MAP

Mediterranean Action Plan

Med Pol

UNEP WHO

Municipal wastewater treatment plants in Mediterranean coastal cities:

Inventory of treatment plants in cities of between 2,000 and 10,000 inhabitants

MAP Technical Reports Series No. 169

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The thematic structure of the MAP Technical Series is as follows:

- Curbing Pollution
- Safeguarding Natural and Cultural Resources
- Managing Coastal Areas
- Integrating the Environment and Development

La Série des rapports techniques du PAM est présentée avec la structure suivante :

- Maîtriser la Pollution
- Sauvegarder le Patrimoine Naturel et Culturel
- Gérer les Zones Côtières de Manière Durable
- Intégrer l'Environnement et le Développement

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EXECUTIVE SUMMARY

Municipal wastewater, either untreated or subjected to various treatments, is discharged directly into the immediate coastal zone through outfall structures of various lengths. Alternatively, it reaches the sea due to seepage caused by leaks in the sewerage systems. Municipal sewage carries increased loads of nutrients such as nitrogen and phosphorus, and a heavy load of micro-organisms, including bacterial and viral pathogens. Generally, in cities, sewage discharged directly into the public sewerage system, contains a variety of chemical wastes, originating from both households and industrial installations.

In the year 1999, at the end of the UN Decade for Water, the Mediterranean Action Plan reviewed the status of wastewater treatment in Mediterranean coastal cities with a population of more than 10,000 inhabitants, and subsequently published the results in MAP Technical Report No. 128 (2000). In 2004, MAP updated and expanded the data and published it in MAP Technical Report No. 157.

In order to assess pollution loads, as well as potential health risks from untreated wastewater discharged into the marine environment, additional data is required. Towns with more than 2,000 inhabitants can have a significant impact on the marine environment. In addition, an assessment including towns of this size is also relevant to the attainment of the Millennium Development Goal Number 7, (Target 10), related to sanitation.

RESUME EXECUTIF

Les eaux usées municipales sont déversées directement dans la zone côtière immédiate, soit sans avoir été traitées soit après avoir été soumises à diverses procédures d'épuration, au moyen d'émissaires de longueur variable, ou bien elles gagnent la mer par infiltration à la suite de pertes se produisant le long du réseau d'égouts ou pour d'autres causes. Les eaux usées municipales véhiculent des charges accrues d'éléments nutritifs tels que l'azote et le phosphore, et une forte charge de microorganismes, notamment d'agents pathogènes bactériens et viraux. Dans les villes et les grandes agglomérations urbaines, elles contiennent généralement toute une série de déchets chimiques provenant des ménages et des installations industrielles qui rejettent directement leurs effluents dans le réseau d'égouts collectif.

Le Programme du PAM, en 2000 a procédé à un bilan de l'épuration des eaux usées dans les villes côtières de la Méditerranée de plus de 10 000 habitants. L'étude a été réalisée et les résultats en ont été publiés dans le No 128 de la Série des rapports techniques du PAM (2000). Un rapport actualisé, comportant des informations plus récentes et détaillées, a été publié en 2004 comme No 157 de la Série des rapports techniques du PAM.

Dans le but d'évaluer les charges de pollution ainsi que les risques sanitaires potentiels résultant des eaux usées non traitées rejetées dans le milieu marin, des données supplémentaires sont requises. Il est notoire que les villes de plus de 2 000 habitants peuvent avoir des incidences marquées sur le milieu marin. Aussi, une évaluation englobant les villes de cette taille serait-elle utile également au regard de l'Objectif 7 du Millénaire pour le développement - cible 10 se rapportant à l'assainissement.

PREFACE

Throughout the centuries and long before the start of the industrial revolution, men have been using the sea as the most convenient place for the disposal of wastes resulting from human activities. The sea's self-purification ability has been largely abused. Dumping of domestic, industrial, and radioactive wastes, as well as the run-off from agricultural products have not only created considerable hazards to human health but have also endangered the marine environment.

The United Nations Conference on Human Environment (Stockholm, 1972) underlined the growing importance of the protection of the marine environment. During the same year in London, the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters was adopted which entered into force in 1975.

The major problems linked to the uncontrolled disposal of wastes in the marine environment were found to be:

a) Dispersion of pathogen organisms capable of endangering human health;
b) Toxic effects on aquatic life – including human life – caused by the various chemical substances reaching the marine environment;
c) Deterioration of the quality of seawater – eutrophication – resulting from the widespread dispersion of nutrients and other organic and inorganic matters.

The above-mentioned problems do not affect the area of activities of one single international organization or of one single country. Instead, they have an impact at global level therefore several institutions of international character such as UNEP, WHO, IMO, OECD and others, developed programmes aimed at finding solutions to their respective priority problems.

At the level of the European Region, since the late 70's, studies and report prepared by scientists and researchers from different European countries indicated that the quality of the marine environment of the Mediterranean Sea was deteriorating. The studies clearly demonstrated the urgency for introducing remedial measures to stop the pollution of Mediterranean Sea.

The causes for the deterioration in the quality of the marine environment are numerous and most of them are interconnected, resulting in a very complex pollution situation.

One of the important causes of marine pollution is the high rate of population growth that the coastal zones of the Mediterranean Basin have experienced since the 1960's and 1970's. This widespread population growth has been accompanied by an increase in the standard of living leading to an equal increase in industrial development to satisfy the needs of the population.

As a consequence of urban and rural development in areas of extraordinary geographical beauty, the tourist population visiting those places has not ceased to grow. This increase in population has had a profound impact on the quantity and quality of wastes produced. Quite often during the tourist season, municipal services in charge of the safe disposal of solid and liquid wastes are totally unable to cope with the additional waste-load that invariably reaches the coastal waters.

However, in spite of the importance of pollution loads originating directly from human agglomerations in coastal areas, they appeared to be of minor importance when compared to other forms of pollution originating inland and discharged into the sea by various means. Discharges from “inland” municipal, industrial and agricultural districts, which are only partially treated or even in untreated form, are still reaching the sea through the hydrographic river network of the Mediterranean Basin.

Municipal wastewater is discharged directly into the immediate coastal zone, either untreated or subjected to various treatment procedures, through outfall structures of variable length, or reaches the sea by seepage as a result of leaks in sewerage systems or other causes. Municipal sewage carries increased loads of nutrients such as nitrogen and phosphorus, and a heavy load of micro-organisms, including bacterial and viral pathogens. In cities and large cities, it usually contains a variety of chemical wastes both from households and from industries discharging directly into the public sewerage system.

PART I

1. ABOUT THE STUDY

1.1 Historical Background of the Study

The protection of the marine environment is an important issue that concerns the countries of the Mediterranean Region. The Mediterranean Action Plan (MAP) that was convened by the United Nations Environment Programme (UNEP) and was approved by all countries (Barcelona, 1975) is a common effort for the protection and upgrade of the marine environment.

In 1976 the representatives of the Mediterranean countries adopted the legal support needed for the implementation of the MAP Programme at a conference convened by UNEP in Barcelona. More specifically, in February 1976 the ***Barcelona Convention*** was signed as an international agreement between Mediterranean Countries for the protection of the Mediterranean Sea against pollution.

In addition to the Barcelona Convention, the Barcelona Conference adopted and signed two supplementary Protocols. One concerned the preventive measures required for protecting the Mediterranean Sea against the dumping of polluting matters from ships and aircrafts and the second protocol referred to the establishment of international cooperation to reduce pollution resulting from accidental spills of oil and other harmful substances. Both protocols were adopted and signed simultaneously with the Barcelona Convention, and entered into force in February 1978.

The preparation of appropriate legal instruments to deal with land-based sources of pollution has been an issue of major concern since it is estimated that land-based sources of pollution constitute more than 80% of the total pollution load of the Mediterranean Sea, therefore the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources (LBS) was adopted and entered into force in 1983.

The above Protocol classified substances that have a deleterious effect on the aquatic environment in two main categories; a "black list" for substances that eventually have to be eliminated and a "grey list" for those substances, by which pollution has to be reduced.

In the 1995 Barcelona Resolution, the Contracting Parties affirmed their determination to use MAP as a tool for sustainable development. To this end the Barcelona Convention was revised and MAP was reformulated with the title of MAP Phase II, while the Mediterranean Committee on Sustainable Development (MCSD) was established as a consultative body to the partners in sustainable development in the Mediterranean. In 1996 the LBS Protocol was amended so as to include also Land-based Activities and MAP's component programme for pollution monitoring and research in the Mediterranean Sea (MED POL) entered then into Phase III for the period 1996 - 2005.

At the International level, the United Nations Environment Programme convened in Washington in 1995 an intergovernmental Conference to adopt the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA). The Conference clearly defined the need for action at the various levels of interventions required. Thus, at national level, emphasis was placed on the introduction of strategies and measures to enable the appropriate management of priority problems. Recognizing the need for the participation of countries in regional and sub-regional arrangements, the Conference stressed the importance of ensuring at national level the resources and instruments required for the effective functioning of regional and sub-regional arrangements.

In 1997 the Contracting Parties adopted the Strategic Action Programme to address Pollution from Land-based Activities (SAP), as a major tool to implement the amended LBS Protocol, taking also into account the provisions of the Global Programme of Action.

In what concerns the role and involvement of the World Health Organization, the Fiftieth World Health Assembly at Geneva, concerned about the potential risks to human health resulting from the deterioration of the Marine Environment, endorsed the Washington Declaration. Therefore, Member States were urged to support the implementation of the Global Programme of Action in general, especially with regard to public health aspects. They were also urged to participate in the development of a clearinghouse for the implementation of the Global Programme of Action and, in particular, to support WHO's efforts to lead the development of the clearinghouse mechanism for information on sewage.

The present document contains information on the municipal wastewater treatment plants in Mediterranean coastal cities with population between 2,000 and 10,000 inhabitants, respective to the MAP Technical Report Series #157 which is focused on Mediterranean coastal cities with over 10,000 inhabitants.

This study was related to: (a) the Genoa Declaration of 1985, where the Contracting Parties agreed to achieve ten targets by the end of the decade. Amongst the priority targets was the establishment of sewage treatment plants in all cities around the Mediterranean sea with more than 100,000 inhabitants and appropriate outfalls and/or treatment plants for all cities with more than 10,000 inhabitants, (b) the Strategic Action Programme to address pollution from land-based activities, where among the targets to be achieved, is the disposal of sewage from cities and urban agglomerations exceeding 100,000 inhabitants and areas of concern in conformity with the provisions of the LBS Protocol, and (c) the commitments of the Johannesburg Summit in 2002, regarding water and sanitation, that include halving of the proportion of population without access to sanitation by 2015.

1.2 Report on the Municipal Wastewater Treatment Plants in the Mediterranean Coastal Cities

The marine environment is subjected to various pressures, which are mostly related to wastewater discharge. The production of wastewater is attributed to human (domestic, industrial or agricultural) activities where use of water is very important and consequently the production of wastewater is inevitable.

The MAP Programme in 2000 (several years after the Barcelona Convention and at the end of the Water Decade) reviewed the status of wastewater treatment in Mediterranean coastal cities of more than 10,000 inhabitants. The study was conducted in the year 1999 and the results were published at the MAP Technical Report Series No. 128 (2000).

According to the Genoa Declaration sewage treatment plants were to be made available to all cities with more than 100,000 inhabitants and that appropriate outfalls and/or treatment plants for all cities with more than 10,000 inhabitants should also to be provided.

The scope of the study presented in the year 2000 provided information for all Mediterranean coastal countries, that was related to the collection of data for each country concerning the population served by wastewater treatment plants and the degree of the treatment provided.

The 2000 MAP and the updated 2004 report included the following information:

1. List of coastal cities with population (permanent and seasonal) between 2,000 - 10,000 persons reflected the situation in each country of the Mediterranean;
2. Existence of WWTPs serving all Mediterranean coastal cities with population between 2,000 - 10,000 inhabitants;
3. Degree of wastewater treatment, (primary, secondary, tertiary, or other degree of treatment);
4. Quantity of wastewater discharged into the marine environment, treated or untreated, and way of discharge.

A comprehensive analysis of the collected data at country and at regional level and assessment of the needs and the formulation of appropriate conclusions followed the collection of all available information.

1.3 Methodology and Procedures of the present Study

The present report completes the information of the years 2000 and 2004 regarding wastewater treatment in coastal areas of the Mediterranean region, with recent data collected by each country and referred to towns with population of between 2,000 and 10,000 inhabitants.

The planning, methodology and working procedures of the study were prepared within the framework of the MED POL Programme. More specifically the information was collected at national level by the officially designated National MED POL Coordinator and included the following:

1. Update of the list of coastal cities with population between 2,000 - 10,000 inhabitants
2. Collect data on the number of WWTPs that serve coastal cities
3. Collect information on the quantity of wastewater treated
4. Collect data on the provided degree of treatment
5. Collect data on the quantity of treated and untreated wastewater and respective way of discharge
6. Evaluation of the provided updated information

2. MUNICIPAL WASTEWATER IN THE MEDITERRANEAN

2.1 Characteristics of Municipal Wastewater in the Mediterranean

According to a common definition, municipal wastewater refers to a mixture of domestic wastewater (residential settlements and services which originates predominately for human metabolism and for household activities) and industrial wastewaters. Industrial wastewaters are discharged to sewerage collection systems or directly enter the wastewater treatment plants, with or without previous treatment. Sewers may also convey groundwater and precipitation that infiltrate into the sewerage networks.

The quantity of wastewater entering the sewerage networks is site specific and depends upon on different factors. For the Mediterranean region, water consumption is to the order of 150-250 l/cap per day, a figure that in many areas of the region may be reduced significantly. Of the total quantity of water supplied to the communities 70-80% reaches the sewerage system, while the rest is infiltrated into the soil (e.g. irrigation of gardens). This does not include industrial wastewater, which depending on local conditions, should also be taken into account, or infiltration inflow into the sewer, which depends upon hydrological conditions in each community.

Wastewater flows depend upon both the climatic conditions and the size of the community while at the same time in coastal communities of the Mediterranean, seasonal variations can be particularly pronounced due to tourist activity.

The composition of municipal wastewater depends upon factors that are related to the standard of living, climatic conditions, water supply systems, the available quantities of water, and composition of industrial wastes.

The basic quality parameters of municipal wastewater are the organic load (BOD_5 biochemical oxygen demand at 20°C over 5 days and the COD parameter), suspended solids, nutrients (nitrogen as N, phosphorus as P) and pathogens. In untreated domestic wastewater, the BOD_5/COD ratio ranges between 0.4 and 0.8.

The concentration of each substance in wastewater depends on the water consumption per capita per day. In the Mediterranean countries, due to limited available quantities of water, expressed as low daily consumption, higher concentrations can be expected in domestic wastewater.

Further to the main pollutants of wastewater, the presence of other substances such total dissolved solids and specific ions, such as sodium, calcium, magnesium and boron may also occur in wastewaters. In communities where industrial activity is intense the contribution of industrial wastewaters to domestic wastewater, is related to the presence of specific compounds/elements, such as phenols, pesticides, chlorinated hydrocarbons and metals (Cd, Zn, Ni, and Hg, etc.). These substances are of particular concern due to their toxicity and because they tend to resist conventional methods of wastewater treatment.

The presence of micro-organisms in municipal wastewater depends on the conditions of sanitation of the population and primarily of indicator organisms, which can be more easily estimated in wastewater than the pathogens, (coliforms, faecal streptococci, shigella, salmonella, *Pseudomonas aeruginosa, Clostridium perfrigens, Mycobacterium tuberculosis,* protozoan cysts, helminth ova, and enteric viruses).

2.2 Impacts of Nutrients

The increase in the rate of supply of organic matter to an ecosystem, which is related to nutrient enrichment enhancing primary production, is known as eutrophication. The main nutrients causing eutrophication are nitrogen in the form of nitrate, nitrite or ammonium and phosphorus in the form of ortho-phosphate. In addition, supply of bioavailable organic phosphorus and nitrogen cause eutrophication, since bacteria under oxygen consumption regenerate the organic phosphorus to phosphate and the organic nitrogen to ammonium, which is further oxidised to nitrite and nitrate. Silicate is essential for diatom growth, but it is assumed that silicate input is not significantly influenced by human activity. Its most serious impact to the aquatic environment is related to algal blooms (red tides), algal scum, enhanced benthic algal growth, and at times a massive growth of submersed and floating macrophytes.

In addition to the effect on the aquatic ecosystem eutrophication and its side effects cause discolouration of waters, reduced transparency and disturbance to bathers thus impairing recreation activities. Dense macrophyte and macro-algae agglomerations chop channels, lagoons and estuaries impairing fishery and navigation and reducing flow and the holding capacity of freshwater reservoirs, etc.

The decaying organic material results to oxygen depletion of the water causing an array of secondary problems such as death of the benthic fauna, formation of corrosive and other undesirable substances such as CO_2, CH_4, H_2S, NH_3, organoleptic (taste and odour producing) substances, organic acids, toxins, etc.

Attachment of algal material and high pH can cause dermatitis and conjunctivitis, while ingestion of algae can cause diarrhoea in sensitive individuals. The development of toxin producing algae in the marine environment, when accumulated in fish, particularly shellfish, is a threat to human health.

The increase in frequency of algal blooms of toxic algae is responsible for causing paralytic and diarrhetic shellfish poisoning (PSP and DSP, respectively, produced by saxitoxin and other toxins in certain dinoflagellates and chrysophyceae), both already known for some time, and the appearance of new forms previously unknown or ignored such as amnesic shellfish poisoning (ASP) produced by domoic acid in diatoms.

2.3 Impacts of Pathogens

The presence of pathogenic micro-organisms in the marine environment may result to impacts on public health, through direct contact with polluted seawater and/or sand, including ingestion of the former while swimming and through consumption of contaminated seafood. Microbial pollution of the marine environment (seawater, sediments and beaches) may affect the gastrointestinal tract, or other parts of the body. As far as the former category is concerned, all the diseases which are spread by the faecal-oral route, and whose aetiological agents are shed in the faeces of diseased individuals or carriers could be contracted by swimming in polluted waters. Apart from diseases affecting the gastrointestinal tract, a number of diseases or disorders affecting the eye, ear, skin, upper respiratory tract and other parts of the body have been associated with bathing in waters where microbial pollution occurs.

The direct discharge of untreated wastewater into aquatic environment is one of the predominant reasons for the microbial pollution and deterioration of the marine environment. However, the general situation is progressively improving through the wastewater treatment facilities and the construction of submarine outfalls.

The permanent population that is concentrated at the Mediterranean Coast is to the order of 150 million inhabitants. It should be stressed however, that this figure might be doubled during the summer period since the area attracts many tourists from all over the world. During the summer months, the sea constitutes the main recreational amenity for local and tourist populations and consequently most beaches, especially those in the vicinity of cities and tourist resorts, are heavily overcrowded, particularly on weekends. The heterogeneous nature of beach populations further facilitates the spread of infections.

The prevailing warm climatic conditions result in a relatively long bathing season and thus longer exposure of the public to seawater and/or beach sand, as compared to other, more temperate countries.

Microbial pollution may also be enhanced by the presence of aquacultures. Water and shellfish quality control measures vary in each country, and in many cases are practically based on "acceptable" concentrations of bacterial indicator organisms. While such organisms can provide a reasonable estimate of the degree of pollution, and perhaps a relative satisfactory correlation with concentrations of bacterial gastrointestinal pathogens, they have not so far been accepted as providing any clear correlation with the presence and density of either viruses or non-gastrointestinal pathogens and the biotoxins from algae (PSP, DSP). In general, there is very limited control over the quality of beach sand, which has only recently commenced to be recognized as a factor to be considered in the transmission of a number of skin and other contact infections, including fungal ones.

2.4 Municipal Wastewater Treatment

The collection and treatment of wastewaters results into point source pollution load, which is discharged into the environment. Depending on the treatment provided, wastewater can be further used (restricted or unrestricted irrigation etc).

Wastewater treatment is achieved through physical, chemical and/or biological processes. Depending upon the degree of treatment, the following processes are identified:

i) Pre-treatment refers to the removal of bulky matter, sand and gravel, greases and oils from wastewater;

ii) Primary treatment includes the application of physical and/or chemical treatment processes for municipal wastewaters that lead to 50% reduction of suspended matter and by 20% reduction of organic load (BOD_5);

iii) Secondary treatment involves the application of physical and/or chemical, biological and other processes, which in municipal wastewaters reduce the concentration of suspended matter and BOD_5 by 70-90%, and COD concentrations at least 75%. When biological treatment is applied a minimum reduction of nutrients to the order of 20% can be also achieved.

iv) Tertiary treatment includes the application of physical and/or chemical, biological and other procedures which in municipal wastewaters reduce the concentration of nutrient salts by 80%.

v) Disinfection is a separate process, which is applied in order to further reduce the number of pathogenic micro-organisms in treated water.

The application of advanced treatment processes (e.g. filtration, additional chemical treatment), combined with the process of disinfection, results in better effluent quality. In these cases and according to the existing legal framework wastewater can be used.

The most important factors that should be considered when evaluating and selecting unit operations and processes for each case, may be grouped as follows:

- process applicability, performance
- environmental constraints (way of discharge, location)
- maintenance and operation requirements (cost, personnel, education level of the personnel)

Wastewater treatment results to the production of sludge during primary and/or secondary sedimentation. Disposal of sludge in the environment without prior treatment may result in significant pollution and threat to public health. The legal framework regarding sludge disposal (at least according to EU Legislation) is progressively encouraging sludge reuse into agriculture. The current trend for sludge utilisation and reuse is combined to the adoption of the term “biosolids” rather than “sludge”.

2.5 Wastewater Discharge into the Sea

The discharge of wastewater to the sea should follow for each case the legislation in force. For example, countries that are members of the European Union, should follow the provisions of the Directive 91/271/EC concerning urban wastewater treatment, (i.e. at least secondary treatment should be provided for agglomerations of more than 10,000 p.e., that discharge their wastewater to coastal areas). Furthermore, according to the SAP, the application of marine outfalls, given appropriate water treatment or a higher degree of

treatment should take place in order to obtain or maintain agreed environmental quality criteria and to avoid exposing shell fisheries, water intakes and bathing areas to pathogens and to avoid the exposure of sensitive environments to excess nutrients or suspended solid loads. The design of marine outfalls is related to the principle of self-purification of waste in the sea, through the process of dilution, dispersion and decomposition. The selection of the way of discharge depends upon hydrographical, topographical and geological conditions in the coastal zone and hydrodynamic conditions in the sea.

3. RESULTS ACHIEVED

3.1 Brief Summary of Data Collection

Data from 18 Mediterranean countries were progressively collected until country summaries were produced using the most reliable information available. The following list presents, in alphabetic order, the countries involved in the study.

Albania, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco, Slovenia, Spain, Syria, Tunisia and Turkey.

Great variations in the data collected between countries as well as between cities were found, which were expected considering the existing variations between the quantity and the quality of wastewater services provided by the different areas. The procedures and the time that each country adopted for the collection of this kind of data could also explain the differences found. Thus, while some countries have a relatively up-to-date list of coastal cities with the present population, other countries used much older data since new data is not available.

In view of the above-mentioned difficulties, a comparative analysis of data in between countries is not a hundred per cent possible, considering the dissimilar set of data amongst the countries (i.e. although the format and fields of the table that had to be completed was provided, some countries either did not fill all the fields, or preferred to sent the data in their own format).

