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**NATIONAL ORGANIZATION FOR POTABLE WATER
AND SANITARY DRAINAGE**

(NOPWASD)

COPY 7 OF 32 COPIES

SR-4

MANPOWER NEEDS ASSESSMENT

**WATER and WASTEWATER INSTITUTIONAL
SUPPORT PROJECT
(WWISP)**

USAID NO. 263-0176

**VOL 1
DRAFT VERSION**

NOVEMBER 1989

EXECUTIVE SUMMARY and ACTION PLAN

**JOINT VENTURE OF
BOYLE ENGINEERING CORPORATION
AND
NATIONAL EDUCATION CORPORATION**

**IN ASSOCIATION WITH
DR. A. ABDEL WARITH/TEAM MISR,
ROBERT R. NATHAN ASSOC'S INC, AND
ECO-REOURCES INCORPORATED**

Boyle Engineering and
National Education (J.V.)
in Association with A.A.W/TEAM MISR
Water & Wastewater Institutional
Support Project (WWISP)

الهيئة المشتركة من شركتي
بويل انجينيرينج وناشيونال ايدوكيشن
بالتعاون مع شركتي عبد الوارث وتيم مصر
مشروع الدعم التنظيمي لقطاع الامداد
بالمياه والصرف الصحي

Eng. Abdel Salam El-Rafie
Deputy Chairman - NOPWASD
96 Ahmed Orabi St.- 16th Floor
Mohandseen, Cairo

29 November 1989
WWISP/00246/HS/em/LTR

Subject: Report No SR-4: Manpower Needs Assessment
WWISP-USAID Project No. 263-0176

Dear Eng. El-Rafie,

Under the provisions of para 4, article II, reports, of our contract (USAID Project No. 263 - 0176), five copies of SR-4, Manpower Needs Assessment are submitted for your review and comment.

This report is the first of the six reports to be delivered to NOPWASD as a part of Task B2, "Manpower Development and Training". Report SR-4 provides NOPWASD with the findings, conclusions and recommendations resulting from the national Manpower Needs Assessment conducted by WWISP. As part of this effort, WWISP personnel visited 20 cities throughout Egypt each with a Water and Wastewater Plant. Data collected from this sample along with findings of previous studies, were used to determine current and projected manpower levels in Urban water and wastewater facilities. In addition, a Training Requirements Survey and Personnel Practices Review were conducted. The findings indicated a great need to improve training throughout the sector for the current estimated 9000 semi-skilled to management employees and the projected potential training population of at least 24,000 by the year 2000.

Under the terms of the contract, your comments are required within 30 days of the date of this letter. In the meantime, we look forward to reviewing this report with you.

Warm personal regards.

Sincerely,



J. A. D'Emidio
Resident Project Manager

Attached: Five Copies
cc: USAID w/5 copies
MHPU w/5 copies

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v

EXECUTIVE SUMMARY

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REPORT SR-4, MANPOWER NEEDS ASSESSMENT

SUBTASK B2.1

A. PURPOSE

The purpose of this Executive Summary is to present the major findings of the Manpower Needs Assessment, to summarize sector-wide manpower problems, and to provide preliminary recommendations for corrective action.

B. THE WATER AND WASTEWATER MANPOWER SITUATION

- I. Historic Background. The manpower problems found in the Egyptian Water and Wastewater Sector have been documented repeatedly over the past twelve years. Studies conducted by Binnie and Partners, and Black and Veatch in the late seventies contained comprehensive data and recommendations for improving the situation. Numerous USAID Sector Assessments also have identified the chronic manpower problems in Water and Wastewater plants. USAID efforts to support manpower development as part of major projects in Cairo, Alexandria, Canal Cities, and Provincial Cities have begun to show positive results in these areas.

In the mid-eighties USAID identified a need to assist NOPWASD in its responsibilities. By late 1988, WWISP began operation and in June, 1989, effort was initiated on the first national Manpower Needs Assessment in close association with NOPWASD. The objective was to determine the manpower needs of the sector which would serve as concrete inputs to the other planning subtasks in the WWISP Manpower Development package. (Chapter 2)

2. **Current Manpower Conditions.** The problems summarized in SR-4 are based upon the findings of the WWISP Manpower Needs Assessment which, in July and August 1989, collected data in twenty cities, each having a water and a wastewater plant.

The WWISP assessment deals with a broad slice of the Water and Wastewater Sector. It reports the number of employees from semi-skilled and skilled to management levels currently working in plants in cities with populations of 40,000 or more and projects the manpower requirements for the next ten years. The skill levels and training needs of this workforce were also determined.

The assessment concentrated on urban areas. It does not include thousands of sector employees in smaller population centers where well networks and compact treatment units are used. (NOPWASD estimates the number of workers on compact units to be at least 2000.)

A brief summary is presented below of circumstances found in the sector and critical assessment findings. There are four major manpower problems now affecting the sector: (1) Lack of adequate funding to support the required level of training, (2) Very large numbers of employees currently in the workforce and many more projected for the future, (3) Low skill levels in the current workforce, and (4) Many personnel practices and labor issues that have a negative effect on employee morale and performance. (Chapters 5 and 7)

- **Funding.** Under Presidential Decree 197, NOPWASD is responsible for providing manpower development and training for the Water and Wastewater Sector. The NOPWASD role has been limited by a severely restricted allocation from the national training budget of only L.E. 11,000 for the current year. NOPWASD Central Department for Training (CDT) conducts courses offered to sector employees on a tuition basis at its small training centers in the Cairo area.

Plant managers in the governorates, who rely on NOPWASD for employee training, feel that free training should be made available at regional centers or in the plants themselves. They do not send more participants to Cairo for NOPWASD training due to the imposed fee and poor residence facilities. (Chapter 8)

- **Manpower Quantities.** Based on the sample of plants in the cities visited, WWISP estimates that there are currently 9000 employees from

semi-skilled to management levels in the sector workforce (5800 in Water, 3200 in Wastewater) and that this number will rapidly expand as new projects are completed. WWISP estimates that within the next ten years, the number will reach at least 24,000 (approximately an additional 8000 in Water, 7000 in Wastewater). The worker populations outside of the larger cities will also continue to grow, especially as new projects spread to these regions. (Chapter 5)

- **Workforce Skill Levels.** Data were collected from plant managers on employee training needs. In addition, a Workforce Skills Survey consisting of written tests was used to determine the adequacy of skills and knowledge. A significant need for training was found for all occupational levels. In TABLE ES-1, below, critical short term training priorities are summarized by occupational group. (Chapter 6 and 7)

TABLE ES-1

SUMMARY OF CRITICAL SHORT TERM TRAINING NEEDS

Top and Mid-Level Managers
Technical Supervisors

Chemists and Lab Technicians
Electrical Engineers and Skilled Technicians
Mechanical Engineers and Skilled Technicians

Storekeepers

Equipment Operators

- **Personnel Practices.** Plant managers were surveyed on a variety of labor issues which affect productivity and attitudes toward training. Issues such as compensation, benefits, promotion, incentives, and shortages/surpluses warrant further inquiry than was possible in the WWISP assessment. However, data collected from plant managers support the finding that solutions to problems in these areas will improve worker morale and performance. (Chapter 8)

C. ASSUMPTIONS

Discussion. The WWISP Task - B2, Manpower Development and Training, is composed of five subtasks. The primary purpose of Subtask B2.1, Manpower Needs Assessment, is to describe the manpower situation and associated problems. The other four WWISP subtasks have specific planning purposes and use the data from the Assessment. These subtask reports will contain detailed recommendations for review by NOPWASD. Therefore, the recommendations in this summary should be considered as preliminary because more specific recommendations will appear in later reports.

The recommendations which follow are based on two assumptions: (1) It is cost effective and beneficial to maximize the use of existing programs, courses, and facilities, and (2) Interim solutions, when available, should be used until Long Range solutions can be implemented. (Chapter 9)

D. SUMMARY OF PRELIMINARY RECOMMENDATIONS

1. **Awareness and Action.** Training is a low priority activity in the sector and funding is extremely limited. Top management at NOPWASD, in the governorates and cities, and at the Central Agency for Organization and Administration should recognize the cost effectiveness of training and give training their full support. Plants will experience reduced operation and maintenance costs when a well trained staff is in place. Training is a wise investment which leads to an improved quality of service, greater public health benefits, increased productivity, and standardization throughout the sector. (Chapter 1)
2. **Management Training - The Critical Priority.** WWISP findings from on-site visits to plants strongly support the immediate need for Management Training throughout the sector. Plant managers in the governorates have had little job-relevant management training. Some of them were unable to provide accurate data on the number of their employees. Few managers had work schedules with specific duty assignments. Yet, this procedure is basic to good organization and plant efficiency. These management problems can be eliminated by good management training programs.

Employees who complete training courses should return to a supportive plant environment created by a manager who wants to take advantage of their new skills. However, this rarely occurs.

If spare parts, correct tools, and necessary materials are not made available by supportive plant managers, or if new procedures are ignored, then plant efficiency will be impaired. The cost effective benefits of training in such a situation also will be limited as a consequence. Therefore, it is very important that plant managers understand the training process and how to take full advantage of their newly trained staff. NOPWASD should develop a sector-wide awareness of the values of training by providing plant personnel with Management Training stressing cost effective benefits when a supportive and receptive environment is created. (Chapter 7)

- **Model Plant Organizations and Procedures.** The Water and Wastewater Sector requires standardization in Management as well as Operations and Maintenance. NOPWASD should develop standardized Plant Management and Operations and Maintenance Procedures and pilot test them under operating conditions. When finalized, these procedures would form the basis for management and supervisory training.

NOPWASD should select one operating Water and one Wastewater Plant as Demonstration and Testing Centers where new procedures, methods and systems could be developed and tested and then disseminated to other plants.

In these Plants, managers and supervisors would be shown how to improve their operations by implementing new systems and procedures.

Systems such as Management Information, Cost Accounting, and Performance Monitoring should be developed for trial use at the Demonstration Plants. When these major systems were ready for regional implementation, the Demonstration Plants would have a key role in helping to train the users of these new and complex systems. (Chapter 7)

- NOPWASD Management Seminars. NOPWASD managers will also require specialized sessions to keep them informed and involved in the numerous changes that will be affecting the organization and the sector.

NOPWASD should support an initial phase of Management Training (WWISP Subtask A3.2) for NOPWASD staff which focuses on Organizational Development (OD).

In OD seminars, each manager would learn methods for defining the Mission, Functions, and Tasks that his department is responsible for performing. The seminars should stress Departmental Roles, Communication, and Coordination as well as Planning, Setting Goals, and Determining Priorities. This training will improve efficiency and aid in the achievement of short and long range objectives. Finally, approaches for Directing and Controlling must be included to ensure proper implementation and follow-up. (Chapter 7)

3. **Standards - Certification and Licensing.** The Water and Wastewater Sector is in critical need of standardization of job descriptions and qualifications. Currently, positions with the same title differ greatly among plants in their duties and required skills.

Promotions are based primarily on service and few employees are required to formally upgrade their knowledge and skills as prerequisites to promotion

A national system of Certification and Licensing is required for enforcement of standards. Promotions must be linked to upgrading of credentials by the successful completion of training courses and the passing of standardized exams. NOPWASD should take a firm leadership role in the establishment of a Water and Wastewater Certification and Licensing Board to study this important manpower issue. (Chapter 7)

4. **Pre-Employment Training.** The Egyptian system of secondary, vocational, and higher education is the most extensively developed in the Arab world. NOPWASD should coordinate closely with the Ministry of Education, Ministry of Manpower and Training, and the Engineering Faculties of the major Universities to ensure that they provide skilled workers to the sector.

By coordinating with educational institutions to train entry level workers for the sector, NOPWASD can reduce its entry level training costs.

Job opportunities are growing in the Water and Wastewater Sector. NOPWASD should ensure that Secondary Vocational Schools conduct courses for Entry Level sector occupations. Sanitary/Environmental Engineering Degree Programs must be coordinated with Engineering faculties to ensure that the growing number of positions for such engineers can be filled.

NOPWASD must take the leadership role in coordination with universities and represent the higher educational needs of the sector.

Finally, NOPWASD should develop and implement standardized job orientation and initial training programs for skilled technicians, Engineers, and Chemists who are currently entering the sector without specific Water or Wastewater pre-employment training. (Chapter 7)

5. **Operations and Maintenance Training.** The priorities for Operations and Maintenance Training are provided in Table ES-1. Adequate facilities for such training can be very expensive and require long lead time before opening. NOPWASD should take advantage of existing training facilities to implement critically needed Entry Level Operations and Maintenance Training.

NOPWASD should overcome the delays in opening the training center at Damanhour and both Water and Wastewater training should be provided at that facility. A date for opening the Damanhour facility should be

established and instructors, training aids and curriculum should be in place for the inauguration of the center.

Utilization of the TOMOHAR regional centers on an interim basis for technical training of entry level workers is a cost effective option for solving immediate needs. These centers are located in all major population center and have labs which are equipped for plumbing and welding trades.

NOPWASD should enter into an agreement with TOMOHAR to use their classroom and lab facilities throughout the country as an interim solution to the need for training facilities and to avoid duplication of training programs.

Based on an evaluation of the effectiveness of using TOMOHAR centers, NOPWASD can plan the construction of permanent NOPWASD Training Centers. (Chapter 7)

6. On-the-Job Training (OJT). Probably the most cost effective approach to technical training at the semi-skilled worker and skilled technician levels is On-the-Job Training. By training directly in the plant, the need for expensive training aids is eliminated and the negative factors of travel and tuition are overcome.

NOPWASD should develop and implement a highly structured OJT system of procedures, curriculum, and performance tests as a major solution to the training of semi-skilled workers and skilled technicians.

Mobile Training Units (MTU) should be outfitted to support particular OJT Programs for Operations and Maintenance jobs and functions. MTU's should contain training aids, audio-visual media, and courseware which allow trainers to conduct organized and effective OJT at the plants.

As a part of this system, each Water and Wastewater plant should designate a Training Coordinator who would receive specialized training in implementing the OJT system at his plant. (Chapter 7)

7. **Train-the-Trainer Program.** NOPWASD must assist the sector in developing an internal capability to train the current workforce and be prepared to train the thousands of employees who will be entering the workforce in the future.

NOPWASD should develop and implement a sector-wide Train-the-Trainer Program beginning with the NOPWASD CDT and branching out to the governorates, cities and plants. TOMOHAR facilities should be used on an interim basis for NOPWASD CDT trainers to conduct regional Train-the-Trainer Courses focusing on the implementation of OJT programs in the plants. (Chapters 9 and 10)

8. **Manpower Needs Assessment.** The value of up-to-date information for decision making is critical to any properly managed organization. The WWISP Manpower Needs Assessment has demonstrated how this information can be collected for the Water and Wastewater Sector and has provided procedures for continuation of the activity.

NOPWASD should ensure that Manpower Needs Assessment is continued by approving WWISP Report SR-4 and implementing the attached Action Plan.
(Chapter 2, 3, and 4)

9. **NOPWASD CDT - A National Training Resource Center.** The NOPWASD Central Department for Training (CDT) should be given full support to implement the comprehensive actions required to solve the manpower development problems facing the Water and Wastewater Sector.

The CDT will be responsible for all aspects of manpower development and training: designing, developing, implementing and evaluating training programs. The CDT will establish a National Training Management Information System (NTMIS) which will maintain close contact with the field and ensure that training programs are responsive to sector needs.

A National Training Resource Center should be established to provide materials, media, assistance and direction to trainers in the field. Under the centralized authority of the NOPWASD CDT, national training, certification and licensing will be standardized, monitored and improved.

It is now being recognized that Action Plans derived from WWISP subtasks have substantial training components within them. NOPWASD should support the establishment of a centralized and structured Counterpart Program coordinated by the CDT for the development of staff capabilities and skills throughout NOPWASD.

The coordination of Off-Shore Training opportunities for NOPWASD staff and plant personnel should also be a CDT responsibility.

In order to accomplish the ambitious and challenging agenda presented in this summary, NOPWASD top management will have to make a substantial commitment to fulfilling its responsibility as the training authority and resource for the sector.

Training must be identified as a top NOPWASD budgetary priority. NOPWASD must strengthen the CDT and provide technical assistance to the department and the sector. Training Experts in all aspects of Instructional Systems (Analysis, Design, Development, Implementation and Evaluation), Media Experts in Photographic, Video and Audio Presentation, and Subject Matter Experts in Sanitary Engineering, Plant O and M, Management and Bacteriology are required to assist the CDT.

The attached Report SR-4 Action Plan describes the process which should be implemented to augment the CDT staff, facilities, equipment, and budget. (Chapter 10)

ACTION PLAN

ACTION PLAN

REPORT SR-4, MANPOWER NEEDS ASSESSMENT

SUBTASK B2.1

A. INSTITUTIONAL SUPPORT

1. **Planning.** The WWISP is an institutional support project. WWISP Advisors and Experts assist NOPWASD to solve problems within the organization itself and the Water and Wastewater Sector. Although most aspects of NOPWASD activity involve some degree of engineering, WWISP is not an engineering project. WWISP is an organizational and management development project. WWISP is the end result of the findings and recommendations of the numerous studies which were conducted over the past ten years. The objective of WWISP is to assist NOPWASD managers in the implementation of solutions to the various problems documented in previous studies and further investigated as part of WWISP.

Effective planning is the most critical management function in the problem solving process. Solutions which exist on paper only have no value. It is through planning, implementation and follow-up that solutions become concrete improvements. USAID has singled out planning support as one of the key areas for WWISP attention.

Each WWISP Manpower Development and Training subtask provides a planning approach to address the specific needs of NOPWASD and the Water and Wastewater Sector. Subtask reports contain an Action Plan providing a sequence and schedule for steps which should be taken to solve problems and make progress. The **Action Plan** for Report SR-4 details the steps necessary to ensure that the NOPWASD CDT develop an internal Manpower Assessment capability and that assessment activities for the Water and Wastewater Sector continue as part of the NOPWASD Manpower Development and Training Mission.

Each chapter of this report contains conclusions and recommendations for the institutional support of NOPWASD and the solution of problems identified as part of the Manpower Needs Assessment. The planning of these improvements involves the identification of a logical sequence of events so that all requirements can become part of the master Implementation schedule.

2. **Implementation.** Recommendations in this report have focused on the need to elevate the priority of training within NOPWASD and the Water and Wastewater sector by supporting the CDT in its efforts to accomplish its mission. The first set of actions to be sequenced as part of the SR-4 Action Plan is associated with Strengthening the CDT. Implementation should be recognized as fundamental to the accomplishment of additional SR-4 recommendations and those which appear in other Manpower Development and Training subtasks.

The second set of actions focuses on Establishing an On-Going Manpower Needs Assessment as a function of the CDT. NOPWASD requires a long range training strategy which is based on current manpower data. Continuation of Manpower Needs Assessment as a priority function of the CDT will ensure that the critical decision making required for implementation of Manpower Development, On-the-Job Training (OJT), and Certification and Licensing Programs will be based on sound planning data.

The two major actions, Strengthening the CDT and Establishing an On-Going Manpower Needs Assessment, are described below. The scheduling of these events is shown in the Action Plan section of this chapter.

- a. **Strengthening the CDT.** The present number of professional and support staff in the CDT is too low for the department to accomplish its Mission (Appendix A). A committee should be formed to analyze the manning needs of the CDT, develop a proposed organization and staffing plan, and begin filling required positions on a phased basis over the next two years.

The professional staff necessary to augment the CDT fall into three groups: (1) Subject Matter Expert Developer Trainers, (2) Human Resources Development Specialists, and (3) Extension Trainers. As clearly presented in Chapters 5 and 7 of this report, NOPWASD must have a large specialized CDT staff to deal with the enormous scope of the manpower needs of the sector.

The CDT requires Subject Matter Experts who can learn how to develop courses and conduct training in: Sanitary, Electrical, Mechanical Engineering; Chemistry and Lab Processes; Equipment Operation and Maintenance; Finance and Accounting; Personnel Administration; Supply & Logistics.

Human Resources Development Specialists are professionals with specific skills in the various aspects of training development and implementation. These people will have to be recruited from outside of NOPWASD or procured by contract. Specialists required include: Assessment/Evaluation; Design/Development; Media/Library; OJT/Certification; Management Training/Career Planning.

The NOPWASD CDT needs a branch which links the activities taking place in Cairo with the Water and Wastewater facilities in the Governorates. Extension Trainers able to collect data, implement programs and conduct training in the field would greatly improve the effectiveness of CDT efforts. These Extension trainers would work closely with NOPWASD Execution Department staff to ensure that contractor provided training was adequate in meeting the needs of new plants. The CDT could be manned with an Extension Trainer for each region of the country. They could be assigned to the current CDT Training Centers (Mogama, Guesr El-Suez). Adequate numbers of trained support staff (typists, clerks,

illustrator/draftsmen, drivers) must also be assigned to strengthen the CDT.

All CDT professional staff should attend Train-the-Trainer courses and specific off-shore programs should be investigated, especially for CDT senior staff and the Human Resources Development Specialists. Career Planning as a goal for NOPWASD and the sector could begin with the CDT itself.

In addition to developing the CDT staff, the facilities, equipment, and materials required to upgrade training and training development must be provided to the department. The CDT needs completely renovated offices and classrooms in Mogama. These spaces should be properly outfitted with appropriate furnishings and audio-visual equipment to support various types of training. Support equipment must include a dedicated Arabic/English computer (PC) for data control, class scheduling and word processing. Reproduction equipment and photocopying machines capable of making overhead transparencies are also required. Materials to develop training aids and paper and printing supplies must be available to the CDT. Funding to establish and maintain a growing CDT Library must be approved.

The CDT budget must be analysed to ensure that adequate funding is made available for the department to accomplish its mission. The CDT should prepare a budget for the remainder of the current

fiscal year and NOPWASD top management should secure the necessary funds. The CDT annual budget should contain extensive justification for the funding requested and should be aggressively defended when it is reviewed within NOPWASD and at the Central Agency for Organization and Administration (CAOA).

b. Establishing an On-Going Manpower Needs Assessment.

