

# 48<sup>TH</sup> ECCE MEETING

LARNACA 17-18 OCTOBER 2008



WATER DEVELOPMENT  
DEPARTMENT  
1047 NICOSIA



REPUBLIC OF CYPRUS  
MINISTRY OF AGRICULTURE , NATURAL  
RESOURCES AND ENVIRONMENT

# REUSE OF TREATED EFFLUENT IN CYPRUS

ANGELIKI LARCOU YIANNAKOU  
SANITARY ENGINEER  
SEWAGE AND REUSE DIVISION

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# **1.MUNICIPAL WASTEWATER TREATMENT PLANTS**

THE FOLLOWING MUNICIPAL WASTEWATER TREATMENT PLANTS ARE IN OPERATION :

## **A. FIVE WASTEWATER TREATMENT PLANTS FOR BIG COASTAL MUNICIPALITIES :**

- PAPHOS
- LIMASSOL
- LARNAKA
- AYIA NAPA
- PARALIMNI

## **B. TWO MUNICIPAL WASTEWATER TREATMENT PLANTS FOR NICOSIA AREA:**

- ANTHOUPOLIS
- MIA MILIA – (BICOMMUNAL PROJECT WHICH IS NOT UNDER THE CONTROL OF CYPRUS REPUBLIC AND THERE ARE NO DATA FOR THE REUSE OF THE TREATED EFFLUENT)
- VATHIA GONIA - UNDER CONSTRUCTION, IT WILL SERVE THE MAJOR NICOSIA AREA .

## **C. CENTRAL MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT PLANT IN VATHIA GONIA**

This plant has been constructed by the Water Development Department and treats waste which is transferred by tankers from the districts of Nicosia and Larnaca (areas which are not connected yet with sewer system but they use septic tanks).

It also treats five types of industrial waste, transferred also by tankers such as dairy washings, fat oil and grease, washings from metals, strong organic waste and weak organic waste.

It also treats the surplus activated sludge from small wastewater treatment plants.

**D. FIVE WASTEWATER TREATMENT PLANTS FOR RURAL COMMUNITIES WITH A POPULATION EQUIVALENT ABOVE 2000 P.E.:**

- KYPEROUNTA
- AGROS
- PLATRES
- PELENTRI
- DALI

## **E. FOUR WASTEWATER TREATMENT PLANTS FOR RURAL COMMUNITIES WITH A POPULATION EQUIVALENT OF LESS THAN 2000 P.E. :**

- PALECHORI
- ASKAS
- ALASSA
- KAKOPETRIA

## **F. FOUR WASTEWATER TREATMENT PLANTS FOR REFUGEE HOUSING ESTATES**

- APOSTOLOS LOUCA HOUSING ESTATE
- LIVADIA
- KOFINOU
- AREDIOU

## **G. FOUR WASTEWATER TREATMENT PLANTS FOR PUBLIC HOSPITALS**

- NEW NICOSIA HOSPITAL
- ATHALASSAS CLINIC
- LIMASSOL HOSPITAL
- LARNACA HOSPITAL

## **H. NINE TREATMENT PLANTS FOR MILITARY CAMPS**

## **2. REUSE OF TREATED EFFLUENT**

IN CYPRUS THE TREATED EFFLUENT FROM THE MUNICIPAL WASTEWATER TREATMENT PLANTS IS REUSED FOR THE FOLLOWING PURPOSES :

- IRRIGATION
- ENRICHMENT OF UNDERGROUND WATER (PAPHOS WASTEWATER TREATMENT PLANT)

THE IRRIGATION IS DONE UNDER THE CODE OF CORRECT AGRICULTURAL PRACTICE.

### **2.1 OTHER WAYS OF DISPOSAL**

- DISCHARGE INTO THE SEA

IN THE PAST YEARS DURING SOME WINTER MONTHS IN LARNACA AND LIMASSOL THERE WAS NO DEMAND AND SOME QUANTITIES WERE DISCHARGED INTO THE SEA.



