

PN-ACA-218

93298

HG V
Private Participation in Environmental Services

**National Strategy for
Private Sector Participation in the
Wastewater Sector in Tunisia**
Final

Prepared for
United States Agency for International Development
Regional Housing and Urban Development Office/Near East and North Africa

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April 1996



*Funds for production of this report were provided by the
United States Agency for International Development*

Acknowledgments

The team would like to thank the members of the HG V implementation committee and of the wastewater working group, the entire staff of the National Sanitation Office, and the representatives of the Ministry of Economic Development, the Ministry of Environment and Regional Planning, the Ministry of the Interior, and the National Environmental Protection Agency for their valuable assistance in the preparation of this study.

Note

This document is the final version of the study on the National Strategy for Private Participation in the wastewater sector in Tunisia. This version was studied by the HG V implementation committee and by the wastewater working group to make it possible to review the project and the draft and pre-final reports. The comments and suggestions made during these meetings have been included in this final version of the report. The contents of this report reflect only the opinions of its authors, and do not in any way engage the responsibility of the Tunisian authorities or the United States Agency for International Development.

List of Acronyms

ANPE	National Environmental Protection Agency (Agence Nationale de Protection de l'Environnement)
BOT	Build-Operate-Transfer
CNRPS	public sector wage-earners
CNSS	private sector wage-earners
CPSCCL	Local Government Loan and Support Fund (Caisse des Prêts et de Soutien aux Collectivités Locales)
FODEP	Anti-Pollution Fund
GOT	Government of Tunisia
MCI	Ministry of International Cooperation and Foreign Investment
MED	Ministry of Economic Development
MFIN	Ministry of Finance
MOE	Ministry of Environment and Regional Planning
MOI	Ministry of the Interior
O&M	operation and maintenance
ONAS	National Sanitation Office (Office National d'Assainissement)
PIC	Municipal Investment Plan
PMU	Performance Monitoring Unit
PPES	Private Participation in Environmental Services
SME	Small and Medium-Sized Enterprise
TD	Tunisian Dinars
USAID	United States Agency for International Development
UTICA	Tunisian Union for Industry, Commerce, and Handicrafts (Union tunisienne de l'Industrie, le Commerce et l'Artisanat)
VAT	value-added tax

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Executive Summary

Following a series of studies dealing with the feasibility of private sector participation in the field of wastewater, this report has been drawn up to present the framework for a national 20-year strategy to increase private sector participation in wastewater service delivery in Tunisia.¹ Two scenarios were designed and tested to assess their respective impacts on financial aspects of private sector participation, on O&M staff of the National Sanitation Office (ONAS — Office National d'Assainissement), and on the improvement of wastewater service coverage.

The goals set for this strategy during a roundtable discussion held with representatives of the main agencies concerned by this policy were:

- to reduce the financial dependence of ONAS on the central government;
- to reduce operating costs;
- to improve ONAS management;
- to improve quality of services; and
- to foster the emergence of new small and medium-sized enterprises (SMEs).

This study is intended to define the parameters for transfer of responsibility for wastewater service provision to the private sector, taking into consideration these goals.

The rate at which the operating and financing of facilities will be transferred from the public to the private sector will depend on a number of factors:

- the impact on ONAS employees;
- the capacity of ONAS to manage these new contracts effectively and efficiently;
- the effect on ONAS's budget; and
- the capacity of ONAS to assume responsibility for the new municipalities.

Two scenarios for transfer were envisioned. In the first, 100 percent of all facilities are transferred to private sector management. In the second, 50 percent of wastewater works are operated by private firms. The first scenario was retained as the better alternative.

Private sector participation in operating activities will affect the total number of jobs in the wastewater sector, since private sector personnel are expected to provide better output than ONAS employees. Nonetheless, job losses should not be considered as such, resulting as they

¹ These studies are the following: feasibility study for contracting out of operation and maintenance (O&M) of a network; feasibility study for contracting out O&M of three wastewater treatment plants; and study of the Performance Monitoring Unit.

will from improved productivity rather than from a loss of activity. Growth in activity in this sector means that few ONAS employees will be affected, and most will be able to find new work in the private sector.

The scenarios and the composition of the different projects (for systems and treatment plants) are based on certain guidelines. These types of contracts are those that have been considered as viable by the market study. They are:

- service contracts for systems;
- service contracts for treatment plants;
- management contracts for treatment plants; and
- Build-Operate-Transfer (BOT) for treatment plants.

Initially, a series of pilot projects is to be carried out for various conditions of private sector participation. Evaluation of these experiments will indicate what corrections are necessary for continuing the strategy.

The scenarios show that private participation in the wastewater sector will entail considerable savings for both ONAS and the Government of Tunisia (GOT). Because of uncertainty regarding costs and savings beyond the Ninth Plan, this analysis concerns only the Eighth and Ninth Plans. The following table summarizes the investment and operating costs for wastewater facilities (systems and treatment plants) for each scenario. It includes the costs for building and operating facilities entrusted to the private sector, and the investment and operating costs for those remaining with ONAS. It also shows the gains for each scenario in amounts and in percentage, compared with construction and operation exclusively by ONAS.

Table 1
Summary of Operating Costs (Eighth and Ninth Plans)

Scenario	ONAS Operating Costs (millions TD)	Savings in Comparison with Total Operation by ONAS (millions TD)	Savings in Comparison with Total Operation by ONAS (%)
1	63.8	6.2	9.7
2	60.0	5.8	9.6

Table 2
Summary of Investment Costs (Eighth and Ninth Plans)

Scenario	ONAS Operating Costs (millions TD)	Savings in Comparison with Total Operation by ONAS (millions TD)	Savings in Comparison with Total Operation by ONAS (%)
1	335.6	10.2	3.0
2	335.6	10.2	3.0

The study team recommends that operation be put in the hands of private operators, as is currently the case for construction of new works and, in large part, for studies. There is no reason why operation cannot be carried out in the same way as construction, since the model for integration of the private sector into operating services is, in large part, identical to that for construction. In regions where the private sector handles operations, ONAS will continue to be ultimately responsible for them and will remain in control of the situation, while the private sector simply carries out tasks on ONAS's behalf. This is true even in the case of BOTs for treatment plants, since the methods of concession involving greater autonomy of the private sector have not been selected.

Considering the various situations, and the 20-year period allowed for application of the strategy, true competition should become established due to the appearance of a certain number of new firms. The strategy calls for maintaining a certain operating capacity in every region during the first years of strategy implementation, to enable ONAS to intervene where required. At the end of strategy implementation, the system will be well-established and the emergence of new private operators will mean that ONAS will not be at the mercy of any one individual contractor.

Objectives and Background

In recent years, the GOT has taken initiatives to increase private sector participation in the provision of environmental services. As a part of these initiatives, ONAS, in collaboration with the United States Agency for International Development (USAID), has assessed various roles that the private sector might play in the field of wastewater. Following a series of studies to determine the feasibility of private sector participation (market study, study of norms and standards, feasibility study for a collection system, feasibility study for wastewater treatment plants, and study of the Performance Monitoring Unit), this report has been prepared to establish the framework for a 20-year national strategy for increasing private sector participation in wastewater service delivery in Tunisia.

The objective of this study is to define the parameters that should guide the transfer of responsibility for wastewater services. Based on the objectives identified by consensus during working group meetings in February 1995, the study was carried out with consistent reference to a number of objectives.

- The first objective is to reduce the financial burden of wastewater services on the GOT. The high cost of infrastructure and the heavy subsidies currently requested of the government lie at the origin of the present attempt to identify financially viable alternative solutions. The desire to improve efficiency and to reduce the costs of operating and maintaining wastewater facilities is another objective of this study. ONAS will gradually disengage itself from sewerage facility management and operation, and will award a growing number of contracts to the private sector. While the quality of ONAS services has always been exceptional considering the applicable standards, the response to customers' needs leaves much to be desired, implying that both the condition and the operational effectiveness of sewerage facilities should be improved, as should sensitivity to the desires of end users.
- A second objective is to provide sewerage services to new communities and to certain unserved older neighborhoods, which is already one of ONAS's responsibilities.
- Lastly, the GOT wants to promote the development of SMEs that could benefit from this vast new market.

The present strategy provides the tools required for analysis and decision-making regarding the transfer of wastewater services to the private sector.

This study was financed under the HG V program, Private Participation in Environmental Services (PPES). In addition to providing budget support for GOT programs in this field, this joint GOT-USAID program provides for funding through technical assistance grants that will facilitate increased private sector participation in environmental service financing and delivery.

Methodology

The present study was carried out in three stages.

1. The first stage involved study of the available documents, namely: the market study, the study on national infrastructure, the study on standard contracts, the study on norms and standards, the two feasibility studies, and other documents related to the wastewater sector. A summary document was drafted to underscore salient points and to raise the questions to be discussed by a working group composed of representatives from the Ministries of Environment and Regional Planning, the Interior, and Public Works and Housing, and by representatives of the National Environmental Protection Agency (ANPE — Agence Nationale de Protection de l'Environnement), ONAS, USAID, and PADCO. A meeting was held to discuss the chief arguments and the findings and recommendations of the above documents, and consensus was reached regarding the strategy's objectives. The specific fields requiring additional research were identified, and the group decided to meet once again to study the preliminary results of the research.
2. The study team then moved to the second stage of the study, collecting data on ONAS personnel and their employment benefits, the options available for private sector financing of wastewater facilities, existing regulations and the problems they may cause, and the feasibility of direct contracting between cities not served by ONAS and the private sector. Visits were made to three municipalities not served by ONAS to evaluate various options for unserved communities and to identify the best ways of including these communities in the national strategy. The results of this research were presented at the working group's second meeting, which was also attended by representatives of two of the cities visited. Discussion concerned every field on which research had been carried out, as well as the measures required to encourage former ONAS employees to set up private companies.
3. The third stage in the mission was one of additional research, analysis, and the drafting of a preliminary national strategy. A methodology was developed for the preparation of a schedule for implementation for investment and for transfer of responsibilities to the private sector. Two scenarios were chosen, and their impacts on ONAS staff, the ONAS budget, and the rapidity with which as-yet-unserved communities might be included were evaluated.

The Wastewater Sector in Tunisia

4.1 Institutional Framework and Regulations

4.1.1 Cities Served by ONAS

In the 1960s, wastewater collection and disposal in Tunisia was the exclusive responsibility of municipal governments. In 1974, in an attempt to improve wastewater services across the country, the Tunisian government created ONAS.

ONAS is a semi-autonomous state agency that operates under the oversight of the Ministry of Environment and Regional Planning (MOE). From the beginning, ONAS has been responsible for managing, operating, and maintaining all wastewater facilities located in the areas in which it assumed service responsibility. In 1993, its responsibilities were widened when it was made responsible for combating all forms of water pollution.

A new law, no. 93-41, of April 19, 1993 concerning ONAS, which rescinded law no. 74-73 of August 3, 1974 creating the agency, stipulates that ONAS is responsible for the management, operation, maintenance, replacement, and construction of any wastewater facility in cities served, particularly treatment plants, drainage channels into the sea, relay stations, and wastewater manifolds installed, in particular, within municipal limits or in any area of tourist or industrial development.

The secondary responsibilities of ONAS are as follows:

- to promote the distribution of treated water and sludge from treatment plants;
- to implement integrated projects involving treatment of wastewater, rainwater, garbage, and other waste;
- to implement projects of individual and rural sewage disposal for central and municipal governments;
- to study the possibilities for taking over storm sewer installations in its areas of intervention on behalf of local governments; and
- to carry out studies for local governments and to provide them with assistance and advice regarding the prevention of forms of pollution that might affect the water supply.

4.1.2 Cities Not Served by ONAS

In the cities not taken over by ONAS, the municipalities play an important role in urban sewerage. Whenever sewer system responsibility devolves to the municipality,² it becomes responsible for the municipality's public domain, which includes municipally owned lots on which wastewater facilities have been constructed. Among the road services and municipal facilities that are incumbent on the municipality, its technical services are responsible for

² Article 121 of law no. 75-33 of May 14, 1975 enacting the organic law of the municipalities.

maintaining, repairing, cleaning, and constructing sewers and for performing all types of wastewater works.³ Thus, the municipalities are directly involved in carrying out their wastewater programs.

4.2 Works

The goal of the national strategy is to plan the way in which operation, management, or even BOT of wastewater facilities can be delegated to the private sector. It is therefore appropriate to recall here the extent of existing facilities, as well as those that are planned or that have been identified as possible components in the private sector participation program. These facilities have already been presented in the market study, and we shall only repeat their outlines here.

In municipalities with over 2,000 inhabitants, wastewater and storm sewer systems total 6,300 km, of which 5,600 km (89 percent) are found in the 90 municipalities for which ONAS is currently responsible. Most of the system involves separate handling of wastewater and rainwater: the wastewater system represents 77.2 percent of the total linear distance, while single-system facilities represent 14.7 percent and the storm sewer system 8.1 percent. ONAS operates most of the country's 256 pumping stations, with a total power of approximately 6,000 kW, and all of the 45 treatment plants. There are also other, more specific wastewater facilities, such as buffer basins, oueds, etc. A list of treatment plants, indicating the processes of water and sludge treatment used, is found in the appendices.

The parts of the system that have been built in recent years are generally in good condition, while the older parts are in a poor state of repair. On the whole, the system is in relatively good condition, which explains the low upgrading rate of 0.48 percent (or 27 out of 5,600 km).

To identify future needs with respect to wastewater infrastructure, ONAS carried out a "Feasibility Study for 2000," including all Tunisian towns whose population was more than 2,000, with the exceptions of Greater Tunis, Greater Sousse, Greater Sfax, Greater Gabès, and Greater Bizerte, for which specific wastewater master plan studies had already been prepared. Through these studies it was possible to identify projects that should be implemented by the year 2001. Carrying out all these projects will, however, require considerable financing and a much higher implementation capacity than is currently available. Implementation of these programs, which are the different built-up areas' highest priority in terms of wastewater, may therefore extend beyond the specified time limit (2000).

According to these hypotheses, the sewerage system will be increased by 5,500 km of pipes, which represents nearly a doubling of the existing system. The number of treatment plants will increase by 155 to handle 326,000 kg of BOD per day, and 173 new pumping stations will be built for a total power of 8,000 kW. When these projects have been completed, total wastewater facilities will represent 11,800 km of pipes, 160 treatment plants, and 429 pumping stations.

³ Article 129 of law no. 75-33.

Appendix A presents tables showing, city by city, existing wastewater facilities, the facilities identified by the 2001 study, and the master plans.

4.3 The Current Roles of the Public and Private Sectors

4.3.1 Public Sector

Cities Served by ONAS

ONAS has territorial jurisdiction throughout the Republic of Tunisia, and intervenes in the cities for which it is responsible at the official request of the municipality concerned, following publication in the Official Gazette of a decree transferring full ownership of wastewater facilities from the municipality to ONAS. ONAS is currently responsible for the operation of community wastewater facilities in 90 of the country's largest 257 municipalities; the population of these 90 municipalities represents 77 percent of the total municipality population. ONAS currently operates approximately 5,600 km of wastewater and storm sewer systems, 256 pumping stations, and 45 treatment plants in various parts of the country, particularly along the coast. These treatment plants process an annual volume of 96 million cubic meters of water, 74 percent of the wastewater discharged in the cities for which it is responsible. The average treatment output of all stations is 96 percent. In 1993, the average flow represented 93 percent of total system capacity.

The activated sludge process is used in all cases, in all its forms: medium-load, low-load (oxidation channel and others), and extensive (optional oxidation ponds). Sludge is usually treated aerobically, although anaerobic treatment is employed in certain cases. Gas recovery is applied in only one instance, where it is used to heat the plant's digesters.

Very little of the treated water is reused, with only 20 percent of the volume of treated water going to agriculture. Sludge reuse varies considerably from one plant to another.

Wastewater is discharged principally through combined systems (wastewater and rainwater drainage) in old urban areas, and through separate systems in almost all recently equipped areas. In the absence of sewer systems, wastewater is usually discharged into cesspools. Some cities also have communal septic tanks.

ONAS annually extends its systems by approximately 170 km annually, and repairs some 30 km per year (1993).

Cities Not Served by ONAS

In the 167 small municipalities not yet served by ONAS, wastewater system operation continues to be assured by the municipalities, although ONAS does intervene in these small municipalities to do studies and to carry out new projects for the government, the municipalities, or third parties.

In all cities, whether or not they are served by ONAS, most wastewater is discharged through combined systems (wastewater and rainwater drainage) in old urban areas and through separate

systems in almost all the areas newly equipped with wastewater systems. The systems are much more highly developed and the rates of system connection are greater in the cities for which ONAS is responsible than in the others. In the absence of sewer systems, wastewater is usually discharged into cesspools. Some cities also have communal septic tanks.

In addition to ONAS and the municipalities, certain government agencies, including the Residential Land Development Agency, the Industrial Estate Agency, and the Tunisian Real Estate Company, build wastewater facilities, particularly sewer systems. Plans for these must first be approved by ONAS, and the works are transferred to ONAS in cities managed by the agency and to the municipalities in cities that are not.

4.3.2 Private Sector

The private sector has long been involved in wastewater activities in Tunisia. ONAS sub-contracts nearly all large and medium wastewater studies to the private sector, and has private firms carry out its projects of system extension and upgrading and construction, as well as construction of treatment plants and pumping stations. Training programs, too, are usually carried out by the private sector.

Private sector participation in O&M is minor, since ONAS maintains its own facilities using its own personnel. ONAS occasionally calls on the services of the private sector for certain maintenance tasks, and rarely for tasks related to operation.

ONAS is not authorized to work on private property; thus, the private sector operates and maintains sewer systems and facilities on hotel grounds and industrial sites, as well as on public sites, including schools, hospitals, and government offices. The private sector also empties privately owned cesspools, septic tanks, and grease pits.

Private wastewater firms, whose numbers are increasing, are also now building facilities, notably sewer systems. The plans for these are first approved by ONAS, and the facilities are transferred to ONAS in the cities that it has taken over and to the municipalities in other towns.

4.4 Financing

4.4.1 Public Sector

Primary infrastructure is financed from the financial operations component of the state budget and by government-secured loans. Funding is generally available on good terms, particularly through international loans, foreign cooperation, and debt recycling. Service on the debt is entered in the ONAS annual budgets. Loans are repaid from the investment budget, while interest charges are paid from the operating account.

When secondary and tertiary systems are built by real estate operators, the cost of these is included in the sale cost of the products and is paid entirely by the purchaser. ONAS also builds systems at the request of owners and as part of large system extension projects.

Operating expenditures are financed through:

- wastewater rates collected from users;
- contributions from the municipal development fund;
- central government transfers; and
- revenues from new connections and other services.

Municipalities

Generally speaking, primary infrastructure is financed and built by the GOT. Tertiary facilities within neighborhoods are usually paid for by the adjacent owners. Secondary infrastructure is sometimes financed in this way, but is usually paid for entirely from the Title II municipality budgets. Title II resources come from the Local Government Loan and Support Fund (CPSCL — Caisse des Prêts et de Soutien aux Collectivités Locales) or foreign borrowings (bilateral and multilateral institutions), financial aid, equipment subsidies or delegated credit, deductions from reserve allowances (constituted by the incorporation of surpluses from previous fiscal years), or allocation of surplus Title I amounts. In addition, law no. 75-33, article 132, provides for the beneficiaries of infrastructure projects participating in their financing, although the decrees to enforce this article have not yet been published. Operating expenses are charged entirely to the municipality operating budget (Title I).

Table 3
Financing Terms of Loans to Local Governments and ONAS

Line of Credit	Amount	Use	Rate	Term	Grace Period	Terms
CPSCL		Controlled landfills	Loan: 35% of the total at 6.5% Subsidy: 45% Municipalities: 20%	15 years	1 year	The project must be a part of the Municipal Investment Plan (PIC)
CPSCL		Equipment purchase	Loan: 72% of the total at 4% Municipalities: 28%	7 years	1 year	The project must be a part of the Municipal Investment Plan (PIC)
CPSCL		Purchase of land	Loan: 50% of the total at 6.5% Municipalities: 50%	15 years	1 year	The project must be a part of the Municipal Investment Plan (PIC)
CPSCL		Studies	Loan: 100% of the total at 6.5%	3 years		The project must be a part of the Municipal Investment Plan (PIC)
Sweden	Debt recycling	Environmental projects				Secured by the Republic of Tunisia
Netherlands	Debt recycling	Environmental projects				Secured by the Republic of Tunisia
Switzerland	Debt recycling	Environmental projects				Secured by the Republic of Tunisia

4.4.2 Private Sector

Currently, funding sources available to the private sector for investment in wastewater facilities are not often used.

The Anti-Pollution Fund

The Anti-Pollution Fund (FODEP) was set up with the aim of preventing pollution and promoting environmental protection by encouraging actions to combat industrial pollution. It is a financial tool funded primarily from grants and loans to the Tunisian government, fines paid by companies guilty of pollution, endowments from the central government budget, and taxes earmarked for the fund. The aim of the FODEP is to prevent pollution and to promote environmental protection.⁴

The FODEP can help finance joint anti-pollution facilities built by public or private operators for industrial firms, and can be particularly effective in the case of joint installations of pollution prevention such as pre-treatment plants. The FODEP provides assistance in the form of a subsidy that may amount to up to 20 percent of the initially approved investment cost. In addition to the subsidy, firms that are eligible for FODEP assistance may obtain bank credit and an exemption from the value-added tax (VAT) and from customs duties.

	Use	Rate	Term	Grace Period
FODEP	To finance depollution installations	Rate set by the Central Bank of Tunisia	7 to 10 years	3 years

Local Financing

Development Banks

The mandate of the development banks is to finance industrial projects, through equity loans, financing of working capital and/or financing of capital goods and services. In deciding whether to grant a loan, the bank evaluates the technical and economic risks of a project and its profit-making potential. The greatest obstacle to obtaining such credit is the requirement that the promoter provide the customary collateral from within and outside the project.

Line of Credit	Amount	Use	Rate	Term	Security
Medium- and long-term	Max. 70% of the total investment	Financing of industrial projects	13% 13.5%	≤ 10 years > 10 years and ≤ 15 years	Standard prudential regulations

⁴ It was set up by law no. 92-122 of December 29, 1992 and by the enforcement degree no. 93-2120 of October 25, 1993.

Merchant Banks

Merchant (or deposit) banks participate in financing economic development projects, including industrial projects, through short-term loans (working capital, treasury, discount, etc.), and medium- and long-term credit (purchase of capital goods, etc.). In deciding whether to grant a loan, the bank evaluates the technical and economic risks, the profit-making potential, and the firm's ability to provide the customary collateral from within and outside the project. Given the regulations stipulated by the Central Bank (mandatory collateral) and the necessity of establishing a sounder balance sheet, merchant banks are now highly cautious regarding the financing of new projects and new firms.

Table 4
Usual Conditions for Bank Loans

Line of Credit	Use	Rate	Term	Collateral Line
Short-Term	Industrial project financing	12% minimum	Less than 3 years	Standard prudential regulations
Medium-Term	Industrial project financing	14% minimum	Between 3 and 5 years	Standard prudential regulations
Long-Term	Industrial project financing	14% minimum	Between 5 and 10 years	Standard prudential regulations

International Financing

Western countries have provided Tunisia with several lines of credit at below-market rates to stimulate local investment and encourage joint ventures. Management of these credit lines is normally reassigned to Tunisian commercial and development banks, and, in granting credit, these banks apply their own standard prudential regulations (internal and external guarantees, domiciliation, etc.).

These lines of credit are earmarked either for the purchase of goods and services imported from the donor country or for the financing of joint ventures (equity loans, financing of working capital or financing of a project or a promoter). The second category of financing requires that a joint venture already exist between a Tunisian firm and a firm originating in the donor country.

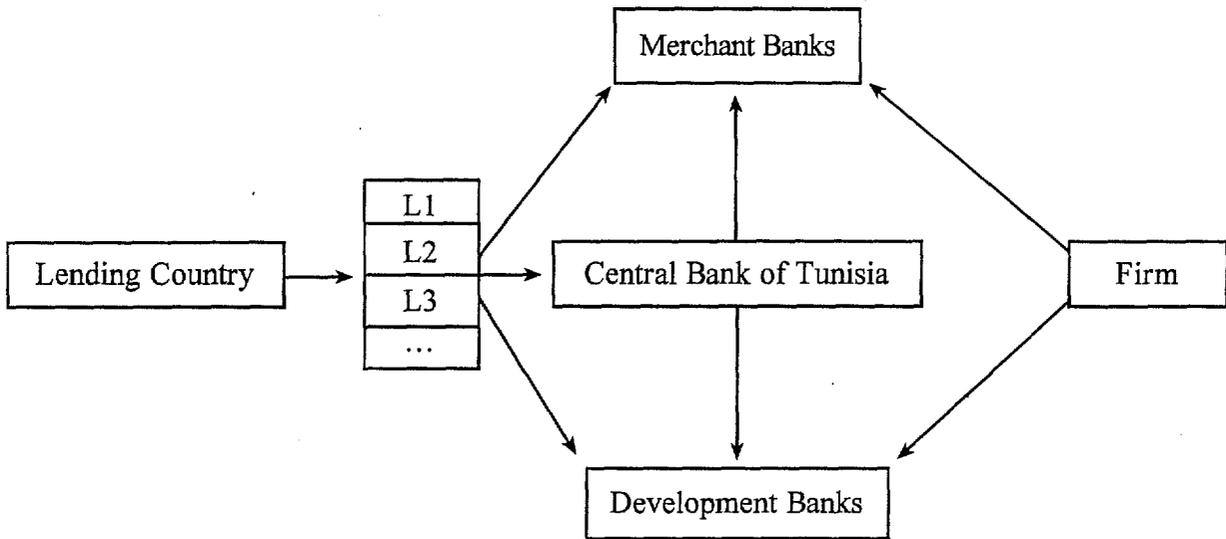
Table 5
The Terms of Credit Lines and the Conditions for Their Use

Line of Credit	Amount	Use	Rate	Term	Grace Period	Collateral Line
BEI financing	Maximum amount: 1 million ecus per promoter Financial package: 7 million ecus for Tunisian promoters; 4 million ecus for EU promoters	1. Equity loans 2. Financing of BDET portfolio investment	1. Without interest 2. If dividends are paid, 66% of the dividends are to be paid back to BEI/BDET	15 to 20 years		
Belgium	Financial package: BFr100 million	1. Purchase of goods and services 2. Equity loans 3. Credits to finance a project or a promoter	5% (if the loan is in BFr) 8% (if the loan is in TD)	10 years	4 years	Standard prudential regulations of Tunisian banks
Wallonia	Financial package: BFr30 million	1. Financing of purchase of goods and services of Wallonian origin 2. Equity loans 3. Credits to finance a project or a promoter	4% (if the loan is in BFr) 7% (if the loan is in TD)	10 years	4 years	Standard prudential regulations of Tunisian banks
France (Beregovoy line)	Maximum amount: TD3 million per firm Financial package: FFr100 million	1. Financing of the purchase of new goods and services of French origin 2. Financing of working capital requirements 3. Equity loans 4. Financing of portfolio investment	5% (if the loan is in FFr) 8% (if the loan is in TD)	10 years	4 years	Standard prudential regulations of Tunisian banks
France (balance of payments assistance)	Minimum amount: FFr200,000	Financing the import of capital goods of French origin	11% (loan in TD)	5 years		Standard prudential regulations of Tunisian banks
France (PROPARCO)	No ceiling	1. Equity financing (5% to 30%) 2. Direct loans to Tunisian promoters	3.5% (with guarantee by the Tunisian government) Rate set in relation to project earning power (without Tunisian government guarantee)	14 years > 12 years	5 years 1 to 5 years	Standard prudential regulations of French and Tunisian banks (in the case of direct loans)
Sweden	Financial package: \$20 million	Financing of the purchase of goods and services of Swedish origin	8% (loan in TD)	8 years	2 years	Standard prudential regulations of Tunisian banks
Italy	Financial package: \$60 million	1. Financing of the purchase of goods and services of Italian origin 2. Financing of working capital requirements 3. Equity loans	4.75% (if loan in dollars or lira) 7.75% (if loan in TD)	10 years	4 years	Standard prudential regulations of Tunisian banks
Canada	Can\$100 million	Financing of the purchase of goods and services of Canadian origin				Standard prudential regulations of Tunisian banks

Note: TD1 = US\$0.93

The following diagram illustrates the procedure by which a private firm can obtain credit from a donor-country line of financing. It shows clearly that, from the firm's standpoint, an international loan has only one advantage over a loan of local origin: the usually lower interest rates. Otherwise, the domestic banks practice the same prudential regulations; in particular, they require the same external guarantees as for a domestic loan. In addition, it is important to note the number of filters between the donor country and the final beneficiary: donor country, Tunisian government, Central Bank of Tunisia, merchant, and development bank. Each of these filters acts to monitor and control (after the fact in the case of the donor country, prior to the loan for the others) the granting of these loans and the respect of the conditions for eligibility for these financing sources, explaining in large part why these funding sources (with the exception of the French credit lines) have met with so little success among Tunisian operators.

Figure 1
How a Private Firm Obtains an International Loan



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The Strategy for Private Sector Participation

5.1 Guidelines

Guidelines have been established for preparing the national strategy and the sample program for awarding contracts to operate wastewater facilities. These involve both primary and secondary principles.

