

MINISTRY OF AGRICULTURE,  
NATURAL RESOURCES AND ENVIRONMENT

WATER DEVELOPMENT DEPARTMENT

**ANNUAL REPORT 2010**

## V. WATER DEVELOPMENT DEPARTMENT

### 1. INTRODUCTION

**1.1.** The Water Development Department (WDD) is responsible for implementing the water policy of the Ministry of Agriculture, Natural Resources and Environment with the aim of providing effective protection, rational development and sustainable management of the water resources in Cyprus.

Following the enactment of the Integrated Water Management Law (79(I)/2010, which was passed and came into force on 15 November 2010, the Department has become responsible for the **integrated management of the water resources in Cyprus.**

In this context, the competences of the Department cover a wide and varied range, including the following:

- a) Collection, processing, classification and recording of hydrological, hydro-geological, geotechnical and other data, which are necessary for the study, maintenance and safety of development projects.
- b) Feasibility studies, design, implementation and maintenance of infrastructure projects, such as dams, ponds, irrigation, water supply and sewerage networks, water refineries, plants for the treatment and reuse of wastewater, as well as desalination units.
- c) Protection of water resources from environmental pollution and contamination.
- d) Cultivation of water saving awareness among consumers.

**1.2** The main pylons of the water policy in 2010 was to secure sufficient quantities of water for the benefit of both the island's inhabitants and the environment through a viable management of water resources.

In more detail the Department focused its efforts on the following priorities:

- a) Addressing the problems of water shortage due to droughts and increased water supply demand, mainly in the main urban centres.
- b) Reinforcement of the water balance in Cyprus through the use of other non-conventional water sources, such as recycled water, desalinated water or brackish groundwater, as well as rain water. The aim is to completely eliminate the dependence of water supply on weather conditions in all urban centres.
- c) Intensification of water awareness efforts, with the aim of conserving water for all uses.

d) Harmonisation with the European acquis by setting up the necessary legal framework for the protection and rational management of water resources.

To this end, the “Integrated Water Management Law (79(1)/2010” was drafted and tabled to the House of Representatives, having been approved and taken effect on 15 November 2010.

The enactment of the law for Integrated Water Management constitutes a historical development, since it brings to an end the division of responsibilities and powers relating to water among the various Departments, which resulted in waste, isolated handling of problems and ultimately in the inability to exercise an integrated, rational and effective management of the sum total of water resources. Under the provisions of the Law, the responsibilities for the issuing of permits for Water Abstraction Projects are transferred from the District Office to the Department; likewise, the responsibilities regarding sewerage systems for refugee settlements, Communities and wastewater treatment Stations in government buildings, such as hospitals, are transferred from the Town Planning and Housing Department to the Water Development Department.

**1.3** The Water situation in 2010 was improved compared to previous years, due to higher rainfall on the one hand resulting in the inflow of larger quantities to the dams, and to the construction of new desalination units on the other, with total capacity reaching 180 000 m<sup>3</sup>/day at the end of 2010 when the Paphos desalination plant was put into operation.

Precipitation in 2010 reached 546 mm or 109% of average rainfall. Inflow to the dams during 2010 (Jan.-Dec 2010) reached 119 MCM.

Reservoir storage on 01/01/2010 was 95,6 MCM or 32,9% of total capacity, while on 31/12/2010 it was 139,3 MCM or 48% of total capacity. Details are shown in Table 9 of the Annex.

Following the satisfactory flow of water to the dams in January 2010, the water rationing measures imposed on Local Authorities were lifted as from 1<sup>st</sup> February 2010.

As a result of the improved water situation, sufficient irrigation water was made available from the Southern Conveyor Project to satisfy 75% of the needs of permanent crops and 85% of green house needs. The needs for potato cultivation were also covered by 42% and for seasonal plantations by 40%.

The activities of the Department per thematic unity during 2010 were as follows:

## **2. MONITORING OF WATER RESOURCES/DATA PROCESSING**

**2.1** The collection and processing of hydrological and hydro - geological data was continued for surface and groundwater resources, as was the handling of hydrological problems relating to the programming and implementation of water works, the control of abstractions and use of groundwater, the monitoring of water quality/pollution and the provision of advice on matters of water usage.

### **Quantitative Monitoring of Surface Water**

**2.2** In the field of quantitative monitoring of surface water, the measurements of stream flows were continued at 51 hydrometric stations equipped with automatic water level recorders. In the context of modernizing the stations, data loggers were installed at a number of monitoring stations and a pilot hydrometric station was put in operation, whereby the measurement of the water depth is carried out using radar sensor.

