monitoring of the Black Sea coast, enhance and strengthen the capacities of the institutions to implement a marine monitoring

3.6. Lessons learned

This is the second joint Bulgarian-Romanian cross-border initiative under Phare CBC programme in the environmental sector following the project **BG 2003/005-631.04** / **RO 2003/005-701.04** Promotion of Sustainable Development and Conservation of Biodiversity in Bulgarian-Romanian Cross Border Region, so the experience obtained has facilitated the actual project preparation.

Based on the previous experience from CBC environmental projects implemented or under implementation, the main lesson learned is the need of closer cooperation with the partner from the other side of the border in order to identify priority targets of common interest and benefit in the field of environment protection to ensure noticeable cross-border impact. This joint project will stimulate the partnership between the Bulgarian and the Romanian stakeholders (central – MRDPW, MoEW, regional – District Governments, District Offices of MoEW, local authorities, NGOs, etc.) involved in environment activities.

For Bulgaria:

The Interim Report developed by EMS Consortium of December 2003 for Cross-Border Cooperation (Bulgarian and Greek border regions), regional development, environment, transport, and justice and home affaires sectors includes the following main recommendations:

• There is a lack of a strategic approach in Phare cross-border cooperation environment programming. The Ministry of Environment and Water should develop a Phare cross-border cooperation programming strategy in environment 2006/2007;

• The Ministry of Environment and Water and the Ministry of Health should re-assess the need for public awareness campaigns in the different sub-sectors and ensure funds to contract and implement the most urgent of the campaigns.

For Romania:

Lessons have been learned from the previous projects under Phare Programmes and the recommendations of the EMS reports have been considered and incorporated in the present project. Having in view the EMS Evaluation Report no R/RO/CBC/03037 issued in July 2003 and following CBC Directorate previous experience, all the problems and aspects have been discussed with the involved institutions and beneficiaries and accordingly corrective measures were taken as regards to the technical, administrative finance aspects. The problems identified as well as the recommendations were considered a basis for developing the present project components.

As for technical and administrative domains concerned, CBC Directorate requested that the community legislation is to be fully reflected in the tender documentation, technical studies and specifications.

The problem of poor design and technical project against ambitious expectations of the beneficiaries were seriously discussed as to avoid further non results of the project and loss of financial backing.

The following aspects were also stressed on:

- a. projects are to be realistic as they are to be used 100 p.c. from the capacity
- b. training for the utilization and maintenance as well as the spare parts necessities are to be taken into account by the beneficiaries
- c. equipment and technical specifications are to be compatible as for the both parts involved are concerned. Otherwise the project and the subsequent activities are compromised.

As for the efficiency is concerned, taking into account that a large number of institutions are involved (line ministries, agencies and subordinated organizations) it is necessary to deeply implicate all in the relevant activities in order to obtain better outputs,

The domains to which the projects are mostly directed are on the improvement or keeping of: air quality, water quality, soil quality, biological diversity, the protection and conservation of forests and cynegetic fauna, waste management, environment radioactivity, industrial accidents, critical zones (areas) as concerning environment quality deterioration and also flood prevention and pollution prevention and reducing.

Regarding the financial aspects, taking into account the previous experience, in order to ensure a clearly stated co-financing provided through the local county budgets, the following measures were taken

- a letter of commitment was requested accompanied by the decision of the relevant institutions
- opening a separate bank account by the beneficiaries for each and every project in part, no matter the co-financing is parallel or joint.
- submitting of a monthly Technical Progress Report including the status of cofinancing (parallel or joint).

4. Institutional Framework

Bulgarian institutional framework

The beneficiaries of the Project are the following institutions:

National Institute of Meteorology and Hydrology – NIMH (through its regional branches in Varna and Pleven) has the obligation to carry out basic operational hydro-meteorological monitoring including the monitoring of the significant aquifers defined in the Act of Council of Ministers No. 15/02.11.1989 and No. 148/25.07.1991 as well as Regulation No. 5 under the present Water Law. The NIMH regional branches in Varna and Pleven will benefit on the exploratory and information potential strengthening part of the service component, giving water resources evaluation tools. NIMH will also benefit on the supply component delivering quantitative monitoring equipment including mobile observation facilities, real-time data transmission facilities, data processing, analysis and dissemination tools, information system with equipment, GIS facilities and software.

Ministry of Environment and Water – MOEW (through its River Basin Directorates in Varna and Pleven) has the obligation to organize and implement water resources management including groundwater management, defined in the present Water Law. The MOEW Directorates will benefit on the exploratory, information potential strengthening and building institutional capacities parts of the service component, giving water resources evaluation tools training and capacity building results for the decision making process. The River Basin Directorates will also benefit on the information system with equipment, GIS facilities and software, delivered by the supply component to ensure effective decision-making transboundary water management.

MOEW (through its Executive Environmental Agency's local laboratories in Russe, Varna, and Shumen) has the obligation to carry out qualitative monitoring of groundwater and will benefit on the supply component delivering equipment for on-site evaluation of relevant hydro chemical and other parameters of the groundwater status, including mobile laboratories.

Romanian institutional framework

The beneficiary institutions:

The main responsible for Water Management is Ministry of Environment and Water Management. The beneficiary institutions are their:

- National Administration "Apele Romane" with its sub-unities: Dobrogea Littoral Water Directorate
- The National Institute of Hydrology and Water Management (Groundwater and Environmental Isotopes Laboratory).

The Ministry of Environment and Water Management through its Water Management Department and the Authority for the Implementation of the Structural and Cohesion Funds for Environmental Infrastructure - Monitoring Department will ensure the overall management of the project.

Role of the DADL-Constanta:

One of the beneficiaries is DADL-Constanta, which is the main responsible for designing and developing the monitoring system, for assessment of the groundwater quality and water management. DADL is responsible as well for elaboration of an action plan for prevention and intervention in case of accidental pollution and for applying it.

Role of NIHWM (National Institute of Hydrology and Water Management):

This institution has the following role: participation with hydrogeology experts in field campaigns, flow and level measures and in situ prelevations for chemical analysis from the existing drillings which are not included in the current monitoring programme and which will not be endowed with automatic stations but provide important data for characterizing the groundwater bodies, processing and interpretation of the obtained data, participation in the elaboration of the monitoring programme and of the management plan for groundwater waters.

INMH will have to cooperate with the DADL in order to elaborate the Management Plan for groundwater bodies. Thus, for both institutions are necessary GIS facilities and modeling software.

The **owner of the equipment** provided under component 2.2 will be Dobrogea - Littoral Water Directorate (groundwater and modeling equipment) and The National Institute of Hydrology and Water Management (groundwater field and GIS equipment), which will undertake to bear the operating costs and the maintenance costs for the supplied equipment.

The National Institute of Hydrology and Water Management will provide the existing database in connection with the available data foreseen for the project implementation.

Contracting Authority: Ministry for European Integration – CBC Directorate.

5. Detailed Budget (MEUR)

	EU	Support				
	Investment	Institution	Total EU	National Co-	IFI*	TOTAL
	Support	Building	(=I+IB)	financing(*)		
Component 1: Te	echnical assist	tance to ensu	re transbou	indary groundwa	ater	
management usir	ng the WFD a	nd Groundw	ater Direct	ive (for BG and	RO)	
Component 1.1:	0	0.8	0.8	0	0	0.8
General						
activities:						
Service Contract						
(BG)						
Component 1.2:	0	0.1	0.1	0	0	0.1
Specific						
activities:						
Framework						
Contract (RO)						
Sub-total	0	0.9	0.9	0	0	0.9
Component 2 Eq	uipment acqu	isition for es	stablishing j	oint monitoring	and inf	formation
systems						
Component 2.1	1.0	0	1.0	0.35	0	1.35
Procurement of						
the necessary						
equipment						
Supply Contract						
(BG)						
Component 2.1	0.4	0	0.4	0.167	0	0.567
Procurement of						
the necessary						
equipment						
Supply Contract						
(RO)						
Sub-total	1.4	0	1.4	0.517	0	1.917
TOTAL	1.4	0.9	2.3	0.517	0	2.867
(BG&RO)						

(*) – The necessary co-financing for Bulgaria will be provided by the National budget through the National Fund Directorate within the Ministry of Finance.