The tables and graphs presented in Part III of this document reflect the situation as reported.

3.2 Constraints Encountered

Considering the specific characteristics and possible difficulties experienced by each country during the reporting, it was inevitable to encounter a series of constraints.

The most important constraints encountered are quoted below:

- In many cases the requested forms were not fully completed. For example, although information regarding the quantity of treated wastewater (i.e wastewater production, collection, treatment and final disposal) was provided, that was not the case for untreated wastewater discharges.

- For all the examined countries, there was no available information regarding the quantities of treaded/ untreated wastewater that are disposed in each way. As a result, percentages concerning the categories of disposal way refer to cases and not to quantities.

- A group of countries reported the permanent population, while there was no separate information for seasonal increase of the reported figure due to tourists. The only

indication for the population increase derived from the population served by a wastewater treatment plant. Other countries, mainly EU Member States, reported population equivalent (i.e. permanent plus seasonal population) that practically coincides to the reporting format required by the European Commission and it was accepted in order to avoid double effort the data.

- In many cases, for a lot of cities with population less than 10,000 inhabitants, served by a central wastewater treatment plant, data regarding the production and disposal of the waste (treated and untreated) were not reported, making difficult the quantitative determination of wastewater respectively to the population.

- According to the provided information, the following possibilities were identified:

    1. A city served by a wastewater treatment plant discharging 100% treated sewage wastewater.
    2. A city served by a wastewater treatment plant discharging treated and untreated wastewater.
    3. A city not served by a treatment plant discharging 100% untreated wastewater.
    4. A city with no treatment plant discharging untreated wastewater, plus the existence of individual wastewater disposal systems, e.g. septic tanks.
    5. A city served only by individual on-site systems.

- Accurate reporting on the degree of treatment of wastewater also proved to be difficult. In several cases the information was not available. The study proposed to use the standard classification for Primary, Secondary and Tertiary Treatment, as described in section 2.4.

- With respect to the quantity of wastewater treated and untreated and the way of disposal, some countries probably experienced difficulties in completing the required information, due to lack of adequate and reliable data.

- Regarding the year of construction, information was not available for almost all of countries.

Acknowledgement should be made to the efforts made by the national MED POL Coordinators to overcome the constraints encountered.

3.3 General Considerations on the Contents of the Tables

1. The study examines the coastal cities that discharge their municipal wastewater into the sea, thus contributing to the pollution of the marine environment. Rivers that are the recipients of wastewater discharges (treated or untreated), from inland cities, also represent a municipal wastewater pollution point source in the Mediterranean, however these were generally not taken into account.

2. Some countries reported cities with a resident population of more than 10,000 habitants due to the fact that they were not reported in the previous study (for coastal cities with population over 10,000 habitants). These cases were not taken into account during the evaluation of the data; however they are presented in the Part II of the study (in each country's table).

3. A number of countries have reported the capacity of the treatment plant related to population equivalent (PE). This is reflected in the tables under the appropriate column heading. As already mentioned this mainly occurred with EU member states due to their obligation of reporting.

4. Where there was not available information about the population equivalent, then permanent population data were taken into account. Additionally, the same way applied where population equivalent referred to a central WWTP of a large city and not to the examined city.

5. For most of the examined countries, information about the population of the city served by a sewerage network and a treatment plant was not reported, resulting in difficulties in drawing a clear conclusion.

6. Occasionally, when comparing equivalent population, served by a treatment plant, with the permanent population, the figure obtained is below the resident population reported. This, although not in all cases can be explained by accepting the fact that a sector of the population uses septic tanks or cesspools or other similar methods of wastewater disposal.

7. With respect to the quantity of untreated wastewater discharged, the provided information is limited and thus, a concrete conclusion regarding the quantity of sewage discharged untreated cannot be easily drawn.

8. Where more than one date appears under the column "year of construction", it means that the plant was renovated or expanded.

3.4 General Tables and Graphs

Summary of Results

Total number of countries	17
Total number of cities	950
Total number of Wastewater Treatment Plants (examined cases)	950

Total number of Wastewater Treatment Plants (examined cases)	950	
Cities without a wastewater treatment plant	*389*	*40.9%*
Cities with a wastewater treatment plant under construction / projected	*68*	*7.2%*
Cities with a wastewater treatment plant on maintenance /out of operation	*28*	*2.9%*
Cities with a wastewater treatment plant	*465*	*48.9%*

Cities with a wastewater treatment plant	465	
Pre-treatment	*47*	*10.0%*
Primary treatment	*100*	*22.0%*
Secondary treatment	*185*	*40.0%*
Tertiary treatment	*131*	*28.0%*
Unknown treatment	*2*	*0.0%*

Total number of cities for which population was reported	950
Total number of cities for which population equivalent was reported	358

Total number of “resident” population reported	2,673,327 (for 592 cities)

Total cubic metres of wastewater treated per day (for reported information) Total permanent population (respective population)	≈ 433, 622 ≈ 2, 278,480
Total cubic metres of wastewater untreated per day (for reported information) Total permanent population (respective population)	≈ 269,472 ≈ 2,097,768

*Note that this quantity is not totally discharged in the aquatic environment.

The results obtained are presented in a form of graphs at the end of Part III of the report.

4. COUNTRY FACTS

4.1 Albania

Three coastal cities were reported with a resident population of 17,200 persons. Information regarding collection systems was not reported. It should be stressed, that there are no wastewater treatment facilities and thus the untreated wastewater is partly discharged into the seawater and cesspools.

4.2 Croatia

Eighty-three coastal cities were reported with a resident population of 368,042 persons. According to the provided information forty two coastal cities are served by WWTPs while pre-treatment is applied for the forty one out of forty two cities. The disposal of primary treated sewage is conducted through submarine outfalls in almost all cases, while untreated sewage is disposed mainly into the aquatic environment by many small submarine outfalls.

4.3 Cyprus

Cyprus has twenty-four coastal cities with a total population equivalent of 106,958 inhabitants. Eight cities are served by a main sewage treatment plant or individual treatment systems. Regarding the degree of treatment tertiary treatment was reported while treated wastewater is reused. Septic tanks and absorption pits are the recipients of the untreated wastewater.

4.4 Egypt

A total of 12 coastal cities with a resident population of 65,458 inhabitants was reported. The number of cities served by a wastewater treatment plant is two. However, according to the available information, the coastal city of Ras-El bar seems to produce large quantities of secondary treated wastewater, especially in the summer. With respect to the treated wastewater discharge, it is led into the sea by canals. Regarding the untreated sewage is disposed in the soil (possibly in desert).

4.5 France

The number of reported coastal cities is seventy seven with a total population (permanent and seasonal) of 762,100 inhabitants. Almost all cities are served by wastewater treatment facilities that provide secondary or primary treatment while there are six cases with the projection of plants' construction.

For the total population of 571,300 inhabitants, according to the available information, 74,293 m^3/ day of treated wastewater are produced. Regarding the disposal of the treated sewage, in approximately 33% of the cases it is led into the submarine environment through an outfall, while 8% of the total is discharged directly to the sea. The provided information concerning the quantities and disposal way of untreated wastewater is significantly inadequate.

4.6 Greece

According to the reported information, in Greece there are a hundred and seventy eight areas with population between 2,000 and 10,000 inhabitants that are located close to the coastline, with a total population of 764,580. It should be noted that this figure also includes the seasonal population that in several cases may result to the significant increase of the permanent population. According to the reported information approximately 31% of the total number of the cities are served by a WWTP, 42% do not have treatment facilities while a significant percentage of 23% will be served by a treatment system (plants under construction/projected).

With respect to the production and disposal of treated wastewater, 61,322 m^3/ day are produced by 245,320 inhabitants and discharged mainly to the aquatic environment (through a submarine outfall - 36% of the cases - or directly into the sea – 55% of the cases-). It should be noted that according to the provided data, untreated sewage is not directly discharged to the marine environment since in all cases raw sewage from households is collected to septic tanks.

4.7 Israel

Eight coastal cities with permanent population greater than 2,000 and up to 10,000 residents were reported with a total population of 44,982 inhabitants. According to the information provided, all cities are served by respective wastewater treatment plants, which in all of the cases provide secondary treatment, while only one coastal city out of eight is served at about 50% by a plant and uses septic tanks for the rest 50%. There is no discharge of untreated wastewater while treated wastewater is mainly reused.

4.8 Italy

The reported data involve a total of a hundred and seventeen cities, while cities with over 10,000 residents are excluded from the evaluation of the data. Total permanent population is about 652,231 persons. The total population served by wastewater treatment plants reaches a figure of 542,998, with 79% of the total cities are served by WWTPs, while 3% are under construction/ projection to be served.

Treatment of wastewater was distributed as follows: pre-treatment 2% primary treatment 77%; secondary treatment 18%; tertiary treatment 1%, and for the remaining 1% no information on the degree of treatment was available. The discharges of treated wastewater is about 73,550 m^3/ day (for the respective population of 542,998 residents), while no information was provided concerning the way of disposal. The quantities of untreated wastewater and its way of disposal were not reported too.

4.9 Lebanon

Available information for Lebanon refers to cities (locations) which gather a population over 10,000 residents, covering several coastal villages, whereas there is no any information about the population per village. For that reason the country of Lebanon have not been included in the data process, it is presented in Part II of the study, only for information reasons.

The reported data involved thirteen coastal localities with a total population of 5,675,000 inhabitants, in three of which the population is currently served by a treatment plant. In the remaining localities wastewater treatment facilities are projected to be operational, serving a total population of 4,175,000 residents. The degree of wastewater treatment is primary for 15% of the total number of cases and secondary for the rest 85%.

4.10 Libya

Provided population data involved seven out of fifteen coastal cities, which were included in the last census of 2006, with a total permanent population of 19,497 inhabitants. In four of the total cases, residents are served by wastewater treatment facilities, mainly providing primary treatment (in 75% of the cases).

Concerning the quantity and disposal of treaded wastewater, 1,792 m^3/ day are produced for a population of 15,536 residents, while they are discharged to the seawater through submarine outfalls. As regards untreated wastewater, there is no available quantitative data, however it is disposed into the sea through submarine outfalls in three of the total cases (there is no information about the rest).

4.11 Malta

Forty two coastal cities with permanent population greater than 2,000 and up to 10,000 residents were reported with a total population of 204,221 inhabitants. 86% of the total cases are served by wwtps while in14% of the total number of cities, plants are under construction. Concerning the degree of the treatment, tertiary treatment is provided to the served cities. It is noted that there is no applicable information regarding the quantities of treated and untreated wastewater, while in the 79% of the cases untreated wastewater is disposed to aquatic environment through a submarine outfall and in 7% directly into the seawater.

4.12 Montenegro

The reported information involves a total of nine cities. Total permanent population is about 35,604 residents. It is noted that none of the reported cities is served by a wwtrp, whereas available information referred to municipalities and not to the cities (for the former population is much greater than 10,000 residents). The available information related to the cities concerns the way of untreated wastewater disposal, according to which it is led into the sea through submarine outfalls.

4.13 Slovenia

Five coastal cities with permanent population greater than 2,000 and up to 10,000 residents were reported, with a total population of 18,045 inhabitants. 100% of the total cases are served by the wwtps of Piran and Koper. Concerning the degree of the treatment, primary treatment is provided, while secondary phase is under construction in both of the wwtps. It is noted that available information regarding the quantities of treated wastes refers to the wwtps of Piran and Koper. In 60% of the cases treated wastewater is disposed through a submarine outfall and in 40% directly into estuaries.

4.14 Morocco

Thirty eight coastal cities have been reported. The total permanent population is 232,748, according to the provided data for 2004. A percentage of 74% of the total number of cities is served by wastewater treatment facilities of the respective localities that provide for secondary treatment. Two projects for new wastewater treatment plants that will serve the areas of Tetouan and Tanger are in progress. Information regarding the wastewater produced (treated and untreated) was no reported.

4.15 Spain

A total of seventy six coastal cities were reported with an equivalent population of 351,654 persons. According to the information provided a percentage of 95% of the cities is served by wastewater facilities. In 72% of the cases provide for secondary and 22% for tertiary treatment. With respect to the quantities and the way of discharge of treated wastewater 85,231 m^3/ day are produced, mainly discharged to the seawater through a submarine outfall or reused.

4.16 Syria

Fifty-three Mediterranean coastal cities were reported with a total resident population of 205,776 inhabitants. According to the information provided, none of the cities is served by wwtps. The total amount of untreated wastewater discharge reaches the 30,656 m^3/ day for a respective population equal to the total resident. Untreated wastewater is discharged totally into aquatic environment through a submarine outfall (in 45% of the cases), many small outfalls (in 47% of the cases) and directly to the seawater in the remaining of the cases.

4.17 Tunisia

A total of twenty six coastal cities were reported with a permanent population of 181,229 persons. Respective wastewater treatment plants in 92% of the cases are served by a wastewater treatment facility from which the percentage of 83 % provides secondary treatment and 17% tertiary treatment. The total quantity of treated wastewater is about 11,144 m^3/ day, with a respective population of 143,617 residents, for which in 50% of the cases it is directly discharged to the sea, while for a percentage of 22% there is no available information about the way of disposal. In 86% of the cases, untreated wastewater is directly discharged into the seawater.

4.18 Turkey

A total of a hundred and ninety two coastal cities were reported with a permanent population of 878,242 residents. It is noted that 81% of the total number of the cities is not served by a treatment plant while for a percentage of 18% there is no available information, only a percentage of 18% is served by a wwtp out of which 83% provide secondary treatment.

The reported quantity of treated wastewater (about 45,042 m^3/day) is discharged through submarine outfalls to the sea, for the percentage of 23% of the cases, whereas for the 73% of the cases there is no available information about the way of disposal. Concerning the untreated wastewater (about 44,244 m^3/day), in 88% of the cases no applicable information was reported.

5. CONCLUSIONS OF THE PRESENT STUDY

a) Acknowledgment has to be made to the National MED POL Coordinators who with a sense of responsibility assisted during the collection and elaboration of data and aid to overcome the constraints encountered. Thanks to their efforts, adequate and accurate data could be gathered during the present study.

b) With respect to the population reported by each country, some countries included the seasonal population to the figure of permanent population, with respective remarks indicating that, while other countries did not provide any information for the population increase. In any case the information is important for the estimation of peak loads that are usually applied during the design of sewage networks and wastewater treatment plants. Furthermore, recent data enable the projection and design of new wastewater disposal systems, as well as the efficient monitoring and evaluation of the performance of operating wastewater treatment plants.

c) The difficulties that may have been encountered by each country are mainly related to the availability of information. Their constraints are also related to those encountered during the elaboration of the data available. Although, as already mentioned the present study includes accurate data, the most important constraints have to be identified:

- Insufficient data for the seasonal increases of population;
- Incomplete or diffuse information on the quantities of wastewater treated or untreated and respective ways of disposal;
- Incomplete information concerning the details for the services being provided to the population, (e.g. population served by treatment plants or by a sewerage network only or by alternative systems, information on the degree of treatment, year of construction of plants).

d) Further to the current situation with respect to wastewater treatment facilities in the Mediterranean region, the protection against wastewater discharges directly into the environment should also involve the indirect forms of pollution which refer to the use of septic tanks (pollution of groundwater and indirectly the marine environment) or the discharging of wastewater from recreational marine vessels. However, in both cases available accurate data or even estimations are difficult to obtain.

PART II

MUNICIPAL WASTEWATER TREATMENT FACILITIES

Legend

Degree of treatment

Primary treatment includes the application of physical and/or chemical treatment procedures for municipal wastewaters with which at least 50% of suspended matter is removed and BOD_5 values are reduced at least 20% from initial concentrations.

Secondary treatment involves the application of physical, chemical, biological and other procedures, which in municipal wastewaters reduce the concentration of suspended matter and BOD_5 70-90%, and COD concentrations at least 75%.

Tertiary treatment includes the application of physical, chemical, biological and other procedures which in municipal wastewaters reduce the concentration of nutrient salts 80%, and remove other specific wastewater parameters, achieving values unattainable by means of secondary treatment.

Pre-treatment involves the application of operations with which bulky matter, sand and gravel, greases and oils are removed from wastewater.

Planning and designing of urban wastewater treatment projects in Mediterranean coastal cities (MAP/UNEP/PAP , 7/TC, 4/1, 1992)

Symbols

Discharge

DI = discharge directly into the sea
SO = discharge through a submarine outfall
Ss = discharge through many small submarine outfalls
RE = discharge is re-used

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: ALBANIA

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Hilmare	7000	-	-	-	-	-	420	84
Shengjin	4500	-	-	-	-	-	270	216
Orikum	5700	-	-	-	-	-	342	274

Remarks: There are informal data.

Himare – 80% of wastewater is discharged in cesspool and 20% of wastewater is discharged in seawater.
Shengjin -80% of wastewater is discharged in Knalla Lagoon and 20% of wastewater is discharged in cesspool.
Orikum - 80% of wastewater is discharged in seawater and 20% of wastewater is discharged in cesspool.

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: CROATIA

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Primorsko- goranska županija - County								
Bakar	7768	no	-	-	-	-	1010	DI
Cres	3200	yes	mechanical	Pre-treatment	358	SO	140	SS
Crikvenica	8000	yes	mechanical	Pre-treatment	896	SO	224	DI
Kraljevica	4593	no	-	-	-	-	643	SS
Krk	6000	yes	mechanical	Pre-treatment	672	SO	168	SS
Mali Lošinj	8391	yes	mechanical	Pre-treatment	940	SO	235	SS
Novi Vinodolski	5165	yes	mechanical	Pre-treatment	672	SO	168	SS
Opatija	10000	yes	mechanical	Pre-treatment	1120	SO	280	SS
Rab	10000	yes	mechanical	Pre-treatment	1120	SO	280	SS
Kostrena	3892	yes	mechanical	Pre-treatment	350	SO	195	SS
Lovran	4500	yes	mechanical	Pre-treatment	504	SO	126	SS
Malinska-Dubašnica	2800	yes	mechanical	Pre-treatment	314	SO	78	SS
Matulji	3510	yes	mechanical	Pre-treatment	393	SO	97	SS
Omišalj	3000	yes	mechanical	Pre-treatment	336	SO	84	SS
Vinodol	4000	yes	mechanical	Pre-treatment	392	SO	168	SS
Ličko-senjska županija - County								
Novalja	3339	yes	mechanical	Pre-treatment	300	SO	167	SS
Senj	8035	yes	biological	secondary	787	SO	337	SS
Zadarska županija - County								
Biograd na moru	5800	yes	mechanical	Pre-treatment	539	SO	231	SS
Nin	4513	no	-	-	-	-	631	DI
Obrovac	3144	no	-	-	-	-	377	DI
Pag	4368	no	-	-	-	-	611	SS

Bibinje	4200	no	-	-	-	-	588	SS
Novigrad	2400	yes	mechanical	Pre-treatment	235	SO	100	SS
Pakoštane	3771	no	-	-	-	-	490	SS
Pašman	2076	no	-	-	-	-	270	SS
Posedarje	3446	no	-	-	-	-	448	SS
Preko	3358	no	-	-	-	-	436	SS
Privlaka	2140	no	-	-	-	-	278	SS
Ražanac	2910	no	-	-	-	-	407	SS
Sukošan	4321	no	-	-	-	-	562	SS
Sveti Filip i Jakov	4511	no	-	-	-	-	586	SS
Splitsko-dalmatinska županija - County								
Hvar	4082	yes	mechanical	Pre-treatment	424	DI	105	DI
Kaštel Gomilica	4002	no	-	-	-	-	530	SS
Kaštel Kambelovac	4324	no	-	-	-	-	562	SS
Kaštel Lukšić	4771	no	-	-	-	-	620	SS
Kaštel Novi	5216	no	-	-	-	-	678	SS
Kaštel Stari	6277	no	-	-	-	-	816	SS
Kaštel Sućurac	6187	no	-	-	-	-	804	SS
Kaštel Štafilić	2528	no	-	-	-	-	329	SS
Omiš	6500	yes	mechanical	Pre-treatment	637	SO	273	SS
Stobreč	6000	yes	mechanical	Pre-treatment	588	SO	252	SS
Žrnovnica	2500	no	-	-	-	-	350	SS
Stari Grad	2767	no	-	-	-	-	387	SS
Supetar	3891	no	-	-	-	-	544	SS
Vis	2010	no	-	-	-	-	261	SS
Baška Voda	2949	yes	mechanical	Pre-treatment	306	SO	76	SS
Dugi Rat	7200	no	-	-	-	-	1008	SS
Gradac	3494	no	-	-	-	-	454	SS
Jelsa	3444	no	-	-	-	-	447	SS
Marina	4900	no	-	-	-	-	686	SS
Podgora	2828	yes	mechanical	Pre-treatment	294	SO	73	SS
Podstrana	8000	no	-	-	-	-	1120	SO

Pućišća	2227	yes	mechanical	Pre-treatment	231	SO	58	SS
Seget	4800	no	-	-	-	-	672	SS
Istarska županija - County								
Novigrad	3984	yes	mechanical	Pre-treatment	446	SO	111	SS
Umag	7919	yes	mechanical	Pre-treatment	997	SO	110	SS
Barban	2769	yes	mechanical	Pre-treatment	345	SO	38	SS
Fažana	3198	yes	mechanical	Pre-treatment	403	SO	45	SS
Kršan	3216	yes	mechanical	Pre-treatment	405	SO	45	SS
Ližnjan	2925	yes	mechanical	Pre-treatment	368	SO	41	SS
Medulin	5825	yes	mechanical	Pre-treatment	446	SO	111	SS
Vodnjan	5560	yes	mechanical	Pre-treatment	231	SO	58	SS
Vrsar	2633	yes	mechanical	Pre-treatment	733	SO	81	SS
Dubrovačko-neretvanska županija - County								
Nova Mokošica	6000	yes	mechanical	Pre-treatment	736	SO	84	SS
Korčula	5896	yes	mechanical	Pre-treatment	613	SO	153	SS
Opuzen	3215	no	-	-	-	-	450	DI
Ploče	6450	no	-	-	-	-	903	DI
Blato	3659	no	-	-	-	-	475	SS
Konavle	8190	no	-	-	-	-	1067	SS
Cavtat	2004	yes	mechanical	Pre-treatment	252	SO	28	SS
Orebić	4041	yes	mechanical	Pre-treatment	367	SO	157	SS
Slivno	2200	no	-	-	-	-	264	SS
Ston	2575	no	-	-	-	-	334	SS
Vela Luka	4379	yes	mechanical	Pre-treatment	398	SO	170	SS
Župa dubrovačka	6532	no	-	-	-	-	849	SS

Šibensko- Kninska Županija - County								
Skradin	4112	yes	mechanical	Pre-treatment	320	SO	213	SS
Vodice	9730	yes	mechanical	Pre-treatment	822	SO	443	SS
Murter	2114	no	-	-	-	-	275	SS
Pirovac	1926	no	-	-	-	-	250	SS
Primošten	3076	yes	mechanical	Pre-treatment	320	SO	80	SS
Tisno	3425	no	-	-	-	-	445	SS
Rogoznica	2441	yes	mechanical	Pre-treatment	222	SO	95	SS
Remarks:								

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: CYPRUS

A/A		Total Permanent Population 2001	Total Population Equivalent 2001	Population Equivalent 2001 connected to the main Sewage Treatment Plant	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m^3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m^3/day)	Discharge of Untreated Wastewater
	AMMOCHOSTOS DISTRICT										
1	Agia Napa Municipality	2,681	6,440	24,880	Yes	Biological	Tertiary	3,110	RB		
2	Deryneia Municipality	4,945	5,782		No					578	*
3	Sotira	4,258	4,939		No					494	*
4	Liopetri	3,838	4,123		No					412	*
	LARNAKA DISTRICT										
5	Livadia	4,875	5,916	500	Yes (Note 1)	Biological	Tertiary	100	RB	592	*
6	Meneou	1,196	2,240		Note 3					224	*
7	Voroklini	3,302	7,004	500	Yes (Note 1)	Biological	Tertiary	100	RB	700	*
8	Xylotymvou	3,443	3,671		No					367	*
9	Ormideia	3,941	4,385		No					438	*
10	Xylofagou	4,981	5,434		No					543	*
11	Kiti	3,141	3,642		No					364	*
12	Perivolia	1,798	5,554		Note 3					555	*
13	Pyla	1,374	3,462	300	Yes (Note 1)	Biological	Tertiary	60	RB	346	*
	LEMESOS DISTRICT										
14	Mouttagiaka	2,700	3,315	300	Yes (Note 2)	Biological	Tertiary	45	RB	331	*
15	Agios Tychon	2,112	5,883	12,000	Yes (Note 2)	Biological	Tertiary	1,795	RB	588	*
16	Episkopi	3,105	3,330		No					333	*
17	Pareklissia	1,324	2,164	2,200	Yes (Note 2)	Biological	Tertiary	335	RB	216	*
18	Pyrgos	1,348	2,014	4,150	Yes (Note 2)	Biological	Tertiary	625	RB	201	*
19	Pissouri	1,033	2,911		No					291	*

	PAFOS DISTRICT										
20	Geroskipou Municipality	5,486	6,302		No (Note 4)					630	*
21	Pegeia Municipality	2,359	5,986		No					598	*
22	Polis Chrysochous Municipality	1,892	3,785		No					378	*
23	Chlorakas	3,154	6,589		No (Note 4)					658	*
24	Kissonerga	1,406	2,087		No (Note 4)					208	*

Remarks:

Note 1 : Part of this population is served by the Sewage Treatment Plant of Sewerage and Drainage Board of Larnaca.