### **Qualitative Monitoring of Surface Water**

**2.3** In the field of qualitative monitoring of water resources, the implementation of the water monitoring programme (rivers, lakes/reservoirs, groundwater) was continued in accordance with Article 8 of the Water Framework Directive 2000/60/EC. In the context of the said programme, 45 river points, 11 reservoirs, as well as 84 boreholes were systematically monitored.

**2.4** During 2010 the national monitoring programme for small reservoirs was continued, in the context of which sample taking is carried out for physicochemical parameters at about 20 water reservoirs in a frequency of three times per annum. In the ten largest water reservoirs, regular measurements (two per week) of the water temperature take place since the spring of 2011 for the purpose of monitoring and timely locating the development of water stratification in the reservoirs.

**2.5** Concerning hazardous substances (e.g. fertilizers, insecticides, heavy metals etc) the concentration on the average of 60 substances was examined and evaluated at 28 river points and at 10 dam points. All data were submitted to the EU in the form of a report through the WISE system.

**2.6** Within the framework of participating in the Intercalibration Exercise of the EU, the Department continued the biological classification of the water systems at rivers and reservoirs in Cyprus, concerning the biological qualitative elements “macrophytes and macro-invertebrates in rivers.”

### **Monitoring of Groundwater**

**2.7** Within the framework of both the national programmes and the programmes under Directive 2000/60/EC for qualitative and quantitative

monitoring of groundwater, the evaluation, revision and proportional modification (including the location, organization and coordination of drilling new boreholes) of monitoring networks continued where considered necessary.

**2.8** Concerning the quantitative monitoring of groundwater, the measurement of fluctuating levels of underground waters continued, using over 1400 boreholes-observatories and the results of 135 springs were measured.

**2.9** A sample-collecting campaign was organized and coordinated in community boreholes across Cyprus with the aim of monitoring and testing the quality of water under Directive 1983/98/EC.

**2.10** The conduct of six-monthly measurements for the conductivity and temperature of groundwater was carried on within the national programmes for monitoring the degree of sea intrusion to the coastal aquifers of Akrotiri, Garryllis, Germasogia, Paramali, Avdimou and Kokkinochoria.

### **Processing of Hydrological Data**

**2.11** All the results of both the quantitative and qualitative monitoring of streams, reservoirs, groundwater and springs are uploaded on the CYMOS database and submitted to the Eionet-WISE network of the European Union.

**2.12** The collection and digital conversion of information for water abstracted from aquifers and for irrigation quantities from groundwater and surface water, as well as information for irrigated areas, was continued with the aim of providing immediate access and faster utilization of the information.

**2.13** A pilot programme was initiated to record all legal and non - licensed boreholes in the Central and Western Mesaoria Plain with the ultimate aim of extending it on an island-wide basis.

**2.14** A pilot study was initiated for the area of the Troodos aquifer, concerning the isotopic composition of rain and underground water of Cyprus in relation to climatic changes.

**2.15** Over 2 100 applications for the sinking of wells, the installation of machinery et al. across Cyprus were processed, as well as approximately 520 applications for the drilling of boreholes for domestic use. A large number of applications for permit to discharge waste were also examined within the context of the law for the protection of Cyprus' water resources. The water metres of over 600 boreholes were also monitored.

**2.16** The delineation of protection zones for domestic water wells was also continued. More specifically, out of approximately 350 domestic water wells, about 140 protection zones have been delineated by Ministerial order and an additional number of 172 in the context of changes in Town Planning Zones.

**2.17** Work for the delineation of protection zones for water supply reservoirs was continued, as required by the Water Protection and Management Law N13(I)2004, with the protection of the Kourris and Arminou dams having been completed.

**2.18** The water balance of the government – controlled areas of Cyprus for 2009 has been assessed for submission to EUROSTAT.

**2.19** Thematic maps concerning the activities of the Department, those of other Departments, Organisations and Consultant Engineers were prepared, e.g. maps for the positioning of water projects, networks and monitoring stations for ground and surface water bodies etc.

**2.20** Isopiezometric digital maps (groundwater levels) of the coastal aquifers of Paramali and Avdimou were prepared for the month of April, Kiti-Pervolia and Kokkinokhoria for June and March, and Akrotiri for the periods February-March and June - July. These maps can be viewed on the Department's website.

**2.21** A report has been prepared concerning the impact from the operation of the water processing Station of the Garyllis River on the aquifer. The development of a mathematical model for the said aquifer was initiated. Moreover, the investigation was completed and the related reports prepared for the possibility of transferring and utilizing this unit in other areas of Cyprus (Akaki-Peristerona, Nicosia Airport, Kattoudkia at Dali and at Pano Deftera-Anayia).