5.1.1 Primary Principles

The primary principles are those that define the major lines of the national strategy. **The findings of the market study provide baseline data for the national strategy.** Before embarking on a policy of private sector participation in the operating and financing of wastewater facilities, ONAS adopted a rational approach that began with a market study to determine whether the new policy met certain criteria for preserving ONAS's interests and facilitating the participation of the private sector, which was interested in engaging in this new activity. The market study is therefore a preliminary step in preparing the national strategy and the sample guide for its future policy of private sector participation, the subject of the present report. Following discussion, the findings of the market study were adopted by the Project Implementation Committee.

Only certain types of contracts were selected. The market study examined the various types of contracts for service delegation and for financing, selecting those that were deemed viable in the current Tunisian context for both the public and the private parties. Given that management contracts imply a greater commercial risk for private companies than do other types of contracts, the study recommended awarding management contracts only for treatment plants built within the last five years. It was decided to reserve concession (BOT) contracts for new treatment plants and to award them at the time construction is planned. Service contracts will apply to treatment plants and will be awarded for treatment plant facilities and for systems.

The different types of contracts are to be evaluated on the basis of pilot projects before replication. ONAS has extensive experience in managing contracts for studies and for new facilities, but little experience in the management of service delegation contracts. Since this is a new activity for the agency, it adopted a cautious approach. The decision was made to enter this new domain gradually, through pilot projects chosen for the different types of contracts that are considered viable. A program of pilot projects is proposed that covers five years and comprises five services contracts for systems and six treatment plant contracts, including one BOT (see Appendix B). Between six months and one year after awarding each pilot contract, ONAS will evaluate the project and make the necessary adjustments for future contracts. Thus, the pilot projects will be ONAS's first concrete actions and will constitute a valuable experiment from which it can draw the necessary lessons before embarking on the program of generalized private sector participation in wastewater disposal.

ONAS's capacity to produce new works will determine the size and the composition of the new contracts. According to the five-year plans and given the possibility for private financing of wastewater infrastructure, the wastewater system managed by ONAS will grow considerably in the short and medium term. This program will determine the size and the composition of new private sector O&M contracts as a function of the absolute size and growth rate of ONAS's entire system. In the case of small projects, the program will specify the year in which the project becomes large enough to generate a profit for a private firm and therefore can be considered for private sector participation.

The pace of implementation of the private participation program will be determined by the administrative and financial capacity of ONAS. The resources that will be generated by the policy of private sector participation will be taken into account. The provisional investment program mentioned above must also take into account ONAS's financial and technical capacities. The implementation procedures of the new policy, as well as the management of the new contracts, will be integrated into ONAS's existing organizational structure as the privatization process proceeds.

The impact on the ONAS employment situation resulting from private sector participation will be minimized. Transferring certain tasks that require large numbers of employees to the private sector will require reorganizing human resources, redistributing functions within ONAS, and drafting a staff management plan for the transition period, to avoid the employment problems that usually result from this type of change. Appropriate measures will be identified to mitigate this difficulty, and the program for private participation must take this aspect into consideration when defining the speed, the duration, and the final goal of private sector involvement.

Awarding of contracts to the private sector will apply to both the wastewater and the storm sewer systems. When ONAS or a municipality makes the private sector responsible for operating wastewater and combined drainage systems in a given area or city, it also makes it responsible for operating the rainwater drainage system in that same area or city. The municipality concerned should make ONAS responsible by contract for operating the storm sewer system in return for payment; in this way, the private sector need deal with only one agency, to which it is obligated by a single contract.

Priority will be given to cost-effective contracts. The goal is to attract the largest possible number of private operators and to rapidly create a climate of competition that will ultimately be beneficial to ONAS. The planning of cost-effective contracts will assist in this process.

5.1.2 Secondary Principles

The program of private sector participation should also, to the extent possible, take into account certain secondary principles, including the following.

The different types of private firms should be targeted when the projects are defined. Small projects may be of interest to young Tunisian firms or to traditionally structured Tunisian firms with no technical or financial contribution for this sector. Large projects might interest international operators (in joint ventures with Tunisians), which would have the advantage of offering a technological, organizational, or even financial contribution. Medium-sized projects might interest Tunisians with the assistance of capital from Tunisian businessmen operating in other sectors, probably with the assistance of Tunisian technicians. In addition, the number of projects must remain within reasonable limits, so as not to overburden ONAS with excessive contract management responsibilities and undue numbers of counterparts.

ONAS should retain some capacity (in human and material resources) for intervention. Wastewater collection and disposal is a public service, making it important to avoid failure and to ensure service continuity under all conditions. ONAS should therefore retain some capacity for intervention in every region, awaiting implementation of procedures covering contract termination and reassignment of the works to another contractor.

Greater Tunis will be divided into a certain number of large projects, to encourage the participation of foreign O&M firms. Tunis's size should make it possible to establish relatively large projects without excessive geographic dispersal. The Greater Tunis network, which in itself represents 38 percent of the ONAS-managed pipeline system, can be divided into four projects corresponding to the catchment areas of the treatment plants. For Greater Tunis, it would be possible to define two relatively large projects of approximately 800 km each, and two more moderately sized projects of 300 and 430 km, respectively. This would attract large international operators who would not be interested in smaller projects, and the participation of large operators would give ONAS access to new methods of wastewater facility operation and management, which could provide new impetus for other operators, and even for ONAS itself.

Some harmony should be introduced into the distribution of system projects and treatment projects. System projects and treatment projects each have their specific characteristics, defined by the tasks involved, the diversity of contract types (services in the case of systems; services, management, and BOT in the case of treatment plants), and above all the differences in geographical distribution between treatment plants and systems. The distribution of treatment plant projects should, to the extent possible, be matched with systems distribution, to minimize ONAS management costs. Planning and building treatment plants takes longer than planning and installing systems, because of differing urgencies and priorities, inevitably causing an increase in the number of treatment projects in a region corresponding to a single system project.

The cities selected for this study include the cities of the feasibility study for 2000 (those whose population was over 2000 in 1992), plus Greater Tunis and the cities of Sfax, Sousse, Bizerte, and Gabès. Greater Tunis is cut up according to the boundaries of the ONAS centers, not according to government-defined divisions, a decision made with reference to available information (especially statistical data). The list of cities includes the great majority of urban population centers that might be concerned by the program for private sector participation in wastewater activities, and totals 222 cities (or ONAS centers, as the case may be).

The various principles may at times have mutually contradictory effects, or they may hinder achievement of the objectives set with respect to private participation. In drafting the scenarios, a balance has to be struck among these different priorities. One objective of the private participation program is to give ONAS new financial resources to increase its independence from the government budget and enable it to extend its activity. A faster introduction of this program might raise problems for ONAS staff management and for the restructuring of its current organization or leave private firms insufficient time to prepare themselves for the new market.

5.2 Cities Not Served by ONAS

Cities that are not served by ONAS could be assigned to private operators either directly by the municipality or by ONAS after it has itself assumed responsibility for them. There are advantages and disadvantages to each of these options.

Extension of ONAS responsibility to these cities has the following advantages.

- These municipalities currently have few, if any, specific resources for covering the operating expenses of a service corresponding to accepted professional standards. If ONAS takes responsibility for such municipalities, it can collect the sewerage rates. Instituting rates similar to those collected by ONAS to benefit the municipalities would raise the problem of national rate-setting, since the financial equilibrium of sewerage services varies from one municipality to another, and is quite different from that of ONAS, which has the advantage of economies of scale. National rate-setting by ONAS would make it possible to equalize rates among the cities served.
- The municipalities not served are usually relatively small and their wastewater infrastructure is limited. Taken individually, contracts for such works would hold little attraction for the private sector. ONAS, on the other hand, is capable of packaging projects that could cover several municipalities and would therefore be more profitable.
- Direct management by the municipalities of a wastewater system operating contract with the private sector would require setting up a qualified service in every municipality, and would thus necessitate recruiting supervisory staff and trained technical staff, when ONAS itself would, after awarding a certain number contracts for operation of its facilities, already have more than sufficient numbers of such staff. What is more, there is absolutely no way of transferring such excess personnel from ONAS to the municipalities, given the differences in professional status and the employee benefits granted.
- Responsibility for wastewater throughout the country will remain with ONAS, thus allowing better planning of new facilities and better management of priorities.

Nevertheless, awarding these cities' wastewater services by the municipalities directly to private operators does have the advantage of strengthening the municipalities' prerogatives and fostering decentralization.

A specific study will be carried out under the HG V program to study the advantages and disadvantages of the different possibilities in greater detail, with a view to choosing the system by which to handle awards to the private sector.

Regardless of the method selected, the fact that such cities do not have large drainage infrastructure and the bad condition of existing facilities mean that private sector contract awarding should be made after completion of work to repair and extend sewerage facilities.

5.3 Types of Contracts

The market study identified the different ways of delegating drainage works to the private sector (service contract, management contract, concession) that are compatible with the Tunisian context. It then studied the different types of contracts, to determine whether they satisfied the conditions and criteria of the public and private sectors and of the users. These criteria particularly concerned potential savings for the public service, improvement of service quality and speed for users, and a minimum cost-effectiveness for the private companies. The following standard contracts were selected following analysis of these criteria, and these will be envisaged in the national strategy:

- service contracts for systems;
- service contracts for treatment plants;
- management contracts for treatment plants; and
- BOT contracts for treatment plants.

For reference, we give below a brief definition of each of these types of contracts.

5.3.1 Service Contracts for Systems

A service contract implies subcontracting sewer system operation to a private company for five years. Such contracts apply to the activities involved in operating the system for collecting, intercepting, and transporting household, tourist-area, and industrial wastewater, pumping and relay stations, and overflows. They concern wastewater drainage systems, combined systems, and storm sewer systems. The private company pays the expenses of personnel, supplies, and replacement of inexpensive spare parts (which are defined in the contract). Equipment purchase can be handled in various ways (e.g., rental or hire-purchase of ONAS equipment for its operating activities; see the section on "Means" in the market study). Rate-setting, billing of clients, and customer relations remain the responsibility of the public agency.

In its specifications, ONAS defines the performance criteria for the execution of the specific tasks assigned to the private contractor, evaluates the service offers by comparing them with current costs, awards the contract, supervises the activities of the private assignee, and pays him an agreed-upon price for his services. This price is based on unit prices specified in the contract.

5.3.2 Service Contracts for Treatment Plants

A service contract for treatment plants implies subcontracting with a private company to operate one or more treatment plants for five years. Such contracts apply to the activities involved in operating wastewater treatment plants and the relay pumping stations attached to them.

In this type of contract, the private company assumes responsibility for the expenses of personnel, supplies, and electricity, as well as replacement of inexpensive spare parts (defined in the contract). Rate-setting and customer billing remain the responsibility of the public agency.

In its specifications, ONAS defines the performance criteria for the specific tasks, the rules of operation, and the disposal standards. It evaluates the service tenders, comparing them with current costs, awards the contract, supervises the private firm's activities, and pays him the agreed-upon price for his services, which is based on unit prices related to the volume of treated water (in cubic meters).

This type of contract could also apply to plants for individual or joint pre-treatment of industrial wastewater, in which case the contract can be awarded to a specialized private company by the group of industrial firms.

5.3.3 Management Contracts for Treatment Plants

Under this type of contract, ONAS transfers treatment plant management to a private company for 10 years. The company is then responsible for operating the plant, for replacing spare parts regardless of their cost, for replacing worn equipment, and for paying for the materials and electrical energy used. The private company must provide the equipment and materials required to perform its assigned tasks. Rate-setting, customer billing, and customer relations remain the task of the public agency.

In its specifications, ONAS defines the performance criteria for the specific tasks, the rules of operation, and the disposal standards. It evaluates the service tenders, comparing them with current costs, awards the contract, supervises the private assignee's activities, and pays him the agreed-upon price for his services, which is based on unit prices related to the volume of treated water in cubic meters.

A management contract may also apply to systems of industrial wastewater pre-treatment, in which case the contract should be awarded directly to a specialized private company by a group of industrial firms.

5.3.4 BOT Contracts for Treatment Plants

In this type of contract, ONAS makes a private company responsible for building a new treatment plant or for extending an existing one, and grants it exclusive operating and management rights for the facility for at least 15 years. Rate-setting, customer billing, and customer relations remain the responsibility of ONAS. At the end of the contract, the private company transfers full ownership of the facility to ONAS on terms that are specified in the contract. In a BOT

contract, joint financing by ONAS and the private company or the use of international financing can improve cost-effectiveness. The private contractor's financial compensation is based on the price per cubic meter of treated water.

This type of contract may also apply to systems of pre-treatment of industrial wastewater, in which case the contract should be awarded directly to a specialized private company by the concerned industrial firms.

The types of contracts described above have been determined to be cost-effective under current economic conditions. Such conditions could change considerably in the next few years, modifying the findings of the market study, and certain types of contracts that were not selected might become profitable under different conditions. It is therefore recommended that this study be updated at least once every five years, at the same time that the five-year plans are being drawn up.

5.4 Establishing Bid Packages for the Contracts

One of the most important tasks in drawing up a plan to delegate responsibilities in the field of wastewater is determining how the services and facilities will be grouped. Here, ONAS's administrative structure should be tapped, since it has the advantage of already being in operation. The existence of ONAS management nuclei in various regional urban centers will ensure the success of any implementation of the strategy for private sector participation.

ONAS has broken the country down into five large areas, which group the country's 23 governorates on the basis of geography, economy, and typical activity. The activities of any one region are managed at the level of the governorate seat. Every ONAS governorate and administrative region has cities whose wastewater infrastructure has been taken over by ONAS, and others in which this has not yet occurred.

In establishing the different contract packages, consideration should be given to a certain number of principles for identifying system projects and treatment plant projects, which can include a number of municipalities from a single region.

The sites for the pilot projects were initially selected with a view to diversifying the difficulties and problems that ONAS might encounter in managing these contracts. The selected sites were scattered among the different ONAS organizational regions and were chosen in both large and small cities, with a certain geographical dispersal. This approach was borne in mind in developing the scenarios.

Establishment of the projects should take into consideration the elements mentioned below.

5.4.1 Projects Must Be of a Certain Size If Their Operation Is to be Cost-Effective

The market study made it possible to define the minimum size of projects that can be operated profitably by the private sector. It has been established that systems with a minimum conduit length of approximately 150 km constitute an interesting base for a SME operating in this sector, while for the minimum treatment plant project that will be of interest to a specialized company is what is called "medium-load" (minimum 3,000 kg BOD per day). Smaller facilities will be incorporated into other projects, and transfer of these will be considered as soon as they reach the minimum size. Thus, these projects will be transferred later in ONAS's plans, at the time when future five-year investment plans are being drawn up.

For small installations of under 1,000 kg BOD per day (oxidation ponds or very small activated sludge plants), consideration will be given to the idea of grouping together all the plants in a given administrative and geographic region.

In regions with a number of medium-sized plants in operation, these will be grouped to make a larger project (10,000 to 20,000 kg BOD per day), which will be offered to the private sector as a single entity. Contracts for projects such as these would be awarded to firms of greater scope and financial capacity.

5.4.2 Projects Will Be Established on the Basis of the ONAS Investment Program

The ONAS investment program provides for complete coverage of all the country's municipalities by the end of the 11th investment plan, i.e., at the end of the year 2006. The investment program is decisive in determining the size and therefore for the cost-effectiveness of the projects. Thus, in the case of certain projects, it affects the time at which they should be awarded to private firms. Similarly, the awarding of certain projects under the BOT system affects the investment program, since it makes income generation possible.

5.4.3 Profiting from the Current ONAS Structure

It is important to profit from the current decentralized administrative structure of ONAS to ensure suitable monitoring of service transfer to the private sector. ONAS plans to set up Performance Monitoring Units (PMUs) to manage and monitor operating contracts awarded to private firms, and these PMUs should have a certain support framework that ONAS can provide them through its regional offices. Thus, by retaining some of its administrative structures and service equipment in each region, ONAS is in a position not only to facilitate the establishment of these PMUs, but also to ensure their operations very quickly, without disrupting the administration or operation of the facilities remaining under its responsibility.

5.4.4 ONAS Capabilities for Operating Wastewater Infrastructure Should Be Maintained

In preparation for transferring a large part of the wastewater facility operation to the private sector, it is important to ensure that a basic infrastructure of public operation is maintained in the regions served, so that any inability on the part of a private firm to carry out its assignment can be offset as quickly as possible. Since the governorate capitals are the base or headquarters for the staff and equipment of ONAS's decentralized regional centers, it has been deemed

necessary to delay privatizing the specific sectors in which the ONAS regional centers have been set up. These centers, therefore, constitute natural projects that could also, although only in the longer term, be assigned to the private sector. This approach would ensure the presence of ONAS in all regions, and will make it easier to set up the appropriate PMUs, whose responsibility will be to assure monitoring and execution of the tasks assigned to the private sector.

5.4.5 Tunis Is a Special Case

Tunis is the country's economic and political center. It is also the city with the longest collection system, representing approximately one-quarter of the country's total system. ONAS's headquarters in Tunis concentrate most of the management and operation resources. It is in Tunis that human, technical, and logistic resources are most abundant.

The subdivision of sewerage works into a number of projects cannot be considered for Tunis. It would probably lead to the awarding of too many service contracts and to the participation of too large a number of service companies. Thus, the Tunis projects have been defined in terms of their catchment areas, leading to the identification of four major system projects. As a result of this approach, transferring the services of operation of the Tunis system projects will require the participation of large-scale firms, probably foreign firms possessing the necessary technical expertise and considerable financial resources.

The first system project whose operation is to be transferred to the private sector will inevitably be the one that first meets the conditions for pilot systems projects, i.e., El Menzah.

5.4.6 ONAS Will Assume Responsibility for Unserved Cities in Accordance with the Progress of its Investment Program

Grouping system works into projects on the basis of regional geographical aspects and current subdivisions of ONAS's organization will include the gradual incorporation of those unserved cities that so desire. Any new municipality created in a given region will be made part of an existing project, taking into consideration its natural geographic location in case the municipality should decide to go through ONAS.

The scenarios for transfer to the private sector should take into consideration ONAS's objective of speeding up the inclusion of cities without sewerage systems that want to be included. Thus, it should be assured that now-unserved cities will be served by the end of the next two five-year investment plans, i.e., at the end of 2006.

5.4.7 In Every Governorate, Transfer of Wastewater Services to the Private Sector Will Be Spread out over the Entire Period of the Strategy

To enable ONAS to better adapt its structures to the new approach, when several projects exist in any one region they will be delegated to the private sector in stages. Thus, when a first project has been awarded in a specific governorate or center, the next transfer may not be awarded before five years have elapsed. This period will provide the ONAS district with the

time to adapt its plan of resource reallocation, and will also give the local organization the time to master this new approach to management and to facilitate accomplishment of the next stages in the transfer.

5.4.8 The Contracts Will Be Evaluated and Adjusted on the Basis of the Pilot Projects

Among the pilot projects as defined in the PACT (five system projects and five treatment plant projects), only one system and one treatment plant project will be transferred to the private sector during the ONAS Eighth Investment Plan. All remaining pilot projects of both sorts will be transferred during the Ninth Investment Plan. The transfer of the other wastewater facilities will not be definitely planned until after an evaluation of the first year of pilot project operation. To the extent possible, one pilot project will be set up in every ONAS district. In addition, if its size permits, this pilot project will be set up in such a manner that a pilot project is chosen near the ONAS regional headquarters, to foster ease in monitoring the privatization experiment. Each pilot project should, as far as possible, provide ONAS with a specific type of experience in privatization; in other words, it should enable ONAS to examine a particular aspect of private sector management.

5.4.9 The System Concession (BOT) Contract Will Not Be Used for Systems

As stated in the findings of the market study, contracts of the BOT type will not be awarded in the framework of activities of transfer of system operation to private companies.

5.4.10 All Treatment Plant Extensions Will Provide an Occasion to Introduce BOT Contracts

In unserved cities that require the construction of relatively large treatment facilities, BOT contracts will be given priority consideration, particularly when such plants will require investments of over 1 million Tunisian Dinars (TD). ONAS should consider transferring existing treatment installations to the private sector at least for a period equal to the term of the BOT contract. Only plants that have a minimum capacity of 3,000 kg BOD per day and whose capacity must be doubled will be considered for this type of contract. Given the goals of obtaining World Bank participation in the funding of wastewater projects under the ONAS Ninth Investment Plan, the introduction of BOT contracts will be accelerated.

5.4.11 All Oxidation Pond Treatment Plants Will Be Grouped in Natural Regional Projects Offered to the Private Sector in the Form of Management Contracts

Since the equipment and facilities that go into operations are relatively limited, the management contract model is the most appropriate contract type here.

5.4.12 New Activated Sludge Treatment Plants Will Be Transferred to the Private Sector through Management Contracts

Management contracts are envisioned for all projects that involve operating newly built treatment plants and that present problem-free functioning.

5.4.13 Old Plants of the Activated Sludge Type Will Be Transferred to the Private Sector by Service Contracts

Service contracts will be awarded for treatment plants whose equipment is older (five years or more) and/or that require large-scale rehabilitation.

5.5 Rate and Duration

The rate of transfer of operating responsibility for wastewater facilities from the public to the private sector will depend on the interplay among four specific factors.

- The first is the impact of the transfer on ONAS employees: progress in the process could be delayed by the existence of ONAS employees who can be neither recruited by the private firm nor reassigned to other ONAS departments.
- A second factor is related to the capacity of ONAS and of the municipalities to manage these new contracts suitably and efficiently. There will undoubtedly be many possibilities for rationalizing the contracting process and for developing mechanisms by which to ensure contract monitoring and management. ONAS should see that its key personnel receive training in contract management, and should perhaps assist the municipalities that so desire. This would be the most difficult thing for ONAS. However, should it become apparent that the contracts would raise too many problems of a legal or other nature, or that too many such problems would have to be solved during contract execution, the rate of transfers might be affected. However, if transfers to the private sector have not raised serious problems during pilot experiments, this factor should not play a decisive role in the development of the process.
- A third element that will affect decision-making regarding the establishment of a rate of transfer is the effect on the ONAS budget and on ONAS's ability to assume responsibility for as-yet-unserved municipalities. If the savings predicted by the market study are realized, or if they go beyond expectations, then the transfer of operation of wastewater facilities to the private sector will probably speed up; but any acceleration in the transfer of responsibilities to the private sector must take into account the other effects discussed here. On the other hand, if savings are lower or if there are losses, the rate of transfer will probably be slowed down, and the process reexamined.

The initial experiments will make it possible to adjust the rate proposed in this study on the basis of the difficulties encountered. Thus, the market study should be updated at least at the beginning of every five-year plan to ensure that it takes all these factors into account.

- Lastly, the experience of other countries has shown the very great importance of public sector agencies' maintaining a capacity for intervention in this field, for two reasons. First, in the smallest contracts, it is important that the private contractor realize that, in case of failure, the public sector is at all times capable of taking over following termination of the contract. Secondly, it is essential that in an emergency the governmental agency is capable of responding appropriately to any call. In the medium and long terms, emergency measures might be delegated, but in the new prospect of transfer, both the municipalities and the cus-

tomers will feel safe if they know that ONAS remains the prime contractor of all operations, and that it is capable of reacting appropriately using its own means.

The interaction of all these factors might make the attempt to satisfy all these objectives at once seem utopian. Even so, emphasis should be placed on optimizing each parameter. Adjustments may be made in the context of monitoring and evaluating pilot projects and the strategy. All these factors of restriction or expansion will be studied and weighed periodically by the advisory committee on strategy (see below).

5.6 Preliminary Measures

Certain concomitant measures will have to be taken as part of the transfer of services from the public to the private sector, to ensure project success. A set of regulatory, institutional, organizational, and financial measures is presented here.

5.6.1 Regulatory Measures

Management and Concession: A Service Activity or a Production Activity?

Service activities are governed by the Commercial Code, and specifically by laws nos. 61-14 and 61-46, which require, among other things, that the service company include a Tunisian partner who represents at least 51 percent of company equity. The production activities defined by the Investment Code (law no. 93-120), on the other hand, allow the creation of companies set up to work on the domestic market but whose capital is held entirely by a foreign firm.

This shows the importance of specifying whether the management and/or concession of a system or of a treatment plant is a service or a production activity. It should be pointed out that many foreign companies have stated great unwillingness to take up joint ventures with Tunisian partners, who would be unable to contribute either capital or any special technical skills, all of which are already available to them.

Ensuring Technical and Economic Equity between ONAS and Private Operators

This means ensuring that the regulations applied to the private sector are applied with the same rigor to ONAS and that, if waivers are granted, these same waivers (which might concern the pollutant load of treated water or the temporary dumping of untreated water into the natural environment in case of temporary saturation of plant capacity) will be granted to the private sector. Of particular concern here are the Water Code and the regulations applying to the field of hygiene and public health.

Next, economic equity must be ensured between ONAS and private operators with respect to exemption from customs duties and from the VAT, and access to subsidized credit and international lines of credit. This equity could be achieved either by giving the private sector these same tax, customs, and financial advantages or by rescinding these advantages and putting ONAS under the common system. It is important to remember that the existence of these economic distortions results in systems concession contracts not being cost-effective, and only barely cost-effective in service and concession contracts for treatment plants.

Defining the Responsibility for Operating Rainwater Drainage Systems

According to the provisions of law no. 93-41, ONAS is no longer responsible for operating storm sewer systems. It can, however, provide the municipalities with this service at their request. As a result, incorporating storm sewers into the service contract between ONAS and a private operator requires the consent of the municipality to pay the expenses, and the signing of a contract to that effect between ONAS and the municipality. This situation could pose an obstacle to application of the national strategy, or at least reduce its impact, if a solution is not found that enables the municipalities concerned to assume this additional financial burden.

Applying Strictly the Legal Provisions Intended to Promote the Activities of Transfer of Public Services to the Private Sector

The purpose of rigorous application of these laws and regulations is to ensure the emergence of successful SMEs in the wastewater sector. Most of the laws in force, particularly the law concerning financial incentives, are recent and are not universally enforced. Laws do exist that provide private companies with financial incentives, but a large number of private entrepreneurs say that they have difficulty having them enforced.⁵

5.6.2 Institutional Measures

The new political orientation tending to involve the private sector in the operating and financing of wastewater projects requires adaptation of the different institutions currently working in this sector.

Creating a Structure for Management of the National Strategy

It is important that a structure be created, or that an existing structure be reinforced, within the MOE, and that the powers of this structure be defined, to enable it to manage the national strategy. It will also be necessary to set up an advisory committee, appoint its members, and define its mission clearly. As the strategy is applied, ONAS will perceive a distinct change in the nature of the tasks it is performing, and a gradual adaptation of its structures will thus be called for.

Defining the Ground Rules among the Various Actors

Projects involving treatment plants and systems require close collaboration among a number of agencies and institutions that are not yet accustomed to working together, such as the Ministries of Environment, the Interior, and Public Health, ONAS, ANPE, the municipalities, private firms, and national and international funding agencies.

⁵ Articles 37 and 38 of law no. 93-120 of December 37, 1993 modifying the Investment Code.

5.6.3 Organizational Measures

Instituting Cost Accounting

Current accounting practices are such that it is very difficult to determine accurately the management costs for every treatment plant and for the wastewater systems. As a result, there are at present no dependable systems for tracking costs and for cost accounting at the level of each wastewater facility. Since ONAS and the municipalities do not understand their real current expenditures well, it is impossible for them to evaluate tenders by the private sector effectively.

Setting Up a System of Supervision, Monitoring, and Technical Control

In addition, the lack of a system of technical monitoring to keep track of the use of their own resources (technical, human, and logistic) makes it improbable that ONAS and the municipalities would be capable of supervising the services of the private sector. Throughout the world, adequate contract supervision and control are the most important elements in checking whether the private sector is satisfying contractual provisions. The municipalities that are not served, and to a lesser extent ONAS, do not have experienced managers or suitable personnel for verifying the enforcement of the laws and of the Water Code, meaning that ONAS and the unserved cities will probably have difficulty setting up adequate control systems for the private sector.

Implementing a Training Program

The implementation of a program of training in project and contract management would appear essential for continuing the process of privatization. As it appears that this approach will be adopted imminently, ONAS should contract with a firm for the preparation of a training program for its head office supervisory staff and for those from the regions, to prepare them to monitor the approach as a whole.

Technical Assistance for ONAS

Certain cases of private sector participation in wastewater will require providing ONAS with technical assistance to establish and supervise these contracts.

5.6.4 Financial Measures

Setting up treatment plants and sewer systems requires a considerable investment. Participation of the private sector in the framework of concessions of systems or of treatment plants should alleviate the burden of ONAS and government investment expenditures in this field. However, the conditions that currently apply to private sector financing are distinctly disadvantageous in comparison with those that apply to the public sector, and, as a result, such private sector participation appears anti-economical and therefore illusory, as it would generate additional costs for ONAS and for the state (see the market study). There is reason to believe that only large international firms with access to privileged funding sources (capital base, bond issues, etc.) could tender for these types of contract.

Strengthening the FODEP in Financing Wastewater Projects

To make the emergence of a Tunisian private sector more likely and to lighten the investment budgets of the government and ONAS, it is important that the FODEP be strengthened, so that it can finance projects in the wastewater sector under better conditions than those of the market.

If necessary, a financial institution (development bank, commercial bank, fund, treasury, etc.) could be appointed to finance projects in the wastewater sector, by being given the management of special credit lines provided by the state or by international donors.

Setting Up Incentives to Promote Private Investment in Basic Infrastructure

The laws currently in force (particularly the Investment Code) do not provide much incentive for a private investor to participate in financing an infrastructure project, whether it be a treatment plant, a sewer system, drinking water supply, roads, a generating station, or a data transmission network. A private operator's choice of investment in a given sector is usually the result of arbitration among a number of opportunities; private investors thus compare the economic growth prospects of activity sectors to the incentives and other measures of encouragement provided by the government for each of these sectors. Nevertheless, given the enormous challenge of economic development, which requires continuous upgrading of the country's basic infrastructure, and given also the Tunisian government's concern to relieve the burden on the government budget, the private sector can act as a motor in the financing of these investments.