Note 2 : Hotels and holiday resorts are connected to the Sewage Treatment Plant of Limassol Sewerage Board

Note 3 : Touristic complexes may have individual small sewage treatment plants. The treated effluent is used for irrigation of green areas.

Note 4 :These cities will be connected 100% on 2011 with the Sewage Treatment Plant of Sewerage Board of Paphos which is a biological treatment with Tertiary degree of treatment.

* : Septic tanks and absorption pits are used in most of the cases.

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: EGYPT

City	Permanent Population (1)	Wastewater Treatment Plant (2)	Wastewater Treatment Method (2)	Degree of Treatment of Wastewater (2)	Wastewater Treated (m^3/day) (2)	Dicharge of Treated Wastewater (2)	Discharg of Untreated Wastewater	Wastewater Untreated (m^3/day) (3)
Sallum (Mattruh) **	8445	No					Soil	850
Fouka (Mattruh) **	2289	No					Soil	210
Zawiyat Al-Shaik (Mattruh) #	2391	No					Soil	215
Sidi Barrani (Mattruh) #	7519	No					Soil	680
Sidi Abd El-Rahman (Mattruh) **	3971	No					Soil	360
Ras Al-Hekma (Mattruh) #	3939	No					Soil	350
Baheeg (Alexandria) #	15790	No					Soil	190
Amriah East (Alexandria) **	30688	Yes	Aeration	Secondary	20000	Amriah Draniage to Med	Under rehabilitation	
Ammriah West (Alexandria) **	12635							
Abu Qir East (Alexandria) **	8915	No					Soil	1400
Abu Qir West (Alexandria) **	29802	Yes	Screening & Sedimentation	Primary	5500	Maruit to Med	Sewerage System to Eastern WWTP	
Edfina (Buhayrah) #	14763	No					Soil	980
Sidi Omar (Buhayrah) #	2611	No					Soil	230
Mhahlla Al-Amhar (Buhayrah) #	8423	No					Soil	760
Ras El-bar (Damietta) **	8635	Yes	Extended Aeration	Secondary	45000 summer 15000 Winter	Naviga. Canal to Med.	-	-
Kafer Al-Battiek (Damietta) #	29163	Yes	Oxidation Ponds	Secondary	4000	Drainage Canal to Med.	-	-
Ashshaykh Mubark # (Kafr Ashshaykh)	8320	No					Soil	660
Disuk (Kafr Ashshaykh) **	**106362**	Large City Excluded from the Survey						
Al-Nassima (Daqahliyah) #		Yes	Package Unit (AS)	Secondary	1500	Drainage Canal to Med.	-	-
Shribin (Daqahliyah) **	**56631**	Large City Excluded from the Survey						
Al-Matrya (Daqahliyah) **	**105728**	Large City Excluded from the Survey						

(Governorate) ** Coastal towns and Cities identified by MAP # Additional towns and Small communities identified in the Survey
(1) Data of National Census of March 2007 (2) Information of Egyptian Holding Company of Water and Sanitation (3) Estimates of Local Municipalities

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000 INHABITANTS
Country: FRANCE

City	Population (in 000)		Wastewater Treatment Plant	Population Equivalent of the plant (in 000)	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Waste-water Untreated (m3/day)	Discharge of Untreated Wastewater	Remarks
	permanent	tourist									
Afa	2.51	—	Yes	0.6	Trickling filter	Primary	180 *	River			Plant overloaded Extension planned (2,500 PE) for 2008 with biodisc treatment
Alata	2.80	1	Yes	0.175	On site treatment method		26 *	Infiltration	36 *	River	
				0.09	Imhoff tank		13 *				
Alénya	2.34	Collected to St-Cyprien (cf. MAP Technical Reports Series no. 157)									
Aléria	2.01	2	Yes	1	Activated sludge	Secondary	600	River			Plant overloaded Plan under way (4,000 PE)
				0.15	Grit removal	Primary	20 *	River			
Balaruc-le-Vieux	2.02	Collected to Sète (cf. MAP Technical Reports Series no. 157)									
Balaruc-les-Bains	6.18	Collected to Sète (cf. MAP Technical Reports Series no. 157)									
Banyuls-sur-Mer	4.90	9	Yes	cf. MAP Technical Reports Series no. 157							
				0.15	Primary sedimentation	Primary	23	Brook			
Bastelicaccia	3.06	2	No								Currently on site treatment Plant under construction (2,000 PE, tertiary treatment, 400m3/day)
Beaulieu-sur-Mer	3.80	9	No						760 *	SO	Plan under way
Beausoleil	12.88	Collected to MONACO (cf. MAP Technical Reports Series no. 157)									
Belgodère	0.38	2	Yes	6	Physical + Chemical			DI			The plant treats other cities wastewater
Biguglia	5.15	Collected to Borgo (cf. MAP Technical Reports Series no. 157)									
Cabestany	8.23	—	Yes	15	Activated sludge	Tertiary	2,700	Ditch ending in a lagoon			
Cap d'Ail	4.57	10	Collected to MONACO (cf. MAP Technical Reports Series no. 157)						62 *	SO	

Cargèse	1.00	5	Yes	10	Activated sludge	Secondary	150 (winter) 500 (summer)	DI			
Carnoux en Provence	6.90	Collected to Marseille (cf. MAP Technical Reports Series no. 157)									
Carqueiranne	8.56	Collected to Hyères (cf. MAP Technical Reports Series no. 157)									
Carry-le-Rouet	6.36	Collected to Sausset-les-Pins (cf. MAP Technical Reports Series no. 157)									
Castellare-di-Casinca	0.55	1	Yes	16	Activated sludge	Secondary	600 (winter) 1,000 (summer)	SO			The plant treats other cities wastewater Extension planned for 2,000 PE more
Cerbère	1.55	4.5	Yes	6.8	Biofilters	Tertiary	1,125	RB			
Ceyreste	4.03	Collected to La Ciotat (cf. MAP Technical Reports Series no. 157)									
Coggia (chef-lieu et Sagone)	0.83	2	Yes	0.5	Physical + Chemical	Primary	30 *	River			
				10	Biofilters	Secondary	200 (winter) 800 (summer)	River mouth			Plan to raise the discharge upstream
Cogolin	10.98	16	Yes	10	Activated sludge	Secondary	1,400	River			
				40	Activated sludge + Biofilters	Secondary	5,600	River			
Collioure	2.93	12	Yes	cf. MAP Technical Reports Series no. 157							
				0.15	Primary sedimentation + Filtration	Primary	18	Brook			
Conca	1.00	3.5	Yes	2.5	Trickling filter	Secondary	60	River			
Elne	6.47	2	Yes	15	Activated sludge + Sand filter	Tertiary	1,500	Brook ending in a lagoon			
Ensuès-la-Redonne	5.10	—	Yes	3	Trickling filter	Secondary	282	Ditch			Plant under construction (5,800 PE, membrane treatment)
Eze	3.10	3	No						620 **	SO	Plan under way
Furiani	4.02	Collected to Bastia Sud (cf. MAP Technical Reports Series no. 157)									
Galéria	0.33	3	Yes	3	Activated sludge + Infiltration beds	Secondary	30 (winter) 450 (summer)	River			
Gassin	2.80	Collected to Cogolin									
Grimaud	3.85	40	Yes	60	Biofilters	Secondary	8,200	River			
La Croix-Valmer	3.14	Collected to Cavalaire-sur-Mer (cf. MAP Technical Reports Series no. 157)									

La Londe-Les-Maures	10.03	31	Yes	cf. MAP Technical Reports Series no. 157						
				6	Physical + Chemical	Primary	200	RB			Ultraviolet treatment to be considered
Lapalme	1.41	3	Yes	2.5	Activated sludge	Secondary	285	Brook ending in a lagoon			
La Turbie	3.16	—	**80% of wastewaters** are collected to MONACO (cf. MAP Technical Reports Series no. 157)						200	SO	Plan under way concerning the 20% of wastewaters untreated
Le Rove (Niolon et Chef-Lieu)	4.07	—	Yes	1.50	Physical + Chemical	Primary	140 *	DI			
				4	Trickling filter	Secondary	376	Ditch			The plant stopping is planned, wastewaters will be collected to Marseille plant
Leucate (Port. Village et La Franqui)	3.39	60	Yes	cf. MAP Technical Reports Series no. 157						
				15	Activated sludge	Secondary	641	Infiltration			
				2	Non aerated lagoons	Primary	-	Unspecified			
L'Ile-Rousse	2.80	7	No						480 à 1,100	SO	Plant under construction (30,000 PE), it will treat 4 other cities wastewater
Linguizzetta	1.04	8	Yes	0.25	Trickling filter	Primary	30 *	River			Bad working
				8	Activated sludge	Primary	130 (winter) 630 (summer)	SO			
Lucciana	3.72	Collected to Borgo (cf. MAP Technical Reports Series no. 157)									
Marseillan (Les Pradels et Plage Onglou)	6.28	55	Yes	32	Aerated lagoons	Secondary	6,000	RB or lagoon			
				12.5	Aerated lagoons	Secondary	2,200	RB or lagoon			
Mèze	7.70	15	Yes	21	Non aerated lagoons	Secondary	2,470 (winter) 3,750 (summer)	Lagoon			The plant treats another city
Mireval	3.07	—	Yes	4	Activated sludge	Secondary	1,500	River			Extension plan
Olmeto	1.14	9	Yes	1.6	Activated sludge						
				7.5	Activated sludge			River			
Ota (dont Porto)	0.54	10	Yes	6.3	Physical + Chemical	Primary	540	DI			Plan under way (1st block 10,000 PE, biological treatment, then 5,000 PE more) + replacement of the submarine outfall, broken since 1999
Penta-di-Casinca	2.48	Collected to Castellare-di-Casinca									

Pérols (Mauguio Plage Carnon Pérols)	8.57	—	Yes	33.3	Activated sludge	Secondaire	3,862	Canal			The plant is located in Mauguio
Piana	0.44	2	Yes	2.5	Activated sludge	Secondary	237	River			
Portiragnes	2.31	30	Yes	13	Non aerated lagoons	Secondary	500 (winter) 3,500 (summer)	Lagoon			Overloaded plant during tourist period Extension plan (20,000 PE, aerated lagoons)
Port-St-Louis-du-Rhône	8.21	3	No						1,012	River mouth	Plan for 2010 (16,000 PE, 3,898 m3/day, discharge in the same place)
Port-Vendres	4.58	6	Yes	cf. MAP Technical Reports Series no. 157							
				0.2	Non aerated lagoons	Primary	40	Brook			
Poussan	5.42	—	Yes	8	Non aerated lagoons	Secondary	1,450	River			The plant treats another city
Roquefort-la-Bédoule	5.02	—	Yes	6	Activated sludge	Tertiary	655	Ditch			
St Florent	1.60	5	Yes	9.5	Activated sludge	Tertiary	400 (winter) 1,200 (summer)	Canal ending in the sea			
Saint Hippolyte	2.30	—	Yes	2.7	Activated sludge + Non aerated lagoons	Tertiary	550	River ending in a lagoon			
Saint-Jean-Cap-Ferrat	2.10	6	No						420 *	SO	Plan under way
Saint Laurent-de-la-Salanque	8.22	2	Yes	8.3	Activated sludge	Primary	2,180	River			
Saint-Mandrier-sur-Mer	6.66	Collected to Toulon Cap-Sicié (cf. MAP Technical Reports Series no. 157)									
Saint Nazaire	2.32	Collected to Canet-en-Roussillon (cf. MAP Technical Reports Series no. 157)									
Sainte Marie-la-Mer	3.84	21	Yes	18	Activated sludge	Tertiary	3,000	River			
Saleilles	4.32	—	Yes	6.5	Activated sludge	Tertiary	1,300	River			
San-Martino-di-Lota	2.58	Collected to Bastia Nord (cf. MAP Technical Reports Series no. 157)									
Sari-Solenzara	1.17	3	Yes	5	Activated sludge	Secondary	330	SO			
Sartène (Tizzano)	3.10		Yes	2.3	Activated sludge			DI			
Sérignan	6.52	20	Yes	54	Activated sludge	Secondary	8,100	River			The plant treats another city
Serra-di-Ferro	0.42	4	Yes	6.5	Activated sludge	Tertiary	372	River			3 new raising stations before summer 2007 will increase the discharge

Sigean	5.00	2	Yes	6	Activated sludge	Secondary	900	Canal			Plant under construction (10,000 PE)
Théoule-sur-Mer (dont Miramar)	1.30	12	Yes	4	Activated sludge	Secondary	272	SO			Extension plan (5,500 PE) Most of the wastewaters are collected to Mandelieu plant (cf. MAP Technical Reports Series no. 157)
Torreilles	2.96	9	Yes	10.7	Activated sludge + Non aerated lagoons	Tertiary	2,400	River			
Ventiseri	2.46	—	Yes	7.5	Activated sludge	Secondary	324	SO			Oversized plant
Vescovato	2.31	Collected to Castellare-di-Casinca									
Vias	5.31	Collected to Agde (cf. MAP Technical Reports Series no. 157)									
Vic-la-Gardiole	2.88	8	Yes	6	Aerated lagoons	Secondary	1,030	River			Plan to improve aeration
Ville-di-Pietrabugno	3.06	Collected to Bastia Nord (cf. MAP Technical Reports Series no. 157)									
Villelongue-de-la-Salanque	2.80	—	Yes	2.3	Activated sludge	Tertiary	540	River			
Villeneuve-lès-Maguelone	8.16	3	Yes	12	Activated sludge	Tertiary	1,285	River			
**** Outflow estimation***											

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: GREECE

City	Permanent Population (in 000)	Population equivalent (in 000)	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater	Remarks
Adamantas*	1.39	3.30	N	-	-	0	-	824	Septic Tanks	
Agia Marina* (Aigina)	0.43	2.93	N	-	-	0	-	731	Septic Tanks	
Agia Marina (Kropias)	2.67	2.67	N	-	-	0	-	667	Septic Tanks	
Agia Marina (Leros)	2.67	2.67	UC	-	-	0	-	668	Septic Tanks	
Agia Paraskevi	2.27	2.29	NOT OPERATIONAL	-	-	0	-	573	Septic Tanks	
Agioi Apostoloi	3.50	3.85	N	-	-	0	-	962	Septic Tanks	
Agioi Theodoroi	5.96	6.78	UC	-	-	0	-	1,693	Septic Tanks	
Agiokampos*	0.36	3.19	N	-	-	0	-	797	Septic Tanks	
Agios Athanasios	4.85	4.85	Y	Activated sludge	TERTIARY WITH N & P REMOVAL	1,211	SO	-	-	Served by the WWTP of Thessaloniki
Agios Kirikos*	1.88	3.41	N	-	-	0	-	853	Septic Tanks	
Agios Konstantinos	2.57	2.83	N	-	-	0	-	707	Septic Tanks	
Agios Nicolaos (Chalkida)	2.64	2.64	N	-	-	0	-	661	Septic Tanks	Projection to be served by the WWTP of Chalkida
Agios Vasileios	2.05	2.05	N	-	-	0	-	511	Septic Tanks	

Agria	5.23	5.29	N	-	-	0	-	1,322	Septic Tanks	
Aianteio	3.65	3.65	N	-	-	0	-	913	Septic Tanks	Projection to be served by the WWTP of Psyttalia
Aigina	7.41	7.81	N	-	-	0	-	1,952	Septic Tanks	
Aitoliko	4.31	4.31	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,077	DI through stream	-	-	
Aliveri	5.62	5.62	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,405	DI through stream	-	-	
Amarynthos	4.14	9.38	N	-	-	0	-	2,343	Septic Tanks	
Amfilochia	4.12	4.50	Y	Activated sludge	TERTIARY WITH N & P REMOVAL	1,125	DI through stream	-	-	
Ampelakia	4.54	4.54	N	-	-	0	-	1,135	Septic Tanks	Projection to be served by the WWTP of Psyttalia
Anavyssos	7.19	7.76	N	-	-	0	-	1,940	Septic Tanks	
Andravida-Lechaina-Tragano	9.31	9.31	NOT OPERATIONAL	-	TERTIARY WITH N & P REMOVAL	0	DI through stream	2,327	Septic Tanks	
Andros*	1.51	2.80	N	-	-	0	-	700	Septic Tanks	
Anthousa	3.02	3.02	N	-	-	0	-	756	Septic Tanks	
Antikyra	2.81	2.81	N	-	-	0	-	702	Septic Tanks	

Antimacheia	2.21	2.21	N	-	-	0	-	552	Septic Tanks	Projection to be served by the WWTP of Kardamaina
Arkitsa*	1.14	3.45	N	-	-	0	-	862	Septic Tanks	
Assos	2.55	2.55	N	-	-	0	-	637	Septic Tanks	
Astakos	2.54	4.32	N	-	-	0	-	1,080	Septic Tanks	
Astros	3.23	8.87	UC	-	-	0	-	2,217	Septic Tanks	
Benitsa	0.79	3.03	Y	Activated sludge	TERTIARY WITH N REMOVAL	757	DI through stream	-	-	
Chalkoutsi	2.08	2.08	N	-	-	0	-	520	Septic Tanks	
Chora	3.46	3.46	UC	-	-	0	-	864	Septic Tanks	
Daratsou	3.21	3.21	Y	Activated sludge	TERTIARY WITH N REMOVAL	802	DI through stream	-	-	Served by the WWTP of Nea Kydonia
Demenika	2.39	2.39	Y	Activated sludge	TERTIARY WITH N REMOVAL	596	SO	-	-	Served by the WWTP of Patra
Diakopto	2.29	2.46	N	-	-	0	-	613	Septic Tanks	
Dilesi	3.18	3.18	N	-	-	0	-	794	Septic Tanks	
Diminio	2.13	2.13	Y	Activated sludge	TERTIARY WITH N REMOVAL	531	SO	-	-	Served by the WWTP of Volos
Drosia (Evoia)	4.01	4.01	N	-	-	0	-	1,001	Septic Tanks	
Efxinoupoli	2.55	2.55	Y	Activated sludge	TERTIARY WITH N REMOVAL	638	DI through stream	-	-	Served by the WWTP of Almyros

Elounta	1.66	2.16	Y	Activated sludge	TERTIARY WITH N REMOVAL	540	Soil	-	-	
Emporeio (Kyklades)	1.77	2.19	Y	Activated sludge	TERTIARY WITH N REMOVAL	547	DI through stream	-	-	
Epanomis	7.33	7.33	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,833	SO	-	-	Served by the WWTP of Touristic Areas of Thessaloniki
Eretria	3.16	3.66	N	-	-	0	-	914	Septic Tanks	
Filiatra	6.72	6.78	NOT OPERATIONAL	-	-	0	-	1,696	Septic Tanks	
Galaxidi	1.72	3.33	Y	Activated sludge	TERTIARY WITH N REMOVAL	833	-	-	-	
Gazi	8.02	8.02	N	-	-	0	-	2,004	Septic Tanks	
Gefyras	3.26	3.26	N	-	-	0	-	814	Septic Tanks	Projection to be served by the WWTP of Thessaloniki
Gefyras (Lakonia)*	1.23	2.87	UC	-	-	0	-	718	Septic Tanks	
Gournes*	1.23	2.07	N	-	-	0	-	517	Septic Tanks	
Gytheion	4.49	7.31	UC	-	-	0	-	1,827	Septic Tanks	
Ierissou	3.12	4.35	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,087	-	-	-	
Ios	1.63	5.39	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,346	DI through stream	-	-	
Istiaia	4.13	4.13	UC	-	-	0	-	1,032	Septic Tanks	

Itea	4.67	5.70	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,424	DI through stream	-	-	
Ithaki*	1.83	3.82	N	-	-	0	-	954	Septic Tanks	
Kalamos*	1.97	2.00	N	-	-	0	-	500	Septic Tanks	
Kallithea (Pierias)	2.74	2.74	Y	Activated sludge	TERTIARY WITH N REMOVAL	685	SO	-	-	Served by the WWTP of South Pieria
Kalythia (Faliraki)	5.86	5.86	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,465	SO	-	-	Served by the WWTP of Rhodes
Kalyves (Chalkidiki)*	1.14	6.64	N	-	-	0	-	1,658	Septic Tanks	
Kalyves (Chania)*	1.29	3.37	UC	-	-	0	-	841	Septic Tanks	
Kanali	3.56	3.56	Y	Activated sludge	TERTIARY WITH N REMOVAL	889	SO	-	-	Served by the WWTP of Kerkyra
Kardamaina*	1.78	5.20	UC	-	-	0	-	1,300	Septic Tanks	
Karpathos	2.08	6.88	N	-	-	0	-	1,719	Septic Tanks	
Karystos	4.96	6.18	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,545	DI through stream	-	-	
Kato Gouves*	1.22	3.66	N	-	-	0	-	914	Septic Tanks	
Kefalos	2.46	2.46	N	-	-	0	-	614	Septic Tanks	
Kissamos	3.82	5.74	N	-	-	0	-	1,435	Septic Tanks	
Kitsi	3.20	3.20	N	-	-	0	-	801	Septic Tanks	Projection to be served by the WWTP of Psyttalia