### **3. IMPLEMENTING THE EUROPEAN ACQUIS**

**3.1** Throughout 2010, important work has been carried out on the harmonization and monitoring of various obligations and requirements of the European Union.

#### **Directive 2000/60/EC**

**3.2** In the context of implementing the Water Framework Directive 2000/60/EC (WFD) in Cyprus (articles 11, 13 and 15), the WDD Contract 97/2007 for the preparation of a water Management Project was carried forward, including a Programme of Measures, a drought management Plan and Proposals for the Revision of Water Policy, as well as the WDD Contract 26/2009 for the Preparation of a Strategic Environmental Assessment for the above plans and the conduct of a campaign for consultation with the public (article 14 of WFD).

**3.3** In this context, the Draft River Basin Management Plan and the Draft Programme of Measures were prepared and submitted for public consultation, along with the Draft Plan for Drought Management, the Proposals for the Revision of Water Policy and the Interim Strategic Environmental Assessment.

**3.4** The consultation campaign was initiated on 28 May 2010 and completed successfully on 30 November 2010. The results of the consultation, deemed successful on account of the large number of participants and their constructive suggestions, were presented at an island-wide event on 1<sup>st</sup> December 2010.

**3.5** During 2010 and following the conclusion of the consultation, the Draft Strategic Environmental Assessment of the Draft Water Management Plan on the Environment was prepared and submitted to the Environmental Authority for an opinion.

**3.6** In March 2010 the Contract was completed for a study on the implementation of Article 9 of the Water Framework Directive 2000/60/EC relating to the development and implementation of water pricing policies in Cyprus in accordance with the Directive.

**3.7** During March-June 2010 a Public Consultation was carried out concerning water pricing policies, in the context of the relevant Contract. There followed further consultation and a study on the prevailing Legislation relating to the pricing policy and actions for its implementation, within the timeframe given by the Directive.

#### **Directive 91/271/EEC**

**3.8** During 2010 the application of the National Implementation Programme for Directive 91/271/EEC was continued for Urban Wastewater Treatment in settlements with population over 2 000.

**3.9** A revised assessment of expenditure for the National Implementation Programme through the Preparation of financial, technical and organizational information and analyses for submission to the European Investment Bank (EIB), was prepared. This resulted in the concluding consultations and the signing of a Financing Agreement for rural sewerage projects for an amount of €290 millions.

**3.10** The drawing up of a feasibility study and a techno - economical study for the Pissouri community was continued.

**3.11** During 2010 the promotion of the implementation programme for the sewerage projects in rural communities with a population below 2000 was also continued. This programme has been drawn up in accordance with the findings of the relevant Draft Reconnaissance Studies and following consultation with the corresponding District Offices and Local Authorities.

#### **Directive 2007/60/EC**

**3.12** During 2010, the necessary work was continued to enable the Department, as the Competent Authority, for the implementation of the European Directive 2007/60/EC concerning the evaluation and management

of flood risks, and the relative harmonization law of Cyprus N.70(I)2010, to respond within the time limits set by the Directive.

## **Community Initiatives**

**3.13** Within the framework of the co-funding procedure for water projects using European Union funds, the Project “Implementation Studies for articles 9, 11, 13, 14 and 15 of the European Water Framework Directive 2000/60/EC was approved and included in the Operational Programme “Sustainable Development and Competitiveness 2007-2013” under the Priority Heading “Basic Infrastructures in the Environment and Energy Sector.”

**3.14** Likewise, in the context of Co-funding Sewerage Projects through Community Resources, two sewerage projects, the Solea Complex and the Kokkinochoria Complex respectively, were approved for co-funding by the Cohesion Fund and were included in the “Sustainable Development and Competitiveness” Operational Programme.

**3.15** The implementation and management was continued (including time and financial planning, preparation of budgets and absorption forecasts, progress monitoring and preparation of reports, observing procedures and regulations, personnel training) of four (4) co-funded sewerage projects, namely the Astromeritis-Peristerona-Akaki Cluster, Athienou Municipality, Solea Complex and Kokkinochoria Complex.

**3.16** The Department participated in the Community initiative JASPERS for the possible co-funding of the permanent desalination plant in Paphos and the major sewerage project of the Kokkinochoria Complex.

**3.17** Preparations for setting the priorities of the Cyprus Presidency of the European Council in the second half of 2012 were initiated.

## **4. ANNOUNCEMENT OF COMPETITIONS**

**4.1** Tender Documents were prepared and Competitions announced for the procurement of supplies and lease of machinery for the Execution of Projects by the District Offices of the Department.