This report provides the CDT with a strong start in terms of the procedures and data necessary to continue performing Manpower Needs Assessment activities. A commitment must be made by NOPWASD top management and the CDT Director to establish data gathering and analysis as permanent tasks for the CDT. The quality of data currently available in the field is very weak, but the CDT can definitely improve the situation by conducting structured periodic assessments.

Assessment activities which are planned to begin within the next two years include:

- Continued analysis of raw data collected during the initial assessment
- Refinement of current assessment procedures and forms
- Expanding the sample used for the initial assessment, and collecting and analyzing field data

- Coordination with the NOPWASD MIS to support the data needs of the CDT
- Conducting a Comprehensive Assessment of NOPWASD Personnel Training Needs
- Conducting a Comprehensive Assessment of MRH, Governorate and City Sector Personnel Training Needs
- Tracking New Plant Completions

All of these activities are scheduled in the SR-4 Action Plan.

3. **Follow-Up.** A good plan must include a method of monitoring progress and contain means of making adjustments and corrections when the situation changes or problems and delays are encountered.

The two key aspects of the SR-4 Action Plan are Strengthening the CDT and time. The latter can be checked by comparing actual progress against the best case estimates in the Action Plan. As soon as delays are identified, the causes must be investigated and the impediments to progress removed. The former must be monitored closely due to the potential for blockages caused by lack of funding. If problems cannot be solved, they must be brought to a higher level of authority within NOPWASD or USAID for assistance.

The NOPWASD Deputy Chairman, the CDT WWISP Counterparts, the WWISP B 2 Task Leader and Long Term Advisors, all have the

responsibility for monitoring and following-up the progress of the Action Plan implementation. Constant coordination among these people will be crucial to accomplishment of the challenging agenda presented in the Action Plan.

In addition to the key staff identified above, all departments within NOPWASD must fully cooperate in order to implement the SR-4 Action Plan. The Personnel Department and the Organization and Management Department have specific and important responsibilities regarding implementation and should be directed by NOPWASD authorities to support the WWISP objectives for improving the CDT and its capability to perform Manpower Needs Assessment. When the CDT begins work on a comprehensive review of NOPWASD training needs, all departments will be involved and cooperation will be the key to conducting a successful in-house assessment.

The SR-4 Action Plan requires that the CDT Director submit a semi-annual Progress Report to the NOPWASD Chairman to keep top management informed regarding: status of scheduled activities, planning, problems and concerns.

B. ACTION PLAN

1. Description. FIGURE 10-1, the SR-4 Action Plan, shows the sequence of events which must be followed within NOPWASD to Strengthen the CDT

and Establish an On-Going Assessment. The Preliminary Recommendations which appeared in Chapter 9 and the Executive Summary are not a part of the SR-4 Action Plan. The reports for Subtasks B2.1 to 2.5 will address the Preliminary Recommendations. The Action Plan identifies specific Action Agents within NOPWASD and realistic dates for each event.

(٨)

وتنقسم الأعمال والمهام بخطة العمل الى ثلاث مهام رئيسية هي :

أولاً : تقوية الادارة المركزية للتدريب : المدة من (١٢ / ١ / ٨٩ الى ٣٠ / ٥ / ١٩٩٠ م) وتشمل :

- ١ - اختيار وتعيين العناصر المطلوبة للادارة .
- ٢ - تدريب العاملين بالادارة المركزية للتدريب ، وكذلك العاملين الجدد الذين سيتم انضمامهم للادارة .
- ٣ - تجديد وتطوير الادارة المركزية للتدريب وتزويدها بالمعدات والوسائل اللازمة للتدريب ، وكذلك مركز تدريب الجارى انشاؤه بمبنى المجمع .
- ٤ - تدبير التمويل المالي اللازم للادارة وذلك للجزء المتبقي من العام المالي ٨٩ - ١٩٩٠ م .
كذلك تجهيز مقترح الميزانية اللازمة للتدريب للعام المالي ٩٠ - ١٩٩١ م .
ويمكن أن يتم تنفيذ الأنشطة السابقة في خلال الستة أشهر التالية لاعتماد التقرير .

ثانياً : عملية تقدير احتياجات القوى العاملة : المدة من (١ / ٢ / ٩٠ - ٣٠ / ١٠ / ١٩٩١ م) :

وتعتبر هذه العملية هي أساس التقرير ٤ - SR ، ولذلك فهي مستمرة لتطوير وتجديد ما تم الوصول اليه من نماذج واجراءات في عملية التقدير الابتدائية ، واستكمال عملية التقدير بصورة مستمرة دوريا لتحديث البيانات . ويستغرق هذا النشاط باقى مدة التقرير .

ثالثاً : تقارير المتابعة : (١ / ٤ / ٩٠ - ٣٠ / ١٠ / ١٩٩١ م) :

وهي تقارير يقوم رئيس الادارة المركزية للتدريب بتحريها دوريا كل ستة شهور ترفع للادارة العليا بالهيئة ، ويبين فيها ما تم من أنشطة ، والمشاكل والمعوقات لتنفيذ الخطة ، وما يرى من توصيات واقتراحات .

(٧)

العمل هذه ويقتضي على الهيئة توجيه هاتين الإدارتين للعمل على تحقيق أهداف مشروع الدعم التنظيمي لقطاع المياه والمرفح المحي . فيما يخص تطوير الإدارة المركزية للتدريب وتحسين قدراتها لتقدير احتياجات القطاع من القوى العاملة .

وعندما تبدأ الإدارة المركزية للتدريب بعمل مراجعة شاملة لاحتياجات الهيئة من التدريب يجب على كافة الإدارات بالهيئة التعاون والتنسيق معها حيث أن ذلك هو العامل الأساسي لعمل تقدير ناجح . وتتطلب خطة العمل بالتقرير ٤ - SR من رئيس الإدارة المركزية للتدريب تقديم تقرير تقدم أعمال نصف سنوي لرئيس الهيئة وذلك لاعلام الإدارة العليا بتقديم الأنشطة حسب الجدول الزمني، وما يقابل تنفيذ الخطة من مشاكل ومعوقات .

وصف خطة العمل :

الجدول المرفق يوضح خطة العمل الخاصة بالتقرير ٤ - SR حيث يوضح التعاقب الزمني للخطوات التي يجب أن تتبعها الهيئة لتدعيم الإدارة المركزية للتدريب وعمل تقدير مستمر للاحتياجات من القوى العاملة والتدريب . ولا تعتبر التوصيات المبدئية الواردة في الفصل (التاسع) والملخص التنفيذي جزءا من خطة العمل بالتقرير ٤ - SR . ولكن التقارير التي تعدها المهام من ب ٢-١ الى ب ٢-٥ سنقوم بمناقشة وعرض التوصيات المبدئية .

- التنسيق مع نظام ادارة المعلومات بالهيئة للدعم بالبيانات التي تحتاج اليها
 - الادارة المركزية للتدريب
 - عمل تقديرات شاملة لاحتياجات العاملين بالهيئة من التدريب
 - عمل تقديرات شاملة لاحتياجات العاملين بالمحافظات والقطاع ككل من التدريب
 - الوقوف على تطور تنفيذ المشروعات الجديدة ومتطلباتها من التدريب
- وقد تم جدولة هذه الأنشطة بخطة العمل المرفقة بالتقرير رقم ٤ - SR

المتابعة :

ثالثا :

يجب أن تشمل الخطة الجيدة طريقة لمتابعة تقدم الأعمال كما يجب أن تشمل الوسائل التي يمكن بها عمل تسويات وتعديلات عند تغير الأوضاع أو عندما تطرأ أي مشكلات أو تأخير .

ويعتبر العاملان الأساسيان في خطة العمل بالتقرير ٤ - SR هما تدعيم الادارة المركزية للتدريب والبرنامج الزمني للتنفيذ . أما العامل الآخر فيمكن دائما مراجعته بمقارنة التقدم الفعلي الى أفضل التقديرات الواردة بخطة العمل . وبمجرد تحديد التأخير في الجدول الزمني للعمل يمكن تحديد الأسباب والمعوقات وأساليب تلافيها . ويجب متابعة ذلك عن قرب نظرا لقلّة التمويل . واذا وجدت بعض المشاكل التي لا يمكن حلها فيجب اثارها على مستوى ادارى أعلى بالجهات المعنية بالهيئة أو بالوكالة الأمريكية للتنمية للمساعدة على حلها .

ويتطلب الأمر التنسيق الدائم بين كل من السيد / نائب رئيس الهيئة القومية للصرف الصحي ورئيس الادارة المركزية للتدريب ورئيس فريق العمل بالمهمة ب ٢ ، (تطوير وتدريب القسوى العاملة) والخبراء ، بعقود طويلة للقيام بالمتابعة الدائمة والرقابة على تنفيذ خطة العمل السوارة بهذا التقرير .

وبالإضافة الى استمرار متابعة تنفيذ خطة العمل ، فيجب على كافة الأقسام بالهيئة التعاون والتنسيق لتنفيذ خطة العمل بالتقرير ٤ - SR . حيث أن الادارة العامة لشئون العاملين والادارة العامة للتنظيم والادارة بالهيئة تقع عليهما مسئولية هامة للغاية بالنسبة لتنفيذ خطة

وأما المعدات الخاصة بالتدريب فيجب أن تشمل حاسبات آية عربي/انجليزي لضبط البيانات ، ووضع البرامج الزمنية للدراسة وكذلك لأغراض الكتابة والطباعة وذلك بالإضافة الى امداد الادارة بماكينات التصوير واللات الطبع وانتاج شفافات العرض مع امداد الادارة بكافة الأدوات والمهمات التي تلزم هذه الأعمال من ورق للطباعة ، وأقلام ، ، الخ . كما يجب أيضا اعتماد التمويل اللازم لانشاء والتوسع في عمل المكتبة الخاصة بالادارة المركزية للتدريب .

ويتطلب ذلك تحليل واقتراح موازنة الادارة المركزية للتدريب بما يضمن اتاحة تمويل مناسب لتنفيذ المهام المنوطة بها وتقوم الادارة باعداد موازنة لما تبقى من العام المالي الحالي حتى تتمكن الادارة العليا بالهيئة من توفير التمويل اللازم . ويجب أن تشمل الميزانية السنوية للادارة المركزية للتدريب مبررات قوية وشاملة للتمويل المطلوب . وعند مناقشة هذه المبالغ داخل الهيئة وبالجهاز المركزي للتنظيم والادارة يجب على الادارة أن تدافع عن مطالبها بقوة واقناع .

٢ - عمل تقديرات مستمرة للاحتياجات من القوى العاملة :

يعطي هذا التقرير الادارة المركزية للتدريب نقطة بداية قوية من حيث الاجراءات والبيانات اللازمة لاستمرار أنشطة تقييم وتقدير احتياجات القوى العاملة . ونوصي الادارة العليا بالهيئة وكذلك مدير الادارة المركزية للتدريب بالانزام بجمع البيانات وتحليلها كمهمة دائمة تقوم بها الادارة المركزية للتدريب . أما عن نوعية البيانات المتوفرة في الوقت الحالي ميدانيا فتعد ضعيفة للغاية ولكن يمكن للادارة المركزية للتدريب تحسين الأوضاع عن طريق عمل تقديرات منظمة، وأنشطة التقدير التي تم تخطيطها لبدء استخدامها خلال السنتين القادمتين تشمل :

- تحليل مستمر للبيانات الاوكية التي تم جمعها خلال التقديرات الاوكية .
- تهييب وتنقيح اجراءات التقديرات الحالية ونماذجها .
- التوسع في العينة التي تم استخدامها بالتقديرات الاوكية وجمع وتحليل البيانات الخاصة بالمواقع .

وتحتاج الادارة المركزية للتدريب لفرع يربط بين الانشطة التدريبية التي تتم بالقاهرة
وبين مراقق المياه والصرف الصحي بالمحافظات .

أما فيما يخص مندوبي التدريب فيجب أن يكون لديهم القدرة على جمع البيانات والمعومات
وتنفيذ برامج تدريبية وعمل دورات بمواقع العمل وهذا يكون من شأنه، تدعيم وتحسين
فاعلية الجهود التي تبذلها الادارة المركزية للتدريب ، ويمكن لهؤلاء المدربين العمل جنباً
الى جنب مع أطقم تنفيذ المشروعات لمتابعة أى دورات تدريبية، تعقد للتشغيل والصيانة
ضمن عقود المقاولات- لضمان أن يتم تنفيذها بما يسد احتياجات المشروعات الجديدة كما
يمكن عن طريق مندوبي التدريب (المدربين الموقدين المنتقلين) تحديد العمالة
المطلوبة للقطاع في أقاليم مصر .

ويكون تعيين مندوبي التدريب بالادارة المركزية للتدريب بحيث يختص كل مندوب بمنطقة
طبقاً للتقسيم الجارى بالهيئة على أن تكون تبعيتهم الحالية لمراكز تدريب الهيئة (المجمع
- جسر السويس) .

كما يتطلب تعيين طاقم خدمات معاونة (عاملي نسخ وطباعة آلة كاتبة ، وكتبة ، رسامين ،
وسائقين ٠٠٠ الخ) لتدعيم الاداة المركزية للتدريب . كما يتطلب على كافة العاملين
المتخصصين بالادارة المركزية للتدريب حضور دورات تدريبية لتدريب المدربين مع بحث
الاستفادة من التدريب بالخارج لأكثر عدد من العاملين بالادارة واخصائى تنمية المصادر
البشرية . وحيث أن تخطيط السلم الوظيفي أحد أهداف الهيئة فانه يمكن البدء في ذلك
بالادارة المركزية للتدريب .

بالاضافة الى تنمية وتطوير العمالة بالادارة المركزية للتدريب يجب امداد الادارة المركزية
للتدريب بالمعدات والأدوات والأماكن والتسهيلات المطلوبة لتطوير التدريب وتنميته .

وتحتاج أيضا الادارة المركزية للتدريب الى تجديد المكاتب والحجرات الدراسية بالمجمع .
وتجهيز هذه المكاتب والفصول بأثاث مناسب وأدوات سمعية وبصرية لمختلف أنواع التدريب .

١ - تدعيم وتقوية الادارة المركزية للتدريب :

يعتبر العدد الحالي من المتخصصين والخدمات المعاونة بالادارة المركزية للتدريب منخفضا للغاية لتنفيذ المهام المنوطة بالادارة (الملحق أ) ويتطلب الأمر تشكيل لجنة لتحليل العمالة المطلوبة للادارة المركزية للتدريب بالهيئة واقتراح خطة تنظيمية يتم عن طريقها شغل الوظائف المطلوبة على مراحل على مدى السنتين القادمتين .

وتعتبر العمالة اللازمة لشغل وظائف الادارة المركزية للتدريب بالهيئة مقسمة لثلاثة مجموعات :

- (١) خبراء متخصصون في التدريب .
- (٢) اخصابون في تنمية القوى البشرية .
- (٣) مندوبو ادارة التدريب بقطاع مرافق مياه الشرب والصرف الصحي .

طبقا لما تم توضيحه في الفصلين (الخامس والسابع) من التقرير 4 - SR يجب أن يكون بالهيئة طاقم عمل متخصص بالادارة المركزية للتدريب يمكنه التعامل مع احتياجات القطاع من القوى العاملة .

تتطلب الادارة المركزية للتدريب خبراء متخصصون في المجالات المختلفة يمكنهم تقديم كيفية وضع وعمل دورات تدريبية في مجالات الهندسة الصحية ، الهندسة الكهربائية ، والهندسة الميكانيكية ، والكيمياء ، وتشغيل المعامل ، والتشغيل وصيانة المعدات ، والتمويل والمحاسبة ، وادارة شؤون الأفراد ، والامداد والخدمات المعاونة .

بالاضافة أنه يجب أن تضم اخصابو تنمية المصادر البشرية ذوى مهارات خاصة في عدة مجالات لتصميم وتنفيذ التدريب . كما تكون لهم خبرات في مجالات التقييم ، والتقدير ، والتصميم ، والتنمية ، والاعلام ، والمكتبات ، والتدريب على الوظيفة ومنح الشهادات والرخس ، والتدريب الادارى ، وتخطيط السلم الوظيفي .

وحيث أنه قد لا تتوفر بعض هذه التخصصات بالهيئة فانه يمكن تعيينهم من خارج الهيئة مؤقتا أو التعاقد معهم بعقود خاصة .

ويتضمن كل فصل من فصول هذا التقرير ملخصاً وتوصيات لدعم الهيئة وحل المشكلات التي ظهرت كجزء من تقدير احتياجات القوى العاملة . ويتطلب التخطيط لعمل هذا لاصلاحات والتحسينات داخل الهيئة توضيح التسلسل المنطقي لبعض الأعمال حتى يمكن لكافة المتطلبات أن تصبح جزءاً من خطة التنفيذ الأساسية .

التنفيذ :

ثانياً :

ركزت التوصيات التي نص عليها هذا التقرير على الحاجة لرفع أولوية التدريب الى مرتبة أعلى داخل الهيئة وقطاع المياه والمرفص الصحي ككل عن طريق تدعيم الادارة المركزية للتدريب في جهودها التي تبذلها لتحقيق المهام المنوطة بها . وقد تم وضع المجموعة الأولى من خطوات العمل كجزء من خطة العمل بالتقرير ، وهذه الخطوات تختص بتدعيم وتقوية الادارة المركزية للتدريب . ويجب اعتبار تنفيذ هذه الخطوات شرطاً أساسياً لتنفيذ التوصيات الأخرى بالتقرير وكذلك تلك التي ستنتج عليها تقارير المهام الأخرى . الخاصة بـ " تطوير وتدريب القوى العاملة " . وترتكز المجموعة الثانية من الأنشطة على وضع نظام دائم لتقدير احتياجات القوى العاملة بمعرفة الادارة المركزية للتدريب بالهيئة . وتحتاج الهيئة وضع استراتيجية بعيدة المدى للتدريب بناء على معلومات القوى العاملة المتوفرة حالياً . والغرض من استمرارية عملية تقدير الاحتياجات مسن القوى العاملة هو ضمان أن القرارات التي تتخذ لتنفيذ أعمال تنمية القوى العاملة قد تم اتخاذها بناء على معلومات تخطيطية سليمة .

وفيما يلي شرح هاتين العمليتين الهامتين :

- تدعيم وتقوية الادارة المركزية للتدريب .
- انشاء نظام دائم ومستمر لتقدير احتياجات القوى العاملة .

الفصل العاشر

خطة العمل

الدعم التنظيمي :

أولا : التخطيط :

تعتبر المهمة الأولى للمشروع هي دعم القطاع تنظيميا حيث يقوم خبراء المشروع ومستشاريه بمعاونة الهيئة في حل المشاكل سواء داخل الهيئة أو بالقطاع ككل . وبالرغم من أن أغلب الأنشطة التي تقوم بها الهيئة تنسم بالطابع الهندسي إلا أن مشروع الدعم التنظيمي لقطاع المياه والصرف الصحي ليس مشروعا هندسيا ولكنه مشروع يختص بتنظيم وتنمية الإدارة . وقد جاء هذا المشروع محصلة الدراسات والأبحاث التي تم عملها في العشرينات الأخيرة ، والغرض من هذا المشروع مساعدة مديري الهيئة على تنفيذ الحلول التي نصت عليها الدراسات السابقة لمشكلات القطاع .

ويعتبر التخطيط الفعال والجيد هو أهم الأعمال الإدارية في عملية حل المشكلات . لذا فإن الحلول التي توجد على الأوراق لا قيمة لها ولكن يمكن أن تصبح فعالة وأداة جيدة للتحسين والاصلاح اذا ما وضعت في اطار من التخطيط الجيد والتنفيذ السليم والمتابعة الدائمة . وقد أشارت الوكالة الأمريكية للتنمية الدولية الى أن التخطيط هو أحد الأعمال الهامة التي يقوم بها المشروع .

وتعطي كل مهمة فرعية من المهام الخاصة بتدريب وتنمية القوى العاملة طريقة للتخطيط لسد الاحتياجات الخاصة بالهيئة وقطاع المياه والصرف الصحي وتحتوى التقارير التي تقدمها هذه المهام على خطط عمل تتضمن خطوات مرحلية وجداول زمنية يجب اتباعها للوصول الى حل للمشكلات وتحقيق التقدم المنشود .

وتضع خطة العمل المرفقة بالتقرير 4 - SR تفاصيل الخطوات اللازمة للقيام بخلق وتنمية قدرات داخلية بالهيئة يمكنها عمل مختلف أنشطة تقديرات القوى العاملة لقطاع مياه الشرب والصرف الصحي كجزء من مهمة الهيئة تجاه القطاع في تدريب وتنمية القوى العاملة .

خطة العمل

كما يجب أن ينال التدريب أولوية في موازنة الهيئة ، وكذلك فانه على الهيئة تقوية الادارة المركزية للتدريب ومدتها وكذلك القطاع ككل بالمعاونة الفنية الخارجية للتدريب والتي يجب أن تشمل على خبراء تدريب في المجالات المختلفة مثل :

- خبراء في التحليل والتنظيم والتصميم والتنفيذ والتقييم للتدريب .
- خبراء اعلام في مجالات التصوير والعروض السمعية والبصرية .
- خبراء في مواد التخصص الفني من هندسة صحية ، وتشغيل وصيانة ، والادارة ، والعلوم البكتريولوجية .

يحتوى التقرير 4 - SR المرفق ، على خطة عمل مبين بها الاعمال المطلوب تنفيذها لزيادة العاملين المتخصصين بادارة التدريب ، وتدعيم مراكز التدريب ، وزيادة الميزانية المخصصة .

(ط) المركز القومي للتدريب :

يجب أن تحصل الإدارة المركزية للتدريب بالهيئة على دعم كامل حتى يمكنها تنفيذ الأعمال الشاملة التي يتطلبها حل مشاكل تطوير القوى العاملة التي يواجهها قطاع مياه الشرب والصرف الصحي ، على أن تصبح الإدارة المركزية للتدريب مسئولة عن كافة أوجه تنمية وتطوير القوى العاملة والتدريب مثل تصميم وتنفيذ وتقييم البرامج التدريبية . كما تقوم الإدارة أيضا بوضع نظام ادارة معلومات خاصة بالتدريب على المستوى القومي والذى من شأنه أن يحفظ الاتصال المباشر مع مواقع العمل لضمان أن تلبي البرامج التدريبية حاجة القطاع من المهارات المختلفة .