6. Implementation Arrangements

6.1 Implementing Agency

For Bulgaria:

The Bulgaria's CBC Implementing Agency is the Ministry of Regional Development and Public Works (MRDPW), which retains overall responsibility for the implementation of the

project (approval of terms of reference, of tender documents, of evaluation criteria, of evaluation of offers, signature of contracts, authorization and payments of invoices).

Contacts:

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Mrs Silvia Teneva, acting Head of Phare CBC IA 17-19, Sv.sv. Kiril i Metodi st, 1202 Sofia, Bulgaria Phone: + 359 2 9405 377 e-mail: steneva@mrrb.government.bg

The project beneficiary institutions are:

For the National Institute for Meteorology and Hydrology
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For the Ministry of Environment and Water Mr. Tzanko Tzanov State Expert Hydrogeologist Water Directorate Ministry of Environment and Water 22 Maria Luisa bul. 1000 Sofia, Bulgaria tel. +359 2 9406589, fax. +359 2 9809641 e-mail tzanov@moew.government.bg

Ms. Rositza Gorova Senior Expert, Water Monitoring Dept. Executive Agency for Environment 136 Tzar Boris III bul. 1618 Sofia, BULGARIA tel. +359 2 9406417, fax. +359 2 9559015 e-mail gorova@nfp-bg.eionet.eu.int The Project shall be managed under the Decentralized Implementation System (DIS).

For Romania:

The Romanian CBC Implementing Agency is the Ministry of European Integration, Department for Cross-Border-Co-operation (MIE), which retains overall responsibility for all aspects of tendering and contracting as well as administrative and financial matters of the implementation of Component 1.2 and 2.2 of the project (approval of: terms of reference, of tender documents, of evaluation criteria, evaluation of offers; signature of contracts, authorisation of invoices). The Payments Directorate within the same ministry will make the payments of invoices.

Contacts: Mrs Daniela Chisiu, Director 12, Libertatii Blvd.Sector 5 Bucharest, Romania Phone: + 40 21 335 53 74 E-mail: <u>daniela.chisiu@dr.mie.ro</u>

The Ministry of Environment and Water Management retains the overall management of the project.

12, Libertatii Blvd.Sector 5 Bucharest, Romania Contact person:
George Constantin, Director; Water Management Department Phone: +40 21 410 24 07
E-mail: <u>gconstantin@mappm.ro</u>

Alberto Simion, Principal Counsellor, Authority for the Implementation of the Structural and Cohesion Funds for Environmental Infrastructure-Monitoring Department. Phone: +40 21 312 25 99 E-mail: <u>alberto@mappm.ro</u>

Beneficiaries:

1. Dobrogea - Littoral Water Directorate, subordinated to "Romanian Waters" National Administration.

Ovidiu Gabor General Director National Administration "Apele Romane" 6. Edgar Quinet Street, sector 1, cod 70106, Bucuresti Phone: +40 21 3151301; +40 21 3110146; fax: +40 21 3122174; +40 3103526 E-mail: <u>ovidiu.gabor@rowater.ro</u>

Contact person: Hristu Uzun, Director Directia Apelor Dobrogea-Littoral 127 Mircea cel Batran Street, Constanta Phone: 0241 67 20 89 E-mail: hristu.uzun@dadl.rowater.ro 2. The National Institute of Hydrology and Water Management

Petre Stanciu Director, 97 Bucuresti Ploiesti Street, Bucharest Phone: +40 21 2309507; +40 21 2333596 E-mail: <u>petre.stanciu@hidro.ro;</u> relatii@hidro.ro

The National Institute of Hydrology and Water Management will provide the existing database in connection with the available data, foreseen for the project implementation.

All the issues related to the project implementation will be coordinated with all the beneficiaries from Bulgaria and Romania. A Steering Committee including all the related parties will be established to manage and monitor the project implementation.

6.2 Twinning: N/A

6.3 Non-standard aspects

There are no non-standard contracts or tender procedures envisaged within this project. "Practical Guide to contract procedures financed from the general Budget of the European Communities in the context of external actions" will be strictly followed.

6.4 Contracts:

For Bulgaria:

Two contracts are foreseen within this programming:

- 1 service contract (1.100 MEUR)
- 1 supply contract (1.600 MEUR 1.2 MEUR Phare and 0.4 MEUR co-financing)

For Romania:

Two contracts are foreseen within this programming:

- 1 framework contract (0.100 MEUR)
- 1 supply contract (0.567 MEUR, 0.4 MEUR Phare and 0.167 MEUR co-financing)

7. Implementation Schedule

7.1 Start of tendering/call for proposals

For both countries the call for proposal will start in January 2005.

7.2 Start of project activity

It is envisaged that the project activities start in September 2005.

7.3 Project completion

Expected date for finalizing the project is December 2006.

8 Equal Opportunity

Equal opportunity for men and women to participate in all the components of the project will be ensured.

The project implementation procedures will ensure that the project brings benefits to both men and women and as well to the ethnic groups.

9 Environment

This Project is an environment protection project aiming to improve the environmental status of the Transboundary groundwater bodies between Bulgaria and Romania in Dobrudja area.

The activities undertaken on both sites will no have any harmful effects on the environment.

10 Rates of return N/A

11 Investment criteria

11.1 Catalytic effect

Without PHARE assistance, the Project would not be implemented in the near future because of lack of national funds. EU PHARE funds will catalyze the implementation of the EC environmental *acquis* and assist the country during pre-accession period.

11.2 Co-financing

For Bulgaria:

The Project is co-financed by the national budget, which will provide 25% of the investment component of the project.

For Romania:

The Project is co-financed by the national budget, which will provide 25% of the investment component of the project.

11.3 Additionality

No other financing sources from the private sector or from IFIs were available for financing this project.

11.4 Project readiness and size

The project is ready to start according to the implementation chart (Annex 2). Under this Programme, each country will implement two projects: one service project and one supply project. Bulgaria will contract a Technical Assistance project under a PPF 2002 (Framework Contract) in order to prepare the TORs for the first component and needs assessment and Specifications for the second component.

For Romania, the Tender Dossiers for both components within the present Phare 2004 Programme will be designed when possible with the support of the team of experts contracted within the Framework Contract RO 2002/000-625-05.02 "Project Preparation Facility for Environmental projects".

11.5 Sustainability

The Project will be sustainable in the long term because of the crucial economic importance of groundwater resources (quantity and quality) for the area of Dobrudja. The maintenance and operational costs for the integrated management and monitoring will be undertaken by the project beneficiaries (Romanian and Bulgarian sides).

According to the recommendations and lesson learned from previous projects, the beneficiaries have to ensure a proper implementation of the project by providing the necessary personnel, qualified and available to undertake the responsibilities and to ensure the sustainability after the project completion.

11.6 Compliance with state aids provisions

The Project respects the state aids provisions.