**4.2** Tender Documents were prepared and Competitions announced for the procurement of various supplies and fittings used in a variety of Department works, such as ductile iron pipes and fittings, valves and air valves, gabions, hydrological instruments, drilling equipment, etc.

**4.3** Competition Documents were prepared and Competitions announced for the provision of Services concerning the undertaking of studies, such as the study for the storage reservoir of recycled water at Vathia Gonia, the investigation of the possibility of producing electricity from the Cyprus dams, etc.



**4.4** Competition Documents were drawn up and Competitions announced for the implementation of works for the construction of sewerage networks at Avgorou, Achna, Dherynia, Kakopetria-Galata, as well as for the design, construction, operation and maintenance of wastewater treatment plants at Astromeritis and Menoyia respectively.

## **5. STUDIES AND EXECUTION OF WATER PROJECTS**

### **Projects completed in 2010**

**5.1** The Techno - economical Study for the use of the recycled water of Larnaca was completed. The Department proceeded to study an alternative scenario for the use of the Larnaca recycled water without desalination, due to the strong reaction by the inhabitants of the Meneou-Pervolia communities and the organized groups of tourist complex owners in the above areas. The consultants submitted the final Project Study in March 2010.

**5.2** The contract has been completed for the “Investigation of the condition of the Water Supply Networks” study, in June 2010.

**5.3** The contract for the study under the title “Strategic Environmental Assessment for Desalination Impact on the Environment” has been completed and placed before the Environmental Authority in October 2010. The Authority’s Opinion is pending.

**5.4** The “Investigation for the Use of Rainwater” study was completed in January 2010 and consultations have been held with the agencies and competent services concerned, accompanied by suggestions for the sustainable use of rainwater.

**5.5** The final study for the desalination pipeline from Vasilikos to Nicosia has been completed along with the construction designs, quantity estimates of materials and Bills of Quantity, as well as the Technical Specifications for the launching of a competition for the procurement of supplies.

**5.6** A study has been completed for the irrigation networks of Tembria and Lympia.

**5.7** The study along with the construction designs for the pumping station of Garyllis for the transfer of recycled water to the Polemidhia dam has been completed.

**5.8** Supplementary construction designs for the Solea Irrigation Project have been completed following modifications during the construction of the Project.

**5.9** The construction of the Paphos Mobile Desalination Plant has been completed, becoming operational in November 2010.

**5.10** The Study for the imposition of a water saving measure through the quota levy system has been completed.

**5.11** In the context of the Scheme for the use/disposal of recycled water from the biological wastewater treatment stations of Anthoupolis and Vathia Gonia, a study was prepared for the construction of a pumping station for the irrigation system of Dali-Potamia-Ayios Sozomenos. Consultations with the Municipalities and the various Communities of wider Nicosia for the disposal of the recycled water to the green areas have been completed.

### **Projects in progress**

**5.12** The contract for the Environmental Assessment Study for the Environmental Impact from the Use of the Recycled Water Projects of the wider Larnaca area Sewerage System was continued. The Draft Report for the above contract was prepared in November 2010, taking into consideration both alternative scenarios for the disposal of recycled water. A special study has been initiated for the likely effects on the quality of the soil from long term irrigation using water of high salinity, as is the case with the recycled water of Larnaca.

**5.13** A Project Study for the transfer of desalinated water from the Vasilikos desalination plant (EAC) is under way for the water supply of the Communities of Western Larnaca and Eastern Limassol.

**5.14** The contract for the feasibility study concerning the recycled water disposal of the sewerage systems of the Wider Limassol Area was continued. The Interim Report has been submitted and the Study is expected to be completed in August 2011.

**5.15** The Contracts for the Provision of Consultancy Services concerning the Study for the water dams of Mylouri at Palaechori, Kammitis and Archangelos in Aradippou and Idalion on Yialia River were continued.

**5.16** The installation of the main pipeline for the transfer of water for the Anadiou Government Water Project was continued in 2010.

**5.17.** The construction is under way of Water Treatment Plant with a capacity of 10,000 m<sup>3</sup> per day in the area of the Asproyia-Kannaviou dam. Its completion is anticipated by the end of 2011.

**5.18** The upgrading, modernization and replacement of community water supply systems in all Districts continued during 2010 for the supply of good quality domestic water and the reduction of losses.

**5.19** The installation of electromechanical equipment in 51 governmental and communal water supply and irrigation projects was continued. Installed also were 23 liquid type chlorination systems in municipal and communal water supply projects, of which 8 were powered by photovoltaic energy.