Kokkari	0.97	3.74	Y	Activated sludge	TERTIARY WITH N REMOVAL	935	DI through stream	-	-	
Koskinou	3.22	4.00	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,000	SO	-	-	Served by the WWTP of Rhodes
Kounoupidianon	5.17	5.17	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,293	SO	-	-	Served by the WWTP of Chania
Kremasti-Paradeison	6.98	8.28	Y	Activated sludge	TERTIARY WITH N & P REMOVAL	2,068	DI through stream	-	-	
Kryopigi*	0.59	3.21	N	-	-	0	-	802	Septic Tanks	
Kymi	3.04	5.20	UC	-	-	0	-	1,299	Septic Tanks	
Kyparissia	4.89	9.25	UC	-	-	0	-	2,312	Septic Tanks	
Lakki*	1.99	3.05	N	-	-	0	-	762	Septic Tanks	
Lardou*	1.21	3.48	N	-	-	0	-	870	Septic Tanks	
Layrio	8.56	8.56	Y	Activated sludge	TERTIARY WITH N REMOVAL	2,140	DI through stream	-	-	
Lechaio	3.95	3.95	N	-	-	0	-	988	Septic Tanks	
Leonidio	3.22	4.95	N	-	-	0	-	1,238	Septic Tanks	
Leptokarya	4.23	4.23	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,056	SO	-	-	Served by the WWTP of South Pieria
Limenaria	2.44	5.38	N	-	-	0	-	1,345	Septic Tanks	
Limni	2.08	2.08	Y	Activated sludge	TERTIARY WITH N REMOVAL	520	DI through stream	-	-	

Livadi (Serifos)	0.96	2.90	Y	Activated sludge	TERTIARY WITH N REMOVAL	725	Soil	-	-	
Livanates	3.02	4.33	N	-	-	0	-	1,083	Septic Tanks	
Lixouri	3.61	7.00	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,750	DI through stream	-	-	
Loggos*	0.76	3.72	N	-	-	0	-	929	Septic Tanks	
Malesina	4.25	4.25	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,061	DI through stream	-	-	
Marathon	4.40	4.40	N	-	-	0	-	1,100	Septic Tanks	
Markopoulo (Oropou)	3.53	3.53	N	-	-	0	-	882	Septic Tanks	
Marmari*	0.46	4.66	N	-	-	0	-	1,164	Septic Tanks	
Marmari (Evoia)*	1.01	5.60	UC	-	-	0	-	1,400	Septic Tanks	
Matala*	0.10	2.10	UC	-	-	0	-	525	Septic Tanks	
Messini	6.69	6.69	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,673	SO	-	-	Served by the WWTP of Kalamata
Methana*	1.15	3.10	UC	-	-	0	-	775	Septic Tanks	
Methoni*	1.17	2.85	UC	-	-	0	-	712	Septic Tanks	
Mithimna*	1.50	4.96	UC	-	-	0	-	1,239	Septic Tanks	
Moraitika	0.59	3.03	Y	Activated sludge	TERTIARY WITH N REMOVAL	757	DI through stream	-	-	
Mournion	6.48	6.48	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,620	SO	-	-	Served by the WWTP of Chania
Myrina	5.11	5.11	UC	-	-	0	-	1,276	Septic Tanks	

Nea Agchialos	5.51	5.76	N	-	-	0	-	1,439	Septic Tanks	
Nea Artaki	8.65	9.03	Y	Activated sludge	TERTIARY WITH N REMOVAL	2,258	DI through stream	-	-	
Nea Karvali	2.30	2.30	Y	Activated sludge	TERTIARY WITH N REMOVAL	575	SO	-	-	Served by the WWTP of Kavala
Nea Palatia	2.42	2.42	N	-	-	0	-	605	Septic Tanks	
Nea Peramos	7.48	7.48	UC	-	-	0	-	1,870	Septic Tanks	
Nea Styra*	0.99	3.39	N	-	-	0	-	848	Septic Tanks	
Neapoli Voion	2.73	5.52	N	-	-	0	-	1,380	Septic Tanks	
Neo Karlovasi	5.74	7.71	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,926	DI through stream	-	-	
Neochori	2.21	2.21	N	-	-	0	-	551	Septic Tanks	
Neoi Epivates	4.07	4.07	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,017	SO	-	-	Served by the WWTP of Touristic Areas of Thessaloniki
Neos Marmaras	2.85	7.63	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,907	DI through stream	-	-	
Nerokourou	4.11	4.11	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,026	SO	-	-	Served by the WWTP of Chania
Nydri*	0.87	2.23	UC	-	-	0	-	556	Septic Tanks	
Oia	0.76	2.76	Y	Activated sludge	TERTIARY WITH N REMOVAL	690	DI through stream	-	-	
Ouranoupoli	0.96	2.24	Y	Activated sludge	TERTIARY WITH N REMOVAL	559	DI through stream	-	-	

Ovria	5.24	5.24	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,310	SO	-	-	Served by the WWTP of Patras
Palaia Fokaia	2.44	8.87	N	-	-	0	-	2,218	Septic Tanks	
Palaio Tsifliki	1.85	5.50	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,375	DI through stream	-	-	
Palairos	2.47	3.60	UC	-	-	0	-	901	Septic Tanks	
Paliochora	2.21	3.80	N	-	-	0	-	950	Septic Tanks	
Paralia	6.01	6.01	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,503	SO	-	-	Served by the WWTP of Patras
Paralia Avlidos	2.58	2.58	N	-	-	0	-	644	Septic Tanks	
Paralia Vergas	2.11	2.11	Y	Activated sludge	TERTIARY WITH N REMOVAL	527	SO	-	-	Served by the WWTP of Kalamata
Patitiri*	1.70	2.44	N	-	-	0	-	610	Septic Tanks	
Perivoli Kydonias	3.06	3.06	Y	Activated sludge	TERTIARY WITH N REMOVAL	763	DI through stream	-	-	Served by the WWTP of Nea Kydonia
Petra*	1.25	3.75	UC	-	-	0	-	937	Septic Tanks	
Plagari	3.77	3.77	N	-	-	0	-	942	Septic Tanks	Projection to be served by the WWTP of Touristic Areas of Thessaloniki
Plaka Dilesi	2.97	2.97	N	-	-	0	-	743	Septic Tanks	
Platamonas	2.20	2.20	Y	Activated sludge	TERTIARY WITH N REMOVAL	549	DI through stream	-	-	Served by the WWTP of South Pieria

Plomari	3.38	3.38	Y	Activated sludge	TERTIARY WITH N REMOVAL	845	DI through stream	-	-	
Portocheli	1.91	1.91	Y	Activated sludge	TERTIARY WITH N REMOVAL	478	DI through stream	-	-	Served by the WWTP of Kranidi
Potos*	0.69	2.05	N	-	-	0	-	513	Septic Tanks	
Prinos*	1.19	2.86	N	-	-	0	-	715	Septic Tanks	
Psachna	5.77	5.77	N	-	-	0	-	1,442	Septic Tanks	
Pylio (Dodekanisa)	2.43	2.43	N	-	-	0	-	607	Septic Tanks	
Pylos	2.10	5.32	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,330	DI through stream	-	-	
Pythagoreio*	1.33	5.89	NOT OPERATIONAL	-	-	0	-	1,473	Septic Tanks	
Rio	5.23	5.50	N	-	-	0	-	1,375	Septic Tanks	
Roditsis	2.63	2.63	Y	Activated sludge	TERTIARY WITH N REMOVAL	658	DI through stream	-	-	Served by the WWTP of Lamia
Rododafni	2.51	2.51	N	-	-	0	-	628	Septic Tanks	
Sami*	1.22	2.08	UC	-	-	0	-	518	Septic Tanks	
Sarti	1.16	2.61	Y	Activated sludge	TERTIARY WITH N REMOVAL	653	DI through stream	-	-	
Selinia	2.35	2.35	N	-	-	0	-	586	Septic Tanks	Projection to be served by the WWTP of Psyttalia
Seliniatika*	1.15	2.94	N	-	-	0	-	735	Septic Tanks	
Silivaniotika*	1.33	6.15	N	-	-	0	-	1,538	Septic Tanks	
Skala Kefallonias*	0.53	3.53	UC	-	-	0	-	882	Septic Tanks	

Skala Patmou*	1.73	3.23	NOT OPERATIONAL	-	-	0	-	807	Septic Tanks	
Skopelos	2.80	7.11	UC	-	-	0	-	1,776	Septic Tanks	
Skyros*	1.75	2.71	NOT OPERATIONAL	-	-	0	-	678	Septic Tanks	
Souda	6.43	6.43	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,606	SO	-	-	Served by the WWTP of Chania
Sourpi	2.01	2.01	N	-	-	0	-	502	Septic Tanks	
Spestes	3.85	7.43	N	-	-	0	-	1,856	Septic Tanks	
Stavros	4.96	7.35	N	-	-	0	-	1,837	Septic Tanks	
Stylida	5.10	5.10	NOT OPERATIONAL	-	-	0	-	1,275	Septic Tanks	
Symi	2.43	4.17	N	-	-	0	-	1,042	Septic Tanks	
Syvota*	0.91	5.27	N	-	-	0	-	1,318	Septic Tanks	
Thasos	2.13	6.66	UC	-	-	0	-	1,664	Septic Tanks	
Thira	2.11	6.67	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,667	DI through stream	-	-	
Tigaki*	0.23	4.53	N	-	-	0	-	1,132	Septic Tanks	
Tinos	4.39	6.74	N	-	-	0	-	1,685	Septic Tanks	
Trilofo	3.52	3.52	N	-	-	0	-	880	Septic Tanks	Projection to be served by the WWTP of Touristic Areas of Thessaloniki
Tympaki	5.01	5.01	UC	-	-	0	-	1,252	Septic Tanks	
Varda	3.10	3.10	UC	-	-	0	-	775	Septic Tanks	

Vari Kykladon*	1.19	2.28	N	-	-	0	-	569	Septic Tanks	
Vasiliki Lefkados*	0.43	2.09	UC	-	-	0	-	523	Septic Tanks	
Vasiliko	6.50	6.50	N	-	-	0	-	1,626	Septic Tanks	Projection to be served by the WWTP of Chalkida
Vathy (Evoia)	2.56	2.56	N	-	-	0	-	641	Septic Tanks	
Velestino	3.27	3.27	N	-	-	0	-	817	Septic Tanks	Projection to be served by the WWTP of Volos
Velon	3.04	3.04	N	-	-	0	-	760	Septic Tanks	Projection to be served by the WWTP of Kiato
Vonitsa	3.84	4.17	NOT OPERATIONAL	-	-	0	-	1,042	Septic Tanks	
Vrachaiika	2.63	2.63	N	-	-	0	-	656	Septic Tanks	Projection to be served by the WWTP of Patra
Vrachati	2.95	3.05	N	-	-	0	-	761	Septic Tanks	
Vrasnon	2.43	6.45	N	-	-	0	-	1,613	Septic Tanks	
Vrontadon	4.61	4.61	Y	Activated sludge	TERTIARY WITH N REMOVAL	1,151	SO	-	-	Served by the WWTP of Chania
Ydra	2.53	6.60	N	-	-	0	-	1,649	Septic Tanks	
Zipario	2.36	2.36	N	-	-	0	-	590	Septic Tanks	
Remarks:	* These coastal cities, although with permanent population less than 2000 (column 2) are included in the list due to the increased seasonal population (column 3), which in all cases exceeds the value of 2000.									

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: ISRAEL

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Even Yehuda	9370	Yes	Activated sludge	Secondary	1874	RB		
Shelomi	5446	Yes	Activated sludge	Secondary	1089	RB+SO*		
Atlit	4500	Yes	Activated sludge	Secondary	900	RB		
Qesarya	4281	Yes	Activated sludge	Secondary	856	RB		
Mazraa	3378	Yes	Activated sludge	Secondary	676	RB		
Elyakhin	2623	Yes	Aerated **lagoon		524	RB		
Fureidis	7549	Yes	Aerated lagoon Activated sludge In construction	Secondary	1510	RB		
Gaser a Zarka	7835	Partly***	Activated sludge	Secondary	783	RB	783	Septing

Remarks: the calculation is based on 5 Km dist from coastline. *-only in winter time. **-planed AS secondary WWTP. *** - about 50% of the houses are connected to WWTP of Hadera, the rest use septing systems

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: ITALY

City	Permanent Population (in 000)	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Acciaroli (Pollica)	2.545	Yes	Primary		356			
Aci Trezza** (Aci Castello)								
Acireale*	52.49	No						
Alba Adriatica*	11.341	No						
Albinia** (Orbetello)								
Albissola Marina	5.68	Yes	Primary		795			
Alì Terme	2.585	No						
Altavilla Milicia	6.012	Yes	Primary		841			
Amalfi	5.457	No						
Ansedonia** (Orbetello)								
Aquileia	3.472	No						
Arenzano*	11.544	Yes	Primary		1616			
Arzachena (includes: Baja Sardinia, Porto Cervo)	11.919	Yes	Primary		1668			
Assemini*	25.776	Yes	Pre-treatment		3608			
Bacoli*	27.357	Under construction						
Belvedere Marittimo	9.321	Yes	Secondary		1304			
Bianco	4.292	Yes	Primary		600			
Bibione*** (San Michele al Tagliamento)	11.771	Yes	Primary		1647	Reuse		
Bosa	7.96	Yes	Primary		1114			
Bova Marina	3.851	Yes	Secondary		539			
Bovalino Marina (Bovalino)	8.404	Yes	Secondary		1176			
Brancaleone Marina (Brancaleone)	3.825	No						
Brolo	5.589	No						

Buonfornello** (Termini Imerese)								
Cabras (includes: S. Giovanni di Sinis)	8.917	No						
Cagnano Varano	8.525	No						
Cala Gonone (Dorgali)	8.322	Yes	Primary		1165			
Camogli	5.695	Yes	Primary		797			
Campomarino	6.709	Yes	Primary		939			
Campora S. Giovanni** (Amantea)								
Capaci*	10.243	Yes	Primary		1434			
Capalbio	4.078	Yes	Primary		570			
Capo S.ta Maria di Leuca (Castrignano del Capo)	5.423	Yes	Primary		759			
Capri	7.247	No						
Casamicciola Terme	8.088	Yes	Primary		1132			
Castel Volturno*	21.926	Yes	Primary		3069			
Casteldaccia*	10.083	Yes			1411			
Castellabate	7.904	Yes	Primary		1106			
Castellamare del Golfo*	14.832	No			2076			
Castelsardo	5.63	Yes	Primary		788			
Castiglioncello** (Rosignano Marittimo)								
Castiglione della Pescaia (includes:Punta Ala)	7.438	Yes	Primary		1041			
Castroreale Terme (Terme Vigliatore)	6.753	Yes	Primary		945			
Catanzaro Lido*** (Catanzaro)	94.612	Yes	Primary		13245			
Cefalù*	13.716	Yes	Primary		1920			
		Under construction	Secondary					
Celle Ligure	5.444	Yes	Primary		762			
Cetraro*	10.198	Yes	Primary		1427			
Cinisi*	10.933	Yes	Pre-treatment		1530			
Codevigo	5.987	Yes	Primary		838			

Comacchio* (includes: Lido delle Nazioni, Lido degli Estensi, Lido di Spina, Porto Garibaldi)	22.517	Yes			3152			
Contarina*** (Porto Viro)	14.483	Yes	Primary		2027			
Corno	3.323	No						
Cupra Marittima	5.166	Yes	Primary		723			
Diamante	5.359	Yes	Secondary		750			
Duino-Aurisina (includes:Sistiana)	8.755	Yes	Primary		1225			
			Primary					
Elmas	8.639	Yes	Pre-treatment		1209			
Eraclea Mare (Eraclea)*	12.679	Yes	Primary		1775			
Ercolano*	55.261	No			7736			
Erice*	28.887	Yes	Primary		4044			
Falcone	2.946	Yes	Primary		412			
Fermo*	37.09	Yes			5192			
Fertilia** (Alghero)								
Fiumicino* (includes: Fregene, Palidoro)	59.373	Yes	Secondary		8312			
Foce Verde*** (Latina)	112.943				15812			
Forio*	16.024	Under construction			2243			
Fossacesia	5.799	Yes	Primary		811			
Fuscaldo	8.242	Yes	Secondary		1153			
Gabicce Mare	5.696	Yes	Primary		797			
Gagliano del Capo	5.484	Yes	Primary		767			
Gela*	77.245	Yes	Primary		10814			
Giardini-Naxos	9.378	Yes	Primary		1312			
Giarre*	26.932	Yes	?		3770			
Golfo Aranci	2.22	Yes	Primary		310			
Goro	4.035	Yes	Primary		564			
Isola di S. Pietro (Carloforte)	6.466	Yes	Primary		905			

Ischia*	18.373	Under construction	Secondary		2572	Reuse planned		
La Caletta*** (Siniscola)	11.254	No			1575			
Laigueglia	2.059	No						
Lavinio Lido di Enea** (Anzio)								
Lesina	6.278	Yes	Primary		878			
Levanto	5.638	Yes	Primary		789			
Licata*	39.091	Under construction	Tertiary		5472	Reuse planned		
Lido di Camaiore*** (Camaiore)	30.85	Yes	Primary		4319			
Lido di Classe** (Ravenna)								
Lido di Metaponto*** (Bernalda)	12.162	Yes	Primary		1702			
Lido di Ostia*** (Roma)	2,547.677	Yes	Secondary		356674			
Lido di Savio** (Ravenna)								
Lido Silvana*** (Pulsano)	10.541	Yes	Primary		1475			
Lignano Sabbiadoro	6.789	Yes	Primary		950			
Lipari* (includes: Stromboli)	10.809	Yes	Primary		1513			
Loano*	11.419	Yes	Primary		1598			
Locri*	12.958	No						
Loreto*	11.785	Yes			1649			
Maiori	5.723	No						
Marano Lagunare	2.007	Yes	Secondary		280			
Maratea	5.25	Yes	Primary		735			
Marina di Camerota (Camerota)	7.198	No						
Marina di Carrara*** (Carrara)	65.125	Under construction			9117			
Marina di Castagneto-Donoratico (Castagneto Carducci)	8.537	Yes	Primary		1195			
Marina di Gioiosa Ionica	6.47	Yes	Secondary		905			
Marina di Grosseto*** (Grosseto)	76.33	Yes	Primary		10686			

Marina di Massa*** (Massa)	69.399	Under construction			9715			
Marina di Pisa*** (Pisa)	87.737	Yes	Secondary		12283	Reuse planned		
Marina di Ragusa*** (Ragusa)	71.969	Yes	Secondary		10075	Reuse planned		
Marina di Torre Grande*** (Oristano)	32.936	No			4611			
Marinella*** (Castelvetrano)	30.351	Yes	Primary		4249			
Marsala* (includes: Birgi)	81.884	No			11463			
Mattinata	6.461	Yes	Primary		904			
Mazara del Vallo*	51.425	Yes	Primary		7199			
Melito di Porto Salvo*	11.245	No						
Menfi*	12.914	Yes	Primary		1807			
Mestre** (Venezia)								
Monasterace Marina (Monasterace)	3.52	Yes	Secondary		492			
Mondello** (Palermo)								
Mondolfo* (includes: Marotta)	11.644	Yes	Primary		1630			
Mondragone*	26.626	Yes	Primary		3727			
Monfalcone*	27.623	No			3867			
Montalto di Castro	8.162	Yes	Primary		1142			
Monte S. Angelo*	13.6	No						
Montesilvano Marina* (Montesilvano)	44.687	Yes			6256			
Muggia*	13.236	Yes	Primary		1853			
Murano** (Venezia)								
Muzzana del Turgnano	2.72	Yes	Secondary		380			
Nervi** (Genova)								
Nicotera	6.58	Yes	Secondary		921			
Noli	2.965	Yes	Primary		415			
Nova Siri	6.587	Yes	Primary		922			
Numara	3.623	Yes	Primary		507			
Oneglia** (Imperia)								
Opicina ** (Trieste)								

Orosei	6.24	Yes	Primary		873			
Ospedaletti	3.605	Under construction			504			
Paestum*** (Capaccio)	21.206	Yes	Primary		2968			
Palau	3.909	Yes	Primary		547			
Palinuro (Centola)	4.875	Under construction						
Palma di Montechiaro*	23.927	No			3349			
Palmadula*** (Sassari)	127.893	No			17905			
Palmi*	19.461	No						
Paola*	17.087	Yes	Primary		2392			
Pedaso	2.154	Yes	Primary		301			
Pegli** (Genova)								
Peschici (includes: Manacore)	4.31	No						
Pietra Ligure	9.077	Yes	Primary		1270			
Pisciotta	2.946	Yes	Primary		412			
Pizzo	8.976	Yes	Pre-treatment		1256			
Platamona Lido*** (Sassari)	14.46	No			2024			
Poggio Imperiale	2.831	No						
Policastro (Petilia Policastro)	9.472	No						
Pomposa*** (Codigoro)	12.883	Yes			1803			
Pontecagnano Faiano*	24.206	No			3388			
Port'Ercole*** (Monte Argentario)	12.914	Yes	Primary		1807			
Porto Azzurro	3.437	Yes	Primary		481			
Porto Cesareo	5.12	No						
Porto Pino (Sant'Anna Arresi)	2.613	Yes	Primary		365			
Porto Recanati*	11.437	Yes			1601			
Porto Rotondo** (Olbia)								
Porto Sant' Elpidio*	24.114	Yes	Secondary ?		3375			
Porto Santo Stefano*** (Monte Argentario)	12.914	Yes	Primary		1807			

Porto Tolle* (includes: Scardovari)	10.364	Yes	Primary		1450			
Porto Torres*	21.953	Yes	Secondary		3073			
Portoscuso	5.33	Yes	Primary		746			
Portovenere	4.045	Yes	Primary		566			
Posada	2.611	Yes	Primary		365			
Positano	3.938	Yes	Primary		551			
Potenza Picena*	15.295	Yes			2141			
Praia a Mare	6.669	Yes	Tertiary		933			
Procida*	10.652	Under construction			1491			
Pula (includes: S.ta Margherita)	7.046	No	Primary					
Quartu Sant' Elena*	70.276	No			9838			
Quarto d'Antino	7.613	Yes	Primary		1065			
Recco*	10.358	Under construction			1450			
Rio Marina (includes: Cavo)	2.164	Yes	Primary		302			
Riola Sardo	2.133	Yes	Primary		298			
Roccalumera	4.135	Yes	Primary		578			
Roccella Ionica	6.706	Yes	Secondary		938			
Rodi Garganico	3.695	No						
Ronchi dei Legionari*	11.682	Yes			1635			
Roseto degli Abruzzi*	23.831	Yes ?			3336			
Rosolina (includes: I. Albarella)	6.359	Yes	Primary		890			
S. Cataldo*** (Lecce)	92.688	Yes	Primary		12976			
S. Felice Circeo	8.26	Yes	Primary		1156			
S. Giovanni a Piro	3.82	Yes	Primary		534			
S. Giovanni Suergiu	6.088	Under construction			852			
S. Lucido	5.905	Yes	Secondary		826			
S. Stefano di Camastra	4.51	Yes	Primary		631			
S. Vincenzo	6.914	Yes	Primary		967			