12 Conditionality and sequencing

- Both partners commit to undertake any additional costs which may arise to ensure the timely completion of the project
- Before the contracts for component 2 can be signed, the following conditions will have to be fulfilled:
 - 1. The list of priority equipment needed to support this joint information and monitoring programmes will be based on needs assessment implemented under the PPF 2002 project activity 3.4.1.
 - 2. The Border Groundwater Coordination Committee will be formally established and will have adopted joint monitoring and information programmes.

Annexes to Project Fiche

- 1. Logical framework.
- 2. Detailed implementation chart.
- 3. Contracting and disbursement schedule, by quarter.
- 4. Reference list of feasibility/pre-feasibility studies, in-depth ex ante evaluations or other forms of preparatory works.
- 5. Reference list of relevant laws and regulations.
- 6. Reference list of relevant strategic plans and studies.
- 7. Indicative lists of the equipment supplies foreseen.
- 8. Tables for preliminary needs assessment.
- 9. Memorandum of Understanding between the Bulgarian beneficiaries.
- 10. Memorandum of Understanding between the Bulgarian and Romanian sides.

Annex 1-Logical framework

LOGFRAME PLANNING MATRIX FOR Project		Programme name and number	
Integrated Management of Transboundar Bulgaria and Romania in Dobrudja/Dobro	y Groundwater between ogea Area	Contracting period expires 30 November 2006	Disbursement period expires 30 November 2007
		Total budget (BG&RO): 3.367 MEUR Total budget (BG): 2.700 MEUR	Phare budget (BG&RO): 2.8 MEUR Phare budget (BG): 2.3 MEUR
Overall objective	Objectively Verifiable Indicators	Sources of Verification	
Integrated Management of Transboundary Groundwater	 Number of future projects identified and implemented Common Programmes in the fields of groundwater monitoring and assessment. 	 Country reports Environmental reports Official Reports on the implementation of WFD 	
Project purpose	Objectively Verifiable Indicators	Sources of Verification	Assumptions
• Definition and implementation of the basic transboundary waters management tools including: a joint monitoring programme of transboundary aquifers in Dobrudja/Dobrogea area, water resources evaluation tools and establishment of the Border Groundwater Committee	 Monitoring and information system in place Real time monitoring of groundwater bodies 	 Official Monitoring Reports Official Reports. Project Implementation Monitoring by EC Delegation Country reports Environmental reports River Basin Management Plans. 	 The continue process of implementation of the Directives in the water sector, mainly implementation of the WFD Good cross border

Results	Objectively Verifiable Indicators	Sources of Verification	 cooperation. Positive impact of the implementation of the project activities Assumptions
 3.3.1. Identified and characterized groundwater bodies and aquifers between Bulgaria and Romania including chemical status, quantitative status, human pressure, and impact in accordance with the requirements of the EC WFD2000/60/EC; 3.3.2. Approved joint transboundary groundwaters monitoring Programme; 3.3.3. Established a Border Groundwater Coordination Committee between Bulgaria and Romania in compliance with the requirements of the EC WFD 2000/60/EC and Convention on the Protection and Use of Transboundary Watercourses and International Lakes; 3.3.4. Information system including data processing, analysis and visualization with incorporated basin oriented GIS approach, ensuring effective decision support and transboundary water management 3.3.5. Trained groundwater management experts. 	 Number of staff trained Border Groundwater Coordination Committee in function Joint Monitoring and Evaluation Programme in function Database in function Number of GIS maps GIS in operation Structural map available Number of reports/documents on economic analysis, trans- boundary Management Action Plan, protected areas etc Number of modelling platform Number of equipment monitoring laboratories 	 Feasibility and pre- feasibilities Study Reports. Project Implementation Monitoring by EC Delegation. Official Monitoring Reports Reports developed by the consultant Phare Monthly meetings Project Steering Committees Joint Monitoring Committee Ministries web sites 	 Support from other relevant institutions Co-financing is ensured Output relevant to project beneficiaries needs Project time-schedule followed

3.3.6. Equipped basic monitoring posts and		
local hydrometric groups and		
laboratories based on the needs		
assessment and in compliance with the		
EC WFD requirements to determine		
relevant hydrometric and hydro-		
chemical parameters, including		
appropriate equipment for sampling,		
field measurements, sample pre-		
treatment, sample handle and		
transportation; GIS facilities, software;		
3.3.7. Operational monitoring system of		
groundwater bodies including		
quantitative and qualitative aspects, data		
transmission, processing, visualization		
and GIS based analysis tools.		

Activities	Means	Assumptions
 <u>Component 1.</u> <u>3.4.2.</u>1. Collection of data and inventories on RO territory; Groundwater bodies further characterization in a common approach with BG; <u>3.4.2.</u>2. Collection of data and inventories on BG territory; Groundwater bodies identification and characterization including economic analysis of groundwater uses; <u>3.4.2.</u>3. Developing of joint model of the aquifers. Review of modeling needs, general modeling concept, applicable modeling platforms, design and preparation of specific common database for future models calibration and validation; 	 1.1 MEUR Service Contract for BG 1.2 MEUR Supply Contract for BG 0.1 MEUR Framework Contract for RO 0.4 Supply contract for RO Number of staff from the beneficiary, from the Implementing Agency and other institutions involved in the project implementation The consultants' team Equipment for qualitative and quantitative monitoring 	 The personnel will be willing to implement this project Effective co-operation between RO and BG

3.4.2.4 . Based on the above, evaluation of water balance	
components at the Bulgarian, and Romanian territory.	
generalizing the water balance for the whole water	
bearing system Special attention should be given to	
the filtration at the BG-RO state boundary region	
including quantification of the flow	
3425 Definition and implementation of a joint	
groundwater monitoring Programme:	
3426 Definition and implementation of a joint	
information system between Bulgaria and Romania in	
the field of Transboundary groundwater integrating	
the data flows created by the supply component and	
including GIS data-base and web sites:	
3427 Assistance in the establishment and initial	
operation of a Border Groundwater Coordination	
Committee between Bulgaria and Romania will be	
dono:	
343 Poyeloning a Program (Action Dian) for joint	
<u>5.4.2.</u> 8. Developing a Hogram (Action Hair) for joint	
hotware Bulgaria and Romania in Dahrudia area	
343 0. Training of identified PC and PO institutions in	
<u>5.4.2.9</u> . Italining of identified bo and KO institutions in	
respect of groundwater issues focusing on monitoring	
and assessment, integrated management including	
Common analysis will be implemented.	
<u>Component 2.1</u>	
3.4.3.1. Delivery and installation of equipment for	
quantitative monitoring of groundwaters and more	
specifically for:	
3.4.3.1.1 Operational monitoring of groundwater levels,	
springs flows and the related to groundwater recharge	
precipitation and surface flows.	