**5.20** The management of Contracts and the supervision of construction works went on during 2010 for the mobile desalination Plant at Kouklia, the Limassol desalination unit, the Solea Dam and the Kannaviou Water Treatment Plant.

**5.21** The monitoring and coordination of the contract was continued for the three-year operation and maintenance of the Vathia Gonia Domestic Wastewater Treatment and Industrial Waste Plant, as well as the monitoring of imposition and collection of discharge rates in the plant.

**5.22** Coordination was continued of the Contract for “The Review study on the environmental impact from the enrichment of the Akrotiri aquifer with recycled water from the sewerage system of Limassol – Amathounta” (Contract No. WDD 74/2009).

**5.23** During 2010 the construction of the liquid waste collection network at the community cluster of Astromeritis, Peristerona, Akaki was continued.

### **Projects initiated in 2010**

**5.24** During 2010 the following Contracts were awarded:

(a) Installation of the liquid waste collection network of the sewerage systems of Achna-Avgorou, Dherynia and Kakopetria-Galata.

(b) Design and construction of the wastewater treatment plant of the Astromeritis-Peristerona-Akaki Community Complex.

**5.25** The “Study of demand management measures” was initiated. The draft study was submitted in November 2010 and is expected to be completed in March 2011.

**5.26** The construction has begun of the Limassol Permanent Desalination Plant, which will have a production capacity of 40.000 m<sup>3</sup> per day with the possibility of extension to 60.000 m<sup>3</sup> per day.

**5.27** During 2010 the construction of the wastewater collection network in the Municipality of Athienou got under way.

**5.28** Construction work has begun on the wastewater collection network in Xylophagou.

**5.29** In January 2010 the construction of the Solea Dam Irrigation Project. Began the construction works are expected to be completed in January 2012.

**5.30** The implementation has begun of the project for the supply and installation of electromechanical equipment for the pumping stations of Anadiou and Kathikas, to be used in the water supply system of 34 Paphos communities from the Kannaviou Water Treatment Plant. The project for the supply and installation of electromechanical equipment for the pumping stations of the Irrigation systems in the communities of Dali, Ayios

Sozomenos, Potamia and Geri has also entered the implementation stage. These communities will be supplied with treated water from the Wastewater Treatment Plant at Vathia Gonia, as well as from the Polemidhia pumping station for the transfer of treated water from the Moni Station to the Polemidhia dam.

## **6. PROJECT OPERATION AND MAINTENANCE**

**6.1** The Water Development Department is responsible for the management, operation and maintenance of installations for the production and transfer of water belonging to the State. The Government Water Supply Systems include the Water Treatment Plants, the Desalination Plants, government boreholes, as well as the pumping systems, the central reservoirs and the main diversion pipelines carrying water from the production points to the Water Boards of Municipalities and Communities.

**6.2** Total domestic water output in 2010 reached 82 MCM. It should be noted that in 2007 when there were no restrictions, the total production of water was 74,3 MCM. The 10% increase does not only concern the increase per consumer but is also due to the connection of new areas to the central water supply systems, on account of the qualitative and quantitative downgrading of community boreholes. The production of the Water Treatment Plants, in 2010 reached 25,04 MCM.

**6.3** During 2010 the management of contracts for type BOOT desalinations continued for the two permanent Plants of Dhekelia and Larnaca, as well as for the mobile Plants of Moni and Garyllis. The Paphos mobile desalination Plant at Kouklia started to function on 22/11/2010. The production of the above plants in 2010 reached 52,79 MCM.

**6.4** The water quantity supplied by the WDD continued to be recorded and corresponding Water Bills were issued based on fees applicable through the Computerised Water Invoicing System. Payment of bills was also monitored in accordance with the prevailing legislation.

**6.5** The effort for the settlement of outstanding debts for water supply bills continued in 2010.

**6.6** Within the framework of implementing the policy on Golf Courses and related development, the Department dealt with the evaluation of environmental impact assessment reports and studies concerning the water supply to the proposed projects. It also dealt with the submission of comments and views to the Environmental Committee, to the Contracting Authority (Town Planning and Housing Department) and to the Ministry of Agriculture, Natural Resources and Environment.

**6.7** Scenarios and water supply percentages were prepared and implemented for farmers based on dam reserves, as well as daily water

balance in all the dams and daily briefing sheets for inflows, reserves, consumption and losses.

**6.8** The process for the implementation of the Debts Limitation Law continued in 2010 concerning the payment of outstanding debts for the consumption of irrigation water from Government Water Works, in cooperation with the Legal Department of the Republic, which proceeded to take court measures against defaulters through private lawyers.

