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POINT SOURCE POLLUTION IN THE DANUBE BASIN

INSTITUTIONAL STUDIES
Bulgaria, the CSFR, Hungary, and Romania

VOLUME II

WASH
WATER AND SANITATION FOR HEALTH PROJECT

USAID
EUROPE BUREAU

JULY 1992

WASH Field Report No. 374

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VOLUME II

Prepared for the Europe Bureau,
U.S. Agency for International Development
under WASH Task No. 271

by

Dan Edwards

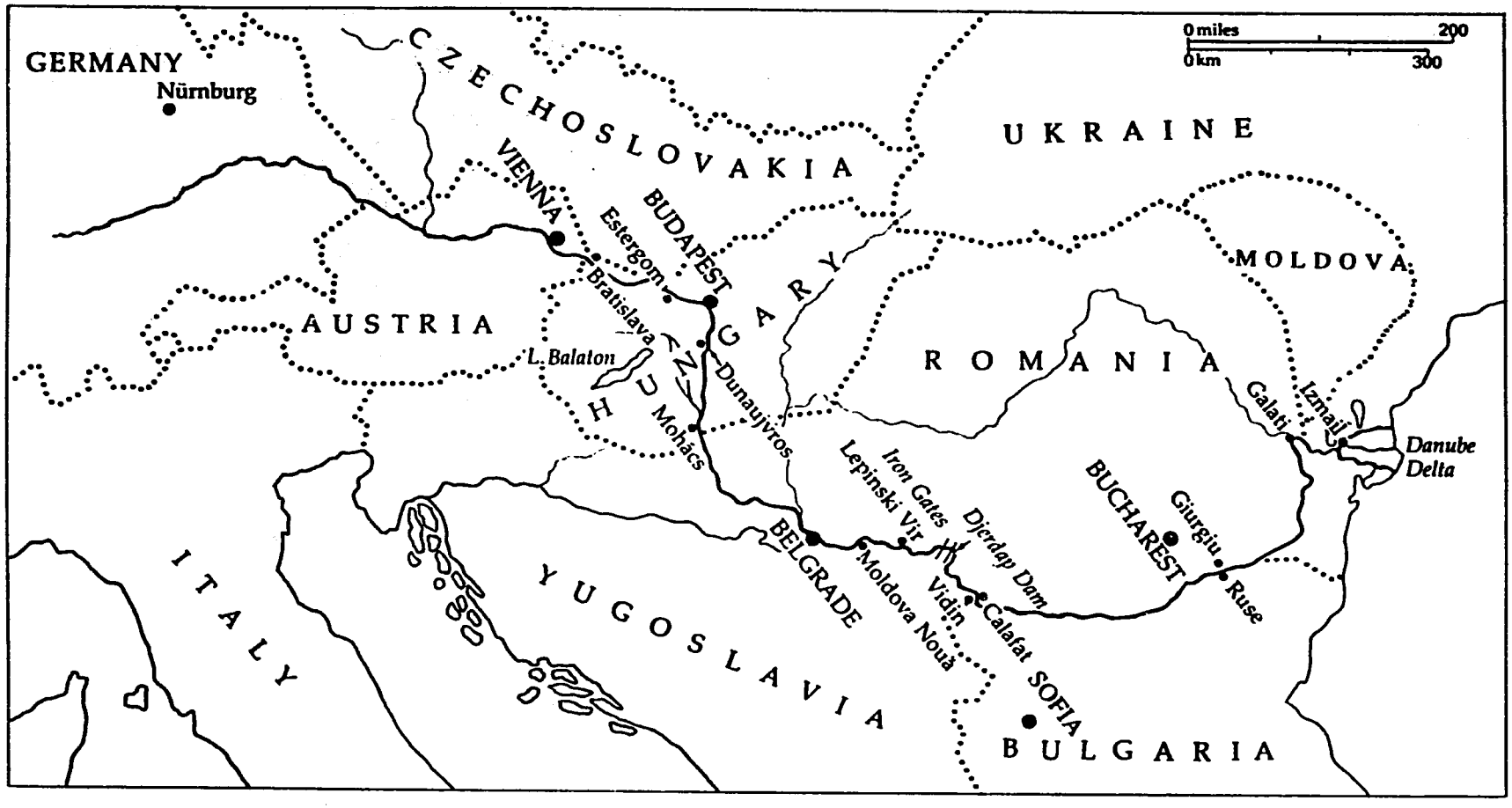
July 1992

Water and Sanitation for Health Project
Contract No. DPE-5973-Z-00-8081-00, Project No. 936-5973
is sponsored by the Office of Health, Bureau for Research and Development
U.S. Agency for International Development
Washington, DC 20523

ACRONYMS

A.I.D.	Agency for International Development
CSFR	Czech and Slovak Federal Republic
DEMDESS	Danube Emissions Management Decision Support System
MEPRD	Ministry of Environmental Protection and Regional Development (Hungary)
MFW	Ministry of Forests and Water (Slovakia)
MOE	Ministry of Environment
NEPA	National Environmental Protection Authority (Hungary)
O&M	Operation and Maintenance
OVF	National Water Authority (Hungary)
SCE	Slovak Commission on the Environment
SHI	Slovak Hydrometeorological Institute
USAID	United States Agency for International Development
WASH	Water and Sanitation for Health Project

THE DANUBE RIVER



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INTRODUCTION

This volume provides institutional profiles of the four countries participating with the WASH team in the development of the Danube Emissions Management Decision Support System (DEMDESS): Bulgaria, the Czech and Slovak Federal Republic (Slovakia), Hungary, and Romania. Each profile describes the water quality management subsector of the environmental sector in each country. Yugoslavia was not included in this study due to the political situation.

The primary point of the team's inquiry was to determine each country's institutional capacity to manage and control wastewater point source discharges into the Danube River and its tributaries. Specific attention is paid to those tasks that are required to manage a successful water quality control program using the decision support tool developed in the USAID project for each country. Attention is also paid to how water quality management and pollution control in general are being treated institutionally in each country.

The essential question addressed in this analysis is, Does the country reviewed have in place those essential structures, policies, and mechanisms to manage water quality relating to pollution in the Danube? In each case, questions arise that need to be addressed either to enhance or continue the development of emissions management in the institutional arena. Each country review lists those issues at the end of its profile.

The structure of each country's environmental sector is described, along with a synopsis of major water quality management institutions. The primary sources of judgment derive from individual interviews conducted in each country with professionals representing a broad cross section within central, regional, and local agencies, as well as from private groups and voluntary organizations. Characteristics of a well functioning water quality operation or desirable end state for quality management are described below. They were developed by the representatives from ministries of environment, national research institutes in water quality, and the WASH team while all participated at a workshop conducted in Visegrad, Hungary, in December 1991.

Purpose and Uses

The information in these institutional studies will be used in various ways. One purpose is to provide information so development investors and planners can understand how the various sectoral tasks are being carried out and who is responsible for what and with which authorities. This information will allow lenders to channel follow-up study activities appropriately for institutional improvement.

Another use has been to relate institutional issues (for example, regulations and charging of fees) to water quality management choices that can be made using the computerized Danube Emissions Management Decision Support System (DEMDESS) developed in the course of the technical studies of the countries involved. Institutional mechanisms, such as sanctions, fines,

regulations, oversight authorities, and planning choices, have been incorporated in DEMDESS based upon some of the information in these profiles.

Institutional issues have been identified by examining barriers to controlling point source pollution that directly relate to the organization and administrative or legal apparatus of each country's water quality control sector. In some cases issues are raised because of a lack of performance due to insufficient resources (people and equipment) or enactment of appropriate control mechanisms. For example, the computerized support system has mechanisms for determining if increased economic activity in manufacturing agricultural products from a given pollution source will result in an unacceptable environmental cost to water quality without special interventions. The ability to manage, control, or regulate that activity is an institutional task that should be present within the sectoral system. If it is not, it must be addressed.

Definitions

For purposes of this study the USAID usage of the term "sector" is intended. USAID commonly uses "sector" to signify a programming area for which activities have been designed and goals can be set to address or solve problems, and for which organizational, managerial, scientific, and institutional structures exist. For example, the "health sector" conducts activities that support human physical well-being. It helps people with health needs through an establishment that serves them. Similarly, the agricultural sector concerns itself with food production issues.

In this instance, the "water quality management" sector comprises those activities relating to the management of ambient water quality. The sector's primary goal is to improve ambient water to acceptable levels of quality for various uses (drinking, industry, and agriculture), and to manage its usage. The water quality management sector can be considered a subsector (or related sector) of the environmental sector. Air quality and natural resource management are other related environmental subsectors.

"Institutions" are defined in development literature to mean several things: organizations, human laws, human groupings, accepted rules and norms, unwritten folkways, and so on. In these studies the term is used to refer primarily to management activities (data collection, analysis, strategies, incentives, and planning), organizational arrangements (structures and roles), and the use of formal rules (policies, sanctions, and standards). In a sector in which physical and engineering sciences often consider physical phenomena, the "institutional" side considers management, people, and policy issues, or "the softer side." The set of formal rules arranged together and the way they are enforced will be referred to as the "regulatory environment."

Institutional "issues" are concerns for which the solutions require improved policies, rules, enforcement, or organizational performance. For example, the need to deal with a geographic jurisdictional difference is an "institutional issue." The same can be said of the lack of enforcement actions, the need to plan for resource allocation, tariff structures, development

and enforcement of norms, the need for trained human resources, the management of resources, and so on.

Structure of the Country Profiles and Analyses

The institutional analyses include general information about responsibilities at various levels for implementation, enforcement, regulation, and policy (and other sectoral tasks that will be defined during the study). Some information about the enforcement of rules that govern wastewater discharges is also given, although not sufficiently to constitute regulatory studies.

Information has been collected and summarized in each of the following areas:

- Sectoral background: recent history, relation to the Danube River system, basic population.
- Roles and responsibilities at central, regional, and local/municipal levels.
- Descriptions of how the major tasks required in a sector are being conducted, as outlined below.

  Primary management tasks

  - Planning
  - Financing
  - Setting policy standards and regulations
  - Implementing the program

  Sector-specific tasks/issues

  - Data collection
  - Data analysis
  - Planning based on data
  - Design
  - Construction
  - Operation and maintenance (O&M)
  - Setting charges
  - Setting standards
  - Issuing permits
  - Monitoring discharge activities

- Inspecting plants, sampling, and so on
- Financial management (collecting/administering funds)

- Descriptions of the primary institutional issues resulting from sector analysis.

An information gathering format was used to conduct these studies. In each country reviewed, the same list of questions was given to key contact persons in the Ministry of Environment and in research institutes. In Hungary, a consultant was engaged to find the answers to the questions in the format. Key contact persons were interviewed several times, and the information they provided was extended and enriched by additional interviews and written materials. The questions that were given in the information gathering format are provided in Appendix A.

Sectoral Performance

In the profiles that follow, consideration was given to the effectiveness of each country's water quality management sector composition, structure, and enforcement policies. Criteria for effectiveness were based upon the following assumptions.

Technological Criteria

- Is preference given to enterprises that minimize pollution or to actions that stimulate industrial changes to minimize pollution?
- Do industries or policies require pretreatment of discharges?
- Is wastewater treatment capacity sufficient to reduce polluting effluent?

Economic Criteria

- Do policies ensure cost-effectiveness in terms of sufficient user charges to maintain infrastructure and conduct effective operations of wastewater treatment for municipal or regional plants?
- Do regulations require that the cost of production incorporate wastewater treatment?
- Do standards require that parameters be set sufficient for water use downstream?

Regulatory/Legal Criteria

- Are standards and norms in place sufficient for a permit and regulatory process to be conducted at appropriate levels and appropriate targets (municipal, industrial, and agricultural)?

- Does enforcement work: Do regulators have sufficient power and sanctions, equipment, and personnel to ensure compliance?

Public Awareness/Social Criteria

- Is information open to the public and are efforts made to inform the public of both their rights and their obligations?
- Are public education programs and activities sufficient to protect the public's interest?

Appropriate Sectoral Planning Criteria

- Is a planning process in place that uses models and instruments to evaluate and develop plans for sectoral improvement, and develop regulations and policies?
- Are goals set, understood, and clear at appropriate local, regional, and national levels?
- To what extent is planning conducted using the river basin as a unit of focus? Are river basin structures in place?

INSTITUTIONAL STUDY: CZECH AND SLOVAK FEDERAL REPUBLIC (CSFR)

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1. SECTORAL OVERVIEW AND BACKGROUND

1.1 Political Organization and Population

As of the spring of 1992, the Czech and Slovak Federal Republic (CSFR) consists of the Czech and Slovak states, which share a single federal governmental system. Both states have a state government and are considered political jurisdictions or regions of Czechoslovakia. The supreme authority of the federal state power is the Federal Assembly, which has two chambers. Both state republics have their own elected national council, which is responsible for all internal matters. External relations, defense, overseas trade, transport, and communications are the domain of the federal government.

On the north and west, the CSFR is bordered by Germany and Poland, on the south by Hungary and Austria, and to the east by the Ukraine. In 1985, the country's population was estimated at 15,503,462. Its total area is 127,923 km^2.

This report will deal primarily with Slovakia because of its relation to the Danube. Slovakia is organized administratively under a series of regions and districts that have councils, which corresponds roughly to old country jurisdictions (7 districts and 37 counties).

1.2 Relation to the Danube River [a]

The Danube flows along the border between Austria and Slovakia and Hungary and Slovakia (100 km of border are river). The Danube catchment area contains the subbasins of the rivers Morava, Váh, Nitra, Hrón, Ipel, Slana, Bodrog, and Hornad, which all drain through Slovakia and eventually reach the Danube. Downstream from Bratislava (the largest city on the Danube in the territory), the Danube separates into three branches for a distance. The branch called the Little Danube flows north and forms an island area (Little Danube Island or, colloquially, "Corn Island"), which is a major source of bank filtered groundwater. This branch rejoins the main stem and the Danube at Komarno. Another branch diverts into Hungary and the main channel continues.

Czechoslovakia has bilateral agreements on pollution control with Poland, Austria, and Hungary and is a part of the Danube Commission. Flood control of transboundary waters is also covered by agreements with neighboring countries.

[a] For more detailed information, refer to the technical report on Slovakia in Volume III.

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1.3 Economic Conditions at Time of Study

While current official data on employment were not available during the time of this study, those interviewed commented on the many and frequent changes in economic conditions resulting from the shift away from a highly centralized state toward a free market economy. In particular, the consequence of the shift toward a market economy has been high unemployment. Many factories that served the interlocking demands of the former USSR have closed down. The question on everyone's mind is what to do with all these unemployed people. A typical interview quote follows:

> They only see that they don't have a job. The other side says "the free market will solve everything." Slovakia has twice the 12 percent unemployment of the country. We hope these A.I.D. projects lead to construction or other employment generating projects. It is not simple or easy to deal with the pollution problems; the equation involves all of these jobs.

1.4 Overview of Roles and Responsibilities

Table 1 presents a short form of water quality management sectoral organization in Slovakia and the roles of major entities dealing with water quality control. Section 2 provides more detailed descriptions of duties and organization. Organization charts are attached at the end of this study.

1.5 Trends in the Sector

1.5.1 Policy Direction for Decentralization

The overall policy direction desired by the Slovak Commission on the Environment (SCE) is to move toward increasing decentralization, local responsibility, cost recovery, and self-management for water pollution and wastewater management. Currently tariff collection for water and wastewater is centralized. Many of those interviewed said the current centralized system will not be sustainable and that within two to three years, delegation and increasing "cost for service" trends will force its restructuring.

The Ministry of Forests and Water (MFW) intends to continue temporarily with centralization in providing water and wastewater treatment. The current structure contains regional water companies that manage operations for water and wastewater. The MFW also intends to continue with a unitary tariff structure for drinking water and wastewater for reasons of equity, but there are pressures to disaggregate tariffs so that each company can operate as a business with its own bottom line.

The desire of all interviewed is to move as quickly as possible toward a delegated structure, but most say that is at least three years away. Constraints are other priority actions for the government, the lack of a local tax structure and sources of revenue, and the lack of legal and

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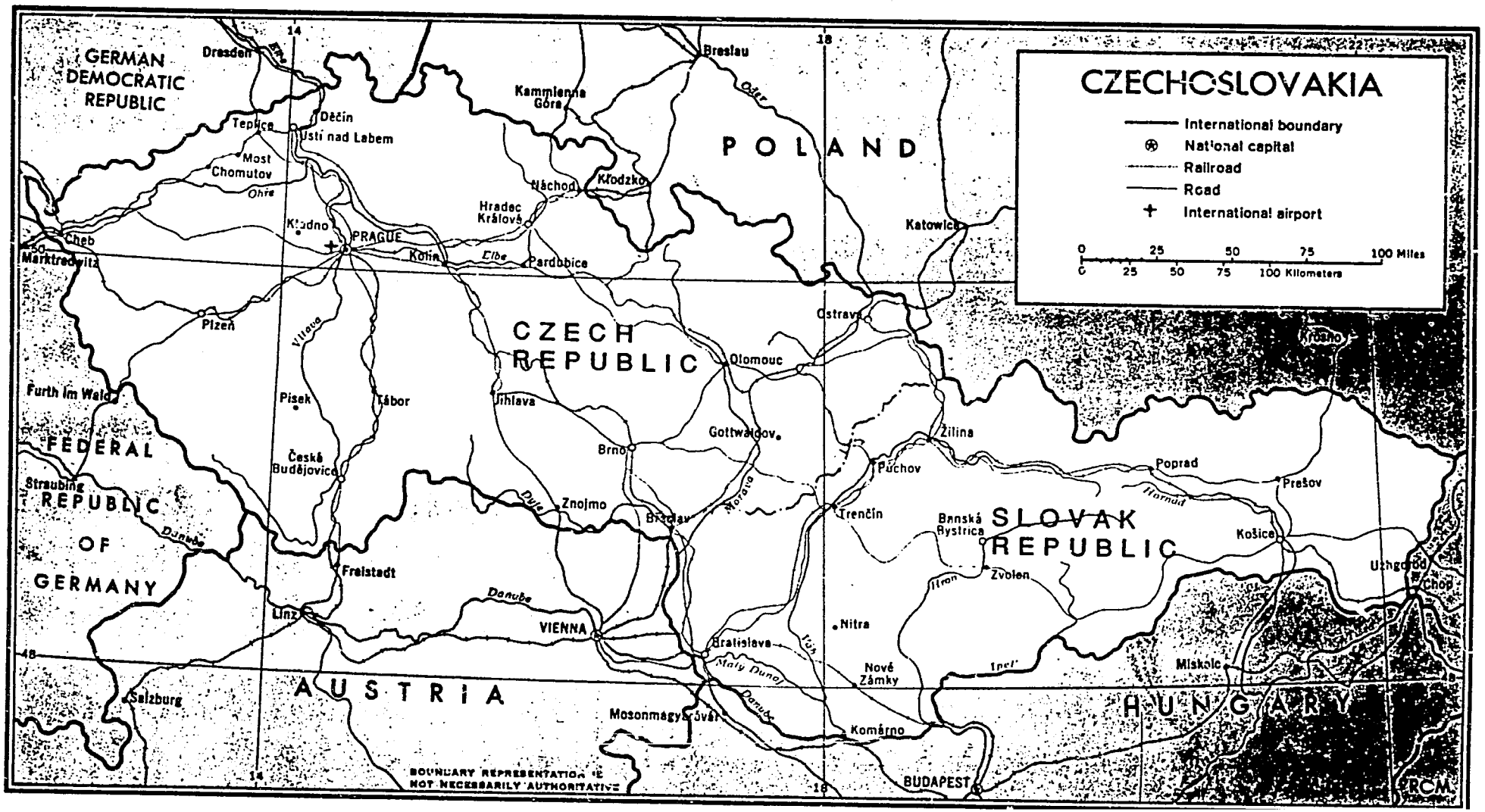
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International boundary
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GERMAN DEMOCRATIC REPUBLIC
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CZECH REPUBLIC
SLOVAK REPUBLIC
FEDERAL REPUBLIC OF GERMANY
AUSTRIA
HUNGARY
Dresden
Děčín
Ústí nad Labem
Teplice
Most
Chomutov
Ohře
Cheb
Marktredwitz
Kladno
PRAGUE
Kolín
Elbe
Pardubice
Hradec Králové
Náchod
Kłodzko
Kamienna Góra
Breslau
Oder
Katowice
Ostrava
Olomouc
Plzeň
Vltava
Písek
Tábor
Jihlava
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Púchov
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Miskolc
Krosno
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INSTITUTIONAL STUDY: CZECH AND SLOVAK FEDERAL REPUBLIC (CSFR)

Table 1

SUMMARY OF ROLES AND RESPONSIBILITIES
SLOVAKIA

	Organization	Responsibilities
1.	Slovak Commission on the Environment (SCE)	Overall environmental quality control, policy, standards, norms, and enforcement. Coordination and management of long-range policy, legislation, and donor activity.
	Environmental Inspectorates	Control activities related to environmental protection, including sampling and inspections of air, water, soil, and solid waste. A part of the SCE.
	Regional Environmental Offices	Regional-level authorities for determining water quality policy and enforcement actions, granting pollution permits, and setting taxes and fines. A part of the SCE.
	Hydrometeorological Institute	Data collection and analysis, performance monitoring reporting, and computerized data base maintenance. A part of the SCE.
2.	Ministry of Forests and Water (MFW)	Water resources management; coordination of water resource use and land use; basin management; and river pollution abatement and control.
	River Basin Authorities	Administration of water resource quantity and use. Linked to the MFW but incorporated with a board. Conduct water quality testing with most of the larger laboratories in Slovakia for all entities, grant water use permits, share in fines and sanctions with the SCE, and supply raw water to drinking water authorities.
	Regional Drinking Water Authorities	Purification, distribution, and commercial management of domestic water, and management of wastewater treatment capacity and infrastructure. Linked to MFW.
3.	Water Research Institute	Semi-autonomous research institute; conducts studies in water resource planning, master plans, technical studies on water quality and the environment, and river basin modeling.
4.	Project Organizations	Engineering construction: Hydro Consult, design engineering; being privatized.

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financial systems to implement semi-private operations or move state organizations toward other arrangements. However, the intent in the interim is to make the water companies operate more like businesses, e.g., have them sell off excess property and lease land, and contract out rather than use permanent staff or hire anew for major tasks. Currently the MFW is studying a proposal to consolidate the water use districts within the river basin structure and make the sector more cost-effective in regard to operating companies.

It is feared within the MFW that were municipalities with scarce resources given the responsibility of managing wastewater themselves, they would assign it low priority. Needs such as health care, street maintenance, and social needs would come before water and wastewater control.

1.5.2 Legislation on Emission Standards

At the time of this writing the SCE is preparing a new water law that specifies the amount of pollutants industrial, municipal, and agricultural point sources may discharge into water bodies. The law is scheduled for approval in 1992 and implementation in 1993. It will supersede former regulations on permissible water quality. The law will be more specific than current in-stream water quality measurement programs and regulations.

In 1991, laws were drafted relating to air, soil, and solid waste, but not water. Existing water laws cover general use and set fine limits too low to be of use as sanctions, although site-specific sanctions can be set for heavy load industries. The new law will allow Slovakia to conform to the international agreements on water quality standards.

1.5.3 Institutional Priorities

The SCE's institutional priorities include the following:

- Setting up and equipping a water quality monitoring network with modem equipment, and equipping field members with facilities to collect water quality samples more frequently.
- Improving the Hydrometeorological Institute to enable it to better monitor water quality and serve the policy needs of the SCE.
- Establishing a laboratory system that provides controls and cross-checks (currently only one set of laboratories is used, and they belong to the river basin authorities and monitor themselves).
- Developing a master plan for water quality and water in general. The current plan is 15 years old. The new plan should include ecological considerations and pollution measures.