3.4.3.1.2 Field measurements of water columns,	
parameters of location and elevation, establishing	
cross-sections profiles, implementing pumping tests to	
evaluate filtration characteristics, perform maintenance	
activities, including off-road laboratory cars, able to	
carry equipment and experts for those works.	
3.4.3.2. Delivery and installation of equipment for	
qualitative monitoring of groundwaters including	
equipment for on-site and laboratory evaluation of	
relevant macro and micro components and other	
parameters characterizing groundwater status.	
including off-road laboratory car to carry people and	
instruments for field evaluations and maintenance	
activities	
3.4.3.3. Information system with data collection,	
processing and dissemination facilities for decision	
support including:	
3.4.3.3.1 Supply, installation and beginning the	
exploitation of equipment, software and supplementary	
database for: raw data pre-processing and validation,	
operational database.	
3.4.3.3.2 Information system for long term data storage,	
analysis and management including hydrogeologically	
oriented GIS layers summarizing the results of the	
services, WEB based data and products dissemination	
system	
Component 2.2	
• Automatic groundwater stations with sensors for the	
physical-chemical measurements and detectors of the	
accidental pollution;	
• Auto-laboratory;	

•	Groundwater sampling equipmen	nt, field
	handling and transportation:	processing,
	nandring, and transportation,	
•	Equipment for field measurements equipment;	with GPS
•	Software for the 3-D groundwater mode	elling of the
	data regarding the groundwater bodies an	d flows, for
	the modelling of three-dimensional transpo	ort model for
	the simulation of advection, dispersion, a	nd chemical
	reactions of dissolved constituents in	groundwater
	systems.	C
	5	

Pre-conditions:

- Bulgaria and Romania continue preparations to accede to EU and the implementation of the Acquis
- Availability of the Tender Dossier and Technical Specification for purchasing the equipment for BG
- Finalization of the Tender Dossier and Technical Specification for purchasing the equipment for RO before the Technical Assistance component start

Annex 2 – Detailed implementation chart

Components		2004		2005						2006							2007																					
× ×	J	AS	S O	N	D.	JI	FN	A A	٩N	1 J	J	A	S	Ο	Ν	D	J	FI	M	A	Μ	J	J	A	S	O	N	D	J	FΝ	Λ	۱N	1 J	J	А	S	0	Ν
Component 1-TA				D]	D	C	С (C (C	C	C	C	I	Ι	Ι	Ι	Ι	Ι	Ι	Ι	I	Ι	Ι	Ι	Ι	Ι	Ι	Ι										
1. Service contract for BG				D	D	C (C (C (CC	C	C	C	l	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι										
2. Service contract for RO				D	D	C (C (C	CC	C	C	C	I	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι										
Component 2-Supply				D	D	С (С (C (C	C	C	C	I	Ι	Ι	Ι	Ι	Ι	I	Ι	Ι	Ι	Ι	Ι														
Equipment acquisition for BG				D	D	C (C (C	C	C	C	C	ΓI	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι														
Equipment acquisition for RO				D	D	C (C (C	C	C	CC	C	ΓI	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι	Ι												

Annex 3 – Contracting and disbursement schedule by q	quarter
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Integrated Management	of Tran	sbound	lary Gro	undwate	r betwee	n Bulgar	ia and R	omania i	n Dobruc	lja/Dobro	gea	Area
Components	Cumu	ilative o	contracti	ng sched	ule by qu	uarter M	EUR					
	20	004		20	005			2	006			Total
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		Budget
Component 1												
Service contract for BG					0.8	0.8	0.8	0.8	0.8	0.8		0.8
Framework Contract for RO					0.1	0.1	0.1	0.1	0.1	0.1		0.1
Component 2												
Supply contract for BG					1.0	1.0	1.0	1.0	1.0	1.0		1.0
Supply contract for RO					0.4	0.4	0.4	0.4	0.4	0.4		0.4
Total BG					1.8	1.8	1.8	1.8	1.8	1.8		1.8
Total RO					0.5	0.5	0.5	0.5	0.5	0.5		0.5
Total contracting budget:					2.3	2.3	2.3	2.3	2.3	2.3		2.3

Integrated Management of T	Frans t	oound	lary Gi	round	water b	etween]	Bulgari	a and F	Romani	a in Do	brudja/E) obrogea	Area		
	Cun	nulati	ve dist	ourser	nent scl	hedule b	y quart	er in M	EUR						Total
Components	20	04		,	2005			20	06			20	007		Allocation
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Component 1															
Service contract for BG					0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Framework Contract for RO					0.06	0.06	0.06	0.06	0.09	0.09	0.1	0.1	0.1	0.1	0.1
Component 2															
Supply contract for BG					0.5	0.5	0.7	0.7	0.7	0.8	1.0	1.0	1.0	1.0	1.0
Supply contract for RO					0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total BG					1.0	1.0	1.3	1.4	1.4	1.6	1.8	1.8	1.8	1.8	1.8
Total RO					0.26	0.26	0.36	0.36	0.49	0.49	0.5	0.5	0.5	0.5	0.5
Total disbursement budget:					1.26	1.26	1.66	1.76	1.89	2.09	2.3	2.3	2.3	2.3	2.3

Annex 4-Reference list of feasibility/pre-feasibility studies

For Bulgaria:

- 1. EC COPERNICUS, Project CIPA-CT93-0139 Ecological problems of karst waters caused by overexploitation and contamination (on the example of North-East Bulgaria), 1994 1997
- 2. PHARE CBC Romania-Bulgaria: Integrated Monitoring of the Romanian Black Sea Coast between Midia and Vama Veche; Integrated Monitoring of the Bulgarian Black Sea Coast between Durankulak and Rezovo, 2003
- 3. The Netherlands Senter Internationaal Pre-accession Programmes. Ref. PPA02/BG/7/1 Strengthening of the capacity and enhancement of the National Groundwater Monitoring System of Bulgaria towards implementation of the Water Framework Directive 2000/60/EC.
- 4. DANCEE Project. Ref. 128/008-0010 Danish EPA, "Implementation of the Water Framework Directive in Bulgaria", 04.2003 10.2004.

For Romania:

- 1. The Report on the Geology and Hydrogeology of the Aquifers of Dobrogea 1995, Authors: Stefan Simionas
- 2. PHARE CBC Romania-Bulgaria: Integrated Monitoring of the Romanian Black Sea Coast between Midia and Vama Veche; Integrated Monitoring of the Bulgarian Black Sea Coast between Durankulak and Rezovo, 2003

Annex 5-Reference list of relevant laws and regulations

EC Legislation and Guidance

- 1. Directive 2000/60/EC of the European Parliament and of the Council of establishing a framework for Community action in the field of water policy (Water Framework Directive)
- 2. Council Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances
- 3. A proposal for a Directive on the protection of groundwater against pollution COM (2003) 550

Other International Legislation

- 1. UN/ECE Convention on the Protection and Use Transboundary Watercourses and International Lakes (Helsinki Convention), Helsinki, 1992
- 2. Convention on Co-operation for the Protection and Sustainable Use of the River Danube (DRPC), Sofia, 1994

For Bulgaria:

- REGULATION No. 1 of 7 July 2000 on the Exploration, Use and Protection of Groundwater Promulgated, State Gazette No. 57/14.07.2000 effective 14.07.2000 Corrected, SG No. 64/4.08.2000
- **REGULATION No. 2 of 16 October 2000 on the Protection of Waters against Pollution Caused by Nitrates** from Agricultural Sources Promulgated, State Gazette No. 57/14.07.2000

- REGULATION No. 5 of 8 November 2000 on the Procedure and Manner for Establishment of Networks and on the Operation of the National Water Monitoring System Promulgated, State Gazette No. 95/21.11.2000 (effective 21.11.2000)
- REGULATION No. 3 of 16 October 2000 on the Terms and Procedures for the Exploration, Design, Approval and Operation of Sanitary Protected Areas Around Water Sources and Installations for Drinking and Domestic Water Supply and Around Water Sources of Mineral Waters Used for Therapeutic, Preventive, Drinking and Hygienic Purposes Promulgated, State Gazette No. 88/27.10.2000
- WATER LAW, Adopted 1999, entered into force 28.01.2000, amended 2001-2004
- Environmental Protection Law, Adopted 2002, amended 2003

For Romania:

- Environmental Protection Law 137/1995 with the following amendments
- Water Law 107/1996
- MO no. 277/1997 for the approval of the Norms of content for technical documents necessary in order to obtain the permits and licenses for water management
- GD no. 964/2000 regarding the approval of the Action Plan for water protection against agricultural nitrate pollution and the setting up of the Commission and Support Group for the implementation of the Action Plan for water protection against agricultural nitrate pollution
- Governmental Decision No. 1212/2000 for the approval of the Regulation on the setting up and operation of the Basin Committees
- Joint Order no. 425/2001 and 105.951/2001 of the Minister of Water and Environmental Protection and the Minister of Agriculture, Food and Forests for the approval of the organization and operations, responsibilities and membership of the Commission and Support Group for the implementation of the Action Plan for water protection against agricultural nitrate pollution
- Order no. 740/2001 of the Minister of Water and Environmental Protection regarding the approval of the Commission for implementation of the Action Plan for water protection against agricultural nitrate pollution membership
- Order no. 377/2001 of the Minister of Water and Environmental Protection concerning the approval of the reference objectives for the quality of surface waters
- GD/HG no. 188/2002 for the approval of the norms regarding the discharging of waste waters into the aquatic environment
- GD/HG no. 118/2002 for approval of the Action Plan for reduction of the aquatic and groundwater environment, caused by discharging of dangerous substances
- GD no. 201/2002 on the approval of the technical Norms for the quality required for shellfish waters
- GD no. 459/2002 on the approval of the Norms concerning the quality of bathing water
- GD no. 100/2002 on the approval of the Norms on the quality required from surface water intended for the abstraction of drinking water and of the Norms for the measurement methods and the frequency of sampling and analysis of surface water intended for the abstraction of drinking water
- Law No 458/2002 on the quality of water intended for human consumption
- Order no. 918/2002 of the Minister of Water and Environmental Protection approving the Code for Good Agricultural Practice
- MO no. 1146/2002 establishment of the surface water quality objectives

- GD no. 202/2002 on the approval of the technical norms related to the quality of fresh waters needing protection or improvement in order to support fish life
- Order no 1072/2003 of the Minister of Agriculture, Forests, Waters and Environment for the approval of the organization of the National Integrated Monitoring, Supervision and Decision Support System against nitrate pollution from agricultural sources in surface waters and ground waters and the Surveillance and Appropriate Control Programme, as well as the procedures and instructions for the assessment of monitoring data of surface waters and groundwater
- MO no. 44/2004 regarding the monitoring of dangerous substances in water

Annex 6-List of relevant strategic plans and studies

For Bulgaria:

A. RELEVANT STRATEGIC PLANS:

National River Basin Management Plan for the Bulgarian Part of the Danube. National Environmental Strategy and Action Plan for its Implementation

B. STUDIES:

- 1. Velikov B., D.Dimitrov, M.Machkova. Estudio hidroqimico de las aguas subterraneas de la norteste de Bulgaria. Hidrogeologia,1989, №4, Espana.
- 2. Dimitrov D., M.Machkova, B.Velikov. Hydrochemical classification of underground water samples from the nort-east of Bulgaria. Geologica Balcanica 21.5, 1991, Sofia.
- 3. Velikov B., M.Machkova, D.Dimitrov. Season Fluctuations and Trends in the Hydrochemical Background of Karst Waters. Journal of Meteorology and Hydrology, vol.3, kn. 3, 1992.
- 4. Dimitrov D., B.Velikov, M.Machkova. Processing of ground water hydrochemical data by means of cluster and discriminant analyses. Hidrogeologia, N8,1993, Espana.
- 5. Dimitrov D., B.Velikov, M.Machkova. Cluster and Discriminant Analyses of Groundwater Hydrochemical Data in North-East Bulgaria. 25th Congress of the International Association of Hydrogeologists, Australia, 1994.
- Matchkova M., A.Pulido Bosch, J.M. Caloforra, P.Penchev, M.L.Calvache, M.Lopez Chicano, D.Dimitrov and B.Velikov. Main hydrogeological problems in karst aquifers in NE Bulgaria. International Symposium on Karst Waters and Environmental Impacts, Antalya - Turkey, 1995.
- Dr. B.Velikov, Dr. D.Dimitrov, Dr. Machkova M., Pro. Dr. A.Pulido Bosch, Dr .M.Lopez-Chikano and Dr. M.L.Calvache. Hydrogeochemical Regime Observations on the Groundwater in the Area of Dobrich - Norteast Bulgaria. Geology and mineral resources,8, Sofia, 1996.
- A.Pulido Bosch, M.Lopez-Chikano, M.L.Calvache, J.M.Calaforra, M.Machkova, D.Dimitrov, B.Velikov and P.Penchev. Principales Caracteristicas de los Aquiferos Carbonatados de la Region de Dobrich (Bulgaria). Soc.Geol.Espana, 9(3-4), 1996.
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For Romania:

A. RELEVANT STRATEGIC PLANS:

- 1. Management Plan of the Hydrographic Danube Basin, including two parts:
 - a. General plan for the basin with trans-border impact
 - b. National Management Plan for every Danube country

B. STUDIES:

1. The Evaluation of groundwater resources for the Aquifers of Dobrogea – 1997, Authors: Group of researchers from The Hydrological and Meteorological National Institute

2.Isotopic Investigation of groundwater flow for the Aquifers of the Southern Dobrogea - 1986, Authors: A.Tenu, D.Davidescu, A. Slavescu

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Annex 7-Indicative list of monitoring equipment

For Bulgaria: Table 1.1. Quantitative monitoring:

Type of observation	Possible type of instrument	Indicat ive price	
1. Manual		price	
• Wells: water level and bottom depth and temperature	Contact level and T°C gauge, average cable length 250m (max 750m)	3 200 €	
• Spring discharges: water speed measurements	Radar flow meter for low velocities	7 700 €	
• River and spring discharges: water speed measurements by rod and cable	Current meter (rod measurements)	5 000 €	
		15 000	
	Current meter (suspended cable measurements)	€	
• River and spring water temperature	Digital temperature probe	1 000 €	
• Spring discharge: volume	Set of folded plastic tanks (20 - 501)	2 000 €	
• River cross-section profiles: geodesic	Theodolite accessories	1 000 €	
	GPS unit with elevation (accuracy 10-20m		
• Longitude, latitude, elevation	elevation better than 1 m)	1 500 €	
• Time	Chronometer	100€	
• Data pre-processing and storage software		10 000	
with GIS and WEB interface	Menu driven package	€	
2. Automatic with local data storage:			
	Automatic level meter, average cable length	2 500 €	
• Wells: water level and temperature	100m.		
3. Automatic with real time data transmission		2 000 E	
Automatic station	Data logger, power supply, accumulator	5 000 € 1 500 €	
• River/spring: water level	Temperature concer	1 300 C 300 €	
Air temperature and relative humidity	Temperature and humidity sensor	1 000 €	
• An emperature and relative numberry		1 000 0	
Precipitation intensity	High accuracy pluviometer for liquid and solid precipitation	4 000 €	
4. Automatic with real time data transmission	precipitation		
• air temperature	Temperature sensor	500€	
• relative humidity	Humidity sensor	500€	
• precipitation intensity	High accuracy pluviometer for liquid and solid precipitation	4 000 €	
5. Real time data transmission	Logger	2 000 €	
Radio modem, radio	Dedicated radios at 405 MHz, modem, or GSM modem, 10m mast	4 500 €	
·	Repeater, 10m mast	4 000 €	

Table 1.2. Computers and software:

Type of product	Possible type of instrument	Indicative price	
1. Personal computers and periphery		-	
• Servers for data handling and distribution at the regional offices	High performance PC, A3 laser printer, UPS	4 000 €	
• Computer for field data collection and data pre-processing at the local offices	Portable PC, small laser printer	2 500 €	
3. Software for data storage, analysis and decision support reports at the regional offices			
Software for reporting, basic calculations	MS Office	500€	
 Software for drawing maps 	Golden software SURFER	1 200 €	
 Software for statistical analysis 	StatSoft Statistica	7 000 €	
 Software for WEB design and service 	Windows based product	1 500 €	
• Software for GIS data visualization, creating maps, spatial analysis	General type GIS software (ESRI ArcGIS or MapInfo package)	6 000 €	
	Developing GIS models for representation		
4. Hydrogeologically oriented GIS layers	of the water bearing systems structure	35 000 €	
	High accuracy DTM (25m resolution)	6 000 €	
	Soils, specific land use classes, detailed hydro-geological map, others	12 000 €	
	All existing wells, channels, pumping stations, dams, lakes, protected areas	5 000 €	
Table 1.3. Mobile laboratory:			
		Indicative	

Possible type of instrument	price
Off road heavy duty car, closed body, all	
wheel drive.	25 000 €
Trailer for heavy and voluminous equipment	
and samples.	3 000 €
	Possible type of instrument Off road heavy duty car, closed body, all wheel drive. Trailer for heavy and voluminous equipment and samples.