### **3. QUANTITIES OF TREATED EFFLUENT PER PLANT**

**TABLES ARE FOLLOWING WITH THE PRODUCED QUANTITIES OF TREATED EFFLUENT FOR THE YEARS 2004-2007**

**GRAPHS FOR**

- THE QUANTITIES**
- THE PERCENTAGE OF REUSE**
- THE PERCENTAGE OF THE TREATED EFFLUENT DISCHARGED INTO THE SEA.**



WASTEWATER AND REUSE DIVISION

USE OF TREATED EFFLUENT  
FROM SEWAGE TREATMENT PLANTS

SEWAGE TREATMENT PLANT	Quantity (m <sup>3</sup> )				USE OF TREATED EFFLUENT (m <sup>3</sup> )											
					SEA				IRRIGATION				AQUIFER RECHARGE			
	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007
LIMASSOL	6.246.854	6.417.670	6.548.410	6.435.900	2.404.183	2.286.503	1.831.932	969.653	3.842.671	4.131.167	4.716.478	5.466.247				-
PAPHOS	1.837.730	2.177.883	2.952.463	2.553.812				-			-	0	1.837.730	2.177.883	2.952.463	2.553.812
AYIA NAPA	790.926	849.204	1.164.053	852.260				0	790.926	849.204	1.164.053	852.260				0
PARALIMNI	1.076.131	1.426.513	1.202.147	1.419.793				0	1.076.131	1.426.513	1.202.147	1.419.793				0
LARNACA	2.859.513	2.744.994	2.603.766	2.063.046	60.416	295.526	189.329	0	2.799.097	2.449.468	2.414.437	2.063.046				-
ANTHOUPOLIS	297.600	297.600	297.600	292.000				0	297.600	297.600	297.600	292.000				0
VATHIA GONIA	457.930	365.502	419.553	335.237				0	457.930	365.502	419.553	335.237				0
<b>TOTAL PRODUCTION (m<sup>3</sup>) (A)</b>	<b>13.566.684</b>	<b>14.279.366</b>	<b>15.187.992</b>	<b>20.846.168</b>	<b>2.464.599</b>	<b>2.582.029</b>	<b>2.021.261</b>	<b>969.653</b>	<b>9.264.355</b>	<b>9.519.454</b>	<b>10.214.268</b>	<b>10.428.583</b>	<b>1.837.730</b>	<b>2.177.883</b>	<b>2.952.463</b>	<b>2.553.812</b>
MIA MILIA(*)	5.580.000	5.580.000	5.580.000	5.475.000				0	5.580.000	5.580.000	5.580.000	5.580.000				
<i>TOTAL PRODUCTION including Mia Milia (m<sup>3</sup>) (B)</i>	<i>19.146.684</i>	<i>19.859.366</i>	<i>20.767.992</i>	<i>19.427.048</i>	<i>2.464.599</i>	<i>2.582.029</i>	<i>2.021.261</i>	<i>969.653</i>	<i>14.844.355</i>	<i>15.099.454</i>	<i>15.794.268</i>	<i>16.008.583</i>	<i>1.837.730</i>	<i>2.177.883</i>	<i>2.952.463</i>	<i>2.553.812</i>
3 no Refugees Housings	275.575	275.575	275.575	275.575					275.575	275.575	275.575	275.575				
4 no Hospitals	368.650	368.650	368.650	368.650					368.650	368.650	368.650	368.650				
4 no Small Communities <2000 P.E.	167.900	167.900	167.900	167.900					167.900	167.900	167.900	167.900				
8 no Military Camps	150.745	150.745	150.745	150.745					150.745	150.745	150.745	150.745				
4 no Rural Communities above 2000 P.E.	456.250	456.250	456.250	456.250					456.250	456.250	456.250	456.250				
<b>SUB TOTAL (C)</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>					<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>				
<b>GRAND TOTAL (A) +(C)</b>	<b>14.985.804</b>	<b>15.698.486</b>	<b>16.607.112</b>	<b>22.265.288</b>	<b>2.464.599</b>	<b>2.582.029</b>	<b>2.021.261</b>	<b>969.653</b>	<b>10.683.475</b>	<b>10.938.574</b>	<b>11.633.388</b>	<b>11.847.703</b>	<b>1.837.730</b>	<b>2.177.883</b>	<b>2.952.463</b>	<b>2.553.812</b>
GRAND TOTAL (A)+(B)+ ( C )	20.565.804	21.278.486	22.187.112	27.740.288												

(\*) This plant is a bicomunal plant and it is not under the government control.No data are available for reuse.

**ANNUAL QUANTITIES OF TREATED EFFLUENT**

WASTEWATER TREATMENT PLANT	QUANTITIES (m <sup>3</sup> )			
	2004	2005	2006	2007
LIMASSOL	6.246.854	6.417.670	6.548.410	6.435.900
PAPHOS	1.837.730	2.177.883	2.952.463	2.553.812
AYIA NAPA	790.926	849.204	1.164.053	852.260
PARALIMNI	1.076.131	1.426.513	1.202.147	1.419.793
LARNACA	2.859.513	2.744.994	2.603.766	2.063.046
ANTHOUPOLIS	297.600	297.600	297.600	292.000
VATHIA GONIA	457.930	365.502	419.553	335.237
<b>TOTAL PRODUCTION (m<sup>3</sup>) (A)</b>	<b>13.566.684</b>	<b>14.279.366</b>	<b>15.187.992</b>	20.846.168
<b>MIA MILIA(*)</b>	5.580.000	5.580.000	5.580.000	5.475.000
<i>TOTLA PRODUCTION WITH MIA MILIA (m<sup>3</sup>) (B)</i>	<b>19.146.684</b>	<b>19.859.366</b>	<b>20.767.992</b>	19.427.048
<b>3 REFUGEE HOUSING ESTATES</b>	<b>275.575</b>	<b>275.575</b>	<b>275.575</b>	<b>275.575</b>
<b>4 HOSPITALS</b>	<b>368.650</b>	<b>368.650</b>	<b>368.650</b>	<b>368.650</b>
<b>4 COMMUNITIES &lt; 2000 P.E.</b>	<b>167.900</b>	<b>167.900</b>	<b>167.900</b>	<b>167.900</b>
<b>8 MILITARY CAMPS</b>	<b>150.745</b>	<b>150.745</b>	<b>150.745</b>	<b>150.745</b>
<b>4 COMMUNITIES ABOVE 2000 P.E.</b>	<b>456.250</b>	<b>456.250</b>	<b>456.250</b>	<b>456.250</b>
<b>TOTAL (C)</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>
<b>TOTAL (A) +(C)</b>	<b>14.985.804</b>	<b>15.698.486</b>	<b>16.607.112</b>	<b>22.265.288</b>
<b>GRAND TOTAL (A)+(B)+ ( C )</b>	<b>20.565.804</b>	<b>21.278.486</b>	<b>22.187.112</b>	27.740.288

(\*) This plant is bicommunal and it is not under the control of the Republic. There are no data for the reuse.

**ANNUAL QUANTITIES OF TREATED EFFLUENT PER PLANT USED FOR IRRIGATION**

WASTEWATER TREATMENT PLANT	IRRIGATION			
	2004	2005	2006	2007
LIMASSOL	3.842.671	4.131.167	4.716.478	5.466.247
PAPHOS			-	0
AYIA NAPA	790.926	849.204	1.164.053	852.260
PARALIMNI	1.076.131	1.426.513	1.202.147	1.419.793
LARNACA	2.799.097	2.449.468	2.414.437	2.063.046
ANTHOUPOLIS	297.600	297.600	297.600	292.000
VATHIA GONIA	457.930	365.502	419.553	335.237
<b>TOTAL PRODUCTION (m<sup>3</sup>) (A)</b>	<b>9.264.355</b>	<b>9.519.454</b>	<b>10.214.268</b>	<b>10.428.583</b>
MIA MILIA(*)	5.580.000	5.580.000	5.580.000	5.475.000
<i>TOTLA PRODUCTION WITH MIA MILIA (m<sup>3</sup>) (B)</i>	<b>14.844.355</b>	<b>15.099.454</b>	<b>15.794.268</b>	<b>15.903.583</b>
3 REFUGEE HOUSING ESTATES	275.575	275.575	275.575	275.575
4 HOSPITALS	368.650	368.650	368.650	368.650
4 COMMUNITIES < 2000 P.E.	167.900	167.900	167.900	167.900
8 MILITARY CAMPS	150.745	150.745	150.745	150.745
4 COMMUNITIES ABOVE 2000 P.E.	456.250	456.250	456.250	456.250
<b>TOTAL (C)</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>	<b>1.419.120</b>
<b>TOTAL (A) +(C)</b>	<b>10.683.475</b>	<b>10.938.574</b>	<b>11.633.388</b>	<b>11.847.703</b>