S. Vito Chietino	5.047	Yes	Primary		706			
S. Vito lo Capo (includes: Torre dell'Impiso)	4.053	Yes	Primary		567			
S.ta Caterina Pittinuri (Cuglieri)	3.002	Yes	Primary		420			
S.ta Cesarea Terme	3.076	Yes	Primary		430			
S.ta Eufemia Lamezia*** (Lamezia Terme)	70.365	Yes	Primary		9851			
S.ta Severa** (Santa Marinella)								
S.ta Teresa di Gallura	4.681	Yes	Primary		655			
S.ta Teresa di Riva	9.057	Yes	Primary		1267			
Sant'Agata di Militello*	13.037	No			1825			
Sapri	7.022	Yes	Primary		983			
Sarroch	5.257	No			735			
Scalea*	10.143	Yes	Primary		1420			
Scilla	5.108	Yes	Secondary		715			
Selinunte*** (Castelvetrano)	30.351	Yes	Primary		4249			
Sferracavallo** (Palermo)								
Silvi Marina*	15.264	Yes	Pre-treatment ?		2136			
Sirolo	3.471	Yes	Primary		485			
Solvay** (Rosignano Marittimo)								
Sorso*	14.46	Yes	Primary		2024			
Sottomarina** (Chioggia)								
Sperlonga	3.257	Yes	Primary		455			
Spotorno	4.171	Yes	Primary		583			
Strongoli	6.172	Yes	Primary		864			
Taggia (includes:Arma di Taggia)	13.205	Yes	Primary		1848			
Taglio di Po	8.431	No						
Taormina (includes: Mazzarò)	10.967	Yes	Primary		1535			
Terme Luigiane (Acquappesa)	2.037	Yes	Secondary		285			

Tindari** (Patti)								
Tirrenia*** (Pisa)	87.737	Yes	Primary		12283	Reuse		
Torcello** (Venezia)								
Torchiarolo	5.069	Yes	Primary		709			
Torre Annunziata*	47.959	No			6714			
Torre Canne*** (Fasano)	38.536	Yes	Primary		5395			
Torre del Greco*	88.372	Yes	Primary		12372			
Torre Faro** (Messina)								
Torre Mileto*** (Sannicandro Garganico)	16.727	Yes	Primary		2341			
Tortolì* (includes: Arbatax)	10.253	Yes	Primary		1435			
Trabia	9.023	No						
Tramariglio** (Alghero)								
Trebisacce	9.159	Yes	Secondary		1282			
Tremestieri Etneo*	21.321	No			2984			
Tricase*	17.909	Yes	Primary		2507			
Trinitapoli*	14.396	Yes	Primary		2015			
Tropea	6.902	Yes	Secondary		966			
Vado Ligure	8.282	Yes			1159			
Varazze*	13.84	Yes	Secondary		1937			
Vico del Gargano	7.952	No						
Vico Equense*	20.523	Under construction	Secondary		2873	Reuse planned		
Villafranca Tirrena	8.919	Yes	Primary		1248			
Villasimius	3.204	Yes	Primary		448			
Viserba** (Rimini)								
Voltri** (Genova)								
Zapponeta	3.145	Yes	Primary		440			

Remarks: ** Even if their population is higher than 10.000, these towns are listed here because they were not included in the previous report.*

*** As these towns belong to Municipalities (indicated in parenthesis) already included in the previous report, their actual pollution load was considered, therefore no population is indicated.*

**** These towns belong to Municipalities (indicated in parenthesis) whose population is higher than 10.000. They are listed here because the Municipalities they belong to were not included in the previous report.*

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: LEBANON

Location	Capacity/ Inhabitants	Wastewater Treatment Plant	Sewer lines	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Aabdeh	80,000-90,000	Study accomplished, Starting date: 2008	Study accomplished		Secondary				
Tripoli	1,000,000	Under execution,due date: 2007	Under execution		Secondary				
Chekka	30,000	Accomplished	Execution under preparation		Secondary				
Batroun	80,000	Execution under preparation	Execution under preparation		Secondary				
Jbeil	80,000	Execution under preparation	Execution under preparation						
Kesrouane	500,000	Study accomplished, lack of funds	Study accomplished, lack of funds		Secondary				
Jounieh	600,000	Study accomplished, lack of funds	Study accomplished, lack of funds		Secondary				
Dora	1,200,000	Execution under preparation	Execution under preparation		Primary, to be secondary by 2010				
Ghadir	1,000,000	operational	Outlet at 2.5 km		Preliminary				
Jieh	100,000	Accomplished	Outlet at 700 m		Secondary				
Saida	400,000	Accomplished	Outlet at 700 m		Secondary				
Zahrani	300,000	Study under preparation	Execution under preparation		Secondary				
Sour	300,000	Execution under preparation	Execution under preparation		Secondary				

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: LIBYA

Cities	Permanent Population	Wastewater Treatment plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treatment m^3/day	Discharge of Treated Wastewater	Wastewater Untreated m^3/day	Discharge of Untreated Wastewater
* Badiy	27386	yes	Biol. treatment	primary	4,107	SO		SO
Bukamash	x	no						
* Al Garabuli	5773	yes	Biol. treatment	primary	865	SO		SO
Bu al Hun	x	no						
Ras Awage	*x*	no						
Ben Jawad	*x*	no						
Ras Lanuf	*x*	no						
* Bishr	773	no						
* Hania	2949	yes	No		244	SO		
Bamba	x	no						
* Al Gardabnah	2450	yes	No	primary	245	SO		SO
Ptolemais	x	no						
* Hamama	1795	no						
Apolonia	x	no						
*Ras al Hilal	1393	no						
* Al Tamimi	4364	yes	Biol. treatment	primary	436	SO		SO

Remarks: *The existing national tables include the available data and information on the population of the Libyan coastal cities, last Census of 2006.*

(a) the cities marked (*) fulfil the requirement and *(b)* the cities marked (X) were not included in the Census.

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: MALTA

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Attard	9539	SASTP	CAS	$Tertiary_1$	Marsa Land Catchment	RB	N/A	N/A
Paola	9240	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Zurrieq	9196	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Tarxien	7795	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Birzebugia	7782	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Siggiewi	7734	SASTP	CAS	Tertiary	Marsa Land Catchment	RB	N/A	N/A
Gzira	7477	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
San Pawl il-Bahar	7396	Cumnija STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Malta North Catchment Catchment	DI
Msida	6916	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Valletta	6748	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
San Giljan	6746	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Rabat	6602	SASTP	CAS	Tertiary	Marsa Land Catchment	RB	N/A	N/A
Santa Venera	6271	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Bormla	6096	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO

Mellieha	5952	Cumnija STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Malta North Catchment Catchment	DI
Swieqi	5904	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Marsascala	5611	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Marsa	5095	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Luga	4956	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Ghaxaq	4400	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Pieta	4110	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Nadur	3937	Gozo Catchment STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Gozo Catchment Catchment	SO
Santa Lucia	3774	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Xaghra	3681	Gozo Catchment STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Gozo Catchment	SO
Isla	3543	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Iklin	3387	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Xewkija	3320	Gozo Catchment STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Gozo Catchment	SO
Balzan	3210	SASTP	CAS	$Tertiary_1$	Marsa Land Catchment	RB	N/A	N/A
Marsaxlokk	3043	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Dingli	3038	SASTP	CAS	$Tertiary_1$	N/A	RB	N/A	N/A
Gudja	3037	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Kalkara	2996	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Birgu	2922	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Mqabba	2920	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO

Pembroke	2907	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Mgarr	2888	Cumnija STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Malta North Catchment	DI
Qrendi	2508	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Floriana	2498	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Lija	2469	SASTP	CAS	$Tertiary_1$	Marsa Land Catchment	RB	N/A	N/A
Ghajnsielem and Comino	2393	Gozo Catchment STP – Under Construction	EAAS	$Tertiary_1$	N/A	N/A	Gozo Catchment	SO
Kirkop	2156	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO
Ghargur	2028	Ta' Barkat STP – Tender Published	BAF	$Tertiary_2$	N/A	N/A	Malta South Catchment	SO

Remarks:

Acronyms

SASTP – Sant Antnin Sewage Treatment Plant
EAAS – Extended Aeration Activated Sludge Process
CAS – Conventional Activated Sludge Process
BAF – Biological Aerated Filter Process

General Comments on Wastewater Treatment Plants

Malta currently has a single urban wastewater treatment plant in operation, the Sant Antnin Plant STP (SASTP), a plant situated between Zejtun and Marsascala, which has been in operation since 1983. The plant was originally designed for a capacity of 12,000m3/day but until the early 90s was treating only 7,000m3/day, a figure which at that time equated to less than 10% of the sewage production total in Malta and Gozo Catchment. The plant underwent an extensive upgrade in 1998. The plant which is equipped with screening, grit/grease removal, primary sedimentation, a biological activated sludge stage and a tertiary stage (sand filtration and chlorination), currently treats an average of about 5,200 m3/day of sewage a day, meeting the irrigation water demand of circa 120 hectares of arable agricultural land, situated in the vicinity of the plant.

Malta has identified the need for setting up three new STPs to conform with the EU Urban Waste Water Directive 91/271/EC. The plants will be located, one at Ta' Mgarr ix-Xini in Gozo Catchment, one to the North Catchment of Malta at ic-Cumnija and the largest one in the South at Ta' Barkat. The South STP with a design capacity of 60,000m3/day of sewage, has been tendered out. The construction of the plants in Gozo Catchment and the North Catchment of Malta is underway and planned for completion during the third quarter 2007. The Gozo Catchment plant will have a design treatment capacity of 6,000m3/day whereas the Malta North Catchment plant has a design capacity of 6,700m3/day.

Degree of Wastewater Treatment

Tertiary$_1$ – Sand filtration followed by Chlorine disinfection
Tertiary$_2$ - Sand filtration followed by UV disinfection

General comments re Wastewater Treated/Untreated

The SASTP caters for the collection of agglomerations which is defined as the Marsa Land catchment. SASTP will be decommissioned once the South STP at Ta' Barkat will come on stream in 2009.

The following is the estimated sewage production by catchment. The specific flow data by city *is not* available. The catchments are defined as follows:

Catchments	Contributing Catchments by Local Council
Marsa Land	Dingli, Rabat, Mdina, Attard, B'Kara, Hamrun, Mosta, Naxxar, Ghargur, Lija, Balzan, Siggiewi, Zebbug, Qormi, Luqa, Iklin.
Malta North	Mellieha, San Pawl il-Bahar, Mgarr.
Gozo	Fontana, Ghajnsielem, Kercem, Munxar, Qala, Rabat (Gozo), Sannat, Xaghra, Xewkija, Gharb, San Lawrenz, Zebbug, Ghasri, Nadur.
Malta South excluding Marsa Land	San Giljan, Sliema, Msida, Marsa, Gzira, Kalkara, Birgu, Bormla, Isla, Zabbar, Fgura, Paola, M'Scala, M'Xlokk, B'Buga, Mqabba, Qrendi, Zurrieq, Safi, Kirkop, Gudja, Ghaxaq, Pembroke, San Gwann, Valletta, Floriana, Xghajra, Zejtun, Pieta', Santa Lucija, Santa Venera, Swieqi, Ta' Xbiex, Tarxien.

Estimated Current Sewage Production by Catchment:

Malta North Catchment - 5,900 m3/day
Gozo catchment - 4,800 m3/day
Malta South Catchment - 51,000 m3/day

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: MONTENEGRO

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day) *)	Discharge of Untreated Wastewater
HERCEG NOVI Municipality	30.034	No	-	-	-	-	5,800	SO
Herceg Novi City	12.739							SO
Igalo	3.754							SO
Bijela	3.748							SS
KOTOR Municipality	22.947	No	-	-	-	-	950	SO
Kotor City	1.331							SO
Risan	2.083							SS
Dobrota	8.169							SS
TIVAT Municipality	13.630	No	-	-	-	-	1,400	SS
Tivat City	9.467							SS
BUDVA Municipality	15.909	No	-	-	-	-	5,800	SO
Budva City	10.918							SO
BAR Municipality	40.037	No	-	-	-	-	8,750	SO
Bar City	13.719							SO
Burtaiši	3.013							SO
Šušanj	2.212							SO
Sutomore	1.827							SO

ULCINJ Municipality	20.290	No	-	-	-	-	4,300	SO
Ulcinj City	10.828							SO

*) Estimated annual average in 2003.y. (Households, Tourists and Industry)

Source: NDA for Montenegro (SAPMED)

Comment: The Suburban and rural settlements in the all municipalities were not connected to the urban sewage system, mostly.

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: MOROCCO

Province	City	Permanent Population	Equivalent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Al Hoceima	Al Hoceima	55357		1996 (operational)	Activated sludge	secondary	3000			
	Targuist	11600		2006 (operational)	Lagoons (A+F)	secondary	1200			
	Bni Bouayach Imzouren	42100		2006 (operational)	Lagoons (A+F)	secondary	5400			
	Aknoul	3325		1980 (out of service)	Sedimentation – Clarification	primary	400			
	Imzourn	25547	4000	1976 (out of service)	Activated sludge	secondary	400			
	Bni Bourfrah	10298								
	Bni Gmil	9461								
	Bni Gmil Maksouline	9922								
	Senada	9870								
	Izemmouren	4437								
	Louta	6325								
	Rouadi	8092								
Berkane	Berkane	80012		2006 (operational)	Lagoons (A+F)	secondary	11200			
	Tafoghalt	3150		2004 (operational)	Biological tower	secondary				
	Saidia	3338								
Chefchaouen	Chefchaoun	31410	20000	1981 (non connected)	Activated sludge	secondary				
	Jebha	2984								
	Steha	10637								
Nador	Nador	112450	100000	1978-91 (operational)	Activated sludge	secondary	10000			
	Ben Taib	10446		2008 (scheduled)	Lagoons (A+F)	secondary	800			
	El Aaroui	36021		2004 (operational)	Lagoons (A+F)	secondary	2360			
	Zaio (1)	25920		(out of service)	Sedimentation - Clarification	primary				
	Zaio (2)	29841		2007 (scheduled)	Lagoons (A+F+M)	secondary	3100			
	Ait Mait	7188								
	Amejjaou	5977								

Nador	Dar El Kebdani	2990								
	Driouch (1)	6884		(out of service)	Sedimentation - Clarification	primary				
	Driouch (2)	10381								
	Oulad Boubker	5765								
	Tazaghine	5032								
	Bni Chiker	4188								
	VBni Sidel Jbel	9623								
	Bni Sidel Louta	7331								
	Farkhana	10994								
	Iksane	9001								
	Afsou	3413								
	Bni Oukil Oulad M'Hand	10496								
	Oulad Daoud Zkhanine	3666								
	Ras El Ma	4532								
	Tiztoutine	4050								
	Azlaf	5337								
	Ben Taieb	10446								
	Boudinar	10504								
	Iferni	7527								
	M'Hajer	3232								
	Ouardana	6921								
	Oulad Amghar	6342								
	Tafrisset	3555								
	Talilit	6161								
	Kerouna	2188								
Oujda	Bni Drar	6663		1976 (out of service)	Lagoons					
Tanger	Dar Chaoui (1)	1403		(out of service+ not connected)	Sedimentation - Clarification					
	Dar Chaoui (2)	4495		2008 (scheduled)	Lagoons (A+F+M)		150			
	Tanger	657000							89300	
	Jouamaa	7173								
	Ksar El Majaz	8949								
	Al Bahraouine	10501								
	Ksar Sghir	10995								

Tanger	Malloussa	10739								
Tetouan	Oued Laou (M)	8383								
	Ain Lahsan	6552								
	Allyene	6126								
	Bni Harchen	7646								
	Tetouan	458800							54600	
	Bghaghza	6457								
	Oulad Ali Mansour	5612								
	Sahtryine	7402								
	Zaouiat Sidi Kacem	10495								

A : anaerobic ponds
F : facultative ponds
M : maturation ponds

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: SLOVENIA

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Luciia	6200	Connected to WWTP Piran	Aerated basin	Primary treatment	8300*	SO		
Piran	4040	Connected to WWTP Piran	Aerated basin	Primary treatment		SO		
Portoroz	2757	Connected to WWTP Piran	Aerated basin	Primary treatment		SO		
Jagodje	2147	Connected to WWTP Koper	Aerated basin	Primary treatment	9000**	Estuary of the river Rižana		
Ankaran	2901	Connected to WWTP Koper	Aerated basin	Primary treatment		Estuary of the river Rižana		

Remarks: WWTP Piran and WWTP Koper are under reconstruction for secondary phase of treatment

- **for WWTP Piran*
- *** for WWTP Koper*

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: SPAIN

City	Permanent Population (2006)	Population Equivalent	Population served	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
CATALONIA										
Cubelles i Cunit	11,835	26,706	19,634	Yes	Biological	Secondary	6,394	SO	None	-
Sant Andreu de Llavaneres	9,463	20,424		Yes	Biological	Tertiary (30%)	4,315	SO+RB	None	-
Montgat [1]	9,427		See Besós							
Alella [2]	9,013			See Teià - Maresme sud						
L' Escala	8,795	20,927	70,000	Yes	Biological	Secondary	6,439	SO	None	-
Arenys de Munt [3]	7,721			See Arenys de Mar						
Tiana [1]	7,305		See Besós							
Cabrils [4]	6,536		See Mataró							
L' Ametlla de Mar	6,744	4,750	6,438	Yes	Biological	Secondary	861	SO	None	-
Teia [2]	5,867			See Teià - Maresme sud						
Constanti [5]	5.813		See Tarragona							
Portbou	1,347	2,704	1,374	Yes	Biological	Tertiary (2%)	507	DI + RB	None	-
El Port de Selva	908	1,436	10,500	Yes	Biological	Tertiary (3%)	567	Riera + RB	None	-
Cadaques	2,922	6,224	2,623	Yes	Biological	Tertiary (3%)	1,142	SO+RB	None	-
Roses	17,173	65,591	100,000	Yes	Biological	Tertiary (4%)	10,782	SO+RB	None	-

Empurias (L'Escala)	Coastal area of l'Escala		See l'Escala							
L' Estartit [6]	Coastal area of Torroella de Mongrit (10,588)			See Torroella de Montgrí						
Begur	4,076	2,099	7,300	Yes	Biological	Secondary	594	SO	None	-
Tossa de Mar	5,414	10,487		Yes	Biological	Tertiary (15%)	25,247	DI+RB+ creek	None	-
Malgrat de Mar	17,531			See Pineda de Mar						
Canet de Mar [3]	12,766			See Arenys de Mar						
Premia de Mar [2]	27,860			See Teià - Maresme sud						
El Masnou [2]	21,833			See Teià - Maresme sud						
Castelldefels [8]	58,663			See Gavà-Viladecans						
Garraf (Sitges-Garraf)	Coastal area of Sitges	800 (Disseny)		Yes	Biological	Secondary	160	DI	None	-
Sitges	25,642	54,145		Yes	Biological	Secondary	10,216	SO	None	-
Calafell	20,521	35,776	18,905	Yes	Biological	Secondary	8,193	SS	None	-
Coma-ruga [9]	Coastal area of El Vendrell		See El Vendrell							
Torredembara	14,044	27,750	20,268	Yes	Biological	Secondary	7,239	SS	None	-
L' Hospitalet de l'Infant	5,134 (+ Vandellòs)	-	-	under construction	Pre treatment					
L' Ampolla	2,613	2,444	2,508	Yes	Biological	Secondary	940	SO	None	-
El Perello	2,504	1,738	2,355	Yes	aerated lagoons	Secondary	440	Coastal creek	None	-
1) Besos		2,105,893	2,010,613	Yes	Biological	Secondary	358,959	SO	None	-
Besos includes:	Badalona; Barcelona (part); Montcada i Reixac (part); Mongat (part); Sant Adrià del Besós (part); Santa Coloma de Gramanet (part); Tiana									

2) Teià - Maresme Sud		123,314	81,671	Yes	Biological	Secondary	16,297	SO	None	-
Teià - Maresme Sud includes:	Alella; Masnou; Premia de Dalt; Premia de Mar; Teia; Vilassar de Dalt									
3) Arenys de mar		21,091	40,000	Yes	Biological	Secondary	3,744	SO	None	-
Arenys de Mar includes:	Arenys de Mar; Arenys de Munt; Canet de Mar									
4) Mataró		110,655	165,000	Yes	Biological	Secondary	28,373	SO	None	-
Mataró includes:	Argentona; Cabrera de Mar; Cabrils; Dosrius; Mataró; Vilassar de Dalt; Vilassar de Mar									
5) Tarragona		132,178	136,904	Yes	Biological	Secondary	25,146	SS (coastal creek)	None	-
Tarragona includes:	Constanti, Els Pallaresos, Tarragona.									
6) Torroella de Montgrí		24,905	68,750	Yes	Biological	Tertiary (0,5%)	6,554	SO	None	-
Torroella de Montgrí includes:	Torroella de Montgrí, Ullà, l'Estartit									
7) Pineda de Mar		166.666 (disseny)	68,428	Yes	pre-treatment		40,000	SS	None	-
Pineda de Mar includes:	Pineda, Santa Susanna, Palafolls, Calella, Malgrat de Mar									
8) Gavà-Viladecans		317,386	195,000	Yes	Biological	Secondary	42,890	DI	None	-
Gavà-Viladecans includes	Gavà, Viladecans, Sant Climent de Llobregat, Castelldefels, Les Botigues de Sitges									
9) El Vendrell		59,883	34,961	Yes	Biological	Secondary	5,403	Coastal creek	None	-
El Vendrell includes:	El Vendrell, Santa Oliva, Sant Vicenç de Calders, Sant Salvador, Coma-ruga i Albinyana									

Murcia										
Atamaría		8,432						RB		
Valencia										
ALBORAYA	21,263	2,689		Yes	Extended aeration	Secondary	549	Ravine Carraixet	None	
ALCALA DE XIVERT	7,074	3,167		Yes	Extended aeration	Secondary	853	Small lagoon	None	
ALCALA DE XIVERT	See above	5,890		No	Screening and submarine outfall	Screening		SO	1,824	SO
ALMENARA	5,324	5,437		Yes	Extended aeration triple carrousel Orbal system	Secondary	1,428	Ravine	None	
BENISSA	12,424	7,178		Yes	Extended aeration plug flow system	Secondary	1,114	Ravine Pou d'Avall	None	
CABANES	2,734	3,006		Yes	Double carrousel extended aeration	Secondary	494	Ravine Ravachol	None	
CANET D'EN BERENGUER	4,696	9,000		No	Screening and submarine outfall	Screening		SO	3,760	SO
ELX	219,032	8,548		Yes	Extended aeration	Secondary	1,219	Irrigation ditch	None	
FAVARA	1,965	2,059		Yes	Extended aeration	Secondary	458	Irrigation canal	None	
FINESTRAT	4,172	2,482		Yes	Extended aeration	Secondary	285	Irrigation canal and Anchero river	None	
MONCOFA	5,278	4,342		Yes	Extended aeration	Secondary	3,312	Belcaire river	None	
NULES	12,666	6,171		Yes	Activated sludge	Chemical addition plus secondary treatment	2,935	Ravine Juan de Mora	None	