Thus, the promotion of private sector participation in environmental services assumes both legal and institutional adjustments (see above), to offer guarantees to foreign investors and, at the same time, to offer specific incentives to investment, thereby ensuring that priority in private investment is given to the infrastructure sector, including wastewater. These incentives might include exemption from corporate income tax for a limited period, removal of the VAT on capital goods, reduction of customs duties to the minimum rate, an investment bonus, or reduction in or exemption from employers' employee benefit contributions for a limited period.⁶

5.6.5 Summary of Measures to Be Taken

The tables below summarize the measures to be taken, indicate the implementation term, and identify the institutions responsible.

⁶ For purposes of comparison, investors in the sector of Saharan tourism enjoy the following incentives:

- tax incentives: total exemption from corporate income tax for 10 years starting from the first year of activity, and a 50 percent exemption starting from the eleventh year for a further 10-year period; waiving of the VAT on capital goods and lowering of customs duties to 10 percent;
- financial incentives: an investment premium of 8 percent of the project cost is granted, including expenses for studies and excluding real estate costs; and
- other incentives: total assumption by the state of the employer's contribution to the national social security plan (18 percent) for five years.

Table 6
Measures to be Taken — Institutional Framework

Objective	Measures	Term	Responsible Institution(s)
Implementation and monitoring of the national strategy	Establishment of a structure within the MOE with the following mandate: <ul style="list-style-type: none"> • implementation of the strategy • monitoring and performance evaluation • regular updating of the strategy and the market study based on progress and preparation of development plans • definition and establishment of regulatory mechanisms to ensure achievement of strategy objectives • identification of obstacles and setting up of corrective measures • information and coordination with the other institutions involved (Ministries of the Interior, Economic Development, and Public Health, ONAS, ANPE, international donors) 	Short-term	MOE
Supervision of wastewater activities delegated to the private sector	Creation of a unit with ONAS responsible for: <ul style="list-style-type: none"> • supervising contract implementation • verifying enforcement of regulations concerning wastewater activities 	Short-term	MOE ONAS

Table 7
Measures to be Taken — Organizational Reform

Objective	Measures	Term	Responsible Institution(s)
Strengthen the skills of ONAS and the municipalities	Organize training sessions in the fields of: <ul style="list-style-type: none"> • contracting with the private sector (preparation and award) • various legal questions • contract management Prepare a procedures manual Set up technical assistance for contract establishment and supervision	Short-term	ONAS MOI Municipalities
Build bridges between the public and private sectors	Favor transfers of skills from the public to the private sector (reinsertion, assistance in setting up businesses by municipal employees, etc.)	Short- and medium-term	MOE ONAS MOI MED
Consolidate institutional experience through pilot projects	Study the technical and economic feasibility of creating semi-autonomous agencies at the municipal level for unserved cities Carry out at least one pilot project per type of activity (system, treatment plant) and per type of private sector participation (service, management, concession, semi-public company, total privatization) Organize roundtables to evaluate and discuss the results of each pilot project	Medium- and long-term	MOI MED MOE ONAS UTICA

Table 8
Measures to be Taken — Regulations

Objective	Measures	Term	Responsible Institution(s)
Contract award			
Improve private sector awareness of Tunisian procedures of contract award	Prepare brochures Hold seminars and roundtable discussions	Short-term	MOE
Adapt the law on public contracts to the process of delegating environmental services to the private sector	Draft a legal definition of a service contract, a management contract, and a concession contract Adapt current regulations to make possible the signing of public contracts for a period greater than five years (BOT) Open tenders in public Define the methods of payment for private operators Specify the methods of price revision Draft a legal definition of environmental activities (service or production)	Short- and medium-term	Prime Minister's Office
Provide effective legal recourse for the private sector	Give the private sector the legal means for ensuring technical and economic equity between public and private operators	Medium-term	Prime Minister's Office
Define the place of international companies in the process	Clarify the rules for their participation Institute incentives for transfer of technologies and for the training of national staff Define incentives for domestic companies	Short-term	Prime Minister's Office MOE MED MCI
Norms and standards of performance			
Draft realistic standards of performance	Study the situation in other countries Define institutional responsibilities Define the administrative and technical regulations concerning wastewater (supervision and monitoring)	Medium-term	MOE ONAS ANPE
Present and explain the prevailing regulations to the private sector	Organize workshops and seminars Disseminate information on the local and regional levels Train supervisory municipality and regional staff	Medium-term	MOI MED MOE UTICA
Evaluate impact on the degree of private sector participation	Identify the cost of enforcing and monitoring admissible standards of water, soil, and air pollution at the wastewater installations	Medium-term	MOE ONAS
Miscellaneous			
Define the responsibility for operating rainwater drainage systems	Study the situation in other countries Set up measures of compensation for storm sewer operators	Medium-term	MOE ONAS MOI MED

Table 9
Measures to be Taken — Mobilizing the Resources Required for Private Sector Participation

Objective	Measures	Term	Responsible Institution(s)
Determine the real costs of wastewater (by wastewater facility)	Train regional supervisory staff in management Introduce cost accounting	Short-term	MINE Municipalities MOE ONAS
Define the mechanisms of cost recovery/cost pricing	<p>Municipalities</p> Optimize current tax revenue Introduce or increase royalties on commercial establishments Improve citizens' understanding of the connection between the wastewater tax and environmental services Institute mechanisms to ensure payment <p>ONAS</p> Identify the exact costs and economic impact Set up an effective, sustainable program to cover the costs of contracts awarded to the private sector (subsidies, taxes, and royalties) Institute mechanisms to ensure payment	Short- and medium-term	MED MOE MOI MFIN ONAS
Ensure sources of revenue	Institute mechanisms to ensure payment (e.g., "use or pay" system) Institute a system of royalties and ensure its viability	Short- and medium-term	MED MOE MOI MFIN

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Table 10
Measures to be Taken — Favoring Local Engineering and Industry in the Wastewater Field

Objective	Measures	Term	Responsible Institution(s)
Strengthen the skills of the private sector	Organize training sessions in: <ul style="list-style-type: none"> • preparing and submitting tenders • techniques and technologies • legal questions • management Prepare a procedures manual		MOE ONAS MOI UTICA
Improve the financial and economic viability of contracts	Promote the FODEP and other similar mechanisms Set up specific incentives for investment in the wastewater infrastructure sector Institute a system of royalties and ensure its viability Institute mechanisms to ensure payment (e.g., “use or pay” system)	Short- and medium-term	MED MOE MOI MFIN

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Table 11
Measures to be Taken — Minimize Impact on Employment

Objective	Measures	Term	Responsible Institution(s)
Identify and quantify the consequences of subcontracting to the private sector	Estimate the net impact on employment of delegating wastewater installation management to the private sector	Short-term	All institutions involved in planning private sector participation in wastewater
Prepare mechanisms of compensation to protect public sector personnel (ONAS and the municipalities)	Assist in the creation of businesses Grant leaves of absence Prioritize recruitment by the private sector Train and re-train Provide job placement for professionals		Prime Minister's Office MED ONAS MOI

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Plan of Action

The plan of action for the national strategy determines the major principles that should underlie a program for private participation in wastewater activities, and the measures to be taken in drawing up program details. When a program has been drawn up, its implications on the various aspects of the activity must then be tested. In particular, it will be necessary to examine the program's effect on the budget of ONAS and/or the municipality, on ONAS personnel, on the improvement of wastewater coverage throughout the country, that is, on the proportion of municipalities served by ONAS, and on the rate of private sector participation in these cities.

In the framework of the present study, two scenarios of private sector participation in wastewater services will be simulated, and the above-mentioned implications tested for them.

6.1 Definition of the Scenarios

To give a picture of the implications of sharing responsibilities between the private and public sectors, and on the basis of the distribution of system projects and treatment plants and the guidelines that have been mentioned above, two scenarios for delegation of wastewater services to the private sector have been simulated and analyzed. The two scenarios have been defined taking two different final target rates for the private participation program. The final target rate is defined as the share of wastewater facilities that is to have been delegated to private operators at the end of the term for which the strategy was devised, the remainder continuing to be operated directly by ONAS. The duration of application of the private sector participation program has been set at 20 years to reduce the negative effects of this new political orientation on ONAS. For the network, the rate is calculated as the percentage of the entire system length that has been assigned to the private sector; for treatment plants, it is the number of plants entrusted to private operators in comparison with the total number of existing plants. The first scenario attributes 100 percent of wastewater facilities to the private sector at the end of 20 years, the second, 50 percent.

6.1.1 Systems

It should be noted that only service contracts will apply to systems.

Scenario 1

For Scenario 1, the final target of assignment of wastewater facilities is taken as equal to 100 percent, meaning that at the end of 20 years, all wastewater facilities are to be operated by the private sector. In this case, ONAS preserves no operating structure.

The total number of system contracts for the Eighth through the Eleventh Plans is 38 service contracts involving 222 cities. At the end of the Ninth Plan, private operators will be awarded seven contracts, five of which will be pilot projects. Twenty percent of the total system length

will thus be in private sector operation as of that date. This scenario proposes an increase in this rate for subsequent plans (25 percent, 29 percent, and 31 percent, respectively).

Scenario 2

For Scenario 2, the final target of wastewater work allocation is taken as 50 percent, meaning that at the end of 20 years, only 50 percent of wastewater facilities will be operated by the private sector. In this case, ONAS and the municipalities will retain the remaining 50 percent.

The total number of system contracts in the Eighth through the Eleventh Plans is 19 service contracts involving 106 cities. At the end of the Ninth Plan, private operators will be awarded five contracts corresponding to pilot projects. Nine percent of the system length will thus be under private operation by that time. This scenario proposes an increase in this rate for the two subsequent plans (16 percent and 18 percent, respectively), while the rate will be 13 percent under the Twelfth Plan.

The systems scenarios can be summarized as follows:

Scenario	Final Target Rate
1	100%
2	50%

Table 12
Main Features of the Different Scenarios

Scenario	Plan					Total
	8th	9th	10th	11th	12th	
Number of contracts per plan						
Scenario 1	1	6	8	8	15	38
Scenario 2	1	4	3	6	5	19
Number of cities						
Scenario 1	2	26	34	68	92	222
Scenario 2	2	22	7	46	29	106
% private sector participation (% of length of the system for the plan considered)						
Scenario 1	2	20	25	29	31	
Scenario 2	2	9	16	18	13	
% private sector participation (% of length of the system under the 12th Plan)						
Scenario 1	1	19	41	69	100	100
Scenario 2	1	11	24	42	54	54

6.1.2 Treatment Plants

Scenario 1

For Scenario 1, the final target for allocation of treatment plants is taken as equal to 100 percent. In other words, at the end of 20 years, all treatment plants will have been delegated to the private sector through service contracts, management contracts, or the BOT system. In this case, ONAS will not be operating any plants. A total of 47 treatment contracts will be awarded during the Eighth to the Twelfth Plans, comprising 17 service contracts, 17 management contracts, and 13 BOTs, involving the 160 existing and projected treatment plants. At the end of the Ninth Plan, private operators will have been awarded 15 contracts, 6 of them for pilot projects. At that time, 31 treatment plants will be privately operated, representing 51 percent of the total number at the end of the Ninth Plan. The rates proposed for the following plans are 33 percent, 44 percent, and 13 percent, respectively.

Scenario 2

In Scenario 2, the final target for allocation of treatment plants is taken as equal to 50 percent, meaning that only 50 percent of treatment plants will have been allocated to the private sector, through service or management contracts or under the BOT system. ONAS and the municipalities will, in this case, retain the remaining 50 percent.

A total of 32 treatment contracts will be awarded during the Ninth through the Twelfth Plans, comprising 16 service contracts, 11 management contracts, and 5 BOT, involving 86 existing and projected plants. At the end of the Ninth Plan, private operators will be allocated 10 contracts, 6 of them for pilot projects. The number of privately operated treatment plants operated at that time will be 24, representing 38 percent of the total number of such plants. The rates proposed for the following plans are 18 percent, 17 percent, and 9 percent, respectively.

It will be noted that the number of BOT contracts is limited to only 44 plants for Scenario 1 and 14 for Scenario 2. The reason for this is that BOT contracts are awarded only for new plants to be built or in some cases for extensions to existing plants.

It may also be noted that for Scenario 2 the number of management and BOT contracts is smaller than in Scenario 1. The reason for this is that when contracts are awarded to private operators, plants over five years old cannot be awarded under management contracts, or else that they were built with the intention of being awarded as BOT contracts.

We also note that the age of many existing plants limits the number of management contracts.

Table 13
Summary of the Main Indicators for Each Scenario

Scenario #	Five-Year Plans																	
	8th			9th			10th			11th			12th			Total		
	svc	mgt	BOT	svc	mgt	BOT	svc	mgt	BOT	svc	mgt	BOT	svc	mgt	BOT	svc	mgt	BOT
Number of contracts per plan																		
1	1	0	0	2	7	5	5	4	4	8	4	4	1	2	0	17	17	13
2	1	0	0	0	4	5	8	1	0	5	5	0	2	1	0	16	11	5
Number of treatment plants																		
1	3	0	0	2	12	14	16	12	9	37	13	21	9	12	0	67	49	44
2	3	0	0	0	7	14	19	1	0	15	12	0	10	5	0	47	25	14
% private sector participation (in comparison with the number of treatment plants for the plan considered)																		
1	7			51			33			44			13					
2	7			38			18			17			9					
% private sector participation (in comparison with the number of treatment plants at the end of the 12th Plan)																		
1	2			18			23			44			13			100		
2	2			13			13			17			9			54		

svc = service contract

mgt = management contract

BOT = Build-Operate-Transfer

6.2 Effects on the ONAS Budget

Estimating the savings to be expected from private sector participation in wastewater services is difficult. The uncertainties regarding operating costs and the savings that will be possible beyond the period of the Ninth Plan, as well as the uncertainty of Tunisia's social and economic context after 2001, are such that it appears difficult to use the results of the market study as they stand for periods beyond the Eighth and Ninth Plans. For these plans, the baseline studies should be updated just before each new plan, to provide more accurate data.

Furthermore, while the market study made it possible to evaluate the order of magnitude of these savings, it is clear that each project constitutes an individual case. Some projects group together small plants or systems lying some distance from one another, while others are composed of one large plant or one large system. The technical constraints, and therefore the savings to be expected, will not be the same in the case of a tourist-oriented coastal city as in that of a highly rural city in the western part of the country. The first simplification thus consisted in considering the projects as comparable from a technical standpoint. The second simplification consisted in reducing these projects to three baseline cases for treatment plants and to four for systems.

These were the cases selected by the market study. It is quite obvious that the savings to be expected are not necessarily proportional to the length of the system or to the tonnage of BOD eliminated daily.

Thus, the results of this section can only be considered as a preliminary estimate of the savings to be expected, subject to modification by the field reality and the technical problems that a private operator might encounter on a given project. They are more in the nature of an overall estimate of savings on the national level than an estimate by project, limited to the period of the Ninth Plan.

The impact of the two scenarios of private sector participation defined for the period 1996-2001 on the ONAS budget varies considerably from one scenario to the other, as is shown on the tables attached in Appendix C.

6.2.1 Investment Budget

Systems

For systems, the investments planned for the period 1996-2001 total TD139.8 million for the two scenarios. The investment schedule is given in the following table.

Table 14
Overall Investment Budget — Systems

	Investment Budget (in millions of TD)
Eighth Plan	15.1
Ninth Plan	124.7
Total	139.8

The share of this investment budget that pertains to ONAS is TD139.8 million for the two scenarios, since no BOT is envisaged for systems.

Treatment Plants

For treatment plants, the investments planned for 1996-2001 total TD206 million for the two scenarios. The investment schedule is given in the following table.

Table 15
Overall Investment Budget — Treatment Plants

	Investment Budget (in millions of TD)
Eighth Plan	36.3
Ninth Plan	169.7
Total	206.0

The share of this investment budget that pertains to ONAS is TD195.8 million for the two scenarios. It should be noted that private sector participation (for the first scenario, in comparison with the second) will be more substantial starting from the Tenth and Eleventh Plans.

The following table gives the breakdown of the ONAS investment budget per plan.

Table 16
Investment Budget (ONAS Share) — Treatment Plants

	Investment Budget (in millions of TD)	
	Scenario 1	Scenario 2
Eighth Plan	36.3	36.3
Ninth Plan	159.5	159.5
Total	195.8	195.8

The following table summarizes the ONAS investment budget for each of the scenarios per plan.

Table 17
Investment Budget (ONAS Share) — Summary
(in millions of TD)

	Scenario 1			Scenario 2		
	Systems	Treatment Plants	Total	Systems	Treatment Plants	Total
Eighth Plan	15.1	36.3	51.4	15.1	36.3	51.4
Ninth Plan	124.7	159.5	284.2	124.7	159.5	284.2
Total	139.8	195.8	335.6	139.8	195.8	335.6

6.2.2 Operating Budget Systems

This analysis concerns only the first two development plans (the Eighth and the Ninth), as it appears difficult to apply the results of the market study concerning possible savings on operating costs as such, without updating, for a period beyond that of the Ninth Plan.

The difference between the two scenarios with regard to the date on which systems will enter into operation means that their impact on the operating budget varies quite perceptibly between the two scenarios. For Scenario 1, the budget for systems operation by ONAS should total TD16.4 million for 1996-2001. The cost to ONAS of private sector participation is estimated

at TD13.3 million for the same period. In other words, the delegation of management of these systems to the private sector will generate savings of TD3.1 million between 1996 and 2001, or 19 percent of the total operating expenses of these systems. For Scenario 2, the budget for systems operation by ONAS should be TD14.1 million for 1996-2001. The cost to ONAS of private sector participation is estimated at TD11.4 million for the same period. In other words, the delegation of management of these systems to the private sector will generate savings of TD2.7 million between 1996 and 2001, or 19 percent of the total operating expenses of these systems.

The table below summarizes the value of the contracts awarded to the private sector, and the savings to be expected from transferring part or all of the management and operation of the systems.

Table 18
Contract Amount and Savings for the Two Scenarios — Systems
(in millions of TD)

	Eighth Plan			Ninth Plan		
	Amount	Savings		Amount	Savings	
Scenario 1	0.48	-0.1	17%	12.8	-3.0	19%
Scenario 2	0.48	-0.1	17%	10.9	-2.6	19%

Treatment Plants

This analysis concerns only the first two development plans (the Eighth and the Ninth), as it appears difficult to apply the results of the market study concerning possible savings on operating costs as such, without updating, for a period beyond that of the Ninth Plan.

The difference between the two scenarios with regard to the date on which treatment plants will enter into operation means that their impact on the operating budget varies between the two scenarios. For Scenario 1, the budget for treatment plant operation by ONAS should total TD47.4 million for the period 1996-2001. The cost to ONAS of private sector participation is estimated at TD44.3 million for the same period. As a result, savings on treatment plant operating costs provided by subcontracting management of these plants to the private sector amount to TD3.1 million between 1996 and 2001, or 6.5 percent of the total operating expenses. For Scenario 2, the budget for treatment plant operation by ONAS should total TD45.8 million for the period 1996-2001. The cost to ONAS of private sector participation is estimated at TD42.8 million for the same period. As a result, savings on treatment plant operating costs provided by subcontracting management of these plants to the private sector amount to TD3.1 million dinars between 1996 and 2001, or 6.7 percent of the total operating expenses.

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The low level of savings estimated in the case of treatment plants is chiefly a result of concession contracts (BOT), which, as was shown by the market study, do not generate savings on the ONAS service costs (because of much less advantageous financing terms that seriously burden the private operator's expense at the end of the contract).

The table below summarizes the value of the contracts awarded to the private sector and the savings to be expected from transferring part or all of the management and operation of treatment plants.

Table 19
Contract Amount and Savings for the Two Scenarios — Treatment Plants
(in millions of TD)

	Eighth Plan			Ninth Plan		
	Amount	Savings		Amount	Savings	
Scenario 1	0.37	-0.06	14%	43.9	-3.0	6%
Scenario 2	0.37	-0.06	14%	42.4	-3.0	7%

6.3 Consequences for ONAS Personnel

Private sector participation in the operation and management of wastewater services (treatment plants) will have an effect on the number of ONAS operating staff required. On the one hand, the number should increase to satisfy the development of operating activity resulting from the increase in wastewater facilities following new projects and the provision of services to new cities. On the other hand, they should decrease because of private sector participation in the operation of wastewater facilities, which will imply the transfer of certain facilities to the private sector. As a result, each scenario of private sector participation has a specific effect on changes in ONAS staffing and on employment in the wastewater sector in general. To analyze this effect, it is interesting to compare the changes in ONAS staff numbers assuming that wastewater facilities continue to be operated directly by that agency, with no participation whatsoever by the private sector, with the changes implied by each scenario.

To estimate changes in ONAS staff numbers, the available statistics were used: in the case of systems, to identify ratios related to the staff involved in operating compared with the length of the network; in the case of treatment plants, a more refined analysis made it possible to determine the number of operating staff required for each plant considered. The table below summarizes the different ratios.

Table 20
ONAS Staff Ratios

	Tunis	Northeast	Northwest	Center	South	Total
System staff						
— permanent	560	170	50	170	150	1 100
— occasional	190	50	10	50	40	340
Total system staff	750	220	60	220	190	1 440
System length (km)	2 200	990	280	1 180	810	5 460
Ratio: number of employees/km	0.34	0.22	0.21	0.19	0.23	0.26
Treatment plant staff						
— permanent	80	90	10	60	60	300
— occasional	30	30	10	20	20	110
Total treatment plant staff	110	120	20	80	80	410

Note: 1993 data

The productivity of the current systems operating staff is 0.26 employees per km, with a peak of 0.34 for the Greater Tunis district.

To estimate the staff required by the private sector to operate the works it will be awarded, hypotheses were developed on the basis of expected gains in productivity. The market study estimated that delegating wastewater services to the private sector would generate a 15–20 percent reduction in the number of employees that ONAS uses to perform the same task. More detailed studies carried out in February and March 1995 among French private operators showed that the gains in productivity for wastewater service personnel can be considerably higher than the figures mentioned above, reaching as much as 35 percent. It was possible to arrive at a compromise that takes the Tunisian context into account, and this provided a private sector staff ratio of 0.21 employees per km, a gain in productivity for the private operator of 20 percent compared with ONAS.

The calculations performed on the basis of the above hypotheses made it possible to identify changes in ONAS staffing for the various scenarios: for the case in which there is no private sector participation in operation and for the case in which ONAS assumes responsibility for all cities not currently served according to a program spread over the next four plans. Should the study of management methods for cities without wastewater services select other forms (direct management by the municipalities, direct allocation to the private sector by the municipalities, etc.), the following data would have to be revised. The results of calculations corresponding to the above hypothesis are as follows.

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Table 21
ONAS Operating Staff Size

	Year				
	1996	2001	2006	2011	2016
No private participation	2,038	2,522	3,121	4,003	4,093
Scenario 1	1,974	1,823	1,427	970	0
Scenario 2	1,974	2,082	2,123	2,372	1,972

This table makes it possible to deduce, for each scenario, the decreases in ONAS staff in comparison to a situation of no private sector participation, and this in turn makes possible a comparison of the advantages of each scenario. The following table shows the resulting figures.

Table 22
ONAS Staff Size by Scenario and Year

	Year				
	1996	2001	2006	2011	2016
Scenario 1	64	699	1,694	3,033	4,093
Scenario 2	64	440	998	1,631	2,121

Scenario 1 provides the greatest alleviation of ONAS staff, and therefore of the wage burden, since it is the scenario in which the private company's participation must cover all wastewater facilities by the end of the year 2016. In these cases, the number of ONAS operating staff is zero at that time.

During the Tenth and Eleventh Plans, Scenario 2 gives a slower reduction in staffing than Scenario 1.

To analyze the impact of the two scenarios resulting from the reduction in ONAS staff on the employment situation and to determine the private sector's capacity to absorb these excess numbers, a comparison should be made of surplus ONAS staff and the recruiting that the private sector will have to do. Tables 23 and 24 below show, for Scenarios 1 and 2, respectively, the private sector's operating staff needs to perform the tasks assigned it. From this is deduced the number of operating staff the private sector will have to recruit for each plan, taking into consideration the staff already at its disposal from the preceding plan. These recruitment needs are then compared, for each plan, with the number of staff ONAS must lay off because of overstaffing due to the allocation of certain facilities to private operators. If, on the other hand, ONAS must recruit staff because of newly served cities and the making of new investments,

despite the awarding of certain works to the private sector, then "nc" (no comment) has been entered in the table. It goes without saying that this comparison will not be fully valid unless the incentives provided by ONAS and by the private sector provide ONAS staff with sufficient motivation.

Study of the following tables shows that both scenarios provide a surplus of 16 operating staff members during the Eighth Plan. This number is negligible in comparison with the total number of ONAS employees, and should pose no problems, since it is more than offset by employee retirement figures.

For scenario 1, the surplus is relatively modest until 2011, at 28 percent, 48 percent, and 38 percent during the Ninth, Tenth, and Eleventh Plans, respectively.

Table 23
Comparison of ONAS Surplus Staff and Private Sector Staff Requirements
(Scenario 1)

		Year				
		1996	2001	2006	2011	2016
Private sector operating staff needs	System	31	322	927	1,748	2,526
	Treatment Plant	17	258	480	856	956
	Total	48	580	1,407	2,604	3,482
Staff to be recruited by the private sector during each plan	System	31	291	604	821	778
	Treatment Plant	17	241	222	376	100
	Total	48	532	826	1,197	878
Variations in ONAS operating staff (+) Recruitment (-) Surplus compared with requirements	System	-39	24	-254	-415	-954
	Treatment Plant	-25	-175	-142	-42	-16
	Total	-64	-151	-396	-457	-970
Difference between staff to be recruited by the private sector and variation with ONAS needs	System	-8	315	350	406	-176
	Treatment Plant	-8	66	80	334	84
	Total	-16	381	430	740	-92
% variation of ONAS staff compared with private staff recruitment	System	125	nc	42	51	123
	Treatment Plant	147	73	64	11	16
	Total	133	28	48	38	110

Scenario 2 presents no difficulty, since both ONAS and the private sector continue to recruit during the Ninth, Tenth, and Eleventh Plans. ONAS recruitment will be less than it would have been without private sector participation. On the other hand, during the Twelfth Plan, ONAS

will have to lay off staff. The farther off the problem of absorption lies, the easier is its solution. The time lapse makes it possible to decrease the magnitude of the surplus thanks to the larger number of staff members retiring, and above all it enables those concerned to organize their departure to other types of activities, and at the same time to prepare themselves psychologically and materially. From this standpoint, Scenario 2 is more advantageous.

Table 24
Comparison of ONAS Surplus Staff and Private Sector Staff Requirements
(Scenario 2)

		Year				
		1996	2001	2006	2011	2016
Private sector operating staff needs	System	31	210	526	995	1,317
	Treatment Plant	17	175	344	533	633
	Total	48	385	870	1,528	1,950
Staff to be recruited by the private sector during each plan	System	31	179	315	469	322
	Treatment Plant	17	158	169	189	100
	Total	48	337	484	658	422
Variations in ONAS operating staff (+) Recruitment (-) Surplus compared with requirements	System	-39	164	107	25	-384
	Treatment Plant	-25	-56	-66	224	-16
	Total	-64	108	41	249	-400
Difference between staff to be recruited by the private sector and variation with ONAS needs	System	-8	343	423	494	-62
	Treatment Plant	-8	102	103	413	84
	Total	-16	445	526	907	22
% variation of ONAS staff compared with private staff recruitment	System	125	nc	nc	nc	119
	Treatment Plant	147	35	39	nc	16
	Total	133	nc	nc	nc	95

It has been assumed, throughout the above analysis, that it is possible to transfer system operating staff to treatment plant operation and vice versa, and that it is possible to transfer staff from one operating center to another.

Identifying staff numbers using linear ratios involves some inaccuracy, since it does not take the effect of geographical dispersal of centers into account. However, given the nature of the study, which aimed primarily at discerning trends in order to establish a strategy, we believe that the accuracy here is sufficient.

Private sector participation in operating activities will, as we have mentioned above, have an effect on the total number of jobs in the wastewater sector in general (taking ONAS and private sector jobs together). This effect is explained by the better performances expected from private sector staff.

6.4 Motivations of ONAS Staff to Join the Private Sector

ONAS staff enjoy a status and benefits that provide them with considerable ease and obvious satisfaction. Even so, the private sector will exercise some attraction for staff working at ONAS, chiefly in terms of income, although this will be offset by a certain private sector job insecurity that the same staff may fear. The fear inspired by the move from the public to the private sector is legitimate, and is based primarily on job security, which clearly differs between the public and private sectors, and on the fear of losing benefits, which, in the case of ONAS employment, are real and considerable.

Another important thing to remember is that the retirement schemes are different for public sector wage-earners (CNRPS) and for those in the private sector (CNSS), and they are at present not unified. It is not feasible to transfer a file, or the corresponding rights, from the public to the private scheme, as the CNSS will not recognize benefits accumulated under the CNRPS.