ونوصي أيضا بإنشاء مركز تدريب قومي لقطاع مياه الشرب والصرف الصحي بالقاهرة الكبرى يكون من مهامه انتاج وتدبير المواد التدريبية، المواد الاعلامية، والمعونة والتوجيه للمدربين بمواقع العمل . كما يجب أيضا أن يتم تحت الرئاسة المباشرة للهيئة (الإدارة المركزية للتدريب) وضع نظم وبرامج قومية لمنح الشهادات والرخى للعاملين بقطاع مياه الشرب والصرف الصحي على مستوى الدولة يتم مراجعتها وتحديثها باستمرار .

ولما كانت كافة خطط العمل التي تضعها المهام المدرجة تحت مشروع الدعم التنظيمي لقطاع المياه والصرف تحوى في طياتها عنصر التدريب . فاننا نوصي الهيئة (ادارة التدريب) متابعة تدريب الجانب المصرى المقابل للعاملين بالمشروع بواسطة الخبراء خلال فترة تنفيذ مشروع الدعم التنظيمي وذلك لتطوير قدرات كوادر العمل بالهيئة وخلق مهارات جديدة بها .

وكذلك يجب أن تتولى الإدارة المركزية للتدريب بالهيئة تنسيق برامج تدريبية بالخارج وتوفير الفرص للعاملين بالهيئة والمرافق لحضور هذه الدورات ببلدان العالم .

ومن أجل تحقيق الخطة الطموحة التي تم ذكرها في هذا الملخص نوصي |ادارة العليا بالهيئة بمتابعة تنفيذ مسؤولياتها كسلطة مسئولة عن التدريب على مستوى القطاع .

وكجزء من هذا النظام يقوم كل مرفق مياه شرب و صرف صحي بتعيين منسق تدريب
يتلقى تدريباً متخصصاً في كيفية تنفيذ وعمل البرامج الزمنية للتدريب على الوظيفة بالمرفق
(الفصل السابع) .

(ز) برنامج تدريب المدربين :

يجب أن تعاون الهيئة القطاع في خلق قدرات به لتدريب العمالة الحالية وتكون مستعدة
لتدريب الآلاف من العاملين المنتظر انضمامهم للقطاع مستقبلاً .
وعلى الهيئة أن تضع وتنفذ برنامجاً لتدريب المدربين على مستوى القطاع بدءاً بالادارة
المركزية للتدريب بالهيئة ثم يمتد ليشمل المرافق بالمحافظات والمدن .
ونوصي الهيئة أن تستعين في ذلك مؤقتاً بمراكز التدريب التابعة لوزارة التعمير كمكان
لعقد دورات تدريبية اقليمية لتدريب المدربين يتم التركيز فيها على كيفية تنفيذ برامج
تدريب على الوظيفة بالمرافق (الفصلين التاسع والعاشر) .

(ح) تقدير الاحتياجات من القوى العاملة :

تعتبر الحاجة الى المعلومات التي يتم تحديثها بصفة دائمة اللازمة لاتخاذ القرارات المناسبة
هي أحد أسس الادارة الحديثة لذا فقد قامت المجموعة المكلفة بمهمة "تقدير احتياجات القطاع
من القوى العاملة" بوضع نظام لجمع المعلومات عن قطاع مياه الشرب والصرف الصحي كما
قامت بشرح خطوات التنفيذ لتسهيل امكانية استمرار هذا النشاط بطريقة دورية لتحديث
البيانات .
وباعتماد الهيئة للتقرير SR - 4 وخطة العمل المرفقة به فانها تؤمن استمرار تقدير
احتياجات القطاع بصفة دورية (الفصول الثاني ، الثالث ، الرابع) .

ويمكن أيضا الاستفادة من المراكز التدريبية التابعة لوزارة التعمير لتنفيذ التدريب الفني للعمال الجديدة . حيث أن ذلك هو أفضل البدائل والحلول الاقتصادية لسد الاحتياجات العاجلة لقطاع في المرحلة الحالية . وهذه المراكز تقع في المراكز السكنية الكبرى ولديها من المعامل والمعدات ما يمكنها من تدريب بعض أنماط من العمالة كالتوصيلات الصحية واللحام .

كذلك نوصي الهيئة بإبرام اتفاقية مع إدارة مراكز وزارة التعمير لاستخدام الفصول الدراسية والمعامل في مختلف أنحاء الجمهورية كحل سريع ومؤقت لسد الاحتياجات من أماكن التدريب مع استخدام ما يتم إنتاجه من برامج ومساعدات تدريب بواسطة الإدارة المركزية للتدريب بالهيئة .

ومع هذا الاقتراح الذي يدعو إلى الاستخدام المؤقت لمراكز تدريب وزارة التعمير . نوصي الهيئة البدء في التخطيط وإنشاء مراكز دائمة للتدريب تتبع الهيئة . (الفصل السابع) .

(و) التدريب على الوظيفة بالموقع (OJT)

ويعد هذا النوع من التدريب هو أكثر فروع التدريب اقتصادا - كما يمكن من خلاله تدريب الفنيين والعمال أنصاف المهرة والمهرة تدريبيا فنيا عمليا من خلال التدريب في مواقع العمل حيث لا توجد حاجة لمساعدات التدريب مرتفعة التكاليف كما أنه يمكن به التغلب على العوامل غير المشجعة مثل تكاليف السفر والإقامة علاوة على مصاريف حضور الدورات .

وعلى الهيئة أن تضع وتنفذ نظاما محكما للتدريب على الوظيفة بكافة تفاصيله، إجراءاته من تجهيز المناهج واختبارات الأداء - وذلك كأحد الحلول لتدريب العمالة الماهرة ونصف الماهرة .

ويجب أيضا تجهيز وحدات تدريب متنقلة مزودة بمساعدات التدريب والوسائل السمعية والبصرية والمناهج الدراسية والاختبارات وذلك لدعم وبرامج التدريب على التشغيل والصيانة .

والتدريب وكليات الهندسة بالجامعات الكبرى وذلك لضمان اماكن أن يحصل قطاع مياه الشرب والصرف الصحي على خريجين جدد حاصلين على المهارات اللازمة .

ويؤدى التنسيق مع المعاهد والهيئات التعليمية الى تخفيض تكاليف تدريب العمالــــة قبل التوظيف .

ونظرا لتزايد فرص العمل بالقطاع يجب التأكد من أن مناهج المدارس الثانوية الفنية تغطي المهارات المطلوبة للقطاع ، كما يجب التنسيق مع الجامعات وكليات الهندسة على وجه الخصوص لتنظيم برامج للتخصى في الهندسة الصحية والبيئية وذلك لضمان أن الأعداد المتزايدة من الوظائف الهندسية اللازمة لقطاع مياه الشرب والصرف الصحي سيتم شغلها بكفاءات متخصصة .

وأخيرا ، يجب القيام بوضع وتنفيذ برامج نموذجية للتعريف بالوظيفة وبرامج أخرى لتدريب العمالة الماهرة الهندسية والكيمائية الذين يلتحقون حاليا بالقطاع دون أن يحصلوا على دورات تدريبية متخصصة في مياه الشرب والصرف الصحي قبل التحاقهم بهذه الوظائف .

(الفصل السابع) .

(هـ) التدريب على أعمال التشغيل والصيانة :

تم توضيح أولويات التدريب على أعمال التشغيل والصيانة في الجدول م - ١ . ونظرا لأن الأمكن والامكانيات اللازمة لاجراء هذا النوع من التدريب تكون مكلفة للغاية وتتطلب وقتا كبيرا لاعادها فانه يجب الحصول على أكبر استفادة ممكنة من الأماكن الموجودة حاليا لتنفيذ البرامج التدريبية الملحة والعاجلة للتشغيل والصيانة للعاملين الجدد .

كما نوصي الهيئة بتذليل أى عقبات قد تؤدى الى تأخير افتتاح مركز التدريب التابع لها بدمهور واستخدامه لعقد دورات تدريبية لمياه الشرب والصرف الصحي بعد تزويده بالمعربين وأتوات ومساعدات التدريب والمناهج الدراسية .

(٨)

وفي مثل هذه الندوات التي تدور حول التطوير التنظيمي يتعلم كل مدير ، طرق تحديد المهام ، والواجبات والوظائف التي يجب أن تقوم بها ادارته . ويجب أن تركز هذه الندوات على الدور الذي تؤديه الادارات والاتصالات والتنسيق والتخطيط الجيد ووضع وتحديد الأهداف وأيضاً وضع الأولويات وسيؤدي هذا النوع من التدريب الى تحسين الكفاءات ويساعد على تحقيق الأهداف البعيدة والقريبة . وأخيراً يجب أن تشمل هذه الندوات طرق الادارة والسيطرة والرقابة لضمان التنفيذ والمتابعة الجيدة . (الفصل السابع) .

(ج) منح الشهادات والتراخيص لمستويات الكفاءة :

يعتبر قطاع المياه والصرف الصحي في حاجة ماسة الى وضع مقاييس وتوصيف للوظائف والمؤهلات اللازمة لأدائها . حيث وجد حالياً أن الوظائف التي تحمل نفس العنوان تختلف من محطة لأخرى في الواجبات الموكلة لها أو المهارات المطلوبة لشغلها .

أما نظام الترقي فيقوم أساساً على عدد سنوات الخدمة ، وفي حالات قليلة لبعض العاملين يكون التأهيل وزيادة المهارات من مطالب الترقي .

وأصبح من الضروري وضع نظام قومي لمنح الشهادات والرخى كشرط لتحديد مستويات المهارة ويجب أيضاً ربط الترقي بتطوير المعلومات والقدرات المهنية عن طريق اتمام دورات تدريبية واجتياز اختبارات نموذجية بنجاح . ويجب أن تأخذ الهيئة القومية لمياه الشرب والصرف الصحي دوراً قيادياً في تشكيل لجنة منح الشهادات والرخى بقطاع المياه والصرف والتي تتولى بحث هذا الموضوع الهام . (الفصل السابع) .

(د) التدريب قبل التوظيف :

يعتبر النظام القائم في جمهورية مصر العربية للتعليم الثانوي الفني ، والعالي هو أحدث النظم في العالم العربي على وجه الاطلاق . ونوصي الهيئة القومية لمياه الشرب والصرف الصحي بالتنسيق المباشر مع وزارة التربية والتعليم ، ووزارة القوى العاملة

ونقترح لرفع كفاءة الإدارة تنفيذ الآتي :

• اختيار وتنظيم مرافق نموذجية :

يتطلب قطاع المياه والصرف الصحي تنظيم نموذجي للإدارة وكذلك لاجراءات التشغيل والصيانة • ويقتضي على الهيئة القومية لمياه الشرب والصرف الصحي وضع تنظيمات موحدة للمرافق ولأساليب التشغيل والصيانة بها ثم يتم اختبار هذه النظم والاجراءات عمليا في ظروف التشغيل الفعلي • وعند نجاحها تصبح أساسا للإدارة واجراء التدريب الذي يتم بناء عليها •

ولذلك نوصي أن تقوم الهيئة باختيار احدى مرافق مياه الشرب العاملة وكذلك احدى مرافق الصرف الصحي يتم استخدامها كمركز لتطبيق واختبار التنظيمات ، والاجراءات والطرق الجديدة ثم نشرها وتعميمها في باقي المرافق •

وفي هذه المرافق النموذجية المختارة يمكن أن يوضح للمديرين والمشرفين كيفية تحسين نظم التشغيل عن طريق تنفيذ طرق واجراءات جديدة مثل نظم ادارة المعلومات وحاسبة التكاليف ومتابعة الأداء • وعندما تصبح هذه النظم الأساسية معدة للتنفيذ الاقليمي يجب على المرافق النموذجية أن تأخذ دورا قياديا في تدريب مستعملي هذه النظم الجديدة والمتكاملة على مستوى القطاع • (الفصل السابع) •

• عقد ندوات خاصة بالإدارة :

ويستلزم الأمر عقد دورات خاصة للمديرين بالهيئة لاعلامهم واشراكهم في هذه التغييرات الأساسية والمتعددة والتي تؤثر على تنظيم الهيئة والقطاع ككل •

ويقتضي على الهيئة القومية لمياه الشرب والصرف الصحي دعم المرحلة الأولى لتدريب الإدارة (المهمة أ^٣ - ٢ بمشروع الدعم التنظيمي) للعاملين بالهيئة ويتم التركيز فيها على تطوير التنظيم •

الصحي استثمارا يحقق تحسين نوعية الخدمات ، والنهوض بالصحة العامة ، وزيادة الانتاج ، ويحقق أيضا النموذجية والتوحيد داخل القطاع . (الفصل الاول) .

(ب) تدريب الادارة :

وتشير نتائج الزيارات التي قام بها طاقم العمل بالمشروع للمحافظات والمدن بأحاء الجمهورية الى الحاجة الملحة والعاجلة لتدريب الادارة على مستوى القطاع . حيث ان مديري المرافق بالقطاع قد تلقى القلة منهم تدريبات تتعلق بوظائفهم الادارية . وعلى سبيل المثال لم يكن البعض منهم قادرا على اعطاء بيانات دقيقة عن عدد موظفيهم بالمرفق . ووجد ان القلة منهم يحتفظ بجدول وخطط تنفيذ موضح بها أسلوب تقسيم الاعمال على العاملين بالمرفق . ويعتبر هذا الاجراء الاساس للتنظيم الجيد وكفاية أداء المحطات . ويمكن التغلب على هذه المشكلات الادارية بتنسيق وعقد دورات تدريب ادارية على مستوى القطاع .

ومن المفترض ان يعود العاملون الذين اتموا دورات تدريبية الى محطات يديرها مديرون لهم رغبة أكيدة في الاستفادة من المهارات والقدرات الجديدة لدى هؤلاء العاملين المدربين ولكن هذا نادرا ما يحدث . فمثلا اذا لم تتوفر للمدربين العائدين من التدريب قطع الغيار ، والأدوات والعدد المناسبة ، والمواد اللازمة للعمل ، بواسطة مديري المرافق . وكذلك اذا تم اهمال الأساليب والاجراءات الحديثة في الادارة فانه في ظل هذه الظروف تصبح المنفعة الاقتصادية من التدريب وفوائده أقل فاعلية ومحدودة النتيجة . حيث ان ظروف وبيئة العمل بعد العودة من التدريب لا تسمح باستغلال المهارات الجديدة التي تم اكتسابها .

لهذا فانه من الضروري ان يتفهم مديرو المرافق عملية التدريب وكيف يمكنهم الاستفادة من طاقم العمل المدرب حديثا . ويقتضي على الهيئة القومية لمياه الشرب والصرف الصحي وضع طريقة لتوعية العاملين على مستوى القطاع بقيمة التدريب وتمثل في منح العاملين تدريبات ادارية تركز على أهمية التدريب من الناحية الاقتصادية والفوائد التي تعود منه عند توفر بيئة تشجع ذلك . (الفصل السابع) .

ج - التوصيات المبدئية :(١) مقدمة :

تتكون المهمة بـ ٢ " تدريب وتطوير القوى العاملة " بمشروع الدعم التنظيمي لقطاع المياه والصرف الصحي من خمسة مهام فرعية . والمهمة الأولى من هذه المهام الخمس الفرعية هي: تقدير الاحتياجات من القوى العاملة " والغرض الأساسي من هذه المهمة هو بحث موقف العمالة والمشكلات المتعلقة بها . أما الأربعة مهام الفرعية الأخرى فإنها ترتبط بأعمال التخطيط للقوى العاملة مستخدمة المعلومات التي تم جمعها في " تقدير احتياجات القطاع من القوى العاملة " وستشمل التقارير التي ستقدمها هذه المهام التوصيات التفصيلية .

وعلى هذا فإنه يجب اعتبار التوصيات الواردة بهذا الملخص التنفيذي توصيات مبدئية وسيتم وضع توصيات محددة في التقارير التالية .

وتقوم التوصيات التي سيرد ذكرها بعد على الآتي :

- حلول اقتصادية وتحقق أفضل استغلال للبرامج ، مواد التدريب ، ومراكز التدريب المتيسرة حاليا .
- يجب استخدام الحلول المؤقتة - عندما تكون متاحة - لحين امكان تنفيذ الحلول طويلة الأمد . (الفصل التاسع) .

(٢) ملخص التوصيات :(أ) التوعية بأهمية التدريب :

يعد التدريب بالقطاع أحد الأنشطة التي لا تعطي أولوية وما يخص لها من التمويل محدود تماما . ويتطلب من الإدارة العليا بالهيئة القومية لمياه الشرب والصرف الصحي والمحافظات والمدن والجهاز المركزي للتنظيم والإدارة الاستعداد من المنفعة لاقتصاديين للتدريب . وعليهم دعم التدريب دعما كاملا . فمثلا تخفيض مصروفات التشغيل والصيانة بالمحطات عندما يتولى تلك الأعمال طاقم عمل مدرب . ويعد التدريب في مجال قطاع المياه والصرف

(٤)

مدى القدرات والمعرفة لدى العاملين بالمحطات • وقد اتضح نتيجة لذلك الاجراء الاحتياج الواضح والملموس لتدريب هؤلاء العاملين على اختلاف مستوياتهم الوظيفية • وفي الجدول رقم (م - ١) تم تلخيص الأولويات الملحة لعمل دورات تدريبية في المدى القصير لكل مجموعة وظيفية • (الفصلين السادس والسابع) •

جدول م - ١

ملخص أولويات الاحتياجات الملحة من التدريب في المدى القصير :

- الادارة العليا والوسطى
- المشرفون الفنيون
- الكيميائيون وفنيو المعامل
- مهندسو الكهرباء والفنيين المهرة
- مهندسو الميكانيكا والفنيون المهرة
- أمناء المخازن
- عمال تشغيل المعدات

(٤) مشاكل العمالة :

تم استطلاع رأى مديري مرافق مياه الشرب والصرف الصحي في مشاكل وقضايا العاملين التي تؤثر على الانتاجية وتقبلهم للتدريب مثل المرتبات ، المكافآت ، والترقي ، والحوافز والعمالة الزائدة ، والنقص في العمالة ، الخ . وقد وجد أن المعلومات التي تم جمعها من مديري المرافق تؤيد نتائج البحث الذي قام به المشروع للتعرف على مشكلات العمل والعاملين بالقطاع والتي اذا ما تم حلها ستؤدي الى تحسن معنويات وأداء العاملين • (الفصل الثامن) •

(١) التمويل :

تعتبر الهيئة القومية لمياه الشرب والصرف الصحي الجهة المسؤولة عن تنمية وتطوير وتدريب القوى العاملة بقطاع المياه والصرف الصحي بموجب القرار الجمهوري ١٩٧ لسنة ١٩٨١ م . ونظرا لما تتلقاه الهيئة من التمويل الضئيل من الموازنة القومية للتدريب والذي لا يتعدى مبلغ احدى عشر ألف جنيه للعام الحالي ، فان هذا يؤدي الى عدم امكن تقديم خدمة تدريبية مناسبة للقطاع ، وتقوم الادارة المركزية للتدريب بالهيئة بعمل دورات تدريبية في مراكز التدريب الصغيرة التابعة للهيئة بمنطقة القاهرة للعاملين بالقطاع مقابل رسوم تعليمية .

ويعتقد مديرو المحطات بالمحافظات - والذين يعتمدون على الهيئة في تدريب موظفيهم - أنه يجب اتاحة فرص التدريب بمراكز التدريب الاقليمية أو في المحطات نفسها ، حيث لا يمكنهم ارسال عدد أكبر من المتدربين للقاهرة لتلقي دورات تدريبية بمعرفة الهيئة ويرجع ذلك الى المصروفات المقررة مقابل التدريب بالإضافة الى سوء أماكن ووسائل اقامة المتدربين بمراكز التدريب المتاحة للهيئة والتابعة لوزارة التعمير . (المل الثامن) .

(٢) اعداد العاملين :

بناء على عينات المحطات التي تم زيارتها بالمدن فقد قدر المشروع عدد العاملين بالقطاع (فيما عدا القاهرة) الاسكندرية و قطاع المياه بمدن القناة) حاليا بحوالي ٩٠٠٠ من العمال أنصاف المهرة حتى مستويات الادارة (٥٨٠٠ بمحطات المياه و ٣٢٠٠ بمحطات الصرف الصحي) و سيزداد هذا الرقم بسرعة عند الانتهاء من انشاء المشروعات الجديدة . ويقدر المشروع عدد العمالة الماهرة الاجمالي بالقطاع خلال العشر سنوات القادمة بحوالي ٢٤٠٠٠ كحد أدنى (بزيادة قدرها ٨٠٠٠ للعاملين بمحطات المياه و ٧٠٠٠ للعاملين بمحطات الصرف الصحي) وكذلك سترتداد العمالة بالقطاع خارج نطاق المدن الكبرى خاصة عندما تنتشر المشروعات الجديدة بهذه الأقاليم . (الفصل الخامس) .

(٣) مستوى المهارات للقوى العاملة :

تم جمع معلومات وبيانات من مديري المحطات عن احتياجات العاملين من التدريب وبالاضافة الى ذلك فقد تم عمل مسح لمهارات القوى العاملة باستخدام نماذج امتحانات مطبوعة لتقريب

هو تحديد احتياجات القطاع من القوى العاملة ، حيث سيتم استخدام هذه المعلومات في المهام الأخرى التي تتعلق بتخطيط القوى العاملة ضمن مجموعة المهام الخاصة بـ " تدريب وتطوير القوى العاملة " بمشروع الدعم التنظيمي للقطاع WWIISP (الفصل الثاني) .