**6.9** Within the framework of measures for the conservation of drinking water the subsidization plans were continued for the drilling of boreholes, the connection of boreholes to lavatories, the installation of grey water recycling systems and the installation of hot water circulators.

**6.10** The installation and maintenance of grey water recycling systems in schools continued in 2010. Eleven new systems in as many schools were installed.

**6.11** The operation and maintenance of Wastewater Treatment Plants continued in the army camps of Malounta, Ayios Ioannis Malountas, Stavrovouni, Kornos, Klirou, Lefkara, Frenaros and Mathiatis. The operation and maintenance for two years of the Central Wastewater Treatment Plant at Vathia Gonia was also continued.

## **7. MANAGEMENT OF INFORMATION TECHNOLOGY AND TRAINING**

**7.1** In the context of further personnel education within the Department, 35 courses were organized with 297 participants. The educational programmes and lectures addressed Technical, Environmental, Administrative and Legislative issues, as well as issues on Public Contracts, Communications, Safety and Health at the workplace, Software Programmes and training for the induction of newcomers to the Public Service.

**7.2** The monitoring of the Southern Conveyor Project is carried out through the use of a Telemetry System, which provides for a continuous and overall view of the functioning of Major Water Works and the possibility to take repair action. The system was upgraded in 2010.

**7.3** The WDD electronic infrastructure includes over 450 network appliances, such as personal computers, printers, scanners and other network peripherals. The entire scientific personnel, and almost all of the technical and clerical staff have access to the internal network files of common use, as well as to the Internet and email services.

**7.4** Technical support in equipment and software programmes is provided on a daily basis at the main offices, district offices and isolated offices of the Department. In the context of technological upgrading, a partial replacement of old computers, printers and other network peripherals has taken place.

**7.5** In preparation for the accreditation of WDD Laboratories concerning the monitoring of water quality, a Laboratory Information Management System (LIMS) was tested and started functioning as the main database for the handling of samples. The system for Economic Analysis of Water Use has also been approved.

**7.6** The WDD website is updated every day. The website includes information on the water resources of Cyprus, the environment, the Water Framework Directive 2000/60/EC and the relevant Cyprus legislation, water saving measures, etc. In addition, the website allows the public to communicate through e-mail and in accordance with statistical data from the Department of Information Technology Services, some 5 500 persons visit the website every month.

**7.7** The computerized Water Invoicing System (WIS) used in recording and billing the consumption of domestic and irrigation water from Government Water Works continued to function during 2010.

**7.8** The Hydrological/Hydro-geological Database (CYMOS) was further developed with the aim of securing proper functioning and simplifying use procedures.

**7.9** The development of a database for the licensing of drilling boreholes and water abstractions from boreholes (Base "Boreholes Licensing") was completed in the context of implementing the Integrated Water Management Law 2010, N.79(I)2010.

**7.10** In December 2010, the Department of Information Technology Services signed contract C.2010/76 for establishing an integrated Geographical Data System (GDS) in the WDD. The GDS system will provide the Department with a common platform for classified access to all data, as well as the facility to prepare reports. The in-built tools for spatial analysis will provide support to the networks monitoring the supply of domestic water, irrigation water and sewage systems, as well as an analysis of the trends affecting future demand. Furthermore, the depiction and mapping of WDD data will give a comprehensive picture of the network in relation to the clients and related infrastructures (CYTA, EAC). The posting of the information on the database will help the Department to meet the operational challenges it is currently facing.

## **8. DEVELOPING WATER SAVING AWARENESS**

**8.1** In the context of intensifying efforts for the creation of water saving awareness among the public, the WDD organized various campaigns and lectures. To this end, the Department hired the services of four teachers, who gave lectures at educational institutions jointly with WDD officers. During 2010 roughly 475 lectures were given at Nurseries, Primary Schools, Technical Schools, Gymnasiums and Lyceums, attended by 49 000 pupils. At the end of

the lectures leaflets, stickers and other promotional material regarding water conservation was given to pupils and teachers.

**8.2** During 2010, the WDD organized and participated in the following events:

- a) "Science Fair about Water" in collaboration with Primary Education of the Ministry of Education and Culture and the University of Cyprus.
- b) Water Saving Week in collaboration with the Water Boards and the Municipalities Union.
- c) "We all care about Water," using stands in all towns with the aim of informing/sensitizing foreign workers who live and work in Cyprus.
- d) An event of symbolical significance involving the clearing of the Pedieos riverbed from litter.
- e) Inauguration ceremony of a Museum Exhibition area on the ground floor of the WDD Offices.
- f) Laying of the Foundation Stone of the Solea Dam by the President of the Republic.
- g) Ceremony for the taking over of new responsibilities at the WDD upon enactment of the Integrated Water Management Law.