6.4.1 The Status of ONAS and the Benefits Offered

ONAS provides a number of advantages that can influence an employee's decision whether to move to the private sector. First, it offers old-age (retirement) insurance and a five-year reduction in labor for difficult and unhealthy work, enabling concerned ONAS agents to retire at the age of 55 instead of 60, while ONAS continues to pay their welfare contributions for those five years. ONAS personnel also enjoy health insurance; good health care conditions and medical expense reimbursement; a preventive medicine service; vaccination campaigns; preferential purchasing conditions in certain stores; the possibility of salary advances; a mutual fund that grants housing loans (at reduced rates of from 3-7 percent) and exceptional loans (interest-free) under exceptional circumstances; an emergency fund (assistance paid to a worker's family in case of death, assistance in the case of chronic illness); two months' sick leave at full pay; and full salary payment for one-and-one-half months in case of work-related accident or occupational disease.

With respect to salary, ONAS employees receive allowances for danger, transportation, and dirty work (these are legally provided for and mandatory). They also enjoy additional provisional wage bonuses (salary adjustments). The payment of an annual thirteenth month of salary is legally prescribed. There is an output bonus equivalent to two months' wages for all personnel, which is granted and calculated on the basis of each employee's output as evaluated by his superior, and is paid quarterly. Employees also enjoy free connection to the wastewater systems and do not pay wastewater rates.

6.4.2 The Attraction of the Private Sector

The private sector is attractive first for its wage levels, which are generally higher than those of public sector employment. A worker who earns TD200 a month in the public sector will receive an additional TD50 in the private sector, while managerial staff whose public sector salary is TD500 can expect to earn TD650 in private employment.

6.4.3 Levels of Motivation and Staffing

The employees who have the least motivation to leave the public sector for the private are those who are relatively advanced in age, those who have contributed for at least 20 years to the CNRPS (public) retirement scheme, and those near retirement who are concerned by the reduction in work time. This applies generally to workers between the ages of 45 and 60. The most highly motivated employees are younger staff who are not yet attached to employee benefits, who accept the idea of mobility, and who believe in the possibility of a private sector career and faster advancement.

In studying staff characteristics, it will be noted that the most marked degree of motivation for moving to the private sector is found in certain specific situations. With respect to age, young people are freer, more mobile, and more ambitious. In terms of marital status, unmarried workers without children are more mobile, while family commitments are a factor of caution. With respect to hierarchy, motivation is low for managerial and supervisory staff, since job security and benefits take precedence over salary increases, which will never be very high in absolute terms.

6.4.4 Motivation Surveys

In concrete terms, motivation surveys might be carried out among a sample of ONAS staff who represent different hierarchy, age, and marital status characteristics. A roundtable might also be held for ONAS employees who are concerned by the subject.

6.4.5 The Program of Actual Staff Transfer from the Public to the Private Sector

To define a public to private sector staff transfer program, a series of key tasks must be carried out. First, the duration of the program should be set. It is considered important for this program to cover at least the first five years, and the program of the 11 pilot projects. Next, it must be a program of mobilization-demobilization, considering the relatively small number of jobs concerned each year (and during the first years concerned). Analysis and evaluation will be carried out case by case, on the basis of the concrete projects written into the program of transfer of services. Demobilization concerns staff leaving their jobs at ONAS. These staff members will be identified using the following criteria: function and position occupied, department and work category, and the personal criteria of age and marital status. Remobilization applies to staff to be incorporated into the private sector, and involves defining needs with respect to position, functions, department, and work category in order to identify the number of employees to be recruited.

6.4.6 Adaptation of Qualifications

The qualifications and skills available will be screened to select those that best correspond to the new needs. Generally speaking, there are no marked differences between qualifications and functions in the public and private sectors, but certain skills-related problems may persist that could be solved through suitable training.

6.4.7 Motivation of Staff Categories

Analysis and evaluation of the segment of staff that is liable to accept transfer from the public to the private sector will be refined on the basis of the number and characteristics of the currently employed staff who, because of their age, the department in which they work, and their marital status, show relatively strong motivation.

6.4.8 Improvement of Motivation

If the candidates (particularly those of value) are little motivated, discussions may be held with them. If their reasons are of a structural nature (e.g., age and the reluctance to lose 20 years of contributions to a particular retirement scheme, or simple refusal to leave ONAS), new arguments will have little effect. If, on the other hand, the reasons are of a temporary nature, additional elements of motivation might be identified and discussed on a case-by-case basis: salary level, salary benefits and bonuses, benefits in kind, responsibilities and rapidity of career advancement, in-house and outside training in Tunisia and abroad, technological contributions — in short, anything that might give the private sector an advantage over ONAS (although this is very difficult, considering the job security and benefits the latter offers). Of course, the private sector has its own limits with respect to motivation. Legal provisions, such as personal leave, can also motivate relatively cautious employees to make the move, since this would ensure them of re-employment in case of failure in the private sector or personally motivated renunciation. In the legal domain, an attempt should be made to unify the public and private retirement plans, which remain an obstacle to transfer to the private sector. ONAS could also improve the motivation of its employees in a number of ways, through training and information, paid internships in private companies, or the creation of other forms of personal leave that allow for returning to ONAS at the end of a certain time.

6.4.9 Widening the Field of Mobilization

In case of failure in the reintegration (remobilization) of demobilized employees whose qualifications were suitable for the new needs of the private sector, the private sector will need to widen the scope of its search to other demobilized employees whose qualifications it has not hitherto considered, with a new evaluation of internal motivations and training needs for these new agents.

The private sector can and should consistently recruit its employees from among ONAS staff who have left their ONAS jobs. In general, this is what should happen: the private sector employs almost all the members of the old team that correspond to its needs. To optimize re-employment of its staff, ONAS should impose this obligation on all tenderers, something that is not, at the moment, provided for.

6.4.10 The Future of Staff Not Assigned to the Private Sector

Only the conclusions of the program discussed above and the study of the results of a real survey of motivation would make it possible to define the real extent and quality of the personnel segment that has been demobilized but that will remain among ONAS personnel. There will be two categories of such staff members: those who have not been assigned to the private sector, and those who have refused the opportunity. In any case, reference should always be made to the plan for changes in staffing, which shows clearly that, taken as a whole, the total number of ONAS personnel and of private sector personnel (assigned to tasks of wastewater facility management and operation) should increase in coming years and decades.

ONAS staff not assigned to the private sector should be considered as staff that ONAS could re-employ in similar facilities (or even in different facilities, if required) and that it will need, in coming years. They are staff who should be transferred and reassigned, rather than staff whose jobs risk being eliminated.

6.4.11 Measures to Re-Engage These ONAS Employees

A certain number of ONAS staff will neither be engaged by private entrepreneurs nor be transferred to another ONAS site (not all staff will be willing to move), and various possibilities for re-employing this particular category of staff should be studied. Consideration might be given to assigning staff to similar activities in the same sector of operations but that are managed by ONAS. This is easier on systems, where the share of operating staff is greater than in treatment plants and requires fewer skills. Staff might seek assignment to other operational sectors, old or new, when ONAS has taken them over. It is important not to forget that the program for introducing services to new cities should be accelerated and that the overall operating activity is in constant expansion.

There are always routine departures for retirement (with or without the five-year anticipated retirement offered). Application of one of the above solutions (other assignments, which could be temporary) could bring an already advanced employee up to the age of retirement. This is the case today for 3 percent of ONAS employees; in five years, it will apply to 10 percent. ONAS could negotiate departures. Certain departures could be obtained in return for financial or professional assistance from both ONAS and the private contractor, whose contribution could be elicited. Such assistance might take the form of severance allowances in excess of what is legally provided for (customary allowances for contract termination), limited exceptional compensation (providing remuneration for the time during which new employment is being sought), assistance in the creation of a business, training and assistance in re-deployment, etc.

The government can provide assistance not only in the specific framework of wastewater, but also as part of the general policy of private sector participation. Such assistance can, for example, concern a return to rural activities for certain employees.

Assistance in the Creation of Private Sector Businesses

As specified above, one objective of private sector participation in the field of wastewater is to favor the emergence of SMEs in this field, and this is what is now happening. Certain ONAS employees should have the skills and means for creating this type of business, which, in addition, would permit the recruitment of other ONAS employees.

The risk of commercial failure exists, and the responsibility for it is usually incumbent only on its creators and directors. If the public party desires to assist in the creation of private firms by ONAS personnel, it could, instead of helping set them up, provide a guarantee of re-employment in case of failure. Such a guarantee exists in the legal framework of leave for personal reasons, by which a potential entrepreneur can take up to five years' leave without pay to carry out a project, with the guarantee of re-employment at the end of the contract. Should he require financing during that period, part-time employment might be negotiated with ONAS management before taking such leave.

Lastly, there is always the possibility of seconding, enabling an ONAS employee to leave the agency for a given time to work for a company that will ensure payment of his salary. While this arrangement applies only to public entities and only to salaried staff, a similar arrangement could be set up whereby ONAS could second a member of its managerial staff to a private company with assurance of re-employment at the end of the period of secondment, or, in case of failure, of the private party.

In general, however, ONAS should handle its personnel and offer them guarantees on the basis of the departments to which they are assigned.

Setting Up Technical Projects Reserved for ONAS Personnel

As an element in its strategy of delegating operation of its facilities to the private sector, ONAS could define and establish technical projects for the allocation of which ONAS staff would receive priority. ONAS could, for example, offer those of its staff who wish to create their own businesses the possibility of tendering for the delegation of works, at the same continuing to work for ONAS until such time as the contract is awarded. Should one of them win the contract — and only in this case — that employee would then have to resign from ONAS. This measure would have two main advantages. For ONAS, it would have the advantage of providing contractors it knows well (since they would be former employees); at the same time, it would give ONAS employees the assurance of retaining their position at ONAS until the contract is awarded. Second, the number and magnitude of these specific technical projects will probably remain small, and for this reason will have little effect on competition with respect to the participation of other private firms.

6.4.12 Other Measures

Table 24 shows that ONAS will be led first to increase, then to reduce, its staff during the coming plans. For this reason, it should begin now to adapt its recruiting policy to its future needs. Specifically, all new recruitment should be made on the basis of a fixed-term contract.

Monitoring and Evaluating the Strategy

7.1 Definition of Evaluation Criteria

Monitoring the strategy will determine whether the planned implementation rate is being respected, using the criteria for evaluation. The criteria for evaluation have been developed to determine as accurately as possible the extent to which the transfer process has attained the following main objectives:

- reducing ONAS's financial dependence on the government;
- reducing operating costs;
- monitoring ONAS management;
- improving quality of services; and
- promoting emergence of SMEs.

Several aims are served by reducing ONAS's financial dependence on the government in its investment and operating budgets. The use of private capital should enable ONAS to reallocate the monies thus saved to the provision of services in newly assumed communities and to the acceleration of the general process of wastewater service implementation. The market of wastewater facility operation is, in the long run, a global market that will never cease growing, since there will always be new cities to be taken over and new investments to be made to improve coverage rates and serve new area. Tunisian businesses will, finally, be able to enter this global market.

Transfer to the private sector will reduce operating expenses, with the effort to keep down energy costs, current expenditures, and personnel costs. To this effect, better productivity should be sought.

The services of management and operation of ONAS facilities (systems and plants) call on considerable, and constantly growing, human, logistic, material, and financial resources. To improve its management, ONAS wishes gradually to divest itself of these tasks and to reorient its activities toward monitoring, management, and planning on the national level. Operating tasks will be entrusted to the private sector. Delegated management will bring about a general improvement in services rendered with respect to staff competence, customer relations, quality of installations, quality of the service rendered to users whether they are connected or not, and quality of treated effluents.

In a more general context, the public authorities are seeking to promote the emergence of specialized SMEs, a type of enterprise that is currently lacking in the sectoral field of wastewater.

All these factors indicate clearly that private sector participation is necessary and desired. With respect to personnel, it will lead to a reduction in staff and to an improvement of the productivity and skills of remaining staff.

In evaluating the process, it is essential that the criteria corresponding to each of the principal objectives are defined. For each of the objectives listed above, the following points are discussed:

- criteria selected for strategy monitoring and evaluation;
- strategy monitoring and evaluation; and
- implementation of the strategy and corrective measures.

In conclusion, monitoring and evaluation will provide a basis for determining whether the strategy initially developed in the form of a program and plans of action has reached the desired objectives, and what deviations and distortions have been noted. At this level, pursuing the strategy consists in confirming all the elements that have provided results in accordance with the objectives, and in defining and implementing measures by which certain elements of the initial strategy could be revised or corrected in such a way as to bring it better into line with the objectives sought. Generally speaking, such corrective measures might include changes in rhythm, changes in means, especially in types of contracts, and the introduction of the necessary changes in the normative (regulations), the institutional (the public actors), and the legal frameworks, whether on the sectoral level (that of wastewater) or the national level (e.g., that of private enterprise).

7.2 The Methodological Approach to Monitoring and Evaluation by Objective

7.2.1 The First Objective: Reducing Financial Dependence of ONAS on the State

Criteria

The criterion chosen for monitoring and evaluating strategy in this field is whether the private sector has replaced the public authority in contributing new capital.

Investment Budget

A distinction should be made between two types of capital, depending on the nature of the public authority. The first comprises capital provided by the private sector in ONAS's stead. The second is the capital that the Tunisian government would have paid as its contribution to the ONAS investment budgets.

These criteria apply to all BOT contracts, since here the private sector must finance what it will itself build and then operate. These criteria can, depending on the case, apply to so-called management contracts, in which case they will concern only investments for which it has been decided that financing and works may be the responsibility of the contractor. These private investments may concern operations of repair and extension of existing facilities. With respect to investment, only treatment plants are concerned.

Operating Budget

The government's contribution also appears in the financing of the ONAS operating budget. As in the case of investment financing, a distinction should be made — again, at the level of private sector contributions — between two types of capital. The first type consists of capital brought by the private sector in ONAS's stead with respect to the operating budget. The second corresponds to what would have been paid by the Tunisian government as its contribution to the ONAS operating budget. All types of contracts and works are concerned, and, as a result, the proportion of private sector financing should increase in comparison with that of ONAS.

Monitoring and Evaluating the Strategy

The public party will collect and analyze all the information presented in the investment and operating budgets. The investments will be summarized for all current contracts, and the result will be expressed in terms of size and evolution of the amount of the investments made by the private sector in ONAS's stead, and by the amount the government would have paid as its contribution to financing the corresponding investments.

Investment Budget

When operations are in full swing, the real investment budgets will be compared to the estimated budgets, and any discrepancies between the two will be studied, as will any corrective measures that may have been taken during the year. It is important to determine whether the proposed budget estimates are credible, and to determine the capacities of private operators to identify and deal with any deviations that may arise.

Achieving the investments that have been planned and approved may give rise to monitoring during the year. Such monitoring is necessary to ensure that there is no untoward overspending with respect to planned investments, which could raise difficult financing problems. This monitoring would be carried out quarterly, providing a complete statement regarding every project at the end of every quarter, with an emphasis on the fixed investments that will remain outstanding at the end of the year.

Investments will be broken down as a function of the main parameters defined in the program and the plan of action initially decided on for the strategy, that is, the number of contracts, the amounts involved, the sites and schedules, and the type of contract (BOT or management). The result will be expressed in terms of distribution among these different parameters.

With regard to the number of markets, respect of the initial planning will be verified, and the reasons for any delays will be analyzed. The magnitude (size and conditions for regrouping elementary projects) of the different contracts and their geographical locations will be studied to see whether these have a perceptible effect on results. If so, an attempt will be made to define the parameters that are most sensitive in this respect. Analysis according to type of contract is of prime importance, and the results for BOT should be differentiated from those for management contracts.

With respect to management contracts, a distinction should be made between those that do and those that do not include provisions obliging the contractor to finance and execute works on his own behalf. For those that do not, the investments made by the private sector under a management contract should be broken down on the basis of the nature of the works executed: major repairs, rehabilitation, reinforcement, extension.

Concurrently, for each contract concerned an analysis will be made of any factor that may have contributed to realizing and setting up private financing for these works, whether such factors were decided on before establishment of the contract, following diagnosis during the period of start-up, or during contract execution.

It is important to analyze the breakdown of the investment in terms of the nature of the works done, an analysis from which it is then possible to evaluate the validity of certain actions and to modify the approach accordingly. In addition, it will reveal any elements that may have been ignored or underestimated at the outset, making it possible to plan the corresponding investment.

Only following this type of analysis can needs be evaluated and corrected in the future, both in kind and in magnitude. Analysis according to the capacity of private operators is also of prime importance. Clearly, not all contractors will have the same chances with respect to investment capacity, particularly when the strategy is only just getting under way. Thus, the results will also be differentiated on the basis of large categories of operators, namely, newly created small and medium domestic operators (e.g., former ONAS staff), existing domestic firms (usually not specialized in wastewater), and mixed Tunisian-foreign companies possessing know-how and large investment capacities.

Operating Budget

An approach similar to that adopted for investment will be followed for operating budgets, which will be summarized for all current contracts. The result will be expressed in terms of the amounts and increases in operating budgets that are supported by the private sector in ONAS's stead, and in the amount that the government would have paid as its contribution to financing the operating budgets.

The operating budgets will be broken down and analyzed as a function of the main parameters defined in the program and the plan of action initially decided upon for the strategy, that is, the number of contracts, the amounts involved, the sites and schedules, the type of contract (service, management, or BOT), and the nature of the facilities involved (systems or treatment plants). The result will be expressed in terms of distribution of the overall budget among these different parameters.

Implementation of the Strategy and Corrective Measures

The initially planned strategy will then be modified or reoriented, if necessary, before being pursued. Corrective measures could concern a number of aspects, e.g., the rate at which the implementation program is carried out. It might be judged necessary to accelerate this if ONAS

and the government wish to disengage themselves more quickly; alternatively, initially planned contracts could be revised, taking into account the composition and grouping of basic projects or their geographical distribution. A given operator might find it advantageous to regroup certain investments (laboratories, rolling stock, inspection equipment) so as to deploy others. The nature and magnitude of the investment might be affected by the parameters it has been decided to use in selecting contracts.

Greater weight might be given to contracts that favor private financing (BOT and management). For one thing, consideration might be given to extending these forms of contract to wastewater systems as well. In addition, the number of BOT contracts could be increased, as could that of management contracts. For management contracts, it might be decided to reinforce the share of investments to be made by the private sector (the nature and bearing of the works).

In the long run, the conditions of remuneration proposed could be adjusted. At present, standard contracts (remuneration by ONAS calculated per cubic meter treated, including operation and redemption of investments) should enable the private investor to balance his accounts. Any margin for maneuvering assured him in this respect will enable him to invest more. Conversely, any excessively restricted field would result in limiting the investment. The desire to obtain more from the private investor in the future could require a reconsideration of the levels of his remuneration and the conditions governing it. Thus, it might be necessary to consider rewriting the articles initially contained in the standard contracts.

The same is true, in the long term, for contract durations. Redemption of investments is inversely proportional to the length of the contract term, and it would therefore be desirable to lengthen the initial contract durations. If, at the same time, it is desired to favor private investment at the level of management contracts, the five-year term should undoubtedly be revised upward.

In the case where large investments are requested from the private sector, the sharing of responsibilities between the contractor and ONAS should also be revised to allow a larger share for the private sector, which supports a considerable technical and financial risk. It should, in particular, be given greater responsibility and freedom of action with respect to conception, choice of techniques, and decision-making regarding the works to be carried out.

Lastly, corrective measures might concern the conditions under which the different contracts are awarded considering the investment capabilities of the private entrepreneurs. In particular, the technical and professional capabilities of private firms, as well as the conditions governing their access to bank loans to purchase operating equipment or to finance works, will be discovered at this level.

A redistribution of contracts on the basis of size, nature (systems or plants), and type could be envisaged as a function of technical and professional capabilities and access to credit. As a result, the strategy program and plan of action could be revised, as might the conditions for

awarding contracts (procedures and regulations for calls for tenders). Concurrently, the standard contracts might be adapted to these new adjustments.

7.2.2 The Second Objective: Reducing Operating Expenses

Criteria

The criterion selected here is that of the operating expenses, which include operating and maintenance expenditures as well as the expenses work done for third parties. This criterion applies only to operating activities, and, what is more, it is identical regardless of the type of contract proposed — service, management, or BOT — and regardless of the type of facility operated (systems or treatment plants).

Monitoring and Evaluating the Strategy

The public party will collect and analyze all the information presented in the management accounts (operating budgets) and reports, and the data will be summarized on the basis of the two broad types of facilities operated, systems and treatment plants.

Systems

Monitoring and evaluation will bear directly on a comparison of the results of the private contractors with those of ONAS. These results will be expressed as financial ratios. In the beginning, the difference in operating costs for systems that have gone from ONAS management to private management will be analyzed. Under full operations, the differences of the results in value will be analyzed. The results will be analyzed in detail for the following three parameters.

- First, quality of the systems: private operation will be examined to determine whether the private sector performs substantially better than ONAS, both on good-quality system segments and on those of bad quality (with structural defects) or those laid in urban sectors of low-income, dense, and/or “medina” (traditional) type occupancy. A comparative analysis according to large types of urban typology might be envisaged.
- Second, the type and size of the systems: the basis for evaluating results might be extended to the type of system (wastewater disposal, storm sewer, combined) and the manifold sizes. Materials and methods differ depending on the diameters operated (whether they can be visited, mechanical scouring, water scouring, etc.) and the nature of the materials involved (particularly joints and branch connections). Each system typology might also be studied to determine whether the private company is performing better than ONAS.
- Third, the size and financial capacity of the private operator: when the number of contracts is relatively large, the results should be studied to see whether there is good adaptation of the private operators to the desired capacities under each contract. There is every reason to suppose that there are contract sizes that are suited to each operator’s capacity, and it is important to demonstrate that the distribution is truly appropriate.

Treatment Plants

A detailed analysis of the results is even more important in the case of treatment plants, since many parameters affect the financial ratios and prevent direct use of the results. Most of these

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parameters are related to the design of treatment facilities and to the conditions of functioning and effluent supply, which were mentioned in the previous section. The treatment operation generally has no control over these parameters, a fact that should be given the greatest consideration in evaluating results.

The quality of the treated effluent is an important component in the cost of the operation. Current legislation does not mention uses or standards of quality for the natural environment in which treated waters are to be dumped. Imminent adaptation of legislation in this regard could have a considerable effect on operating costs, and in this case the financial ratios of operation should be compared on the basis of the levels of treatment required.

It should also be specified that private operators will seek a method of operation that is closest to the standards imposed by regulations governing waste, and that they will equip themselves with means of internal inspection and supervision. They will thus be quite distinct, on the energy level, from many ONAS operating sites. Nonetheless, it is possible, in a first stage, to analyze the reduction in operating costs for treatment plant projects that have gone from ONAS to private management. When operations are fully underway, the differences in value in the results will be analyzed.

As the operating of treatment plants is a relatively specialized technical field, it would be valuable also to analyze the results (reduction in expenses) from the standpoint of the capacities and skills of the private contractors. This might reveal the necessity of adapting the allocation of the various projects (size and grouping) to those capacities and results.

Implementation of the Strategy and Corrective Measures

The initial strategy will be modified or reoriented if necessary. Corrective measures might concern the strategy program implementation and the analysis of the results, taking into account the nature of the facilities and the planning of the projects.

Analysis of the results of the first pilot projects will undoubtedly reveal a need to revise and adapt the definition and planning of the base projects (size and geographical distribution) or the real capacities of the private operators, which will mean taking into consideration their prior commitments and their residual availability for new contracts. Account will also be taken of any skills they have exhibited in the first contracts they have been awarded, as a result of which it will be possible to define a work scope whose characteristics correspond more specifically to these skills. By extension, an analysis of the results taking into account the characteristics of existing facilities and the resulting difficulties of operation should also lead to a revision of the definition and planning of the base projects. This applies indiscriminately to treatment plants and sewerage systems. As a result, the strategy program and plan of action should be revised, as should the conditions for awarding contracts (procedures and regulations governing calls for tenders).

7.2.3 The Third Objective: Limiting the Development of ONAS

Criteria

The criteria selected for monitoring and evaluating the strategy in this field are related chiefly to the means brought to bear by ONAS in financing, managing, and operating its own wastewater facilities. These means are financial, human, logistic, and material in nature, and encompass both investments and operating expenses and means.

Monitoring and Evaluating the Strategy

The public party will gather and analyze the information concerning investment and operating costs and staffing numbers.

Investments

Investments will be summarized for all current contracts. The result will be expressed in terms of size and changes in the amounts of investments made by the private sector in ONAS's stead. As a result, it will reflect the level of and changes in ONAS disengagement with respect to investments.

Operating Expenses

Operating expenses will also be summarized for all current contracts. The result will be expressed in terms of size and changes in the amounts of operating expenditures made by the private sector in ONAS's stead. As a result, it will reflect the level of and changes in ONAS disengagement in this respect.

Staff Reduction

For each contract, ONAS should study how many of its staff have actually joined the private employer, these being staff members whose technical skills have been recognized by the private operator and who have accepted the transfer. Similarly, such staff will be summarized for all current contracts. The result will be expressed in terms of staff size and changes in staff numbers transferred to the private sector. It is important that the structure (age, division, skills, and function) of the staff actually transferred to the private sector be studied, as well as the motivations that led them to accept this transfer.

Concurrently, ONAS will mention any difficulties it has had in taking back an employee, either because he was not employed by the private company or because he himself did not desire the transfer. In the same spirit, should ONAS have decided to take transitional measures (e.g., the possibility of reassigning former employees following a period of work for the private contractor), the staff members who have decided to leave the private sector and return permanently to ONAS should be studied.

Implementation of the Strategy and Corrective Measures

The initial strategy will, if necessary, be modified or reoriented. Corrective measures concerning the investment and operating expenses aspects have been discussed above.

A number of important aspects may be noted with respect to personnel. The employment issue, and particularly the professional future of ONAS staff, is a major element in the success of the strategy. Transfer of the major part of the current operating staff to the private sector rests on motivating these employees to join that sector, and wage considerations are a considerable factor in motivation here. The question of granting attractive wages concerns first of all the private sector, which, as a result of reductions in operating costs, can consider transferring part of the resulting gains in the form of higher salaries. As has already been emphasized, however, the gains will not be obvious in certain contracts, particularly those for treatment plants of old design, which are sometimes only barely able to ensure the required level of treatment. In this case, the reduction in costs will involve a substantial reduction in staff, which is not the employment objective sought.

Thus, it is up to ONAS, and to the public party in general, to agree in the long run to contribute by accepting the private contractor's conditions of remuneration, those which enable him to balance his accounts and at the same time to maintain a wage policy that provides his staff with motivation for transfer.

Changes in the terms of the standard contracts should eventually be considered to promote the success of the employment plan, which involves success in reorganizing ONAS (which can contribute to creating new jobs and to reassigning part of its staff). The success of the employment plan may also require maintaining ONAS staff in their positions, and if necessary this must be done, meaning that some facility management and operating services might not be transferred to the private sector, or possibly that such transfer could be delayed. A direct consequence of this would be the necessity of readjusting the program and the strategy plan of action, considering that transfer to the private sector no longer concerns all services, but that ONAS would retain a certain portion of them. Lastly, the success of the employment plan also implies successful transfer of investments to the private sector — this is the only way ONAS can release and transfer budgets that will enable it to assume responsibility for new municipalities that will, in leading to the creation of new services, easily absorb the jobs that have not been taken up by the private sector. Thus, it is absolutely essential that the corrective measures proposed with respect to investments (see above) be taken into consideration.

7.2.4 The Fourth Objective: Improving the Service

Criteria

There are five criteria for monitoring and evaluating service quality.

- Quality of service in rate of service coverage: This can be evaluated by identifying the number of users connected, the rate of connection to the current system, and the extension of the area of coverage.

- Quality of service with respect to installations: In particular, the quality of maintenance of existing installations should be examined.
- Quality of the service offered customers: This deals mainly with customer relations.
- Quality of waste dumped into the natural environment: This applies to levels and qualities of treatment.
- Quality of the water environment: This can be determined from the number of users connected and the number of treatment plants set up.

Monitoring and Evaluating the Strategy

This involves the public authorities' gathering and analyzing information regarding quantity factors and technical ratios on the local, regional, and national levels. When operations are in full swing, the following elements will be analyzed:

- changes in the numbers of customers connected to a sewer system;
- number of disorders corrected on existing systems;
- nationwide changes in the number of customers who are connected to a treatment plant;
- changes in the pollutant loads generated and treated;
- changes in the overall pollution dumped into the natural environment (treated and not yet treated);
- changes in the general level of maintenance of installations; and
- changes in the level of service offered customers.

Implementation of the Strategy and Corrective Measures

The initial strategy will, if necessary, be modified or reoriented before it is pursued. Corrective measures could address a number of aspects. For example, the strategy will attempt to discern the rate of transfer that will enable ONAS to dispose of the means for undertaking to provide wastewater services in new centers. If accelerating the transfer of wastewater facilities to the private sector seems to have no ill effects on personnel, ONAS could increase the speed of transfer. It might be deemed necessary to revise regulations regarding technical standards for levels of treatment and the objectives and qualities of environments receiving dumped material as a function of their uses.

In the aim of making it possible to improve direct relations between users and operators, a number of corrective measures might be envisaged. First, the initially conceived projects and standard contracts could be revised or broadened. This would make it possible to improve the direct relation between users and operators, it would encourage operators to maintain their facilities, and it would ensure the financing (whether public or private) of such facilities. Next, regulations concerning technical standards for levels of treatment and the objectives and qualities of environments receiving dumped material as a function of their uses might be modified.

7.2.5 The Fifth Objective: Promoting the Emergence of SMEs

Criteria

The criteria selected for this objective will be designed to measure the creation of SMEs, the existence and power of which will be indicated by turnover, results, and the extent to which these businesses assume a predominant position in the sector. The quantitative and qualitative evaluation of their human and material resources will also give indications as to the numbers of such firms in the wastewater sector.