2. WATER QUALITY MANAGEMENT INSTITUTIONS

2.1 Sectoral Geographic/Administrative Organization

The organization of Slovakia's water quality management sector follows river basin geography with the exception of some overlaps, as explained below.

Currently in the sector there are five districts that correspond roughly along the lines of major watersheds:

City	District	Basin
Bratislava	Trans Danube	Danube
Kosice	Eastern	Hornad
Banská Bystrica	South Central	Hrón
Zilina	North Central	Orova/Upper Váh
Nitra	South West	Váh and Nitra

Under the organization of different ministries (explained below), each district has

- a river basin authority,
- a regional environmental inspectorate for water quality, and
- a regional drinking water/wastewater company.

The five regions contain 38 counties, in which lower-level offices reside and are supervised by a regional office. A county has a local environmental office and a local water office. Water from regional water companies is distributed down to municipalities. Wastewater is linked to each regional water company in the same way.

2.2 The Slovak Commission on the Environment

The SCE is the state government agency of Slovakia responsible for all environmental affairs in Slovakia. Included in its duties is water quality control. While the SCE is called a commission, it operates in the same way a ministry would if Slovakia were an independent state. It is directed by a chairman, who operates with the authority of a state minister.

Under the SCE chairman is a minister's council, and in the first line of senior management are three deputy ministers. The department for water quality management (called Water Balance and Protection) reports to a deputy minister responsible for water, air, solid waste, and field

operations (called State Custody Sectors I and II). A second deputy manages legislation, and the third oversees environmental monitoring and management information (see organization charts). Special institutes and programs reporting directly to the SCE are the Department of Water Inspection (which supervises special environmental inspectorates for water in each watershed); the Slovak Hydrometeorological Institute (SHI); the State Institute for Landscape and Nature Protection (USOP); and the Institute for Urban Planning (URBION).

The Water Balance and Protection Department is responsible for coordinating overall policies and standards for water quality and for water monitoring and the water information system. Environmental quality standards for discharges and for in-stream uses are set by the SCE with technical advice from this department. The department has been the primary counterpart to the WASH team in the development of a decision support system for Danube water pollution.

The SCE also maintains the State Environmental Fund, which collects a portion of fines and sanctions for environmental improvements.

2.2.1 Regional Offices for Environment

Slovakia has seven regional offices for environment, which report to the SCE. There are also local environmental councils that provide input to the regional offices. Regional offices manage the full range of environmental permits and oversight and supervise the county offices of the environment.

Each regional office participates locally through a regional committee for environmental protection (CEP). The CEP's task is to coordinate decision making, enforce national laws, and coordinate investments to solve local problems. The CEP also ultimately decides on local interventions for the environmental control of water quality. Coordination is maintained with the regional environmental office for industrial oversight on water quality matters. The CEP has the authority to push the municipality to take action for environmental needs or require industry to remediate if it is out of compliance with law or agreements.

2.2.2 Regional Offices for Water Protection

Regional water quality environmental inspectorates (REIs) correspond to river basin organization and report on a separate line to the chief inspector's office in Bratislava. The chief inspector also reports separately to the commissioner of the SCE. These offices originally formed part of the Ministry of Forests and Water and were later transferred to the SCE. They are located in the Bratislava regional area, Nitra, Zilina, Banská Bystrica, the Kosice regional area, and Poprad.

The inspectorates maintain a sampling routine for industrial pollution and periodically take point source samples from industries.

A typical REI (the inspectorate located in the town of Nitra is used as the example here) will have one local chief inspector and about eight specialists divided among the areas of water

inspection, air inspection, and solid waste. The Nitra inspectorate has, for example, 1,200 registered sources of water pollution that it must monitor. Of these, 34 are considered important because of size and quantity of pollutants. They comprise a combination of industrial and agricultural point sources (large animal farms, for example). The office works in nine counties relating to the Nitra and lower Váh River basin. Because of the large geographic area to cover (and only one available vehicle), much of the industrial monitoring is left to the tests and results that the polluters themselves provide.

Periodic samples are taken to cross-check the self-reporting system. River samples are also taken by the river basin authorities, whose subsequent reports are also collected and analyzed by the regional inspectorate. The current routine only allows cross-checking every two years for the more important sources, and every three or four years for small violators.

A record is maintained for every monitored source (currently not computerized at local levels). Allowable standards (by law) are compared with real discharge values and fines are levied accordingly. The maximum fine allowed is 1 million korunas per violation (about $78,000 in 1992 U.S. dollars). In past years, many exceptions were granted for polluting industries, and sanctions have not significantly affected industries nor could seriously be counted as a factor of the cost of production. New legislation now being drafted will grant no exceptions, will require time periods to come within compliance, and will allow closure of violating industries that do not comply within specified time limits.

2.2.3 The Slovak Hydrometeorological Institute

The Slovak Hydrometeorological Institute (SHI) reports to the SCE and operates as one of its sources of scientific analysis, particularly for air and weather. It also maintains computerized data bases on water quality field data produced by the laboratories of the river basin authorities. The SHI is responsible for collecting and archiving environmental data and contracts with laboratories owned by river basin authorities for analysis. It also provides regional monitoring of the Danube water scheme for Gabčikovo, and this year is preparing to monitor the Tasra National Park. The Environmental Monitoring and Ecological Center was established at the SHI in 1992.

The SHI's duties regarding water quality monitoring are to do as follows:

- Store all available data in a computer system central data bank. The data is collected by the river authorities, who do lab analysis under contract for this service. (Only laboratories for air quality work are maintained at the institute.)
- Publish annual reports on surface water and groundwater.
- Coordinate environmental monitoring activities in Slovakia.

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2.3 The Ministry of Forests and Water

Water quantity management and water use in Slovakia are the responsibility of the Ministry of Forests and Water (MFW). The MFW has three major divisions: the Department of Forestry, the Wood Products Department, and the Department of Water Resources and Management. The Wood Products Department is a holdover from the days of state industry. It manages saw mills, furniture manufacture, pulp mills, and lumber production. The Department of Forestry works as a traditional forestry department, overseeing forest preservation, conservation, and management.

As its name implies, the Department of Water Resources and Management oversees water resources. It consists of a budget, economics, and planning section; a floods and dams section; and a drinking water and wastewater section. Other departments, each headed by a deputy, are the Water Energy Project (a special unit that deals with the Gabčikovo Dam Project), and a deputy for Budget, Economics, and Planning.

The MFW has two sets of jurisdictions that serve the water resources sector: A regional river basin management scheme with four authorities that relate to major catchment basins and one to the Danube; and five regional water distribution and wastewater companies (also called waterworks authorities). Both of these jurisdictions report to the ministry, although they operate with varying degrees of autonomy.

The regional river basin authorities deal with river flow regulation, floods control, and water supply storage (dams and reservoirs). Their job differs from that of the drinking water companies, whose job it is to treat and distribute drinking water, and treat wastewater. Drinking water standards are the responsibility of the Ministry of Health.

The MFW's current sources of finance for capital investment regarding wastewater treatment are

- the state budget for new investments;
- fees from selling water from river basin authorities; and
- joint investments under which new factories agree to finance treatment plants to deal with the increased loads they create.

2.3.1 River Basin Authorities

The four river basin authorities are organized to correspond to the four catchment areas: Danube, Váh, Hrón, and Homad. Their primary functions are licensing and controlling ship transport on waterways and dams; flow regulation; flood control; energy and hydroelectric use; water use (extraction) pumping fees and licensing; water quality testing (laboratory maintenance for the sector); channel improvement and maintenance; monitoring water discharges into the river; and operation and maintenance of facilities. They must control and secure the quality of the water in the river as well.

Fees (also called taxes) are paid to the river basin authorities for wastewater emissions into water bodies for agreed upon limits. Additionally, fines are charged for discharges beyond the agreed upon base. These are divided between the given authority and the SCE.

Exhibit 1 (below) provides an example of a Slovakian river basin authority.

Exhibit 1

The Váh River Basin Authority

The Váh River Basin Authority, located in the town of Piestany, is used here as one example of a typical Slovakian water authority, its functions, and its organizational structure. This river basin authority is responsible for the Váh River basin, which includes the upper Váh, the Orova, Nitra, and lower Váh. The total population is about 2.5 million people (the Nitra basin has 800,000 people). The Váh catchment area is 17,000 km^2 and comprises about 30 percent of the country. The main stream of the Váh is 380 km in length, and its tributaries are the Orova, Nitra, and Gitiva.

The authority has a legally delegated structure from the Ministry of Forests and Water with an executive director and a board of directors. The staff of the authority includes 1,470 engineers.

The authority is divided into six geographic regions (four on the Váh, two on the Nitra). Each divisional office has about 200 staff members, including technical personnel and laborers. Eighty percent are direct hire, and 20 percent are contract staff.

The authority has a budget that it must manage based upon the assigned income allotted to it from taxes and fines and the sale of water and products. The authority's total income is 420 million korunas (190 million from water sales and fines, 210 million from reservoirs and electric production, and 20 million from shipping permits). The Ministry of Finance assigns back allocations of budget based upon revenues. Approximately 80 percent of the taxes and other income of this authority is passed on to the government. The authority operates self-sufficiently and covers its operational costs with this income. It also sells gravel and produces some pipe products. The authority is moving toward partial privatization in the next two to three years.

The authority's primary duties include managing pumping and pumping stations, administration, water storage in reservoirs, and reservoir maintenance. The reservoir on the Orova has a capacity of 350 million cu m. Duties also include water quality control and maintenance, allotment of water usage among competing demands (irrigation, industry, drinking, electricity and hydropower, reservoirs, and dams), drainage, flood control, and channel preparation and maintenance for shipping for about 100 km.

(cont'd)

13

Exhibit 1 (cont'd)

The Nitra subbasin in particular presents water quality problems to the authority because of low flows in summer months and high pollution loads (dissolved oxygen is less than 1 ppm). Currently project plans are under way to build reservoirs to help manage flows and dilution.

All along the subbasin are industries and municipal pollutants. Seventy dischargers are monitored, with 40 being priority sources and 9 extreme polluters. The more extreme polluters produce BOD_5. The authority, however, does not have equipment to monitor chlorinated hydrocarbons.

About 50,000 people inhabit the township of Prievidza, which discharges 7 million cu m per year of BOD_5. Nearby in Nováky is a chemical plant, a power station (producing arsenic pollution due to ash that leaches from storage lagoons into the river), and a leather processing plant. Other townships produce loads in Porchai and Nitra (population, 80,000). In Dormi-Ottai, a sugar beet processing plant produces spirits.

In addition, spills occur from river transporters carrying coal, and ash is produced from the power station. The storage lagoons from the power plant have broken open three times, contaminating Nitra's groundwater.

Water that is supplied to regional water companies from river basin sources is sold to regional distribution companies. The price varies from .92 korunas/cu m to 5.0 at the upper cost range.

The river basin authority's duties in relation to the SCE are as follows:

- The authority grants permits for water extraction and use.
- Land use for river related and adjacent lands are legally prescribed but the river authority grants land use permits on construction.
- The river basin authority can report violations to the SCE but cannot enforce pollution laws itself. Ultimate authority for water quality is with the SCE.
- The local district authority on the environment (under the SCE) grants pollution permits and assigns basic taxes.

2.3.2 Regional Waterworks Authorities

Five drinking water authorities operate along large regional boundaries that coincide with major river basins in Slovakia: Bratislava City, West Slovakia in Bratislava, North Slovakia in Zilina, Middle Slovakia in Banská Bystrica, and East Slovakia in Kosice. These are state-owned companies that manage, distribute, and sell water. Their task is to operate as regional management units for water supply. Duties include planning, investments, managing municipal units, and operation and maintenance. Each management unit has many small community and municipal units. The exceptions are a number of village units that have constructed and

operate their own small systems. The focus of the regional water companies is mostly municipal or mixed municipal-regional.

Nationally, approximately 30 wastewater treatment plants are under construction in various stages, but funds are insufficient to complete them. The MFW estimates the current need to be about 1 billion korunas to finish the job in progress (1 kr = U.S. $.035). Slovakia has 160 operational wastewater treatment plants.

Exhibit 2 (next page) portrays a typical Slovakian water and wastewater company.

2.4 The Institute for Water Research

The Institute for Water Research provides research and studies related to water management, water treatment, forecasting, resource planning studies, wastewater and sludge treatment, hydrology engineering, data processing and information services, and hydraulics. It had been a government managed institute under the Ministry of Forests and Water but is now being made independent and is on its way to privatization. At the time of this study the institute had 350 staff members. It operates much the same way its sister institutes do in Hungary, Bulgaria, Romania, and Yugoslavia.

The institute's departments are as follows:

- Wastewater and Sludge Treatment
- Environmental and Water Management Information
- Industrial Property Protection
- Analysis and Water Protection
- Hydrologic Engineering
- Automated Data Processing
- Hydraulics
- Water Management Planning
- Water Treatment Technology

The institute's role in the water quality management sector has been to specify and define needs through studies and prepare criteria for standards and parameters. Construction companies, such as Hydro Consult, conduct detailed designs for construction projects using basic parameters and specifications provided by the institute under contract. Some of the institute's recent studies have included biological treatment for small plants and towns (5,000 to 20,000 people). The institute has also done growth projections for macro-level planning, and long-range land use planning for the Ministry of Forests and Water, the Slovak Commission on the Environment, and the Ministry of Agriculture. Each is involved in decisions on land and use data and studies provided by the institute.

Exhibit 2

The Western Slovakia Water and Wastewater Company, Nitra Branch Office

The Western Slovakia Water and Wastewater Company is headquartered in Bratislava. The branch office reviewed here is located in the township of Nitra (population 80,000), which is the economic and cultural center of the district. The town dates back to the 8th century and was the seat of the old Moravian Kingdom.

The company was reformed under national reorganization in 1991 and is responsible for water supplies to Nitra and the towns along the watershed of the Nitra and lower Váh River. It supervises 23 municipal systems, manages 320 km of water supply network, operates 3 wastewater treatment plants, and maintains 250 km of sewage network collectors and transmission. The Nitra office of the company employs 275 staff.

The wastewater treatment plant for Nitra was built in 1984 with a design capacity for 80,000 people. It employs mechanical and biological treatment with sludge treatment. Currently the plant must serve 150,000 people and is overloaded. Sixty percent of the population is connected to the sewer system. The plant employs 21 people who operate the plant and the plant laboratory. Construction of a new plant is under way with a budget of 400 million korunas.

The water and wastewater services provided to consumers are highly subsidized, but because water companies have not operated with business management systems, they have no precise available data on per unit costs and subsidies. They estimate that individuals would need to pay about 15 times the current cost if the company were privatized, to reflect the real cost of water and wastewater. The water authority has not been allowed to charge for the real costs of water. Current costs are 1.50 korunas per cu m for water and the same for wastewater. These costs represent a tariff increase. The year before this study, there were kr .60 for water and kr .20 for wastewater. Industry pays kr 5.25 per cu m for water and 4.25 per cu m for wastewater. A 30 percent tariff increase has been proposed for the current year. The system is metered and the company estimates about a 16 percent unaccounted for water rate (considered good).

The water and wastewater company must pay fines to the SCE and the river basin authority of Nitra for excess pollution loads coming from the wastewater treatment plant. The water company has been granted an exception, or allowance, of up to 35 mg/L of BOD_5 but, due to industrial production and lack of treatment capacity, the current load is 65 mg/L. The plant treatment flow capacity is 220 L/second, but the actual flow is 300-420 L/s. Some local industries have pretreatment plants operating. These include a brewery, a soft drink factory, and a wine production plant.

Nitra's drinking water must come from distant sources because the Nitra River is heavily polluted. A variety of sources is used. There are 30 deep water wells in Jelka Village, about 60 km away and situated next to the Little Danube Island (called "Corn Island" locally). Five pumping units are required to transport the water. Another source is located approximately 70 km away at Bonovita. A third source is 12 km away. The only treatment for this water is chlorination. When the Gabčikovo Dam becomes operational, an extra source will be available through bank filtering for an additional 300 L/s.

2.5 Laws and Enforcement

Past legislation in Slovakia compartmentalized laws relating to water quality control along the line of prior functional agencies. Air, water, soil, and forests all were dealt with as separate entities. With the creation of the SCE, a new comprehensive environmental law has been drafted whose primary goal will be to protect the environment. The portions dealing with air, soil, and solid waste were passed in 1990 and enacted into law. The portion dealing with water quality control and standards continues to be reviewed and is currently in parliamentary committee. Because Czechoslovakia has become a signatory of the European Environmental Agency Convention, the standards and legal structure of this new legislation are required.

Slovakia has no standard pollution load allocations for industry. Each industry sets up an individual, negotiated agreement on the amount of acceptable pollution loads, depending upon river absorption capacity and type of pollutants. The agreement is made between each municipal council and the industry. If an industry discharges into a sewer, the wastewater company levies a charge to cover the costs the industry will be required to pay as a fine. The fines that are levied are divided between the environmental fund of the SCE, the river basin authority, and the municipality.

The new standards under review are considered by many to be too high because treatment plant capacity is not up to the task, according to interview sources. The legislation provides for an incremental standards plan to increase standards and penalties and (it is hoped) offer assistance in finance and control measures for industry.

Previously, exceptions to standards could be obtained informally and often were. Industries made deals to donate to local needs and so on, and were granted waivers. From 1992 on, these loopholes will be closed. All outstanding waivers will be suspended, and revenues from fines will be used to construct treatment plants.

In the past, sanctions have been insufficient to cause polluters to change their treatment processes. End-of-pipe solutions (treatment, pretreatment, or increased municipal capacity) are often considered too costly. The new standards will require higher fines and will especially affect industries that will require pretreatment or that will need to change their industrial processes to minimize pollution.

Slovakia also maintains standards for plant emissions, post- wastewater treatment, and in-stream water quality. They are set according to the condition of the receiving waters, using the categorization scheme for river water quality and its use (1st level, 2nd level, 3rd level). As in Hungary, there have been master plans that set variable basin standards depending on downstream use and river conditions. These pertain to the amount of effluent produced according to individual parameters.

2.6 Sectoral Planning

The process of budget and policy development in Slovakia's water quality management sector is coordinated by the SCE but, ultimately, decisions on funding are made by the legislature.

The policy process is as follows:

1. SCE collects data, considers problems, and selects critical areas for action.
2. Proposals for interventions requiring investment are put forward to the government.
3. The Ministry of Finance includes the above in the budget proposals.
4. The legislature approves or rejects the budget.
5. Implementation is assigned to the appropriate organ: the Ministry of Agriculture, the Ministry of Forests and Water, or the SCE.

The current master plan for water resources development is about 15 years old and was developed by the Ministry of Forests and Water Resources. The plan covers water use and conservation: dams, water supply, source development, and protection. It was developed before attention to and focus on environmental issues were in vogue. The task of the SCE is to manage the program for redevelopment of a national master plan within the next year and incorporate into it environmental use issues. It will be developed by the Institute for Water Research under contract to the SCE. The institute will put forward a master plan on water management up to the year 2000.

2.7 Sectoral Finances and Tariffs

Currently water and wastewater in Slovakia remain highly subsidized within a centralized national system. The supply of untreated water passes from one organization to another (from the river basin authority to a regional water company). Under a national system this has been considered "the same pocket." The sale of untreated water to water distribution companies from river basin authorities is provided for by a uniform national rate that allows for cross-subsidy from areas where raw water ranges from moderately expensive to very expensive. Because of this system, sufficient income has been provided to river basin authorities in raw water sales to meet operational costs, but this does not allow for investment in water quality management and water resources planning and development.

About 50 percent of the drinking water systems are self-sufficient according to the MFW. The rest are higher-cost systems with long transmission lines. However, since January 1991, water quality standards have required further treatment, and therefore costs will go even higher. The wastewater system, in general, does not cover costs and runs in the red. Problems with tariffs account for the deficit.

The total cost of water and wastewater per household connection (or apartment family) is about 20 korunas per month (approximately U.S. $.71). At the time of this writing, the SCE

estimated the average monthly family income to be about kr 3,800 (approximately U.S. $135.00 in February 1992). Fees are kr 1.50 per house per cu m for water and kr 1.50 for wastewater, graduated up for more usage. Systems are metered, but usually apartment buildings charge flat rates because individual apartments are not metered. Individual metering is difficult because in many cases, for example, hot water is provided on one line from a central source, and cold water on another line. Rates are higher for industry and are graduated based on quantity used. Industry pays kr 5.25 for water and kr 4.25 for wastewater. The average use per connection for Bratislava (including industrial) is about 500 L per day. This breaks down to about 200 L per household for domestic use. The balance is for industrial use.

2.8 Institutional Issues

The following institutional issues limit the sector's ability to implement fully a water resource decision making model and program after the pilot phase.

1. Monitoring infrastructure: In order for an emission management system to work, a complete and well managed, well equipped monitoring system needs to be in place. Currently, samples are taken far too infrequently, and too much "self-monitoring" takes place for there to be sufficient confidence in the data provided.

   Monitoring and permits for water use and pollutants are given by the SCE at the district office levels. One of the problems the SCE is experiencing is that currently the Ministry of Forests and Water oversees regulations and self-monitoring in terms of data collection and analysis. It then passes on this information to the data collection service the SCE maintains at the Slovak Hydrometeorological Institute. The SCE feels this is a conflict of interest and that it should have its own monitoring capability to serve as a check on the system.

   The SCE plans to strengthen the SHI to provide data gathering and testing, and water quality control and planning capabilities. This improvement is desired to provide an independent source for environmental control.

2. Tariff policy: The intention expressed in interviews is that tariff policy move toward a price for water and wastewater that reflects the real cost of production, operation, and maintenance. The system is currently about 50 percent subsidized, and prices are 20 korunas per month per family for water and wastewater combined. The average per capita income is kr 3,800 per month (about one-half of 1 percent of total monthly per capita income).

   If a new policy is adopted following the principle that the polluter pays, it will create incentives for pollution abatement and help finance wastewater treatment capital costs. This begins with individuals but also includes businesses. The current policy of wastewater and water subsidy severely limits the ability to raise revenues, and would also be considered a limitation by any multilateral lender. The current direction to raise tariffs slowly is positive. Undoubtedly, more will be required.