ب - الحالة الراهنة للقوى العاملة :

ان المشكلات المتعلقة بالقوى العاملة والتي تم تلخيصها في التقرير رقم SR-4 تعتمد بصورة أساسية على نتائج التقييم الذي قامت به مجموعة العمل لاحتياجات القطاع من القوى العاملة بناء على المعلومات والبيانات التي تم جمعها في يوليو وأغسطس ١٩٨٩ م من عشرين مدينة بجمهورية مصر العربية بكل منها مرفق مياه شرب ومرفق صرف صحي .

وتتناول عملية تقدير احتياجات القطاع من القوى العاملة التي قام بها مشروع الدعم التنظيمي شريحة عريضة من قطاع مياه الشرب والصرف الصحي حيث يغطي التقرير عدد العاملين من أُنصاف المهرة الى المهرة الى مستويات الادارة التي تعمل حاليا بمرافق المدن التي يبلغ عدد سكانها ٤٠٠٠٠٠ نسمة أو أكثر ، وكذلك أوضح هذا التقدير احتياجات القطاع من القوى العاملة على مدى العشر سنوات القادمة بالإضافة الى مستويات المهارة المطلوبة والتدريب اللازم لتلك العمالة .

وقد تم التركيز في هذا التقدير على المناطق الحضرية ولم يشمل الالف من عاملي القطاع بالمراكز الريفية حيث تستخدم مصادر مياه من الآبار ووحدات التنقية النقالي ، وقد أشارت الهيئة القومية لمياه الشرب والصرف الصحي الى أنه يوجد على الأقل ٢٠٠٠ فني يقومون بتشغيل وصيانة الوحدات النقالي .

وفيما يلي نقدم ملخصاً موجزاً عن المشاكل التي وجدت بالقطاع ونتائج التقييم المؤثرة التي تتمثل في وجود أربعة مشكلات أساسية تتعلق بالقوى العاملة :

- وجود أعداد كبيرة من العاملين حالياً بقطاع المياه والصرف الصحي تحتاج الى التدريب ومن المتوقع زيادة أعدادهم مستقبلاً .
- هبوط مستوى مهارة العمالة الحالية بالقطاع .
- عدم وجود التمويل الكافي لدعم المستويات المطلوبة من التدريب .
- وجود العديد من المشاكل العمالية والتي لها آثار سلبية تنعكس على معنويات العاملين بالقطاع ومستويات أدائهم (الفصل الخامس ، الفصل السابع) .

ملخص تنفيذي

للتقرير رقم : 4 - SR

" تقدير الاحتياجات من القوى العاملة "

المهمة الفرعية ب ١/٢

١ - الغرض :

الغرض من هذا الملخص التنفيذي هو استعراض النتائج الرئيسية لتقدير الاحتياجات من القوى العاملة ، وتلخيص مشاكل القوى العاملة والتدريب على مستوى القطاع وكذلك وضع التوصيات المبدئية والاجراءات التصحيحية .

٢ - الوضع الراهن للقوى العاملة في قطاع المياه والصرف الصحي :

أ - خلفية تاريخية :

على مدى الاثني عشرة عاما الماضية تم استعراض وتحديد مشاكل القوى العاملة بقطاع مياه الشرب والصرف الصحي بمصر مرارا وتكرارا . وقد تضمنت بعض الدراسات - كتلك التي أجراها بني تايلور وشركه - وبلاك وفيتش في أواخر السبعينات - بيانات شاملة وتوصيات لتحسين الأوضاع . وكذلك أوضحت الدراسات العديدة التي أجرتها الوكالة الأمريكية للتنمية الدولية لتقدير الاحتياجات من العمالة في القطاع - مشاكل القوى العاملة المزمنا والمتأصلة بمرافق المياه والصرف الصحي . وقد أثمر دعم الوكالة الأمريكية للتنمية الدولية USAID لتنمية القوى العاملة كجزء من المشروعات الكبرى بالقاهرة والاسكندرية ومدن القناة والمدن الاقليمية نتائج ايجابية في هذا المجال . وفي منتصف الثمانينات أُقنت الوكالة الأمريكية للتنمية الدولية حاجة الهيئة القومية لمياه الشرب والصرف الصحي الى ضرورة معاونتها على القيام بمسئولياتها . لهذا وفي أواخر ١٩٨٨م بدأ مشروع الدعم التنظيمي لقطاع مياه الشرب والصرف الصحي . وفي يونيو ١٩٨٩م بدأ المشروع لأول مرة في بذل الجهود لتقدير حاجة القطاع من القوى العاملة - وبالتعاون مع الهيئة القومية لمياه الشرب والصرف الصحي . وكان الغرض من هذا التقدير

ملخص تنفيذي

الهيئة القومية لمياه الشرب والصرف الصحى

تقرير رقم SR-4

تقدير احتياجات القوى العاملة بقطاع المياه والصرف الصحى

مشروع الدعم التنظيمى لقطاع الامداد بالمياه والصرف الصحى

مسودة

نوفمبر ١٩٨٩

ملخص تنفيذى وخطة العمل

مجموعه شركات

بويل انجينيرنج ومؤسسة التعليم القومى

بالمساهمه مع :

المكتب الاستشارى د. احمد عبدالوارث- شركه تيم مصر

شركه روبرت ناثان

شركه ايكو ريسورسز

الهيئة القومية لمياه الشرب والصرف الصحى

تقرير رقم SR-4

تقدير احتياجات القوى العاملة بقطاع المياه والصرف الصحى

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شركه ايكوريسورسز

PA-AEE-746

**NATIONAL ORGANIZATION FOR POTABLE WATER
AND SANITARY DRAINAGE**

(NOPWASD)

COPY 7 OF 24 COPIES

SR-4

MANPOWER NEEDS ASSESSMENT

**WATER and WASTEWATER INSTITUTIONAL
SUPPORT PROJECT**

(WWISP)

USAID NO. 263-0176

**VOL 2
DRAFT VERSION**

NOVEMBER 1989

METHODOLOGY and PROCEDURES

**JOINT VENTURE OF
BOYLE ENGINEERING CORPORATION
AND
NATIONAL EDUCATION CORPORATION**

**IN ASSOCIATION WITH
DR.A.ABDEL WARITH/TEAM MISR,
ROBERT R.NATHAN ASSOC'S INC,AND
ECO-REOURCES INCORPORATED**

71

Boyle Engineering and
National Education (J.V.)
in Association with A.A.W/TEAM MISR
Water & Wastewater Institutional
Support Project (WWISP)

الهيئة المشتركة من شركتي
بويل انجنييرينج وناشيونال ايدوبوكيشن
بالتعاون مع شركتي عبد الوارث وتميم مصر
مشروع الدعم التنظيمي لقطاع الامداد
بالمياه والصرف الصحي

Eng. Abdel Salam El-Rafie
Deputy Chairman - NOPWASD
96 Ahmed Orabi St.- 16th Floor
Mohandseen, Cairo

29 November 1989
WWISP/00246/HS/em/LTR

Subject: Report No SR-4: Manpower Needs Assessment
WWISP-USAID Project No. 263-0176

Dear Eng. El-Rafie,

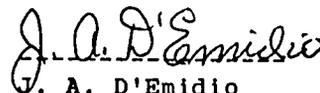
Under the provisions of para 4, article II, reports, of our contract (USAID Project No. 263 - 0176), five copies of SR-4, Manpower Needs Assessment are submitted for your review and comment.

This report is the first of the six reports to be delivered to NOPWASD as a part of Task B2, "Manpower Development and Training". Report SR-4 provides NOPWASD with the findings, conclusions and recommendations resulting from the national Manpower Needs Assessment conducted by WWISP. As part of this effort, WWISP personnel visited 20 cities throughout Egypt each with a Water and Wastewater Plant. Data collected from this sample along with findings of previous studies, were used to determine current and projected manpower levels in Urban water and wastewater facilities. In addition, a Training Requirements Survey and Personnel Practices Review were conducted. The findings indicated a great need to improve training throughout the sector for the current estimated 9000 semi-skilled to management employees and the projected potential training population of at least 24,000 by the year 2000.

Under the terms of the contract, your comments are required within 30 days of the date of this letter. In the meantime, we look forward to reviewing this report with you.

Warm personal regards.

Sincerely,



J. A. D'Emidio
Resident Project Manager

Attached: Five Copies
cc: USAID w/5 copies
MHPU w/5 copies

**NATIONAL ORGANIZATION FOR POTABLE WATER
AND SANITARY DRAINAGE
(NOPWASD)**

SR-4

MANPOWER NEEDS ASSESSMENT

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FOREWORD

This Report **SR-4, Manpower Needs Assessment** has been prepared under contract between the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the Joint Venture Firms of Boyle Engineering Corporation/National Education Corporation in association with subcontractors TEAM International, AAW (Dr. Ahmed Abdel Warith), Robert R. Nathan Associates, Inc., and ECO-Resources Inc. It supports efforts by the Arabic Republic of Egypt and the U.S. Agency for International Development (USAID) to provide Technical Advisory Services and Institutional Development for NOPWASD. The project is entitled **Water and Wastewater Institutional Support Project (WWISP)**.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

REPORT SR-4, MANPOWER NEEDS ASSESSMENT

SUBTASK B2.1

A. PURPOSE

The purpose of this Executive Summary is to present the major findings of the Manpower Needs Assessment, to summarize sector-wide manpower problems, and to provide preliminary recommendations for corrective action.

B. THE WATER AND WASTEWATER MANPOWER SITUATION

- I. **Historic Background.** The manpower problems found in the Egyptian Water and Wastewater Sector have been documented repeatedly over the past twelve years. Studies conducted by Binnie and Partners, and Black and Veatch in the late seventies contained comprehensive data and recommendations for improving the situation. Numerous USAID Sector Assessments also have identified the chronic manpower problems in Water and Wastewater plants. USAID efforts to support manpower development as part of major projects in Cairo, Alexandria, Canal Cities, and Provincial Cities have begun to show positive results in these areas.

In the mid-eighties USAID identified a need to assist NOPWASD in its responsibilities. By late 1988, WWISP began operation and in June, 1989, effort was initiated on the first national Manpower Needs Assessment in close association with NOPWASD. The objective was to determine the manpower needs of the sector which would serve as concrete inputs to the other planning subtasks in the WWISP Manpower Development package. (Chapter 2)

2. Current Manpower Conditions. The problems summarized in SR-4 are based upon the findings of the WWISP Manpower Needs Assessment which, in July and August 1989, collected data in twenty cities, each having a water and a wastewater plant.

The WWISP assessment deals with a broad slice of the Water and Wastewater Sector. It reports the number of employees from semi-skilled and skilled to management levels currently working in plants in cities with populations of 40,000 or more and projects the manpower requirements for the next ten years. The skill levels and training needs of this workforce were also determined.

The assessment concentrated on urban areas. It does not include thousands of sector employees in smaller population centers where well networks and compact treatment units are used. (NOPWASD estimates the number of workers on compact units to be at least 2000.)

A brief summary is presented below of circumstances found in the sector and critical assessment findings. There are four major manpower problems now affecting the sector: (1) Lack of adequate funding to support the required level of training, (2) Very large numbers of employees currently in the workforce and many more projected for the future, (3) Low skill levels in the current workforce, and (4) Many personnel practices and labor issues that have a negative effect on employee morale and performance. (Chapters 5 and 7)

- **Funding.** Under Presidential Decree 197, NOPWASD is responsible for providing manpower development and training for the Water and Wastewater Sector. The NOPWASD role has been limited by a severely restricted allocation from the national training budget of only L.E. 11,000 for the current year. NOPWASD Central Department for Training (CDT) conducts courses offered to sector employees on a tuition basis at its small training centers in the Cairo area.

Plant managers in the governorates, who rely on NOPWASD for employee training, feel that free training should be made available at regional centers or in the plants themselves. They do not send more participants to Cairo for NOPWASD training due to the imposed fee and poor residence facilities. (Chapter 8)

- **Manpower Quantities.** Based on the sample of plants in the cities visited, WWISP estimates that there are currently 9000 employees from

semi-skilled to management levels in the sector workforce (5800 in Water, 3200 in Wastewater) and that this number will rapidly expand as new projects are completed. WWISP estimates that within the next ten years, the number will reach at least 24,000 (approximately an additional 8000 in Water, 7000 in Wastewater). The worker populations outside of the larger cities will also continue to grow, especially as new projects spread to these regions. (Chapter 5)

- **Workforce Skill Levels.** Data were collected from plant managers on employee training needs. In addition, a Workforce Skills Survey consisting of written tests was used to determine the adequacy of skills and knowledge. A significant need for training was found for all occupational levels. In TABLE ES-1, below, critical short term training priorities are summarized by occupational group. (Chapter 6 and 7)

TABLE ES-1

SUMMARY OF CRITICAL SHORT TERM TRAINING NEEDS

Top and Mid-Level Managers
Technical Supervisors

Chemists and Lab Technicians
Electrical Engineers and Skilled Technicians
Mechanical Engineers and Skilled Technicians

Storekeepers

Equipment Operators

- **Personnel Practices.** Plant managers were surveyed on a variety of labor issues which affect productivity and attitudes toward training. Issues such as compensation, benefits, promotion, incentives, and shortages/surpluses warrant further inquiry than was possible in the WWISP assessment. However, data collected from plant managers support the finding that solutions to problems in these areas will improve worker morale and performance. (Chapter 8)

C. ASSUMPTIONS

Discussion. The WWISP Task - B2, Manpower Development and Training, is composed of five subtasks. The primary purpose of Subtask B2.1, Manpower Needs Assessment, is to describe the manpower situation and associated problems. The other four WWISP subtasks have specific planning purposes and use the data from the Assessment. These subtask reports will contain detailed recommendations for review by NOPWASD. Therefore, the recommendations in this summary should be considered as preliminary because more specific recommendations will appear in later reports.

The recommendations which follow are based on two assumptions: (1) It is cost effective and beneficial to maximize the use of existing programs, courses, and facilities, and (2) Interim solutions, when available, should be used until Long Range solutions can be implemented. (Chapter 9)

D. SUMMARY OF PRELIMINARY RECOMMENDATIONS

1. **Awareness and Action.** Training is a low priority activity in the sector and funding is extremely limited. Top management at NOPWASD, in the governorates and cities, and at the Central Agency for Organization and Administration should recognize the cost effectiveness of training and give training their full support. Plants will experience reduced operation and maintenance costs when a well trained staff is in place. Training is a wise investment which leads to an improved quality of service, greater public health benefits, increased productivity, and standardization throughout the sector. (Chapter 1)
2. **Management Training - The Critical Priority.** WWISP findings from on-site visits to plants strongly support the immediate need for Management Training throughout the sector. Plant managers in the governorates have had little job-relevant management training. Some of them were unable to provide accurate data on the number of their employees. Few managers had work schedules with specific duty assignments. Yet, this procedure is basic to good organization and plant efficiency. These management problems can be eliminated by good management training programs.

Employees who complete training courses should return to a supportive plant environment created by a manager who wants to take advantage of their new skills. However, this rarely occurs.

If spare parts, correct tools, and necessary materials are not made available by supportive plant managers, or if new procedures are ignored, then plant efficiency will be impaired. The cost effective benefits of training in such a situation also will be limited as a consequence. Therefore, it is very important that plant managers understand the training process and how to take full advantage of their newly trained staff. NOPWASD should develop a sector-wide awareness of the values of training by providing plant personnel with Management Training stressing cost effective benefits when a supportive and receptive environment is created. (Chapter 7)

- **Model Plant Organizations and Procedures.** The Water and Wastewater Sector requires standardization in Management as well as Operations and Maintenance. NOPWASD should develop standardized Plant Management and Operations and Maintenance Procedures and pilot test them under operating conditions. When finalized, these procedures would form the basis for management and supervisory training.

NOPWASD should select one operating Water and one Wastewater Plant as Demonstration and Testing Centers where new procedures, methods and systems could be developed and tested and then disseminated to other plants.

In these Plants, managers and supervisors would be shown how to improve their operations by implementing new systems and procedures.

Systems such as Management Information, Cost Accounting, and Performance Monitoring should be developed for trial use at the Demonstration Plants. When these major systems were ready for regional implementation, the Demonstration Plants would have a key role in helping to train the users of these new and complex systems. (Chapter 7)

- NOPWASD Management Seminars. NOPWASD managers will also require specialized sessions to keep them informed and involved in the numerous changes that will be affecting the organization and the sector.

NOPWASD should support an initial phase of Management Training (WWISP Subtask A3.2) for NOPWASD staff which focuses on Organizational Development (OD).

In OD seminars, each manager would learn methods for defining the Mission, Functions, and Tasks that his department is responsible for performing. The seminars should stress Departmental Roles, Communication, and Coordination as well as Planning, Setting Goals, and Determining Priorities. This training will improve efficiency and aid in the achievement of short and long range objectives. Finally, approaches for Directing and Controlling must be included to ensure proper implementation and follow-up. (Chapter 7)

3. **Standards - Certification and Licensing.** The Water and Wastewater Sector is in critical need of standardization of job descriptions and qualifications. Currently, positions with the same title differ greatly among plants in their duties and required skills.

Promotions are based primarily on service and few employees are required to formally upgrade their knowledge and skills as prerequisites to promotion.

A national system of Certification and Licensing is required for enforcement of standards. Promotions must be linked to upgrading of credentials by the successful completion of training courses and the passing of standardized exams. NOPWASD should take a firm leadership role in the establishment of a Water and Wastewater Certification and Licensing Board to study this important manpower issue. (Chapter 7)

4. **Pre-Employment Training.** The Egyptian system of secondary, vocational, and higher education is the most extensively developed in the Arab world. NOPWASD should coordinate closely with the Ministry of Education, Ministry of Manpower and Training, and the Engineering Faculties of the major Universities to ensure that they provide skilled workers to the sector.

By coordinating with educational institutions to train entry level workers for the sector, NOPWASD can reduce its entry level training costs.

Job opportunities are growing in the Water and Wastewater Sector. NOPWASD should ensure that Secondary Vocational Schools conduct courses for Entry Level sector occupations. Sanitary/Environmental Engineering Degree Programs must be coordinated with Engineering faculties to ensure that the growing number of positions for such engineers can be filled.

NOPWASD must take the leadership role in coordination with universities and represent the higher educational needs of the sector.

Finally, NOPWASD should develop and implement standardized job orientation and initial training programs for skilled technicians, Engineers, and Chemists who are currently entering the sector without specific Water or Wastewater pre-employment training. (Chapter 7)

5. **Operations and Maintenance Training.** The priorities for Operations and Maintenance Training are provided in Table ES-1. Adequate facilities for such training can be very expensive and require long lead time before opening. NOPWASD should take advantage of existing training facilities to implement critically needed Entry Level Operations and Maintenance Training.

NOPWASD should overcome the delays in opening the training center at Damanhour and both Water and Wastewater training should be provided at that facility. A date for opening the Damanhour facility should be

established and instructors, training aids and curriculum should be in place for the inauguration of the center.

Utilization of the TOMOHAR regional centers on an interim basis for technical training of entry level workers is a cost effective option for solving immediate needs. These centers are located in all major population center and have labs which are equipped for plumbing and welding trades.

NOPWASD should enter into an agreement with TOMOHAR to use their classroom and lab facilities throughout the country as an interim solution to the need for training facilities and to avoid duplication of training programs.

Based on an evaluation of the effectiveness of using TOMOHAR centers, .NOPWASD can plan the construction of permanent NOPWASD Training Centers. (Chapter 7)

6. On-the-Job Training (OJT). Probably the most cost effective approach to technical training at the semi-skilled worker and skilled technician levels is On-the-Job Training. By training directly in the plant, the need for expensive training aids is eliminated and the negative factors of travel and tuition are overcome.

NOPWASD should develop and implement a highly structured OJT system of procedures, curriculum, and performance tests as a major solution to the training of semi-skilled workers and skilled technicians.

Mobile Training Units (MTU) should be outfitted to support particular OJT Programs for Operations and Maintenance jobs and functions. MTU's should contain training aids, audio-visual media, and courseware which allow trainers to conduct organized and effective OJT at the plants.

As a part of this system, each Water and Wastewater plant should designate a Training Coordinator who would receive specialized training in implementing the OJT system at his plant. (Chapter 7)

7. **Train-the-Trainer Program.** NOPWASD must assist the sector in developing an internal capability to train the current workforce and be prepared to train the thousands of employees who will be entering the workforce in the future.

NOPWASD should develop and implement a sector-wide Train-the-Trainer Program beginning with the NOPWASD CDT and branching out to the governorates, cities and plants. TOMOHAR facilities should be used on an interim basis for NOPWASD CDT trainers to conduct regional Train-the-Trainer Courses focusing on the implementation of OJT programs in the plants. (Chapters 9 and 10)

8. **Manpower Needs Assessment.** The value of up-to-date information for decision making is critical to any properly managed organization. The WWISP Manpower Needs Assessment has demonstrated how this information can be collected for the Water and Wastewater Sector and has provided procedures for continuation of the activity.

NOPWASD should ensure that Manpower Needs Assessment is continued by approving WWISP Report SR-4 and implementing the attached Action Plan. (Chapter 2, 3, and 4)

9. **NOPWASD CDT - A National Training Resource Center.** The NOPWASD Central Department for Training (CDT) should be given full support to implement the comprehensive actions required to solve the manpower development problems facing the Water and Wastewater Sector.

The CDT will be responsible for all aspects of manpower development and training: designing, developing, implementing and evaluating training programs. The CDT will establish a National Training Management Information System (NTMIS) which will maintain close contact with the field and ensure that training programs are responsive to sector needs.

A National Training Resource Center should be established to provide materials, media, assistance and direction to trainers in the field. Under the centralized authority of the NOPWASD CDT, national training, certification and licensing will be standardized, monitored and improved.

It is now being recognized that Action Plans derived from WWISP subtasks have substantial training components within them. NOPWASD should support the establishment of a centralized and structured Counterpart Program coordinated by the CDT for the development of staff capabilities and skills throughout NOPWASD.

The coordination of Off-Shore Training opportunities for NOPWASD staff and plant personnel should also be a CDT responsibility.

In order to accomplish the ambitious and challenging agenda presented in this summary, NOPWASD top management will have to make a substantial commitment to fulfilling its responsibility as the training authority and resource for the sector.