(\*) Αυτός ο σταθμός είναι δικαιοδικός και δεν είναι κάτω από τον έλεγχο της Δημοκρατίας. Δεν υπάρχουν στοιχεία για την επαναχρησιμοποίηση.

**ANNUAL QUANTITIES PER PLANT FOR AQUIFER ENRICHMENT**

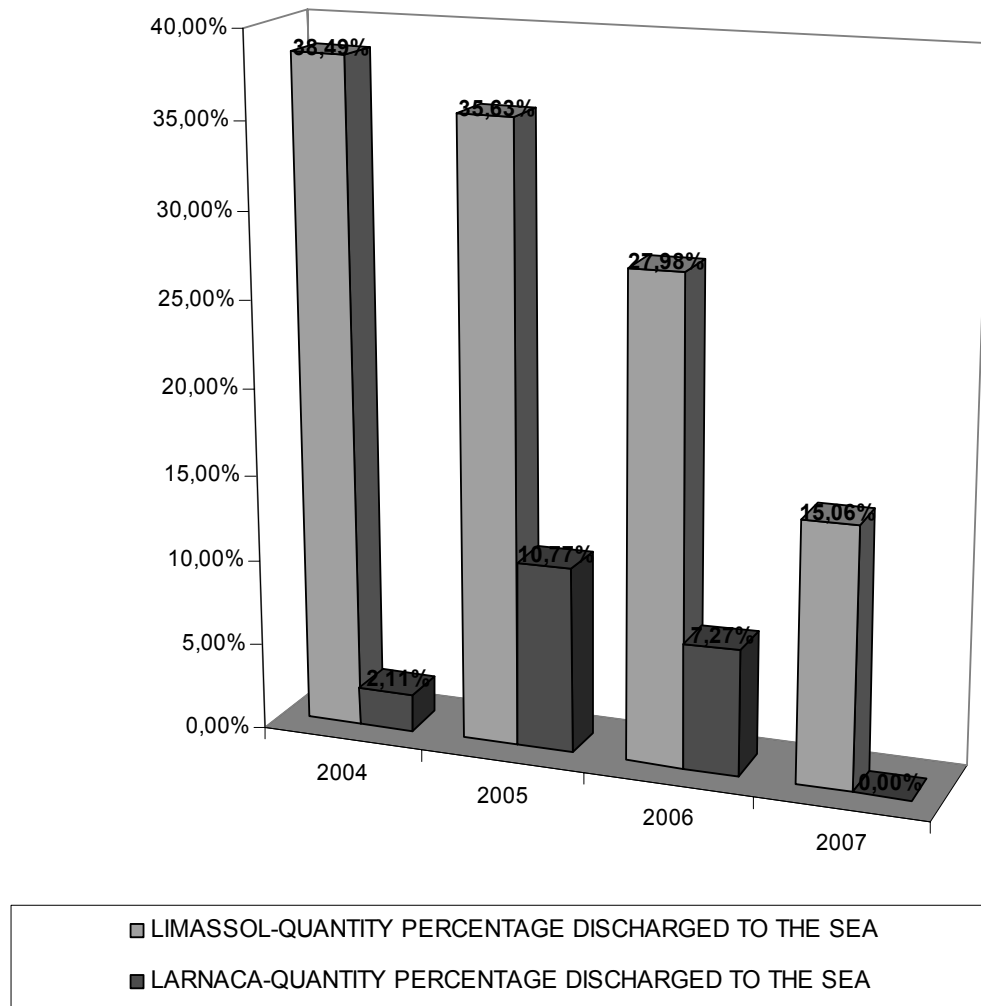
<b>WASTEWATER TREATMENT PLANT</b>	<b>AQUIFER ENRICHMENT</b>			
	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>LIMASSOL</b>				-
<b>PAPHOS</b>	1.837.730	2.177.883	2.952.463	2.553.812
<b>AYIA NAPA</b>				0
<b>PARALIMNI</b>				0
<b>LARNACA</b>				-
<b>ANTHOUPOLIS</b>				0
<b>VATHIA GONIA</b>				0
<b>TOTAL PRODUCTION (m<sup>3</sup>) (A)</b>	<b>1.837.730</b>	<b>2.177.883</b>	<b>2.952.463</b>	<b>2.553.812</b>
<b>MIA MILIA(*)</b>				
<i>TOTLA PRODUCTION WITH MIA MILIA (m<sup>3</sup>) (B)</i>	<b>1.837.730</b>	<b>2.177.883</b>	<b>2.952.463</b>	<b>2.553.812</b>
<b>3 REFUGEE HOUSING ESTATES</b>				
<b>4 HOSPITALS</b>				
<b>4 COMMUNITIES &lt; 2000 P.E.</b>				
<b>8 MILITARY CAMPS</b>				
<b>4 COMMUNITIES ABOVE 2000 P.E.</b>				
<b>TOTAL (C)</b>				
<b>TOTAL (A) +(C)</b>	<b>1.837.730</b>	<b>2.177.883</b>	<b>2.952.463</b>	<b>2.553.812</b>
<b>GRAND TOTAL (A)+(B)+ ( C )</b>				