 Table 2.1. Equipment for on-site evaluation of components characterizing groundwater status:

№	Description	Measured parameters and additional activities	Price EURO
1	Portable photometer and thermoreactor	ammonium, nitrite, nitrate, orthophosphate, chloride, sulfate, cyanide, calcium, magnesium, COD, heavy metals	5000.00
2	Water sampler portable, with microprocessor control, vacuum dosing system, insulating box with 12 x 1 l bottles	Sampling	10000.00
3	Sampler swinging, with bottles 500 ml 1000 ml	Sampling	400.00
4	Portable pH/ORP meter Portable	pH, ORP	1500.00
5	conductivity/TDS/ salinity meter	conductivity,TDS, salinity	1100.00
6	Portable dissolved oxygen meter	dissolved oxygen, BOD	4000.00
7	Turbidimeter portable	Turbidity	1000.00
8	Ceramic top hot plate	permanganate index, preliminary preparation of the samples in accordance with the methods	3100.00
9	Hot plate stirrer	preliminary preparation of the samples in accordance with the methods	800.00
10	Balance portable	preliminary preparation of the samples in accordance with the methods	1700.00
11	Digital burettes, 25 ml capacity (3 pieces)	alkalinity, acidity, permanganate index	2300.00
12	Timers (2 pieces)	permanganate index, photometric analysis	100.00
13	Pipettes automatic (10 pieces), 2-200µl, 50- 1000µl, 1-5 ml, 1-10 ml	preliminary preparation of the samples in accordance with the methods and on-site determinations of the parameters	2100.00
14	Membrane filter glass holders with vacuum diaphragm pump	preliminary preparation of the samples in accordance with the methods and on-site determinations of the parameters	2000.00
15	Bath water	preliminary preparation of the samples in accordance with the methods	1100.00
16	Thermostat, 20 °C	BOD	500.00
17	Refrigerator	conservation of the samples and on-site determinations of the parameters	500.00
18	Submersible pump (portable and stationary), sensor controller, generator, sensors for temperature, level, (pH/ORP, conductivity,	Sampling	30000.00

	dissolved oxygen)		
19	Winch portable	Sampling	2000.00
20	Water sampler, 21	Sampling	2000.00
	Real time PCR for on-site		
21	analysis of	Microorganisms	55000.00
	microorganisms, portable		
	Sampler with cartridge		
22	kits for spontaneously	Sampling	500.00
	releasing gases		
23	Radiation counter portable	radiation level	800.00

Table 2.2. Consumables, reagents and glassware for on-site evaluation of components characterizing groundwater status:

№	Description	Measured parameters and additional activities	Price EURO
1	Tests methods, AQA products and reagents for sample preparation for portable photometer	ammonium, nitrite, nitrate, orthophosphate, chloride, sulfate, cyanide, calcium, magnesium, COD, heavy metals	7600.00
2	Certified reference materials for tests methods to portable photometer (element and ion standards)	ammonium, nitrite, nitrate, orthophosphate, chloride, sulfate, cyanide, calcium, magnesium, COD, heavy metals	1000.00
3	Reference materials for buffer solutions	pH	800.00
4	Reference materials for conductivity measurement	conductivity	550.00
5	Reference materials for checking photometer	absorbance, stray light testing, testing of the resolution power, wavelength	760.00
6	Reference solutions for turbidity	turbidity	520.00
7	Reference solutions for color	color	1150.00
8	Solutions ready to use	alkalinity, acidity, permanganate index	800.00
9	pH-indicator paper and solutions	pH, alkalinity, acidity	250.00
10	Filter paper (for fine particulates, glass microfibre, membrane filters, 0.45 µm, 50 mm diam.) and Parafilm	preliminary preparation of the samples in accordance with the methods and on-site determinations of the parameters	14400.00
11	Reagents	preparation of the samples, preminary with the methods and on-site determinations of the parameters	40500.00

12	Glassware	sampling, preliminary preparation of the samples in accordance with the methods and on-site determinations of the	17600.00
13	Pipette tips, 2-200µl, 50-1000µl, 1 – 5 ml, 1 – 10 ml	parameters preliminary preparation of the samples in accordance with the methods and on-site determinations of the parameters	300.00
14	Stirring rods	preliminary preparation of the samples in accordance with the methods and on-site determinations of the parameters	300.00
15	Detection kits, sample preparation kits and consumables for analysis through real time PCR	microorganisms	20000.00

For Romania:

Equipment for Romania

Table 1.1 Monitoring equipment

Type of observation	Possible type of instrument			
• Longitude, latitude, elevation	GPS unit with elevation (accuracy 10-20m, elevation better than 1 m)			
• 1 ime	Chronometer			
• Data pre-processing and storage software with GIS and WEB interface	Processing Modflow			
• Automatic station with real time data transmission	Data logger, power supply, accumulator			
Piesometric level	preassure sensor			
Auto-laboratory				
• groundwater flow	High accuracy preassure sensor			
• Ph, and temperature sensor				
Suspended sediments	Suspended sediments sensor			
Automatic liquid analyzer				
Real time data transmission	Logger			
• Radio modem, radio	Dedicated radios at 405 MHz, modem, or GSM modem, 10m mast Repeater, 10m mast			

Table 1.2. Computers and software:

Type of product	Possible type of instrument
Personal computers and periphery	
• Servers for data handling and distribution at the regional offices	High performance PC, A3 laser printer, UPS
• Software for data storage, analysis and decision support reports at the regional offices	
 Software for reporting, basic calculations 	Office pakket
 Software for WEB design and service 	Windows based product
Hydrogeologically oriented GIS layers	Developing GIS models for representation of the w bearing systems structure High accuracy DTM (25m resolution)
	Soils, specific land use classes, detailed hydro- geological map, others
	All existing wells, channels, pumping stations, dam lakes, protected areas
Modeling software	Groundwater modeling System, Visual Modflow

Annex 8 – Preliminary needs assessment tables

For Bulgaria:

Needs of Equipments for Quantity Monitoring (Wells):

Total number of points at present	Geol.	Frequency of measurement at present [in year]	Expected number	Available equipment	Number	Not available equipment	Needed number of equipment	Needed at:
10	N1s	Twelve times	At least 50	Contact water level meter	2	Digital temperature probe	7	NIMH Local Branches
10	K1v	Twelve times	At least 50	Termometer [40C]	4	Theodolite, accessories		
1	K1v	Daily		Automatic level meter	1	GPS unit with elevation (accuracy 10-20m, elevation better than 1 m)		
						Contact level and T gauge, average cable length 250m. (max 750m)	7	NIMH Local Branches