OLIVA	26,844	8,864		Yes	Activated sludge plug flow	Secondary	3,110	SO	None	
ORIHUELA	77,979	4,193		Yes	Extended aeration carrousel	Secondary	546	Irrigation lagoon	None	
ORIHUELA	See above	2,745		Yes	Extended aeration carrousel	Chemical addition plus secondary treatment	562	Irrigation ditch and Segura river	None	
ROJALES	15,987	4,786		Yes	Extended aeration	Secondary	495	Irrigation lagoon	None	
SUECA	27,593	2,221		Yes	Activated sludge	Secondary and Physico-chemical	1,304	Irrigation canal del Rey	None	
TAVERNES DE LA VALLDIGNA	17,988	7,702		Yes	Activated sludge	Secondary	1,228	Irrigation canal Mare	None	
TAVERNES DE LA VALLDIGNA	See above	3,867		Yes	Extended aeration	Secondary	1,554	Irrigation canal Mare	None	
TEULADA	12,745	7,250		No	Chemical treatment and submarine outfall	Chemical treatment with P removal	1,077	SO	None	
TEULADA	See above	4,838		Yes	Extended aeration	Secondary	805	Ravine Teulada	None	
TORREBLANCA	5,884	8,041		Yes	Activated sludge	Chemical addition plus secondary treatment with N & P removal	1,553	SO	None	
VALENCIA	805,304	2,931		Yes	Extended aeration compact	Secondary	402	Irrigation canal Roll de la Fila	None	
VALENCIA	See above	4,310		Yes	Extended aeration	Secondary	641	Irrigation canal Acequia Ribàs	None	
VALENCIA	See above	2,146		Yes	Extended aeration carrousel	Secondary	469	Irrigation canal La Sequiota	None	

VALENCIA	See above	8,281		Yes	Extended aeration carrousel	Secondary	2,116	Irrigation canal Albufera	None	
VALENCIA	See above	2,727		Yes	Extended aeration carrousel	Secondary	1,131	Irrigation canal Albufera	None	
VERGER, EL	4,538	3,041		Yes	Extended aeration	Secondary	755	Girona river	None	
XERESA		3,432		Yes	Extended aeration	Secondary	648	Ravine Martina	None	
Andalucía										
Algarrobo	5,668			Yes	Activated sludge	Secondary	6,000	Coastal waters	None	
Balanegra-Balerma	6,736			Yes	Extended aeration	Secondary	1,500	Coastal waters	None	
Carchuna-Calahonda	3,367			Yes	Extended aeration	Secondary	210	Coastal waters	None	
Castell de Ferro-Gualchos	2,762			Yes	Extended aeration	Tertiary	105	Coastal waters	None	
La Herradura	4,151			Yes	Extended aeration	Secondary	210	Coastal waters	None	
Manilva	11,181			Yes	Activated sludge	Secondary	No data available	Coastal waters	None	
Torrox	14,925			Yes	Activated sludge	Secondary	204	Coastal waters	None	
Palmones	2,681			Yes	Extended aeration	Secondary	No data available	Coastal creek	None	
Vera	11,159			Yes	Lagoons	Secondary	2,305	Coastal creek	None	
Balearic Islands		Average popul-equiv	Maximum popul-equiv							
ANDRATX	Andratx (10,410)	8,670	13,333	Yes	Activated Sludge	Tertiary	1,301	SO-RB	None	
CALA FERRERA	Felanitx (16,948) & Santanyí (11,172)	7,222	10,000	Yes	Extended Aeration	Tertiary	1,083	SO	None	
CALA MESQUIDA	Capdepera (11,074)	1,461	5,333	Yes		Secondary	219	RB	None	
CAMP DE MAR	Andratx (10,410)	2,767	4,666	Yes	Aerated Lagoons	Secondary	415	SO-RB	None	
CANYAMEL	Capdepera (11,074)	3,585	6,666	Yes	Activated Sludge	Tertiary	538	SO	None	
COLÒNIA DE SANT PERE	Artà (6,730)	2,037	3,000	Yes	Extended Aeration	Secondary	306	RB	None	

FONT DE SA CALA	Capdepera (11,074)	2,503	6,666	Yes	Activated Sludge	Tertiary	376	SO-RB	None	
PORTOCOLOM	Felanitx (16,948)	4,965	13,333	Yes	Extended Aeration	Secondary	745	SO-RB	None	
SA RÀPITA	Campos (8,296) + Llucmajor (31,381)	1,555	4,666	Yes	Extended Aeration	Secondary	233	RB	None	
SON SERRA	Santa Margalida (10,204)	2,323	4,000	Yes	Extended Aeration	Tertiary	349	RB	None	
CALA EN PORTER	Alaior (8,933)	3,108	12,666	Yes	Extended Aeration	Tertiary	466	SO	None	
CALA GALDANA	Ciutadella (27,468) & Ferreries (4,476)	2,774	9,333	Yes	Extended Aeration	Tertiary	416	RB	None	
ES MIGJORN	1,503	3,938	6,666	Yes	Extended Aeration	Tertiary	591	RB	None	
CALA DE SANT VICENT	San Joan de Labritja (4,975)	674	3,333	Yes	Aerated Lagoons	Secondary	101	RB	None	
CALA LLONGA	Santa Eularia del Riu (27,152)	3,941	12,666	Yes	Extended Aeration	Secondary	591	RB	None	
PORT DE SANT MIQUEL	San Joan de Labritja (4,975)	1,471	4,000	Yes	Extended Aeration	Tertiary	221	RB	None	

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: SYRIA

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Asqubeen	6181	no					972	SO
Burge Al-Qasab	5304	no					795	SO
Baksa	3433	no					514	SS
Stmerkhu	2389	no					385	SS
Senguan	4044	no					606	SS
Shamiah Latakia	3301	no					495	SO
Qanjera	4825	no					723	SO
Kersana	5700	no					855	SS
Meshairfet Al-Samoot	3832	no					574	DI
Bahloliah	2298	no					344	SO
Jandiriah	2250	no					337	SO
Burge Eslam	5456	no					808	DI
Shabatliah	3283	no					492	SS
Saleeb Al-turkman	3984	no					597	SO
Mashkita	2741	no					411	SO
Hanadi	4061	no					609	SS
Bassa	5382	no					807	SS
Sunober	4198	no					629	SS
Shair	2632	no					394	SO
Shalfatiah	2059	no					308	SS
Fadiu	4147	no					622	SS
Berjal	4540	no					681	SO
Beili Jeli	2442	no					366	SO
Hamimeem	4206	no					630	SS
Huaiz	2372	no					355	SS

Ra's Al-Ein	4007	no					601	SS
Arab- Almulk	3759	no					563	SO
Qabu Awamiah	2219	no					332	SO
Ein Al-Sharqieah	2746	no					411	SS
Hadan	4132	no					619	SO
Zama	2676	no					401	SO
Zabadieh	2016	no					302	SS
Ein Qabta	3126	no					468	SO
Qalaie'	2218	no					332	SO
Qateilbieah	3483	no					522	SS
Babda	2811	no					421	SO
Duairet Babda	2879	no					431	SO
Ein Shqaq	4245	no					363	SS
Rawdet Benjaroo	2456	no					368	SS
Seiano	5975	no					896	SO
Budi	3713	no					557	SO
Dalia	4613	no					691	SS
Hafeh	7184	no					1077	SO
Salma	2288	no					343	SS
Saferqieah	2024	no					303	SO
Kelmakho	2662	no					399	SS
Al-Qerdaha	8690	no					1303	SS
Harf Mesietra	2741	no					411	SO
Qasmeen	2223	no					333	SS
Jubat Berghal	7263	no					1089	SS
Kassab	3625	no					543	DI
Ein Al-teenah	7619	no					1142	DI
Harf Al-mesietra	7323	no					1098	SS

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country : TUNISIA

City	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Population Equivalent (1)	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Khlidia*	6731	Connected to WWTP **Sud Méliane**	Oxidation ditch	secondary	350000	673	RB :120 DI : 553	0	-
Rafraf*	9839	Connected to WWTP **Awsaja**	Oxidation ditch + extended aeration	secondary	85000	983	_	983	DI
Mètline*	7370					511	_	511	DI
Ghar El Melh*	5018					501	_	501	DI
Aousja	3980	Operational before end 2007				295	_	295	DI
Tazarka	7613	WWTP Tazzrka ; Study prepared	Oxidation ditch	secondary		0	-	761	DI
Maâmoura*	6619	Will be connected to WWTP **Tazarka**				0	-	661	DI
Somaa*	6287					0	-	628	DI
Menzel Horr*	4798	Will be connected to WWTP **Menzel Témime** : Study prepared	Oxidation ditch	secondary		479	_	479	DI
Elmida*	3437	Will be connected to WWTP **Korba**	Activated sludge with extended aeration	tertiary	74898	343	_	343	DI
Hammam- Al-Aghzaz*	7806	Connected to WWTP **Kélibia**	Activated sludge with extended aeration	tertiary	780	_	780	DI	780
Korbous	3551	Finalisation of construction works by end of 2007		tertiary	355	_	355	355	DI
Haouaria	9273	Yes	Oxidation ditch	secondary	927	DI		927	
Bouficha*	8701	Connected to WWTP **Hammamet Sud**	Activated sludge with extended aeration	secondary	76000	870		0	-

Hergla	6332	Construction study is finalized				0	-	633	DI
Zaouet Sousse*	10455>10000	Connected to WWTP **Sousse Sud**	Activated sludge + trickling filter aerobic stabilisation	secondary	320000	1045	RB DI	0	-
Ksibet -thrayet*	8762					872		0	-
Lamta*	5408	Connected to WWTP **Sayada**	Activated sludge + Oxidation ditch	secondary	17000	2032	RB DI	0	0
Bou Hjar*	4831							0	0
Khnis*	9748	Connected to WWTP **Monastir Frina**	Activated sludge with extended aeration	secondary	148500	5575	RB DI	0	-
Réjich*	8925	Connected to WWTP **Mahdia**	Aerated ponds	tertiary	150000	4618	RB DI	0	-
Malloulech	6411	Without station	Programme on the technical and institutional study for the sanitation of small cities			641 (treated indirectly)	DI	0	-
Skhira	8627	No treatment plant				862 (treated indirectly)	DI	0	-
Metouia	9946	Yes : Testing phase (WWTP Metouia-Ouethref)	Activated sludge : 2700 m^3 / d	secondary		994	DI	0	-
Azzarat	5205	WWTP Mareth – Azzarat	(work in progress) : activated sludge	secondary		0 (the expected capacity is of 2850 m^3 / d)	-	520	Continental environment

* The cities with asterisk are connected to a major Wastewater Treatment Plant

(1) The population equivalent is relative to the treatment plants underligned, that receive the domestic wastewater from other communities (cities in the first column)

(2) The estimation of the daily quantity of treated wastewater in m^3 is based on an average consumption of 100 litres per person/day

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION BETWEEN 2,000 AND 10,000
Country: TURKEY

Province	County	Municipality	Permanent Population	Wastewater Treatment Plant	Wastewater Treatment Method	Degree of Treatment of Wastewater	Wastewater Treated (1000 m^3/year)	Wastewater Treated (m^3/day)	Discharge of Treated Wastewater	Wastewater Untreated (1000 m3/year)	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
ADANA	SEYHAN	KARAYUSUFLU	5479	N/I								N/A
ADANA	SEYHAN	KÜÇÜKDİKİLİ	8255	N/I								N/A
ADANA	YÜREĞİR	ABDİOĞLU	5642	NO						102.20	280.00	N/A
ADANA	YÜREĞİR	BAKLALI	3346	NO						76.65	210.00	N/A
ADANA	YÜREĞİR	HAVUTLU	7030	NO						104.39	286.00	N/A
ADANA	YÜREĞİR	SOLAKLI	9124	N/I								N/A
ADANA	YÜREĞİR	SULUCA	2781	NO						35.77	98.00	N/A
ADANA	YÜREĞİR	YUNUSOĞLU	7858	NO						117.53	322.00	N/A
ADANA	ALADAĞ	ALADAĞ	6674	NO						127.75	350.00	N/A
ADANA	ALADAĞ	AKÖREN	4211	NO						18.25	50.00	N/A
ADANA	CEYHAN	BÜYÜKMANGIT	3260	NO						43.80	120.00	N/A
ADANA	CEYHAN	DORUK	5075	NO						146.00	400.00	DI
ADANA	CEYHAN	MUSTAFABEYLİ	2611	NO						49.28	135.00	N/A
ADANA	FEKE	FEKE	4632	NO						83.95	230.00	N/A
ADANA	KARAİSALI	KARAİSALI	6883	NO						158.78	435.00	N/A
ADANA	KARAİSALI	ÇATALAN	2595	NO						51.10	140.00	N/A
ADANA	KARAİSALI	SALBAŞ	3055	NO						20.08	55.00	N/A
ADANA	POZANTI	POZANTI	9627	NO						219.00	600.00	N/A
ADANA	SAİMBEYLİ	SAİMBEYLİ	5198	NO						127.75	350.00	N/A
ADANA	TUFANBEYLİ	TUFANBEYLİ	5332	NO						144.91	397.00	N/A

ADANA	YUMURTALIK	YUMURTALIK	4745	YES	Biological	Secondary	35.77	98.00	DI			
ANTALYA	AKSEKİ	CEVİZLİ	7737	NO						149.65	410.00	N/A
ANTALYA	AKSEKİ	KUYUCAK	4841	NO						91.25	250.00	N/A
ANTALYA	ALANYA	AVSALLAR	8493	YES	Biological	Secondary	1825.00	5000.00	SO			
ANTALYA	ALANYA	CİKCİLLİ	5167	NO						105.85	290.00	SO
ANTALYA	ALANYA	YEŞİLKÖY	3401	N/I								SO
ANTALYA	GÜNDOĞMUŞ	GÜNDOĞMUŞ	5021	NO						102.20	280.00	N/A
ANTALYA	KEMER	BELDİBİ	9718	N/I	Biological	Secondary	2766.70	7580.00	SO			
ANTALYA	KEMER	ÇAMYUVA	7480	N/I	Biological	Secondary	3784.32	10368.00	SO			
ANTALYA	KEMER	TEKİROVA	5769	N/I	Biological	Secondary	3279.89	8986.00	SO			
ANTALYA	KORKUTELİ	BOZOVA	2106	YES	Biological	Secondary	43.80	120.00				N/A
ANTALYA	MANAVGAT	EVRENSEKİ	5502	N/I								N/A
ANTALYA	MANAVGAT	GÜNDOĞDU	3010	N/I								N/A
ANTALYA	MANAVGAT	SARILAR	3838	NO						69.35	190.00	N/A
ANTALYA	SERİK	BOĞAZKENT	2191	YES	Biological	Secondary	455.52	1248.00	N/A			
ANTALYA	SERİK	GEBİZ	4191	NO						12.78	35.00	SO
AYDIN	MERKEZ	ÇEŞTEPE	5510	NO						127.02	348.00	N/A
AYDIN	MERKEZ	DALAMA	2073	NO						21.90	60.00	N/A
AYDIN	MERKEZ	OVAEYMİR	6518	NO						138.70	380.00	N/A
AYDIN	MERKEZ	TEPECİK	3764	NO						73.00	200.00	SO
AYDIN	BOZDOĞAN	BOZDOĞAN	8300	YES	Biological	Secondary	182.50	500.00	N/A			
AYDIN	BOZDOĞAN	YAZIKENT	2214	NO						54.75	150.00	N/A
AYDIN	BUHARKENT	BUHARKENT	7074	YES	Physical	Primary	102.20	280.00	N/A			
AYDIN	ÇİNE	AKÇAOVA	2905	NO						29.20	80.00	N/A
AYDIN	GERMENCİK	HIDIRBEYLİ	2093	NO						96.73	265.00	N/A
AYDIN	GERMENCİK	MURSALLI	2049	NO						14.60	40.00	N/A
AYDIN	KARACASU	KARACASU	5915	NO						182.50	500.00	N/A
AYDIN	KOÇARLI	YENİKÖY	5174	NO						91.25	250.00	N/A
AYDIN	KÖŞK	KÖŞK	8349	NO						50.37	138.00	N/A
AYDIN	KUYUCAK	KUYUCAK	7282	NO						20.81	57.00	N/A

AYDIN	SÖKE	SAVUCA	7932	N/I								N/A
AYDIN	SULTANHİSAR	ATÇA	7660	YES	Biological	Secondary	25.55	70.00	N/A			
BALIKESİR	MERKEZ	PAMUKÇU	3147	NO						65.70	180.00	N/A
BALIKESİR	BANDIRMA	EDİNCİK	5084	NO						182.50	500.00	N/A
BALIKESİR	BİGADİÇ	İSKELE	2028	NO						54.75	150.00	N/A
BALIKESİR	BURHANİYE	PELİTKÖY	2162	NO						54.75	150.00	N/A
BALIKESİR	EDREMİT	GÜRE	3944	NO						69.35	190.00	N/A
BALIKESİR	EDREMİT	KADIKÖY	4404	N/I								SO
BALIKESİR	ERDEK	KARŞIYAKA	2786	NO						109.50	300.00	DI
BALIKESİR	GÖMEÇ	KARAAĞAÇ	2459	NO						146.00	400.00	N/A
BALIKESİR	GÖNEN	SARIKÖY	5279	NO						233.60	640.00	N/A
BALIKESİR	HAVRAN	BÜYÜKDERE	2226	NO						102.20	280.00	N/A
BALIKESİR	İVRİNDİ	İVRİNDİ	5772	NO						142.35	390.00	N/A
BALIKESİR	İVRİNDİ	BÜYÜKYENİCE	2598	NO						132.50	363.00	N/A
BALIKESİR	İVRİNDİ	KAYAPA	2140	NO						58.40	160.00	N/A
BALIKESİR	İVRİNDİ	KORUCU	2185	NO						91.98	252.00	N/A
BALIKESİR	KEPSUT	KEPSUT	5545	NO						248.20	680.00	N/A
BALIKESİR	MANYAS	MANYAS	5455	NO						318.65	873.00	N/A
BALIKESİR	MARMARA	MARMARA	2215	NO						146.00	400.00	SO
BALIKESİR	MARMARA	AVŞAADASI	2611	NO						105.85	290.00	SO
BALIKESİR	SAVAŞTEPE	SARIBEYLER	3610	NO						80.30	220.00	N/A
BALIKESİR	SINDIRGI	YÜREĞİL	2441	NO						114.98	315.00	N/A
BALIKESİR	SUSURLUK	GÖBEL	2440	NO						169.36	464.00	N/A
BALIKESİR	SUSURLUK	KARAPÜRÇEK	2029	NO						113.88	312.00	N/A
ÇANAKKALE	AYVACIK	AYVACIK	6475	NO						164.25	450.00	N/A
ÇANAKKALE	AYVACIK	KÜÇÜKKUYU	5261	NO						208.05	570.00	N/A
ÇANAKKALE	BİGA	GÜMÜŞÇAY	2509	NO						54.02	148.00	N/A
ÇANAKKALE	BİGA	KARABİGA	3131	NO						61.32	168.00	DI
ÇANAKKALE	ÇAN	TERZİALAN	2427	NO						73.00	200.00	N/A
ÇANAKKALE	EZİNE	GEYİKLİ	3635	NO						96.73	265.00	DI
ÇANAKKALE	GELİBOLU	EVREŞE	2145	NO						80.67	221.00	N/A

ÇANAKKALE	GÖKÇEADA	GÖKÇEADA	7254	NO						127.75	350.00	SO
ÇANAKKALE	LAPSEKİ	LAPSEKİ	8489	NO						149.65	410.00	DI
ÇANAKKALE	LAPSEKİ	UMURBEY	3078	NO						82.13	225.00	DI
ÇANAKKALE	YENİCE	YENİCE	5487	NO						211.70	580.00	N/A
ÇANAKKALE	YENİCE	KALKIM	2145	NO						84.32	231.00	N/A
ÇANAKKALE	YENİCE	PAZARKÖY	2064	NO						70.81	194.00	N/A
EDİRNE	ENEZ	ENEZ	3941	NO						94.17	258.00	N/A
EDİRNE	HAVSA	HAVSA	8081	NO						164.25	450.00	N/A
EDİRNE	İPSALA	İPSALA	8471	NO						142.35	390.00	N/A
EDİRNE	İPSALA	ESETÇE	2160	NO						23.73	65.00	N/A
EDİRNE	İPSALA	İBRİKTEPE	2074	NO						33.95	93.00	N/A
EDİRNE	İPSALA	SULTAN	2020	NO						47.45	130.00	N/A
EDİRNE	KEŞAN	BEĞENDİK	2252	NO						70.45	193.00	N/A
EDİRNE	MERİÇ	MERİÇ	3382	NO						63.15	173.00	N/A
EDİRNE	MERİÇ	KÜPLÜ	3272	NO						71.91	197.00	N/A
EDİRNE	MERİÇ	SUBAŞI	2199	NO						43.80	120.00	N/A
EDİRNE	SÜLEOĞLU	SÜLEOĞLU	6548	NO						87.60	240.00	N/A
EDİRNE	UZUNKÖPRÜ	KIRCASALİH	3922	NO						73.00	200.00	N/A
EDİRNE	UZUNKÖPRÜ	KURTBEY	2206	NO						58.40	160.00	N/A
HATAY	MERKEZ	DURSUNLU	5147	NO						91.25	250.00	N/A
HATAY	MERKEZ	GÜZELBURÇ	5259	NO						62.05	170.00	N/A
HATAY	MERKEZ	KARLISU	3754	NO						51.10	140.00	N/A
HATAY	MERKEZ	KÜÇÜKDALYAN	5637	NO						87.60	240.00	N/A
HATAY	MERKEZ	MAŞUKLU	3633	NO						14.60	40.00	N/A
HATAY	MERKEZ	ODABAŞI	7184	NO						131.40	360.00	N/A
HATAY	MERKEZ	OVAKENT	5413	NO						65.70	180.00	N/A
HATAY	MERKEZ	ŞENKÖY	2095	NO						36.50	100.00	N/A
HATAY	MERKEZ	TURUNÇLU	2865	NO						58.40	160.00	N/A
HATAY	MERKEZ	YEŞİLPINAR	3330	NO						65.70	180.00	N/A
HATAY	ALTINÖZÜ	ALTINÖZÜ	5352	NO						100.01	274.00	N/A
HATAY	ALTINÖZÜ	ALTINKAYA	3433	NO						76.65	210.00	N/A