**ANNUAL QUANTITIES OF TREATED EFFLUENT DISCHARGED TO THE SEA**

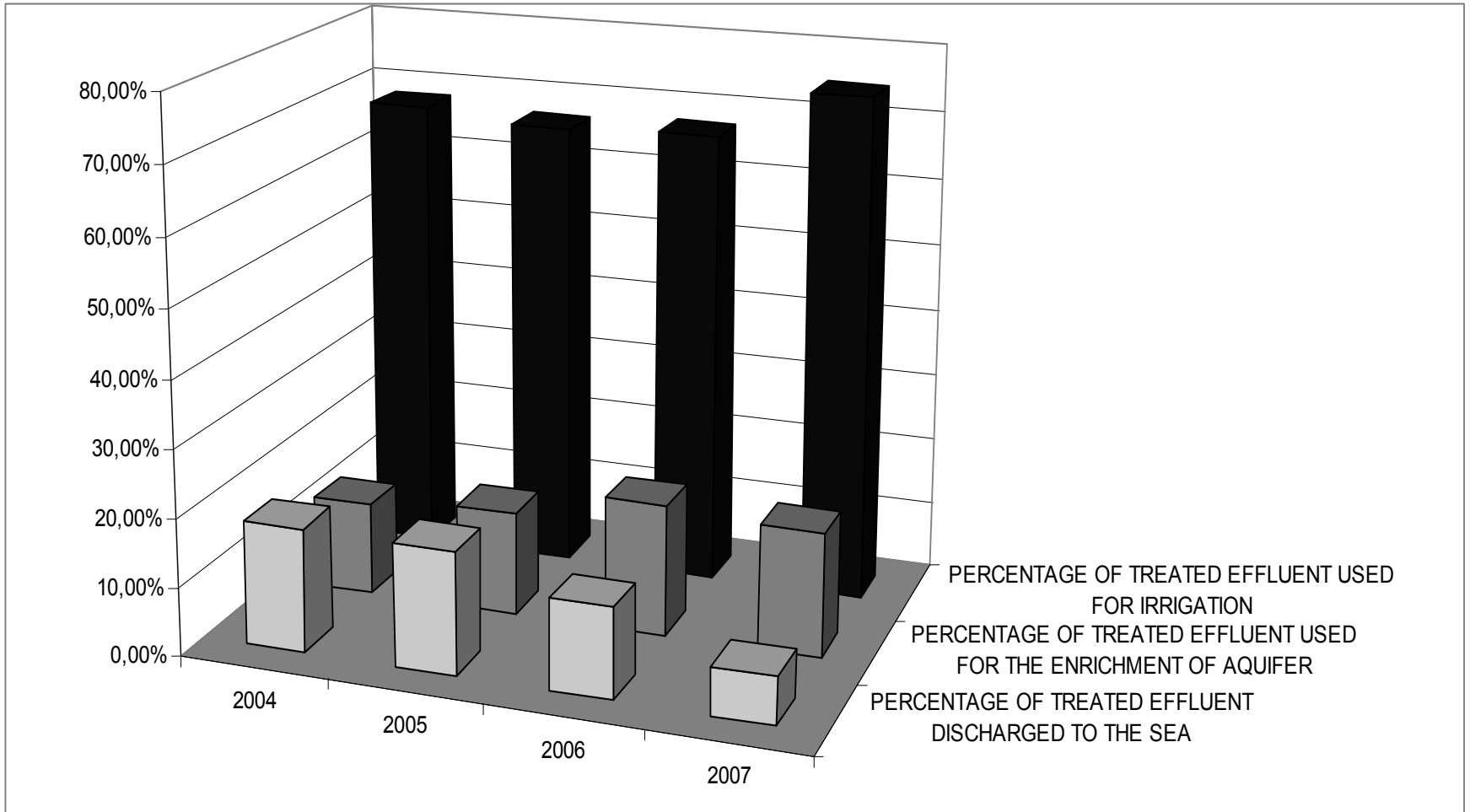
WASTEWATER TREATMENT PLANT	SEA			
	2004	2005	2006	2007
LIMASSOL	2.404.183	2.286.503	1.831.932	969.653
PAPHOS				-
AYIA NAPA				0
PARALIMNI				0
LARNACA	60.416	295.526	189.329	0
ANTHOUPOLIS				0
VATHIA GONIA				0
<b>TOTAL PRODUCTION (m<sup>3</sup>) (A)</b>	<b>2.464.599</b>	<b>2.582.029</b>	<b>2.021.261</b>	969.653
MIA MILIA(*)				0
<i>TOTLA PRODUCTION WITH MIA MILIA (m<sup>3</sup>) (B)</i>				
<b>3 REFUGEE HOUSING ESTATES</b>				0
<b>4 HOSPITALS</b>				0
<b>4 COMMUNITIES &lt; 2000 P.E.</b>				0
<b>8 MILITARY CAMPS</b>				0
<b>4 COMMUNITIES ABOVE 2000 P.E.</b>				0
<b>TOTAL (C)</b>				0
<b>TOTAL (A) +(C)</b>	<b>2.464.599</b>	<b>2.582.029</b>	<b>2.021.261</b>	969.653
<b>GRAND TOTAL (A)+(B)+ ( C )</b>				

(\*) This plant is bicomunal and it is not under the control of the Republic. There are no data for the reuse.