ORGANIZATIONAL CHARTS: CSFR

Chart 1

STRUCTURAL RELATIONSHIP OF ENVIRONMENTAL AUTHORITIES IN SLOVAKIA

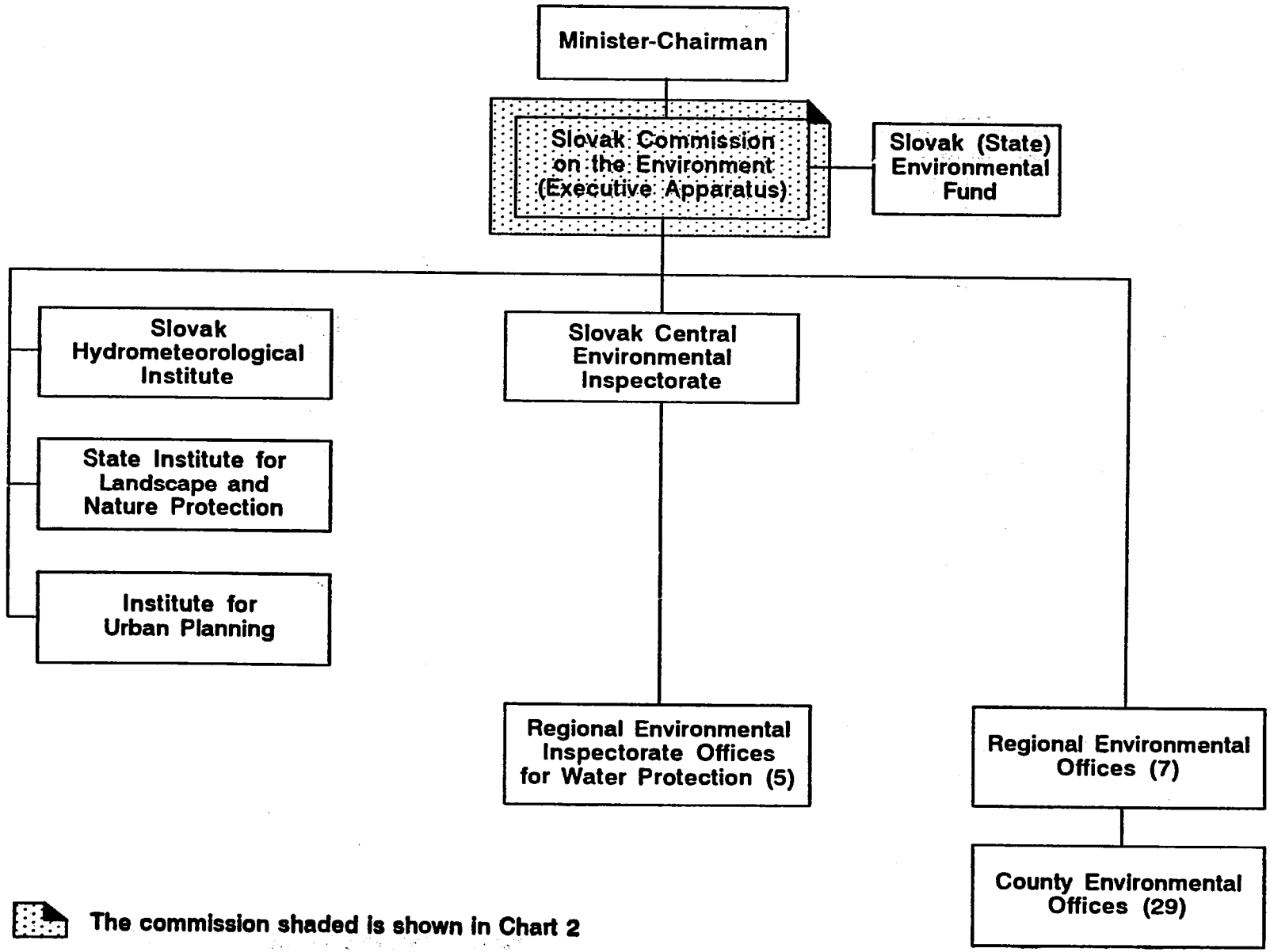

Chart 2

SLOVAK COMMISSION ON THE ENVIRONMENT

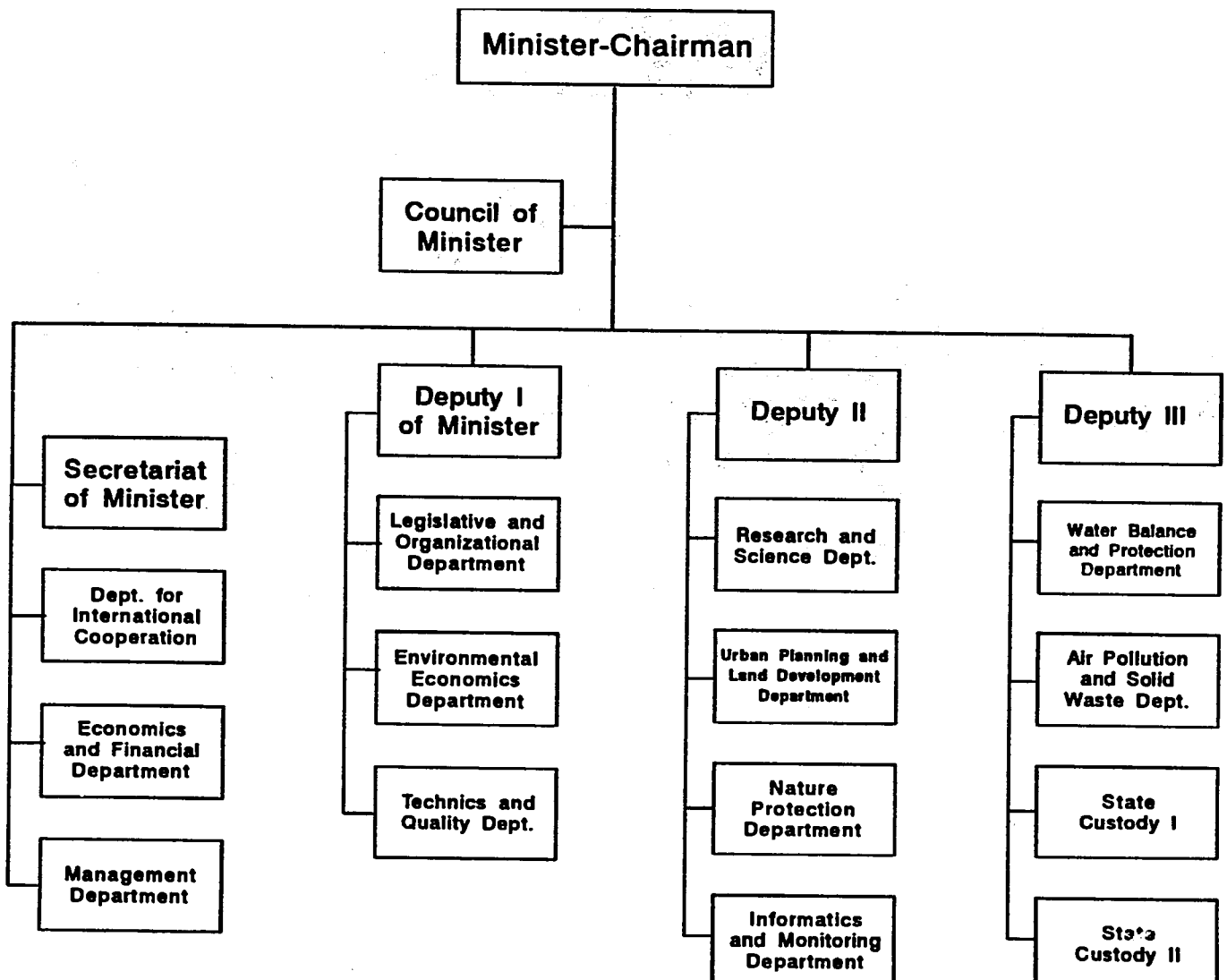

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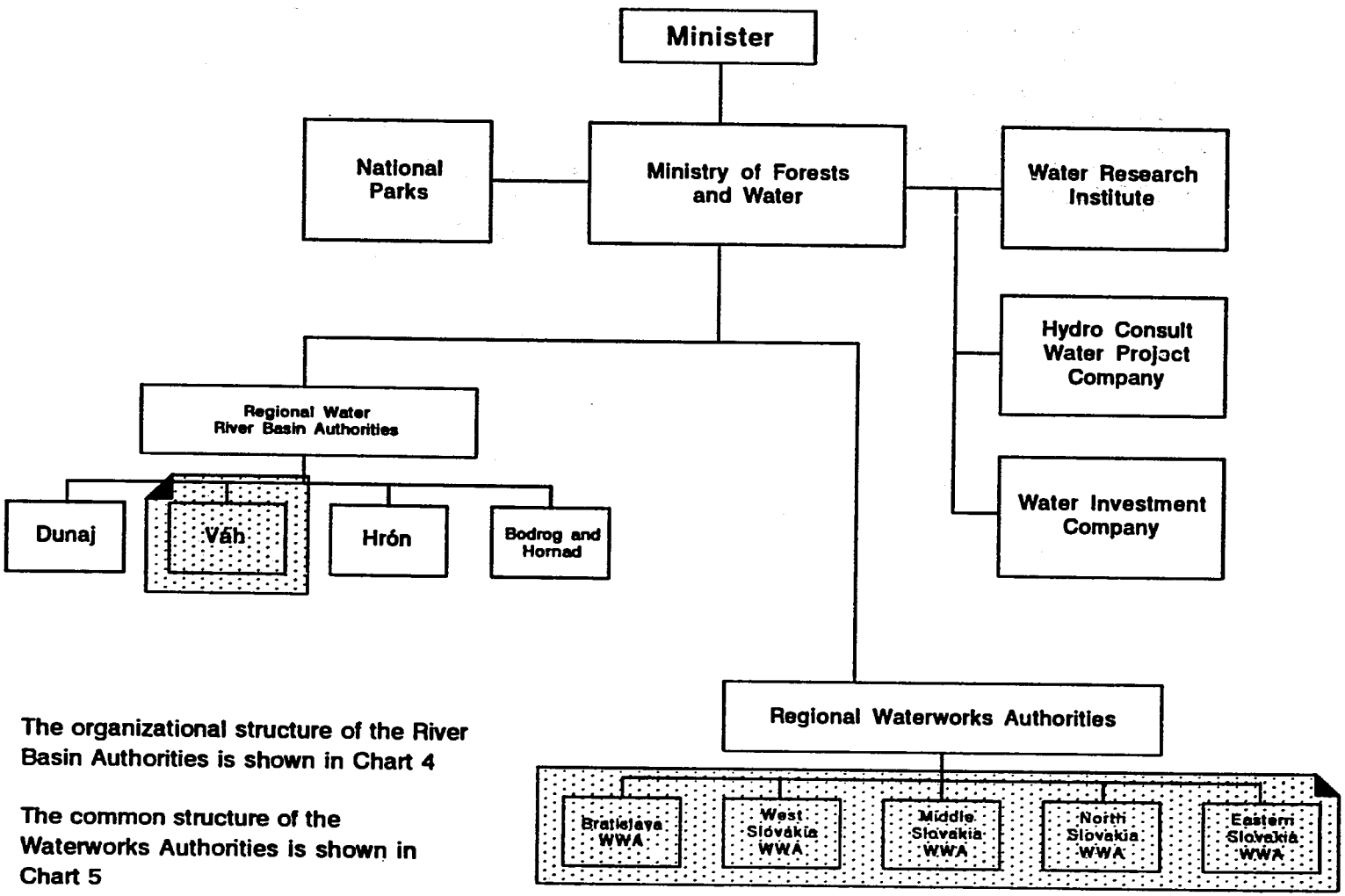
Chart 3

ORGANIZATIONAL STRUCTURE OF THE WATER AUTHORITIES IN SLOVAKIA



The organizational structure of the River Basin Authorities is shown in Chart 4

The common structure of the Waterworks Authorities is shown in Chart 5

Chart 4

THE VAH RIVER BASIN AUTHORITY, SLOVAKIA

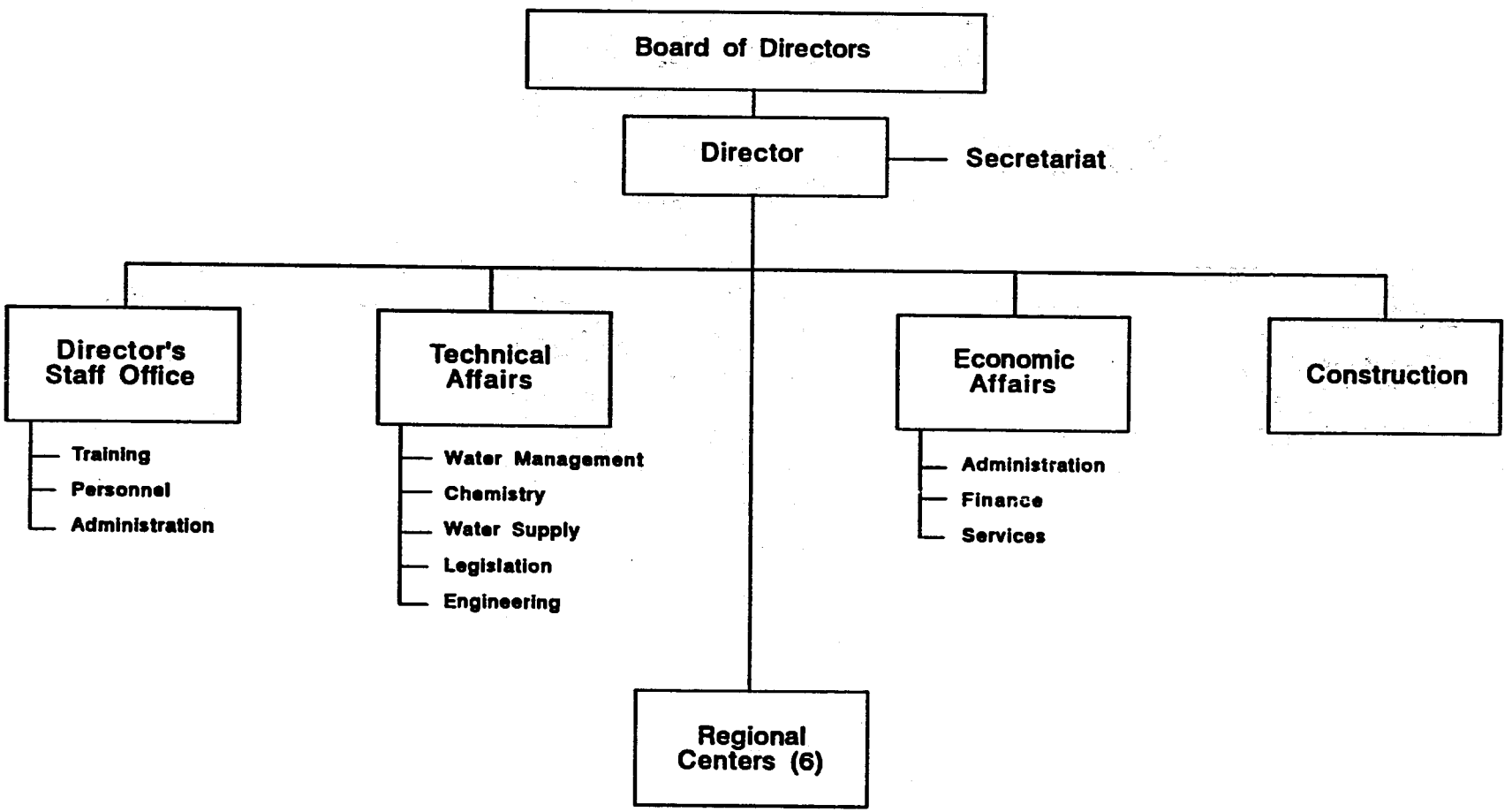


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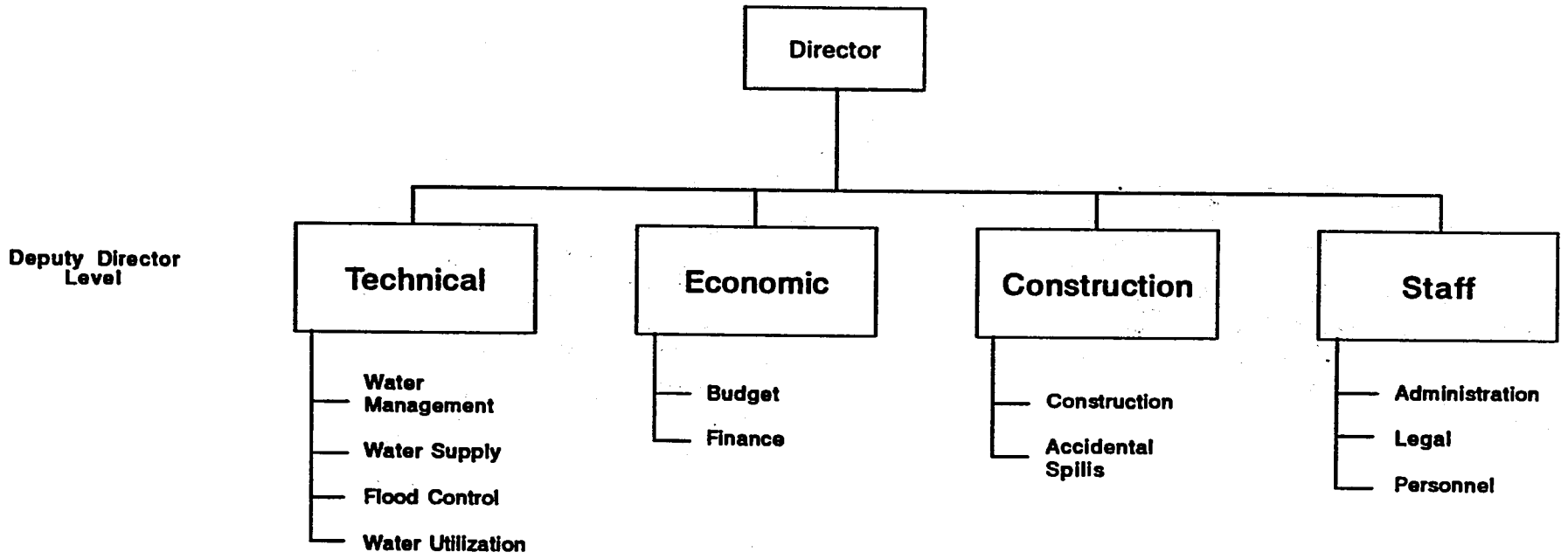
Chart 5

ORGANIZATIONAL STRUCTURE OF FIVE REGIONAL WATERWORKS AUTHORITIES OF SLOVAKIA (RIVER BASIN)



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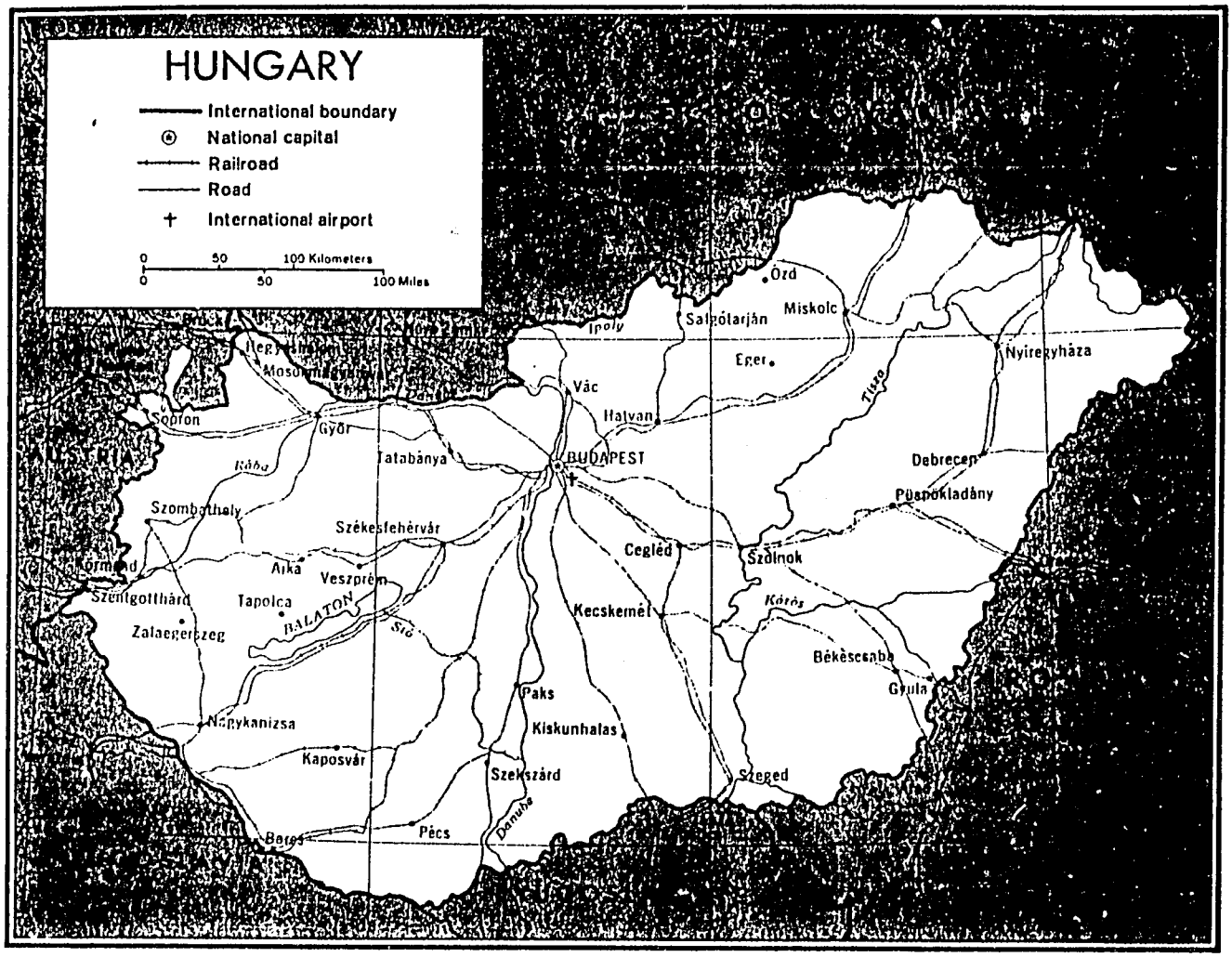
INSTITUTIONAL STUDY: HUNGARY


HUNGARY
International boundary
National capital
Railroad
Road
International airport
0 50 100 Kilometers
0 50 100 Miles
Ózd
Miskolc
Salgótarján
Ipoly
Eger
Nyíregyháza
Tisza
Vác
Hatvan
Sopron
Győr
Rába
Tatabánya
BUDAPEST
Debrecen
Püspökladány
Szombathely
Székesfehérvár
Cegléd
Szolnok
Körmend
Aika
Veszprém
Szentgotthárd
Tapolca
BALATON
Sió
Kecskemét
Körös
Zalaegerszeg
Békéscsaba
Gyula
Paks
Nagykanizsa
Kiskunhalas
Kaposvár
Szekszárd
Szeged
Pécs
Danube
Baja

INSTITUTIONAL STUDY: HUNGARY

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1. SECTORAL OVERVIEW AND BACKGROUND

1.1 Political Organization and Population

Hungary maintains a parliamentary system made up of elected representatives. It is headed by a general assembly, which elects a council of ministers and the president. Hungary is divided into 19 counties, each of which has an elected council. In all, there are 120 towns with town councils and 3,200 communities. The total population is 10.27 million, which represents a slight decline since the 1985 census, which counted 10.66 million inhabitants. Just over half of the population live in towns (56.4 percent in 1985); the rest reside in villages and rural settlements. The largest city is the capital, Budapest, with about 2.1 million people. Approximately half of the total urban population live in Budapest and five other towns with populations over 100,000. Eighty-four percent of the population have piped drinking water and 46 percent are served with a public sewer collector. Half of the collected sewage is treated.

Hungary is 93,000 km^2 in size and is located entirely within the Carpathian basin. The Danube catchment area constitutes 48 percent of the territory, and the Tisza subcatchment, which flows into the Danube, makes up the remaining 52 percent. Hungary is in the center of middle Europe and the center of the overall Danube catchment system. To the north is the Slovakian portion of Czechoslovakia and to the west is Austria. From the former Yugoslav federation there is Slovenia to the southwest, with Croatia and Serbia due south. On the east and southeast borders is Romania, and a small corner of the Ukraine Republic borders on the northeast where the Tisza River flows in. Formerly the old Austro-Hungarian Empire extended out from this center to encompass the entire central basin area formed by the Carpathians and the Austrian and Swiss Alps. Remnants of Hungarian-speaking populations remain in most bordering countries.

1.2 Relation to the Danube River [a]

The main territory of Hungary is crossed by two main rivers, the Danube and the Tisza. To the south, the Dráva River drains from the Swiss Alps and the south slopes of the Bakony range in Hungary, and runs along the southwest boundary with Croatia before joining the Danube.