**8.3** In addition, the WDD subsidized awards for the best water saving message among the students of the University of Cyprus. Also, film showings and radio broadcasts took place concerning water saving.

## **9. SAFEGUARDING QUALITY**

**9.1** During 2010 the draft work on the accreditation of WDD laboratories was almost completed. Accreditation is expected to take place in 2011.

### **Monitoring domestic water quality**

**9.2** During 2010, chemical tests were carried out on 4 013 water samples and bacteriological tests on 910 samples. In addition, tests were performed for the needs of the following:

- a) Desalination Plants of Dhekelia, Larnaca, Moni, Garyllis and Kouklia.
- b) Water Treatment Plants of Tersefanou, Limassol, Asprokremmos and Kornos.
- c) WDD District Offices.
- d) Monitoring programmes for community boreholes, minor dams, major springs, hydrological research of ideotypical water composition, the Water Framework Directive 2000/60/EC, and
- e) Monitoring water quality in pipelines that supply domestic water from the Desalination Plants and the Water Treatment Plants.

### **Monitoring recycled water quality**

**9.3** The collection of samples was continued for anionic analyses and tests for metals and toxic content of treated water from the Wastewater Treatment

Plants of the Sewerage Systems of Larnaca, Limassol, Paphos, Paralimni – Ayia Napa and Nicosia. Sampling for chemical and microbiological tests of treated wastewater also took place.

**9.4** Sample taking for chemical tests (BOD, SS, FOG, TN, TP) of untreated wastewater took place from the Wastewater Treatment Plants of the Sewerage Systems of Limassol and Paralimni – Ayia Napa, in accordance with the Discharge Permits.

**9.5** Sample taking for chemical and microbiological water tests took place from the Polemidhia Dam, before and after the period recycled water was discharged in it.

**9.6** Sample taking for chemical tests (Nitrates, Nitrites, Ammoniacal Nitrogen, and Total Phosphorus) of water from the sea areas of Limassol and Larnaca took place before and after the period recycled water was discharged in them.

**9.7** Collection of samples took place for chemical soil analyses which is irrigated by using the treated wastewater from the Waste Treatment Plant of the Sewerage Boards of Limassol, Paphos, Larnaca and Paralimni-Ayia Napa, in accordance with Discharge Permits.

### **Safety and Health**

**9.8** During 2010 the Department put into operation three Safety and Health Schemes for the construction of water reservoirs, water towers, conveyor pipes and borehole drilling, in accordance with the Safety and Health at the Workplace Laws N89(1) 1996-2003.

### **Internal Auditing**

**9.9** The internal auditing of works continued during 2010 by on-site visits to WDD construction work projects with self – supervision, which are being carried out by the District Offices. The same held for Government Irrigation Projects across Cyprus, with the aim of maintaining good work standards and preventing and avoiding accounting and technical omissions or oversights.

**9.10** Apart from routine checks, the auditing concentrated on locating institutional and procedural problems and preparing proposals for resolving them. Proposals include changes to the way of carrying out the contests for the execution of water supply projects, the empowerment of the District Offices in respect of laboratory testing, adopting the use of new type valves and initiating the preparation or modern drawings for circular water tanks, as well as the preparation of new technical specifications concerning water supply networks.