Training must be identified as a top NOPWASD budgetary priority. NOPWASD must strengthen the CDT and provide technical assistance to the department and the sector. Training Experts in all aspects of Instructional Systems (Analysis, Design, Development, Implementation and Evaluation), Media Experts in Photographic, Video and Audio Presentation, and, Subject Matter Experts in Sanitary Engineering, Plant O and M, Management and Bacteriology are required to assist the CDT.

The attached Report SR-4 Action Plan describes the process which should be implemented to augment the CDT staff, facilities, equipment, and budget. (Chapter 10)

CHAPTER 1

INTRODUCTION

CHAPTER I

INTRODUCTION

A. Project Description

1. Since the 1970's Egypt has been moving toward a decentralized decision-making process. During this evolutionary period, the Government of Egypt (GOE) and the United States Agency for International Development (USAID) have recognized the need for improvement in the complex framework of central and local authority in the water and wastewater services. Sector assessments by GOE and various external organizations have identified a series of interrelated problems which need to be solved before a fully effective water and wastewater system can be achieved. A well developed and effectively functioning water/wastewater sector is essential to the health, well-being and productivity of the Egyptian work force and the populace.
2. The Water and Wastewater Institutional Support Project (WWISP) was conceived by the GOE and USAID as necessary to create a more functional and effective water/wastewater industry (sector) throughout all the Governorates of Egypt. WWISP was designed to develop responses to the interrelated problems of attraction and retention of qualified key personnel, training at all levels throughout the sector, diffusion of authority among multiple levels of government, coordination of

interrelated development programs, establishment of laws and regulations, and public awareness of the health consequences of inadequate water/wastewater services.

3. Historically, in projects like this one, consultants have arrived, done their investigations, submitted their reports, and departed. WWISP was conceived to break this traditional pattern. The Project Manager and his staff were to create an environment where counterparts from within GOE, outside Egyptian experts, and American advisors could work as a team to develop solutions to various interrelated problems. Then GOE counterparts would implement these solutions with assistance from long term advisors, both Egyptian and American. The key point in this concept is that the advisors will not do the work for the GOE counterparts. Rather, they will help the counterparts plan the necessary work and then assist in the implementation according to an "Action Plan."

4. On 31 August, 1988 a contract was signed between the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the Joint Venture firms of Boyle Engineering Corporation and National Education Corporation for the provision of technical assistance advisory services for the Water and Wastewater Institutional Support Project (WWISP). The WWISP was implemented in December 1988 with the arrival of the Project Manager and two Deputy Project Managers in Cairo.

5. The Project (WWISP), as envisioned by GOE and USAID, is composed of the following elements:
 - a. Policy guidance and monitoring
 - b. Plan, review and finance
 - c. Administration, organization and management
 - d. Planning and economic analysis
 - f. Finance and accounting
 - g. Engineering and environmental controls

6. The WWISP work programs are divided into the NOPWASD work program and the Ministry of Housing and Reconstruction (MHR) work program. The former program is separated into five tasks and twenty subtasks. the latter has three tasks and twelve subtasks.

7. This report focuses on documenting the activities conducted as part of Subtask B2.1, **Manpower Needs Assessment**.

B. SUBTASK B2.1

1. **Purpose.** The WWISP B 2 Task, **Manpower Development and Training**, contains five subtasks which as a group form the basis for developing the current NOPWASD training capability. The first, Subtask B2.1, **Manpower Needs Assessment**, is a systematic analysis of the present and future training needs of the Water/Wastewater Sector.

Report SR-4, **Manpower Needs Assessment**, describes the current manpower situation, and projects the manpower needs of the sector for the next ten years. The report provides numeric data of current and future manning levels. It also provides a descriptive analysis of the training needs of the work force and management issues which have an effect on manpower and training. The other four subtasks in the B 2 group focus on specific strategies, solutions, and plans for dealing with the findings identified in Report SR-4, **Manpower Needs Assessment**.

3. SCOPE OF MANPOWER NEEDS ASSESSMENT REPORT

1. **Scope.** NOPWASD is national organization and has a very broad range of responsibility. For the purposes of this study, the following boundaries were established to define the scope of analytic effort.

This study is limited to:

- Urban areas with populations of at least 40,000
- Governorate Water and Wastewater Plants and related facilities with the exception of: Cairo Water and Wastewater, Alexandria Water and Wastewater, and Canal Cities Water
- Semi-Skilled to Management manpower training needs
- Sector organizations as indicated in FIGURE 1-1, **WATER AND WASTEWATER SECTOR MANPOWER PYRAMID DIAGRAM** below.

**Minister
of
Reconstruction
and Housing (MRH)**

**MRH Departments & Central
Department of Public Utilities
(CDPU)**

**National Organization for Potable Water
and Sanitary Drainage (NOPWASD)**

**Governorate Housing Department, Engineering General
Department and Administrative Support Departments**

**City Engineering Department, Public Utilities Department and
Administrative Support Departments**

**Water and Wastewater Plants, Networks and Pump Stations - Urban Areas
(Population of 40,000 and Greater)**

Water and Wastewater Facilities - Rural Areas (Population Under 40,000)

FIGURE 1-1, WATER AND WASTEWATER SECTOR MANPOWER PYRAMID DIAGRAM

Fig. 1-1

3. **Specific Outputs.** The following are products of Subtask B2.1:

- Current National Manpower Assessment
- Ten-Year Projected National Manpower Needs
- Workforce Skills Survey
- Master Training Requirements/Priorities List
- Entry Level Skill Requirements
- Personnel Practices Review

Each output of this subtask is accompanied by interpretation, conclusions and recommendations. The major recommendations form the basis of the SR-4 Action Plan which is a suggested schedule of events and assignments aimed at ensuring the continuation of the assessment efforts already initiated.

4. **Approach.** The WWISP American Advisors and Egyptian Experts working on the Task B-2, **Manpower Development & Training** subtasks are committed to assisting NOPWASD in fully developing its own training capabilities. The WWISP team is dedicated to supporting the CDT as it increases in role, responsibility and importance within NOPWASD and the sector.

In order to further assist NOPWASD, the WWISP Task B 2 reports are partially formatted as manuals of methods, specifically designed

procedures, and examples, so that they can be used as a references by the CDT staff in the future.

5. **How to Use this Report.** This report provides the detailed set of procedures and examples which were developed by the WWISP and CDT team to conduct the national **Manpower Needs Assessment**.

Sections of the report which focus on the assessment process also contain specific conclusions and recommendations about improving the process itself. Sections which focus on key summary data contain specific conclusions and recommendations about the findings of the assessment itself.

This report serves two purposes. First, it provides the NOPWASD CDT with a manual which can be used in the future to continue the assessment process. Second, the report provides the concrete data collected from the field which will form the basis for effective manpower planning.

6. **Key Role of Counterparts.** In addition to being an advisory consulting project, the WWISP is a Counterpart Training Project. Four members of the NOPWASD CDT have been assigned to Task B 2 so that they can work closely with American Advisors and Egyptian Experts in an effort to acquire new job skills. The NOPWASD Counterparts have been involved in every step of the B2.1 Subtask and have made a significant contribution to its success.

When base-line data was required from NOPWASD, the Counterparts were extremely helpful in assisting the WWISP staff in locating the necessary information. The exams which were used in the field as part of the Workforce Skills Survey were written completely by the NOPWASD Counterparts. Coordination with the NOPWASD Projects Implementation Units for data collection trips throughout Egypt was arranged by the CDT Counterparts. In summary, a positive and highly productive Advisor/Counterpart relationship has developed on the B 2 subtasks and has contributed to the successful completion of the initial phase of the national Manpower Needs Assessment.

D. RELATIONSHIP TO OTHER SUBTASKS

1. **Coordination.** The WWISP is a complex project with many of the subtasks having overlapping responsibilities. Close coordination among highly related subtasks is critical to the sequence of project events and overall projects goals. Subtask B2.1 is closely related to the following WWISP subtasks and Advisors have been working together to ensure continuity:

- A2.1/B1.1 - National Needs Assessment
- A2.2 - Five-Year Plan and Annual Budget
- A3.2 - Management Training
- A3.3 - IHPU Manpower Needs Assessment

- B2.2 - Manpower Development Program
- B2.3 - OJT Program
- B2.4 - Certification & Licensing Program
- B3.3 - Inter & Intra Organizational Structure

E. COORDINATION REQUIREMENTS WITH OTHER AGENCIES

1. A considerable amount of coordination was conducted outside of NOPWASD in order to determine whether any agencies in Cairo could be of assistance in a National Water and Wastewater Manpower Needs Assessment. Contacts have been established with the agencies listed below on behalf of the NOPWASD CDT.

- MRII-CDPU
- Central Agency for Public Mobilization and Statistics
- Ministry of Manpower & Vocational Training
- Governorate and City Utilities Offices
- Cairo Organization for Sanitary Drainage
- Cairo Organization for Potable Water
- TOMOHAR

Appendix F, Contact Log contains a complete listing of all contacts that were made by WWISP to complete this report.

F. REPORT PREVIEW

1. This report has 10 Chapters with the last Chapter covering the Action Plan. Appendices provide supporting data.
2. Chapter 2, Establishing a Manpower Assessment Baseline. Discusses the situation that existed at the NOPWASD CDT at the start of WWISP Task B 2 and the mission statement, Job Classification System and Facilities Data-Base that were required as prerequisites to initiating efforts on the Subtask B2.1 - Manpower Needs Assessment. Summaries of previous important reports are part of this chapter.
3. Chapter 3, Data Collection Procedures. Presents all of the procedures specially developed for data collection at Water and Wastewater facilities all over Egypt.
4. Chapter 4, Raw Data Reduction and Analysis Procedures. Presents all of the procedures specially developed for analyzing the raw data collected in the field. Includes methods for extrapolation and projection from sample to national estimates.
5. Chapter 5, Current and Projected Manpower Levels. This is the first of the Data Output chapters. It contains summary tables of Current and Projected manning levels by occupation. Projection is presented by year for the first 5 years and as a lump sum estimate for years 6-10.

6. Chapter 6, Workforce Skills Survey. Presents summary data on the testing by written exam of Electricians, Mechanics and Chemists working in the governorates.

7. Chapter 7, Master Training Requirements List. Identifies those positions which are considered Critical Short-Term Training Needs and which positions represent Long-Term Training Needs. Entry Level Skill Requirements are presented as well as the need for benchmark standards such as Certification and Licensing.

8. Chapter 8, Personnel Practices Review. Presents summary findings on critical manpower management issues such as: hiring and firing; training and promotion; compensation and benefits; career development and job rotation, etc.

9. Chapter 9, Manpower Problems Summary. Presents a collection of the most important manpower problems facing the sector.

10. Chapter 10, Action Plan. A schedule of events and assignments which are recommended in order to continue the efforts started by this subtask. Initial emphasis is placed on the strengthening of the NOPWASD CDT in terms of additional manpower, budget, and facilities.

CHAPTER 2

ESTABLISHING A MANPOWER

ASSESSMENT BASELINE

CHAPTER 2

ESTABLISHING A MANPOWER ASSESSMENT BASELINE

A. REVIEW OF CDT ASSESSMENT EFFORTS

1. **Assessment.** When the WWISP American Advisors and Egyptian Experts assigned to the assessment subtask began working with the staff of the CDT in June, 1989, it was found that no manpower assessment effort was on-going. The resources of the CDT were limited. No specific budget was available for the travel and expenses associated with data collection in the field.

The training courses offered by the CDT were based on the staff's experience with the training needs of the sector and to a limited extent on the findings of the Provincial Water Supplies Project conducted in the late 1970's by Binnie-Taylor. The CDT had prepared and distributed some mail-in questionnaires for completion by the governorates, however the response was incomplete. Manpower development planning in general and assessment of training needs in particular were not high priority activities of the CDT.

After discussions with the WWISP staff, the Counterparts recognized the need to conduct a rigorous National Manpower Needs Assessment. In order

to determine the number of skilled employees currently working in the sector, the projected quantities for the future and the training priorities.

The Counterparts became convinced that increases in the funding critically required to upgrade the current level of training support provided by NOPWASD to the sector could only be justified with up-to-date data which had been systematically collected and scientifically analyzed.

2. **CDT Mission & Responsibilities.** Working closely with the WWISP staff, the Counterparts conducted a comprehensive review of the CDT mission and departmental responsibilities. The process of updating the CDT mission statement became a means for WWISP staff to communicate the overall purpose of the Manpower Development and Training Task. The process also involved the Director of the NOPWASD Organization and Management General Department which shares manpower planning responsibilities with the CDT.

The updated version of the **CDT Mission and Responsibilities** is presented in Appendix A.

B. REVIEW OF PREVIOUS STUDIES

1. **Report Summaries.** Over the past fifteen years, many reports have been prepared for a wide variety of GOE agencies concerning various

water and wastewater sector performance and planning. Some of these reports are particularly important to the WWISP/CDT because they contain detailed studies of training and manpower issues. By becoming aware of the work previously accomplished in the field, a frame of reference was quickly established for forming new assumptions and plans.

The WWISP Advisors reviewed extensive listings of documents available at the USAID Resource Center and reports found at NOPWASD. A small project library was established as a repository for materials being collected and a binder of key excerpts was created as a reading file for the Counterparts.

Summarized below are the reports considered to be the most important due to their descriptions of the manpower development and training situation in the Egyptian water and wastewater sector. These brief descriptions are included as a reference list of key documents to inform counterparts of the valuable information which is already available for use in manpower planning and training activities.

- Provincial Water Supplies Project: Final Report, 1980

This very comprehensive report is the most useful of all previous studies of manpower and training issues in the sector. Although the study was conducted in the late 1970's, many of the findings, conclusions and recommendations still warrant consideration. The

sections concerning manpower projections, training needs, proposed courses and manpower problems and issues are very complete and offer a very good historical context for current and future investigations. The methods utilized to collect and analyze data and the sections detailing manpower management practices in the sector were of particular value to the WWISP assessment effort.

- Water and Wastewater Sector Assessment, 1983

Although the Manpower and Training section of this USAID report is brief, it is very direct in stating the urgency of the manpower problem in the sector. The NOPWASD role and degree of effectiveness in providing national training are clearly presented. The central recommendation stresses the need to conduct a detailed assessment of the manpower and training requirements of the sector. The appendices of this report contain English translations of the NOPWASD decree and the Labor Laws pertinent to compensation issues in the sector.

- Egypt - Water and Wastewater Sector Assessment-Final Report, 1985

In this summary report, USAID reviews its efforts in the sector with considerable elaboration of the training and Human Resources Development in the sector. Wide ranging estimates of sector work

force quantities are compared and the need for an accurate survey is stressed. Recommendations include the need for an Institutional/Human Resources Development Project (IHRD) to support the sector in manpower planning. The appendices include a list of definitions of Human Resources Development and Training Terms which is an important reference for NOPWASD Counterparts. Summaries of all USAID funded training activities through 1985 are also included and will be very useful in identifying where courses and materials are available.

- Provincial Cities Development Project-Final Work Plan Assessment, 1985/86

This report is listed as an example of the numerous sources which document the results of the various attempts to improve the level of worker skill, knowledge, performance, and productivity on actual USAID funded development projects. Conclusive findings are presented that On-the-Job-Training can have beneficial results when it is instituted on a long-term basis under supportive management. The training materials that were developed for the project also are discussed.

2. **General Findings.** Conclusions of previous reports regarding the current state of training in the sector and corrective measures are very consistent. Some key points of commonality are presented below.

- Training is a low priority sector-wide
- Funding and facilities for training are inadequate
- Current levels of training are inadequate
- All skilled occupations in the sector require training
- Accurate assessment of the workforce is imperative
- Training can be effective if it is supported by an overall management, and operations and maintenance system

These summary findings provide valuable direction for the design of instruments and data collection procedures.

C. IDENTIFYING AN INFORMATION BASE

1. Information Requirements. In the early design stage of the National Water and Wastewater Sector Manpower Needs Assessment, certain basic information and systems were identified as critical prerequisites.

- A Water and Wastewater Job Classification System
- A Current Population Database
- An Up-to-Date Water and Wastewater Plants In Use Database
- An Up-to-Date Water and Wastewater Plants Under Construction, Planned and Funded Database

These items are not the direct responsibility of the NOPWASD CDT to prepare or maintain. The Job Classification System is the responsibility

of the Personnel Department and the Organization and management Department, while the Databases are the responsibility of the various engineering and information departments within NOPWASD. Upon investigation it was found that none of the requirements of the information base was available at NOPWASD in a useable, up-to-date form. The WWISP National Assessment and Management Information System Subtasks have responsibility for assisting NOPWASD in establishing these data bases. It is planned that they will be available in the future for CDT use.

2. **Water and Wastewater Sector Job Classification System.** The WWISP/CDT team developed a comprehensive Job Classification System focusing on the Water and Wastewater Plant and Pump Station organizations.

The system organizes manpower into the following fifteen job categories. The categories were created to provide a structure within which aggregated data for closely related occupations could be more easily manipulated and analyzed.

1. Management
2. Engineer
3. Chemist
4. Legal
5. Accountant

6. Public Relations
7. Quality Control (Follow-Up)
8. Purchasing, Contracting and Supply
9. Personnel and Training
10. Technical Supervisor
11. Administrative
12. Clerical
13. Skilled Technician
14. Semi-Skilled Technician
15. Unskilled

Appendix B, Water and Wastewater Job Classification System contains the structure and comprehensive listings at the facilities level. Positions for NOPWASD and the Governorate/City level are presented more generally. Comprehensive assessments of these levels are included in the SR-4 Action Plan and more detailed position listings for NOPWASD and the Governorates and Cities will be developed as part of those efforts.

3. **Population.** A key parameter defining the scope of this assessment was population. This initial effort concentrated on urban areas throughout all regions of Egypt with the noted exceptions of Cairo, Alexandria and Canal Cities (Water). A population of 40,000 was identified as the urban benchmark used by USAID in a describing sector activities and was adopted by the WWISP.

Although NOPWASD has an on-going requirement to assess population growth as a component of Master Planning and Feasibility Studies, no reliable source of population statistics was readily available to the WWISP/CDT team from within NOPWASD. Contact had to be established between the WWISP and the Central Agency for Public Mobilization and Statistics (CAPMAS) so that accurate, up-to-date population data could be used as a basis for determining the specific urban areas to be included in the assessment.

FIGURE 2-1, URBAN POPULATION CENTERS, lists all of the cities throughout the governorates with populations of at least 40,000 based on the 1986 census and updated by CAPMAS using percentage for average annual population growth.

FIGURE 2-1 URBAN POPULATION CENTERS

Region	Governorate Name	Location ^a	Population Est. 1989**
East Delta	Port Said	Port Said	442000
Mid-Delta	Gharbia	Mahalla el Kubra	370944
East Delta	Suez	Suez	373000
Mid-Delta	Gharbia	Tanta	353152
East Delta	Dakahlia	Mansura	339772
Mid Egypt	Assuit	Assuit	295470
East Delta	Ismailia	Ismailia	294000
Mid-Delta	Sharkia	Zagazig	263160
Mid Egypt	Fayoum	Fayoum	228512
Upper Egypt	Aswan	Aswan	206310
West Delta	Beheira	Damanhur	203682
West Delta	Beheira	Kafr El Dawwar	200859
Mid Egypt	Menia	Minya	192892
Mid-Delta	Damietta	Damietta	191776
Mid Egypt	Beni Suef	Beni Suef	162572
Upper Egypt	Suhag	Suhag	144336
Mid-Delta	Menoufia	Shibin el Khayma	142857
Upper Egypt	Qena	Luxor	135991
East Delta	Qahubia	Benha	130620
Upper Egypt	Qena	Qena	130301
Mid-Delta	Kafr el Sheikh	Kafr el Sheikh	110250
Mid Egypt	Menia	Mallawi	106560
Mid-Delta	Sharkia	Bahig	103716
East Delta	Dakahlia	Mit Ghamr	100164
East Delta	Qahubia	Qalyub	98276
Mid-Delta	Kafr el Sheikh	Disuq	83490
East Delta	Dakahlia	Mataraya	79542
East Delta	Dakahlia	Belkas	78560
Upper Egypt	Suhag	Akhmin	76824
West Delta	Beheira	Hansh Isa	75260
West Delta	Beheira	Edko	75256
Mid-Delta	Menoufia	Minuf	75036
Mid-Delta	Sharkia	Abu Kehir	74304
Upper Egypt	Suhag	Girga	73332
East Delta	North Sinai	El Arish	72960
Mid-Delta	Gharbia	Zifta	72416
Mid Egypt	Menia	Samalut	68672
East Delta	Dakahlia	Simbillawein	64812
Upper Egypt	Suhag	Taha	63438
Mid-Delta	Gharbia	Kafr el Zaigat	61504
East Delta	Dakahlia	Talkha	59902
Mid-Egypt	Fayoum	Sannoures	59444
Upper Egypt	Qena	Arment	59176
East Delta	Dakahlia	Manzala	58920
Mid-Delta	Menoufia	Ashmun	58602

Fig. 2-1 a

FIGURE 2-1 URBAN POPULATION CENTERS

Mid Egypt	Beni Suef	Naser	58200
Mid-Egypt	Assuit	El Nassia	56950
Upper Egypt	Aswan	Mfu	56233
West Delta	Beheira	Rashid	55624
Mid Egypt	Menia	Maghaha	55056
East Delta	Qakubia	Qantir El Khairiya	54736
Mid Egypt	Assuit	Abu Tig	52930
Mid Egypt	Assuit	Abnub	52260
East Delta	Dakahlia	Dekerness	52046
Mid-Delta	Sharkia	Faqus	51858
Mid-Egypt	Menia	Beni Mazar	51504
Upper Egypt	Suhag	Tima	51216
Mid-Delta	Kafir el Sheikh	Begola	51156
Mid-Delta	Kafir el Sheikh	Fauwal	49392
Upper Egypt	Aswan	Kom Ombo	49333
Mid Egypt	Menia	Fekria	49136
Mid-Delta	Sharkia	Minget el Qamh	48762
West Delta	Marsa Matrouth	Marsa Matrouth	48732
Mid Egypt	Assuit	Pairut	48240
East Delta	Dakahlia	Gamalia	48118
Mid Egypt	Giza	Ausin:	47500
Upper Egypt	Qena	Esna	46658
Upper Egypt	Qena	Isna	46658
Mid Egypt	Beni Suef	Fashn	46360
Upper Egypt	Qena	Qws	46089
Mid Egypt	Assuit	Manfalut	45360
East Delta	Qakubia	Khanka	44704
Mid-Delta	Gharbia	Samannud	43648
East Delta	Dakahlia	Sherbeen	43208
Mid Egypt	New Valley	Kharga	42784
Mid Egypt	Beni Suef	Biba	42680
East Delta	Dakahlia	Menyet & El Nasr	42226
Mid-Delta	Gharbia	Basym	41664
Upper Egypt	Qena	Dishna	41537
Mid-Delta	Menoufia	Tala	41366
Upper Egypt	Suhag	Maashah	40740

* Cairo & Alexandria Excluded

** Populations Projected by CAPMAS

Fig. 2-1 b

4. **CURRENT PLANTS.** Proceeding from the cities listed in FIGURE 2-1, it was possible to determine which water and wastewater plants would be a part of the assessment. Separate databases for water and wastewater plants currently in operation were developed with the help of the NOPWASD Technical Assistance Department and the Regional Project Execution Departments. Investigation of the current manpower levels at these plants provides one of the most critical outputs of this assessment, the quantity of employees actually working in the urban portion of the sector now.