Almost all rivers in Hungary originate abroad. The Danube is the largest in terms of flow volume and runs along the border with Slovakia before turning south toward Budapest. The Sajo, Homad, and Bodrog come from Slovakia and join the Tisza, which flows from Ukraine. The west slopes of the Carpathian drain from Romania, where the rivers Szamos, Krasima,

[a] For more detailed information on the Danube and water resources in Hungary, refer to the technical report on the country in Volume III.

the three Kroses, and the Maros flow down and join the Tisza, which flows south to and joins the Danube above Belgrade.

Upstream from Hungary, the Danube takes water draining from the Alps in the west and the Carpathian range in the north and east. Hungary is situated in a basin and has two plains areas: the Little Hungarian Plain in the west and the Great Hungarian Plain in the center of the country. The Tisza crosses the Great Hungarian Plain and moves sluggishly across this semi-arid area, which receives precipitation of only 300 mm/per year. Periodically severe droughts hit the area, followed by opposite extremes of floods on the plain.

1.3 Current Trends in the Sector

1.3.1 Devolution of Authority

During the two years preceding this review a great deal of structural, organizational, and economic changes took place within Hungary. The water resources sector has built into it a strong environmental protection presence and policy with the formation in 1989 of the Ministry of Environmental Protection and Regional Development. This agency has taken responsibility for enforcing pollution controls from the agencies that formerly had managed water and wastewater and all other water resources. The regional development focus of the ministry also requires that it manage river water quality in basins through its regional environmental inspectorates and its nature conservation directorates.

Parallel to this has been the overall government process of increasingly moving toward a mixed capitalist/socialist economic system and overall decentralization and devolution of services, resources, and power to local and regional entities. Former government services such as water provision, state research institutes, and industrial ownership have been moved toward self-sufficiency, privatization, or devolution. Hungary has led all of the central and eastern European countries within the former Socialist Bloc with these programs, as well as a strong ecological awareness movement. While all four countries reviewed were found to be following similar paths within the water quality management sector, Hungary appeared to be about two years ahead of most.

With all of the above movement and restructuring, confusion is occurring at operational levels. Individuals who worked for county water and wastewater companies, which operated as subsidized state enterprises, must now shift their loyalty to a municipal company or limited shareholding company that must operate to cover its costs. Moving toward financial and commercial operations is new. The process of billing and collecting, setting tariffs, and operating as a business without state subsidies has thrust new responsibilities on local institutions that have no experience in running water and wastewater companies to cover costs.

Despite the adjustments and changes taking place, a program for regulation is growing in Hungary:

- A new environmental protection act is being developed to create new policy that will
  - incorporate positive elements from prior legislation;
  - set new objectives for each watershed basin according to use, ecology, environment, and land use; and
  - require environmental impact assessments for all new development and industry.
- The water quality monitoring program is being upgraded to comply with European Community standards.
- A good national program exists that matches grants for small villages and towns to construct water and wastewater facilities. This is administered by the Ministry of the Interior. When towns can collect 30 to 40 percent of the cost of a treatment plant, the govemment will provide a matching grant. Construction programs are going on all over the country using this program.

1.3.2 Water Quality Management System

A set of priority, impact areas has been set up for national attention in water quality control and management. These priorities have been in effect for some years and include Lake Balaton (which has been restored to such quality that bathing is permitted), drinking water protection, recreational areas along the Danube and other rivers, and irrigation zones. In addition to these priorities are programs to determine and maintain effluent standards, monitoring procedures, and action programs.

Sampling stations had been set up since 1968 for a national monitoring system with public health agencies and the water authorities. These inspection structures have since been replaced by the new system of regional environmental inspectorates, but the monitoring system continues. Sampling routines established earlier and the water quality criteria for different uses (drinking, industrial, agricultural, commercial fishing, and recreation) continue to be used. New environmental legislation for quality standards for air, water, and soil are now being developed by parliamentary committee, in conjunction with the Ministry of the Environment and its research institute.

In 1992, Hungary is developing a revised national action plan for water quality control and investment in the environment as part of its cooperation with the European Community.

1.4 Overview of Roles and Responsibilities

Table 1 presents a quick reference to the organization of the water quality management sector and the roles of major entities that manage water quality in relation to the Danube in Hungary. At the end of the study are six organizational charts that describe the various agencies in the sector in more detail.

Table 1

SUMMARY OF ROLES AND RESPONSIBILITIES
HUNGARY

Organization	Responsibilities
1. The Ministry of Environmental Protection and Regional Development	Establishes national policy and regulations for water quality control and management. Sets standards for water quality and effluent. Controls and supervises, through its National Environmental Protection Authority, the regional inspectorates and the national water quality monitoring network.
Department for Air, Water, and Soil Protection	Provides policy analysis and planning for water quality control and management. Coordinates the development of standards, legislation on water quality, and in-stream water quality. Develops annual report on the status of water quality.
National Environmental Protection Authority	Manages and supervises 12 regional environmental inspectorates; compiles national data base on sources of pollution and water effluent and in-stream water quality; enforces and collects fines for sanctions on pollution.
Institute for Environmental Management	Provides environmental research, information, and data analysis. Maintains national data base on water quality monitoring network.
2. The Ministry of Telecommunications, Transport, and Water Management	Large umbrella agency for public utilities, including airports, roads, public transportation, and water.
National Water Authority	Implements water services, planning, and construction of water and wastewater systems. Enforces national policy relating to drainage, accidental water spills and pollution, and inland navigation. Responsible for river basin management through 12 district water authorities and manages some drinking water and wastewater through 5 regional companies. Maintains international bilateral water management agreements (dams and floods).
District Water Authorities (12)	Responsible for river basin management, flood control, accidental spills in rivers, river channel maintenance, and construction of waterways. Grant licenses (with concurrence from the environmental inspectorates) for water extraction, water supply and treatment, and wastewater treatment. Provide technical assistance to local councils for water and wastewater. Issue water use permits. Under the National Water Authority.

Water Management Services Department	Operates water and wastewater companies in five regional areas of the country; has state enterprises where local authorities do not operate. State enterprises are in transition to limited shareholding companies. Under the National Water Authority.
3. Scientific Research Center for Water Resources Development	Established in 1952. Formerly under the National Water Authority to provide water-related research and to serve agricultural and other water use research: hydrology, hydrobiology, engineering, and water pollution control. Now, a portion of the organization has been made a shareholding state enterprise, and recently 40 percent of shares were purchased by private foreign interests.
4. Ministry of Health and Welfare	Sets and monitors drinking water standards with the assistance of the National Public Health Institute. Maintains national laboratory network for sampling drinking water. Issues water use permits for public consumption.
5. Ministry of the Interior	Coordinates activity of local government and manages matching fund grants to public utilities for financing water and wastewater system construction.
County Governments (19)	Oversee county water quality management and permits for wastewater and industrial discharge into county and municipal systems. Enforces sanctions and fines for discharges into municipal systems.
6. Large Municipal Companies	Large cities all operate their own water and wastewater management units through special departments under the mayor. Local councils divide large urban cities into neighborhood units. The latter must be involved in water and wastewater provision decisions, tariffs, and investments.
7. Municipal Government	Smaller towns also operate municipal water and wastewater companies. Former county water companies now are owned by municipalities that either operate them directly or have formed limited shareholding companies to do so. The municipal government operates water and wastewater treatment plants and grants land use permits.
8. The Ministry of Agriculture and Food	Monitors surface water and sediment for pesticide residue for agricultural use, irrigation, and fish ponds.

2. WATER QUALITY MANAGEMENT INSTITUTIONS

2.1 Brief Overview and Context of Sector

2.1.1 Historical Background

Water quality management sector functions are assigned to different agencies in Hungary. One primary set of duties is for water management and supply, the other is for environmental control. Water management is divided into several different levels and agencies. Environment is assigned to one agency that operates at national and regional levels. Water and wastewater extend down to county and municipal jurisdictions.

Because the current configuration of the sector is somewhat complex, it is important to describe the evolution of water quality management within Hungary. The roots of these changes can be traced to the establishment of the water resources management sector some 30 years ago.

When Hungary formed an industrialized state following World War II, it began an extensive reconstruction and industrialization program. The development of the modern water supply system began at that time without sufficient corresponding wastewater treatment, and little attention was given to the environment and water quality protection. Industrial development did not include measures to protect water development.

Water quality management began with the formation in 1960 of the National Water Authority (also referred to as the OVF) and 12 district water authorities. In 1961, the first governmental decree on sanctions against wastewater pollution was issued. In 1966, a water quality inspectorate was formed within the OVF.

The water quality inspectorate was granted authority to levy fines based upon pollution loads into water bodies. It used a system that considered river conditions and downstream use and assigned different parameter loads accordingly. A pollution charge rate was based on kilograms of individual pollutants discharged (see Section 2.5 for more on sanctions). Funds collected went into a central water fund for solving pollution problems. By 1970, the OVF was allowed to fine industrial dischargers dumping into public sewers. New regulations were issued in 1984 that updated old laws and increased fines considerably.

The recordkeeping and structure of this inspectorate continue to this day, but now works as a part of the National Environmental Protection Authority; data base management is done by the Institute for Environmental Management; both are under the Ministry of Environmental Protection and Regional Development (MEPRD).

Before the MEPRD was formed, the Fourth Water Act of 1964 was amended in December 1987 to form the Ministry of Environmental Protection and Water Development (MEPWD) out of the former National Environmental Protection and Nature Conservation Authority and the National Water Authority. This amendment assigned broad responsibility for the regulation and

control of water resources management and water quality management to this new entity. This agency had a life of about three years.

Due to public and political pressure resulting from the ecological movement, a further amendment separated out the National Water Authority from the MEPWD and assigned it to the Ministry of Telecommunications, Transport, and Water Management, which oversees all Hungarian national utilities except electricity. The MEPRD was thus formed in its current structure in the latter part of 1990, and it retained responsibility for all water quality control and water monitoring, with the exception of health monitoring, which continues to be handled by the Ministry of Health and Welfare.

Field operations and monitoring continue through the system of 12 regional inspectorates. The regional inspectorates report to the National Environmental Protection Authority (NEPA), headquartered in Budapest. The director of the NEPA reports to the permanent secretary of MEPRD. The NEPA considers itself "operations," while the corresponding technical department (air, water, and soil) in the ministry sets norms and policy.

2.1.2 Overview of Drinking Water and Wastewater Responsibilities

The following entities supply and operate drinking water and wastewater plants in Hungary:

- regional water and wastewater companies belonging to the Ministry of Telecommunications, Transport, and Water Management, and organized under the OVF;
- municipal government in large cities and towns, and local government in villages; and
- shareholding companies under county or municipal charter.

These entities deal with the treatment of drinking water and the operation and maintenance of the sewage treatment plants. The complicated nature of these arrangements is due to the transition process that has been taking place in the past two years. The largest part of the water supply industry in Hungary used to be managed by county waterworks operations, which were state companies. Another portion was operated by the OVF. In the decentralization/devolution process, county operations were turned over to local authorities, who had the option of operating them or setting up shareholding companies to do so.

The OVF continues to maintain regional water and wastewater companies temporarily in the former status until their final disposition is decided. It manages five regional drinking water companies, which supply water and manage wastewater within their district areas and also supply water companies in some cases. Generally, municipal governmental units and shareholding water companies do not operate in the same geographic territory in which the OVF regional companies do.

At the time of this writing, all of the regional water companies were in the process of being decentralized to some extent. Interview sources say the regional companies will probably

remain under the direct management and control of the OVF but may be set up through concessions or contracts for semi-private operators to run for the government.

Enterprises that are now reorganized and that fall under the responsibility of local government have an administrative connection to the Ministry of the Interior because the latter advises local government and provides certain funding and support.

A number of small communities have formed their own associations and have applied for assistance to build small community water systems under a matching grant program from this ministry.

The OVF continues to design and construct water and wastewater systems.

2.2 The Ministry of Environmental Protection and Regional Development

The Ministry of Environmental Protection and Regional Development (MEPRD) establishes national policy and regulations for water quality control and management and all other environmental areas (air, soils, and solid waste). It sets standards for water quality and effluent, and controls and supervises, through its National Environmental Protection Authority, 12 regional environmental inspectorates and the national water quality monitoring network. (See the organizational chart for this agency at the end of this study.)

Established in its present form in late 1990, the ministry is organized under a minister and a permanent secretary. Four assistant state secretaries manage technical departments in the following areas: regional development, nature conservation (national parks and conservation districts), architecture and human settlements, and environmental protection.

The ministry operates a variety of staff offices: legislation and administration, economics/budget, research and education, international relations, information systems, human resources, and personnel. Two national agencies are under the umbrella: the National Agency for Historic Monuments and the National Meteorological Service. The Institute for Environmental Management (called KGI locally) is in transition to become a foundation but continues to be owned by the ministry. Its director reports to the minister.

Within the technical section under the state secretary dealing with environmental protection are three staff units: the Department for Environmental Policy and Analysis, the Department for Environmental Technology, and the Department for Air, Water and Soil Protection.

The Department for Air, Water and Soil Protection is the major policy and coordination office relating to the water quality management sector. This office provides normative oversight, policy analysis, and planning for water quality control and management. It coordinates the development of standards and legislation on water quality, and develops an annual report on the status of water quality in Hungary. The department has been the counterpart office to the USAID project for a water quality decision support system and inherits management of the system as WASH completes its task.

2.2.1 National Environmental Protection Authority

The National Environmental Protection Authority (NEPA) compiles a national data base on sources of pollution. Additionally, it enforces and collects fines from sanctions on pollution, and plans implementation actions for all environmental programs linked to regional structures. The NEPA is on a separate managerial line within the MEPRD (see organizational chart). It maintains a central office and 12 regional environmental inspectorates, and reports to the permanent secretary for environment. Specific operational management for inspections and monitoring is done by the regional inspectorates.

2.2.2 Regional Environmental Inspectorates

Hungary has 19 counties and 8 administrative regions. However, the MEPRD has set up its jurisdictions along major watershed areas, in the form of 12 environmental protection authorities, or regional environmental inspectorates. They are

- The North Transdanubian
- Central Danube Valley
- Lower Danube Valley
- Central Transdanubian
- South Transdanubian
- West Transdanubian
- Upper Tisza Valley
- North Hungarian
- Central Tisza Region
- Transtiszian
- Lower Tisza Region
- Körös Region

Duties of the inspectorates include monitoring surface, ground, and sewage discharge and point source discharges directly into water bodies. They also control the quality of water in these bodies and issue permits for discharges of water relating to these bodies if the withdrawal or discharge is directly into the water body or river. The municipal government or corresponding district council issues permits for discharging into the municipal sewers or county, but when the effluent leaves the municipal treatment plant and goes into a water body, the permit and fine/sanction process is between the municipality as discharger and the environmental inspectorate (i.e., a municipality is considered a direct discharger and must be licensed and fined accordingly).

Each regional inspectorate has a water quality program and a department that manages it. The program covers in-stream and point source water.

- *In-stream program:* All surface bodies are sampled at strategic points every two weeks and selected points every week. This is part of the national sampling program called The National Harmonizing Program. These data are forwarded to the KGI, which verifies the data and supplies summary data to the various users (approximately 30 different entities receive these data, including universities, other institutes, water authorities, and ministries).

- *Point source program:* This is a variable sampling program, depending on the size of the dischargers. Small dischargers are sampled randomly 2 to 3 times a year, large dischargers 8 to 10 times a year. Very large polluters are required to maintain a constant laboratory sampling program internally and produce reports. Random samples are taken a few times a year to validate their reports.

The regional inspectorate at Győr, for example, has 102 employees, 5 of whom work full time collecting samples. These 5 individuals must cover 300 villages and 10 towns, and monitor 200 industries. The law requires that a minimum of two samples per year be taken from a point source in order to be able to impose a fine. The inspectorate staff has one vehicle, which is reportedly in continuous operation during working hours. The inspectorate believes its work force is too small to handle its tasks.

In the North Transdanubian inspectorate region, industries are considered under control for the most part. Most large industries have plants that provide full treatment if they directly discharge into rivers. If they discharge into municipal sewers, pretreatment is required. If capacity is inadequate, they pay fines. All new industries are required to install pretreatment or full treatment equipment. Many former heavily polluting industries have closed in this region (leather tanning, for example).

The biggest problem in the North is considered to be municipal wastewater, as very few effective municipal plants exist. Only the township of Tata and one other are in compliance with standards. Many municipalities directly discharge into the Danube. The plant at Győr (population 150,000) is under construction, but this will not solve the problem because its capacity will only manage about half of the required amount, according to the inspectorate. The large cities need financing sources for municipal infrastructure and treatment plants.

2.3 The Ministry of Telecommunications, Transport, and Water Management

The Ministry of Telecommunications, Transport, and Water Management (MTTWM) is a large umbrella ministry that holds most of the national infrastructure management under its broad wings. It has national authorities for Navigation, Railways, Roads, Aviation, and Telecommunications (see organizational chart). There is a separate authority for water

management headed by a deputy state secretary. Under this is the National Water Authority (OVF), whose head reports to the deputy state secretary.

Within the central structure of the OVF, there are three major technical departments and a number of staff offices. The technical departments are Flood Control and River Training, Water Use and Environmental Protection, Water Management Services, and the staff offices headed by the Secretariat. Staff offices include budget, administration/legal, personnel, and international relations.

2.3.1 District Water Authorities

At the regional level, the National Water Authority manages the 12 district water authorities. They correspond to the same districts, and in fact share the same office buildings, as the regional environmental inspectorates listed above. River basin management takes place in the 12 regional units. Duties consist of flood control, water pumping, river channel maintenance, and accidental spills monitoring.

A district water authority is organized with three departments, a technical department (water management, water supply, flood control, and water use), an economics department (finance, budget, accounting, collections, and payment), and a construction department (spills and river cleanup, maintenance, and construction).

One of the duties related to water quality management is to issue permits for water rights. These are permits to withdraw water and use it for drinking or industrial use. The permit requires a preliminary, construction, and operational clearance. Each stage requires documentation (design and planning). In addition, local government councils must issue a land use permit, and a clearance from the corresponding environmental protection office is required.

2.3.2 Regional Waterworks Companies

The Water Management Services Division of the OVF is responsible for five regional waterworks companies, which are state owned. They are considered commercial companies and provide piped, treated water to communities. The companies operate waterworks and sewerage companies down to the local level within their geographic coverage areas.

2.4 Water and Wastewater Fees

The cost of water and wastewater now is based on a variable tariff throughout Hungary. Each waterworks company operates as a cost center. In some cases, the tariff is set low and subsidized out of general funds if a community cost is very high and the ability to pay is low. In the past, charges have been standardized and cross-subsidized nationally. It is difficult to move toward a metered system for each family or user because in most urban centers families

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live in large apartment complexes. In each building, there is one meter for hot water and one for cold water. Hot water often comes from a central source. The rental fee for apartments includes the charge for water and wastewater and is rationalized (spread equally to all tenants).

For example, in Budapest, the fee for water is 11.50 forints/cu m and 9.50 per cu m for wastewater (the exchange rate at the time of this writing was U.S. $1.00/74.00 forints). Most families pay about 20 forints per month for water and sewerage (about U.S. $.37). The north Budapest wastewater treatment plant estimates that it costs about 27 forints to treat a cubic meter of sewage and that tariffs are highly subsidized. In smaller towns and cities, the charges for water and wastewater are much higher. Fees there run to 30 or 35 forints per month. Parliament has set a national limit for tariffs at 60 forints.

2.5 Fines and Sanctions

There are two levels of administration of fines or sanctions for pollution in Hungary. One is administered by the municipality that receives pollution loads into its wastewater treatment system. The other is administered by the NEPA through its inspectorate system. The NEPA fines the municipality at the end of the line as it passes on the untreated portion of the load into a river.

Hungary developed a fine and sanction system for polluting industries and municipalities early on. It maintains an integrated set of technical, economic, and administrative measures that started with the Water Law of 1964. This law has been amended many times. In 1969 the government was permitted to issue effluent permits for direct discharge into a water body. This law specified that the fine was based upon the quantity being discharged into the water. In 1970, a provision was added that limited the amount of discharge into a municipal sewer. This was intended to stimulate the construction of pretreatment facilities or to encourage changes in industrial processing. New regulations were again passed in 1984 to increase the amount charged.

At the same time, a system of priority protection areas was established. These were given geographic zonal definition and a quality marker from 1 to 5. A 1 rating constitutes a water body that cannot easily dilute or purify itself and also has high economic usefulness. Sanctions for polluting this type of body are very severe. Lake Balaton has a 1 rating. The Danube River has the lowest rating, 5, based on its high flow rate and dilution factor. Rivers that are highly polluted when entering Hungary are given ratings in the 2 and 3 categories.

The formula for setting a sanction is based on a yearly load by parameter and amount in cubic meters per day, the amount of days discharging occurs in a year, the concentration of specific parameters compared with the limit for each, consideration of the dilution in the water body, and the priority area factor. Other factors that can be applied relate to toxins, danger of pollutants to life, and the number of years of pollution.

The parameters measured and the amounts charged are noted in the "Hungary Technical Report" in Volume III. They include standards factors such as chemical oxygen demand

(COD), biological oxygen demand (BOD_5), oil, organic solvents, pH, dissolved solids, phenols, suspended solids, tar, nitrates and nitrites, iron, manganese, detergents, sulphide, free chlorine, fluoride, phosphorus, and toxic materials (heavy metals).

The regional authorities are the first line of management for issuing permits for water and wastewater and for overseeing water quality control. Sanctions and penalties are operated by both the local authorities and at the national level, if they are major enough. The court system adjudicates disputes. The sanctions system sets up discharge limits. If limits are exceeded, a fine is assessed.

Ministry of the Environment officials claim fines were too low in past years to serve as a deterrent. With new regulations now under development, it is expected that within two years policy will provide sanctions that will be significant, and that those industries that remain operational (considering the economic transitions taking place) will begin to exercise options either to change their manufacturing processes or increase treatment and pretreatment capacity.

The data base on polluters and sanctions is maintained for the ministry in a centralized system by the Institute for Environmental Management.

2.6 Institutional Issues

The issues listed below are those that may limit the ability of the water quality management sector in Hungary to implement fully a water resources decision making model such as the one USAID is assisting the Ministry of the Environment to develop.

The institutional infrastructure is in place in Hungary to manage water quality in the sector and to operate a decision support system. Established are a legal and policy structure that is working with a sanctions system, administrative systems, routines for sampling and water quality control, and well-trained and experienced staff. Additionally, industrial policy is aimed at protecting water bodies.

The following issues will require attention.

1. *Sector finance and tariffs*: Overall water quality management in Hungary will require intervention to create municipal wastewater systems along all the major rivers (about 50 percent of municipal wastewater now receives treatment). Currently, tariffs are unable to cover operation and maintenance of those systems now working. Undoubtedly, international multilateral lending sources will require increased tariffs to finance, construct, amplify, and upgrade collection and treatment systems. The tariff structure will require substantial increments to begin to cover some of the debt service.

2. *Point source monitoring and infrastructure*: The frequency of sampling for industry and municipal wastewater point sources of 8 to 10 times a year and self-reporting for large loads with spot checks should probably be reviewed and a determination made of

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exactly how frequently a control program should operate to maximize controls and costs.

3. *Industrial policy*: Charges for pollution to industry, while raised and improving, will probably require yearly increases so that industries will find it more cost-effective either to change their production processes or install pretreatment plants. Much of the sanction policy instruments are aimed at treatment solutions at the end of the pipe in industry. This tends to push industry to build pretreatment plants, which could be expensive as alternatives, and which also may not encourage recovery of other waste products that industry generates. Consideration of incentive policies that would encourage industry to change manufacturing processes and find alternative uses for by-products should be encouraged.