## LIMASSOL - LARNACA PERCENTAGE OF TREATED EFFLUENT DISCHARGED TO THE SEA



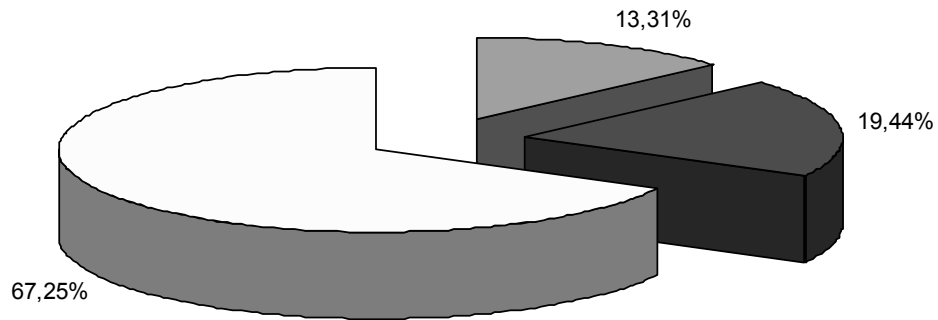
# PERCENTAGE OF DISPOSAL OF TREATED EFFLUENT FROM MUNICIPAL WASTEWATER TREATMENT PLANTS



- PERCENTAGE OF TREATED EFFLUENT DISCHARGED TO THE SEA
- PERCENTAGE OF TREATED EFFLUENT USED FOR THE ENRICHMENT OF AQUIFER
- PERCENTAGE OF TREATED EFFLUENT USED FOR IRRIGATION

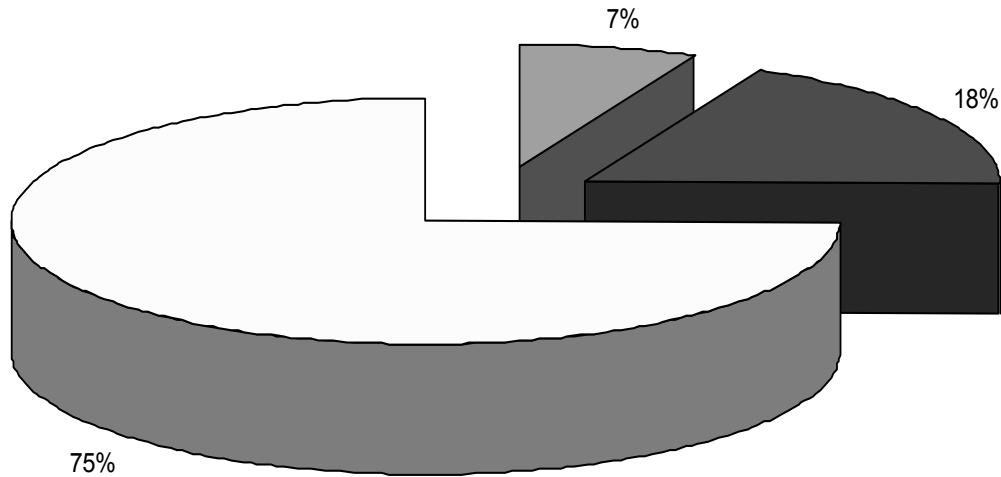


## 2006 PERCENTAGE DISPOSAL OF TREATED EFFLUENT



- PERCENTAGE OF TREATED EFFLUENT DISCHARGED TO THE SEA
- PERCENTAGE OF TREATED EFFLUENT USED FOR THE ENRICHMENT OF AQUIFER
- PERCENTAGE OF TREATED EFFLUENT USED FOR IRRIGATION

## 2007 TREATED EFFLUENT PERCENTAGE DISPOSAL



- PERCENTAGE OF TREATED EFFLUENT DISCHARGED TO THE SEA
- PERCENTAGE OF TREATED EFFLUENT USED FOR THE ENRICHMENT OF AQUIFER
- PERCENTAGE OF TREATED EFFLUENT USED FOR IRRIGATION

## **4. CROPS WHICH ARE IRRIGATED WITH TREATED EFFLUENT**

THE TREATED EFFLUENT COULD BE USED FOR THE FOLLOWING:

- ALL TYPES OF PLANTS ,
- SEASONAL AND PERMANENT

**EXCEPT** OF FOLIACEOUS VEGETABLES ,BULBS AND  
CONDYLES THAT ARE EATEN RAW.

EVERYTHING IS DONE ACCORDING TO THE CODE OF CORRECT  
AGRICULTURAL PRACTICE.

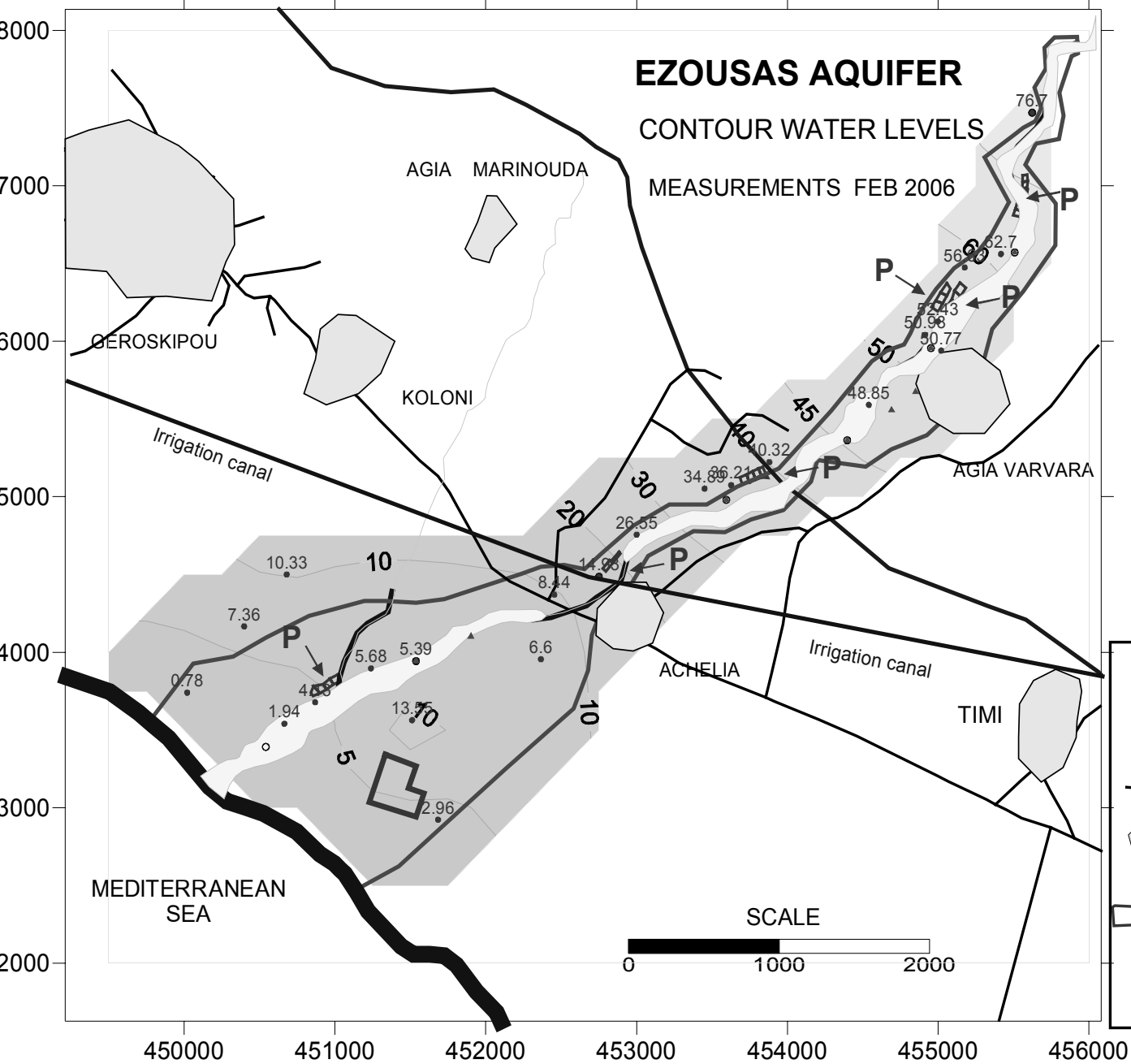
## 4.1 THE TREATED EFFLUENT IS MAINLY USED FOR :