These databases will become components of the NOPWASD Management Information System (MIS) and will be accurately updated as part of NOPWASD National Needs Assessments. Until the time when the MIS is fully operational, the CDT will attempt to maintain the database found in Appendix C, Water Facilities and Appendix D, Wastewater Facilities (Current) so that up-to-date information will be more easily available for assessment purposes.

4. **NEW PLANTS.** The major factor accounting for growth in the manpower levels throughout the sector will be the completion and operation of the new plants which are currently under construction or in the planning/funding stages. The WWISP/CDT team developed separate databases for expected water and wastewater plants currently under construction or in planning. The help of the NOPWASD Regional Project Execution Departments was critical in identifying these plants.

The progress of any project is directly dependent upon its funding. The current economic and management circumstances in Egypt make accurate prediction of plant completions very difficult. The completion dates in the following tables are provided for planning and projection purposes and should be interpreted as best case estimates. By taking a best case approach, manpower projections may be somewhat inflated if taken on a strictly annual basis. Appendix C, Current and Projected Water Facilities and Appendix D, Current and Projected Wastewater Facilities (New) will require a very close level of attention so that updates reflect actual completions and more accurate estimates planned completions.

D. CONCLUSIONS AND RECOMMENDATIONS

1. **Conclusion.** That manpower development and training within NOPWASD have traditionally been considered low priority activities. This status is reflected in the small number of staff assigned to the CDT, the limited facilities dedicated to training, and the low annual training budget of L.E. 11,000. Appendix A, CDT Mission and Responsibilities, clearly lists the broad scope of the very important activities that the CDT must accomplish if NOPWASD is to properly support manpower development and training throughout the sector.

Recommendation. That NOPWASD top management recognize the key role that the CDT plays in the NOPWASD Mission and support the CDT accordingly in terms of adequate allocation of personnel, facilities and

budgetary resources. The first major activity in the SR-4 Action Plan, Strengthening the CDT, should receive the total commitment of the Chairman so that the necessary support required by the CDT to satisfy its Mission can be implemented without delay.

- 2 **Conclusion.** That a significant amount of work has been conducted and is underway in the sector to assess manpower and develop training. The CDT has a limited awareness of these efforts and therefore can not take advantage of the findings that countless experts have documented in detailed studies.

Recommendation. That the CDT Director commit his staff to a program of internal upgrading which has its primary focus on collecting and absorbing the wealth of information already available in Egypt concerning manpower development and training in the water and wastewater sector.

- 3 **Conclusion.** That the data requirements of the CDT necessary for manpower planning and decision making are not being adequately supported by NOPWASD as a whole. This is true both in terms of the quantity and quality of up-to-date data available within NOPWASD.

Recommendation. That NOPWASD top management place high priority on the development and maintenance of professional information systems within NOPWASD and that these systems be responsive to the

information requirements of the CDT. That the CDT maintain the databases which have been created as part of this assessment effort.

4. **Conclusion.** That the current manpower planning and training conducted by the CDT is based on experience with the training needs of the sector instead of a combination of experience, current data and analytic methods.

Recommendation. That the CDT Director identify Assessment as a critical departmental activity and require that plans and proposals presented within the department always have a justification based on up-to-date and accurate data.

5. **Conclusion.** That the CDT operates in isolation from the other major activities within NOPWASD. That the CDT needs to develop strong and regular coordination and communication with the other NOPWASD Central Departments and with some key outside GOE agencies.

Recommendation. NOPWASD top management and the Directors of Central Departments recognize the interrelatedness of their activities to the mission of the CDT and coordinate with the CDT on a regular basis through periodic high level meetings organized by the CDT Director to present the CDT agenda.

CHAPTER 3

DATA COLLECTION PROCEDURES

CHAPTER 3

DATA COLLECTION PROCEDURES

A. ASSESSMENT PROCEDURES

- 1. Structuring the Assessment Process.** The Manpower Needs Assessment was conducted as a six step process: Assessment Design, Instrument Development, Data Collection, Data Reduction, Analysis, and Reporting of Findings.

During Design and Development, the goals for the assessment were clearly identified and an overall plan was established for accomplishment of objectives. In the case of the WWISP Subtask B2.1, the goals were specified as the following assessment outputs for the Water and Wastewater Sector:

- Current Manpower Assessment
- Ten-Year Projected Manpower Needs
- Work force Skills Survey
- Entry Level Skill Requirements
- Master Training Requirements List
- Personnel Practices Review

The results of the Assessment provided the basis for the planning of Subtask B2.2, Manpower Development Program. The Design and Development steps Incorporated the information needs of the Manpower Development Program and ensured that appropriate data would be collected and provided in a form compatible with the planning requirements of Subtask B2.2.

This chapter presents the procedures which were designed and developed for the collection of data in the field from Governorate, City, Water Plant, Wastewater Plant, and Pump Station personnel. Each procedure is presented in a standardized format to demonstrate how data were collected for this initial assessment and to serve as a reference for conducting future manpower needs assessments. The examples in each procedure are actual schedules, plans, and forms taken from data collection in the twenty cities which were included in the sample.

These procedures are contained in this report to serve as a reference for future use by CDT Counterparts in their on-going assessment efforts.

2. Format. The elements of a standard procedure are given below to provide guidance in its use. Each procedure has three main components: Introduction, Instruction, and Comments.

The Introduction contains: the Procedure Name, Revision Number, Date of the Last Revision, and the Purpose of the Procedure. The Manpower

Needs Assessment is intended to be an on-going process and future use of the procedures is expected. The Revision Number and Date are very important in maintaining records of modifications which are made to procedures.

The Purpose should clearly state exactly why certain data is being collected. The specific purpose of each procedure should be agreed upon by the data collection staff and the final users of the data. This coordination is critical and should also include review of procedural steps and any data collection forms developed for the assessment. Data collection is not done in isolation. It is part of the planning process and needs to be closely tied to the other efforts in the CDT.

The Instruction describes the step-by-step procedure. Most procedures developed for this assessment have associated data collection forms. These forms are described in the instruction and are attached. In the case of assessments conducted in the Water and Wastewater Sector, Arabic must be the primary language for data collection. Both Arabic and English versions are included when a procedure requires a form.

The Comments section of each procedure contains suggestions based on experience in the field. The Comments may include hints on how to explain a form during an interview or how to record information efficiently. More importantly, the comments may identify difficulties with the current version of the form. These comments should alert the

user to potential problems and serve as reminders for later revisions. Each procedure identifies the difficulties encountered and suggested changes.

3. **Data Collection Procedures:** This section contains the SR-4 Data Collection Procedures which were used to plan and conduct the WWISP Assessment.

- Selecting a Sample
- Data Gathering Logistics
 - Notification & Coordination
 - Schedule
 - Assignments
- Collecting Data at the Governorate and City (Form DC-1)
- Collecting Data at a Water or Wastewater Plant (Form DC-2)
 - Current Manpower Level (Form DC-3)
 - Training Priority & Specific Training Needs (Form DC-4)
 - Projected Manpower Needs (Form DC-5)
 - Entry Level Skills (Form DC-6)
 - Personnel Practices Review (Form DC-7)

 - Workforce Skills Survey (Form DC-8 E, M, C)
 - Electrician, Mechanic, Chemist Tests

CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Selecting a Sample

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To identify a combination of facilities, governorates, and cities which when taken as a group are representative of the Sector.

INSTRUCTION: Described below are the steps to be followed to identify a Sample from a pool of Water Plants according to specified criteria.

Manpower information and training needs have been derived from 16 Water Treatment Plants out of a total of 64 plants serving urban areas of 40,000 or more in their populations. Therefore, 48 plants remain to be visited for information to be added to the findings of the initial assessment.

Logistical considerations (budget, availability of manpower, etc.) will dictate the number of plants to be visited. Each visit could consume two days at each plant, with two plants per week, allowing one day for travel. Visits could be concluded in 5 weeks if two teams were to be deployed in the field to cover 20 plants. That is $20 \text{ plants} \times 2.5 \text{ days per visit} / 2 \text{ teams} = 25 \text{ days}$ or 5 working weeks.

With some knowledge of the number to be visited, the next step is to identify which plants should be visited on a random representative sampling basis. The following procedure is recommended:

Step 1. Prepare a 10-cell matrix so that plants may be entered by their location and design capacities such as the following:

Design Capacity	Region				
	Upper Egypt	Mid-Egypt	West Delta	Mid-Delta	East Delta
< 300 L/S					
> 300 L/S					

A convenient split for design capacities might be 300 Litres/Second.

Step 2. Plot all plants by region and their capacities. Plants will be entered by numbering them rather than by name. Enter only those plants which have not been visited (48 plants). It may be necessary to combine cells if entries are very low in number, i.e. combine East Delta with Mid-Delta, etc.

Step 3. Draw the numbers of plants from each cell in proportion to its percentage of 48 remaining plants to be visited. For example, if a cell has

11/6

10 plants, then :

$$\frac{10 \text{ plants/cell}}{20 \text{ plants/visited}} = 21\% \times 10 \text{ plants} = 4 \text{ plants to be drawn at random}$$

Step 4. Consult a table of random numbers to assist in making the draw. Such tables have columns of four-digit randomized numbers.

Read the table horizontally by row or vertically by column. It makes no difference, but determine which digits are to be read, i.e. the first-placed digits or those that follow. In the following example, the random draw is on the first two digits. Let us say that a cell has 10 plants numbered 1 thru 10 and we are making a draw for that cell from the following columns in a random table.

<u>0235</u>	7501
1127	<u>0900</u>
<u>0768</u>	9384
1206	1177
5896	<u>0101</u>

we need to draw 4 plants from this cell and so we move down the columns until we pick up that number which fall in the 1 - 10 listing. Continue reading the table until a number is encountered which is similar to a cell entry (Plant). This plant will be selected for visit. Continue to read the

table and match numbers with cell entries until 20 plants have been selected.

Step 5. Determine the sum of all plants drawn at random. It should equal 20 plants to be visited during the next field trip.

COMMENTS: Due to constraints of preparation time, available manpower, and field time, twenty cities were selected which each had a Water and a Wastewater Plant. By identifying sites where both types of facilities could be visited, significant travel time and manpower was saved. This approach tended toward areas with greater populations where most Wastewater Plants are currently found. A reasonable distribution of Water Plants according to capacity and source was achieved although it is strongly recommended that future samples rely more closely on the Instruction.

CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Data Gathering Logistics

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To coordinate all logistical aspects of the field effort including: Authorization, Notification, Scheduling, Assignments, Travel Arrangements, and Transportation.

INSTRUCTION: Listed below are the steps to be followed to ensure that the data gathering in the field is properly supported by advanced coordination between NOPWASD and the Governorates, Cities, and Plants.

Step 1. Each major assessment effort must have an Assessment Leader assigned by the CDT Director. The leader has responsibility for implementation of this procedure and for arranging other details of the assessment. Organization is critical when going into the field. Everyone involved in data collection should be fully prepared and understand their role. Data collection requires detailed organization and special arrangements. The best set of instruments can be easily undermined by inadequate attention to logistics of the field effort.

Step 2. Scheduling of the effort is critical. An adequate amount of time should be allowed for the data collection on-site. The total time required should be based on field trials of the instruments plus travel and time for any necessary stops at local government offices.

Step 3. Team assignments should be coordinated well in advance so that staff have adequate time to make personal and family plans.

Step 4. Funding requirements to cover travel, local transport, lodging, food, etc. should be carefully calculated. Cash advances should be arranged.

Step 5. A meeting must be requested by the CDT Director with the NOPWASD Deputy Chairman to review all plans for the effort in the field and to secure his authorization of the Assessment Activity and all the details of schedule, assignment, and the travel and related expenses which are expected.

Step 6. A proposed notification letter from the NOPWASD Chairman or his Deputy as advanced notice for the assessment, should be prepared by the Assessment Leader and approved by the CDT Director. The notification should clearly state the purpose of the assessment, the people to be contacted, the required level of local effort and any preparation necessary by them, the names of the data collection team, and the dates of the visit. A sample Arabic letter is attached. This notification letter should be sent at

least one month prior to the expected travel to allow for delivery time and an opportunity to respond.

Step 7. After receiving authorization for the planned assessment, coordination with NOPWASD Project Execution Regional Representatives to meet assessment teams at sites is essential. These Representatives can help in the establishment of rapport at each site. They are available at the NOPWASD Mogama offices on Sundays and Thursdays. They spend the middle of the week in the field and can preview forms on-site and assist in other arrangements such as hotel accommodations.

Step 8. Final arrangements must be made for travel ticketing and advances. All personnel traveling to the field should be instructed to make daily contact with the Cairo office and report on progress.

COMMENTS: The WWISP assessment was conducted during the two week period from 24 July to 2 August, 1989 by five teams each having one American Advisor and One Egyptian Expert. NOPWASD Execution Department Regional Representatives joined the teams on site. CDT Counterparts did not take part in field data gathering activities. Since the establishment of on-going assessment is an important WWISP objective, NOPWASD should authorize the participation of CDT Counterparts. The data gathering schedule is shown below.

Week 1, 24 – 27 July

- Team 1. Aswan, Luxor
- 2. Assuit, Minya
- 3. Qena, Sohag
- 4. Benha, Zagazig
- 5. Kafr El-Zayat, Damanshour

Week 2, 30 July – 2 August

- Team 1. Suez, Port Said
- 2. Beni Suef, Fayoum
- 3. Domiat, Mansura
- 4. Tanta, Minuf
- 5. Kafr El-Sheikh, Mahalla El-Kubra

The assessment sample covered all regions of Egypt. Future assessment activities should account for climatic conditions and schedule accordingly. The WWISP assessment included travel to Upper Egypt during mid-summer and conditions were difficult. In general, field work should be avoided during the summer.

It seems that the more advanced governmental and plant level coordination, the more efficient the process of data collection will be. During the initial assessment, only the Governorate offices were notified by NOPWASD letter. WWISP field experience strongly supports the need for sending notifications

to all three sector field levels (Governorate, City, and Plant) to ensure a more complete awareness of planned visits.

Preparation of instruments should include limited pilot testing in a nearby city and plant to identify problems with forms or procedures and to determine the time required for administration. Allowing NOPWASD Execution Department Regional Representatives to hand deliver notifications and copies of the forms would greatly improve the overall data gathering process.

As the field becomes more accustomed to CDT assessments better relations and communication should develop. The current situation does not support the use of mail-in forms, but experimentation with them in the future is suggested.

Boyle Engineering and
National Education (J.V.)
in Association with A.A.W/TEAM MISR
Water & Wastewater Institutional
Support Project (WWISP)

الهيئة المشتركة من شركتي
بول انجنيرينج وناشيونال ايدوكيشن
بالتعاون مع شركتي عبد الوارث وتيم مصر
مشروع الدعم التنظيمي لقطاع الامداد
بالمياه والصرف الصحي

Eng. Abdel Salam El-Rafie
Deputy Chairman, NOPWASD
Mogamma Building - 6th Floor
Tahrir Square
Cairo, Egypt

July 5, 1989
WWISP/89/00192/HIS/em/LTR

Dear Eng. El-Rafie,

The Manpower Development and Training staff (U.S. Advisors and Egyptian Experts) are now preparing to visit 20 cities throughout Egypt in order to collect data for Subtask B2.1 - Manpower Needs Assessment. (Attachment I - Travel Schedule).

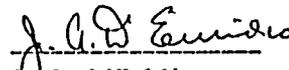
Your assistance is requested to :

- Notify the appropriate government authorities of our plans to visit Water and Wastewater Plants in their Governorates. (Attachment 2 Introductory letters).
- Authorize the counterparts from the NOPWASD Central Department for Training to take part in these visits.
- Assign engineers from NOPWASD Regional Execution Units to accompany the WWISP staff and counterparts to the sites. The local contacts that the Execution people have will be very valuable in speeding up the data collection process.

The effectiveness of our data collection in the field is essential to the success of the Manpower Development and Training efforts. Your assistance and approval of these items will help to ensure that WWISP accomplishes its Manpower Assessment goals.

Warm personal regards.

Sincerely yours,


J. A. D'Emidio
Resident Project Manager

Approved []
Returned for []
Additional Information []

Eng. Abdel Salam El-Rafie

MANPOWER NEEDS ASSESSMENT

TRAVEL SCHEDULE

July M, T, W, TH
24, 25, 26, 27

July S, M, T, W.
30, 31, AUG 1 & 2

LOCATION

1. ASWAN, LUXOR
DR. CHOW
REDA IBRAHIM
MOHAMED HADIDI
2. ASSUIT, MINYA
DR. NIEMEYER
SAMIR AHMED
3. QENA SOHAG
DR. SANSON
KHAIRY EL KENAWY
4. BENHA, ZAGAZIG
HOWARD SOKOLOFF
MUKHTAR NURDIN
5. KAFR EL-ZALAT
DAMANHOOR
DR. CHORNESS
YOUSSEF HENIEN

LOCATION

1. SOUTH SINAI, PORT SAID
DR. SANSON
KHAIRY KENAWY
MOHAMED HADIDI
2. BENI SUEF, FAYUM
DR. NIEMEYER
YOUSSEF HENIEN
3. DOMIAT, MANSOURA
DR. CHOW
MUKHTAR NURDIN
4. TANTA, MINUF
DR. CHORNESS
REDA IBRAHIM
5. KAFR EL-SHEIKH
MAHALLA EL- KUDRA
HOWARD SOKOLOFF
SAMIR AHMED

بسم الله الرحمن الرحيم

الهيئة القومية لمياه الشرب والصرف الصحي
مكتب رئيس مجلس الإدارة

السيد / سكرتير عام محافظة المنوفية

تحية طيبة وبعد ..

تقوم الهيئة القومية لمياه الشرب والصرف الصحي بالتعاون مع هيئة التنمية الأمريكية بعمل دراسة لتقدير الاحتياجات من القوى العاملة والتدريب في قطاع مياه الشرب والصرف الصحي ، تشمل :

- (١) تحديد الأعداد الحالية من العمالة مقسمة حسب المهنة .
- (٢) احتياجات التدريب المحلية .
- (٣) مستوى المهارة الحالي للعمالة .
- (٤) احتياجات التدريب خلال السنوات القادمة .
- (٥) مشاكل التدريب .

وسنقوم بمجموعات العمل المشكلة من العاملين بالهيئة والخبراء الأمريكيين والأمريين بزيارة محلات معالجة مياه الشرب والصرف الصحي في حوالي ٢٠ مدينة على مستوى الجمهورية بغرض تجميع البيانات الآتية :

- (١) المواصفات الأساسية لمحطات المعالجة .
 - (٢) أعداد العاملين بالمحطة حسب الوظائف (الموجود بالميزانية ، الوضع الحالي ، المطالب المستقبلي) .
 - (٣) الاحتياجات التدريبية (العاجلة ، في المدى المتوسط ، في المدى البعيد) .
 - (٤) ستجرى عينة من الاختبارات للعمالة في مجال (الكهرباء ، الميكانيكا ، الأنابيب) بدون تحديد أسماء المختبرين لاطعاً فكرة أولية عن المستوى الحالي .
 - (٥) موضوعات عامة (أهمية التدريب ، التدريب علي الوظائف ، تقييم الأداء ، تخطيط القوى العاملة) .
- وسنقوم بالمجموعة الآتية أسائها بعد زيارة مدينة _____ من بوم ٣٠ يوليو الحالي .

مستر / دكتور / تشورنس

مهندس / رضا ابراهيم

وبصاحبة المهندس / السيد رالي / السيد / مندوب الهيئة .

برجاء التكرم باعطاء توجيهاتكم للمسؤولين في القطاع بالتعاون والمعاونة في تجميع البيانات لما سنعود به هذه الدراسة من تحسين لمستوى العمالة وكفاءة التشغيل والصيانة في محلات مياه الشرب والصرف الصحي .
وتفضلوا بقبول فائق الاحترام ، ، ،

رئيس مجلس الإدارة

(م . محمد خالد مصطفى)

صورة مرسله للسيد / وكيل وزارة الاسكان محافظة المنوفية

تحية طيبة وبعد ..

رجاء التفضل بالاحاطة واعطاء تعليماتكم للمسؤولين في القطاع بالتعاون وتسهيل مأموريتهم .

وتفضلوا بقبول فائق الاحترام ، ، ،

رئيس مجلس الإدارة

(م . محمد خالد مصطفى)

CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Collecting Data at the Governorate and City Level

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To determine the Water and Wastewater projects that are under construction or are being planned for the next 10 years and the estimated completion date for each project.

INSTRUCTION: Listed below are the steps to be followed to complete data collection at the local government level.

Step 1. Complete all preliminary information such as Location, Date, Name of Interviewee. Sample attached.