4. *Potential for role confusion*: The roles and responsibilities within the sector appear to lend themselves to role conflicts and overlaps. The problem of who manages wastewater and water services and how between regional companies, counties, and municipalities and private and public entities invites inconsistencies, inefficiencies, conflicts, and difficulties in achieving economies. The web of bureaucracy controlling permit issuance (county, local water departments, environment authorities, regional water companies, and municipal authorities) appears daunting and potentially very time-consuming and expensive for those who decide to use water or to pretreat effluent.

ORGANIZATIONAL CHARTS: HUNGARY

Chart 1

MINISTRY OF ENVIRONMENTAL PROTECTION AND REGIONAL DEVELOPMENT, HUNGARY (MEPRD)

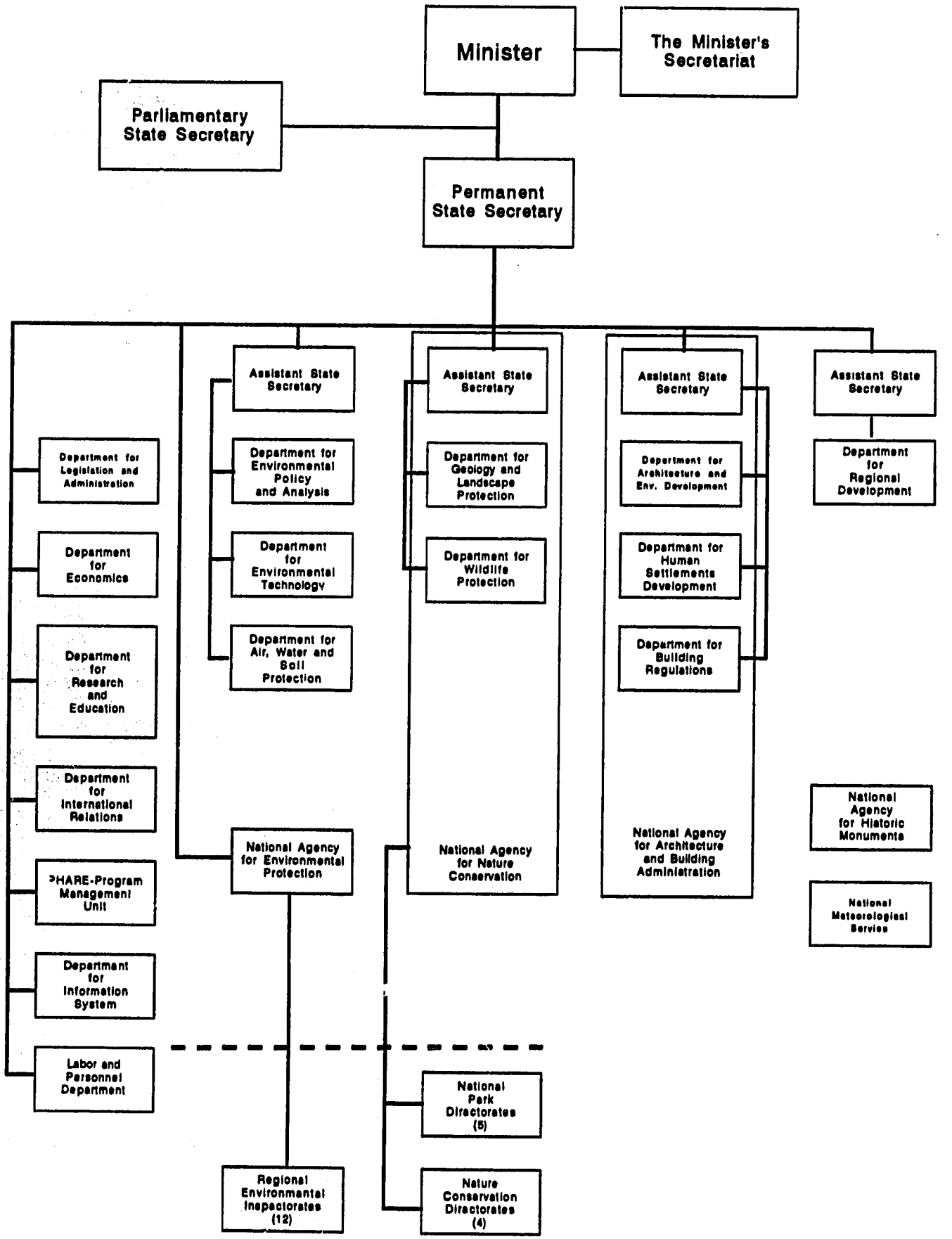

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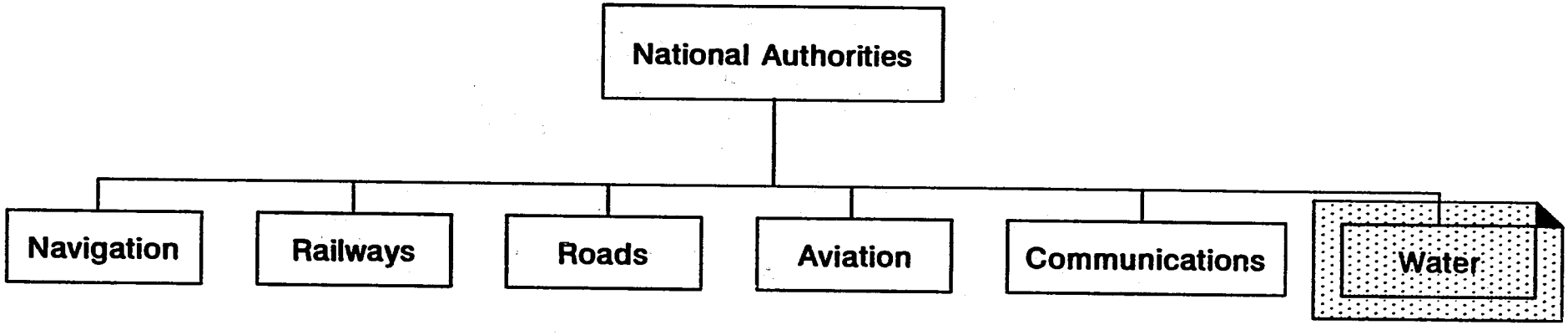
Chart 2

MINISTRY OF TELECOMMUNICATIONS, TRANSPORT, AND WATER MANAGEMENT, HUNGARY



The authority shaded is shown in Chart 3

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Chart 3

NATIONAL WATER AUTHORITY, HUNGARY

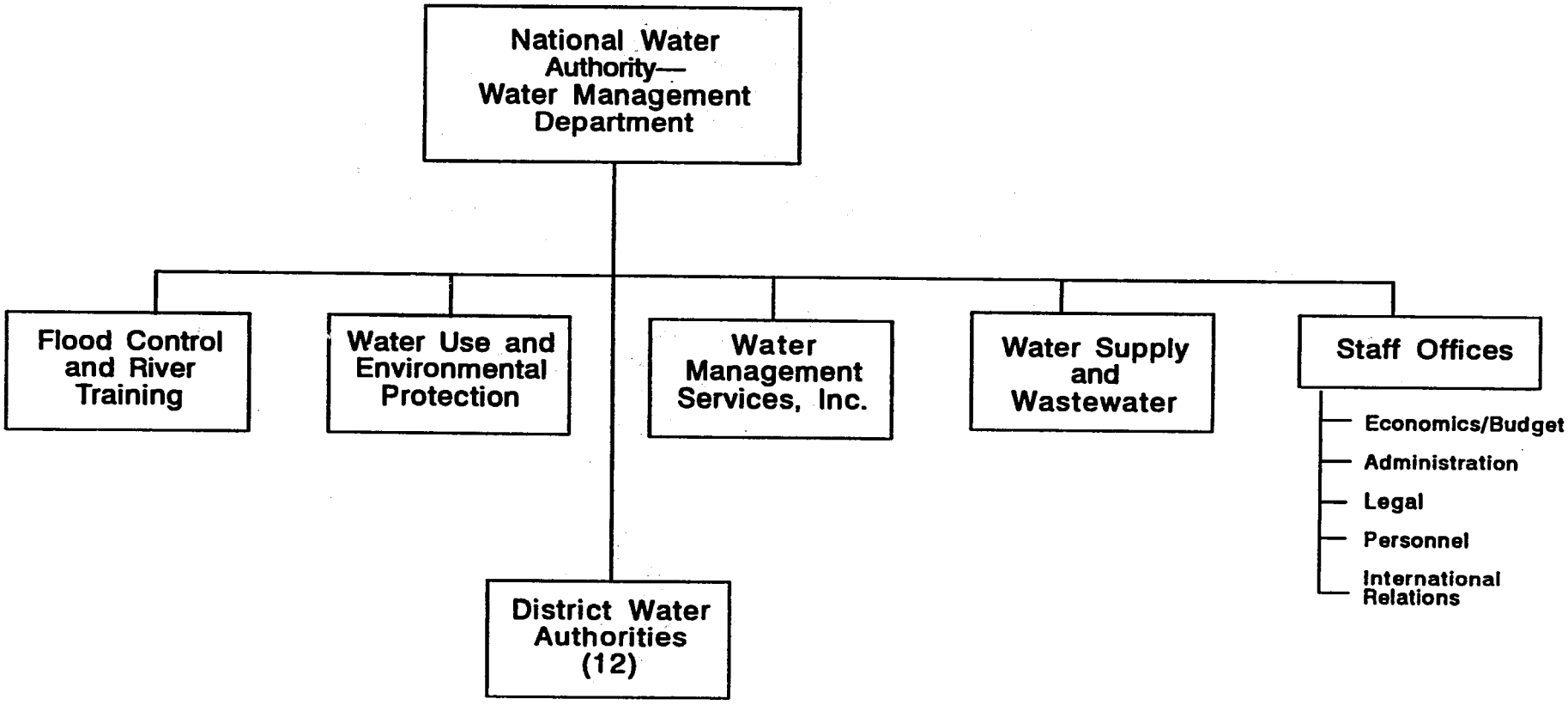

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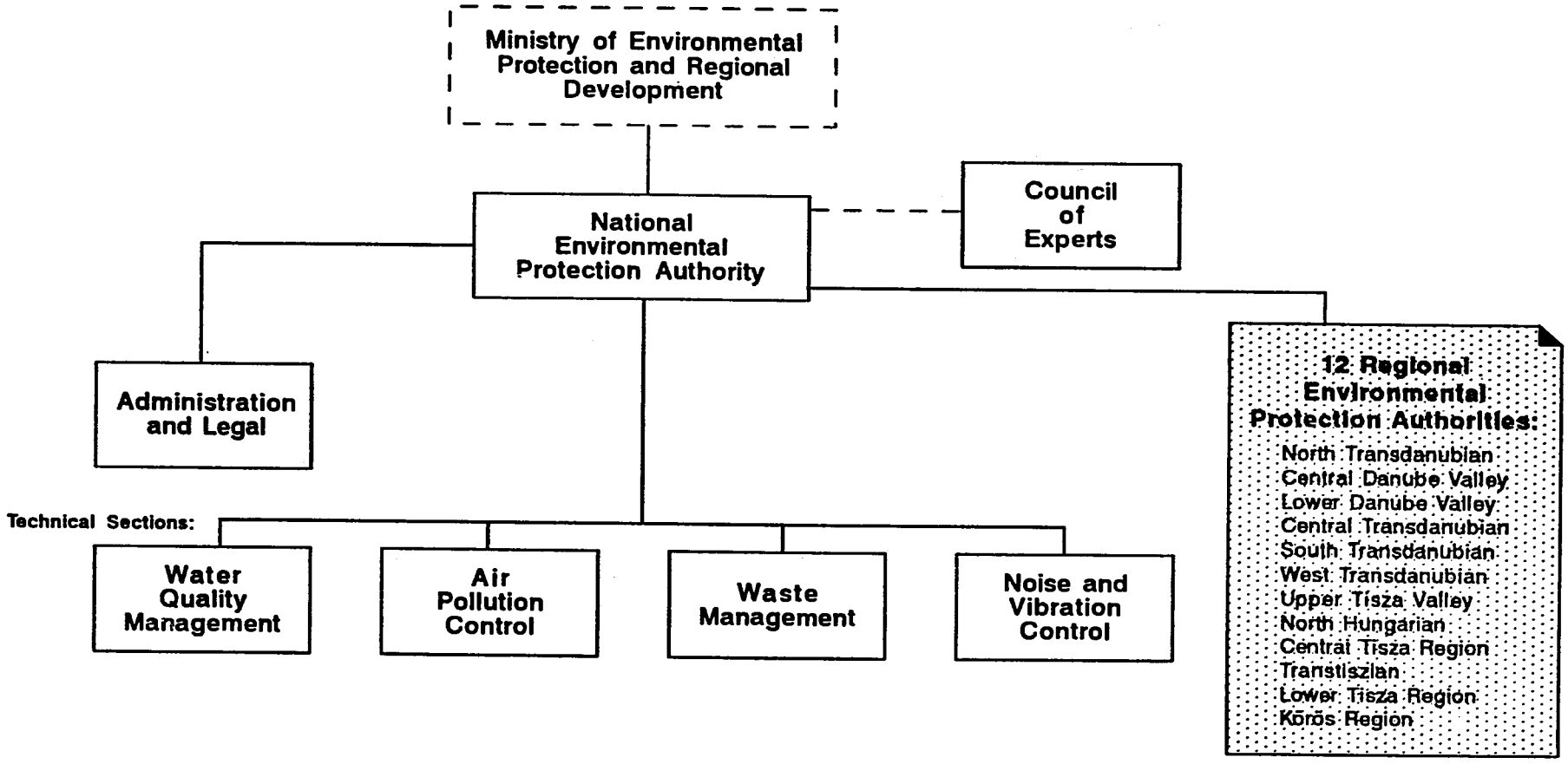
Chart 4

NATIONAL AGENCY FOR ENVIRONMENTAL PROTECTION, HUNGARY



The common organizational structure of the organizations shaded is broken down in Chart 5

Chart 5

ORGANIZATIONAL STRUCTURE OF 12 REGIONAL ENVIRONMENTAL PROTECTION AUTHORITIES, HUNGARY (MEPRD)

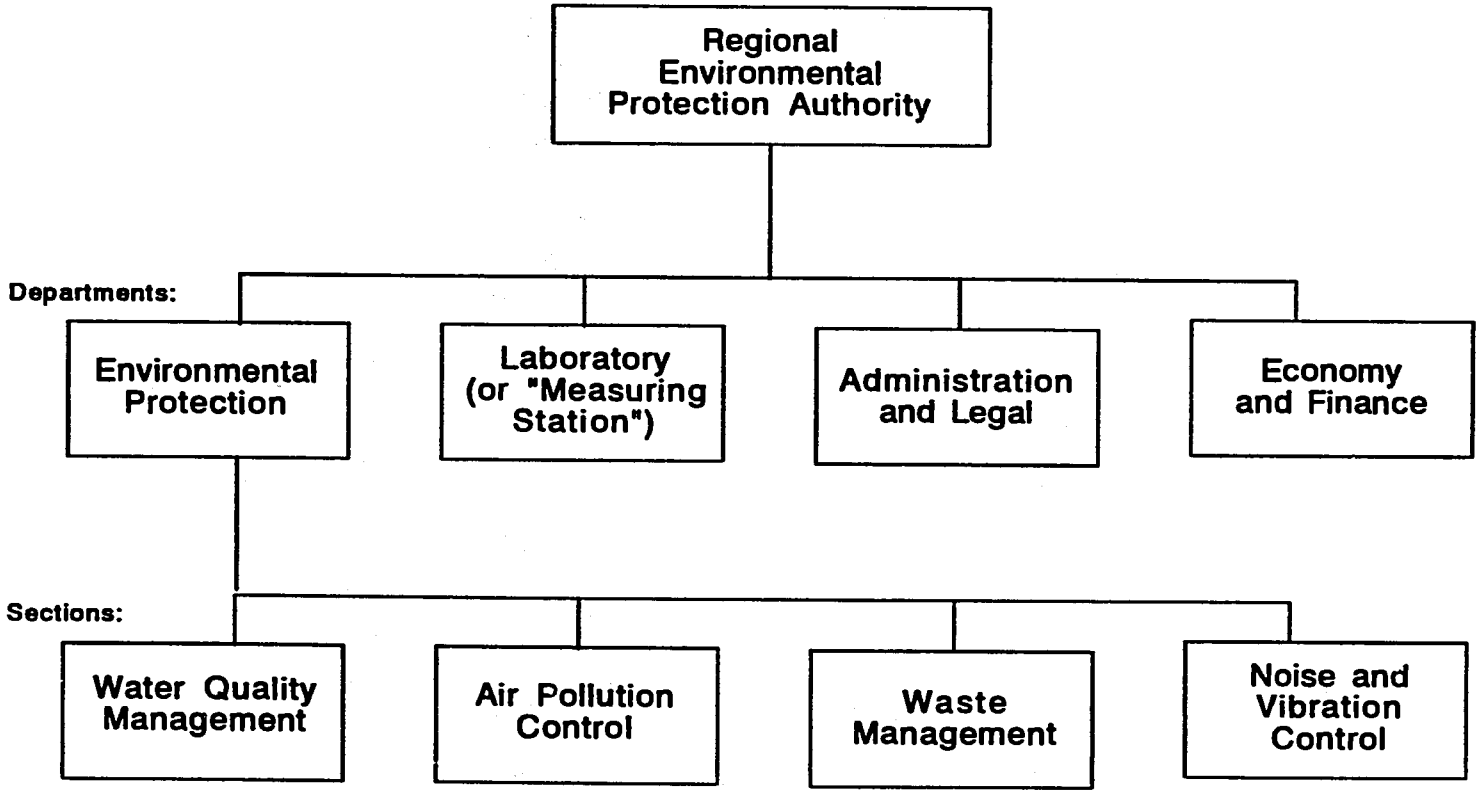
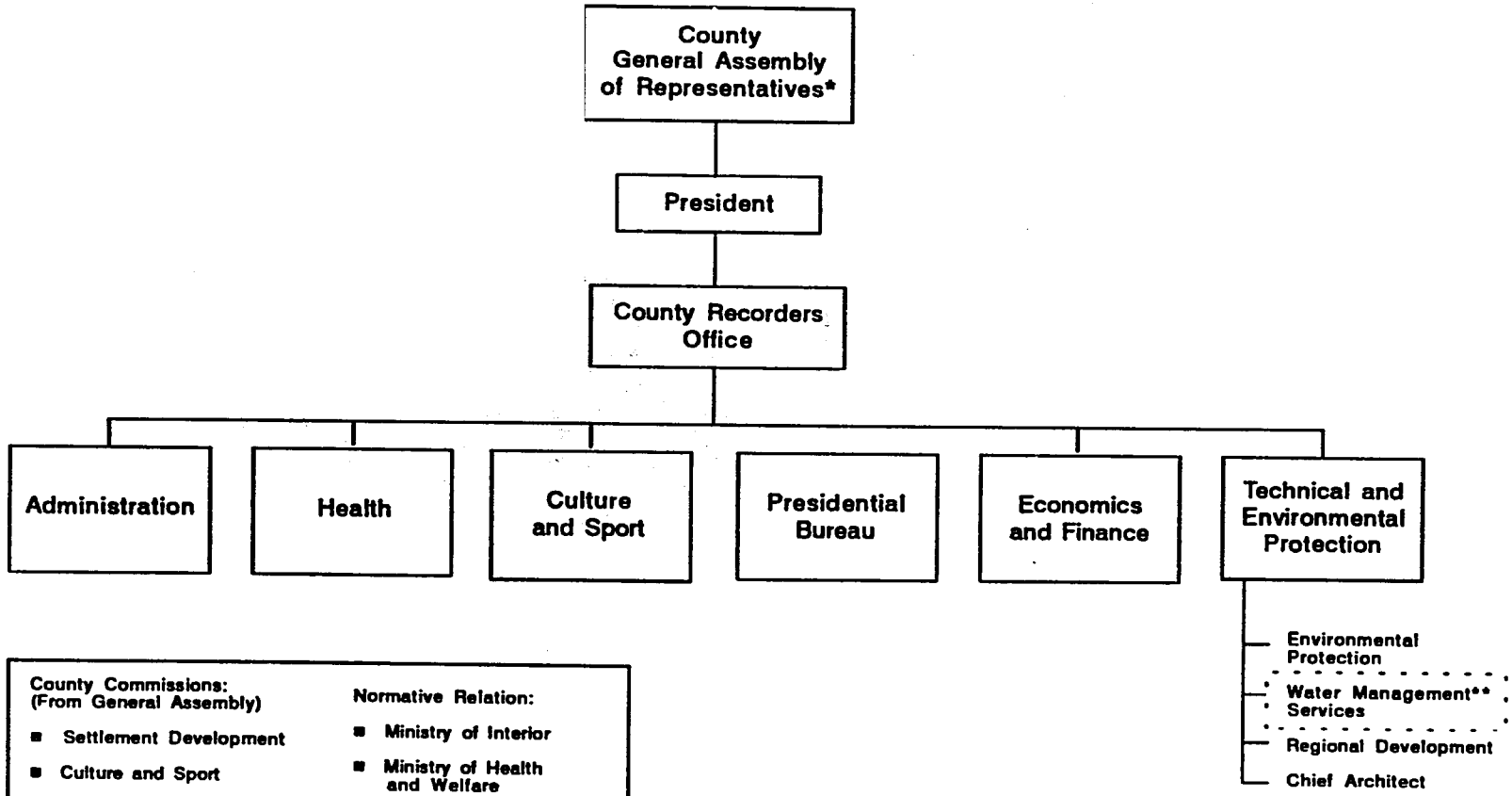


Chart 6

HUNGARIAN COUNTY GOVERNMENT
(EXAMPLE: KOMAROM-ESZTERGOM COUNTY)



County Commissions:
(From General Assembly)

- Settlement Development
- Culture and Sport
- Health
- Technical and Environmental Protection
- Economics and Finance