Monitoring and Evaluating the Strategy

The public party will gather and analyze information concerning the following factors: trends in turnover and margins; trends in investments; changes in quantitative derivatives and human and material resources brought to bear; monitoring of economic and financial ratios; improvement of the level of staff skills and autonomy; difficulties that have compromised the development of the firm; and problems related to personnel.

Implementation of the Strategy and Corrective Measures

The initially conceived strategy will, if necessary, be modified and reoriented. Monitoring of the strategy will enable the public sector to take corrective measures in the field of difficulties in obtaining loans, contract management, and, lastly, personnel problems.

If SMEs appear to be having difficulty tapping into credit, the government could react in a number of ways. First, legislation regarding loans to private firms could change. Next, subsidized loans could be set up. Finally, the state could set up real assistance for creators of firms in this sector.

If difficulties arise in contract management, a revision and/or broadening of projects or of standard contracts might be envisaged, which would enable the private firm to act and to assume responsibilities commensurate with its policy of expansion. This might concern its level of responsibility, its choice of investments, its customer relations, its autonomy, and its responsibility in general.

Third, the strategy could be modified if personnel problems arise. This aspect might concern the future of staff members in the private sector, the employment aspect, and the level of training. If not enough is done in the field of employee relations, what are the limits of the private firm's capabilities? How can it break out of these limits? Training and staff qualifications in the private sector should be analyzed to determine whether they are adequate, and, if not, what means can be brought to bear to improve them. Account should also be taken of the future of staff who have been excluded from the private firm, and of the means for developing a complementary role for the public sector.

7.3 Criteria for Evaluation of Pilot Projects

7.3.1 Monitoring and Evaluating the Role Played by the Public Authority

One of the main functions of monitoring and evaluation will be to propose changes that are deemed necessary in planning and means. It is essential to verify that the procedures (especially those concerning reporting) required of the various contractors have been respected, and to identify any gaps and difficulties that contractors may have encountered.

The evaluation will consist chiefly in gathering the results that characterize service both by private operators and by the public services that have been retained by ONAS. In addition, these results must be analyzed, with particular attention to the following aspects:

- the results of management that has been transferred to the private sector;
- a comparison of results between private and public management;
- the general development of the situation with respect to numerical results and referring to the basic objectives in the preparation of the strategy;
- the capacity of private entrepreneurs and the operators with whom they work; and
- means, particularly standard contracts.

In an overall sense, ONAS and its ministry of oversight are the principal representatives of the public authority.

7.3.2 Obligations of the Private Operator

An operator is awarded one or more contracts. Such contracts may be service contracts for the operation and maintenance of systems and treatment plants, management contracts for the operation, maintenance, and rehabilitation or extension of treatment plants, or BOT contracts for operations of financing, construction, and then operation of new treatment plants.

The contract between the private operator and ONAS will include a definition of the nature and scope of the facilities transferred, as well as of the nature of the services and responsibilities that are being entrusted to the operator. Among these, the contract will specify the obligation of accountability to the public authority. In concrete terms, the contractor will be requested to keep records and to submit reports regarding results to the government authority of oversight. The content of the records and of what is then presented to the authority of oversight is defined on the basis of each of the chief objectives sought and of the contract type.

To facilitate evaluation and monitoring of these by the public party, and comparison with the current results of ONAS, the elements to be recorded by the private operator and the form in which they are to be submitted will be modeled after those of documents currently used by ONAS: investment budgets, operating budgets, and annual reports (systems and treatment plants), etc. The frequency with which elements are to be recorded and reports submitted will also be set in the contract.

7.4 Implementation of Monitoring and Evaluation According to Objective

7.4.1 The First Objective: Reducing Financial Dependence of ONAS on the State

Contractor's Obligations

The contractor will be responsible for drawing up and submitting an annual investment budget and an operating budget for each contract. Private contractors will have been given model budgets for each type of contract, and these will be an integral part of the contracts. They will be prepared and handled in accordance with the rules of cost accounting.

Investment Budget

The general investment budget will be presented annually, and must include the following information:

- investments in operational installations — treatment plants (all or part), pumping stations, connections;
- investments in buildings for general use — offices, laboratories, garages; and
- investments in equipment:
 - ▶ vehicles, specialized machinery, tools, and automated equipment;
 - ▶ laboratory equipment;
 - ▶ office furniture and supplies, computers, and other office machines;
 - ▶ expenses for replacement of such investments; and
 - ▶ income and other taxes.

In addition, the budget is to include medium-term estimates. The required investments are often substantial, and they should be budgeted to facilitate planning and identification of the financing tables.

When operations are fully under way, private entrepreneurs will present documents that show budget changes over at least three years, the estimated and real budgets for the last reference year, and the estimate for the coming (i.e., current) year.

A special remark: spending on planned and authorized investments should be monitored throughout the year through a document called the Quarterly Investment Check, which should show the following elements for every main project (or every line of credit):

- the total project amount;
- the amount invested during previous fiscal years;
- the amount authorized during the current fiscal year;
- the amount allocated for capital investments that have been completed;
- the amount of outstanding capital investments; and
- the amount of committed but outstanding expenditures.

Operating Budget

With respect to a possible reduction in ONAS's financial dependence on the government, the operating budget is of interest to us only in a general way, both with respect to ONAS and to the government's participation to ensure the balance of the ONAS budget. Thus, the details for presenting the operating budgets will be specified in the following section concerning the reduction of operating costs.

7.4.2 The Second Objective: Reducing Operating Expenses

Contractor's Obligations

Operating Budget

The contractor is to keep, and submit annually (and for every contract), an operating budget that shall result from the drafting of an estimated operating account to which the real operating account should hold as closely as possible. The budget for a given fiscal year should be prepared no later than during the fourth quarter of the preceding fiscal year, on the basis of the results already known for that fiscal year.

The operating budgets and accounts must include information concerning expenditures related directly to the functioning and supervision of wastewater systems, pumping installations, and treatment plants, namely:

- labor;
- electrical energy;
- treatment products and other expendables consumed;
- expenses of maintenance and repair;
- expenses for replacement of equipment investments, vehicles, specialized machinery, tools, automated equipment, and laboratory equipment; and
- office furniture and supplies, computers, and other office machines.

The estimated budget will be drawn up on the basis of an evaluation of changes in inflation rates, salaries, social welfare contributions and transportation costs, the cost of electricity, and the cost of materials and services. These elements will be completed by:

- probable changes in wastewater discharge and the distribution of this as a function of the different customers;
- changes in the areas served by wastewater systems and the nature of the newly connected populations;
- the volume of work liable to be executed for third parties; and
- the estimated margin, changes in employee numbers and distribution, and the probable distribution of expenses among wages, energy, and other elements.

The results obtained in this domain for the current and preceding fiscal years will provide very valuable information in this respect.

Here, then, are all the elements necessary to draw up the estimated operating account, preferably in cost accounting form. Naturally, this estimated budget will not necessarily be restricted to the coming year; it might extend to cover a period of three to four years, in which case it would be called a medium-term plan, and every year the estimates for the year $n - 1$ would be reviewed on the basis of the real situation for year n .

At the same time that the contractor draws up the operating account, he should also produce a report presenting the financial indicators showing the level of operating costs, and provide a detailed analysis of the specifications of the installations operated and of the conditions of their operation.

Financial Indicators

Financial indicators could be established for the functioning of treatment plants and for systems. For plants, the cost of treatment can be determined with respect to the number of inhabitants or to the volume treated (in TD per cubic meter or kg BOD/day), or the cost of energy compared with the volume treated. For systems, operating and maintenance costs will be determined on the basis of the system's length and the number of inhabitants connected.

The Characteristics of Installations Being Operated and the Conditions of Operation

In this part of his report, the contractor should specify all the elements that might, in his opinion, have any effect whatever on the financial ratios. This approach is important in that it makes it possible to judge the relative importance of certain results that might be deemed disappointing. In many cases, the characteristics of existing installations and the way in which they are operated leave only a small margin for maneuvering to reduce operating costs. For certain facilities that suffer from structural defects (age, bad condition and bad materials, inadequacies, bad conditions of pipe-laying, unsuitable connections, etc.), even the best operating techniques cannot remedy disorders that require costly means of intervention.

7.4.3 The Third Objective: Limiting the Development of ONAS

Contractor's Obligations

The contractor will be required to draw up and submit an annual investment budget and an operating budget for every contract. Detailed methods for reducing financial dependence on the state (Objective 1) and for reducing operating costs (Objective 2) have been defined in the two sections above.

Transfer of employees responsible for management and operating activities to the private sector is a consequence of the delegation of the service, and contractors should thus, in their annual management reports, mention aspects concerning the personnel assigned to operations. The information provided must include data regarding personnel employed under each contract:

- number, structure and qualifications, function, and assignment;
- origin (are they former ONAS employees or have they been recruited from outside?);

- if they are former ONAS employees, how were they reassigned (what training means were decided on?); and
- what are the company regulations and the work and salary conditions?

7.4.4 The Fourth Objective: Improving the Service

Contractor's Obligations

The contractor is required to draw up and submit annual operating reports containing the following information:

- extensions and hook-ups to the system;
- improvements made to the system;
- facility maintenance and improvement;
- statistics of intervention on the systems and customer relations; and
- quality of wastewater discharged from the treatment plants.

7.4.5 The Fifth Objective: Promoting the Emergence of SMEs

Contractor's Obligations

The contractor is required to submit three reports annually.

- The first report, which is mandatory for at least the first two years, will specify the characteristics of the private company and its evolution. The annual report will include the following information: the company's date of creation and legal form; capital, main shareholders, and evolution, if appropriate; annual turnover, balance sheets, and income and expenditure account (non-confidential information); financial operations (financial package and securities) carried out in relation to wastewater activities (material related to operating or investment in facilities and equipment); and any difficulties encountered in obtaining loans, particularly if they have compromised the firm's development.
- The second annual report will concern the details of operation. The contractor is to specify a number of elements concerning the facilities that he has taken over. This report will include the quantitative specifications of the facilities transferred and developments concerning them. It will also include documentation regarding changes in the human and material resources brought to bear by the firm, and a description of the training programs offered and their impact on the staffing levels.
- Lastly, the contractor is required to provide an annual internal report in which he specifies difficulties encountered in managing the ONAS contract, particularly any problems that have compromised the company's development. It should also include any satisfactions or difficulties encountered with respect to personnel transferred from ONAS to the private company.

The Future Role of Operators

Implementation of the new policy to involve the private sector in the operation, the management, and even the financing of wastewater facilities will bring about changes in the tasks that ONAS currently carries out. On the governmental level, too, new operators will appear in the sector and will be concerned by this new policy.

An advisory committee might be set up with standing members representing the various ministries concerned and, of course, ONAS. The commission's standing members will include a representative of the MOE, who will chair it, and representatives of the ANPE, the Ministry of Finance (MFIN), the Ministry of the Interior (MOI), the Ministry of Economic Development (MED), and the Ministry of Public Health. In addition, the committee can bring in other representatives on a temporary basis to help it handle specific issues.

8.1 The Future Role of ONAS

Private sector participation in operating activities will alleviate or limit certain ONAS tasks, and will create for it new missions that will strengthen its role as planner and supervisor of the quality of services rendered by the private sector. ONAS, under the oversight of the MOE, will be the most important government agency responsible for the wastewater sector in Tunisia. ONAS's new role will thus revolve around the following tasks.

- The agency will continue to be the vis-à-vis for central, regional, and local governments for wastewater issues.
- ONAS will provide technical assistance to municipalities to define their wastewater needs, establish priorities, and supervise the implementation of projects.
- It will entrust to the private sector all or part (depending on the scenario selected) of the operating and/or management of the wastewater facilities it owns.
- ONAS will manage the contracts for studies, new facilities and purchase of goods and services, and also contracts awarded to private contractors for the operation and/or management of wastewater facilities. It will also supervise the proper execution of all such contracts.
- ONAS will continue to be the customers' vis-à-vis and the agency responsible for billing and collecting payment for wastewater services. It will continue to propose the rates for such payments to the competent authorities to ensure the balance of its accounts.
- ONAS, as the organization most directly concerned, will sit on the advisory committee to be created within the MOE to manage the national strategy for private participation in wastewater services.

8.2 The Future Role of Other Operators

8.2.1 The Ministry of Environment and Regional Planning

The MOE is the ministry responsible for wastewater policy in Tunisia, and therefore oversees ONAS. Thus, it is the MOE's responsibility to manage the national strategy for private participation in the wastewater field. The advisory committee may be set up within this ministry.

8.2.2 Other Actors

Alongside the main actors mentioned above, others will exercise their customary prerogatives in the course of application of the national strategy:

- ANPE: control of waste and respect of standards;
- Ministry of Public Health: hygienic control and public health-related issues;
- MOI: participation in drafting programs to initiate services in new municipalities, in collaboration with the concerned municipalities and with ONAS; and
- MED: preparation of five-year plans and of the wastewater budget, in collaboration with the sectoral commissions, the MOE, and ONAS.

Conclusions and Recommendations

The national strategy for private participation in the operating, managing, and financing of wastewater facilities is a tool that will make it possible to set the framework and the orientation for this new policy. In addition, it proposes a program for participation and concomitant measures to ensure the success of this policy and to draw maximum benefit from the anticipated advantages.

The objectives set for this strategy during a roundtable organized with representatives of the main agencies concerned by this policy are:

- reduction of the financial dependence of ONAS on the government;
- reduction of operating costs;
- improvement of the management of ONAS;
- improvement of quality of services; and
- the emergence of new SMEs.

Two scenarios were designed and tested to assess their respective impacts on financial aspects of private sector participation, on O&M staff of ONAS, and on the improvement of wastewater service coverage.

In preparing the two scenarios, a "final target rate" was adopted for private sector participation. This rate corresponds to private sector participation at the end of the Twelfth plan equal to 100 percent in the first scenario and to 50 percent in the second.

Table 25
Parameters Assigned to Each Scenario

Scenario	Final Target Rate
1	100%
2	50%

The scenarios and the constitution of the various bid packages (systems projects and treatment plant projects) are based on guiding principles, which include the following.

- The types of contracts that have been incorporated in the strategy are those that were considered as viable in the market study, namely:
 - ▶ service contracts for systems;
 - ▶ service contracts for treatment plants;
 - ▶ management contracts for treatment plants; and

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- ▶ BOT contracts for treatment plants.
- A series of pilot projects is first to be carried out for various types of private sector participation. The evaluation of these experiments will make it possible to take the corrective actions necessary to continue the strategy.
- Employment-related problems to which this new policy might give rise must be minimized.
- It will be necessary to target various types of private firms to increase competition.
- ONAS should retain an operating capacity to be capable of intervening if required.

The table below summarizes the operating costs for wastewater facilities (system and treatment plants) for each scenario for the period 1996-2001. It includes the costs of operation of facilities transferred to the private sector and the operating costs for facilities remaining under ONAS. It also shows the gains, in amounts and in percent, for each scenario in comparison with operation exclusively by ONAS.

Table 26
Summary of Operating Costs
1996-2001

		ONAS Operating Costs (in millions of TD)	Savings over ONAS Operation (in millions of TD)	Savings over ONAS Operation (%)
Scenario 1	System	13.3	3.1	19.0
	Treatment Plant	44.3	3.1	6.5
	Total	57.6	6.2	10.8
Scenario 2	System	11.4	2.7	19.0
	Treatment Plant	42.8	3.1	6.7
	Total	54.2	5.8	10.7

This table shows that the savings made possible by participation of the private sector are similar in the two scenarios; only the degree of private sector participation varies.

The effect of the two scenarios on ONAS operating personnel is summarized in the following table.

Table 27
Impact of the Different Scenarios on ONAS Operating Staff

	Year				
	1996	2001	2006	2011	2016
Scenario 1					
Difference between demobilization of ONAS staff and private sector recruitment	-16	381	430	740	-92
% variation in ONAS staff vs. private recruitment	133	28	48	38	110
Scenario 2					
Difference between demobilization of ONAS staff and private sector recruitment	-16	445	526	907	22
% variation in ONAS staff vs. private recruitment	133	nc	nc	nc	95

This table shows that it is Scenario 2 that provides the best absorption of the ONAS staff released because of private participation.

Given the considerable financial advantages of Scenario 1, its acceptable rate of ONAS operating staff absorption by the private sector, and its final target rate enabling total private participation by the end of the Twelfth Plan, we recommend that this scenario be chosen for the national strategy. In addition, this scenario will enable ONAS to disengage itself completely, during the next 20 years, from operating tasks, transferring them to the private sector and devoting itself entirely to supervision and planning. At that time, operations will be ensured entirely by private operators, as is currently the case for new works, and in large part for studies. There is no reason that operating activities could not be handled in the same way as new works, since the model for private sector integration into operating services is in large part similar to that for new works. ONAS will continue to be responsible for operating services and will remain in ultimate control of the situation, while the private sector only carries out work on its behalf, even in the case of BOT for treatment plants, since the forms of concession that would give the private sector the greatest autonomy have not been selected.

It is true that this scenario does not, as would Scenario 2, permit ONAS to operate a portion of the facilities (50 percent), meaning that it would be less dependent on the private sector and more easily able to take over from it when necessary. In our view, however, these disadvantages can easily be surmounted by contracts that take the different situations into consideration. Given the period proposed for application of the strategy (20 years), we think that true competition will have ample time to arise with the appearance of a certain number of new firms. The strategy provides, during the first years of application, for the maintaining of a certain operating capacity in every region, thereby enabling ONAS to intervene if necessary. At the end of the strategy,

the system will be well-established, and the number of private operators will prevent ONAS from being at the mercy of any single contractor.

This study will be a basic document in helping the competent authorities prepare the wastewater section of the Ninth Plan. It should be updated immediately before every plan, to refine the conclusions it expresses and take previous experience into account.

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APPENDICES

Appendix A
Capital Works

Gouvernorat	Centre Onas	Pop. 1993	Prise en charge année	Taux de branch. (%)	CONDUITES					regards unité	Avaloirs unité	Bouche d'égout unité	Boîte de branch. unité	
					Unitaire ml	eau usée ml	pluvial ml	linéaire total ml	% bon état					
					OUVRAGES ACTUELS									
TUNIS	BAB SOUIKA		1975	95	80361				80361		4220	1387		16066
	BAB BHAR		1975	99	97875				97875		5199		5113	23343
	EL MENZAH-EL KHRADR		1975	96	58922	65058	33030	157010		5526	2272			5907
	JBEL JELOUD		1975	90	72604	140767	43005	256376		10153	2851			37107
	RAS TABIA - EL OMRANE		1975	80	74990	103857	44251	223098		7669	2510	0		26140
	BARDO - HRAIRIA		1975	76	7462	132456	17456	157374		5239	1772	393		13475
	SEDJOURMI		1975	95	2145	102667	13000	117812		5639	805			13732
	GOULETTE - EL KRAM		1975	75		94782	14132	108914		3471	970			7172
	MARSA - SIDI BOU SAID		1975	75	4240	186120	14240	204600		6273	813	813		10230
	Total	1048568				398599	825707	179114	1403420		53389	13380	6319	
ARIANA	ARIANA - K. EL ANDALOUS		1975	55		95545	22621	118166		3942	446	50		9091
	EL MANAZEH	0	1975	100		97197	57647	154844		3423	2547			14136
	MANOUBA	0	1975	80		60825	7997	68822		2277	246	294		4484
	ETTADHAMEN - OUED ELLIL	0	1988	36	1000	97756	14274	113030		4257	508	2		10799
	Total	123311				1000	351323	102539	454862		13899	3747	346	
BEN AROUS	BEN AROUS		1975	86		160220	38690	198910		5504	1225			9273
	RADES - MEGRINE		1975		28334	88053	14703	131090		3747	477	7037		7037
	MORNAG		1988											
	HAMMAN LIF		1975	65	0	136171	65568	201739		5929	1236			9973
	Total	393508				28334	384444	118961	531739		15180	2938	7037	
NABEUL	NABEUL	53305	1978	76	2962	88588	4862	96412	60	3519	120			7293
	DAR CHAABANE	28502	1980	86	2759	34734	0	37493	70	1305	21	31		3656
	BENI KHIAR	14139	1980	58	448	23082	0	23530	60	815	41	12		1534
	MAAMOURA	5137		25	3850	0	0	3850	40	39	0	180		257
	SOMAA	4893		78	8850	0	0	8850	30	89	0	413		763
	KORBA	27952	1992	70	4458	53629	1127	59214	60	1538	4	75		4004
	TAZARKA	6205		70	0	8500	0	8500	40	283	0	0		869
	MENZEL TEMIME	29777		62	820	34500	1980	37300	40	1178	20	38		3692
	KELIBIA	31673	1975	65	0	51660	1100	52760	60	1606	47			3693
	HAMMAMAM LAGHZAZ	5955		70	3700	4185	0	7885	60	177	0	173		834
	HAOUARIA	9452		57	10560	0	0	10560	10	106	0	493		1078
	SOLIMAN	19574	1993	80	11830	0	370	12200	40	122	4	552		3132
	KORBOUS	3553		20	300	1000	0	1300	100	36	0	14		142
	MENZEL BOUZELFA	14308	1993	68	14850	11750	600	27200	50	546	6	693		1946
	BENI KHALLED	8777		60	10000	0	2000	12000	40	120	20	467		1053
	GROMBALIA	15777	1993	90	18260	24065	0	42325	40	1549	90	165		2726
	BOU ARGOUN	6606		17	0	1000	0	1000	0	33	0	0		225
	HAMMAMET	35076	1978	40	4000	62881	4810	71691	70	1930	262			3205
	EL MIDA	3067		25	0	2340	0	2340	100	78	0	0		153
	AZMOUR	4754		20	0	3500	0	3500	60	117	0	0		190
MENZEL HERR	6622													
TAKELSA	16067			5		2000		2000	50	67	0	0		161
ZAOUIET DJEDIDI	5189			23		3000		3000	82	100	0	0		239
Total	356359				97647	410414	16849	524910		15352	635	3305		40844

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		OUVRAGES ACTUELS								
Gouvernorat	Centre Onas	Tissus urbain zones				St. pompage		STEP		
		tourist.	ind.	urbain		Nbr.SP unité	puis. KW	unité	DBO Kg/j	TYPE TRAIT.
				Pop/rur	moy +					
TUNIS	BAB SOUIKA			80	20					
	BAB BHAR			40	60			1	24000	BA
	EL MENZAH-EL KHRADR		20	15	65					
	JBEL JELOUD		70	25	5					
	RAS TABIA - EL OMRANE		0	50	50					
	BARDO - HRAIRIA			40	60					
	SEDJOURMI			90	10					
	GOULETTE - EL KRAM		10	25	65					
	MARSA - SIDI BOU SAID	15	10	15	60			1	5000	LA
Total						34	896	2	29000	
ARIANA	ARIANA - K. EL ANDALOUS		10	20	70			1	25000	CO
	EL MANAZEH			5	95					
	MANOUBA		5	50	45					
	ETTADHAMEN - OUED ELLIL			90	10					
Total					8	113	1	25000		
BEN AROUS	BEN AROUS		5	20	75			1	15000	CO
	RADES - MEGRINE		5	25	70			1	265	LA
	MORNAG			80	20					
	HAMMAN LIF		5	30	65					
Total					26	1781	2	15265		
NABEUL	NABEUL	35	10	25	30	4	238	2	6570	BA/CO
	DAR CHAABANE			50	50	1	125			
	BENI KHIAR			50	50	1	22			
	MAAMOURA			60	40					
	SOMAA			70	30					
	KORBA	1		49	50	3	50			
	TAZARKA			70	30	1	20			
	MENZEL TEMIME			60	40	1	5			
	KELIBIA	5	5	35	55	2	9	1	880	BA
	HAMMAMAM LAGHZAZ			60	40					
	HAOUARIA			80	20					
	SOLIMAN			40	60	1	8	1	1900	CO
	KORBOUS			70	30					
	MENZEL BOUZELFA			60	40	2	15	1	700	CO
	BENI KHALLED			60	40	1		1		
	GROMBALIA		10	30	60			1	1050	CO
	BOU ARGOUB			60	40					
	HAMMAMET	45		15	40	10	603	2	3527	BA
	EL MIDA			90	10					
	AZMOUR			90	10					
	MENZEL HERR			90	10					
	TAKELSA			90	10					
	ZAQUIET DJEDIDI			70	30	1	5			
Total						28	1100	9	14627	

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Gouvernorat	Centre Onas	Pop. 1993	Prise en charge année	Taux de branch. (%)	CONDUITES					regards unité	Avaloirs unité	Bouche d'égout unité	Boite de branch. unité
					Unitaire ml	eau usée ml	pluvial ml	linéaire total ml	% bon état				
					ZAGHOUAN	ZAGHOUAN	15244	1991	76				
	ZRIBA	6631	1992	55	0	22564	115	22679	40	923	7	1257	
	FAHS	14814		70		23350	1650	25000	30	795	17	2074	
	NADHOUR	3326		15		3255		3255	90	109	0	100	
	BIR M'CHERGA	3566									0		
	Total	43582			10131	94187	1880	106198		3969	70	6911	
BIZERTE	BIZERTE	119485	1982		105852	24037	11453	141342	56	5139	68	12725	
	ML JEMIL	0	1		13130	20345	922	34397	37	1158		3073	
	ML ABDERRAHMEN	0	1			13545		13545	29	653		1623	
	EL ALIA	12342		72	9319	9000		18319	70	393	0	1777	
	RAS JEBEL	18924	1988	64	5228	22015	1078	28321	80	1197		2722	
	METLINE	6034		70	8850			8850	60	89	0	845	
	RAF RAF	8383		76	0	10000		10000	70	333	0	1274	
	MENZEL BOURGUIBA	51368	1984	60	17988	40488	3575	62051	70	2066	319	4269	
	SEJNANE	3715		81	6500			6500	30	65	0	602	
	GHAR EL MELH	4486		75	5500			5500	70	55	0	673	
	AOUSJA	3249		65	5030	8734		13764	60	341	0	422	
	MATEUR	27543	1992	75		49869		49869	62	1877	74	4370	
	TINJA	12987	1	41	3890	3983		7873	80	245	19	856	
	Total	268516			181287	202016	17028	400331		13611	480	35231	
BEJA	BEJA	58292	1991	85	30000	70000	7700	107700	60	3338	216	7938	
	NEFZA	4504		61	4500	1500	1000	7000	60	105	10	549	
	MEDJEZ EL BAB	17152	1992	42	10000	34000		44000	50	1233	0	1441	
	TESTOUR	12221		60	10000	3000		13000	20	200	0	1467	
	TEBOURSOUK	11889		60	17000			17000	40	170	0	1427	
	AMDOUN	4158		65		4300		4300	60	143	0	541	
	GUBELLAT	2624				750		750	100	25	0	0	
	Total	110840			71500	113550	8700	193750		5215	226	13362	
JENDOUBA	JENDOUBA	43707	1991	60	55429	15706		71135	50	2475	1106	6443	
	BOU SALEM	20402		45	4800	3760		8560	60	173	0	1836	
	GHARDIMAOU	17689		65	5040	17470		22510	50	633	0	2300	
	TABARKA	13784	1992	60	1952	17903	2345	22200	85	630	137	1507	
	AIN DRAHEM	7606		50	8000			8000	20	80	0	761	
	Total	103188			75221	54839	2345	132405		3991	1243	12846	
LE KEF	LE KEF	46109	1982	80		87968	0	87968	79	3820	59	7126	
	SAKIET SIDI YOUSSEF	6002		35		3800		3800	40	127	0	420	
	TAJEROUINE	18871		70		24000		24000	70	800	0	2642	
	KALAAAT SENANE	5858		36		8000		8000	12	267	0	422	
	KALAA KHASBA	3805		34		6500		6500	46	217	0	259	
	JERISSA	17448		6		1920		1920		64	0	209	
	DAHMANI	16378		70		22800		22800	60	760	0	2293	
	EL KSOUR	5333		43		9500		9500	20	317	0	459	
	SERS	4441		70		8100		8100	31	270	0	622	
	NEBEUR	4148		40		4200		4200	60	140	0	332	
	MENZEL SALEM	4148		23		4000		4000	80	133	0	191	
	TOUIREF	2867											
	Total	135408			0	180788	0	180788		6914	59	14974	

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Gouvernorat	Centre Onas	OUVRAGES ACTUELS								
		Tissus urbain zones				St. pompage		STEP		
		tourist.	ind.	urbain		Nbr.SP unité	puis. KW	unité	DBO Kg/j	TYPE TRAIT.
Pop/rur	moy +									
ZAGHOUAN	ZAGHOUAN	2	20	48	30					
	ZRIBA			80	20					
	FAHS			80	20					
	NADHOUR			90	10					
	BIR M'CHERGA			90	10					
	Total						0	0	0	0
BIZERTE	BIZERTE	1	29	20	50	5	32			
	ML JEMIL			50	50					
	ML ABDERRAHMEN			50	50					
	EL ALIA			70	30					
	RAS JEBEL			70	30	2	8			
	METLINE			70	30					
	RAF RAF			50	50	1	10			
	MENZEL BOURGUIBA		5	45	50	2	35			
	SEJNANE			60	40					
	G HAR EL MELH			70	30					
	AOUSJA			70	30					
	MATEUR		1	59	40	4	9			
	TINJA			40	60	1	2			
Total						15	96	0	0	
BEJA	BEJA		20	30	50			1	7800	BA
	NEFZA			70	30					
	MEDJEZ EL BAB			70	30	4		1	1970	BA
	TESTOUR			70	30					
	TEBOURSOUK			80	20					
	AMDOUN			90	10					
	GOUBELLAT			90	10					
	Total					4	0	2	9770	
JENDOUBA	JENDOUBA		5	55	95	5		1	3400	BA
	BOU SALEM			60	40					
	G HARDIMAOU			70	30					
	TABARKA	30		30	40	5		1	1825	LA
	AIN DRAHEM			60	40					
Total					10	0	2	5225		
LE KEF	LE KEF		5	50	45	2	7			
	SAKIET SIDI YOUSSEF			70	30	1				
	TAJEROUINE			90	10					
	KALAAAT SENANE			90	10					
	KALAA KHASBA			90	10					
	JERISSA			90	10					
	DAHMANI			90	10					
	EL KSOUR			90	10					
	SERS			90	10					
	NEBEUR			90	10					
	MENZEL SALEM			90	10					
	TOUIREF			90	10					
	Total					3	7	0	0	