HATAY	DÖRTYOL	KARAKESE	5819	NO						127.75	350.00	N/A
HATAY	HASSA	AKTEPE	8692	NO						170.46	467.00	N/A
HATAY	KIRIKHAN	KURTLUSOĞUKSU	3472	NO						57.31	157.00	N/A
HATAY	SAMANDAĞ	AKNEHİR	2707	NO						43.80	120.00	N/A
HATAY	SAMANDAĞ	TEKEBAŞI	6393	NO						127.75	350.00	N/A
HATAY	YAYLADAĞI	YAYLADAĞI	7717	NO						54.75	150.00	N/A
HATAY	YAYLADAĞI	KARAKÖSE	2374	NO						73.00	200.00	DI
MERSİN	MERKEZ	ADANALIOĞLU	9958	NO						127.75	350.00	N/A
MERSİN	MERKEZ	ÇİFTLİKKÖY	5590	N/I								N/A
MERSİN	MERKEZ	FATİH	4188	NO						32.85	90.00	N/A
MERSİN	MERKEZ	KARACAİLYAS	6503	YES	Pyhsical	Primary	138.70	380.00	N/A			
MERSİN	MERKEZ	YALINAYAK	3571	N/I								N/A
MERSİN	AYDINCIK	AYDINCIK	7941	N/I			10.95	30.00				DI
MERSİN	ÇAMLIYAYLA	ÇAMLIYAYLA	8806	YES	Pyhsical	Primary	21.90	60.00	N/A			
MERSİN	ÇAMLIYAYLA	SEBİL	4894	NO						16.43	45.00	N/A
MERSİN	ERDEMLİ	KIZKALESİ	8139	NO						182.50	500.00	N/A
MERSİN	GÜLNAR	KUSKAN	3069	NO						94.90	260.00	N/A
MERSİN	TARSUS	ATALAR	3454	NO						63.88	175.00	SO
MERSİN	TARSUS	YEŞİLTEPE	2447	NO						41.98	115.00	N/A
İZMİR	GÜZELBAHÇE	YELKİ	2070	N/I								N/A
İZMİR	ALİAĞA	HELVACI	4097	NO						87.60	240.00	N/A
İZMİR	BAYINDIR	ÇIRPI	5893	NO						109.50	300.00	N/A
İZMİR	BAYINDIR	ZEYTİNOVA	2085	NO						76.65	210.00	N/A
İZMİR	BERGAMA	GÖÇBEYLİ	3037	NO						109.50	300.00	N/A
İZMİR	BERGAMA	YENİKENT	3398	NO						69.35	190.00	N/A
İZMİR	BERGAMA	ZEYTİNDAĞ	4354	NO						240.90	660.00	N/A
İZMİR	BEYDAĞ	BEYDAĞ	5521	NO						127.75	350.00	N/A
İZMİR	ÇEŞME	ALAÇATI	8401	NO						290.91	797.00	SO
İZMİR	FOÇA	BAĞARASI	3031	NO						65.70	180.00	N/A
İZMİR	FOÇA	GERENKÖY	3263	NO						74.83	205.00	N/A
İZMİR	KARABURUN	KARABURUN	2932	YES	Biological	Secondary	23.36	64.00	N/A			

İZMİR	KEMALPAŞA	ARMUTLU	7046	NO						165.71	454.00	N/A
İZMİR	KEMALPAŞA	BAĞYURDU	7738	NO						175.20	480.00	N/A
İZMİR	KEMALPAŞA	ÖREN	3826	NO						91.25	250.00	N/A
İZMİR	KEMALPAŞA	ULUCAK	4646	NO						182.50	500.00	N/A
İZMİR	KEMALPAŞA	YUKARIKIZILCA	2225	NO						47.45	130.00	N/A
İZMİR	KINIK	POYRACIK	7001	NO						250.03	685.00	N/A
İZMİR	KINIK	YAYAKENT	2421	NO						81.03	222.00	N/A
İZMİR	MENDERES	GÖRECE	7431	YES	Biological	Secondary	547.50	1500.00	SO			
İZMİR	MENDERES	GÜMÜLDÜR	8716	YES	Biological	Secondary	292.00	800.00	N/A			
İZMİR	MENDERES	TEKELİ	2971	NO						58.40	160.00	N/A
İZMİR	MENEMEN	HARMANDALI	3464	NO						65.70	180.00	DI
İZMİR	MENEMEN	KOYUNDERE	3998	NO						290.54	796.00	N/A
İZMİR	MENEMEN	MALTEPE	2649	NO						85.78	235.00	N/A
İZMİR	MENEMEN	SEYREK	5630	NO						116.80	320.00	N/A
İZMİR	MENEMEN	TÜRKELLİ	2653	NO						58.40	160.00	N/A
İZMİR	ÖDEMİŞ	BADEMLİ	3435	NO						116.80	320.00	N/A
İZMİR	ÖDEMİŞ	BİRGİ	2838	NO						59.86	164.00	N/A
İZMİR	ÖDEMİŞ	BOZDAĞ	2455	NO						116.80	320.00	N/A
İZMİR	ÖDEMİŞ	ÇAYLI	2319	NO						109.50	300.00	N/A
İZMİR	ÖDEMİŞ	KAYAKÖY	2197	NO						73.00	200.00	N/A
İZMİR	ÖDEMİŞ	KAYMAKÇI	4958	NO						127.75	350.00	N/A
İZMİR	ÖDEMİŞ	KONAKLI	2616	NO						94.90	260.00	N/A
İZMİR	ÖDEMİŞ	OVAKENT	4054	NO						127.75	350.00	N/A
İZMİR	ÖDEMİŞ	ZEYTİNLİK	2533	N/I								N/A
İZMİR	SEFERİHİSAR	DOĞANBEY-PAYAMLI	6161	NO						127.75	350.00	N/A
İZMİR	TİRE	GÖKÇEN	3052	NO						109.50	300.00	N/A
İZMİR	TORBALI	AYRANCILAR	7719	NO						265.72	728.00	N/A
İZMİR	TORBALI	ÇAYBAŞI	7276	NO						116.80	320.00	N/A
İZMİR	TORBALI	KARAKUYU	2013	NO						31.03	85.00	N/A
İZMİR	TORBALI	PANCAR	4414	NO						113.88	312.00	N/A

İZMİR	TORBALI	YAZIBAŞI	6179	NO						164.25	450.00	N/A
MUĞLA	BODRUM	BİTEZ	4983	YES	Biological	Secondary	1095.00	3000.00	N/A			
MUĞLA	BODRUM	GÖLTÜRKBÜKÜ	3851	YES	Biological	Secondary	336.17	921.00	N/A			
MUĞLA	BODRUM	KONACIK	4035	NO						51.10	140.00	N/A
MUĞLA	BODRUM	MUMCULAR	2166	NO						36.14	99.00	N/A
MUĞLA	BODRUM	ORTAKENTYAHŞİ	4662	YES	Biological	Secondary	109.50	300.00	N/A			
MUĞLA	BODRUM	TURGUTREİS	8540	NO						219.00	600.00	SO
MUĞLA	FETHİYE	ÖLÜDENİZ	5600	NO						151.84	416.00	DI
MUĞLA	KAVAKLIDERE	KAVAKLIDERE	3432	NO						219.00	600.00	N/A
MUĞLA	KAVAKLIDERE	MENTEŞE	2641	NO						62.78	172.00	N/A
MUĞLA	KÖYCEĞİZ	KÖYCEĞİZ	7523	YES	Biological	Secondary	547.50	1500.00	N/A			
MUĞLA	MARMARİS	BELDİBİ	4848	N/I								N/A
MUĞLA	MARMARİS	İÇMELER	9348	N/I								N/A
MUĞLA	MARMARİS	TURUNÇ	2400	YES	Biological	Secondary	109.50	300.00	N/A			
MUĞLA	MİLAS	GÜLLÜK	3338	NO						65.70	180.00	N/A
MUĞLA	MİLAS	SELİMİYE	4148	NO						91.25	250.00	N/A
MUĞLA	ORTACA	DALYAN	4848	YES	Biological	Secondary	707.01	1937.00	N/A			
MUĞLA	ULA	AKYAKA	2193	NO						51.10	140.00	N/A
MUĞLA	YATAĞAN	TURGUT	2256	NO						47.45	130.00	N/A

*2004 Statistical Data From TUIK (Turkish Statistical Institute)

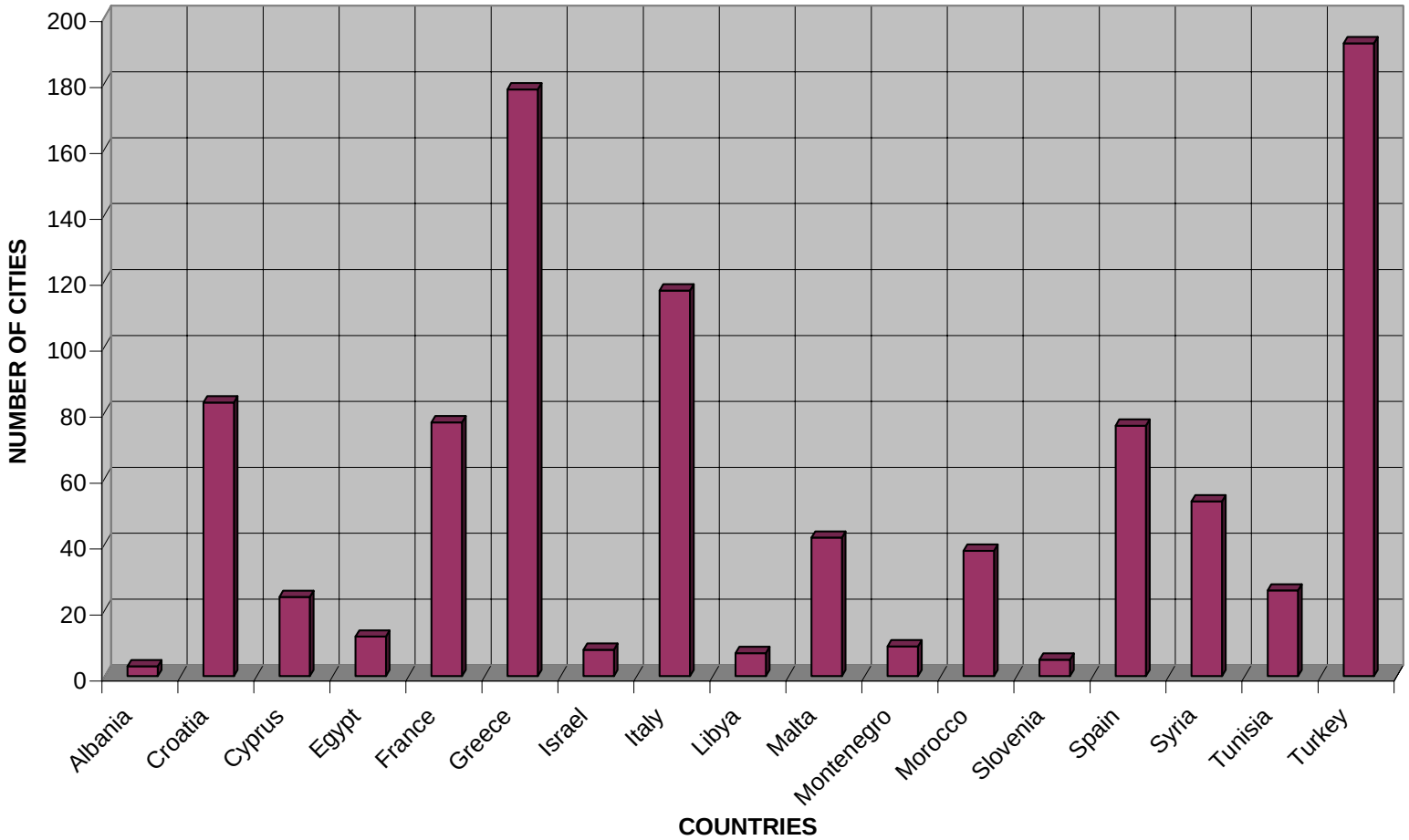
N/I: No Information

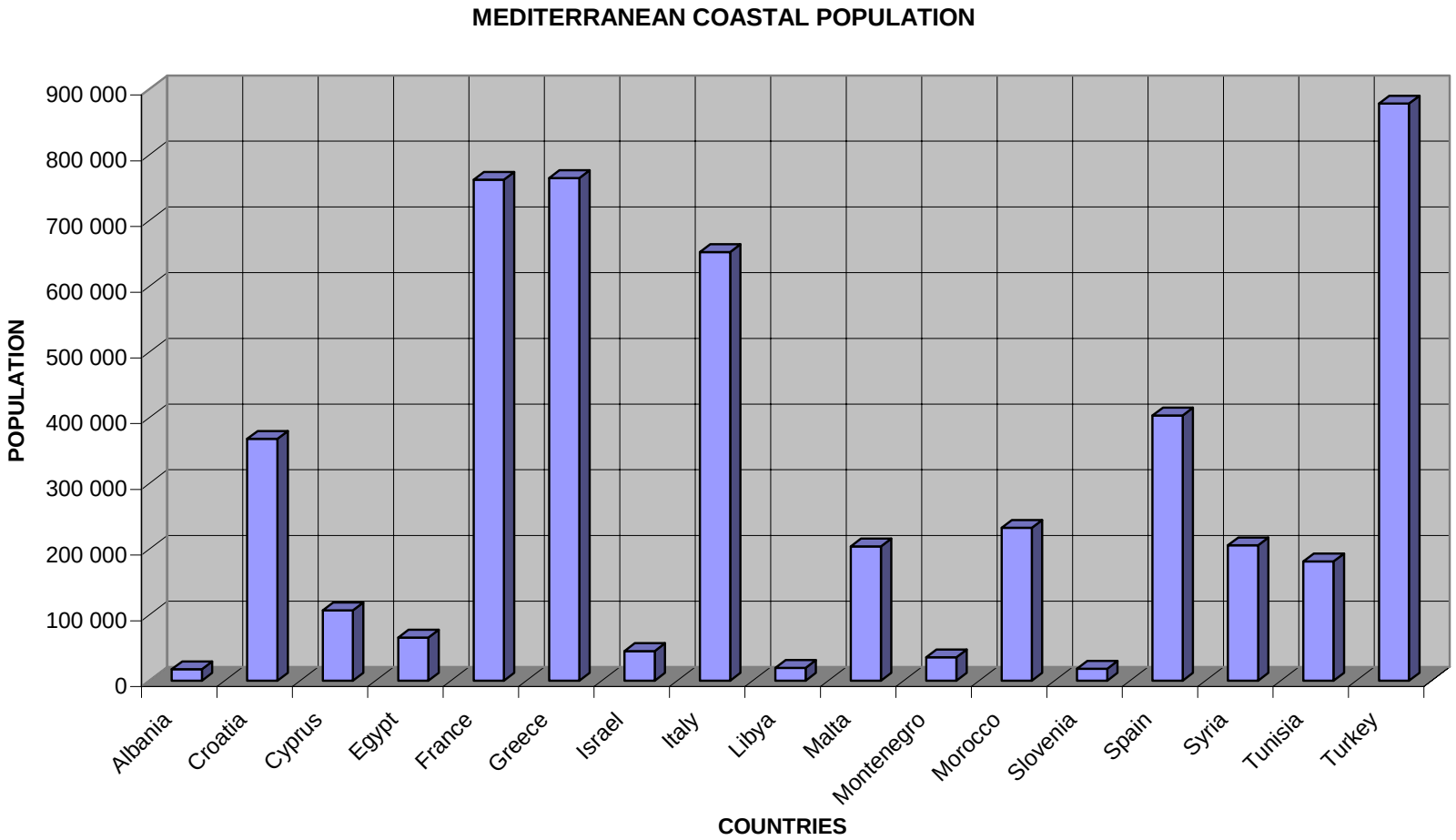
N/A: Not Applicable Information

PART III

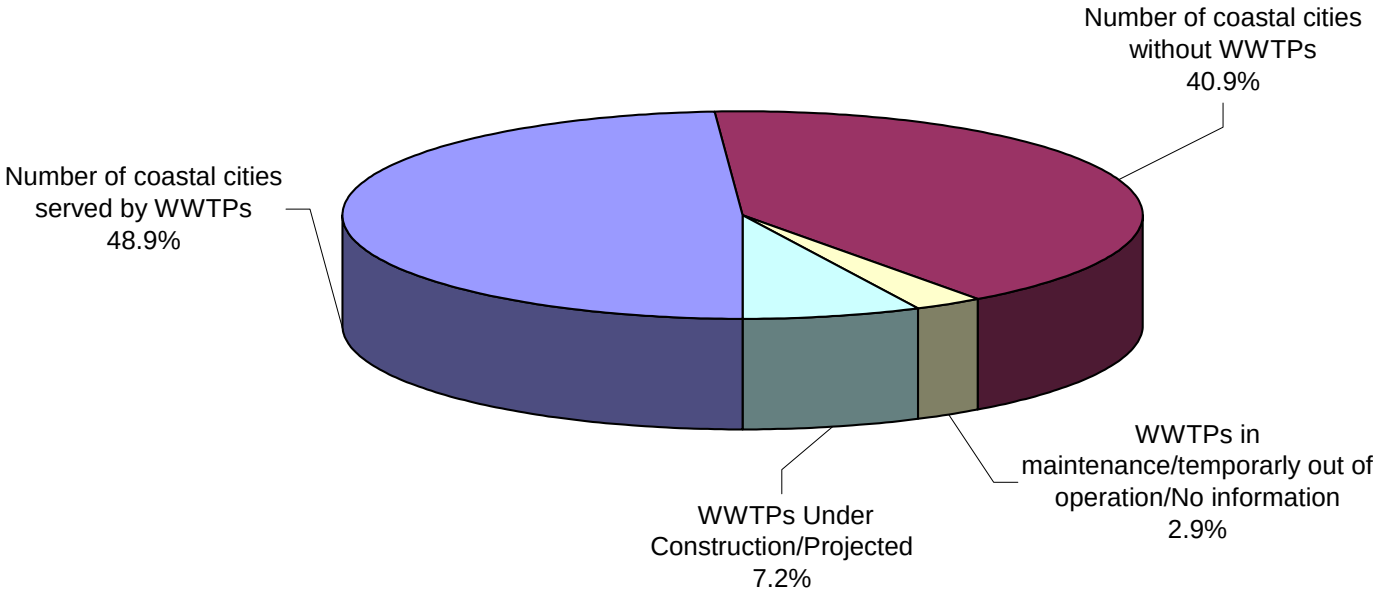
GRAPHS PRESENTING THE CURRENT SITUATION WITH RESPECT TO WASTEWATER TREATMENT PLANTS IN THE MEDITERRANEAN

MEDITERRANEAN COASTAL TOWNS WITH POPULATION OF BETWEEN 2,000 AND 10,000 INHABITANS

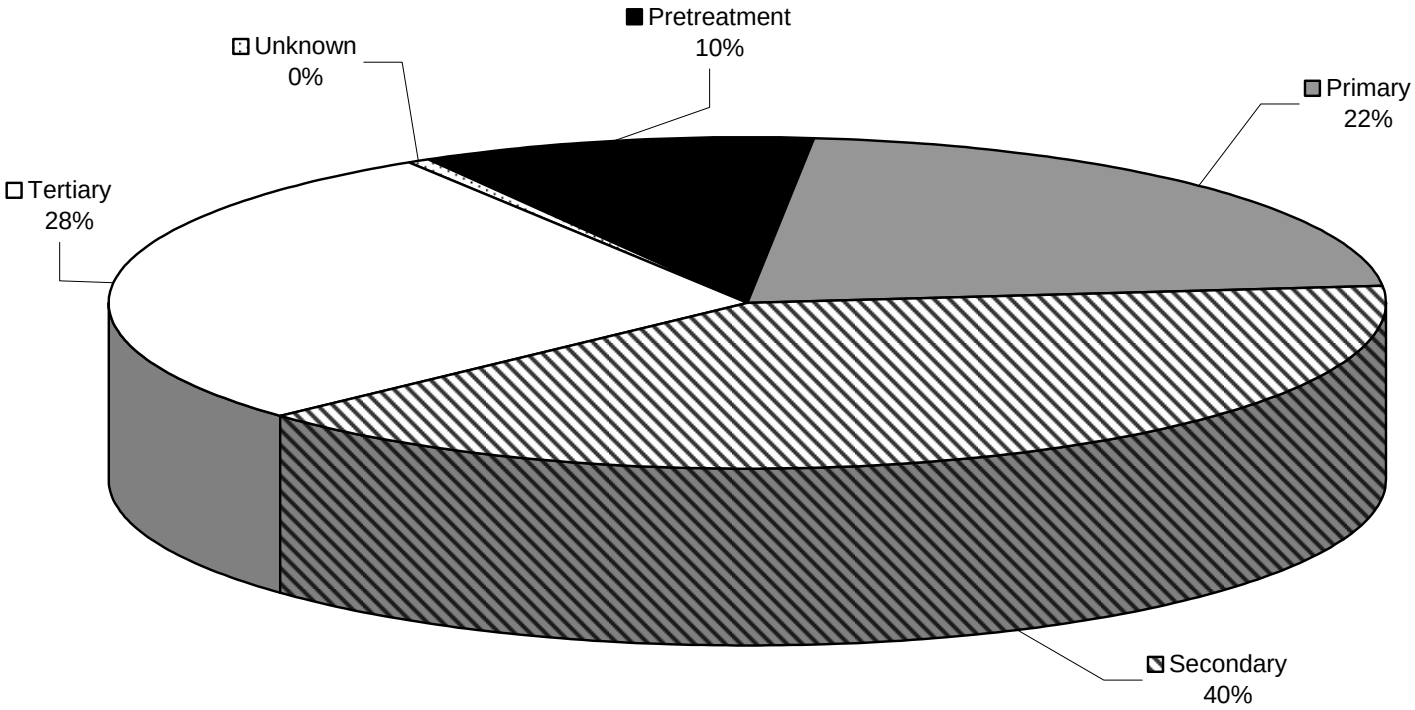



MEDITERRANEAN COASTAL POPULATION
POPULATION
900 000
800 000
700 000
600 000
500 000
400 000
300 000
200 000
100 000
0
Albania
Croatia
Cyprus
Egypt
France
Greece
Israel
Italy
Libya
Malta
Montenegro
Morocco
Slovenia
Spain
Syria
Tunisia
Turkey
COUNTRIES

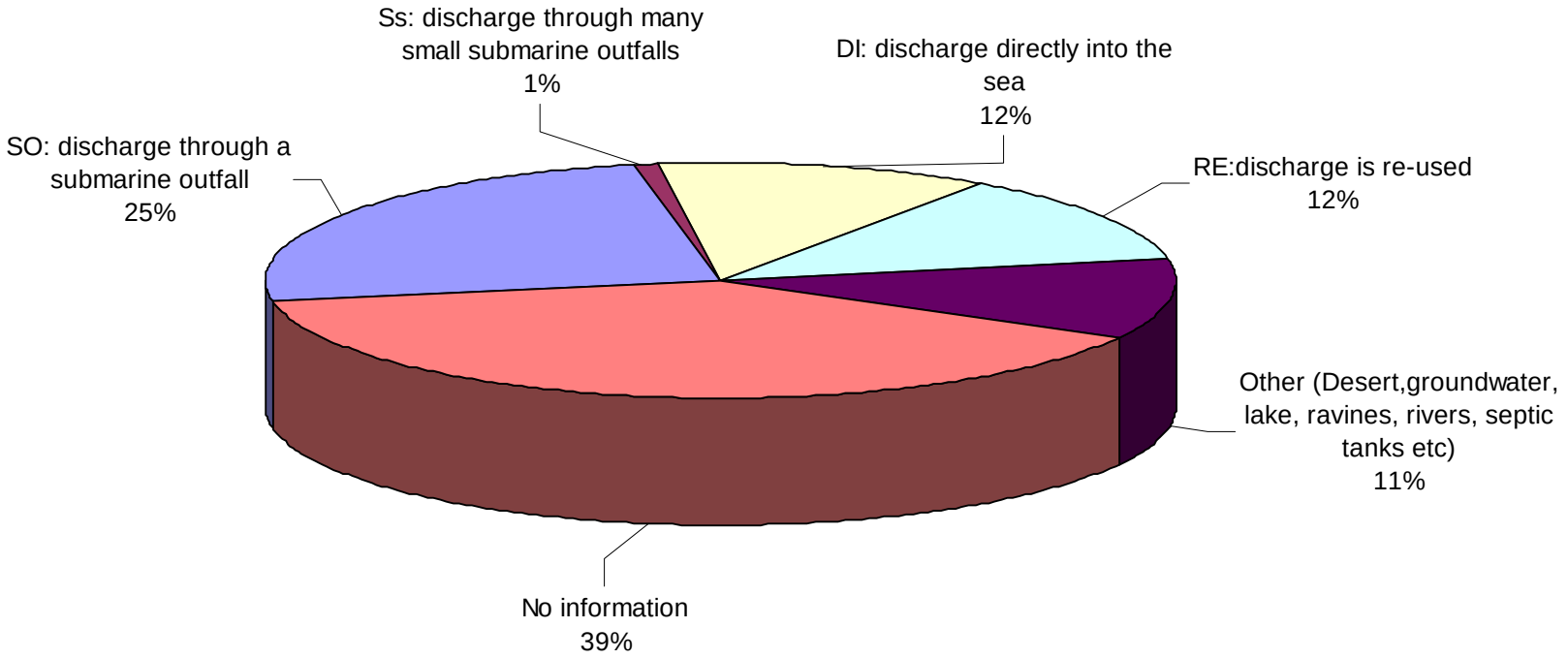
WASTEWATER TREATMENT PLANTS (WWTPs) IN COASTAL TOWNS WITH POPULATION OF BETWEEN 2,000 AND 10,000 INHABITANTS