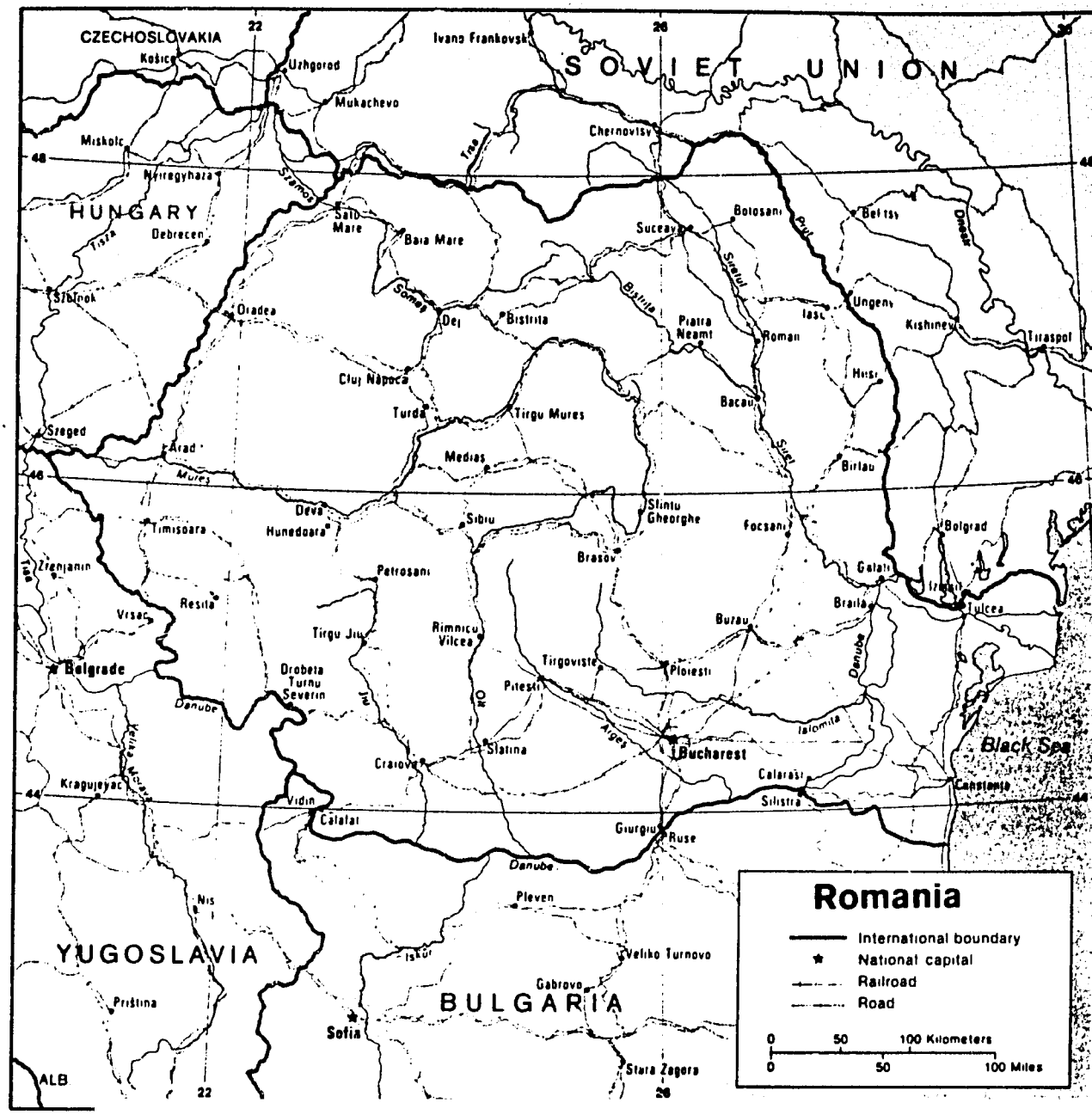
Normative Relation:

- Ministry of Interior
- Ministry of Health and Welfare
- National Water Authority

* 50-member assembly representing 72 communities

** Water Management Services: distribution, billing, collection, permits, treatment, and maintenance

INSTITUTIONAL STUDY: ROMANIA


Romania
International boundary
National capital
Railroad
Road
0 50 100 Kilometers
0 50 100 Miles
CZECHOSLOVAKIA
SOVIET UNION
HUNGARY
YUGOSLAVIA
BULGARIA
ALB
Black Sea
Košice
Uzhgorod
Ivano Frankovsk
Mukachevo
Miskolc
Nyiregyhaza
Debrecen
Chernovtsy
Suceava
Botosani
Beltsy
Dnestr
Prut
Siret
Tisa
Szolnok
Oradea
Salo Mare
Baia Mare
Somes
Dej
Bistrita
Bistrita
Piatra Neamt
Roman
Iasi
Ungeni
Kishinev
Tiraspol
Hirsi
Cluj Napoca
Turda
Tirgu Mures
Bacau
Sereg
Arad
Mures
Medias
Birlau
Deva
Hunedoara
Timisoara
Sibiu
Slintu Gheorghe
Focsani
Bolgrad
Zrenjanin
Petrosani
Brasov
Galati
Izmail
Braila
Tulcea
Vrsac
Resita
Tirgu Jiu
Rimnicu Vilcea
Buzau
Belgrade
Drobeta Turnu Severin
Tirgoviste
Ploiesti
Danube
Pitesti
Olt
Arges
Ialomita
Bucharest
Slatina
Craiova
Calarasi
Constanta
Kragujevac
Vidin
Calafat
Silistra
Giurgiu
Ruse
Nis
Pleven
Veliko Turnovo
Gabrovo
Priština
Sofia
Stara Zagora
Iskur
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INSTITUTIONAL STUDY: ROMANIA

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1. SECTORAL OVERVIEW AND BACKGROUND

1.1 Political Organization and Population

Romania has the largest number of inhabitants living in the hydrographic basin of the Danube of any of the riparian countries, about 20.8 million of its estimated 23 million. Bucharest, the capital, has a population of about 2.3 million and is surrounded by a peri-urban area and 12 villages that have a total of about 250,000 inhabitants. Fifty-one percent of the population live in urban areas. Virtually all of the land mass of Romania is a part of the Danube River basin system. The largest of the riparian countries, Romania measures 237,500 km^2.

Romania is bordered on the southeast by the Black Sea and the Danube Delta; to the north and northeast is the Ukraine and Moldavia; to the northwest is Hungary, to the southwest Serbia (formerly the Yugoslav federal republic), and to the south lies the Danube, which divides the territory from Bulgaria.

Under the operative new constitution of 1991, Romania has a bicameral legislative system. Direct popular vote elects representatives and the president. The Council of Ministers is elected from members of the National Congress. The country is divided into 40 administrative districts, called counties[a].

1.2 Relationship to the Danube River[b]

Hydrogeographically, Romania descends from the northwestern and southern slopes of the Carpathian range into the lower Danube or the Danube Delta. Romania is the end point for the entire drainage of the Danube basin system. Rivers that have crossed the north of Czechoslovakia and Hungary, such as the Tisza and the Körös, which drain the southwestern slopes of the Carpathians, enter the Danube near Belgrade and shortly before crossing into the Romanian-Bulgarian section of the Danube.

Major tributaries and basins that cross Romania and drain into the Danube or the delta are the Cerna, Jiu, Olt, Arges/Dimbovita, Ialomita, and the Buzau-Siret-Birlad. The lower course of the Danube River (including the navigable portions) that flows along and through Romania is 1,075 km, representing 38 percent of the river's length[c].

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[a] The term "county" is translated *judet*, which is the Romanian word for jurisdiction. *Judets* were created in medieval times.

[b] For more detailed information, refer to the technical report on Romania in Volume III.

[c] "Aspects of Ecological Protection and Water Management in the Lower Danube Area." Unpublished paper written for presentation to the WASH team conference at Visegrad, Hungary. Romanian Engineering Research Institute, Bucharest, December 1991.

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The Danube is very important to Romania. Of the 20.8 million people living in the basin area, 1.3 million draw their drinking water directly from the Danube[d]. In the south, in urban areas along the river, the Danube supplies 30 percent of potable/industrial water.

1.3 Economic and Social Conditions at Time of Study

During the visits in October 1991, and February and March 1992, a great deal of economic and social change was occurring in Romania as the government began to reorganize.

In 1990, the Ministry of Industry closed factories and large businesses that were no longer economically viable without linkage and support from the former USSR, but approximately 50,000 new small businesses were granted operating licenses. Many state industries continue to operate as well. Stated policy was to invite foreign investment, so therefore a great many economic missions were visiting, seeking investment opportunities. By June 1992, guarantees by the international donor community to secure foreign exchange and guarantee foreign investment were also stated policy. Prior to that time, a stable currency had not yet emerged to stimulate investor confidence.

Municipal elections took place in February 1992. Parliamentary and presidential elections scheduled for July 1992 have been postponed until the fall of 1992, thus making somewhat uncertain the status of proposed environmental laws and structures, which all those interviewed said would not be put forward until after national elections. In view of the amount of changes, reorganization, and the upcoming elections, it is possible that the information below will be out of date within six months of publication. Consequently, Section 2 omits the sectoral administration overview present in the previous three institutional studies.

1.4 Overview of Roles and Responsibilities

From 1990 to 1992, three different ministers of environment were appointed, and each reorganized or started reorganization of the ministry and the water resources sector. Many posts in ministries remain unfilled, and it is suspected that until after the elections, it will remain uncertain which individuals currently on staff will retain their positions.

The former National Water Council has been dismantled and water quality duties have been divided among a variety of authorities. (See Table 1 for a description of current roles and responsibilities by institution.)

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[d] "Danube River Water Quality and the Influence Upon Drinking Water in Riverine Localities." Liliana Ursu, et al., Institute of Hygiene and Public Health, Bucharest, 1991.

Table 1

SUMMARY OF ROLES AND RESPONSIBILITIES
ROMANIA

Organization	Responsibilities
1. Ministry of Health	Drinking water standards and monitoring.
Institute of Hygiene and Public Health	Sampling and testing of drinking water. Primary public health resource of the MOH.
2. Ministry of Environment	Pollution and water quality standards and monitoring.
Regional Environmental Assessment and Management Agencies (Inspectorates)	Pollution monitoring, sampling, testing, and environmental control.
Institute for Environmental Research and Engineering	Water and environmental research and data management and collection.
3. Romanian Water Authority	Coordination of river basin management and sectoral planning for water quality management.
River Basin Authorities	Implementation of water conservation management. ■ Flood protection ■ Water resource management ■ Water quality management ■ Raw water sales and supply
National Hydrometeorological Institute	Environmental monitoring and data management on air, water, and soil. Data collection.
4. Ministry of Public Works	Administration of construction of water supply and wastewater treatment plants.
5. Municipalities and Regional Water Companies	Implementation of water supply and wastewater treatment.
6. Ministry of Industry	Industrial water supply and industrial pollution abatement.

2. WATER QUALITY MANAGEMENT INSTITUTIONS

2.1 Ministry of Environment

The Ministry of Environment (MOE) was set up in December 1989. Prior to that time, it was an umbrella ministry that included forests, water resources, and land (essentially, a ministry of the interior). It assumed its current environmental status in July 1990 by separating out the National Administration for Regulation of Water (also known as the Romanian Water Council). It still retains the Department of Forestry.

The MOE controls air and water quality, solid and hazardous waste, and radioactive contamination through its various commissions, programs, and 40 regional inspectorates. These monitor the environment by collecting and analyzing data on air, water, soil, and radioactivity. The 40 regions include a special region for Bucharest and correspond to the administrative organization of the main government. Of the 40 regional offices, 11 have duties related to river and water body sampling.

The ministry reorganization of February 1992 set up a structure with five major technical divisions reporting to the minister:

- Environmental Quality Inspection and Evaluation Division;
- National Commission for Nuclear Control;
- General Directorate for Water Resources Management and Protection;
- General Directorate for Natural Resources (includes Forestry and Wildlife Protection departments); and
- General Directorate for Legislation and Biosphere Conservation.

The MOE also maintains three staff offices covering international and public relations, management/social relations/privatization, and budget/economics. The minister has four special offices and institutes that report directly to him or her: The Danube Delta Reserve, the Romanian Marinelife Conservation Institute, the Environmental Engineering Institute, and the Documents Center. Each of the 40 regional Environmental Protection District Office chiefs are on a direct reporting line to the minister as well. The subsections of the inspectorates (monitoring, regulations/permits, inspections) have technical and normative relationships with the corresponding ministerial sections.

There are two divisions and one institute that directly relate to the water quality subsector. The Environmental Quality Inspection and Evaluation Division has an environmental impact evaluation section, a data base and monitoring section, and an inspections section. The General Directorate for Water Resources Management and Protection has a water strategies and regulations section, and a water conservation and re-use section. These sections provide norms and regulations for water quality and water use to the Romanian water authorities,

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which manage river basins, and to the commercial and municipal water companies, which supply drinking water.

The Environmental Engineering Institute records and analyzes air and water quality data reports and has water quality modeling, computer analysis, and laboratory capacity. This has been the counterpart institute to the WASH team's water quality decision support system development project.

2.1.1 Regional Environmental Assessment and Management Agencies (Inspectorates)

The field offices of the MOE consist of the 40 Environmental Assessment and Management Agencies (Inspectorates). These offices conduct the full range of environmental activities relating to air, soil, and environmental control. They correspond to the regional inspectorate concept present in the other countries in this report. Their job is air, water, and soil monitoring; inspections; pollution control and sanctions; laboratory analysis; and enforcing water quality regulations.

Exhibit 1 (next page) describes a typical inspectorate operation.

Exhibit 1

Institutional Case Description
The Ploesti Management and Assessment Agency

Ploesti is an industrial center, about one hour from Bucharest (60 km), and has a population of 250,000. The regional inspectorate is the largest field office outside of Bucharest, with 93 employees. It is in the watershed of the Ialomita River, which drains east and enters the Danube below the Arges.

The office is responsible for monitoring one of the largest industrial production areas of the country. The major petroleum refineries of Romania are here. The area was heavily bombed by the Allied Forces during the German occupation, and a great deal of the groundwater is contaminated with petroleum. Industrial platforms occupy 50 percent of the surface areas of the city. The population density within the city boundary is 4,200 per km^2. There are 50 large industrial units in the town. Major industries and products are

- petroleum refineries;
- petrochemical by-products;
- chemicals;
- fertilizers (the highest producers of sulfuric acid and ferrous sulphur);
- metallurgy (a heavy polluter); and
- detergents.

Some of the larger plants are 8 km^2 in land area. The city is entirely ringed by these industries so that no matter what direction the wind blows, the air is polluted.

Air quality is so bad here that there are serious health consequences. Indicators for lung disease, cancer, and infant mortality are all high. In the area adjacent to the fertilizer factory, the population suffers the highest incidence of infant mortality in the nation, with about 56.6 per 1,000.* For examole, the sulphur dioxide (SO_2) level here is measured at 10 ppm, while the national standard is 0.7.

The regional agency is organized with a director who supervises four basic functional sections:

- Inspections (16 staff);
- Permits, norms, and regulations (25);
- Laboratory analysis (36);
- Integrated monitoring/sample collection (6); and
- Administration (14): accounting, finance, transportation, and legal.

(cont'd)

*The infant mortality rate is calculated by including only those children who die after three months of age. The rate is probably about three times that statistic, according to estimates given by regional staff.

Exhibit 1 (cont'd)

The tasks of the Inspections Department are routine inspections, accidental emissions, and damage control.

The program of inspections has been developed on the basis of experience and available transportation (one vehicle for the whole office of 90). It has identified 15 river points in all, 7 of which are considered strategic because of their proximity to pollution sources. These 7 are sampled twice monthly. Eight points are secondary and are sampled once a month. "We know we should take more frequent samples but we do not have the transportation," one staff member says.

Sanctions: The inspectorate implements a regular program of fines to industry, but the office reports that "they pay little attention to this." With the change in law one year ago, we can fine up to 100,000 lei [300 lei = U.S. $1]. Before this, we could only fine up to 1,000 lei.

"The law is wholly inadequate but it is better than before. It is not an environmental law but one small section of the land reform law that gives the people the right to own property [Law #18-1991]."

The process for handling emergency spills involves looking for the source, documenting the amount spilled, assessing the damage, and imposing a fine. "If it is very severe, we can close down the source temporarily. So far we have been able to get about 70 percent of the oil product pollutants cleaned out of the river after spills. Other spills are difficult to identify and clean up. We sometimes have to introduce reservoir water to dilute spills."

The agency's laboratory has added air sample analysis as a task within the last two years. Previously the lab was only capable of performing water analysis. Standard biological and bacterial tests are conducted, and 52 physical/chemical indicators and basic biological indicators are tested. Tests are conducted for 12 air indicators as well. The laboratory chief indicates problems in obtaining culture media and an absence of supplies and equipment.

In terms of the quality of work, the laboratory chief reports that staff members are well trained but lack proper equipment for taking samples. She feels the device used for deep lake and water samples is adequate but is not confident about the equipment for sampling oil, petroleum, and chemicals. She says errors in sampling are common.

The laboratory analysis methods used are calorimetric, gravity, physical, and liquid chromatograph. The lab has no equipment for pesticide analysis but is trying to develop a method for using the liquid chromatograph for this purpose. The lab also can test for some specific pesticides using a spectrographic process.

The city wastewater treatment plant provides only primary mechanical treatment. The plant was designed for 1,100 L/s and now takes in 1,800 L/s.

Drinking water comes from two mountain reservoirs with sources that, unfortunately, have populations around them. Consequently, the coli count exceeds the norm.

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2.1.2 The Institute for Environmental Research and Engineering

The Institute for Environmental Research and Engineering was organized under the MOE in August 1990, but has much experience in water/air/soils engineering research. It consists of three divisions: environmental ecology and monitoring, technologies and management, and environmental investigation of facilities. At present the institute has a budget of 200 million lei, funded 70 percent by the MOE (50 percent from direct support, 20 percent from contracts). Research contracts from other groups provide the remaining source of income.

The institute has recently contributed a report on the state of the environment for the world conference in Brazil in 1992. Other projects include a case study on the heavily polluted town of Kopsâ Micâ, which contains a chemical plant and steel mill.

The section of the institute that deals with environmental monitoring and a data base has worked with the WASH project to develop a computerized emissions decision support model.

The institute has also assisted in the development of Romania's water quality monitoring network. It uses the data from this system to compile annual reports on the quality of water.

Monitoring is conducted in five parts of the hydrosphere: rivers, lakes (natural or man-made), groundwater, marine water from the Black Sea, and wastewater. Each monitoring area is structured to collect specialized data on international river basin boundaries and district boundaries. A first-order network of 280 sampling points covers flows in 13 subbasins, while a second-order network covers points of regional significance. In addition, grab samples are taken to monitor conditions at other points. Groundwater samples are taken at 1,000 points. Also, 50 to 60 lakes are sampled, and 15 streams in the Danube Delta are monitored during the summer.

2.2 The Romanian Water Authority/River Basin Authorities

The purpose of the Romanian Water Authority (formerly called the National Council for Water) is primarily basin and water quality management in rivers and inland waters. It does not treat water or wastewater. As part of its duties, the authority provides raw water in bulk supply to municipal and regional water authorities. While still called the National Council for Water, the RWA was converted to a semi-autonomous water authority with offices in Bucharest and normative and administrative linkages to each of the 11 river basin authority offices. The RWA is responsible for reservoirs, rivers, groundwater extraction, transportation of water, and maintenance of water transmission pipe in urban areas. It also sells river products such as gravel and operates as a cost center with a business requirement of self-sufficiency.

The authority's basic duties include flood protection, water resource management, and water quality conservation. The newest function for the authority is water quality protection, now being set up within the national office with an accidental spills control unit. The authority reports that it needs funds to increase its measurement capability.

At the implementation level, 11 local river basin authorities are organized along major watershed areas. The basin authorities have been delegated authority for full management from the RWA. The primary linkage from the national to the river basin authority level is the budget, which is submitted and approved at the central level and passed on to the Ministry of Finance and the Ministry of Environment for final review.

The 11 river basin authorities perform operational functions, regulating flows using reservoirs and dams, allocating water and distributing it to users, and collecting data on flows. They receive raw water from regional authorities, but doing so is a major task that requires special transmission pipes, canals, pumping stations, and wells. Water is obtained from all sources, including groundwater, rivers, and reservoirs.

The river basin authorities are also responsible for protecting rivers and assessing fines for pollution. The govemment recently decided to require that industrial and municipal users pay for water (with surcharges assessed for excessive use) and pollution (fines for exceeding given effluent limits). The river basin authorities administer these surcharges and fines. The basin authorities also have the power to require cessation of pollution activity if it is deemed excessive.

The policy mandate for the regional authorities is that they be self-sufficient. The objective is that they be able to cover their costs through the sale of bulk water, through dam usage fees, and through the products they sell. Theoretically they may set variable rates. In an interview, one director observed that variable costs have been calculated per authority. Then, a unitary rate has been applied across the country for the sale of water to municipal and supply companies.

Up until January 1991, prices were not charged to municipalities for bulk supplies of water. The real cost of water has become an issue, now that a tariff structure is being constructed to charge for water use. It has quickly become apparent that water loss had been high. Prior to the installation of a rationalized (equally spread out) tariff structure, a low, temporary tariff was put into effect (rather symbolic at first, to get people used to the idea). It is now being raised incrementally.

The factors that go into cost determination are the cost of production; the rate of commercial or municipal household and agricultural use; and the amount of wastewater that is returned to the systems. The current policy is to set tariffs sufficient for cost recovery of operation and maintenance. (For more on tariffs, see Section 2.4.)

The central office claims there are problems with the sanction system because of a lack of equipment for measuring water quality. The problem is determining just how much waste goes back into the receiving waters. According to one official: "We would like to be able to tell people to stop polluting now, if we could measure what they are doing, and if they had any way of correcting it; but they don't have resources and neither do we. We are a young agency: we need equipment, training, and an exchange of experts."

2.3 Water Supply Organizations for Urban Water Supply and Wastewater Treatment

2.3.1 Urban Services Department

Formerly, urban potable water treatment and wastewater treatment (in those few cases that existed) were managed within a municipality as one section of a multivariate department called the Urban Services Department. This department was responsible for electricity, garbage collection, heat, gas, and water.

Urban affairs nationally are the responsibility of the Ministry of Urbanism. Previously, the National Council for Municipalities had national-level supervision over city services. The National Water Council only supplied water in bulk (which it continues to do under its new name, the Romanian Water Authority). At the time of this writing, a new Secretariat for Municipalities had been formed in the Ministry of Urbanism. It has been assigned responsibility for all municipal services (wastewater plants included), but is reported to have no budget. Hence, these services are left to the local municipalities to manage as they are able. Most of this organizational structure is now under transition.

During the transition period, the urban and municipal water companies in many municipalities will continue to operate under the Urban Services Department. Because traditionally water and wastewater were different departments in most cities and water used to be supplied at greatly subsidized rates, organizing municipal water and wastewater under a cost-conscious, commercial operation is a new challenge and has not been realized in most municipalities.

According to the Institute of Hygiene and Public Health, there are 240 towns with municipal systems in Romania; almost all need rehabilitation, and their staff need training. No formal training program exists for operators; most training is done informally on the job. The institute believes staff do not understand process control and how to ensure good water quality.

According to the institute, the 10 percent of wastewater treatment plants that are in large cities account for 90 percent of the municipal pollution loads in rivers. The water treatment plants in towns and cities are reported to be out of service 50 percent of the time each day as a matter of administrative routine. They are shut down at night and their transmission lines depressurized, according to the institute.

Only 60 percent of the people in Romania have piped water. The urban population is 80 percent piped, but mostly via very old, inadequate, leaky, and contaminated systems. According to an institute official:

> The ones who don't have piped water take it from contaminated sources, shallow wells. In the delta area they even take raw water from the Danube. The towns in the delta area have very poor water, and it is a health problem for our own tourists who go down to the sea; they get sick from diarrheal diseases.

Sanitary engineering is reportedly a new specialization at the university level. The education normally provided has been for traditional civil engineering. Most lower-level training is

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informal. The institute source quoted above said, "We do train water operators [who must have a 12th grade education] in some technical areas, but they do not understand water chemistry or biology. If you [attempt to discuss] the knowledge and skills for wastewater treatment, their capacity and knowledge is even lower."

2.3.2 The General Water Supply Company of Bucharest

Bucharest's water and wastewater needs are served jointly through one city company, the General Water Supply Company of Bucharest. Previously water and wastewater were handled by two separate city departments. The General Water Supply Company deals with intake, treatment, distribution, and wastewater disposal and treatment.

The company has a board of directors, a general director, a secretary general, and four divisions: technical, personnel and administration, economic and finance, and materials, transport, and production (operation and maintenance). A commercial division is being added. The production branch is the largest and is subdivided into intake/pumping, a distribution network, and a treatment plant. Another new division being added is wastewater.

Consumer relations and customer service constitute a new area receiving attention. Other ideas are also surfacing in the sector. According to General Water Supply's director:

> "We would like to form an association of water producers; there is already a movement to form a users' association. We are developing the financial services division and adding in commercial, billing, and collection."

Financially, the municipal authority has recently been advised by a World Bank consultant who has helped them rethink the structure of the authority. An institutional improvement project also is being designed to assist in commercial functions and overall management.