Gouvernorat	Centre Onas	Pop. 1993	Prise en charge année	Taux de branch. (%)	CONDUITES					regards unité	Avaloirs unité	Bouche d'égout unité	Boite de branch. unité	
					Unitaire ml	eau usée ml	pluvial ml	linéaire total ml	% bon état					
					OUVRAGES ACTUELS									
SILIANA	SILIANA	20230	1992	85	15000	8600		23600	70	437	0	700	3439	
	BOUARADA	11834		38		13000		13000	80	433	0	0	899	
	GAAFOUR	11038		20	5000			5000	50	50	0	233	442	
	LE KRIB	6440		70		9300		9300	50	310	0	0	902	
	BARGOU	4650		36		2950		2950	100	98	0	0	335	
	MAKTHAR	13628		30		9000	300	9300	30	303	3	0	818	
	ROHIA	391		60		6110		6110	15	204	0	0	47	
	EL AROUSSA	2508												
	KESRA	2920		30		3500		3500	50	117	0	0	175	
	SIDI BOUROUIS	4740												
Total	78379				20000	52460	300	72760		1952	3	933	7056	
KAIROUAN	KAIROUAN	108104	1979	66	0	161571	1382	162953	60	5760	312		11814	
	SBIKHA	5201				600		600	100	20	0	0	0	
	OUESLATIA	8543		65	400	8230		8630	95	278	0	19	1111	
	HAFFOUZ	5726		70		14840		14840	90	495	0	0	802	
	EL ALA	2918												
	SIDI AMOR BOU HAJLA	4245				6000		6000	100	200	0	0	0	
	SIDI ALI NASRALLAH	5551												
	HAJEB AEL AYOON	8161		30		7350		7350	83	245	0	0	490	
	MENZEL MHIRI	3640												
Total	152090			400	198591	1382	200373		6998	312	19	14216		
KASSERINE	KASSERINE	70915	1984	42		59466		59466	94	1920			5498	
	SBEITLA	17098	1988	83		27014		27014	100	850			2312	
	SBIBA	4924		6		1000		1000	100	33	0	0	59	
	THALA	16317		70		10900	1600	12500	60	379	16	0	2284	
	FERIANA	17066												
	TELEPTE	3309												
	MAJEL BEL ABBES	2882												
	JEDLIANE	2754												
	FOUSSANA	3192												
	HAIKRA	2615												
Total	141072			0	98380	1600	99980		3183	16	0	10154		
SIDI BOUZID	SIDI BOUZID	30602	1988	68		53652	3840	57492	80	1842	237		3270	
	JELMA	5504												
	REGUEB	4192												
	MAKNASSY	13186		10		5050		5050	100	168	0	0	264	
	BIR EL HFAY	4035												
	BEN AQOUN	491												
	EL MEZZOUNA	4227												
	OULED HAFFOUZ	2936												
Total	65173			0	58702	3840	62542		2010	237	0	3534		

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Gouvernorat	Centre Onas	OUVRAGES ACTUELS								
		Tissus urbain zones				St. pompage		STEP		
		tourist.	ind.	urbain		Nbr.SP unité	puis. KW	unité	DBO Kg/j	TYPE TRAIT.
Pop/rur	moy +									
SILIANA	SILIANA			60	40					
	BOUARADA			80	20					
	GAAFOUR			90	10					
	LE KRIB			90	10					
	BARGOU			90	10					
	MAKTHAR			90	10					
	ROHIA			90	10					
	EL AROUSSA			90	10					
	KESRA			90	10					
	SIDI BOUROUIS			90	10					
	Total					0	0	0	0	
KAIROUAN	KAIROUAN	2	3	40	60	5	21	1	3500	BA
	SBIKHA			90	10					
	OUESLATIA			90	10					
	HAFFOUZ			90	10					
	EL ALA			90	10					
	SIDI AMOR BOU HAJLA			90	10					
	SIDI ALI NASRALLAH			90	10					
	HAJEB AEL AYOUN			90	10					
	MENZEL MHIRI			90	10					
		Total					5	21	1	3500
KASSERINE	KASSERINE		10	35	55			1	7500	LA
	SBEITLA			60	40					
	SBIBA			90	10					
	THALA			70	30					
	FERIANA			90	10					
	TELEPTE			90	10					
	MAJEL BEL ABBES			90	10					
	JEDLIANE			90	10					
	FOUSSANA			90	10					
	HADRA			90	10					
	Total					0	0	1	7500	
SIDI BOUZID	SIDI BOUZID			50	50	2	2	1	900	LF
	JELMA			90	10					
	REGUEB			90	10					
	MAKNASSY			90	10					
	BIR EL HFAY			90	10					
	BEN AOUN			90	10					
	EL MEZZOUNA			90	10					
	OULED HAFFOUZ			90	10					
		Total					2	2	1	900

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Gouvernorat	Centre Onas	Pop. 1993	Prise en charge année	Taux de branch. (%)	OUVRAGES ACTUELS									
					CONDUITES					regards	Avaloirs	Bouche d'égout	Boite de branch.	
					Unitaire ml	eau usée ml	pluvial ml	linéaire total ml	% bon état					
SOUSSE	SOUSSE - CITE EZZOUHOUR	151061	1975	71	2613	200716	20527	223856	66	8047	115		19299	
	HAMMEN SOUSSE	0	1982			60382	664	61046		2057	49		3804	
	KALAA KEBIRA	38607	1988	42		46462		46462	35	1404	1		4502	
	AKOUDA	14026	1988	69		20799		20799	65	724			1590	
	MSAKEN	55486	1991	74	0	95497	2580	98077	28	2610	89		9594	
	KALAA SGHIRA	15060	1992	60		17382		17382	80	635	10		1754	
	KSIBET THRAYET	5528		18		2600		2600	92	87	0	0	199	
	HERGLA	26631		31		4100		4100	100	137	0	0	1651	
	SIDI BOU ALI	16454		20		5900		5900	60	197	0	0	658	
	ENFIDA	7606		38		11250		11250	60	375	0	0	578	
	BOU FICHA	5223		13		1050		1050	72	35	0	0	136	
	ZAQUIET SOUSSE	5218		42		5600		5600	80	187	0	0	438	
	MESSADINE	4694		36		4500		4500	95	150	0	0	338	
	Total	345594				2613	476238	23771	502622		16644	264	0	44541
MONASTIR	MONASTIR	54309	1975	80	9300	83047	13447	105794	70	3739	525		7620	
	KHENIS	7658		20		3000		3000	40	100	0	0	306	
	BEMBLA ET MENARA	9143		41		7500		7500	100	250	0	0	750	
	OUARDANINE	14991	1988	76		23482	1519	25001	87	902	43	5	1898	
	SAHLINE-MOOTMAR	10101	1988	42		34805		34805	90	629			891	
	JEMMAL	29614	1988	76		52889		52889	60	2725	2		4837	
	ZERAMDINE	12928	1988	35		12837		12837	70	389			988	
	BENI HASSENE	7203		30		5000		5000	40	167	0	0	432	
	KSIBET MEDIOUNI	7692		2		300	1000	1300		20	10	0	31	
	BENNENE BOUDHAR	8497		3		500		500	100	17	0	0	51	
	TOUZA	5776		5		1350		1350	100	45	0	0	58	
	SAYADA	10338		43		11050		11050	100	368	0	0	889	
	KSSAR HELLAL	31728	1989	30		26307	2315	28622	70	942	18		1873	
	MOKNINE	36933	1984	70	285	51340		51625	34	1852	8		4961	
	TEBOULBA	23670		40	1643	18760		20403	100	642	0	77	1894	
	BEKALTA	13521		44		9400		9400	100	313	0	0	1190	
	LAMTA	4725		50		7070		7070	100	236	0	0	473	
	BOUHJAR	3353		40		3985		3985	100	133	0	0	268	
	SIDI AMEUR	4215		40		3650		3650	100	122	0	0	337	
	ZAQUIET KOUNTECH	4044	1989	58		8130		8130	60	271	0	0	469	
	MENZEL FERSI	2405												
	SIDI BENNOUR	3065												
	EL GHENADA	4204												
	CHERAHIL	3044												
	MENZEL ENNOUR	6961		70		8000		8000	100	267	0	0	975	
	MENZEL KAMEL	6833		30		4200		4200	100	140	0	0	410	
	EL MAZDOUR	2895		80		4200		4200	70	140	0	0	463	
	MENZEL HAYET	8504						0						
	AMIRET EL HAJJAJ	5151						0						
	AMIRET EL FOUHOU	3044						0						
	AMIRET ETTOUAZRA	3566						0						
	Total	350112				11228	380802	18281	410311		14408	606	82	32063

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		OUVRAGES ACTUELS								
Gouvernorat	Centre Onas	Tissus urbain zones				St. pompage		STEP		
		tourist.	ind.	urbain		Nbr.SP unité	puis. KW	unité	DBO Kg/j	TYPE TRAIT.
				Pop/rur	moy +					
SOUSSE	SOUSSE - CITE EZZOUHOUR	25	5	20	50	17	670	2	15700	
	HAMMEN SOUSSE	40	5	10	45					
	KALAA KEBIRA			50	50	1	13			
	AKOUDA			50	50	1	15			
	MSAKEN			30	70	1	2			
	KALAA SGHIRA			50	50	2	13	1	500	CO
	KSIBET THRAYET			70	30					
	HERGLA			70	30					
	SIDI BOU ALI			70	30					
	ENFIDA			70	30	1	2			
	BOU FICHA			70	30					
	ZAQUIET SOUSSE			70	30					
	MESSADINE			70	30					
	Total					23	715	3	16200	
MONASTIR	MONASTIR	35	15	15	35	4	40	1	2158	FB
	KHENIS			50	50					
	BEMBLA ET MENARA			40	60					
	OUARDANINE			60	40			1	600	CO
	SAHLINE-MOOTMAR			60	40	10	40	2	750	BA/CO
	JEMMAL		2	48	50					
	ZERAMDINE			50	50	1	3			
	BENI HASSENE			70	30					
	KSIBET MEOUONI			60	40					
	BENNENE BOUDHAR			60	40					
	TOUZA			70	30					
	SAYADA		2	48	50	1	9	1	600	CO
	KSSAR HELLAL			40	60	1	2			
	MOKNINE		2	38	60	3	50	1	3000	LA
	TEBOULBA			60	40	2	15			
	BEKALTA			60	40	1	5			
	LAMTA			60	40	1	14			
	BOUHJAR			60	40					
	SIDI AMEUR			60	40					
	ZAQUIET KOUNTECH			60	40					
	MENZEL FERSI			80	20					
	SIDI BENNOUR			80	20					
	EL GHENADA			80	20					
	CHERAHIL			90	10					
	MENZEL ENNOUR			90	10					
	MENZEL KAMEL			90	10					
	EL MAZDOUR			90	10					
	MENZEL HAYET			90	10					
	AMIRET EL HAJJAJ			90	10					
	AMIRET EL FOUHOUL			90	10					
	AMIRET ETTOUAZRA			90	10					
Total					24	178	6	7108		

Gouvernorat	Centre Onas	Pop. 1993	Prise en charge année	Taux de branch. (%)	CONDUITES					regards unité	Avaloirs unité	Bouche d'égout unité	Boîte de branch. unité
					Unitaire ml	eau usée ml	pluvial ml	linéaire total ml	% bon état				
MAHDIA	MAHDIA	40838	1975	46		63562	1230	64792	80	2493	280		4560
	KSOUR ESSEF	25042		53		24500		24500	90	817	0	0	2654
	CHEBBA	19214						0					
	SIDI ALOUANE	5578						0					
	BOU MERDES	3175		35		6700		6700	90	223	0	0	222
	EL JEM	15880	1992	50		23303		23303	70	759	64		1806
	CHORBANE	5659						0					
	SOUASSI	3391		40		4000		4000		133	0	0	271
	REJICHE	7099						0					
	KARKAR	5237						0					
	OULED CHAMEKH	4598						0					
	HBIRA	3576						0					
	MELLOULECH	5141						0					
	BRADAA	7259						0					
Total	151686				0	122065	1230	123295		4425	344	0	9514
SFAX	SFAX NORD	383373	1975	45	6872	87005	5305	99182	65	3286	129	97	6526
	SFAX VILLE	0	1975	45		238442		238442		8537	1038	0	20417
	JEBENIANA	7915						0					
	HANCHA	4616						0					
	KERKENA	21500						0					
	BIR ALI BEN KHELIFA	3168						0					
	MAHRES	13876	1933			19767		19767	95	659	0	0	0
	AGUEREB	5737						0					
	MENZEL CHEKER	2789						0					
	SKHIRA	4577						0					
	Total	447550				6872	345214	5305	357391		12482	1167	97
GAFSA	GAFSA	66566	1984	36	4023	57464	1748	63235	50	2176	17	17	5233
	SENEDE	4893						0					
	REDEYEF	17819		60		17400		17400		580	0	0	2138
	METLAQUI	44150		20		16500		16500	27	550	0	0	1766
	OUM EL ARAIS	19739		12		7075		7075	100	236	0	0	474
	EL GUETAR	12563						0					
	MDHILLA	11806		28		4200		4200	50	140	0	0	661
	EL KSAR	25842		50	20300	1500		21800	50	253	0	947	2584
	Total	203378				24323	104139	1748	130210		3935	17	964
TOZEUR	TOZEUR	27257	1985	75	3276	45260	1180	49716	90	2700	26		5591
	DEGUECHE	7024						0		0	0	0	0
	NEFTA	18671	1988	75		31250		31250	95	1042	0	0	2801
	HAMMET JERID	5850						0		0	0	0	0
	Total	58802				3276	76510	1180	80966		3742	26	0
KEBILI	KEBILI	18624	1992	45		23563		23563	100	730			1439
	DOUZ	19481					300	300		3	3	0	0
	JEMNA	4910						0					
	EL GOLAA	4675						0					
	SOUK EL AHAD	17378						0					
	Total	65069				0	23563	300	23863		733	3	0

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Gouvernorat	Centre Onas	OUVRAGES ACTUELS								
		Tissus urbain zones				St. pompage		STEP		
		tourist.	ind.	urbain		Nbr.SP	puis. KW	unité	DBO Kg/j	TYPE TRAIT.
Pop/rur	moy +									
MAHDIA	MAHDIA	5	15	30	70	6	287	1	4700	LA
	KSOUR ESSEF			50	50	1	8	1	500	CO
	CHEBBA			60	40					
	SIDI ALOUANE			90	10					
	BOU MERDES			90	10					
	EL JEM			50	50	1	5	1	600	LF
	CHORBANE			90	10					
	SOUASSI			90	10					
	REJICHE			60	40					
	KARKAR			60	40					
	OULED CHAMEKH			90	10					
	HBIRA			90	10					
	MELLOULECH			90	10					
	BRADAA			90	10					
Total						8	300	3	5800	
SFAX	SFAX NORD	1	5	29	65	8	30	1	12300	
	SFAX VILLE	1	4	30	65	11	470			
	JEBENIANA			90	10					
	HANCHA			90	10					
	KERKENA			80	20					
	BIR ALI BEN KHELIFA			70	30					
	MAHRES			90	10	2	11	1	400	CO
	AGUEREB			90	10					
	MENZEL CHEKER			90	10					
	SKHIRA			60	40					
	Total					21	511	2	12700	
GAFSA	GAFSA	1	9	40	50	2	60	1	1250	LF
	SENEB			90	10					
	REDEYEF		5	80	15					
	METLAOUI		5	80	15					
	OUM EL ARAIS		5	80	15					
	EL GUETAR			90	10					
	MDHILLA		5	90	5					
	EL KSAR			90	10					
Total					2	60	1	1250		
TOZEUR	TOZEUR	20	2	48	30	3				
	DEGUECHE			70	30					
	NEFTA	20		50	30	2	30	1	600	CO
	HAMMET JERID			90	10					
Total					5	30	1	600		
KEBILI	KEBILI	2		58	40	1	5.2			
	DOUZ	2		88	10					
	JEMNA			90	10					
	EL GOLAA			90	10					
	SOUK EL AHAD			90	10					
	Total					1	5	0	0	

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Gouvernorat	Centre Onas	Pop. 1993	Prise en charge année	Taux de branch. (%)	OUVRAGES ACTUELS								
					CONDUITES					regards	Avaloirs	Bouche d'égout	Boite de branch.
					Unitaire ml	eau usée ml	pluvial ml	linéaire total ml	% bon état				
GABES	GABES(1975) - EL HAMMA(1982)	118415	1975			131062	3599	134661	77	4746	232		11275
	EL METOUIA	8936					0	0					
	OUEDDhref	10033					0	0					
	MARETH	6969					0	0					
	MATMATA	5816					0	0					
	ZARRAT	3971					0	0					
	Total	154139				0	131062	3599	134661		4746	232	0
MEDENINE	MEDENINE	38727	1990	30		35792		35792	90	1040			2121
	JERBA (ILE)		1979			73333	2853	76186		1508	45	64	1320
	ZARZIS	64661	1989	6		26340	175	26515	90	573	17	6	667
	BEN GUERDENE	13453					1600	1600		16	16	0	0
	BENI KHEDACHE	2763					350	350		4	4	0	0
	Total	119605				0	135465	4978	140443		3141	82	70
TATAOUINE	TATAOUINE	36526	1989	34		33081		33081	90	920			2630
	GHOMRASSEN	13134						0					
	REMADA	3980						0					
	DHEHIBET	3779						0					
	BIR LAHMAR	2709						0					
	Total	60128				0	33081	0	33081		920	0	0
total		4976056				932,431	4,853,540	514,930	6,300,901	210837.2867	26085.5	25255.96	530853.88

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Gouvernorat	Centre Onas	OUVRAGES ACTUELS								
		Tissus urbain zones				St. pompage		STEP		TYPE TRAIT.
		tourist.	ind.	urbain		Nbr.SP unité	puis. KW	unité	DBO Kg/j	
Pop/rur	moy +									
GABES	GABES(1975) - EL HAMMA(1982)	1	5	39	55	9	112.3			
	EL METOUIA			60	40					
	OUEDDHREF			80	20					
	MARETH			50	50		7			
	MATMATA			80	20					
	ZARRAT			90	10					
	Total					9	119	0	0	
MEDENINE	MEDENINE		3	37	60	1	1.8			
	JERBA (ILE)	80	3	5	12	3	48.9	1	2825	LA
	ZARZIS	15	5	30	50	3	6.8	1	1520	CO
	BEN GUERDENE			60	40					
	BENI KHEDACHE			90	10					
	Total					7	58	2	4345	
TATAOUINE	TATAOUINE	1	2	47	50	2	5.8			
	GHOMRASSEN			80	20					
	REMADA			90	10					
	DHEHIBET			90	10					
	BIR LAHMAR			90	10					
	Total					2	6	0	0	
total						237	5997.8	39	158,790	

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OUVRAGES PROJETES											
Gouvernorat	Centre Onas	CONDUITES					Tissus urbain zones				Station de pompage
		Unitaire ml	eau usée ml	pluvial ml	total ml	Invest. mD	tourist.	ind.	urbain		nombre unité
									Pop/rur	moy +	
TUNIS	BAB SOUIKA	2289		2115	4404	1,424			80	20	
	BAB BHAR	3137			3137	1,425			40	60	
	EL MENZAH-EL KHRADR	492	540		1032	318		20	15	65	
	JBEL JELOUD				0			70	25	5	
	RAS TABIA - EL OMRANE	3754			3754	2,000			50	50	
	BARDO - HRAIRIA				0				40	60	
	SEDJOUMI		23197	700	23897	7,326			90	10	
	GOULETTE - EL KRAM				0			15	25	60	
	MARSA - SIDI BOU SAID		8500	3225	11725	1,380	20	10	15	55	
Total	9672	32237	6040	47949	18,395						1
ARIANA	ARIANA - K. EL ANDALOUS		12766	11129	23895	5,752		15	20	65	
	EL MANAZEH				0				5	95	
	MANOUBA				0			5	50	45	
	ETTADHAMEN - OUED ELLIL		19200		19200	2,969			90	10	
Total	0	31966	11129	43095	8,721						1
BEN AROUS	BEN AROUS		9135	5336	14471	2,074		25	15	60	
	RADES - MEGRINE		3000	2260	5260	3,021		25	20	55	
	MORNAG				0				80	20	
	HAMMAN LIF		4470	1174	5644	744		5	30	65	
	Total	0	16605	8770	25375	5,839					
NABEUL	NABEUL		66120		66120	2,894	36	9	25	30	4
	DAR CHAABANE		52250		52250	2,430	10	5	40	45	
	BENI KHIAR		34450		34450	1,578	10	5	40	45	1
	MAAMOURA		13600		13600	711	10	5	50	35	1
	SOMAA		12650		12650	678			70	30	2
	KORBA		39300		39300	1,857	1		50	49	2
	TAZARKA		15250		15250	773	5		65	30	
	MENZEL TEMIME		41250		41250	1,967		2	60	38	1
	KELIBIA		51850		51850	2,334	6	6	35	53	1
	HAMMAMAM LAGHZAZ		14100		14100	726			60	40	
	HAOUARIA		23300		23300	1,155			80	20	1
	SOLIMAN		28025		28025	1,277		5	40	55	1
	KORBOUS		5000		5000	256			70	30	1
	MENZEL BOUZELFA		32260		32260	1,541		5	60	35	1
	BENI KHALLED		14450		14450	693		5	60	35	
	GROMBALIA		22950		22950	1,054		15	60	25	1
	BOU ARGOUB		17650		17650	869		5	30	65	1
	HAMMAMET		56620		56620	2,540	50		60	-10	
	EL MIDA		8250		8250	395			15	85	
	AZMOUR		8780		8780	421			90	10	
MENZEL HERR		22500		22500	1,190			90	10		
TAKELSA		2000		2000	104			90	10		
ZAQUIET DJEDIDI		10000		10000	448			70	30		
Total	0	592605	0	592605	27,891						18

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Gouvernorat	Centre Onas	OUVRAGES PROJETES						no	Nbr./ centre	Puis Sp de Transfert pour projeté	Puis SP de Transfert pour existant		
		STEP			INVEST. TOTAL mD	Population							
		puls. KW	Invest. mD	unité		DBO Kg/j	mD					1990	Taux accrois.
TUNIS	BAB SOUIKA						1,424 DT			1			0
	BAB BHAR			ext			1,425 DT			2			0
	EL MENZAH-EL KHRADR						318 DT			3			0
	JBEL JELOUD						0 DT			4			0
	RAS TABIA - EL OMRANE						2,000 DT			5			0
	BARDO - HRAIRIA						0 DT			5			0
	SEDJOUMI						7,326 DT			6			0
	GOULETTE - EL KRAM						0 DT			7			0
MARSA - SIDI BOU SAÏD			ext			1,380 DT			8			0	
Total	2212	4,054 DT	1	34756	25.700 DT	48,149 DT	0	0		13	1106		448
ARIANA	ARIANA - K. EL ANDALOUS			1+ext	56000	25,700 DT	31,452 DT			9	2	0	0
	EL MANAZEH						0 DT			10		0	0
	MANOUBA						0 DT			11	1	0	0
	ETTADHAMEN - OUED ELLIL						2,969 DT			12	1	0	0
Total	2665	2,852 DT	2 ext	16454	22,640 DT	34,213 DT	0	0			1333		56.5
BEN AROUS	BEN AROUS			ext	10000	22,100 DT	24,174 DT			13	1	0	0
	RADES - MEGRINE						3,021 DT			14	2	0	0
	MORNAG						0 DT			15	1	0	0
	HAMMAN LIF						744 DT			16	1	0	0
Total	282	1,051 DT	1 ext	19275	22,100 DT	28,990 DT	0	0			141		890.5
NABEUL	NABEUL	90	830 DT	ext	1264	2,190 DT	5,914 DT	48640	3.1	17	1	45	119
	DAR CHAABANE	125	431 DT				2,861 DT	25120	4.3	18	1	0	0
	BENI KHAR	5	123 DT				1,701 DT	12790	3.4	19	1	0	0
	MAAMOURA	3	100 DT	1	245	703 DT	1,514 DT	4770	2.5	20		1.5	0
	SOMAA	5	123 DT				801 DT	4530	2.6	21		0	0
	KORBA	43	407 DT	1	1560	2,774 DT	5,038 DT	25730	2.8	22	1	21.5	0
	TAZARKA			1	553	1,347 DT	2,120 DT	5580	3.6	23		0	0
	MENZEL TEMIME	2	86 DT	1	1682	2,924 DT	4,977 DT	27570	2.6	24		1	0
	KELIBIA	4	113 DT	ext	1211	2,580 DT	5,027 DT	29240	2.7	25	1	2	4.5
	HAMMAMAM LAGHZAZ						726 DT	5780	1	26		0	0
	HAOUARIA	2	86 DT	1	498	980 DT	2,221 DT	8550	3.4	27		1	0
	SOLIMAN	5	123 DT	1	525	1,010 DT	2,410 DT	18230	2.4	28	1	2.5	4
	KORBOUS	3	101 DT	1	378	964 DT	1,321 DT	3490	0.6	29		1.5	0
	MENZEL BOUZELFA	8	178 DT	1	664	1,158 DT	2,877 DT	13170	2.8	30		4	7.5
	BENI KHALLED						693 DT	8570	0.8	31		0	0
	GROMBALIA	4	113 DT				1,167 DT	14480	2.9	32	1	0	0
	BOU ARGOUB	3	100 DT	1	396	996 DT	1,965 DT	6280	1.7	33	1	1.5	0
	HAMMAMET			ext	4842	5,684 DT	8,224 DT	33150	1.9	34	1	0	301.5
	EL MIDA			1	134	465 DT	850 DT	2890	2	35		0	0
	AZMOUR			1	202	613 DT	1,034 DT	4480	2	36		0	0
MENZEL HORR						1,190 DT	6240	2	37		0	0	
TAKELSA			1	105	429 DT	533 DT	15140	2	38		0	0	
ZAOUIET DJEDIDI						448 DT	4890	2	39		0	0	
Total	302	2,914 DT	12	14259	24,807 DT	55,612 DT	329310	55			151		550

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		OUVRAGES PROJETES												
Gouvernorat	Centre Onas	CONDUITES					Tissus urbain zones					Station de pompage		
		Unitaire ml	eau usée ml	pluvial ml	total ml	Invest. mD	tourist.	ind.	urbain		nombre	unité		
									Pop/rur	moy +				
ZAGHOUAN	ZAGHOUAN		34525		34525	1,544	3	25		45	27	1		
	ZRIBA		17865		17865	904				80	20	3		
	FAHS		32810		32810	1,808				5	75	20	1	
	NADHOUR		11700		11700	576					90	10		
	BIR M'CHERGA		15225		15225	747					90	10		
	Total	0	112125	0	112125	5,379								5
	BIZERTE	BIZERTE	4533	57664	12750	74947			6,079	5	30		20	45
ML JEMIL					0			5	50			45		
ML ABDERRAHMEN					0				50			50		
EL ALIA			19300		19300	938			70			30		
RAS JEBEL			24300		24300	1,111		3	70			27	3	
METLINE			12220		12220	740			70			30	2	
RAF RAF			12700		12700	677			50			50	4	
MENZEL BOURGUIBA			58250		58250	3,414		10	40			50		
SEJNANE			14200		14200	756			60			40	1	
G HAR EL MELH			6800		6800	343			70			30	1	
AOUSJA			7100		7100	391			70			30		
MATEUR			19850		19850	976		5	55			40	3	
TINJA			23600		23600	1,038			40			60	1	
Total		4533	255984	12750	273267	16,463								25
BEJA	BEJA		63810		63810	2,917		25		30	45	1		
	NEFZA		12550		12550	977				70	30	1		
	MEDJEZ EL BAB		40000		40000	1,843			5	65	30			
	TESTOUR		22750		22750	1,114				70	30	1		
	TEBOUSSOUK		25810		25810	1,311			2	80	18	1		
	AMDOUN		32200		32200	380				90	10	1		
	G OUBELLAT		9000		9000	444				90	10	1		
	Total	0	206120	0	206120	8,986							5	
JENDOUBA	JENDOUBA		72650		72650	3,222		15		30	55	2		
	BOU SALEM		56800		56800	2,482			7	56	37	2		
	G HARDIMAOU		45605		45605	2,344				70	30	3		
	TABARKA		42400		42400	1,923			35	5	25	35	1	
	AIN DRAHEM		21345		21345	1,022			15		50	35		
	Total	0	238800	0	238800	10,993							8	
LE KEF	LE KEF		57100		57100	2,524		10		50	40	1		
	SAKIET SIDI YOUSSEF		15450		15450	701				70	30	1		
	TAJEROUINE		33950		33950	1,565				90	10			
	KALAA SENANE		13450		13450	641				90	10			
	KALAA KHASBA		7400		7400	341				90	10			
	JERISSA		47150		47150	2,100				90	10	1		
	DAHMANI		35700		35700	1,873				90	10			
	EL KSOUR		13600		13600	682				90	10	1		
	SERS		8800		8800	523				90	10	1		
	NEBEUR		9700		9700	497				90	10	2		
	MENZEL SALEM		10700		10700	509				90	10			
	TOUIREF		0		0	0				90	10			
	Total	0	253000	0	253000	11,956							7	