<b>LIMASSOL PLANT</b>	<b>LARNACA PLANT</b>	<b>PARALIMNI AYIA NAPA PLANT</b>	<b>VATHIA GONIA PLANT</b>
CITRUS FRUITS	COWGRASS	CITRUS FRUITS	COWGRASS
FODDER CROPS AND INDUSTRIAL PLANTS (COWGRASS AND CORN)	CORN	OLIVE TREES	CORN
VEGETABLES	LOLIUM AND SUTAX	POTATOES	BARLEY
PUBLIC GREEN AREAS	PUBLIC GREEN AREAS	PUBLIC GREEN AREAS	FODDER CROPS
	FOOTBALL FIELDS	FOOTBALL FIELDS	GRASS PRODUCTION

## **4.2 AREA OF PAPHOS**

IN THIS AREA THE TREATED EFFLUENT IS USED FOR THE ENRICHMENT OF EZOUSA AQUIFER.

THE MAP OF THE POINTS OF ENRICHMENT OF EZOUSA AQUIFER - PAPHOS



## **4.3 TREATED EFFLUENT FOR RURAL COMMUNITIES AND REFUGEE HOUSING ESTATES**

THE TREATED EFFLUENT IN THESE AREAS IS MAINLY USED FOR:

- AGRICULTURAL USE
- GREEN AREAS

FOLLOWING THE CORRECT CODE FOR THE AGRICULTURE PRACTICE

## **4.4 TREATED EFFLUENT FOR HOSPITALS AND MILITARY CAMPS**

THE TREATED EFFLUENT IN THESE AREAS IS MAINLY USED FOR:

- GREEN AREAS

## SELLING RATES OF TREATED EFFLUENT FROM TERTIARY TREATMENT PLANTS

The rate of the treated effluent from the big wastewater treatment has been set by a ministerial decree as per the following table. These rates are charged by the government.

		Water Selling Rate	
A/A	USE	Existing Rate of Tertiary Treated Effluent	<i>Suggested Selling Rate of Fresh not filtered water from governmental water works</i>
		EURO Cent/ m3	<i>EURO Cent/ m3</i>
1	a) For Irrigation divisions for agricultural production	5	<i>15</i>
	b) For Persons for agricultural production	7	<i>17</i>
2	For sports	15	<i>34</i>
3	For irrigation of hotels green areas and gardens	15	<i>34</i>
4	For irrigation of Golf Courses	21	<i>34</i>
5	For pumping from an underground aquifer recharged by treated effluent	8	
6	For over consumption for items 1 to 5	Increase by 50%	<i>56</i>
7	For municipal parks, green areas etc for rural communities where a plant has been built within its limits and the quantity does not exceed the approved quantity of more than 10 %		



## 6. QUALITY CHARACTERISTICS AND CONTROL OF TREATED EFFLUENT

ACCORDING TO THE DIRECTIVE OF EUROPEAN COUNCIL 91/271/EEC FOR THE TREATMENT OF MUNICIPAL WASTEWATER TREATMENT THE REQUIREMENTS FOR THE DISCHARGE IS AS FOLLOWS:

PARAMETER	CONCENTRATION mg/l	MINIMUM REDUCTION %
BOD5	25	70-90 40( ACCORDING TO ARTICLE 3 PAR 2)
COD	125	75
TOTAL SUSPENDED SOLIDS	35 (*) 35 (ABOVE 10,000 p.e.) 60 (between 2-10,000 p.e. ) (*optional)	90(*) 90(above 10,000 p.e.) 70 (between 2-10,000 p.e.) (*optional)

## 6.1 REQUIREMENTS FOR DISCHARGES FROM MUNICIPAL WASTEWATER TREATMENT PLANTS IN SENSITIVE AREAS WHERE THERE IS THE PHENOMENON OF EUTROPHICATION:

According to the local conditions the following parameters could be applied:

PARAMETERS	CONCENTRATION mg/l	MINIMU PERCENTAGE REDUCTION %
TOTAL PHOSPHOROUS	2 (10,000-100,000 P.E)  1 (ABOVE 100,000 P.E. )	80
TOTAL NITROGEN	15 (10,000-100,000 P.E)  10 (ABOVE 100,000 P.E. )	70-80

## **7. QUALITY CHARACTERISTICS AND CONTROL OF THE TREATED EFFLUENT ACCORDING TO THE DISCHARGE PERMITS:**

The Environment Service is the Competent Authority for the control of the quality of the treated effluent according to the European Directive 91/271/EEC.