GOVERNMENT WATER WORKS 2010

TABLE 9

WATER WORKS-DAMS		Capacity M.C.M	Storage 1/1/2009	Inflow 1/1-31/12/09	Water used 2010 M.C.M			
					Domestic	Irrigation	Recharge	Total
<b>1</b>	<b>SOUTHERN CONVEYOR PROJECT</b>							
1.1	<b>DAMS</b>							
	(i) Kouris	115,000	39,496	29,620	6,316	18,305	2,941	27,562
	(ii) Kalavassos	17,100	2,321	7,075	0,011	2,316		2,327
	(iii) Lefkara	13,850	1,402	4,071	0,865	0,147		1,012
	(iv) Dipotamos	15,500	1,443	6,229	2,643	0,468		3,111
	(v) Germasogeia	13,500	4,875	8,869	5,817	0,576		6,393
	(vi) Polemidia	3,400	0,869	1,056		0,646		0,646
	(vii) Arminou	4,300	1,655	20,016			1,325	1,325
	(viii) Achna	6,800	0,131			0,183		0,183
	<b>Total from Dams S.C.P.</b>	<b>189,450</b>	<b>52,192</b>	<b>76,936</b>	<b>15,652</b>	<b>22,641</b>	<b>4,266</b>	<b>42,559</b>
1.2	Nicosia Boreholes-Domestic use				0,228			0,228
1.3	Germasogeia Boreholes-Domestic use				0,897			0,897
1.4	Kouris Delta Boreholes-Domestic use				2,963			2,963
1.5	Krasochria boreholes-Domestic use				0,060			0,060
1.6	Limassol Boreholes- Irrigation					2,433		2,433
1.7	Limassol Garillis Boreholes- Irrigation (Brine)					0,520		0,520
1.8	Larnaca Disalination				19,853			19,853
1.9	Dekelia Disalination				21,858			21,858
1.10	Moni Disalination				7,428			7,428
1.11	Garillis Disalination				2,793			2,793
1.12	Recycle Water East and West of Limassol					4,400		4,400
	<b>Totals Southern Conveyor Project</b>				<b>71,732</b>	<b>29,994</b>	<b>4,266</b>	<b>105,992</b>
<b>2</b>	<b>PAFOS PROJECT</b>							
2.1	<b>DAMS</b>							
	(i) Asprokremmos	52,375	17,999	22,032	1,496	5,410	0,144	7,050
	(i) Kannaviou	17,168	11,067	7,340	4,200	0,230		4,430
	(iii) Mavrokolymbos	2,180	1,662	0,103		1,243		1,243
	<b>Total from Dams</b>	<b>71,723</b>	<b>30,728</b>	<b>29,475</b>	<b>5,696</b>	<b>6,883</b>	<b>0,144</b>	<b>12,723</b>
2.2	Boreholes & Diversions-Domestic				3,800			3,800
2.3	Boreholes-Diarizos					0,148	0,584	0,732
2.4	Boreholes-Ezousa and Recycle					3,463		3,463
2.5	Pafos Disalination				0,851			0,851
	<b>TOTALS PAFOS</b>				<b>10,347</b>	<b>10,494</b>	<b>0,728</b>	<b>21,569</b>
<b>3</b>	<b>CHRYSOCHOU PROJECT</b>							
3.1	<b>DAMS</b>							
	(i) Evretou	24,000	10,284	8,828		4,165		4,165
	(ii) Pomos	0,860	0,484	0,462		0,885		0,885
	(iii) Agia Marina	0,298	0,120	0,230		0,270		0,270
	(iv) Argaka	0,990	0,667	0,420		1,035		1,035
	<b>Total from Dams</b>	<b>26,148</b>	<b>11,555</b>	<b>9,940</b>	<b>0,000</b>	<b>6,355</b>	<b>0,000</b>	<b>6,355</b>
3.2	Boreholes -Irrigation					0,015		0,015
	<b>TOTALS CHRYSOCHOU</b>				<b>0,000</b>	<b>6,370</b>	<b>0,000</b>	<b>6,370</b>
<b>4</b>	<b>Nicosia District</b>							
4.1	<b>DAMS</b>							
	Xyliatos	1,430	0,589	1,101		0,805		0,805
	Vizakia	1,690	0,173	1,032		0,337		0,337
	Kalopanayiotis	0,363	0,363	0,191		0,327		0,327
	Lymbia	0,220				0,020		0,020
	<b>Total from Dams</b>	<b>3,703</b>	<b>1,125</b>	<b>2,324</b>	<b>0,000</b>	<b>1,489</b>	<b>0,000</b>	<b>1,489</b>
4.2	Recycle Water-Vathia Gonia					0,236		
5	Recycle Water-Larnaca					1,733		
6	Avdimou- Paramali							
	<b>SOURCES - TOTALS</b>	<b>291,024</b>	<b>95,600</b>	<b>118,675</b>				
	<b>DAMS</b>				<b>21,348</b>	<b>37,368</b>	<b>4,994</b>	<b>63,710</b>
	<b>BORHOLES</b>				<b>7,948</b>	<b>6,579</b>		<b>14,527</b>
	<b>DISALINATION</b>				<b>52,783</b>			<b>52,783</b>
	<b>RECYCLE WATER</b>					<b>4,400</b>		<b>4,400</b>
	<b>ΟΛΙΚΟ</b>	<b>291,024</b>	<b>95,600</b>	<b>118,675</b>	<b>82,079</b>	<b>48,347</b>	<b>4,994</b>	<b>135,420</b>
	<b>TOTAL CONSUMPTION</b>				Water transferred to Achna Dam			-2,941
								<b>132,479</b>

\* These quantities not included in to the totals.