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Gouvernorat	Centre Onas	OUVRAGES PROJETES						Population		no	Nbr./ centre	Puiss Sp de Transfert pour projeté	Puiss SP de Transfert pour existant
		puis. KW	Invest. mD	STEP			INVEST. TOTAL mD	1990	Taux accrois.				
				unité	DBO Kg/l	mD							
ZAGHOUAN	ZAGHOUAN	3	101 DT	1	1050	1,568 DT	3,213 DT	13320	4.6	39	1	1.5	0
	ZRIBA	8	284 DT	1	447	1,088 DT	2,276 DT	6140	2.6	40	1	4	0
	FAHS	15	188 DT	1	926	1,927 DT	3,723 DT	13170	4	41		7.5	0
	NADHOUR			1	181	566 DT	1,142 DT	3000	3.5	42		0	0
	BIR M'CHERGA			1	356	923 DT	1,670 DT	3360	2	43		0	0
	Total	26	573 DT	5	2960	6,072 DT	12,024 DT	38990	17			13	0
	BIZERTE	BIZERTE	900	1,420 DT	1	5000	10,000 DT	17,499 DT	110500	2.64	44	1	450
	ML JEMIL					0 DT	0 DT			45	1	0	0
	ML ABDERRAHMEN					0 DT	0 DT			46	1	0	0
	EL ALIA			1	516	1,284 DT	2,222 DT	11630	2	47		0	0
	RAS JEBEL	6	200 DT	1	839	1,361 DT	2,672 DT	17780	2.1	48	1	3	0
	METLINE	14	274 DT	1	275	765 DT	1,779 DT	5770	1.5	49		7	0
	RAF RAF	18	469 DT	1	384	906 DT	2,052 DT	7970	1.7	50		9	0
	MENZEL BOURGUIBA			1	4619	5,616 DT	9,030 DT	47840	2.4	51	1	0	0
	SEJNANE	3	101 DT	1	207	622 DT	1,479 DT	3390	3.1	52		1.5	0
	G HAR EL MELH	5	123 DT	1	209	627 DT	1,093 DT	4290	1.5	53		2.5	0
	AOUSJA			1	140	471 DT	862 DT	3080	1.8	54		0	0
	MATEUR	6	132 DT	1	1333	1,822 DT	2,930 DT	26340	1.5	55	1	3	0
	TINJA	3	100 DT			1,138 DT	1,138 DT	12060	2.5	56	1	0	0
	Total	955	2,819 DT	10	13522	23,474 DT	42,756 DT	250650	23			477.5	0
BEJA	BEJA	2	86 DT			3,003 DT	3,003 DT	54130	2.5	57	1	0	0
	NEFZA	5	195 DT	1	270	1,145 DT	2,317 DT	4170	2.6	58		2.5	0
	MEDJEZ EL BAB					1,843 DT	1,843 DT	15470	3.5	59	0	0	0
	TESTOUR	2	276 DT	1	565	1,368 DT	2,758 DT	11550	1.9	60		1	0
	TEBOUSSOUK	15	188 DT	1	570	1,704 DT	3,203 DT	11170	2.1	61		7.5	0
	AMDOUN	3	101 DT	1	167	532 DT	1,013 DT	3930	1.9	62		1.5	0
	G OUBELLAT			1	148	489 DT	933 DT	2480	1.9	63		0	0
	Total	27	846 DT	5	1720	5,238 DT	15,070 DT	102900	16			13.5	0
JENDOUBA	JENDOUBA	4	175 DT			3,397 DT	3,397 DT	39080	3.8	64	1	0	0
	BOU SALEM	70	484 DT	1	1502	2,701 DT	5,667 DT	16890	6.5	65		35	0
	G HARDIMAOU	45	560 DT	1	1013	2,052 DT	4,956 DT	15590	4.3	66		22.5	0
	TABARKA	5	123 DT	1	269	1,094 DT	3,140 DT	12010	4.7	67	1	2.5	0
	AIN DRAHEM			1	952	1,892 DT	2,914 DT	6860	3.5	68		0	0
	Total	124	1,342 DT	4	3736	7,739 DT	20,074 DT	90430	23			62	0
LE KEF	LE KEF	3	100 DT	1	2998	4,389 DT	7,013 DT	41830	3.3	69	1	1.5	0
	SAKIET SIDI YOUSSEF	2	86 DT	1	392	990 DT	1,777 DT	5320	4.1	70		1	0
	TAJEROUINE			1	976	2,000 DT	3,565 DT	16680	4.2	71		0	0
	KALAA SENANE			1	255	725 DT	1,366 DT	5520	2	72		0	0
	KALAA KHASBA			1	188	581 DT	922 DT	3650	1.4	73		0	0
	JERISSA	4	112 DT	1	730	1,634 DT	3,846 DT	16250	2.4	74		2	0
	DAHMANI			1	848	1,813 DT	3,686 DT	14560	4	75		0	0
	EL KSOUR	2	86 DT	1	283	781 DT	1,549 DT	4880	3	76		1	0
	SERS	2	86 DT	1	278	771 DT	1,380 DT	4100	2.7	77		1	0
	NEBEUR	4	113 DT	1	166	531 DT	920 DT	3920	1.9	78		2	0
	MENZEL SALEM			1	162	520 DT	1,029 DT	3920	1.9	79		0	0
	TOUIREF					0 DT	0 DT	2710	1.9	80		0	0
	Total	17	583 DT	11	7276	14,735 DT	27,274 DT	123340	33			8.5	0

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		OUVRAGES PROJETES											
Gouvernorat	Centre Onas	CONDUITES					Tissus urbain zones				Station de pompage		
		Unitaire ml	eau usée ml	pluvial ml	total ml	Invest. mD	tourist.	ind.	urbain		nombre	unité	
									Pop/rur	moy +			
SILIANA	SILIANA		31625			31625	1,385		5	60	35		1
	BOUARADA		19200			19200	867		5	75	20		1
	GAAFOUR		32070			32070	1,525			90	10		1
	LE KRIB		15200			15200	740			90	10		
	BARGOU		16500			16500	750			90	10		
	MAKTHAR		43210			43210	2,042			90	10		3
	ROHIA		8200			8200	377			90	10		
	EL AROUSSA		0			0				90	10		
	KESRA		9700			9700	490			90	10		
	SIDI BOUROUIS		0			0				90	10		
	Total	0	175705	0		175705	8,176						6
KAIROUAN	KAIROUAN		80000			80000	1,073		5	35	53		5
	SBIKHA		21600			21600	1,388			90	10		3
	OUESLATIA		14400			14400	917			90	10		
	HAFFOUZ		14000			14000	912			90	10		
	EL ALA		12000			12000	768			90	10		
	SIDI AMOR BOU HAJLA		10200			10200	678			90	10		1
	SIDI ALI NASRALLAH		13000			13000	849			90	10		
	HAJEB AEL AYOUN		19800			19800	1,272			90	10		2
	MENZEL MHIRI		0			0				90	10		
		Total	0	185000	0		185000	7,857					
KASSERINE	KASSERINE		117860			117860	5,390		10	35	55		
	SBEITLA		18075			18075	818			60	40		1
	SBIBA		17100			17100	795			90	10		2
	THALA		18060			18060	878			70	30		2
	FERIANA		39000			39000	1,794			90	10		
	TELEPTE		0			0				90	10		
	MAJEL BEL ABBES		0			0				90	10		
	JEDLIANE		0			0				90	10		
	FOUSSANA		0			0				90	10		
	HADRA		0			0				90	10		
	Total	0	210095	0		210095	9,675						5
SIDI BOUZID	SIDI BOUZID		51050			51050	2,425			50	50		
	JELMA		13100			13100	642			90	10		1
	REGUEB		0			0				90	10		
	MAKNASSY		32400			32400	1,546			90	10		
	BIR EL HFAY		0			0				90	10		
	BEN AOUN		0			0				90	10		
	EL MEZZOUNA		0			0				90	10		
	OULED HAFFOUZ		0			0				90	10		
	Total	0	96550	0		96550	4,613						1

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Gouvernorat	Centre Onas	OUVRAGES PROJETES						Population		no	Nbr./ centre	Puiss Sp de Transfert pour projeté	Puiss SP de Transfert pour existant
		puis. KW	Invest. mD	STEP			INVEST. TOTAL mD	1990	Taux accrois.				
				unité	DBO Kg/j	mD							
SILIANA	SILIANA	2	86 DT	1	1643	2,876 DT	4,347 DT	16700	6.6	81	1	0	
	BOUARADA	2	86 DT	1	684	1,561 DT	2,514 DT	10490	4.1	82	1	0	
	GAAFOUR	12	173 DT	1	577	1,388 DT	3,086 DT	10310	2.3	83	6	0	
	LE KRIB			1	328	868 DT	1,608 DT	5660	4.4	84	0	0	
	BARGOU			1	251	715 DT	1,465 DT	4110	4.2	85	0	0	
	MAKTHAR	36	480 DT	1	779	1,710 DT	4,232 DT	12080	4.1	86	18	0	
	ROHIA			1	190	586 DT	963 DT	340	4.8	87	0	0	
	EL AROUSSA					0 DT	0 DT	2370	1.9	88	0	0	
	KESRA			1	123	427 DT	917 DT	2760	1.9	89	0	0	
	SIDI BOUROUIS					0 DT	0 DT	4480	1.9	90	0	0	
	Total	52	825 DT	8	4575	10,131 DT	19,132 DT	69300	36		26	0	
KAIROUAN	KAIROUAN	54	81 DT	1	2667	4,376 DT	5,530 DT	94460	4.6	91	1	27	
	SBKHA	15	352 DT	1	331	875 DT	2,615 DT	4210	7.3	92	7.5	0	
	OUESLATIA			1	378	963 DT	1,880 DT	7910	2.6	93	0	0	
	HAFFOUZ			1	345	902 DT	1,814 DT	5090	4	94	0	0	
	EL ALA						768 DT	2710	2.5	95	0	0	
	SIDI AMOR BOU HAJLA	6	132 DT	1	305	825 DT	1,635 DT	3370	8	96	3	0	
	SIDI ALI NASRALLAH			1	242	697 DT	1,546 DT	5170	2.4	97	0	0	
	HAJEB AEL AYOUN	42	407 DT	1	434	1,140 DT	2,819 DT	7070	4.9	98	21	0	
	MENZEL MHIRI					0 DT	0 DT	3410	2.2	99	0	0	
	Total	117	972 DT	7	4702	9,778 DT	18,607 DT	133400	39		58.5	10.5	
KASSERINE	KASSERINE						5,390 DT	60910	5.2	100	1	0	
	SBEITLA	6	132 DT	1	1067	2,127 DT	3,077 DT	14940	4.6	101	1	3	
	SBIBA	5	123 DT	1	274	763 DT	1,681 DT	4290	4.7	102	2.5	0	
	THALA	7	140 DT	1	777	1,705 DT	2,723 DT	14760	3.4	103	3.5	0	
	FERIANA			1	857	1,826 DT	3,620 DT	14700	5.1	104	0	0	
	TELEPTE					0 DT	0 DT	3100	2.2	105	0	0	
	MAJEL BEL ABBES					0 DT	0 DT	2700	2.2	106	0	0	
	JEDLIANE					0 DT	0 DT	2580	2.2	107	0	0	
	FOUSSANA					0 DT	0 DT	2990	2.2	108	0	0	
	HADRA					0 DT	0 DT	2450	2.2	109	0	0	
	Total	18	395 DT	4	2975	6,421 DT	16,491 DT	123420	34		9	0	
SIDI BOUZID	SIDI BOUZID			ext		1,895 DT	4,320 DT	26210	5.3	110	1	0	
	JELMA	4	137 DT	1	343	898 DT	1,677 DT	4480	7.1	111	2	0	
	REGUEB					0 DT	0 DT	3560	5.6	112	0	0	
	MAKNASSY			1	784	1,717 DT	3,263 DT	11040	6.1	113	0	0	
	BIR EL HFAY					0 DT	0 DT	3780	2.2	114	0	0	
	BEN AOUN					0 DT	0 DT	460	2.2	115	0	0	
	EL MEZZOUNA					0 DT	0 DT	3960	2.2	116	0	0	
	OULED HAFFOUZ					0 DT	0 DT	2750	2.2	117	0	0	
Total	4	137 DT	2	1127	4,510 DT	9,260 DT	56240	33		2	1		

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		OUVRAGES PROJETES										
Gouvernorat	Centre Onas	CONDUITES					Tissus urbain zones				Station de pompage	
		Unitaire ml	eau usée ml	pluvial ml	total ml	Invest. mD	tourist.	ind.	urbain		nombre	
									Pop/rur	moy +		unité
SOUSSE	SOUSSE - CITE EZZOUHOUR	19597	91010	44277	154884	6,740	25	10	20	45	3	
	HAMMEN SOUSSE				0		40	10	10	40		
	KALAA KEBIRA		45050		45050	2,016			50	50	1	
	AKOUDA		18250		18250	1,256			50	50		
	MSAKEN		75000		75000	3,597		5	30	65	1	
	KALAA SGHIRA		21900		21900	1,021			50	50	1	
	KSIBET THRAYET		14500		14500	712			70	30	2	
	HERGLA		18600		18600	996	30		50	20	2	
	SIDI BOU ALI		72500		72500	3,312			70	30		
	ENFIDA		18200		18200	868			70	30		
	BOU FICHA		13950		13950	714		5	65	30		
	ZAOUIET SOUSSE		11750		11750	608			70	30	2	
	MESSADINE		11000		11000	563			70	30	1	
	Total	19597	411710	44277	475584	22,403					13	
MONASTIR	MONASTIR		80000		80000	4,016	35	15	15	35	1	
	KHENIS		19200		19200	954			50	50	1	
	BEMBLA ET MENARA		18000		18000	883			40	60	1	
	OUARDANINE		20900		20900	976			60	40	1	
	SAHLINE-MOOTMAR		18850		18850	903			60	40	1	
	JEMMAL		32750		32750	1,546		5	45	50		
	ZERAMDINE		28850		28850	1,222			50	50	1	
	BENI HASSENE		18700		18700	930			70	30	2	
	KSIBET MADIOUNI		19250		19250	914			60	40	2	
	BENNENE BOUDHAR		23700		23700	1,141			60	40	1	
	TOUZA		18000		18000	854			70	30		
	SAYADA		17600		17600	805		2	50	48	1	
	KSSAR HELLAL		73300		73300	3,402			40	60	3	
	MOKNINE		32600		32600	1,865		2	40	58		
	TEBOULBA		44400		44400	1,920			60	40		
	BEKALTA		13600		13600	622			60	40		
	LAMTA		10800		10800	480			60	40		
	BOUHJAR		5550		5550	253			60	40		
	SIDI AMEUR		7400		7400	334			60	40		
	ZAOUIET KOUNTECH		5700		5700	262			60	40		
	MENZEL FERSI		0		0				80	20		
	SIDI BENNOUR		0		0				80	20		
	EL GHENADA		0		0				80	20		
	CHERAHIL		0		0				90	10		
	MENZEL ENNOUR		9000		9000	474			90	10	1	
	MENZEL KAMEL		17000		17000	936			90	10	1	
	EL MAZDOUR		8000		8000	457			90	10	1	
MENZEL HAYET		0		0				90	10			
AMIRET EL HAJJAJ		0		0				90	10			
AMIRET EL FOUHOUL		0		0				90	10			
AMIRET ETTOUAZRA		0		0				90	10			
Total	0	542950	0	542950	26,149					18		

Gouvernorat	Centre Onas	Ouvrages Projétés						Population		no	Nbr./ centre	Puiss Sp de Transfert pour projeté	Puiss SP de Transfert pour existant	
		puis. KW	Invest. mD	STEP			INVEST. TOTAL mD	1990	Taux accrois.					
				unité	DBO Kg/j	mD								
SOUSSE	SOUSSE - CITE EZZOUHOUR	23	58 DT	1	12000	5,400 DT	12,198 DT	137800	3.11	118	2	11.5	335	
	HAMMEN SOUSSE						0 DT			119	1	0	0	
	KALAA KEBIRA	2	86 DT				2,102 DT	35850	2.5	120	1	0	0	
	AKOUDA			1	2487	3,946 DT	5,202 DT	13140	2.2	121	1	0	0	
	MSAKEN	22	218 DT	1	3294	4,632 DT	8,447 DT	50630	3.1	122	1	11	0	
	KALAA SGHIRA	2	86 DT	ext	184	516 DT	1,623 DT	14150	2.1	123	1	1	6.5	
	KSIBET THRAYET	6	200 DT				912 DT	5350	1.1	124		0	0	
	HERGLA	10	160 DT	1	269	752 DT	1,908 DT	24230	3.2	125		5	0	
	SIDI BOU ALI			1	1362	2,523 DT	5,835 DT	12430	9.8	126		0	0	
	ENFIDA			1	564	1,289 DT	2,157 DT	6940	3.1	127		0	0	
	BOU FICHA			1	270	755 DT	1,469 DT	4670	3.8	128		0	0	
	ZAOUJET SOUSSE	6	200 DT				808 DT	5110	0.7	129		0	0	
	MESSADINE	8	148 DT				711 DT	4410	2.1	130		0	0	
	Total	79	1,156 DT	7	20430	19,813 DT	43,372 DT	314710	37				39.5	357.5
	MONASTIR	MONASTIR	25	230 DT	1	5346	6,104 DT	10,350 DT	48420	3.9	131	1	12.5	20
KHENIS		7	140 DT				1,094 DT	7280	1.7	132		0	0	
BEMBLA ET MENARA		10	160 DT				1,043 DT	8590	2.1	133		0	0	
OUARDANINE		2	86 DT	ext	176	506 DT	1,568 DT	13600	3.3	134	1	1	0	
SAHLINE-MOOTMAR		2	86 DT	1	1894	2,784 DT	3,773 DT	9660	1.5	135	1	1	20	
JEMMAL				1	1991	3,291 DT	4,837 DT	27500	2.5	136	1	0	0	
ZERAMDINE		2	86 DT	1	1033	2,080 DT	3,388 DT	11900	2.8	137	1	1	0	
BENI HASSENE		8	230 DT				1,160 DT	6650	2.7	138		0	0	
KSIBET MEDIOUNI		14	258 DT				1,172 DT	7400	1.3	139		0	0	
BENNENE BOUDHAR		5	123 DT				1,264 DT	8150	1.4	140		0	0	
TOUZA				1	263	741 DT	1,595 DT	5210	3.5	141		0	0	
SAYADA		4	113 DT	1	996	1,494 DT	2,412 DT	9770	1.9	142		2	4.5	
KSSAR HELLAL		42	430 DT				3,832 DT	29120	2.9	143	1	0	0	
MOKNINE				ext	2505	3,046 DT	4,911 DT	35320	1.5	144	1	0	25	
TEBOULBA							1,920 DT	21980	2.5	145		0	0	
BEKALTA							622 DT	12410	2.9	146		0	0	
LAMTA							480 DT	4070	5.1	147		0	0	
BOUHJAR							253 DT	3150	2.1	148		0	0	
SIDI AMEUR							334 DT	3960	2.1	149		0	0	
ZAOUJET KOUNTECH							262 DT	3800	2.1	150	1	0	0	
MENZEL FERSI							0 DT	2260	2.1	151		0	0	
SIDI BENNOUR							0 DT	2880	2.1	152		0	0	
EL GHENADA							0 DT	3950	2.1	153		0	0	
CHERAHIL							0 DT	2860	2.1	154		0	0	
MENZEL ENNOUR		4	115 DT				589 DT	6540	2.1	155		0	0	
MENZEL KAMEL		4	115 DT				1,051 DT	6420	2.1	156		0	0	
EL MAZDOUR		1	66 DT				523 DT	2720	2.1	157		0	0	
MENZEL HAYET							0 DT	7990	2.1	158		0	0	
AMIRET EL HAJJAJ							0 DT	4840	2.1	159		0	0	
AMIRET EL FOUHOUL							0 DT	2860	2.1	160		0	0	
AMIRET ETTOUAZRA							0 DT	3350	2.1	161		0	0	
Total		130	2,238 DT	6	14204	20,046 DT	48,433 DT	324610	73				65	89

OUVRAGES PROJETES

Gouvernorat	Centre Onas	CONDUITES										Tissus urbain zones				Station de pompage	
		Unitaire ml	eau usée ml	pluvial ml	total ml	Invest. mD	tourist.	ind.	urbain		nombre	unité					
									Pop/rur	moy +							
MAHDIA	MAHDIA		66050			66050	3,445		10	15		20	55		1		
	KSOUR ESSEF		13000			13000	553					50	50				
	CHEBBA		41500			41500	1,987					60	40		1		
	SIDI ALOUANE		0			0						90	10				
	BOU MERDES		6800			6800	326					90	10				
	EL JEM		10600			10600	456					50	50				
	CHORBANE		13500			13500	603					90	10				
	SOUASSI		13600			13600	651					90	10				
	REJICHE		15000			15000	721					60	40				
	KARKAR		0			0						60	40				
	OULED CHAMEKH		0			0						90	10				
	HBIRA		0			0						90	10				
	MELLOULECH		0			0						90	10				
	BRADAA		0			0						90	10				
	Total		0	180050	0	180050	8,742									2	
SFAX	SFAX NORD	4993	233870	67593	306456	10,751		1	10		29	60		9			
	SFAX VILLE				0			1	9		30	60					
	JEBENIANA		19750		19750	1,057					90	10		1			
	HANCHA		14950		14950	790					90	10					
	KERKENA		15800		15800	847					80	20		1			
	BIR ALI BEN KHELIFA		0		0						70	30					
	MAHRES		10000		10000	792					90	10					
	AGUEREB		17000		17000	827					90	10					
	MENZEL CHEKER		0		0						90	10					
	SKHIRA		0		0						60	40					
	Total	4993	311370	67593	383956	15,064									11		
GAFSA	GAFSA		113700		113700	5,383		3	10		37	50		4			
	SENEDE		17950		17950	927					90	10					
	REDEYEF		47930		47930	2,362			5		80	15					
	METLAOUI		73400		73400	3,604			5		80	15					
	OUM EL ARAIS		36000		36000	1,751			5		80	15		2			
	EL GUETAR		33320		33320	1,644					90	10		1			
	MDHILLA		24260		24260	1,167			5		90	5		2			
	EL KSAR		58200		58200	2,745					90	10		2			
	Total	0	404760	0	404760	19,583									11		
TOZEUR	TOZEUR		47200		47200	2,181		25	5		45	25		1			
	DEGUECHE		21665		21665	1,048					70	30		1			
	NEFTA		26600		26600	1,244		25			45	30		1			
	HAMMET JERID		15200		15200	809					90	10					
	Total	0	110665	0	110665	5,282									3		
KEBILI	KEBILI		44000		44000	2,046		5	5		55	35					
	DOUZ		54700		54700	2,647		5			85	10					
	JEMNA		14600		14600	770					90	10					
	EL GOLAA		19700		19700	996					90	10		1			
	SOUK EL AHAD		60600		60600	2,916					90	10					
	Total	0	193600	0	193600	9,375									1		

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Gouvernorat	Centre Onas	OUVRAGES PROJETES						Population		no	Nbr./ centre	Puiss Sp de Transfert pour projeté	Puiss SP de Transfert pour existant
		puis. KW	Invest. mD	STEP			INVEST. TOTAL mD	1990	Taux accrois.				
				unité	DBO Kg/l	mD							
MAHDIA	MAHDIA	130	437 DT				3,882 DT	36200	4.1	162	1	0	143.5
	KSOUR ESSEF			ext	697	1,193 DT	1,746 DT	22850	3.1	163		0	4
	CHEBBA	14	190 DT	1	978	2,003 DT	4,180 DT	17330	3.5	164		7	0
	SIDI ALOUANE						0 DT	5090	3.1	165		0	0
	BOU MERDES			1	171	542 DT	868 DT	2880	3.3	166		0	0
	EL JEM			ext	200	521 DT	977 DT	14490	3.1	167	1	0	2.5
	CHORBANE			1	262	738 DT	1,341 DT	5380	1.7	168		0	0
	SOUASSI			1	217	645 DT	1,296 DT	2880	5.6	169		0	0
	REJICHE						721 DT	6670	2.1	170		0	0
	KARKAR						0 DT	4920	2.1	171		0	0
	OULED CHAMEKH						0 DT	4320	2.1	172		0	0
	HBIRA						0 DT	3360	2.1	173		0	0
	MELLOULECH						0 DT	4830	2.1	174		0	0
	BRADAA						0 DT	6820	2.1	175		0	0
	Total	144	627 DT	4	2525	5,642 DT	15,011 DT	138020	40				72
SFAX	SFAX NORD	500	1,975 DT	1	4000	5,050 DT	17,776 DT	356000	2.5	176	6	250	15
	SFAX VILLE						0 DT			177		0	0
	JEBENIANA	8	145 DT	1	442	1,079 DT	2,281 DT	7160	3.4	178		4	0
	HANCHA			1	297	809 DT	1,599 DT	4010	4.8	179		0	0
	KERKENA	2	100 DT	1	966	1,913 DT	2,860 DT	18840	4.5	180		1	0
	BIR ALI BEN KHELIFA						0 DT	2760	4.7	181		0	0
	MAHRES			ext	743	1,261 DT	2,053 DT	12230	4.3	182		0	5.5
	AGUEREB			1	261	737 DT	1,564 DT	5390	2.1	183		0	0
	MENZEL CHEKER						0 DT	2620	2.1	184		0	0
	SKHIRA						0 DT	4300	2.1	185		0	0
	Total	510	2,220 DT	5	6709	10,849 DT	28,133 DT	413310	31			255	255.5
GAFSA	GAFSA	170	925 DT	ext	2441	3,847 DT	10,155 DT	59520	3.8	186	1	85	30
	SENEDE			1	207	622 DT	1,549 DT	4530	2.6	187		0	0
	REDEYEF			1	805	1,748 DT	4,110 DT	16450	2.7	188		0	0
	METLAOUI			1	2326	3,799 DT	7,403 DT	38800	4.4	189		0	0
	OUM EL ARAIS	20	311 DT	1	896	1,883 DT	3,945 DT	18330	2.5	190		10	0
	EL GUETAR	3	101 DT	1	549	1,341 DT	3,086 DT	11700	2.4	191		1.5	0
	MDHILLA	18	308 DT	1	510	1,274 DT	2,749 DT	11060	2.2	192		9	0
	EL KSAR	11	255 DT	1	1347	2,503 DT	5,503 DT	22580	4.6	193		5.5	0
	Total	222	1,900 DT	7	9081	17,017 DT	38,500 DT	182970	25			111	30
TOZEUR	TOZEUR	5	123 DT	ext	2070	3,382 DT	5,686 DT	25090	2.8	194	1	2.5	0
	DEGUECHE	5	123 DT	1	341	894 DT	2,065 DT	6580	2.2	195		2.5	0
	NEFTA	2	86 DT	ext	665	1,158 DT	2,488 DT	17440	2.3	196	1	1	15
	HAMMET JERID			1	233	679 DT	1,488 DT	5480	2.2	197		0	0
	Total	12	332 DT	2	3309	6,113 DT	11,727 DT	54590	10			6	15
KEBILI	KEBILI			1	1133	2,218 DT	4,264 DT	16180	4.8	198	1	0	0
	DOUZ			1	1494	2,691 DT	5,338 DT	18090	2.5	199		0	0
	JEMNA			1	201	610 DT	1,380 DT	4600	2.2	200		0	0
	EL GOLAA	4	124 DT				1,120 DT	4380	2.2	201		0	0
	SOUK EL AHAD			1	713	1,806 DT	4,522 DT	16280	2.2	202		0	0
	Total	4	124 DT	4	3541	7,125 DT	16,624 DT	59530	14			2	0

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		OUVRAGES PROJETES										
Gouvernorat	Centre Onas	CONDUITES					Tissus urbain zones				Station de pompage	
		Unitaire ml	eau usée ml	pluvial ml	total ml	Invest. mD	tourist.	ind.	urbain		nombre unité	
									Pop/rur	moy +		
GABES	GABES(1975) - EL HAMMA(1982)		63885	19935	83820	6,027	1	10	35	54	5	
	EL METOUIA		35700		35700	1,721			60	40		
	OUEDDHREF		39550		39550	1,999			80	20		1
	MARETH		23100		23100	1,202			50	50		
	MATMATA		0		0				80	20		
	ZARRAT		18000		18000	882			90	10		1
	Total	0	180235	19935	200170	10,831						7
MEDENINE	MEDENINE		72600		72600	3,955		5	35	60	5	
	JERBA (ILE)		173500		173500	8,322	80	3	5	12		2
	ZARZIS		152800		152800	6,814	15	10	30	45		3
	BEN GUERDENE		65000		65000	3,064			60	40		
	BENI KHEDACHE		0	0	0				90	10		
Total	0	463900	0	463900	22,155							
TATAOUINE	TATAOUINE		58400		58400	3,078	1	3	45	51	1	
	GHOMRASSEN		34760		34760	1,701			80	20	4	
	REMADA		0		0				90	10		
	DHEHIBET		0		0				90	10		
	BIR LAHMAR		0		0				90	10		
	Total	0	93160	0	93160	4,780					5	
total		38795	5299192	170494	5,508,481	289,308					173	

Gouvernorat	Centre Onas	OUVRAGES PROJETES						Population		no	Nbr./ centre	Puis Sp de Transfert pour projeté	Puis SP de Transfert pour existant
		puis. KW	Invest. mD	STEP			INVEST. TOTAL mD	1990	Taux accrois.				
				unité	DBO Kg/j	mD							
GABES	GABES(1975) - EL HAMMA(1982)	70	330 DT			0 DT	5,357 DT	109000	2.8	203	2	0	0
	EL METOUIA			1	811	1,757 DT	3,478 DT	8060	3.5	204		0	0
	OUEDDhref	2	103 DT				2,102 DT	9680	1.2	205		0	0
	MARETH			1	595	1,417 DT	2,619 DT	6020	5	206		0	0
	MATMATA						0 DT	5170	4	207		0	0
	ZARRAT	7	168 DT				1,050 DT	3720	2.2	208		0	0
	Total	79	601 DT	2	1406	3,174 DT	14,606 DT	141650	19				39.5
MEDENINE	MEDENINE			1	2393	3,860 DT	7,815 DT	33550	4.9	209	1	0	0
	JERBA (ILE)	6	144 DT	2 + ext	885	2,453 DT	10,919 DT	25450	3	210	3	3	24.45
	ZARZIS	47	216 DT	ext	2666	2,779 DT	9,809 DT	58490	3.4	211	1	23.5	3.4
	BEN GUERDENE			1	908	1,901 DT	4,965 DT	11960	4	212		0	0
	BENI KHEDACHE						0 DT	2380	5.1	213		0	0
	Total	53	360 DT	4	6852	10,993 DT	33,508 DT	131830	20				26.5
TATAOUINE	TATAOUINE	5	148 DT	1	1740	2,995 DT	6,222 DT	33720	2.7	214	1	2.5	0
	GHOMRASSEN	18	551 DT	1	617	1,453 DT	3,705 DT	11950	3.2	215		9	0
	REMADA						0 DT	3590	3.5	216		0	0
	DHEHIBET						0 DT	3540	2.2	217		0	0
	BIR LAHMAR						0 DT	2538	2.2	218		0	0
	Total	23	699 DT	2	2357	4,448 DT	9,927 DT	55338	14				11.5
total		8057	29,620 DT	#VALUE!	197751	288,565 DT	607,493 DT	3134538	589.95		84	4029	2882

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Appendix B
Pilot Projects

PROJETS PILOTES

PROGRAMMATION DES PROJETS PILOTES

Plan Investissement ONAS	PLAN VIII		PLAN IX				PLAN X			
	Année	1995	1996	1997	1998	1999	2000	2001	2002	2003
RESEAU										
Réseau Pilote 1			TUNIS 4							
Réseau Pilote 2		EV		NABEUL 1 - NORD EST						
Réseau Pilote 3			EV	KAIROUAN - CENTRE						
Réseau Pilote 4			EV		SFAX 2 - SUD					
Réseau Pilote 5				EV	MEDENINE 2 - SUD					
					EV					
STEP										
STEP Pilote 1			EV	NABEUL E1 - NORD EST						
STEP Pilote 2					MAHDIA E1 - CENTRE					
STEP Pilote 3				EV	KASSERINE E1 - CENTRE					
STEP Pilote 4				EV	BEJA E1 - NORD OUEST					
STEP Pilote 5					EV	MEDENINE E1 - SUD				
STEP COT Pilote 6							SFAX E1 - SUD			15 ans →
							EV			

EV = Évaluation

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 10/01/07

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Appendix C

Methodological Approach to Calculating the Scenarios

The scenarios were drawn up using a twofold approach.