According to the Laws of the Water Pollution Control of 2002 until 2007, for the big municipal wastewater treatment plants the Minister Of Agriculture is issuing a Wastewater Discharge Permit to the following :

- Sewerage Boards
- Water Development Department

In the Discharge Permit the quality characteristics defined as well as the disposal of the treated effluent.

In the Discharge Permits the number and the type of analyses is defined for the Sewerage Boards and the Water Development Department. The Water Development Department is responsible for the disposal of the treated effluent in the big municipalities. For this reason the cost of the tertiary equipment and the operational costs of the tertiary treatment are undertaken by the government.

- At the same time the Environment Service is following up whether every plant is meeting the requirements of the Discharge Permits by running their own analyses.

- The Water Development Department and the Sewerage Boards are also following the quality of the treated effluent according to the requirements of their Discharge Permits.

- THE QUALITY CHARACTERISTICS OF THE TREATED EFFLUENT WHICH ARE INCLUDED IN THE DISCHARGE PERMITS FOR THE WASTEWATER TREATMENT PLANTS ABOVE 2000 P.E. AND THE FREQUENCY OF THE ANALYSES ARE PRESENTED IN THE FOLLOWING TABLE.

**REPUBLIC OF CYPRUS**  
**MINISTRY OF AGRICULTURE NATURAL RESOURCES & ENVIRONMENT**  
**WATER DEVELOPMENT DEPARTMENT**  
**WASTEWATER AND REUSE DIVISION**

<b>REUSED EFFLUENT QUALITY CHARACTERISTICS INCLUDED IN THE DISCHARGE PERMITS FOR BIG SEWAGE TREATMENT PLANTS</b>			
PARAMETERS		Maximum Permitted Value	Frequency of analyses
BOD5 (mg/l)		10	1/15 days
COD (mg/l)		70	1/15 days
Suspended Solids (mg/l)		10	1/15 days
Conductivity (µS/cm)		2200	1/15 days
Total Nitrogen (mg/l)		15 *	1/15 days
Total Phosphorous (mg/l)		10**	1/15 days
Chlorides (mg/l)		300	1/15 days
Fat and Oil (mg/l)		5	1/15 days
Zinc(mg/l)		1***	3/year
Copper (mg/l)		0,1	3/year
Lead (mg/l)		0,15	3/year
Cadmium (mg/l)		0,01	3/year
Mercury (mg/l)		0,05	3/year
Chromium (mg/l)		0,1	3/year
Nickel (mg/l)		0,2	3/year
Boron (mg/l)		0,75	3/year
Faecal Coliforms		50 / 100ml	1/15 days
Eggs of Intestinal Worms		nothing /l	4/year
Residual Chlorine (mg/l)		1****	1/15 days
pH		6,5 -- 8,5	3/week

\* for discharge in sensitive areas and into the sea maximum level 10 mg/l

\*\* for discharge in sensitive areas and into the sea maximum level 2 mg/l

\*\*\*for discharge into the sea maximum level 0,1 mg/l

\*\*\*\*for sensitive areas and discharge into the sea 0,5 mg/l

**QUALITY SPESIFICATIONS OF THE TREATED EFFLUENT FROM MUNICIPAL WASTEWATER TREATMENT PLANTS FROM AGGLOMERATIONS LESS THAN 2000 P.E.**

	<b>SPECIES ALLOWED TO BE IRRIGATED</b>	<b>BOD<sub>5</sub> mg/l</b>	<b>SUSPENDED SOLIDS mg/l</b>	<b>E. COLI /100ml</b>	<b>INTESTINAL WORMS***</b>
1	ALL CROPS AND GREEN AREAS WITH NOT RESTRICTED USE (A)	10*	10*	5* 15**	NIL
2	COOKED VEGETABLES (B)	10* 15**	10* 15**	50* 100**	NIL
3	PRODUCTS FOR HUMAN EATING , GREEN AREAS WITH RESTRICTED USE BY THE PUBLIC	20* 30**	30* 45**	200* 1000**	NIL
4	FODDER CROPS	20* 30**	30* 45**	1000* 5000**	NIL
5	INDUSTRIAL PLANTS	50* 70**	--	3000* 10000**	--

\* 80% OF THE SAMPLES, 24 SAMPLES / YEAR

\*\* MAXIMUM ACCEPTABLE VALUE

\*\*\* SAMPLING FREQUENCY ONCE A YEAR / SUMMER MONTHS

(a) VEGETABLES WITH LEAVES, BULBS AND CONDYLES EATEN RAW

(b) POTATOES, BEETROOTS

## 9. FUTURE QUANTITIES OF TREATED EFFLUENT

	<b>2012</b>	<b>2015</b>	<b>2025</b>
MUNICIPAL WASTEWATER TREATMENT PLANTS	46,000,000	51,000,000	69,000,000
WASTEWATER TREATMENT PLANTS FOR RURAL COMMUNITIES	13,000,000	14,000,000	16,000,000
<b>TOTAL QUANTITIES</b>	<b>59,000,000</b>	<b>65,000,000</b>	<b>85,000,000</b>

## **10. GENERAL COMMENTS FOR THE REUSE OF TREATED EFFLUENT**

The treated effluent is another constant source of water.

The Government's policy is to introduce the treated effluent in the Cyprus Water Balance.

The Quality is under control and remains constant.