2.4 Sector Finances and Tariffs

Exact data on the cost of water and wastewater were not available at the time of this writing, due to the rapid changes taking place within the sector. Water billing and collection has been included in the unitary fee for all urban services (heat, garbage, electricity, and water). Interview data indicate that previous water rates were very low and mostly free. Due to increased measurement now taking place, the water providers have recently uncovered major problems in water meter underregistration, heavy leakage in distribution systems, and leaking plumbing fixtures.

At the level of the National Water Authority, new charges for bulk supply of untreated water to municipal companies are reported to be able to cover operational costs for dams and pumping. However, the rates have only been in effect for the last year.

The question of sectoral finance for wastewater and other infrastructure is tied to a number of institutional questions:

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- How will municipal authorities organize water companies? Will they be formed as limited shareholding entities or continue to be subsidized from municipal sources?
- How will tariffs be determined?
- If water companies are formed, how will commercial and business skills and approaches be taught?

The larger question of overall economic conditions remains unclear at this moment. As well, the ability of local government to tax, and the disposition of fines for pollution control remain uncertain due to pending legislation.

2.5 Laws and Sanctions

The legislation to revise water quality standards, fines, pollution load allocations, and environmental controls was being written at the time of this study. The information below describes current practices and the sanction and policy tool in effect. Current law regulates in-stream quality and withdrawal of water for both municipal and industrial uses. The law governing municipal waste emission is as follows:

C90-83/1983:	This law governs the national council of waters and municipal councils and is in effect until another is passed. Its limits on heavy metals are considered much too high. In part, allowance was made for industrial pollution: the collection system in the country has combined sewers for municipal and industrial use. And while there is some pretreatment in industry, plants are far below their required capacity in this regard.
1001-1990:	This law governs limits on industrial wastewater emissions into water bodies.
18-1991:	This land reform law permits private ownership of land. It has one section that requires preservation of the land and environment and allows sanctions of up to 100,000 lei for pollution damages to property and natural resources.

Implementation of laws in effect require specific agreements with polluters. Load allocations are set up by adjusting the industrial allowance to match allowable loads given current river water quality and flow. All polluters have an agreed upon allotment. If they exceed it, they are fined. The fine amounts, however, are very low, and the program of fines enforced by the environmental inspectorates does little to inhibit polluters.

Payment for fines goes to the National Water Authority at the national level. A fine is also levied by the local environmental agency. Payments on fines are collected in a national water fund for system improvements (this fund reportedly is not yet operational). The water fund so far has not been able to get people to pay because the country's overall economic situation

is so bad. The new comprehensive environmental law is written to create a similar environment fund that will also cover air quality improvements. Two major problems with implementing the law are that industries are contesting the accuracy of laboratory results, and the time and effort required to enforce sanctions are beyond the resources of the authorities.

2.6 Institutional Issues

The following improvements are needed to support the water quality management portion of Romania's environmental sector and to make best use of a water quality management decision support model as provided by USAID.

1. *Regulations:* A new general law of the environment has been drafted to replace the obsolete 1972 law. The new law is expected to be passed by Parliament and implemented within the next few months. It has provisions for air, water, and noise pollution. Development of the legislation has been assisted by the Environmental Engineering Institute. The law will set water quality standards and limits on emissions (and will be in line with European Community standards). Until this law is put into effect with a firm enforcement policy, little will change.

2. *Enforcement:* In the past, the roles of state ownership of industry and government regulatory authority were at odds. Exceptions were often made to waive standards. The ability to enforce also requires measurement mechanisms.

   Within the next two years, increased privatization of industry may bolster the enforcement of effluent standards for industry. Many old industries will be closed as economically nonviable, rather than on the basis of environmental pollution. Additionally, strategies have been developed for environmental regulation of energy production and air pollution based on the existence of regional autonomous regulatory authorities.

3. *Monitoring Infrastructure:* The capacity to monitor infrastructure and the availability of laboratory equipment and a regular analytical program at local and regional levels are very rudimentary. The Environmental Engineering Institute has laboratory capability but it is limited to studies.

4. *Coordination and focus of the sector:* In order for the potential users' group for a water quality decision support model to be realized, help must come from a combination of sources: the Ministry of Environment, and the National Water Authority and its river basin management organizations. It is possible that municipal water and wastewater companies may have information needs also. Currently there is little coordination and few means to bring together these forces, given the transitional nature of the government. Obtaining data that reside in different offices and ministries is a major task (data in the past have been considered rather proprietary). While the Environmental Engineering Institute has the skills to develop and run the

decision program model that WASH is helping with, it is unclear who will assume leadership in using the model as a planning instrument.

5. *Human resources development:* Interview data indicate that the skills for managing and running wastewater and water treatment plants and water quality sampling are in need of development. Programs in training and a training system have fallen by the wayside with the reorganization of the sector.

6. *Sectoral financing:* The cost of water and wastewater have been heavily subsidized. The real cost of water and wastewater is not yet clear but is probably far behind that covered by the tariffs now charged. Water quality management will require that, at a minimum, operational costs be recovered. Some means to finance sector investment will also be needed before multilateral lending institutions will finance loans.

ORGANIZATIONAL CHARTS: ROMANIA

Chart 1

MINISTRY OF ENVIRONMENT, ROMANIA

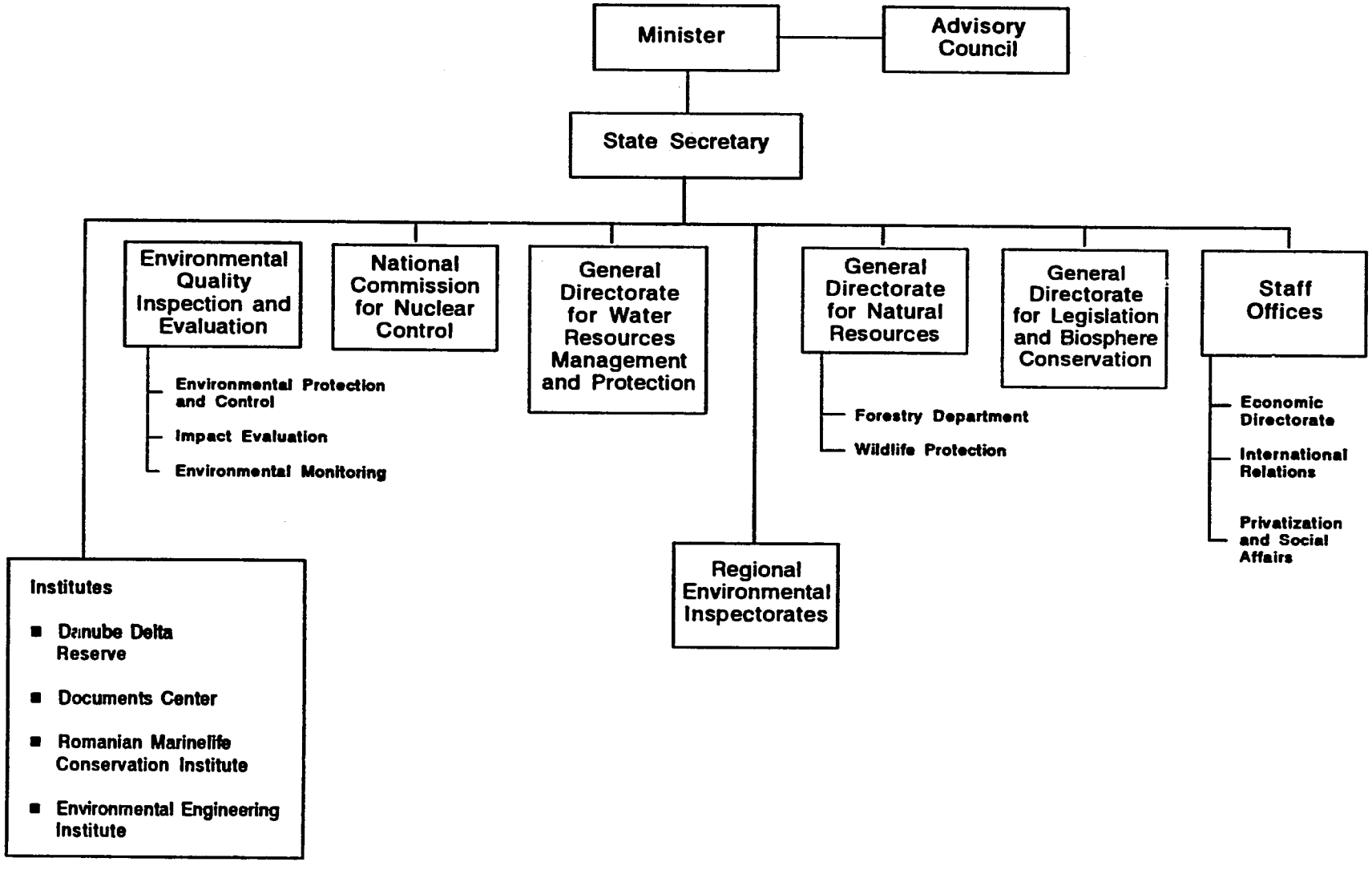

Chart 2

ROMANIAN WATER AUTHORITY
(FORMERLY THE NATIONAL COUNCIL FOR WATER)

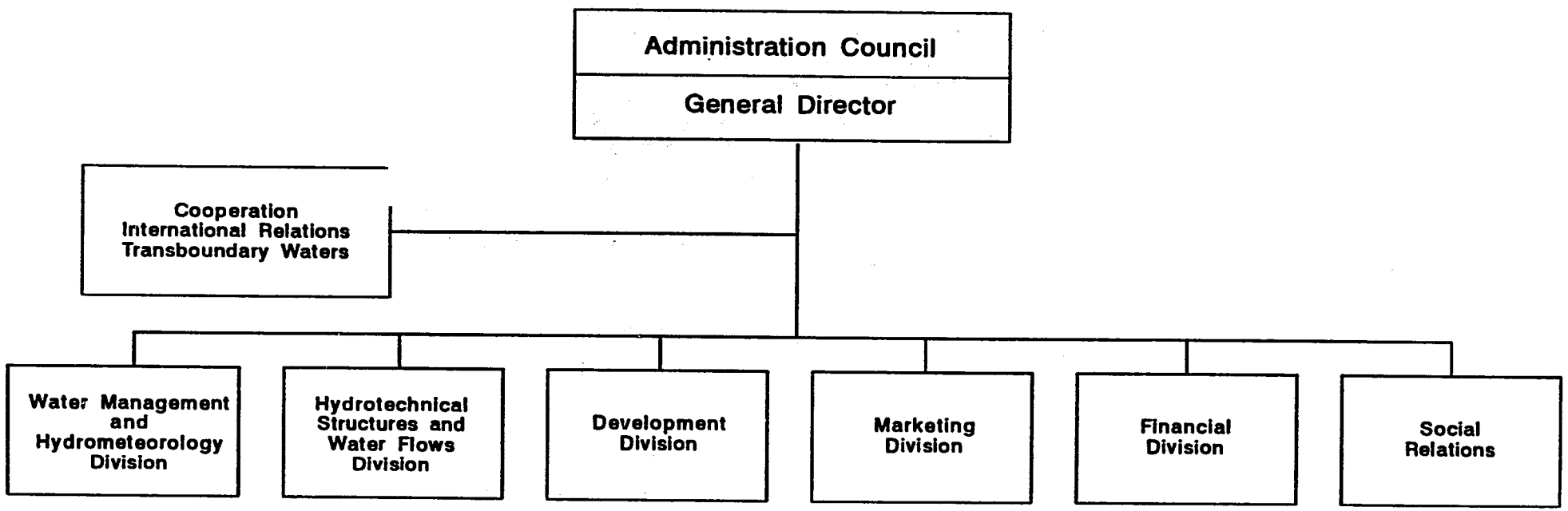

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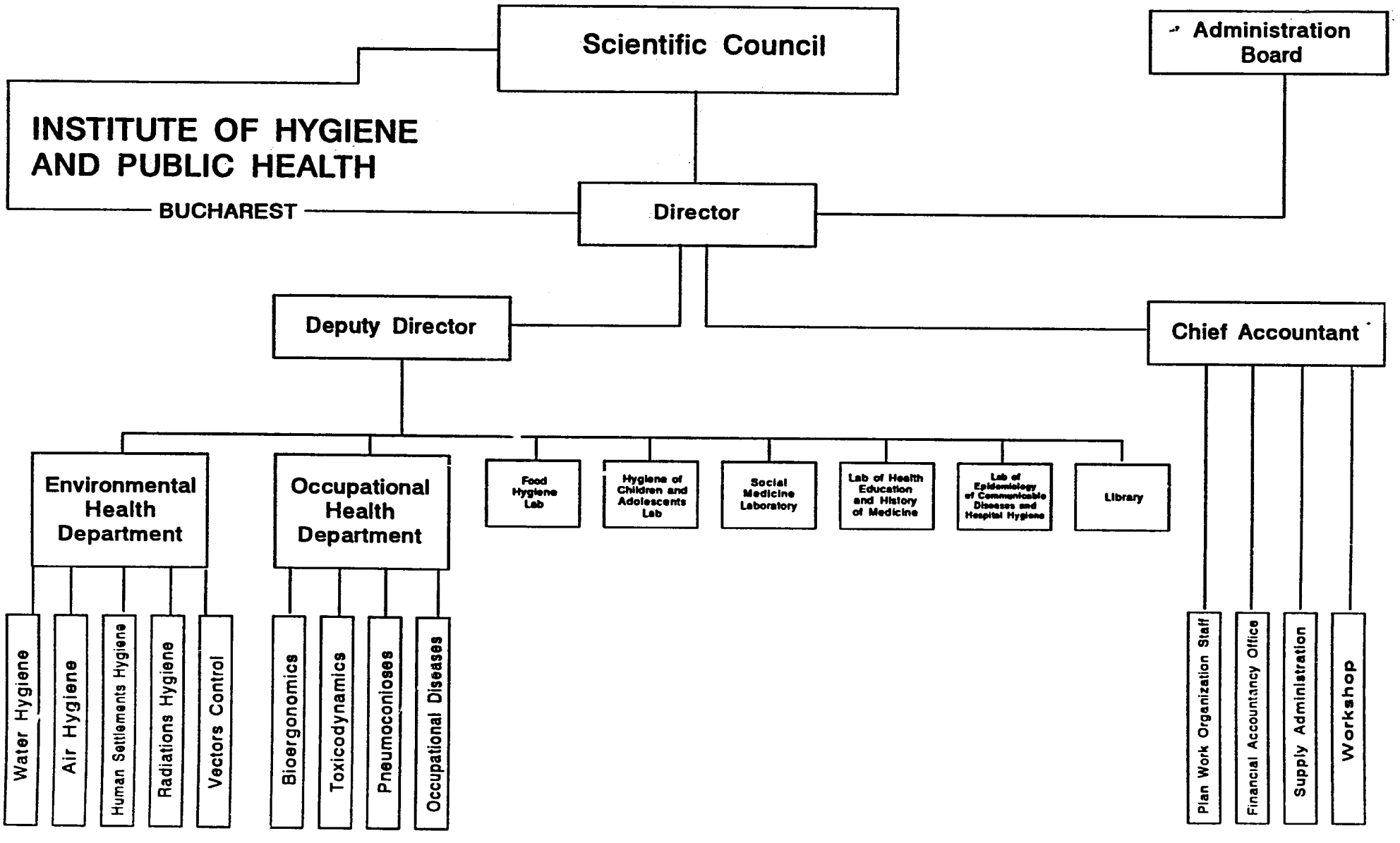
Chart 3

MINISTRY OF HEALTH, ACADEMY OF MEDICAL SCIENCES, ROMANIA



Appendix A

INFORMATION GATHERING FORMAT FOR INSTITUTIONAL ANALYSIS

Appendix A

INFORMATION GATHERING FORMAT FOR INSTITUTIONAL ANALYSIS

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1. ASSESSING THE WATER QUALITY MANAGEMENT SECTOR CONTEXT

The following information was requested of each country participating in the study. Interview questions were designed to gather this information.

1.1 Historical Background

Briefly describe how sectoral organization evolved to its present form.

- What key historical events helped to shape the current organization of the sector?
- What support has existed and now exists within the socio-political environment for water quality management?
- Are important groups favored by the current sectoral arrangements? What are the vested interests?

1.2 Water Availability, Quality, and Topography

- What are the primary sources of water in the basin in this country, and what is the tributary/system relation to the Danube River?
- What are the primary uses of water extracted from the Danube River basin in this country?
- What topographical features are important to understanding the water quality environment?
- What are the major known sources of contaminants affecting water quality in the basin system (for example, 40 percent agricultural nonpoint, 30 percent industrial, 30 percent municipal point sources)?

1.3 Demography and Land Area

- What is the population of the country and how is it concentrated, particularly in relation to the Danube River system?
- What are the trends in population growth and how is the sector responding to needs for water use?

2. DIVISION OF ROLES AND RESPONSIBILITIES BY LEVELS

- Who is responsible for which activities at national, regional, and local levels (or appropriately arranged levels) in general?
- Who has water quality management responsibilities? Include those responsible for management of water input and those responsible for management of output (emissions or discharge).
- What kind of actions can authorities or entities take to control or manage?
- Who gives permission for withdrawing water and discharging water or emissions into the river?
- To what extent do agencies exercise, are allowed, or are capable of the authority to charge fees, assess fines, or otherwise finance operations?

3. WATER QUALITY MANAGEMENT SECTOR INFORMATION

The section below covers major tasks of the water quality management sector. During the analysis, each task area should be assessed in terms of current performance (high, medium, or low achievement). An indicator of achievement should be included that explains why the performance is considered high or low (a description of the criteria upon which the judgment was made). Also, each task area should indicate the institution responsible for carrying it out. If deficiencies exist, they should be indicated. The "issues" discussion in the sector should refer to areas needing attention institutionally, as well as other potential investment or interventions needed.

3.1 Setting Policies and Standards

- How do overall policies and standards get set and monitored? For example, who is responsible for setting effluent standards? Who enforces them and with what authority?
- What are the major policies and what is the direction of policy?
- What means are used to communicate policies and standards and what is the process to ensure that they are met?

3.2 Planning

- How does planning occur? Who does it? How interactive is it? What levels of planning take place—for example, master planning for the whole sector, operational planning for implementing agencies, or project investment planning?
- What types of planning should be carried out that are not currently being done?

3.3 Financing

- Is there a strategy currently in place to gain funding from external support agencies? Does a national plan exist? How are the various requirements and activities of external support agencies coordinated?
- How are investments in the sector financed?
- Is there a system for user fees? How are they determined and who manages them?
- How does the water management sector fit in in terms of national priorities for investment?

3.4 Data Collection and Management

- How is data collected for monitoring emissions? Are sampling procedures adequate? standardized? Who collects the data?
- Who is responsible for data analysis and feedback to sectoral planners? How is this process managed?

3.5 Monitoring and Control

- Who is responsible for issuing permits and how adequate is this process?
- How is the monitoring and control process managed? How are rules enforced?
- What is the process for inspecting plants and other common sources of effluent/emissions (sampling, etc.)?

3.6 Program/Project Implementation

- Who is responsible for treatment plant design? Does the design and planning process include interaction with the community or other stakeholders?
- Who is responsible for treatment plant construction, and is this managed appropriately?

3.7 Operation and Management of Programs

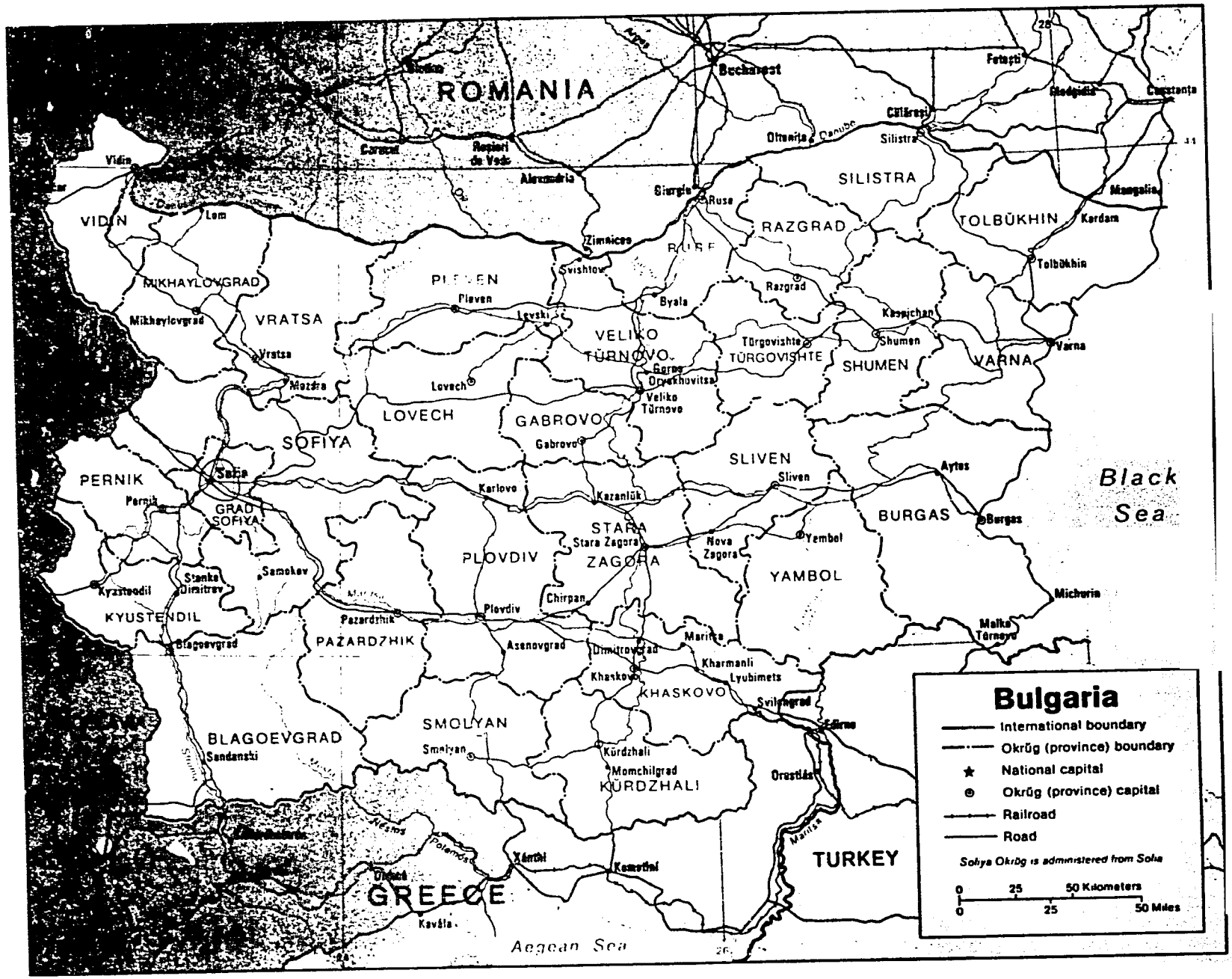
- Are funding, staff, and management adequate to provide appropriate operation and management of waste treatment programs?
- Is there a process for setting charges for households and other effluent producers that corresponds to the real cost of treatment? How is this done?
- What is the process for collecting fees?
- What is the process for maintaining consumer relations?
- How well is the management process conducted and what deficiencies exist?

3.8 Maintenance of Infrastructure

- How well is infrastructure maintained? What is the basic maintenance management system and who is responsible for it?
- What corrective maintenance or system replacement needs are projected for the future?

- At what stage is system expansion, replacement, or improvement determined or planned? Have studies been made? What is the estimated cost? Is this an area in which potential investment will be required? How will financing for corrective maintenance be obtained?