Step 2. Explain the purpose of the data collection effort and the potential improvements which can be brought about by basing future manpower planning on up-to-date input from the field. Allow the interviewee to examine the instrument and discuss it with members of his staff.

Step 3. Ask for the required information and be prepared to wait patiently for consultation with other related staff, review of local records, etc. Try to get the most complete answers possible and encourage further discussion

of the subjects addressed. All data entries should be made by a member of the data collection team.

Step 4. The instructions given in Steps 1-3 above should be followed as initial steps for all data collection procedures. No additional instructions are required for this procedure.

COMMENTS: The people at the local government level concerned with public utilities are aware of the projects under construction, but may be reluctant to estimate project completions. Since supervision of construction falls under NOPWASD, project completion dates are best received from the NOPWASD Regional Representative.

Under the current Five-Year planning process, local government proposes new projects for funding review. Therefore, local officials are a reasonable source of information regarding projects in the long-term planning/funding stages.

For projects under construction in the planning phase, local officials seem more willing to discuss expansions to existing plants than new facilities.

بيانات عن المخطط لمشروعات المياه والصرف الصحي المستقبلية
(مستوى المحافظة)

المحافظة :
ادارة / مديرية :
التاريخ :
المدينة :
اسم المدير أو معطي البيان :

=====

١ - ما هي الخطط المستقبلية لانشاء محطات تنقية مياه شرب جديدة أو زيادة كفاءة المحطات القائمة خلال الخمس سنوات المقبلة ؟

خلال السنة الاولى

الثانية

الثالثة

الرابعة

الخامسة

خلال ٥ سنوات تالية (٦ - ١٠ سنة)

٢ - ما هي الخطط المستقبلية لانشاء محطات صرف صحي جديدة أو زيادة كفاءة المحطات القائمة للخمس سنوات القادمة ؟

السنة الاولى

السنة الثانية

السنة الثالثة

السنة الرابعة

السنة الخامسة

خلال خمسة سنوات (٦ - ١٠ سنة)

GOVERNMENT LOCAL LEVEL

LOCATION: -----
OFFICE: -----
DATE: -----

CITY:-----
INTERVIEWEE:-----

1. WHAT ARE THE PLAN FOR NEW WATER PLAT CONSTRUCTION AND EXPANSION FOR THE NEXT 5 YEARS ?

YEAR 1
 2
 3
 4
 5
FOLLOWING 5 YEARS (6-10)

2. WHAT ARE THE PLANS FOR NEW WASTEWATER PLANT CONSTRUCTION AND EXPANSION FOR THE NEXT 5 YEARS ?

YEAR 1
 2
 3
 4
 5
FOLLOWING 5 YEARS (6-10)

**CENTRAL DEPARTMENT FOR TRAINING
DATA COLLECTION PROCEDURE**

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Plant Characteristics

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To describe the technical characteristics a particular Water or Wastewater Plant.

INSTRUCTION: Listed below are the steps to be followed to obtain accurate descriptive information for the Water or Wastewater plant being visited.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. This instrument contains a number of open-ended information categories. The data collector should encourage full discussion and record all relevant comments. Samples of Water and Wastewater instruments are attached.

COMMENTS: The data collection form for this procedure gathers descriptive technical information which may not be of immediate use to the

CDT. However, it provided an opportunity for the on-site plant personnel to describe their facility and produced valuable information.

It also assisted in developing rapport, as most plant managers were willing to discuss the physical aspects of their operation.

Future assessments should evaluate the feasibility of the CDT collecting technical information. Since the process is time consuming, a more focused data collection instrument is suggested for future use. The National Needs Assessment and the Management Information System Subtasks should establish and update technical databases which will be extremely useful to the CDT.

بيانات صرف مياه الشرب

مواقع الصرف : تاريخ الزيارة : اسم جامع البيان : اسم مقدم البيان ووظيفته :

طبيعة النظام :

حضره مستقل
 ادم للخدمات
 ونكسي

بيانات الشبكة :

المساحة المخدومة :
 حضري مستقل
 مدن

مراكز

قرى

تقدير نسبة الصناعة للاستهلاك الكلي :

بيانات أعمال التنقية :

تاريخ بدء التشغيل :

خط تنقية رقم (1)
 (2)
 (3)

طريقة التنقية

(1)
 (2)
 (3)

حالة أعمال التنقية :

خطوط خفالة :

خطوط غير خفالة :

خطوط تعمل عند الذروة لفظ :

تصرف أعمال التنقية x 1000 م³/يوم

خط تنقية رقم (1)
 معدل التصرف اليومي (2)
 (3)

مصدر المياه العكورة :

نهر النيل
 السرع
 الآبار

محطات الرفع :

محطة المياه العكورة :

عبر التصرف
 رقم الاسمى
 الاجمالي الوحدات

(1)
 (2)
 (3)

محطة مياه الضغط العالي :

عبر التصرف
 رقم الاسمى
 الاجمالي الوحدات

(1)
 (2)
 (3)

خواص المياه :

العكورة :

شبكة التوزيع :
 الطول الاجمالي للشبكة كم

الروافع :

مكان الرفع
 معدل التصرف ل / ت
 القوى المحركة

المقاييس :

خزانات المياه :

سعة التخزين الاجمالية 3م
 عدد وسعة الخزانات الارضية :
 عدد وسعة الخزانات العالية :

القوى المحركة :

بيانات محطة المحولات الكهربائية :
 بيانات عبر توليد القوى الاحتياطية :
 معدات الكلور :

معدلات الاستهلاك :

للفرد
 عند المعينات الرئيسية بالشبكة

عنايات قياس الاستهلاك :

العدد الاجمالي التقديرى للمعانات :
 نسبة الصالح :
 نسبة المعطل :
 مستهلكون غير مركب لهم عنادات :

التحميل :

نسبة لينة التحميل على قراءات فعلية :
 نسبة لينة التحميل على تقديرات استهلاك :

PLANT CHARACTERISTICS

WATER TREATMENT PLANT

PLANT LOCATION:-----
PLANT NAME: -----

DATE: -----
INTERVIEWEE:-----

SYSTEM TYPE

REGIONAL: YR.COMMISSIONED
RURAL T. LINE NO. YR COMM.
MUNICIPAL -----

NETWORK -----
AREA SERVED -----

REGION PRINCIPLE OF TREATMENT

CITIES -----

STATUS
MARAKAZ FUNCTIONING LINES

ABANDONED LINES

VILLAGE MISC. WORKING LINES

PLANT CAPACITY 1000 M3/DAY

T. LINE NO. CAPACITY

SOURCE OF RAW WATER
RIVER NILE
CANAL
WELLS

PUMPING STATIONS
RAW WATER STATION

T. LINE NO. CAPACITY

PRIME MOVERS
ELECT. DIESELS

WATER QUANTITY

RAW

TREATED

STORAGE _____
OVERALL STORAGE CAPACITY M3 --
NO. OF STORAGE RESERVOIRES ---
ELEVATED TANKS -----

POWER SUPPLY
CITY
EMERGENCY
CHLORINATION

10/11

DISTRIBUTION SYSTEM

CONSUMPTION

COLLECTIONS

O/ALL KM LENGTH -----

BOOSTERS

CAPACITY L/SEC

LOCATION

MOVERS ELECT./MECH.

LEAKAGE:

CONSUMER METERING

O/ALL % LOSS

ATTRIBUTED TO:

LOSSES WITHIN THE TREATMENT PLANT ----%

LOSSES WITHIN THE NETWORK ----%

ILLEGAL CONNECTIONS ----%

CONSUMER WASTAGE ----%

STAND PIPE WASTAGE ----%

DC 2-b W

بيانات مرافق مياه المجارى

اسم المدينة : تاريخ الزيارة : موقع المرقي : الطالبة مع :

الشبكات ومحطات الرفع :

تقدير الرشح :

أعمال التفتية : (البيانات والخواص)

الطول الاجمالي للجمعيات
الرئيسية كم
الطول الاجمالي للشبكات
الفرعية كم

نسبة الرشح الداخلى للشبكة /
نسبة الرشح الخارج من الشبكة /

تاريخ أعمال المحطة الخدمية :
خط التفتية رقم سنة بداية الخدمة

تصرف أعمال التفتية : (م^٢/يوم

الصرف رقم خط التفتية

محطات الرفع الفرعية :

تقدير التجميعات :

- طريقة التفتية :

رقم المحطة / م^٢ / يوم
الصرف الاجمالي
الذى المحركة

عدد العاني السكنية المحكومة
نسبة مياه الصناعة

للخط الاول :
للخط الثاني :
للخط الثالث :

حالة خطوط التفتية :

الخطوط المشغالة :

الخطوط الغير مشغالة :

معالجة الحمأة :

كمية التخلص من الماء العفنة :

كمية التخلص من الحمأة :

محطات الرفع الرئيسية :

رقم المحطة / م^٢ / يوم
الصرف الاجمالي
الذى المحركة

محطات الرفع بأعمال التفتية :

التعميم بالكور :

بيانات محطات الرفع :

محطة المدخل

محطة المحولات الكهربائية :

محطة الحمأة / الماء المعاد

محطة التوليد الكهربائية للطوارئ :

محطة الحمأة الزائدة

محطة المياه المعالجة

PLANT CHARACTERISTICS

SEWAGE TREATMENT PLANT

PLANT LOCATION: -----
PLANT NAME: -----

DATE: -----
INTERVIEWEE: -----

COLLECTION
O/ALL LENGTH OF
MAIN COLLECTORS ---KM
SUB SEWERS -----KM
O/ALL LENGTH OF

ESTIMATE OF FILTRATION
INFILTRATION -----%
EXFILTRATION -----%
CONNECTIONS
NO. OF HOUSES SERVED -----
PERCENTAGE INDUSTRY -----

TREATMENT
PLANT (DATA CHARACT.)
YEAR COMMISSIONED
T. LINE NO. YR. COMM.

PLANT CAPACITY 1000m³/DAY
T. LINE NO. CAPACITY

STN.NO. O/ALL CAP MOVER
----- m³/day -----

MAIN PUMPING STATIONS:
STN. NO O/ALL CAP M3/DAY

PRINCIPLE OF TREATMENT

STATUS
FUNCTIONING LINES

ABANDONED LINES

TREATMENT OF SLUDGE

DISPOSAL OF T. WATER

DISPOSAL OF SLUDGE

111

PUMPING STATIONS (IN THE NETWORK)

CHLORINATION

POWER SUPPLY

INLET STATION

CITY: _____

RETURN SLUDGE/WATER

EMERGENCY:

EXCESS SLUDGE

TREATED WATER

DC 2-b WW

1/2

CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Current Manpower Level

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To determine the number of employees by occupation assigned in a Water or Wastewater Plant.

INSTRUCTION: Listed below are steps to be followed to collect data on the current manpower levels at a Water or Wastewater Plant.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. Explain that this instrument represents a generic large scale Water or Wastewater Plant and that the plant being visited will be compared to the generic organization. Samples are attached.

Step 3. The form requires authorized, actual and shortage/surplus data.

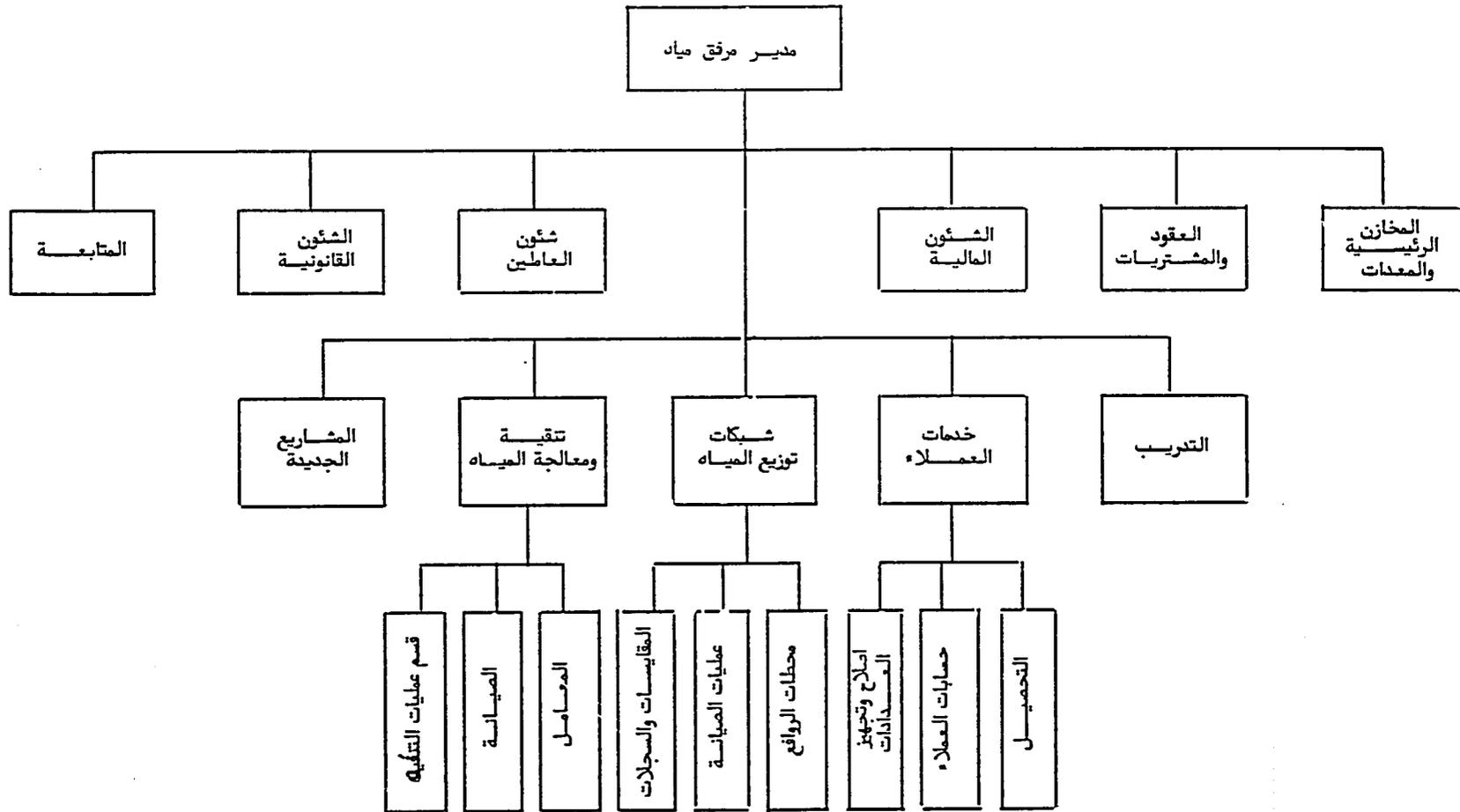
Step 4. Smaller plants may not have all of the same departments or positions shown in the organization. These deviations should be noted.

Step 5. If a plant has positions not already listed on the form, they should be added for the appropriate organizational unit.

Step 6. Arrangements should be made to collect data at other locations if information concerning an organizational elements such as Pump Station is not available at the plant.

COMMENTS: Both the Water and Wastewater forms were based on generic plant organizations. Plant managers in the field responded well to the generic organizations and job titles, but were not able to provide information about functions such as personnel, finance, and customer services which were usually a part of the local government. Future assessments focusing on the governmental levels supporting the sector should be planned. Data for pump station manning was also difficult to collect at each plant, especially in cities with larger networks. Future assessments should allow adequate time to meet with the supervisors who can provide such information.

The initial forms provided space for authorized (budgeted), actual, and shortage/surplus manpower. However, generally plant managers were not able to provide such data, but were could provide actual manpower levels. Future assessments may find that this data is available at the local government level and procedures should be modified accordingly.



بيان موقف القوى العاملة لمرفق مياه

اسم مدير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :
أسماء الخبراء

مدير
مرفق المياه

المهنة	أ	ب	
مساعد مدير			
كاتب آلة كتابة			

ادارة شئون العاملين			ادارة الشئون القانونية			ادارة المتابعة		
أ	ب		أ	ب		أ	ب	
مدير شئون العاملين			مندوب التحقيقات			مدير المتابعة		
كاتب شئون أفراد			مدير الشئون القانونية			مراقب المتابعة		
كاتب للمهايا والاجور			كاتب آلة كتابة			جامع بيانات للمتابعة		
كاتب آلة كتابة						فنيون		
						كاتب		
						كاتب آلة كتابة		

أ - الأعداد الحالية
ب - الأعداد حسب الميزانية

1176

بيان موقف القوى العاملة لمرفق مياه

اسم مدير المحطة : أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :
أسماء الخبراء :

مدير
مرفق المياه

ادارة المخازن الرئيسية والمعدات			ادارة العقود والمشتريات			ادارة الشؤون المالية		
	ب	ا		ب	ا		ب	ا
مدير المخازن			مدير ادارة العقود والمشتريات			مدير الشؤون المالية		
أمين مخزن			مساعد الشؤون الادارية			محاسب		
كاتب آلة كاتبة			اخصائي العقود			كاتب آلة كاتبة		
كاتب مخازن			كاتب مشتريات			محاسب للميزانية		
رئيس مخازن المعدات			كاتب آلة كاتبة			كاتب		
ميكانيكي								
كهربائي								
عمال								

بيان موقف القوى العاملة لعرفق مياه

اسم مدير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :
أسماء الخبراء :

مدير
مرفق المياه

			ادارة التدريب			المشروعات الجديده		
م	ل		الوظيفة المهنية	م	ل		م	ل
			مدير التدريب				كبير مهندسي المشروعات	
			مهندس اخصائي العمليات				مهندس التقية	
			مهندس اخصائي الصيانة				مهندس شبكات / محطات	
			كاتب آلة كاتبة					

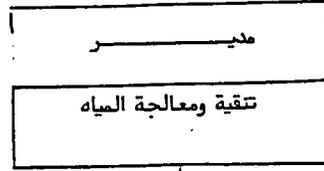
1/2

اسم المحطة :
أسماء الخبراء

الموقع :

التاريخ :

اسم مدير المحطة أو معطي البيان :



قسم المعامل	قسم الصيانة			قسم عمليات التنقية					
	م	ب		م	ب		م	ب	
كبير الكيماويين				مشرف الصيانة			ملاحظ المصافي وفصل الرمال		
مساعد كيميائي				كهربائي محطات			ملاحظ تحضير وحقن جرعة الشبه		
عامل صيانة جرتة الشبه				ميكانيكي ممتاز			ملاحظ أحواض الترسيب		
عامل معمل				مشرف الصيانة للمباني والحدائق			ملاحظ المرشحات		
				عمال حدائق			ملاحظ التعقيم (الكلور)		
				عامل تليفون			ملاحظ محطات طلبات		
				أمن البوابة			عامل تشغيل محطة ظلمية (أ) محطة مياه عكره		
				عامل صيانة طرق			عامل تشغيل محطة طلبات (ب) محطة مياه مرشحة		
				نجار			عمال		
				بناء					
				نقاش					
				أستورجي					

بيان موقف القوى العاملة لمرفق مياه

اسم مدير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :
أسماء الخبراء

مدير ادارة

خدمات العملاء

قسم التحميل

قسم حسابات العملاء

قسم الاصلاح وتجهيز العدادات

م

ت

م

ت

م

ت

محمل

كاتب آلة كاتبة

رئيس قسم العملاء

قارئ العدادات

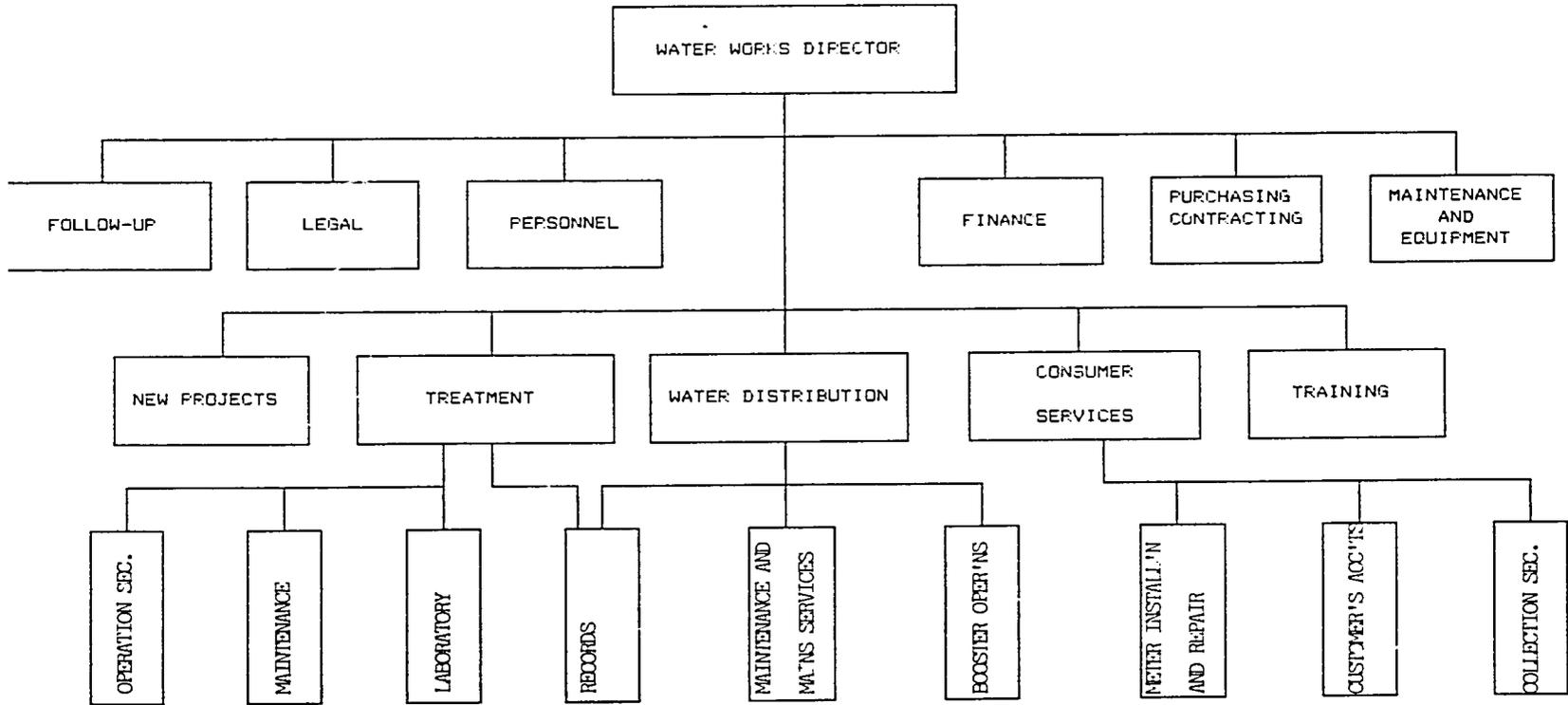
كاتب حسابات العملاء

كاتب آلة كاتبة

رئيس عمال

عامل اصلاح العدادات

عمال



DC 3-a W

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DIRECTOR
WATER DEPARTMENT

FOLLOW UP			LEGAL			PERSONNEL		
JOB TITLE			JOB TITLE			JOB TITLE		
MGR. FOLLOW UP			MGR. LEGAL			MGR. PERSONNEL		
INSPECTOR FOLLOW UP			ADMIN. ASSISTANT			CLERK PERSNN.		
COLLECTING DATA FOR FOLLOW UP			CLERK			CLERK/TYPIST		
TECHNICIAN			TYPIST			CLERK/PAYROLL		
CLERK								
TYPIST								