			Data logger, power supply, accumulator	30	NIMH Local Branches
			Automatic level metter, average cable length 100m.	30	NIMH Local Branches
			Temperature sensor	30	NIMH Local Branches
			Menu driven package		

Needs of Equipments for Quantity Monitoring (Springs, artesian wells and rivers):

Total number of points at present	Geology	Frequency of measurement at present [in year]	Expected number of monitoring points	Available equpment	Number	Not available equpment	Needed number of equipment	Needed at:
6	N1s	One - twelve times	At least 30	Current meter	2	Radar flow meter for low velocities	7	NIMH Local Branches
						Digital temperature probe	7	NIMH Local Branches

1	K1v	Twelve times	At least 20 including artesian wells	Termometers	4	Set of folded plastic tancs (20 - 50l) - restricted number and volume	7	NIMH Local Branches
				Folded plastic tancs	3	Current metter (rod measurements)	7	NIMH Local Branches
1	River	Daily	3			Current metter (suspended cable measurements)	7	NIMH Local Branches
						Theodolite, accessories	7	NIMH Local Branches
						GPS unit with elevation (accuracy 10- 20m, elevation better than 1 m)	7	NIMH Local Branches
						Data logger, power supply, accumulator	15	NIMH Local Branches
						Drift free water level probe	15	NIMH Local Branches

			Temperature sensor	15	NIMH Local Branches
			Chronometer	7	NIMH Local Branches
			Menu driven package	7	NIMH Local Branches
			Offroad car	5	NIMH Local Branches; Local chemical laboratories of MoEW; Local Branches of River Basin Directorate

Total number of points	Frequency of measurement at present [in year]	Expected numbers	Available equpment	Number	Not available equpment	Needed number of equipment	Needed at:
6	daily	At least 10	Manual Vild raingauges		Temperature and humidity sensor	10	NIMH Local Branches
					High accuracy pluviometer for liquid and solid precipitation	10	NIMH Local Branches
					Data logger, power supply, accumulator	10	NIMH Local Branches
					Menu driven package	10	NIMH Local Branches

Needs of Equipments for Recharge Parameters Monitoring (Precipitation/Evaporation Stations):

Chemical Equipments Needs

N⁰	Description	Price <u>€</u>	Needed No	Needed at:
1	Portable photometer and thermoreactor	5000.00	1	Local chemical laboratories of MoEW
2	Water sampler portable, with microprocessor control, vacuum dosing system, insulating box with 12 x 1 l bottles	10000.00	1	Local chemical laboratories of MoEW
3	Sampler swinging, with bottles 500 ml, 1000 ml	400.00	1	Local chemical laboratories of MoEW
4	Portable pH/ORP meter	1500.00	1	Local chemical laboratories of MoEW
5	Portable conductivity/TDS/ salinity meter	1100.00	1	Local chemical laboratories of MoEW
6	Portable dissolved oxygen meter	4000.00	1	Local chemical laboratories of MoEW
7	Turbidimeter portable	1000.00	1	Local chemical laboratories of MoEW
8	Ceramic top hot plate	3100.00	1	Local chemical laboratories of MoEW
9	Hot plate stirrer	800.00	1	Local chemical laboratories of MoEW
10	Balance portable	1700.00	1	Local chemical laboratories of MoEW
11	Digital burettes, 25 ml capacity (3 pieces)	2300.00	1	Local chemical laboratories of MoEW
12	Timers (2 pieces)	100.00	1	Local chemical laboratories of MoEW
13	Pipettes automatic (10 pieces), 2-200µl, 50-1000µl, 1-5 ml, 1-10 ml	2100.00	1	Local chemical laboratories of MoEW
14	Membrane filter glass holders with vacuum diaphragm pump	2000.00	1	Local chemical laboratories of MoEW
15	Bath water	1100.00	1	Local chemical laboratories of MoEW
16	Thermostat, 20 °C	500.00	1	Local chemical laboratories of MoEW
17	Refrigerator	500.00	1	Local chemical laboratories of MoEW
18	Submersible pump (portable and stationary), sensor controller, generator, sensors for temperature, level, (pH/ORP,	30000.00	3	Local chemical laboratories of MoEW

19	conductivity, dissolved oxygen) Winch portable	2000.00	1	Local chemical laboratories of MoEW
20	Water sampler, 2 l	2000.00	1	Local chemical laboratories of MoEW
22	Station-Manager for the collection, processing, storage and transmission of data with multi-parameter probe for water quality monitoring in both ground and surface water	10000.00	1	Local chemical laboratories of MoEW
23	Real time PCR for on-site analysis of microorganisms, portable	55000.00	1	Local chemical laboratories of MoEW
24	Sampler with cartridge kits for spontaneously releasing gases	500.00	1	Local chemical laboratories of MoEW
25	Radiation counter portable	800.00	1	Local chemical laboratories of MoEW
26	Compact ion chromatography system	30000	2	Local chemical laboratories of MoEW – Rouse, Varna
27	UV-VIS Spectrophotometric system	13000	3	Local chemical laboratories of MoEW
28	Atomoc Absorbtion Spectrometer	75000	1	Local chemical laboratories of MoEW - Shoumen
29	Magnetic stirrer with heating	2000	3	Local chemical laboratories of MoEW

Chemical Consumables needs:

Nº	Description	Price EURO	Needed equip. number	Needed at:
1	Tests methods, AQA products and reagents for sample preparation for portable photometer	7600.00	1	Local chemical laboratorie s of MoEW
2	Certified reference materials for tests methods to portable photometer (element and ion standards)	1000.00	1	Local chemical laboratorie
3	Reference materials for buffer solutions	800.00	1	of MoEW Local chemical laboratorie s of MoEW
4	Reference materials for conductivity measurement	550.00	1	Local chemical laboratorie s
5	Reference materials for checking photometer	760.00	1	of MoEW Local chemical laboratorie s of MoEW
6	Reference solutions for turbidity	520.00	1	Local chemical laboratorie
7	Reference solutions for color	1150.00	1	of MoEW Local chemical laboratorie s of MoEW
8	Solutions ready to use	800.00	1	Local chemical laboratorie s of MoEW

9	pH-indicator paper and solutions	250.00	1	Local chemical laboratorie s of MoEW
10	Filter paper (for fine particulates, glass microfibre, membrane filters, 0.45 µm, 50 mm diam.) and Parafilm	14400.00	1	Local chemical laboratorie s of MoEW
11	Reagents	40500.00	1	Local chemical laboratorie s of MoEW
12	Glassware	17600.00	1	Local chemical laboratorie s of MoEW
13	Pipette tips, 2-200µl, 50-1000µl, 1 – 5 ml, 1 – 10 ml	300.00	1	Local chemical laboratorie s of MoEW
14	Stirring rods	300.00	1	Local chemical laboratorie s of MoEW
15	Detection kits, sample preparation kits and consumables for analysis through real time PCR	20000.00	1	Local chemical laboratorie s of MoEW

Needs of Computers and Software including equipment for real time data transmission:

	Needed	Needed at:		
Not available equpment	number of			
1. The second seco	equipment			
High performance PC, A3	1.5	The local branches of the River Basin Directorates: Local		
laser printer, UPS	15	Chemical Laboratories; NIMH Local Branches		
portable PC, small laser		The NIMH mobile measurement groups		
printer	5			
	•	The local branches of the River basin Directorates: Local		
MS Office	20	Chemical Laboratories; NIMH Local Branches		
	_	NIMH Local Branches: Local Branches of River Basin		
Golden software SURFER	5	Directorates		
		NIMH Local Branches: Local Branches of River Basin		
StatSoft Statistica	5	Directorates		
	-			
	-	NIMH Local Branches; Local Branches of River Basin		
Windows based product	5	Directorates		
General type GIS software				
(ESRI ArcGIS or MapInfo	5	NIMH Local Branches; Local Branches of River Basin		
package)		Directorates		
Developing GIS models for				
representation of the water	1	NIMH Local Branches; Local Branches of River Basin		
bearing systems structure		Directorates		
High accuracy DTM (25m	1	NIMH Local Branches; Local Branches of River Basin		
resolution)	1	Directorates		
Soils, specific land use				
classes, detailed	1	NIMH Local Branches; Local Branches of River Basin		
hydrological map, others		Directorates		
All existing wells,				
channels, pumping	1	NIMH Local Branches; Local Branches of River Basin		
stations, dams, lakes		Directorates		
ORACLE depending of the	1	Local chemical laboratories of MoEW		
operational system	1			
Real time data Transmission				
Laggar	12	NIMH Local Branches; Local Branches of River Basin		
Logger	12	Directorate		
Dedicated radios at 405		MIMILL and Droughos: Local Droughos of Divor Desig		
MHz, modem, or GSM	36	Directorate		
modem, 10m mast				
Papatar 10m most	15	NIMH Local Branches; Local Branches of River Basin		
Repeater, rom mast	13	Directorate		

For Romania:

№	Description		Needed at:
1	GPS with elevation		DADL NIHW M
2	Chronometer		DADL
3	Automatic station with real time data transmission	Incl. Data logger, power supply, accumulator	DADL
4	Piesometric level sensor	Groundwater level	DADL
5	High accuracy pressure sensor	Groundwater flow	DADL
6	Ph, and temperature sensor		DADL
7	Suspended sediments sensor		DADL
8	Automatic liquid analyzer		DADL
9	Logger		DADL
10	Dedicated radios at 405 MHz, modem, or GSM modem, 10m mast	Radio modem for autom. stations	DADL
11	Submersible pump, portable and stationary, sensor controller, power generator, sensor of temperature, level, pH, conductivity, dissolved oxygen	Field sampling set	DADL NIHW M
12	Personal computers and periphery	Incl. Software	DADL NIHW M

№	Description		Needed at:
13	Servers	for data handling and distribution at the regional offices	DADL' s Reg. offices
14	Software for data storage, analysis and decision support reports at the regional offices		DADL' s Reg.offi ces
15	Software for reporting, basic calculations		DADL
16	Data pre-processing and storage software with GIS and WEB interface	processing MODFLOW	DADL
17	Software for WEB design and service	Developing GIS models for representation of the water bearing systems structure	DADL
18	Hydrogeologically oriented GIS layers		DADL
19	Groundwater modelling software		DADL
20	Auto laboratory		NIHW M
21	Software for GIS		NIHW M
22	Portable computers	Field data collection and data pre- processing at the local offices	NIHW M
23	Consumables		NIHW M

Annex 9 Memorandum of Understanding between the Bulgarian beneficiaries

Memorandum of Understanding

Between the Bulgarian beneficiaries of the Phare CBC project "Integrated Management of Transboundary Groundwater between Bulgaria and Romania in Dobrogea/Dobrudja Area"

Today,between:

The Ministry of Environment and Water, 22 Maria Louisa str. 100 Sofia, represented by Mr. Nikolay Kouyumdjiev, Deputy Minister (hereinafter called MOEW), and **The National Institute of meteorology and Hydrology**, 66 "Tsarigradsko shosse" blvd., 1784 Sofia, represented by Dr. Konstantin Tzankov, Director (hereinafter called NIMH), was reached an agreement on the following:

- 1. NIMH and MOEW as beneficiaries of the mentioned above project will actively collaborate in the mentioned above project giving personnel and premises according to their legal obligations. They equally benefit on the project results and especially on the equipment supply. There is a general agreement on the activities requested for the Service equipment given in Annex 1 and the Detailed Budget table given in Annex 3.
- 2. The parties will equally benefit on the results of the supply component of the project, given in Annex 2, through the NIMH regional branches and the MOEW River Basin Directorates in Varna and Pleven, as well as the Executive Environmental Agency's local laboratories in Russe, Varna, and Shumen.
- 3. Both sides undertake the exploitation and maintenance of the monitoring equipment, data processing and analyses techniques, created by the project

NIMH Director: /K. Tzankov/ MOEW Deputy Minister: /N. Kouyumdjiev/

Supply component activities

1. Delivery and installation of equipment for quantitative monitoring of groundwaters and more specifically for:

1.1 Operational monitoring of groundwater levels, springs flows and the related to groundwater recharge precipitation and surface flows.

1.2 Field measurements of water columns, parameters of location and elevation, establishing cross-sections profiles, implementing pumping tests to evaluate filtration characteristics, perform maintenance activities, including off-road laboratory cars, able to carry equipment and experts for those works.

2. Delivery and installation of equipment for qualitative monitoring of groundwaters including equipment for on-site evaluation of relevant macro and micro components and other parameters characterizing groundwater status, including off-road laboratory car to carry people and instruments for field evaluations and maintenance activities;

3. Information system with data collection, processing and dissemination facilities for decision support including:

3.1 Supply, installation and beginning the exploitation of equipment, software and supplementary data base for: raw data pre-processing and validation, operational database.

3.3 Information system for long term data storage, analysis and management including hydrogeologically oriented GIS layers summarizing the results of the services, WEB based data and products dissemination system.

	Project component	Benefi- ciaries*	Budget [MEUR]
1.	Quantitative monitoring in Dobrudja area	Ν	0.6
2.	Hydro-chemical monitoring in Dobrudja area	R	0.554
3.1.	Data collection, processing and validation	N, B	0.146
3.2.	Information system, GIS, WEB	N, B	0.3

Beneficiaries, budget

N – National Institute of Meteorology & Hydrology (Varna and Pleven branches), R – Regional laboratory of the Executive Agency for Environment of MoEW Regional laboratories – in Varna Shoumen Rouse, B – River Basin Directorates of MoEW – in Pleven Varna

Annex 10. Memorandum of Understanding between the Bulgarian and Romanian sides.

Memorandum of Understanding

Between the Bulgarian and Romanian beneficiaries of the Phare CBC project "Integrated Management of Transboundary Groundwater between Bulgaria and Romania in Dobrogea/Dobrudja Area"

Today,between:

The Ministry of Environment and Water (MOEW), 67 William Gladston str., 1000 Sofia, represented by Ms. Dolores Arsenova, Minister and

The Ministry of Environment and Water Management (MEWM),Address....., represented by

agreed on the following:

- 4. To ensure active cooperation in the development of the above mentioned project facilities to be carried out on the territories of the both countries, namely:
 - a. Nominating contact persons responsible for the permanent correspondence between the Romanian and Bulgarian sides during the project implementation.
 - b. Giving free access to information and technical data related to the preparation of TORs, specifications and others that facilitate the harmonization of the activities at the sides of the Bulgarian-Romanian border.
 - c. Making available relevant experts for the Joint Steering Committee.
- 5. To create the necessary conditions, implementation and functioning of a common database containing validated data and products for the quantitative and qualitative status of ground water and relevant recharge and discharge characteristics.
 - a. Two identical copies of which are maintained simultaneously by both sides
 - b. Relevant data and products, agreed by Joint Steering Committee, is published via Internet with free access giving prompt information to the large public on the status of the transboundary groundwater bodies.
- 6. Both sides undertake the exploitation and maintenance of the monitoring equipment, data processing and analyses techniques, created by the project

For MOEW:

For MEWM:

D. Arsenova