INSTITUTIONAL STUDY: BULGARIA


Bulgaria
International boundary
Okrŭg (province) boundary
National capital
Okrŭg (province) capital
Railroad
Road
Sofiya Okrŭg is administered from Sofia
0 25 50 Kilometers
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ROMANIA
GREECE
TURKEY
Black Sea
Aegean Sea
VIDIN
MIKHAYLOVGRAD
VRATSA
PLEVEN
SILISTRA
RAZGRAD
TOLBŬKHIN
RUSE
VELIKO TŬRNOVO
TŬRGOVISHTE
SHUMEN
VARNA
LOVECH
GABROVO
SOFIYA
SLIVEN
BURGAS
PERNIK
GRAD SOFIYA
STARA ZAGORA
PLOVDIV
YAMBOL
KYUSTENDIL
PAZARDZHIK
KHASKOVO
SMOLYAN
BLAGOEVGRAD
KŬRDZHALI
Bucharest
Sofia
Plovdiv
Varna
Burgas
Ruse
Vidin
Pleven
Lovech
Gabrovo
Sliven
Yambol
Haskovo
Kŭrdzhali
Blagoevgrad
Pazardzhik
Samokov
Kyustendil
Dimitrovgrad
Asenovgrad
Smolyan
Karlovo
Kazanlŭk
Stara Zagora
Nova Zagora
Chirpan
Razgrad
Shumen
Kardam
Tolbukhin
Silistra
Kavala
Alexandria
Zimnicea
Svishtov
Byala
Veliko Tŭrnovo
Gorna Oryakhovitsa
Mezdra
Lom
Mihailovgrad
Vratsa
Levski
Karnobat
Kŭrdzhali
Momchilgrad
Harmanli
Lyubimets
Svilengrad
Edirne
Orestiás
Malko Tŭrnovo
Michurin
Aytos
Yambol
Danube
Olt
Argeş
Iskŭr
Vit
Osŭm
Lom
Maritsa
Nestos
Strymon
Polemos
Xánthi
Komotini
Ulcinj
Constanța
Mangalia
Cilibrasi
Fetești
Medgidia
Oltenița
Giurgiu
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Caracal
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INSTITUTIONAL STUDY: BULGARIA

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1. SECTORAL OVERVIEW AND BACKGROUND

1.1 Political Organization and Population

Bulgaria is organized under a unicameral national assembly, which elects the country's state council and council of ministers. The country is divided into 28 provinces, each with an elected council responsible for local administration. Each provincial council and municipal (or urban) council is locally elected; there are 136 urban councils. The 1986 census lists the country's population at about 9 million; its total area covers 110,912 km^2 (42,823 mi^2). The trend in population growth is from constant to negative. The urban areas hold about 66 percent of the nation's population.

Bulgaria is located on the Balkan Peninsula. The north frontier is along the Danube River, with Romania sharing this divider until the river turns north into Romania and toward the delta. The western border is the former Yugoslavia (Macedonia in the southwest corner and Serbia due west). Greece is south, the Black Sea east, and Turkey southeast. Bulgaria's highest point is Musala, which climbs 2,925 m (9,579 ft).

1.2 Relation to the Danube River [a]

The Danube River enters Bulgaria at the country's junction with Yugoslavia and Romania at the village of Novo Selo, and flows east along the border with Romania for 471 km. Runoff into the Danube River on the Bulgarian side comes from melting snows from the Balkan and Rila mountains. The catchment area in Bulgaria is from the Danube River at 375 km to 845 km (measured from the start of the river at the Black Sea upstream) and includes the Danube River valley, Fore-Balkan, and part of the northern slopes of the Balkan and Rila mountains. The larger tributaries are the rivers Lom, Ogosta, Iskar, Vit, Osam, Jantra, and Rusenski Lom.

The Danube is a considerable water resource for Bulgaria. The total water consumption, including irrigation and drinking water, is 836 million cu m, of which 643 million cu m come from river sources and the rest from terrace reservoirs and groundwater.

Bulgaria is a signatory to the agreement under the Bucharest Declaration on water quality control for the Danube. It also has agreements with Turkey and Romania regarding pollution of the Black Sea.

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[a] For more detailed information on river basins, pollution, the Danube, and Bulgaria, refer to the technical report on Bulgaria in Volume III.

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1.3 Overview of Roles and Responsibilities

Table 1 presents a quick reference to sectoral organization in Bulgaria. Detailed descriptions of the primary organizations in the water quality management sector are presented below, in Section 2.

1.4 Trends in the Sector

Decentralization is the major trend for water and wastewater organizations. New structures and rules are under development for environmental agencies. The words most often used by those interviewed were, "We are in transition." River basin management as such has not yet begun; most of the streams and rivers are heavily polluted, and no jurisdictional units exist to view or manage a watershed area as they do in Slovakia and Romania.

1.4.1 Trends in Water and Wastewater Management

The Ministry of Territory and Settlements, Housing and Construction formerly was organized with central control over all water and wastewater companies and sectoral affairs. It decided, planned, managed, and funded the sector. The ministry had several organizations beneath it for this purpose. Vodocanal Engineering was the water and wastewater agency responsible for water and wastewater management. Hydrostroy was a state engineering and construction organization that carried out large civil works. About 40 regional and local water and wastewater delivering agencies operated under the ministry's control through Vodocanal Engineering.

In 1989 the government began a series of decentralization and reorganization programs that decentralized the sector and required most of these agencies to be self-supporting. Government water and wastewater organizations became either limited state companies, or responsibility was given to local governmental entities. In this move, the municipal councils were given the job of managing the disposition of water and wastewater. Many observers have said that municipal government had few resources to deal with this new responsibility and much of the operational level of the sector is consequently in disarray.

In some cases, municipal companies were set up, and in others, limited shareholding companies were formed. They are now considered autonomous organizations. Their linkage to the ministry is only a normative or regulatory linkage.

This same normative linkage also exists from the municipal level to the Ministry of Health for drinking water standards and to the Ministry of Environment for the control of effluent and discharges into rivers and water bodies.

The Role of the Ministry of Settlements now is to coordinate, oversee the quality of construction, set norms, and provide limited state funding for water and wastewater projects. It continues to maintain Vodocanal Engineering, whose job is to serve as a funding and investment organization for the ministry. Prior functions, such as direct responsibility for

Table 1

SUMMARY OF ROLES AND RESPONSIBILITIES
BULGARIA

Organization	Responsibilities
1. Ministry of Territory and Settlements, Housing and Construction (MTSHC)	Sets standards for water supply and wastewater for regional and municipal water and wastewater companies.
Vodocanal Engineering	Finances and regulates projects for water and wastewater under the direction of the MTSHC.
2. Municipal/Shareholding Water Companies	
Regional and Municipal Water and Wastewater Companies	Under regional or municipal councils, they provide, manage, and operate water and wastewater companies.
3. National Water Resources Council	Issues water withdrawal and water use permits (water resources planning).
4. Ministry of Environment	Sets policies and enforces water quality standards and control. Issues permits, sanctions, legislation, and data base information, and monitors ambient water quality. Oversees discharge permits and industrial monitoring.
Regional Environmental Inspectorates	Monitor and sample water quality in rivers, monitor industrial pollution, conduct laboratory testing, and discharge permits to municipal and industrial sources. Set and collect fines.
The Laboratory and Information Center	Provides research, data base information, and modeling on water, air, and soil. A section in the Ministry of Environment.
5. Bulgarian Academy of Sciences, Water Research Institute	Conducts specialized studies in water and groundwater.
6. Ministry of Public Health	Does water quality testing and drinking water monitoring and testing.
7. Independent Project Organizations	■ Institute for Water Supply and Sewerage: Design and Research. Recently reorganized as semi-private. ■ The principal Organization for Hydraulic Construction (Hydrostroy). Semi-private company, formerly state construction company for large dams, reservoirs, canals, and wastewater treatment plants.

management, as described above, have devolved to local government. Vodocanal Engineering now has only about 600 (reduced from 1,500) staff placed in different regions and in the capital city of Sofia. Very limited investment funds are now available from taxes; the limited amount that exists in special funds operated for the environment are shared by the ministry, municipalities, and the Ministry of Environment.

The responsibility for sectoral planning is now dispersed to all of the municipal and operating entities. The ministry has developed a master investment plan up to the year 2010. Parts of that plan have been moved along to the project planning stage, and basic feasibility studies have been done for many water and wastewater plants throughout the country.

1.4.2 Trends in Water Quality Management

The trend in water quality management desired by the Ministry of Environment is to develop a means of considering the whole river basin as a management unit (which does not exist at present) and put in place a better monitoring system.

The Ministry of Environment was given its current mandate under definitions promulgated into law on October 2, 1991. The former "Committee for Nature Protection" was disbanded under this law and the ministry reformed. The prior Nature Conservation Act (1967, 1977, 1968) was amended as the Environmental Protection Act of 1991 (State Gazette No. 86/18.10.1991). This act sets out general authorities but does not specify regulations or parameters, nor does it define specific pollution control measures.

The ministry is in the process of setting up new legislation, incentives, rules, standards, and norms. An ordinance on economic sanctions for polluting industries is under draft. A tax on energy use has been proposed, specifically for use of oil and coal with a high sulphur content. Tax concessions of 15 percent have also been established for equipment that industries purchase for environmental protection. Goods made from waste by-products are exempt from the 22 percent turnover tax. Additionally, a proposal is under draft for a 40 percent tax exemption for income tax on environmental investments (such as a pretreatment plant for an industry or upgrades to lessen pollutants).

2. WATER QUALITY MANAGEMENT INSTITUTIONS

2.1 Sectoral Administrative Organization

Because of recent and continuing reorganization in Bulgaria's water quality management sector, data on organization are based upon the relatively limited information available.

As mentioned in Section 1, Bulgaria comprises 28 regional provinces, each with its own council. The regional provinces are divided into 136 urban townships. The former structure divided rural areas into 1,016 communes, now considered rural districts.

The Ministry of Environment operates 16 administrative regions that cross regional boundaries. Each region has an inspectorate with responsibility for overseeing a portion of one of the country's seven major river basins.

2.2 The Ministry of Environment

The Ministry of Environment, according to the Environmental Protection Act of 1991, is responsible for policies and enforcement relating to municipal, industrial, and private discharges into water bodies and for pollution control in general (air, water, and soil). It is also responsible for setting water quality standards for wastewater discharges and water quality control overall. Through its regional offices, the ministry issues permits for wastewater load allocation and enforces sanctions for violations of those load allocations.

The Ministry of Environment also maintains the National Environmental Protection Fund. The fund, which is in its beginning stages, is provided for by fines from polluters. The regional inspectorates' monitoring programs discover violations, and the resulting fines are collected. According to article 3, paragraph 3 of the Environmental Protection Act of 1991, 50 percent is given to the municipal environmental fund, 40 percent to the regional inspectorate for environmental protection activities, and 10 percent to the National Environmental Protection Fund.

The Minister of Environment is required to present a report on the state of the environment once a year to the Council of Ministers, which, in turn, submits it to the National Assembly for approval. The ministry is required to maintain data collection, laboratories for analysis, and a monitoring system. Environmental information, by law, must be published and made available to citizens and state and municipal authorities.

The ministries of Health and Agriculture also play a role in data collection and analysis. Agriculture reports on agricultural contamination, and the Public Health Department assesses the quality of drinking water. Industries and municipal polluters are also required to test and maintain records on the sources of pollution and produce regular reports on their activities. The control activities of the Ministry of Environment require that pollution loads and parameters be specified for each pollution source and a permit be given. Also, any new activity

of either the state, the municipality, or individual industries having a potentially adverse impact on the environment requires an environmental assessment and impact statement.

The Ministry of Environment consists of a minister, two deputy ministers who manage technical departments, a secretary general who manages staff departments, and direct line management from the minister down to the 16 regional inspectorates and one central laboratory and information center. Advisory groups include the Interministerial Coordinating Council, a collegium, an operative group for ecological accidents and disasters, and the Council of Experts.

2.2.1 Regional Environmental Inspectorates

Sixteen regional environmental inspectorates cover the seven river basins and the major municipalities in Bulgaria. Some inspectorates correspond to a river basin, others divide a basin, and others do not monitor a river basin but a geographic and urban area. It is their job to carry out monitoring routines and sample point sources at municipalities and industry sites, as well as sample water monitoring stations on river reaches in their territory.

The inspectorates also maintain a laboratory that conducts routine tests on a standard set of parameters. Through this program, discharge permits to municipal and industrial sources are issued. Allowable discharge amounts are set and when exceeded, fines are collected. Because most sources will exceed allowable amounts, a set amount of tax is levied as a standard sanction. Amounts above this require exceptional fines.

A typical inspectorate will have about five employees to conduct inspections (for air, water, sand, soil, and solid waste), one vehicle, a laboratory chief with two technicians, and a regional chief inspector. For example, the regional inspectorate located in the township of Veliko Torznovo monitors pollution point sources on the Jantra River basin. The basin has 323 identified point sources that include villages of more than 500 people. Of these point sources, 211 already have treatment, although only two of these are towns, the rest being industries. Of the remaining sources, 83 need some type of intervention. Those point sources that are larger (municipal sources and larger industries) have their own laboratory routines for sampling and submit reports. Reports are verified with spot checks two to six times a year. Lesser sources may only be sampled once a year. River stations are sampled once a month.

2.2.2 The Laboratory and Information Center

Until February of 1992, the Ministry of Environment maintained a monitoring center that conducted environmental research, collected data, maintained a monitoring data base, and provided modeling on water, air, and soil. The ministry has recently reorganized and set up a laboratory and information center that has three units: a monitoring section, a laboratory complex, and an information management section. The functions of the former monitoring center will be conducted within this new structure. The monitoring function that is carried out by regional inspectorates will provide data for analysis to this group. Presumably the data

based monitoring instrument (DEMDESS) developed within the USAID program will be managed in this center.

2.3 The Ministry of Territory and Settlements, Housing and Construction

As mentioned in Section 1.4.1, the Ministry of Territory and Settlements, Housing and Construction has had a greatly reduced role in the water quality management sector since the reorganization that took place from 1989 to 1992. It formerly exercised control over all water and wastewater companies and sectoral affairs (construction, investments, and planning). The ministry had several organizations beneath it for this purpose:

- Vodocanal Engineering managed water and wastewater companies and channeled funding, planning, designing, and contracting for construction and civil works for its plant network.
- Hydrostroy managed large civil works under contract as a state company.
- The Design Institute for Water Supply and Sewerage provided design engineering as a state company under contract to the ministry.

The only former sectoral organization remaining within the ministry is Vodocanal. Vodocanal operates now much as a construction loan management arm of the ministry. The limited funds available for construction of water and wastewater facilities are lent to municipal governments under matching fund arrangements. Vodocanal prepares the loans and provides technical verification of the quality of the construction work.

2.4 Municipal Water and Wastewater Companies

Under Bulgaria's devolution program, government water and wastewater organizations became either limited state companies, or responsibility was given to local governmental entities directly. Municipalities, in their new role as managers of the disposition of water and wastewater, in turn decide whether to operate a water and wastewater entity as a direct municipal operation or to arrange for another management entity or privatize the assets.

In some cases, municipal companies have been set up, and, in others, limited shareholding companies have been formed. An example of a shareholding company is Vodocanal Complex Ltd. (no relation to Vodocanal Engineering), a state water company established as an independent entity within a partnership between shareholders and the state. Another company, The Sofia Water Company, operates as a municipal department. The disposition of many water companies has not yet been determined by municipal councils.

Municipalities also now have the authority to set tariffs. The price charged for water and wastewater in Bulgaria had been the same for all families and normally was combined with the utility and heating bill. Under decentralization, rates now vary from city to city and regional water company.

2.5 Laws and Enforcement

The Environmental Protection Act (State Gazette No. 86/18.10.1991) sets the general provisions for the responsibilities of the Ministry of Environment. It describes the ministry's duties and authorities and the general processes for determining environmental sanctions, incentives, and monitoring. The act does not provide specific environmental ordinances. Because Bulgaria is a signatory to international conventions on the Danube and Black Sea, it follows in-stream water quality standards outlined in the implementation agreement of the Bucharest Declaration. This specifies parameters to measure and uses a river classification system (1, safe to treat for drinking; 2, specified agricultural or industrial use; 3, unsafe). The basic law regulating water usage is the Law on Water (April 11, 1969, No. 29).

Drinking water must conform to the Bulgarian State Standard 2823-83. This document specifies the parameters and values to which drinking water fit for human consumption must conform. It generally parallels the specifications of the World Health Organization.

Bulgaria also has ordinances relating to discharge permits (ordinances nos. 2, 7, 8, and 9). These specify that discharges must be made in accordance with measured in-stream standards and the classification of the river involved. Limits are specified for loads and an agreement is made with each polluter. The allowed amount requires a basic tax. Any amount exceeding that incurs a fine. Articles 29, 30, 31, 32, 33, and 34 of chapter six (Law 86-1991) specify sanctions and penalties for individuals, experts who falsify data, and companies and municipalities. Companies out of compliance may be fined from 20,000 to 2 million leva if they have repeated an offense a second time, if the offense causes irreversible harm to environmental and human health, or if the activity has been prohibited under court order. Smaller infractions carry a 1,000 to 10,000 leva fine.

Those interviewed said the former sanctioning system did not work. Penalties were very low and many exceptions were made. The sanctions specified above still are probably insufficient to deter large industries from polluting.

2.6 Sector Finances and Costs

As noted in Section 2.3, the sources of revenue for financing capital investment in the water quality management sector are minimal, due to a change in structure and the general economic conditions at the moment. It is doubtful that even operational costs are now being met.

The cost of water in Bulgaria is lower than in any comparable country in Europe, as charges for water and wastewater in the country have a history of heavy subsidy. The highly subsidized rate provides no incentive to control water waste or for management entities to work on a real-cost basis.

In general, the prices range from the low end in Sofia, with .50 leva per cu m, to 2 leva per cu m in cities in the north (at the time of this writing the exchange rate was 24 leva to U.S. $1.00). The price for wastewater is "symbolically" included in the water charge but the amount

is minuscule (.081 leva per cu m of water). The average public employee in Bulgaria earns about 1,200 leva per month. A family with two wage earners has an income twice that. In current exchange rate terms, this amounts to $100 monthly.

In the past, local government has only received funds from the Central Finance Ministry. The environmental fund will be a potential source of investment capital once sanctions begin to work and are pursued more vigorously. These processes are new to local government, however. The issues of local taxes, ways to increase the environmental fund paid into municipalities, and sectoral planning at local levels will require learning and management experience. Few staff members at local levels possess environmental expertise.

2.7 Institutional Issues

The following issues are institutional constraints to the management of water quality and to the future use of the Danube decision support and management system. They were developed with the assistance of the USAID project.

- Laboratory Capability

  Inspections on field trips made by the WASH team and information given during interviews indicate that the local water quality laboratories are very poorly equipped, often lack reagents, and require staff training. Sampling equipment for industrial and municipal point source discharges are also lacking.

- Monitoring System Needs

  In conjunction with the need for laboratory and monitoring equipment listed above, the ability to have parallel computer programs with a local data base and local data input, and transmittal to the central model repository will be needed. Computers, training, software, and increased data gathering routines will be required.

- Structures for River Basin Management

  The move toward decentralization has made municipalities responsible for the planning of very small river segments. Yet, a structure that considers the needs of an entire river basin as a water quality management unit will be important for future water quality management and planning. How to accomplish this, whether or not within the Ministry of Environment, is a matter for special study or attention.

- Funding for Capital Investment in Water and Wastewater

  The operation and maintenance of water and wastewater treatment suffers from decentralization, disorganization, and low-priority attention. Funding of water and wastewater operations is extremely inadequate. The fee structure for tariffs needs revision because it is so low that it bears no relationship to actual operating costs. Local operations and municipal companies need management assistance and must learn how to operate a business soundly.

ORGANIZATIONAL CHART: BULGARIA

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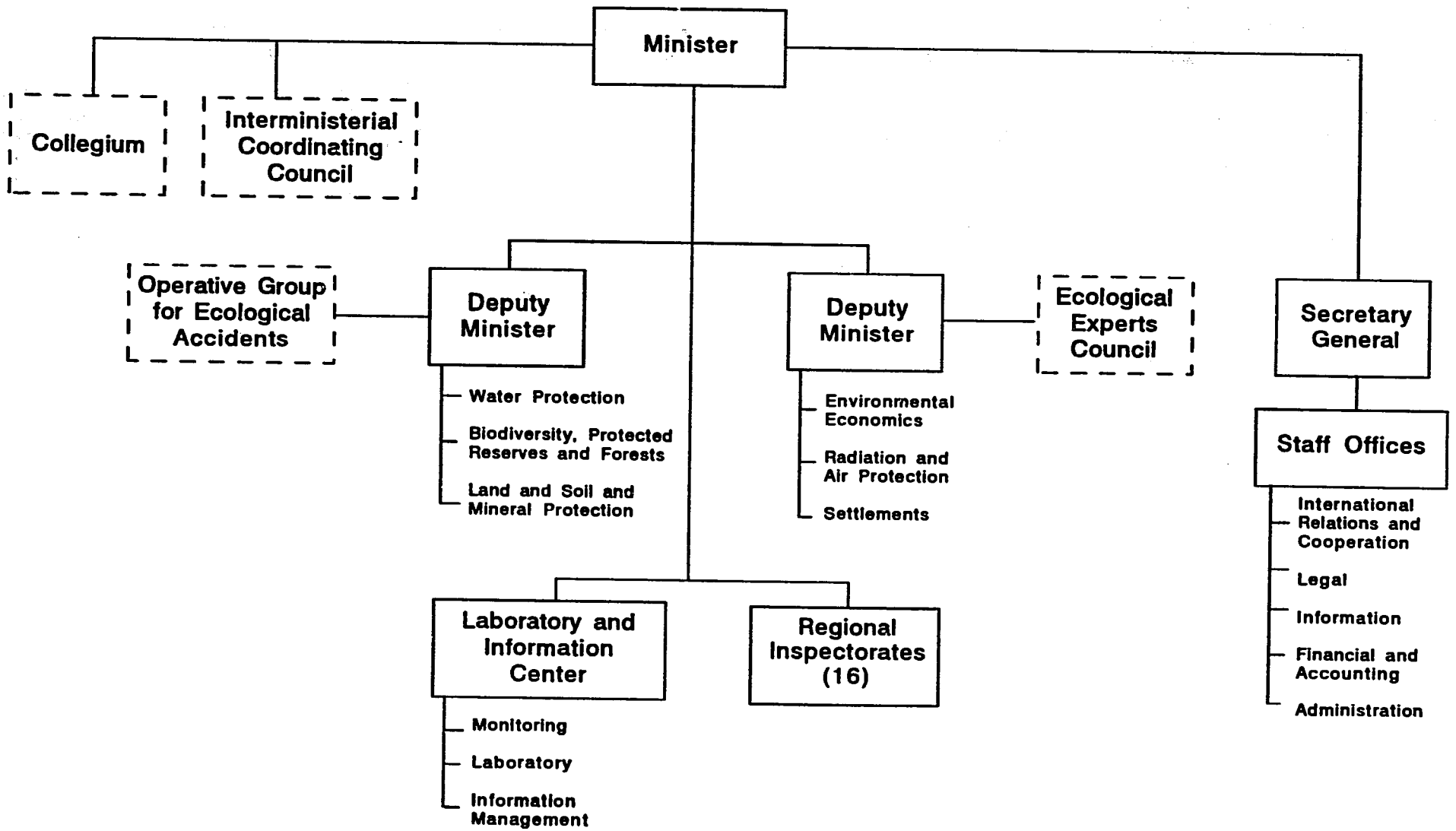
Chart 1

MINISTRY OF ENVIRONMENT—BULGARIA



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