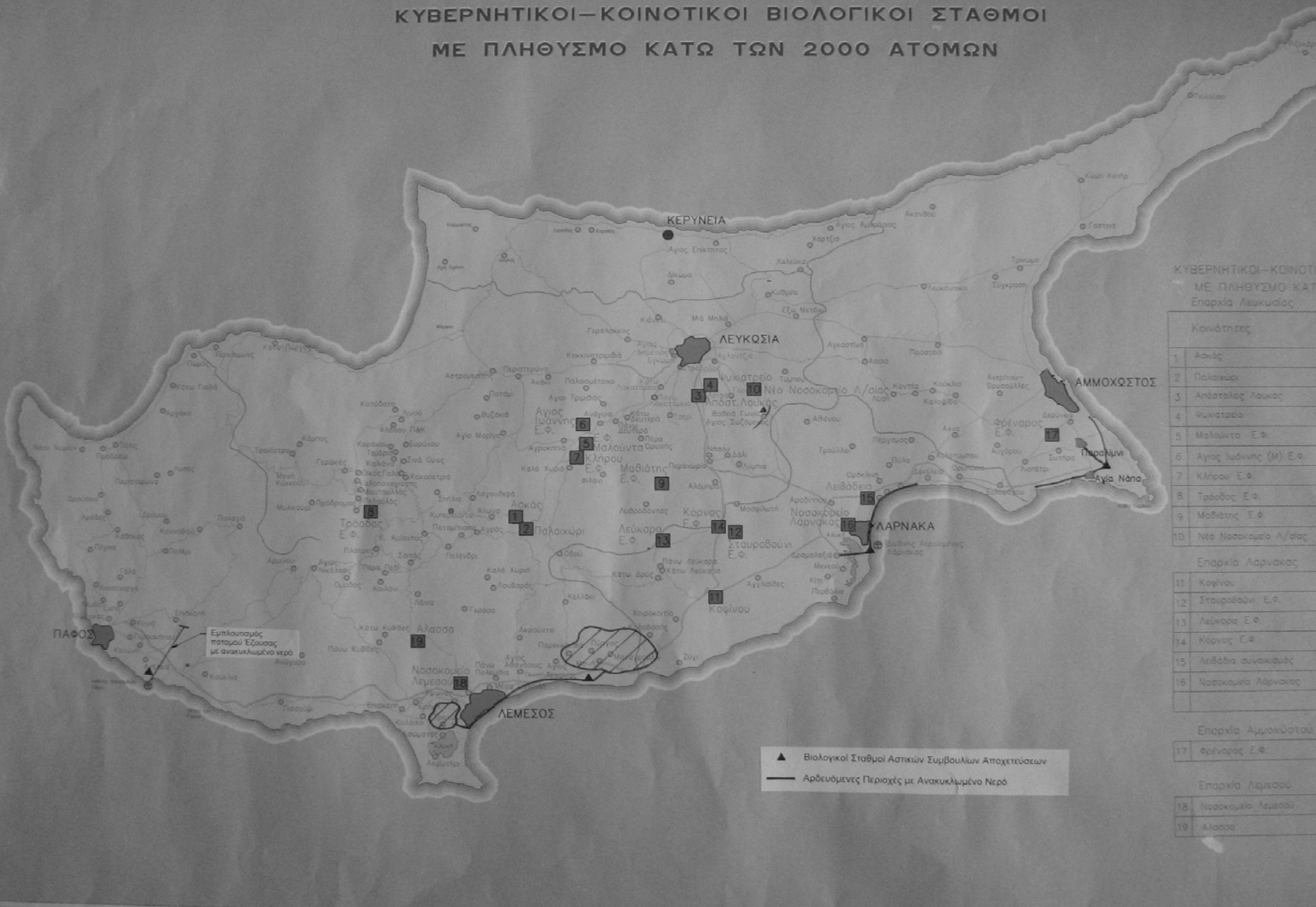
The treated effluent is suitable for the majority of the crops.

Almost all the Wastewater Treatment Plants are equipped with Tertiary Treatment , consisting of Sand Filtration and Chlorination in order to achieve higher quality characteristics in order to use the treated effluent in the Agriculture.

The farmers use less quantities of fertilisers because the treated effluent contains already nutrients such as Phosphorous and Nitrogen.



# ΚΥΒΕΡΝΗΤΙΚΟΙ-ΚΟΙΝΟΤΙΚΟΙ ΒΙΟΛΟΓΙΚΟΙ ΣΤΑΘΜΟΙ ΜΕ ΠΛΗΘΥΣΜΟ ΚΑΤΩ ΤΩΝ 2000 ΑΤΟΜΩΝ



ΚΥΒΕΡΝΗΤΙΚΟΙ-ΚΟΙΝΟΤΙΚΟΙ  
ΜΕ ΠΛΗΘΥΣΜΟ ΚΑΤΩ  
Επαρχία Λευκωσίας

Κοιότητες	
1	Ασός
2	Πολοκωρι
3	Απόστολος Λουκάς
4	Ψικιστάρια
5	Μαλιούντα Ε.Φ.
6	Άγιος Ιωάννης (Μ) Ε.Φ.
7	Κλήρου Ε.Φ.
8	Τρόδος Ε.Φ.
9	Μαθιάτης Ε.Φ.
10	Νέο Νοσοκομείο Λ/σίας

Επαρχία Λάρνακας	
11	Κοφίνου
12	Σταυραβούνι Ε.Φ.
13	Λεϊκωρά Ε.Φ.
14	Κόρνος Ε.Φ.
15	Λειβάδια ορεινών
16	Νοσοκομείο Λάρνακας

Επαρχία Αμμοκώστης	
17	Φρέναρος Ε.Φ.

Επαρχία Λεμεσού	
18	Νοσοκομείο Λεμεσού
19	Άλσος

▲ Βιολογικοί Σταθμοί Αστικών Συμβουλίων Αποχετεύσεων  
— Αρδευόμενες Περιοχές με Ανακυκλωμένα Νερά



# ΤΜΗΜΑ ΑΝΑΠΤΥΞΗΣ ΥΔΑΤΩΝ

ΥΠΟΥΡΓΕΙΟ ΓΕΩΡΓΙΑΣ, ΦΥΣΙΚΩΝ ΠΟΡΩΝ ΚΑΙ ΠΕΡΙΒΑΛΛΟΝΤΟΣ





WATER DEVELOPMENT  
DEPARTMENT  
1047 NICOSIA



REPUBLIC OF CYPRUS  
MINISTRY OF AGRICULTURE , NATURAL  
RESOURCES AND ENVIRONMENT

**THANK YOU FOR YOUR  
TIME**