- Technical: two scenarios were defined. For each, a schedule for delegation to the private sector was specified.
 - ▶ The first scenario assumes that by the Twelfth Plan, 100 percent of management of systems and treatment plants will have been delegated to the private sector.
 - ▶ The second scenario was drawn up assuming that in 2012 only 50 percent of the management of systems and treatment plants will have been delegated to the private sector.
- Financial: To estimate the management savings that can be expected from private participation, and considering the large number of situations, it was decided as a first approximation to select three types of treatment plant. The types of treatment plants selected are:
 - ▶ oxidation pond, medium size, 3,000 kg BOD/day eliminated
 - ▶ activated sludge, medium size, 5,000 kg BOD/day eliminated
 - ▶ activated sludge, small, 1,000 kg BOD/day eliminated

A total of 139 ONAS and other centers have been identified, each with one type of treatment plant. On the basis of the market study, which calculated the management savings to be expected from the private sector for each of these types of plant, the corresponding management gains were allocated for each center the management of which is destined to be delegated to the private sector.

In the case of systems, four main system typologies have been defined:

- ▶ low-income neighborhood
- ▶ affluent neighborhood
- ▶ predominantly industrial neighborhood
- ▶ predominantly touristic neighborhood

On the basis of these typologies and of the basic characteristics of each project, a specific system has been defined for each project. As an illustration, the project TUNIS 3 comprises the municipalities of La Marsa, Sidi Bou Said, Laoulette, and Kram. ONAS data indicate that the system, whose total length is 325 km, is 15 percent (49 km) of the low-income neighborhood type, 55 percent (179 km) of the affluent neighborhood type, 20 percent (65 km) of the predominantly touristic neighborhood type, and 10 percent (33 km) of the predominantly industrial neighborhood type.

In all, 37 projects were defined, with the characteristics of the system for each. The market study had made it possible to determine, for these four system typologies, the management savings to be expected from the private sector. These savings were calculated per 100 linear km of system. Considering the real length of the system of each project and its typologic

characteristics, the amount represented by these savings was then estimated according to the nature of the market (service, management, concession).

It should be noted that these are the most probable types, defined on the basis of plausible technical elements resulting from ONAS data and from data regarding the municipalities not served, and that, in any case, the real situation should not be fundamentally different from them.

Lastly, it has been supposed that, in the case of mixed BOT, the share of investments to be made by ONAS has been taken as equal to 50 percent of the total.

Itemized Savings on Service Costs by ONAS

Systems

	Rate of Delegation to the Private Sector (12th Plan)	Savings on Investment Costs	Savings on Operating Costs
Scenario 1	100%	8th Plan: 9th Plan: 10th Plan: 11th Plan: 12th Plan:	8th Plan: -0.1 million TD 9th Plan: -3.0 million TD 10th Plan: not significant 11th Plan: not significant 12th Plan: not significant
Scenario 2	50%	8th Plan: 9th Plan: 10th Plan: 11th Plan: 12th Plan:	8th Plan: -0.1 million TD 9th Plan: -2.6 million TD 10th Plan: not significant 11th Plan: not significant 12th Plan: not significant

Treatment Plants

	Rate of Delegation to the Private Sector (12th Plan)	Savings on Investment Costs	Savings on Operating Costs
Scenario 1	100%	8th Plan: 9th Plan: 10th Plan: 11th Plan: 12th Plan:	8th Plan: -0.1 million TD 9th Plan: -3.0 million TD 10th Plan: not significant 11th Plan: not significant 12th Plan: not significant
Scenario 2	50%	8th Plan: 9th Plan: 10th Plan: 11th Plan: 12th Plan:	8th Plan: -0.1 million TD 9th Plan: -2.6 million TD 10th Plan: not significant 11th Plan: not significant 12th Plan: not significant

Appendix D

References

Market Study: Private Participation in the Liquid Waste Sector in Tunisia, PADCO/SIDES/EICO, December 1994.

Wastewater Feasibility Study for 2001, Reports A1 to A6, SOTINFOR/SERAH Group, ONAS, April 1993.

ONAS — Investment Budget, 1993-94.

ONAS — Operating Budget, 1993-94.

ONAS — Statistical Reports.

Feasibility Study for Private Operation of the El Menzah Pilot Area Wastewater System.

Feasibility Study for Private Operation of Stations SE-1, SE-2, and SE-3.

Study to Update the Greater Tunis Wastewater Master Plan, ICN/SCET, ONAS, December 1992.

Study to Update the Greater Sfax Wastewater Master Plan, ICN/SCET, ONAS, December 1992.

Study to Update the Greater Gabès Wastewater Master Plan, ICN/SCET, ONAS, May 1992.

Study to Update the Greater Bizerte Wastewater Master Plan, ICN/SCET, ONAS, May 1992.

Study to Update the Greater Sousse Wastewater Master Plan, ICN/SCET, ONAS, December 1992.

Study of Cost Recovery and Investment Optimization at ONAS, ONAS-IBRD.

Appendix E
Scenarios

3/04/1996 /

Réseau Scénario 1 (100%)

STR-R-DD.XLS

1996 17:06	Investissement					linéaire km					PLANNING D'ATTRIBUTION DES MARCHES RESEAU SCENARIO 2 (50%)				
	VIII	IX	X	XI	XII	VIII	IX	X	XI	XII	VIII	IX	X	XI	XII
LOT	jusqu'à 1996	1997-2001	2002-2005	2006-2010	2011-2015	jusqu'à 1996	(1997-2001)	2002-2005	(2006-2010)	(2011-2015)	jusqu'à 1996	(1997-2001)	(2002-2005)	(2006-2010)	(2011-2015)
		13 640	11 829			868352	887 211	912 744	912 744	912 744					sca(01/12)
	775	4 482	2 358			788115	815 875	825 096	825 096	825 096					sca(01/07)
		1 740	748			313514	321 722	325 239	325 239	325 239			sca(01/03)		
	760	12 572	4 538			430020	536 742	564 351	564 351	564 351	P1-sca(06/95)	sca(01/00)			
1	2 202	15 414	4 404			189294	333 484	374 884	374 884	374 884			sca(01/03)		
2	1 161	884	3 205	1 188		126293	143 631	189 248	222 388	222 388			sca(01/03)		
3		1 612	2 344	1 310		84754	110 528	148 800	187 174	167 174					sca(01/11)
1	300	611	2 522	9 019		234026	242 584	291 457	486 984	465 984		P2-sca(01/97)			
2	2 398	1 526	2 488	2 728	1 789	176840	205 849	254 788	305 288	338 335					sca(01/12)
3	368	1 224	980	6 092		116085	136 513	153 228	272 783	272 783					sca(01/12)
AN	432	2 188	2 284	1 058		106198	145 033	188 812	210 452	210 452			sca(01/03)		
		1 509	2 587	3 583		119000	133 389	163 501	255 010	255 010				sca(01/08)	
	377	4 683	048	2 502		57750	102 285	111 315	181 415	161 415					sca(01/11)
DA 1	437	5 483	3 417	4 288		102205	153 205	198 049	284 380	284 380				sca(01/06)	
DA 2			307	2 761		30200	30 200	38 604	93 945	93 945					sca(01/13)
	525	210	758	3 023	1 889	122768	127 938	141 048	188 808	239 888					sca(01/13)
		810	1 803	2 038		40420	57 860	88 630	142 370	142 370					sca(01/11)
1	843	8 477	3 698	1 748		84590	186 738	251 280	286 240	288 240					sca(01/12)
2	430	6 306	1 686	1 810		31300	82 078	105 488	140 538	140 538					sca(01/13)
AN		808	1 078	6 758		181743	220 543	271 743	382 343	382 343			P3-sca(01/97)		
INE		736	386	9 120		88980	111 729	118 055	310 075	310 075					sca(01/13)
IZID		485	1 051	3 201		82542	72 010	84 042	159 092	159 092					sca(01/14)
1		4 202	8 850			223856	288 812	423 740	423 740	423 740		sca(01/08)			
2		1 733	3 888	4 414		188938	197 898	273 144	381 438	381 438			sca(01/02)		
3	458	1 088	3 231	1 488		110777	131 777	181 052	214 027	214 027			sca(01/04)		
DIR 1	1 911	425	3 375	5 147		182100	200 180	282 545	357 308	357 308				sca(08/07)	
DIR 2	213	2 027	6 072	8 023		210211	245 745	378 931	538 381	538 381				sca(01/08)	
1		216	2 270	7 472		131285	135 785	177 005	320 345	320 345				sca(01/09)	
		11 888	21 480	832		99182	282 502	528 378	548 338	548 338			sca(08/05)		
			355	2 211		258209	258 209	284 789	301 009	301 009			P4-sca(01/88)		
		1 822	2 851	17 178		130210	163 240	217 989	534 870	534 870				sca(01/08)	
	230	2 074	351	2 958		80885	123 445	129 948	188 811	188 811					sca(01/14)
	286	1 832	2 795	4 008		23863	58 444	116 843	211 743	211 743					sca(01/14)
	288	2 483	7 681	1 050		134851	178 413	312 840	330 840	330 840			sca(01/03)		
VE 1	385	3 428	7 162	3 084		64257	130 737	282 387	347 397	347 397				sca(08/09)	
VE 2	212	3 217	5 037			76188	142 118	245 348	245 348	245 348			P5-sca(06/88)		
INE	340	3 058		2 252		33081	85 841	85 841	120 401	120 401					sca(01/14)
	15 098	124 888	128 567	122 877	3 678	6 300 881	7 793 211	9 722 118	12 074 457	12 148 818					
aché par plan											1	6	8	8	15
aché cumulé											1	7	15	23	38
le plan quinquennal de l'attribution											180 000	1 560 018	2 393 297	3 462 859	3 741 774
lème plan											160 000	2 212 778	2 578 207	3 462 859	3 741 774
de ville											2	26	34	68	92
de ville cumulé											2	28	62	130	222
patron du Privé/ml réseau du plan											2%	20%	25%	29%	31%
46 Partil. du Privé/ml réseau au XIIème plan											1%	10%	41%	68%	100%

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Réseau Scénario 2 (50%)

1996 15:56	Investissement					lineaire ml					PLANNING D'ATTRIBUTION DES MARCHES RESEAU SCENARIO 2 (50%)				
	VIII {jusqu'à 1996}	IX {1997-2001}	X {2002-2005}	XI {2006-2010}	XII {2011-2015}	VIII {jusqu'à 1996}	IX {1997-2001}	X {2002-2005}	XI {2006-2010}	XII {2011-2015}	VIII {jusqu'à 1996}	IX {1997-2001}	X {2002-2005}	XI {2006-2010}	XII {2011-2015}
		13 640	11 829			858362	887 211	912 744	912 744	912 744					
	775	4 462	2 358			788116	815 875	825 096	825 096	825 096					
		1 740	748			313614	321 722	325 239	325 239	325 239				sca(01/07)	
	780	12 572	4 636			430020	536 742	604 351	604 351	604 351	P1-sca(06/95)		sca(01/04)		
1	2 202	16 414	4 404			189284	333 484	374 684	374 684	374 684					sca(01/13)
2	1 161	984	3 209	1 189		126293	143 631	199 248	222 388	222 388					sca(01/12)
3		1 612	2 344	1 310		84754	110 528	148 890	167 174	167 174					
1	300	511	2 522	9 018		234028	242 694	291 457	466 984	466 984			P2-sca(01/97)		
	2 396	1 625	2 488	2 728	1 709	176849	206 049	254 786	306 288	336 336					
	380	1 224	880	6 092		116085	139 613	153 220	272 793	272 793					
AN	432	2 198	2 294	1 058		108198	140 039	188 912	210 462	210 462					
		1 509	2 507	3 503		119000	133 389	163 501	255 010	255 010					
	377	4 663	848	2 502		67750	102 285	111 315	161 415	161 415					
A 1	437	5 463	3 417	4 288		102206	153 205	198 048	284 380	284 380					sca(01/11)
A 2			307	2 781		30200	30 200	39 604	93 945	93 945					
	525	210	756	3 023	1 889	122768	127 338	141 046	198 809	239 098					
		818	1 003	2 038		40420	57 068	98 630	142 370	142 370					
	843	8 477	3 099	1 740		84690	198 739	251 280	286 240	286 240					
	430	5 305	1 508	1 910		31300	82 678	105 469	140 530	140 530					
N		605	1 076	0 760		191743	220 643	271 743	382 343	382 343			P3-sca(01/97)		
IE		730	399	9 120		99980	111 729	118 055	310 075	310 075					
HD		406	1 051	3 204		82642	72 910	94 942	159 092	159 092					
		4 202	6 958			223858	299 812	423 740	423 740	423 740			sca(01/05)		
		1 733	3 009	4 414		166930	187 998	273 144	301 439	301 439				sca(01/06)	
	458	1 068	3 231	1 489		110777	131 777	191 062	214 027	214 027					
R 1	1 911	426	3 375	5 147		142100	209 100	282 645	357 300	357 300				sca(06/07)	
R 2	213	2 627	8 077	8 023		210211	286 745	379 931	538 381	538 381				sca(01/06)	
		216	2 270	7 472		13 296	136 795	177 905	320 345	320 345					sca(01/13)
		11 888	21 480	632		93182	252 502	528 378	640 338	640 338			sca(08/05)		
			355	2 211		210209	258 209	264 769	301 009	301 009			P4-sca(01/98)		
		1 022	2 891	17 170		139210	183 240	217 800	534 970	534 970					
	230	2 074	351	2 350		80966	123 446	129 948	188 911	188 911					
	296	1 032	2 795	4 806		23863	58 444	118 943	211 743	211 743					
	286	2 463	7 851	1 050		134661	179 413	312 640	330 840	330 840				sca(01/07)	
1	396	3 428	7 182	3 064		64257	130 737	282 387	347 397	347 397					sca(08/14)
2	212	3 217	5 037			76186	142 118	245 349	245 349	245 349			P5-sca(06/98)	sca(06/09)	
NE	340	3 088		2 252		33081	85 641	85 641	120 401	120 401					
	16 098	124 688	128 587	122 977	3 678	6 300 881	7 793 211	9 722 118	12 074 457	12 146 616					
ché par plan											1	4	3	8	6
ché cumulé											1	5	8	14	19
le plan quinquénaire de l'attribution											160 000	713 402	1 610 409	2 168 327	1 549 194
ne plan											160 000	1 224 885	1 528 420	2 168 327	1 549 194
de ville											2	22	7	46	29
de ville cumulé											2	24	31	77	108
tion du Privé/ml réseau du plan											2%	8%	10%	18%	13%
Part. du Privé/ml réseau au XIIème plan											1%	11%	24%	42%	64%

Stations d'épuration Scénario 1 (100%)

Centre Oras et autres	Investissement DT					PLANNING D'ATTRIBUTION DES MARCHES STEP -SCENARIO 1- (100%)															
	VIII	IX	X	XI	XII	VIII (jusqu'à 1998)			IX (1997-2001)			X (2002-2005)			XI (2005-2010)			XII (2011-2015)			
	Juqu'à 1998	1997-2001	2001-2005	2006-2010	2011-2015	[Service]	[Gestion]	[COT]	[Service]	[Gestion]	[COT]	[Service]	[Gestion]	[COT]	*Service	*Gestion	*COT	*Service	*Gestion	*COT	
NAR (chargés)	0	0	0	0	0																
A - SIDI BOU (C.Mord)	0	0	8 800	0	0																
Chargé Tourni - K. EL ANDALO	5 432	37 429	31 139	0	0																
siha	280	3 457	882	0	0																
da	397	4 803	800	0	0																
E	5 268	2 947	0	0	0																
L. BOURQUIBA	2 116	3 184	0	0	0																
NE	0	0	622	0	0																
IR	0	2 048	1 162	0	0																
A	0	1 088	812	0	0																
DEL	0	1 664	836	0	0																
E	0	0	766	0	0																
F	0	860	840	0	0																
L. MELH	0	0	827	0	0																
A	0	0	471	0	0																
DUS (Stud marine)	0	9 807	18 193	0	0																
EDRIA	0	3 100	2 600	0	0																
MEGRINE (Eternit)	0	0	0	0	0																
	0	2 190	0	0	0																
ULIA	0	1 500	200	0	0																
MEZ	0	0	6 804	0	0																
	0	2 800	100	0	0																
A	0	900	800	0	0																
TEMME	0	2 400	600	0	0																
	3 474	086	0	0	0																
	0	0	0	485	0																
IA	0	800	800	0	0																
	0	0	0	1 010	0																
	0	0	0	884	0																
BQUZELFA	0	0	1 158	0	0																
ILLED	0	0	0	0	0																
LIA	0	0	0	0	0																
QVB	0	1 700	0	0	0																
	0	0	0	613	0																
	0	0	0	428	0																
IK	0	1 300	1 800	0	0																
	0	1 700	300	0	0																
	0	1 400	1 100	0	0																
	0	0	0	668	0																
MOA	0	0	0	923	0																
	0	0	0	0	0																
	0	843	1 667	0	0																
	0	0	0	532	0																
BAB	0	0	0	0	0																
	202	2 482	408	0	0																
Y	0	0	0	489	0																
UK	208	2 572	420	0	0																
	0	0	0	0	0																
VI	234	2 894	472	0	0																
OU	0	0	2 052	0	0																
	0	0	0	1 094	0																
TA	0	0	868	1 324	0																
	1 718	3 780	0	0	0																
YOUSSEF	0	0	0	990	0																

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216 1 788 453

SMART

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Stations d'épuration Scénario 1 (100%)

		PLANNING D'ATTRIBUTION DES MARCHES STEP - SCENARIO 1- 100%																		
Centre Désignation	Investissement DT					VIII (jusqu'à 1996)			IX (1997-2001)			X (2002-2003)			XI (2006-2010)			XII (2011-2015)		
	VIII jusqu'à 1996	IX 1997-2001	X 2001-2005	XI 2006-2010	XII 2011-2015	(Service)	(Gestion)	(COT)	(Service)	(Gestion)	(COT)	(Service)	(Gestion)	(COT)	*Service	*Gestion	*COT	**Service	**Gestion	**COT
		0	0	0	1 913	0										01-06				
IALEM	0	0	0	831	0												01-08			
INE	0	0	0	2 000	0												01-08			
SEHANE	0	0	0	725	0												01-08			
MASRA	0	0	0	581	0												01-08			
	0	0	0	1 634	0												01-08			
	0	0	0	781	0										01-07					
	0	800	800	0	0										01-07					
	241	2 974	485	0	0										**01-07					
IA	0	1 000	1 000	0	0										01-07					
	0	0	0	716	0												**01-08			
	0	1 500	800	0	0										01-07					
	0	0	0	586	0												01-08			
	0	0	0	427	0												01-08			
	0	0	0	1 388	0										01-07					
	0	0	0	868	0												01-08			
	0	4 148	881	0	0						**01-08									
	0	0	0	878	0												**01-08			
	0	0	0	902	0												D1-08			
BOU HAJJA	0	0	0	828	0												01-08			
ASRALLAH	0	0	0	507	0												01-08			
L AYOUN	0	0	0	1 140	0												01-08			
A	0	800	400	0	0										01-07					
E	0	0	0	0	0				**03-01-08											
	0	2 003	897	0	0								**01-04							
	0	0	783	0	0								01-04							
	0	0	1 708	0	0								01-04							
	0	0	1 828	0	0								01-04							
ID	0	0	1 885	0	0												**01-08			
	0	0	0	890	0												01-08			
Y	0	1 000	1 000	0	0												01-08			
	0	0	227	528	0															
CITE EZZOUHOUR	0	0	0	0	0				**06-98											
BOU (*)	3 992	4 881	6 228	0	0					**01-08										
	0	0	3 948	0	0								**01-04							
HIRA	0	0	518	0	0								01-04							
	0	800	400	0	0								01-04							
ALI	0	0	2 523	0	0								01-04							
	0	1 200	1 300	0	0								01-04							
	4 430	1 888	0	0	0				**01-98											
L	3 500	2 880	0	0	0										**01-07					
INE	0	0	800	0	0										01-07					
MOUMAR	0	0	1 382	1 382	0										01-07					
	0	0	1 494	0	0										01-07					
	280	3 315	0	0	0							**01-04								
E	280	3 315	0	0	0							01-04								
	0	0	741	0	0							01-04								
	0	0	3 048	0	0							**01-05								
	0	0	0	0	0															
SEF	0	0	1 193	0	0				**02-01-98											
	0	0	2 003	0	0				**02-01-98											
	0	0	0	0	0									**01-05						
ES	0	0	542	0	0									D1-05						
	0	0	0	521	0				**02-01-98											

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Stations d'opération Scénario 1 (100%)

28/03 '97 18:07

216 1 786 453

SMART

Centre Ouvr et autres	Investissement DT					PLANNING D'ATTRIBUTION DES MARCHES STEP -SCENARIO 1- (100%)															
	VIII	IX	X	XI	XII	VIII (jusqu'à 1996)			IX (1997-2001)			X (2002-2005)			XI (2005-2010)			XII (2011-2015)			
	1997-2001	1997-2001	2001-2005	2005-2010	2011-2015	(Service)	(Gestion)	(COT)	(Service)	(Gestion)	(COT)	(Service)	(Gestion)	(COT)	(Service)	(Gestion)	(COT)	(Service)	(Gestion)	(COT)	
ORBANE	0	0	738	0	0																
ASSI	0	0	848	0	0																
K SUD	0	0	0	0	0																
X NORD (*)	0	3 772	6 226	0	0				005-99					01-05							
MAIANA	0	800	600	0	0																
CHA	0	0	0	809	0																
GENA	0	0	0	1 913	0															001-08	
RES	0	0	0	1 281	0															01-08	
EFEB	0	0	0	737	0															01-08	
SA	0	0	3 842	0	0															01-08	
D	0	0	0	822	0															01-08	
YEF	0	0	0	1 748	0																
ADUI	0	3 400	1 600	0	0																001-12
EL ARAIS	0	0	0	1 889	0																01-12
AYAH	0	0	0	1 241	0																01-12
LA	0	0	0	1 274	0																01-12
AN	0	0	0	2 503	0																01-12
JIL	830	3 650	0	0	0																01-12
ECHE	0	0	0	894	0																01-12
LEY JERAD	0	0	0	1 188	0																001-10
EL HAMMA	0	0	0	879	0																01-10
TOUIA	0	2 100	1 700	0	0																01-10
TH	0	1 300	700	0	0																001-08
	0	1 800	2 200	0	0																01-08
	0	1 400	2 100	0	0																
	0	0	0	810	0																
EL AHAD	0	0	0	1 808	0																001-13
ME	1 000	6 000	0	0	0																01-13
	0	0	2 778	0	0																01-13
ENDENE	0	0	1 801	0	0																
BLEI	1 080	7 781	7 300	0	0																001-04
UANE	450	6 030	0	0	0																001-05
ABSEN	0	0	1 453	0	0																001-02
	0	0	0	0	0																001-99
de contrat	38 327	180 806	150 608	50 532	0																001-08
nombre de contrats						1	0	0	2	7	5	5	4	4	8	4	4	1	2	0	
de STEP attribués aux Pivés						1	0	0	3	7	5	5	4	4	8	4	4	1	2	0	
nombre de STEP						3	0	0	2	12	14	16	12	9	16	15	13	17	17	13	
de STEP par pivot						3	0	0	5	12	14	21	24	23	37	37	21	9	12	0	
part du privé / nombre de STEP du Plan considéré						3			28			37			71			21		44	
part du privé / nombre de STEP à la fin du XII ^{ème} Plan						7%			51%			33%			44%			13%		13%	
du personnel ONAS concerné						25	0	0	85	181	118	139	130	49	303	135	97	48	97	0	
						25	25	0	344			318			535			143			

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Stations d'épuration Scénario 2 (50 %)

Centre Orpes et autres	Investissement OT					PLANNING D'ATTRIBUTION DES MARCHES STEP -SCENARIO 2- (50%)														
						VIII (jusqu'à 1996)			IX (1997-2001)			X (2002-2006)			XI (2008-2010)			XII (2011-2015)		
	VIII Jusqu'à 1996	IX 1997-2001	X 2001-2006	XI 2008-2010	XII 2011-2015	{Service}	{Gestion}	{COT}	{Service}	{Gestion}	{COT}	{Service}	{Gestion}	{COT}	{Service}	{Gestion}	{COT}	{Service}	{Gestion}	{COT}
II	0	0	0	1 813	0															
SALEM	0	0	0	531	0															
JINE	0	0	0	2 000	0															
SENANE	0	0	0	725	0															
HASBA	0	0	0	581	0															
	0	0	0	1 834	0															
R	0	0	0	781	0															
	0	800	600	0	0															
	241	2 974	485	0	0															
IA	0	1 000	1 000	0	0															
	0	0	0	215	0															
R	0	1 500	900	0	0															
	0	0	0	588	0															
	0	0	0	427	0															
R	0	0	0	1 369	0															
	0	0	0	868	0															
R	0	4 149	6 651	0	0															
	0	0	0	878	0															
	0	0	0	902	0															
R BOU HAJLA	0	0	0	825	0															
FABRALLAH	0	0	0	607	0															
EL AYOUB	0	0	0	1 140	0															
IA	0	800	400	0	0															
VE	0	0	0	0	0															
	0	2 003	097	0	0															
	0	0	0	783	0															
	0	0	1 705	0	0															
	0	0	1 626	0	0															
ZID	0	0	1 696	0	0															
	0	0	0	898	0															
SY	0	1 000	1 500	0	0															
IA	0	0	227	528	0															
CITE EZZOUHOUR	0	0	0	0	0															
JODD (*)	3 992	4 581	6 228	0	0															
	0	0	3 946	0	0															
BHINA	0	0	810	0	0															
	0	600	400	0	0															
ALI	0	0	2 823	0	0															
	0	1 200	1 300	0	0															
	4 430	1 985	0	0	0															
IL	3 600	2 980	0	0	0															
JINE	0	0	508	0	0															
MOUJMAR	0	0	1 392	1 392	0															
	0	0	1 494	0	0															
	260	3 315	0	0	0															
VE	280	3 315	0	0	0															
	0	0	741	0	0															
	0	0	3 046	0	0															
	0	0	0	0	0															
ISEF	0	0	1 183	0	0															
	0	0	2 003	0	0															
DES	0	0	542	0	0															
	0	0	0	521	0															