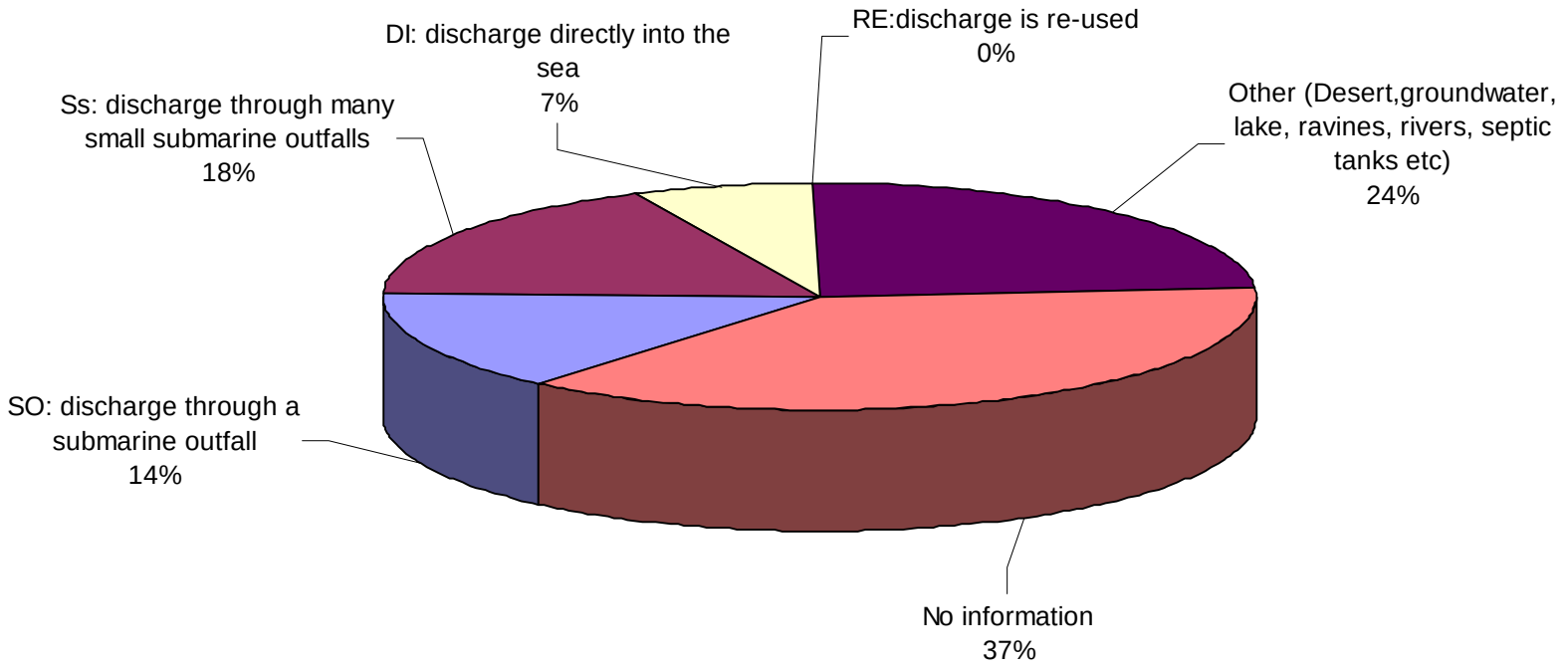
DEGREE OF TREATMENT



DISCHARGE OF TREATED WASTEWATER



DISCHARGE OF UNTREATED WASTEWATER



LIST OF MAP TECHNICAL SERIES REPORTS (MTS)

LISTE DES RAPPORTS TECHNIQUES DU PAM

MTS Reports are available from the Documents & Publications section of our web site at www.unepmap.org

MTS 169. UNEP/MAP/MED POL/WHO: **Municipal wastewater treatment plants in Mediterranean coastal cities – Inventory of treatment plants in cities of between 2,000 and 10,000 inhabitants.** MAP Technical Reports Series No. 169, UNEP/MAP, Athens, 2008.

MTS 168. UNEP/MAP/BLUE PLAN: **Water demand management, progress and policies: Proceedings of the 3rd Regional Workshop on Water and Sustainable Development in the Mediterranean.** Zaragoza, Spain, 19 - 21 March 2007. MAP Technical Reports Series No. 168. UNEP/MAP, Athens, 2007.
Gestion de la demande en eau, progrès et politiques : Actes du 3e atelier régional sur l'eau et le développement durable en Méditerranée.

MTS 167. UNEP/MAP/BLUE PLAN: **Energy and Sustainable Development in the Mediterranean: Proceedings of the Regional Workshop, Monaco, 29 - 30 March 2007.** MAP Technical Reports Series No. 167. UNEP/MAP, Athens, 2007.
Energie et développement durable en Méditerranée: actes de l'atelier régional, Monaco, 29 - 30 mars 2007

MTS 166. UNEP/MAP/MED POL**: Proceedings of the Workshop on the MED POL Biological Effects Programme: Achievements and Future Orientations (Alessandria, Italy, 20 -21 December 2006).** MAP Technical Reports Series No. 166, UNEP/MAP, Athens, 2007. (English).

MTS 165. UNEP/MAP/CP RAC: **State of the art of sustainable production in the Mediterranean.** MAP Technical Reports Series No. 165, UNEP/MAP, Athens, 2006. (English, French, Spanish).
État de la production durable en Méditerranée.
Estado de la producción sostenible en el Mediterráneo.

MTS 164. PNUE/PAM: **Programme d'Aménagement Côtier (PAC) de la "Zone côtière algéroise": Rapport final intégré.** No. 164 de la Série des rapports techniques du PAM, PNUE/PAM, Athènes, 2006. (French only)

MTS 163. UNEP/MAP/MED POL: **Sampling And Analysis Techniques for the Eutrophication Monitoring Strategy of MED POL.** MAP Technical Reports Series No. 163. UNEP/MAP, Athens, 2005. (English)

MTS 162. UNEP/MAP: **Review And Assessment Of National Strategies For Sustainable Development In The Mediterranean Region.** MAP Technical Reports Series No. 162, UNEP/MAP, Athens, 2005. (English, French)
Bilan et évaluation des stratégies nationales de développement durable en méditerranée.

MTS 161. UNEP/MAP/BLUE PLAN: **Financing And Cooperation For Sustainable Development In The Mediterranean, Sophia Antipolis, France, 3 – 4 June 2004. Vols. I & II.** UNEP/MAP, Athens, 2005.
Financement et Coopération pour le développement durable en méditerranée : Sophia Antipolis, France, 3-4 Juin 2004 : Tomes I & II.

MTS 160. UNEP/MAP: **MAP CAMP Project "Lebanon": Final Integrated Project Document.** UNEP/MAP, Athens, 2005. (English).

MTS 159. UNEP/MAP/Blue Plan: **Dossier on Tourism and Sustainable Development in the Mediterranean.** UNEP/MAP, Athens, 2005. (English, French).
Dossier sur le tourisme et le développement durable en Méditerranée.

MTS 158. PNUE/PAM/PLANBLEU: **L'eau des Méditerranéens : situation et perspectives**. PNUE/PAM, Athènes, 2004. (French).

MTS 157. UNEP/MAP/MED POL/WHO: **Municipal wastewater treatment plants in Mediterranean coastal cities (II)** UNEP/MAP: Athens, 2004. (English, French).
Stations d'épuration des eaux usées municipales dans les villes côtières de la Méditerranée (II)

MTS 156. UNEP/MAP/MED POL: **Inventories of PCBs and nine pesticides**. UNEP/MAP: Athens, 2004. (English, French)
Inventaire des PCB et de neuf pesticides.

MTS 155. UNEP/MAP/MED POL: **Plan for the management PCBs waste and nine pesticides for the Mediterranean Region.** UNEP/MAP: Athens, 2004. (English, French).
Plan de gestion des déchets dangereux, y compris un inventaire des déchets dangereux dans la région méditerranéenne.

MTS 154. UNEP/MAP/MED POL: **Guidelines for the development of ecological status and stress reduction indicators for the Mediterranean Region.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices pour l'élaboration d'indicateurs d'état écologique et de réduction du stress.

MTS 153. UNEP/MAP/MED POL/WHO: **Guidelines for the management of industrial wastewater for the Mediterranean Region.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices pour la gestion des eaux usées industrielles dans la région méditerranéenne.

MTS 152. UNEP/MAP/MED POL/WHO: **Guidelines on sewage treatment and disposals for the Mediterranean Region.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur le traitement et l'élimination des eaux usées dans la région méditerranéenne.

MTS 151. UNEP/MAP/MED POL: **Guidelines for river (including estuaries) pollution monitoring programme for the Mediterranean Region.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices pour un programme de surveillance continue de la pollution fluviale (estuarienne y comprise) dans la région méditerranéenne.

MTS 150. UNEP/MAP/MED POL/WHO: **Reference handbook on environmental compliance and enforcement in the Mediterranean region.** UNEP/MAP: Athens, 2004. (English, French).
Manuel de référence sur le respect et l'application effective des dispositions environnementales dans la région méditerranéenne.

MTS 149. UNEP/MAP/MED POL/WHO: **Guidelines on environmental inspection systems for the Mediterranean region**. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur les systèmes d'inspection environnementale pour la région méditerranéenne.

MTS 148. UNEP/MAP/MED POL/WHO: **Guidelines on management of coastal litter for the Mediterranean region**. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur la gestion des détritus côtiers pour la région méditerranéenne.

MTS 147. UNEP/MAP/MED POL: **Plan for the management of hazardous waste, including inventory of hazardous waste in the Mediterranean region**. UNEP/MAP: Athens, 2004. (English, French).
Plan de gestion des déchets dangereux, y compris un inventaire des déchets dangereux dans la région méditerranéenne.

MTS 146. UNEP/MAP/RAC/CP: **Guidelines for the application of Best Available Techniques (BATs), Best Environmental Practices (BEPs) and Cleaner Technologies (CTs) in industries of the Mediterranean countries.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur l'application des meilleures techniques disponibles (MTD), des meilleures pratiques environnementales (MPE) et des technologies plus propres dans les industries des pays méditerranéens.
MTS 145. UNEP/MAP/RAC/CP: **Plan for the reduction by 20% by 2010 of the generation of hazardous wastes from industrial installations for the Mediterranean region.** UNEP/MAP: Athens, 2004. (English, French).
Plan de réduction de 20%, d'ici à 2010, de la génération de déchets dangereux provenant des installations industrielles dans la région méditerranéenne.

MTS 144. UNEP/MAP/MED POL: **Plan on reduction of input of BOD by 50% by 2010 from industrial sources for the Mediterranean region.** UNEP/MAP: Athens, 2004. (English, French, Arabic).
Plan de réduction de 50%, d'ici à 2010, des apports de DBO d'origine industrielle dans la région méditerranéenne.

MTS 143. UNEP/MAP/RAC/CP: **Guidelines for the application of Best Environmental Practices (BEPs) for the rational use of fertilisers and the reduction of nutrient loss from agriculture for the Mediterranean region.** UNEP/MAP: Athens, 2004. (English, French, Arabic).
Lignes directrices sur l'application des meilleures pratiques environnementales (MPE) pour l'utilisation des engrais et la réduction des pertes d'éléments nutritifs dans l'agriculture en région méditerranéenne.

MTS 142. UNEP/MAP/RAC/CP: **Guidelines for the application of Best Available Techniques (BATs) and Best Available Practices (BEPs) in industrial sources of BOD, nutrients and suspended solids for the Mediterranean region.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur l'application des meilleures techniques disponibles (MTD) et des meilleures pratiques environnementales (MPE) aux sources industrielles de DBO, d'éléments nutritifs et de matières en suspension pour la région méditerranéenne.

MTS 141. UNEP/MAP/MED POL: **Riverine transport of water, sediments and pollutants to the Mediterranean Sea.** UNEP/MAP: Athens, 2003. (English).

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MTS 140. UNEP/MAP/MED POL: **Mariculture in the Mediterranean**. UNEP/MAP: Athens, 2004. (English).

MTS 139. UNEP/MAP/MED POL: **Sea Water Desalination in the Mediterranean: Assessment and Guidelines.** UNEP/MAP: Athens, 2003. (English, French)
Dessalement de l'eau de mer en méditerranée: évaluation et lignes directrices.

MTS 138. UNEP/MAP/PAP: **MAP CAMP Project "Malta": Final Integrated Project Document and Selected Thematic Documents.** UNEP/MAP: Athens, 2003. (English).

MTS 137. UNEP/MAP/BLUE PLAN: **Free Trade and the Environment in the Euro-Mediterranean Context, Montpellier/Mèze, France, 5 – 8 October 2000**: Volume I: Technical Report of the Workshop; Volume II: Regional and International Studies; Volume III: National Studies; Volume IV: Environmental Aspects of Association Agreements (4 Vols), UNEP/MAP: Athens, 2002. **Libre-échange et environnement dans le contexte euro-méditerranéen : Montpellier/Mèze, France, 5 – 8 octobre 2000** (Parts in English & French).

MTS 136. UNEP/MAP/MED POL: **Guidelines for the management of fish waste or organic materials resulting from the processing of fish and other marine organisms**. UNEP/MAP: Athens, 2002. (English, French, Spanish & Arabic).

MTS 135. PNUE/PAM: **PAC DU PAM "Zone côtière de Sfax": Synthèse des études du projet, rapport de la réunion de clôture et autres documents choisis.** PNUE/PAM, Athènes, 2001. (French).

MTS 134. UNEP/MAP/PAP: **MAP CAMP Project "Israel": Final Integrated Report and Selected Documents.** UNEP/MAP: Athens, 2001. (English).

MTS 133. UNEP/MAP: **Atmospheric Transport and Deposition of Pollutants into the Mediterranean Sea: Final Reports on Research Projects**. UNEP/MAP: Athens, 2001. (English).

MTS 132. UNEP/MAP/WHO: **Remedial Actions for Pollution Mitigation and Rehabilitation in Cases of Non-compliance with Established Criteria.** UNEP/MAP: Athens, 2001. (English).

MTS 131. UNEP/MAP: **MAP CAMP Project "Fuka-Matrouh", Egypt: Final Integrated Report and Selected Documents**. (2 Vols.), UNEP/MAP: Athens, 2001. (English).

MTS 130. UNEP/MAP/WMO: **Atmospheric Input of Persistent Organic Pollutants to the Mediterranean Sea**. UNEP/MAP: Athens, 2001. (English).

MTS 129. UNEP/MAP/MED POL: **Guidelines for the Management of Dredged Material.** UNEP/MAP: Athens, 2000. (English, French, Spanish and Arabic).
Lignes Directrices pour la gestion des matériaux de dragage.
Directices para el manejo de los materiales de dragado.

MTS 128. UNEP/MAP/MED POL/WHO: **Municipal Wastewater Treatment Plants in Mediterranean Coastal Cities.** UNEP/MAP: Athens, 2000 (English, French).
Les Stations d'épuration des eaux usées municipales dans les villes cotiers de la Méditerranée.

MTS 127. UNEP/MAP/BLUE PLAN: **Minutes of the Seminar, Territorial Prospective in the Mediterranean and the Approach by Actors,** Sophia Antipolis, France, 7-9 November 1996. UNEP/MAP: Athens, 2000. In French with English introduction and 1 paper).
Actes du séminaire, La prospective territoriale en Méditerranée et l'approche par acteurs.

MTS 126. UNEP/MAP/MCSD/Blue Plan: **Report of the Workshop on Tourism and Sustainable Development in the Mediterranean, Antalya, Turkey, 17-19 September 1998**. UNEP/MAP: Athens, 1999. (English, French).
Rapport de l'atelier sur le tourisme et le développement durable en Méditerranée, Antalya, Turquie, 17-19 septembre 1998.

MTS 125. UNEP/MAP: **Proceedings of the Workshop on Invasive *Caulerpa* Species in the Mediterranean,** Heraklion, Crete, Greece, 18-20 March 1998. UNEP/MAP: Athens, 1999. (English, French). **Actes de l'atelier sur les especes *Caulerpa* invasives en Méditerranée,** Heraklion, Crète, Grèce, 18-20 mars 1998.

MTS 124. UNEP/MAP/WHO: **Identification of Priority Hot Spots and Sensitive Areas in the Mediterranean.** UNEP/MAP: Athens, 1999. (English, French).
Identification des "Points Chauds" et "Zones Sensibles" de polution prioritaire en Méditerranée.

MTS 123. UNEP/MAP/WMO: **MED POL Manual on Sampling and Analysis of Aerosols and Precipitation for Major Ions and Trace Elements.** UNEP/MAP: Athens, 1998. (English).

MTS 122. UNEP/MAP/WMO: **Atmospheric Input of Mercury to the Mediterranean Sea.** UNEP/MAP: Athens, 1998. English).

MTS 121. PNUE: **MED POL Phase III. Programme d'évaluation et de maîtrise de la pollution dans la région Méditerranéenne (1996-2005).** UNEP/MAP: Athens, 1998. (In publication)

MTS 120. UNEP/MAP: **MED POL Phase III. Programme for the Assessment and Control of Pollution in the Mediterranean Region (1996-2005).** UNEP/MAP: Athens, 1998.

MTS 119. UNEP/MAP: **Strategic Action Programme to Address Pollution from Land-Based Activities.** UNEP/MAP: Athens, 1998. (English, French)
Programme d'Actions Stratégiques visant à combattre la pollution due à des activités menées à terre.

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MTS 117. UNEP/MAP: **La Convention de Barcelone pour la protection de la mer Méditerranée contre la pollution et le développement durable.** UNEP/MAP: Athens, 1997 (Français seulement).

MTS 116. UNEP/MAP/IAEA: **Data Quality Review for MED POL (1994-1995), Evaluation of the analytical performance of MED POL laboratories during 1994-1995 in IAEA/UNEP laboratory performance studies for the determination of trace elements and trace organic contaminants in marine biological and sediment samples.** UNEP/MAP: Athens, 1997 (English).

MTS 115. UNEP/MAP/BP **Methodes et outils pour les études systémiques et prospectives en Méditerranée, PB/RAC, Sophia Antipolis, 1996.** UNEP/MAP/BP: Athens, 1996 (français seulement).

MTS 114. UNEP/MAP: **Workshop on policies for sustainable development of Mediterranean coastal areas, Santorini Island, 26-27 April 1996. Presentation by a group of experts.** UNEP/MAP: Athens, 1996 (Parts in English or French only). PNUE: **Journées d'étude sur les politiques de développement durable des zones côtières méditerranéennes, Ile de Santorin, 26-27 avril 1996. Communications par un groupe d'experts.** (Parties en anglais ou français seulement).

MTS 113. UNEP/MAP/IOC: **Final reports of research projects on transport and dispersion (Research Area II) - Modelling of eutrophication and algal blooms in the Thermaikos Gulf (Greece) and along the Emilia Romagna Coast (Italy).** UNEP/MAP: Athens, 1996 (English).

MTS 112. UNEP/MAP/WHO: **Guidelines for submarine outfall structures for Mediterranean small and medium-sized coastal communities.** UNEP/MAP: Athens, 1996 (English, French).
Lignes directrices pour les émissaires de collectivités côtières de petite et moyenne taille en Méditerranée.

MTS 111. UNEP/MAP/WHO: **Guidelines for treatment of effluents prior to discharge into the Mediterranean Sea.** UNEP/MAP: Athens, 1996 (English).

MTS 110. UNEP/MAP/WHO: **Assessment of the state of pollution of the Mediterranean Sea by anionic detergents.** UNEP/MAP: Athens, 1996 (English, French). PNUE/OMS: **Evaluation de l'état de la pollution de la mer Méditerranée par les détergents anioniques.**

MTS 109. UNEP/MAP/WHO: **Survey of pollutants from land-based sources in the Mediterranean.** UNEP/MAP: Athens, 1996 (English, French).
Evaluation de l'enquête sur les polluants d'origine tellurique en Méditerranée (MED X BIS).

MTS 108. UNEP/MAP/WHO: **Assessment of the state of microbiological pollution of the Mediterranean Sea.** UNEP/MAP: Athens, 1996 (270 pgs.) (English, French).
Evaluation de l'état de la pollution microbiologique de la mer Méditerranée.

MTS 107. UNEP/MAP/WHO: **Guidelines for authorization for the discharge of liquid wastes into the Mediterranean Sea.** UNEP/MAP: Athens, 1996 (English, French).
Lignes directrices concernant les autorisations de rejet de déchets liquides en mer Méditerranée.

MTS 106. UNEP/MAP/FAO/WHO: **Assessment of the state of eutrophication in the Mediterranean Sea.** UNEP/MAP: Athens, 1996 (English, French).
Evaluation de l'état de l'eutrophisation en mer Méditerranée.

MTS 105. UNEP/MAP/FAO/WHO: **Assessment of the state of pollution of the Mediterranean Sea by zinc, copper and their compounds.** UNEP/MAP: Athens, 1996 (English, French).
Evaluation de l'état de la pollution de la mer Méditerranée par le zinc, le cuivre et leurs composés.

MTS 104. UNEP/MAP/FAO: **Final reports on research projects dealing with eutrophication and heavy metal accumulation.** UNEP/MAP: Athens, 1996 (English, French).
Rapports finaux sur les projets de recherche relatifs à l'eutrophisation et à l'accumulation des métaux lourds.

MTS 103. UNEP/MAP/FAO: **Final reports on research projects dealing with biological effects (Research Area III).** UNEP/MAP: Athens, 1996 (English, French).
Rapports finaux sur les projets de recherche relatifs aux effets biologiques (Domaine de Recherche III).

MTS 102. UNEP/MAP: **Implications of Climate Change for the Coastal Area of Fuka-Matrouh (Egypt).** UNEP/MAP: Athens, 1996. (English).

MTS 101. PNUE: **État du milieu marin et du littoral de la région méditerranéenne.** UNEP/MAP: Athens, 1996 (français seulement).

MTS 100. UNEP/MAP: **State of the Marine and Coastal Environment in the Mediterranean Region.** UNEP/MAP: Athens, 1996 (English).

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