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DIRECTOR
WATER DEPARTMENT

FINANCE				PURCHASING/CONTRACTING				MAIN STORES AND EQUIPMENT			
JOB TITLE				JOB TITLE				JOB TITLE			
MGR. FINANCE				MGR PURCHASING CONTRACTING				MGR STORE			
ACCOUNTANT				ADMIN. ASSISTANT				STOREKEEPER			
BOOKKEEPER				CONTRACT SPECIALIST				CLERK/TYPIST			
BUDGET ACCOUNTANT CLK				CLERK PURCHASING RECORDS				STORE CLERK			
CLERK PAYROLL				CLERK/TYPIST				EQUIPMENT			
CLERK/TYPIST								FOREMAN			
								MECHANICS			
								ELECTRICIAN			
								LABORERS			

NEW PROJECTS

NEW PROJECTS				TRAINING							
JOB TITLE				JOB TITLE				JOB TITLE			
CHIEF ENGINEER FOR NEW PROJECTS				MGR. TRAINING							
TREATMENT ENGINEER				ENG. SP'LIST OPER.							
				“ ” MAINT.							
DISTRIBUTION ENGINEER				CLERCK/TYPIST							

DC :3-1 W

TREATMENT
CHIEF ENGINEER

OPERATION SECTION				MAINTENANCE				LABORATORY			
JOB TITLE				JOB TITLE				JOB TITLE			
SUP. SCREENING AND GRIT REMOVAL				MAINTENANCE SUP.				CHIEF CHEMIST			
SUP. COAGULANT, PREPAR. DOSING.				CHIEF ELECTRIC				CHEMIST			
SUP. SETTLING				CHIEF MECHANIC				ALUMINUM SULPHATE HELPER			
SUP. FILTRATION				ZONE LABORER				OFFICE BOY			
SUP. CHLORINATION				BUILDING & GROUNDS SUP.							
SUP. PUMPING STAT'N				GRADEN LABORERS							
SUP. PUMP'G STAT'N				TELEPHONE OPERATOR							
OPERAT'N I P. STAT'N				SECURITY							
OPER. II P. STAT'N				ROAD MAINTENANCE							
LABORERS				CARPENTER							
				INTERIOR PAINTER							
				MANSON							
				FURNITURE FINISHER							

WATER DIRECTOR

CHIEF ENGINEER

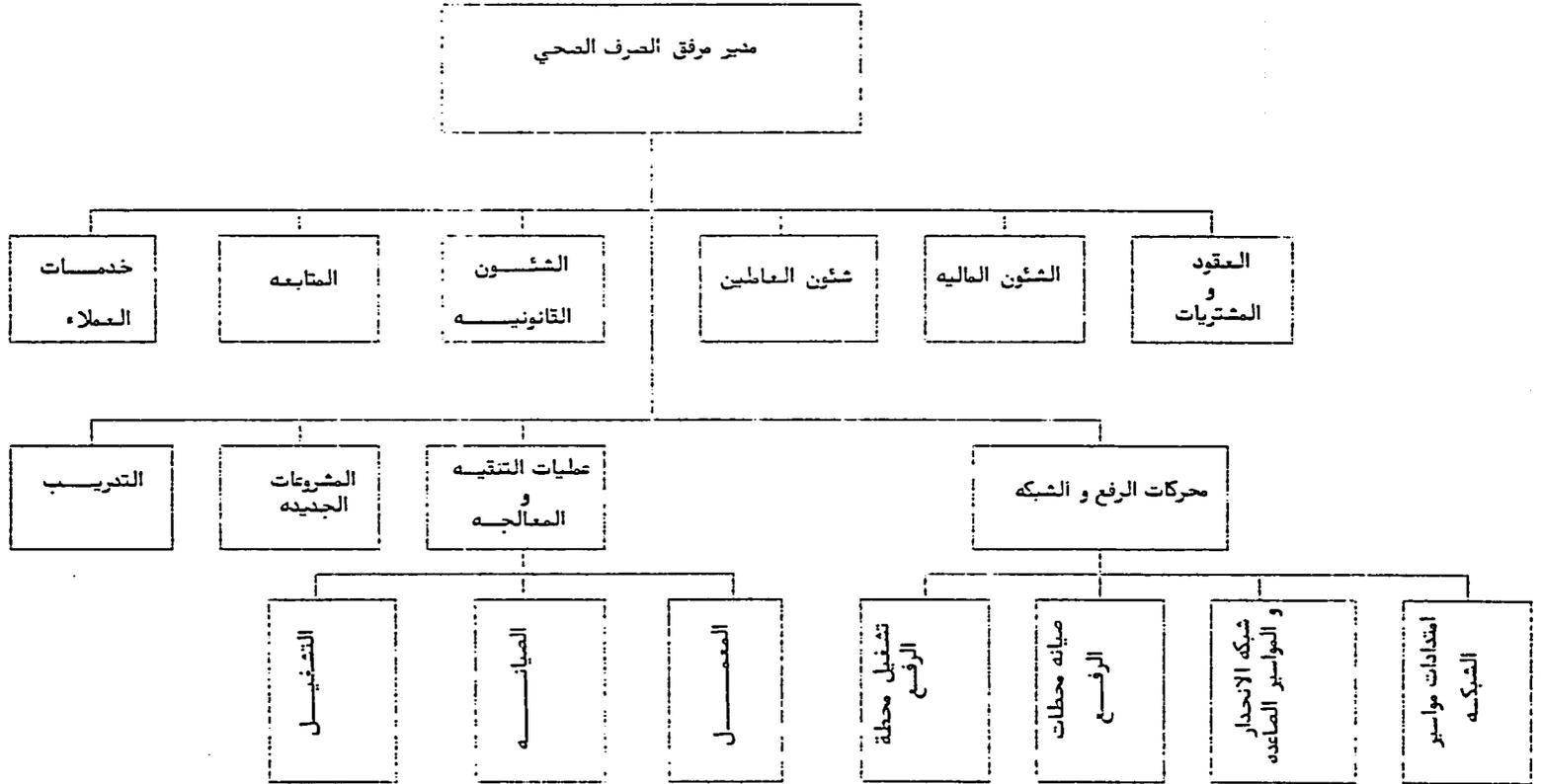
RECORDS				MAINTENANCE MAINS AND SERVICES				BOOSTERS OPERATIONS			
JOB TITLE				JOB TITLE				JOB TITLE			
NETWORK ENGINEER				CREW CHIEFS				1ST SHIFT SUP			
TECHNICIANS				TECHNICIANS				2ND SHIFT SUP.			
DRAFTSMAN				LABORERS				3RD SHIFT SUP.			
				FOREMEN				BOOSTER OPER.			
				VALVE MAINTENANCE				ASSIT. B. OPER.			
				VEHICLE SUPERVISOR				LABORERS			
				VEHICLE MECHANIC				MAINT. SUP. B. O.			
				VEHICLE ELECT.				LEAD MECH. M.			
				VEHICLE IRON WKR				MECH. SUB. FOR OPERATOR			
				DRIVER - CARS				DRIVER			
				DRIVER - EQUIP.							

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CUSTOMER SERVICE
CHIEF ENGINEER

METER INSTALLATION & REPAIR				CUSTOMER ACCOUNTS SECTION				COLLECTION SECTION			
JOB TITLE				JOB TITLE				JOB TITLE			
FOREMAN				CHIEF				CASHIERS			
METER REPAIR				METER READER				CLERK/TYPIST			
LABORERS				CUSTOMER/ACC. CLERK							
				CLERK/TYPIST							

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بيان موقع الفئوي العاملة للصرف المحي

اسم مدير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :

أسماء الخبراء

مدير ادارة

مرفق الصرف الصحي

العقود والمشتريات	الشئون المالية				شئون العاملين						
مدير العقود والمشتريات				مدير الشئون المالية				مدير شئون العاملين			
مساعد للشئون الادارية				محاسب				كاتب شئون الاقراء			
اخصائي العقود				محاسب للميزانية				كاتب آلة كاتبة			
كاتب للمشتريات				كاتب				كاتب للمرتبات والامن			
كاتب آلة كاتبة				كاتب آلة كاتبة							

DC 3-c WW

اسم مدير المحطة أو منطى البيان :

التاريخ :

الموقع :

اسم المحطة :

أسماء الخبراء

مدير ادارة

المراف المحلي

المشاريع الجديدة

التدريب

كبير مهندسي المشروعات

مهندس تخطيط

مهندس تقدير تكاليف ابتدائية

مهندس أول

مهندس ثاني

رسم

مراجع فني

مدير التدريب

مهندس اخصائي عمليات

مهندس اخصائي صيانة

رسم

كاتب آلة كتابة

بيان موقف القوى العاملة الصرف الصحي

اسم منير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :

أسماء الخبراء

مدير ادارة

عمليات التتية والمعالجة

الميزانية	التشغيل	التشغيل
رئيس الصيانة لخدمة التتية	عمال أحواض تجفيف الحمأة	رئيس عملية التنفيذ
ملاحظ صيانة ميكانيكي	ملاحظ غرفة التعقيم	ملاحظ أحواض تصفية وراسب رمل
ملاحظ صيانة كهربائي	ميكانيكي محطة المياه المعاده	تطهير الشبكات
ميكانيكي أول للصيانة	ميكانيكي محطة دفع الحمأة	ملاحظ أحواض ترسيب ابتدائي
ميكانيكي ثاني الصيانة	كهربائي محطة المياه المعاده	ملاحظ مرشحات وعملية التبيوية
كهربائي أول للصيانة	كهربائي محطة رفع الحمأة	ملاحظ أحواض تجفيف الحمأة
كهربائي ثاني الصيانة	كهربائي تشغيل زحافات	
ميكانيكي سيارات	سائق سيارة نقل	
جنائني		
أمن		
عامل تليفون		
سائق		
عمال		

اسم مدير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :

أسماء الخبراء

مدير ادارة

عمليات التفتية والمعالجة

المعمل

كيمائى

مساعد معمل

عامل معمل

عامل عادى

DC 3-f WW

بيان موقف القوى العاملة لشرف المحمي

اسم مدير المحطة أو معشي النيل :

التاريخ :

الموقع :

اسم المحطة :

أسماء الخبراء :

مدير ادارة

محطات الرفع والشبكة بالمدينة

شبكة الانحدار والمواسير الصناعية	صيانة محطات الرفع	تشغيل محطة الرفع
رئيس الشبكة	رئيس الصيانة	رئيس الوريدية
ملاحظ الترميمات	ملاحظ كهربائي	ميكانيكي تشغيل طلمبات
ملاحظ صيانة المواسير	ملاحظ ميكانيكي	كهربائي تشغيل محركات
بناء	كهربائي أول	عامل تطهير الشبكة (السرند)
سباك	كهربائي ثاني	عامل
لحام	ميكانيكي أول	
سائق	ميكانيكي ثاني	
ملاحظ تطهير الشبكات	سائق عربة رواسب	
ملاحظ تطهير المحطات	عامل عادي	
ميكانيكي آلة التسليك بالجرذل		
سائق سيارة نافوري		
مهني سيارة نافوري		
عامل		
سائق كباش		

اسم مدير المحطة أو معطي البيان :

التاريخ :

الموقع :

اسم المحطة :

أسماء الخبراء

مدير ادارة

محطات الرفع الشبكه

امتدادات مواسير الشبكة

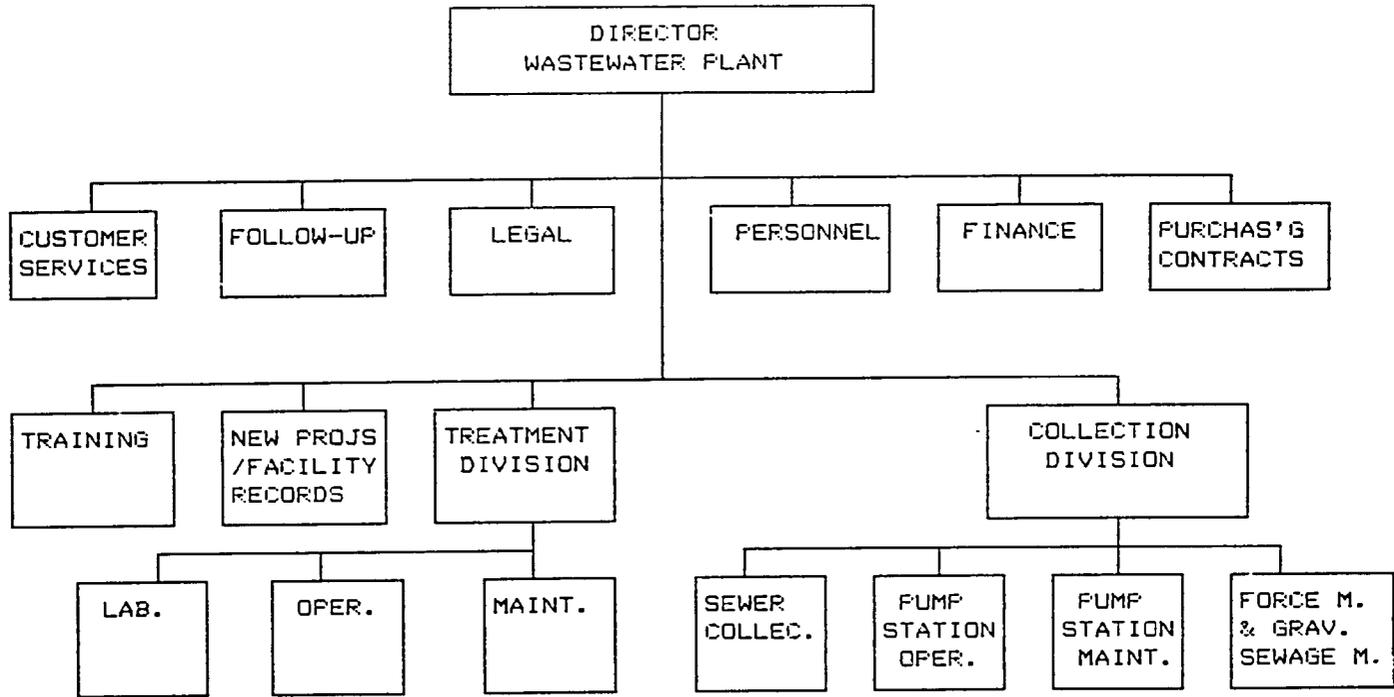
ملاحظ امتدادات

ملاحظ توصيلات المباني

سائق سيارة نقل مهمات

سائق سيارة اصلاحات

عمال



DC 3-a WW

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DIRECTOR
WASTWATER DEPARTMENT

CUSTOMER SERVICE				FOLLOW-UP				LEGAL			
JOB TITLE				JOB TITLE				JOB TITLE			
MGR. CUSTOMER SERVICES				MGR. FOLLOW UP				MGR.LEGAL SER.			
ADM. ASST.				INSPECT.,F.U.				ADMIN.ASST.			
CLERCK/TYPIST -				TECH. FOLLOW-UP				CLERCK/TYPIST			
				TECHNICIAN							
				CLERCK/TYPIST							

DC 3 -b WW

162

DIRECTOR
WASTEWATER DEPARTMENT

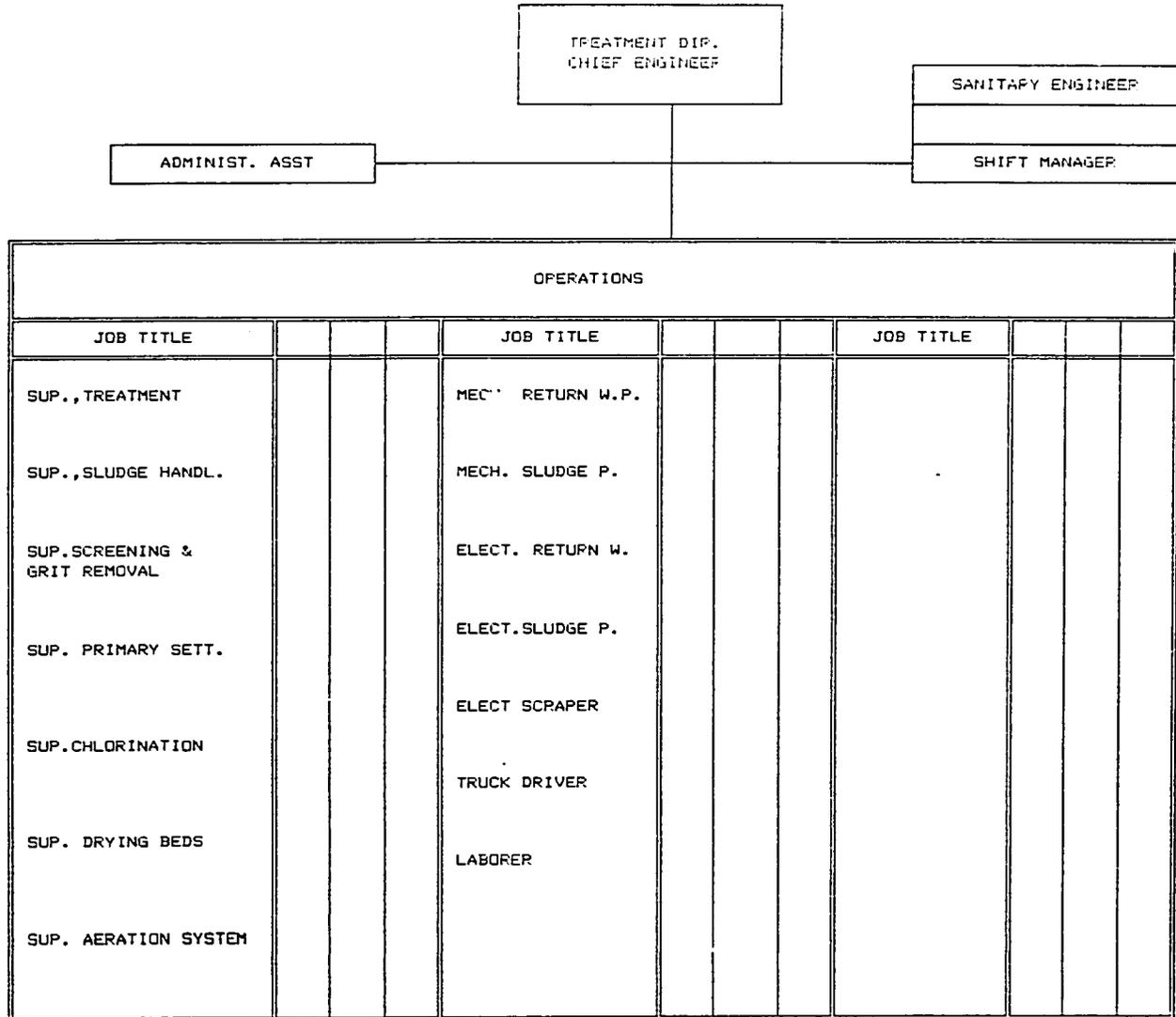
PERSONNEL				FINANCE				PURCHASING/CONTRACTING			
JOB TITLE				JOB TITLE				JOB TITLE			
MGR. PERSONNEL				MGR. FINANCE				MGR. PUR. /CONT.			
SUP. PERS.				ACC.				ADMIN.			
CLERK, PERS. RECORDS				BOOK KEEPER				CONT. SPECIA.			
CLERK/TYPIST				BUDGET & ACC. CLERK				CLERK, PUR. REC.			
				CLERK PAYROLL				CLERK/TYPIST			
				CLERK/TYPIST				SUPPLY CLERK			

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DIRECTOR
WASTEWATER DEPARTMENT

TRAINING				NEW PROJECTS/FACILITY RECORDS							
JOB TITLE				JOB TITLE				JOB TITLE			
MGR TRAINING				MGR. PROJ. RECORDS							
ENG. SPECIALIST OPER.				PLANNING ENG.							
ENG. SPECIALIST MAIN.				RECORDS ENG/ COST ESTIMATOR							
CLERCK/TYPIST				ENGINEER I							
				ENGINEER II							
				DRAFTSMAN							
				TECHNICIANS							

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TREATMENT DIRECTOR
 CHIEF ENGINEER

MAINTENANCE										
JOB TITLE				JOB TITLE				JOB TITLE		
TREAT. PLANT M. SUP.				WATCHMAN						
FOREMAN, MECHANICAL MAINTENANCE				DRIVER						
FOREMAN ELETRICAL MAINTENANCE				TEL. OPERATOR						
FOREMAN, TREAT. PLANT. M.				LABORER						
MECHANIC I										
MECHANIC II										
ELECTRICIAN I										
ELECTRICIAN II										
OUTMOTIVE EQUIP. MECH.										
GARDENER										

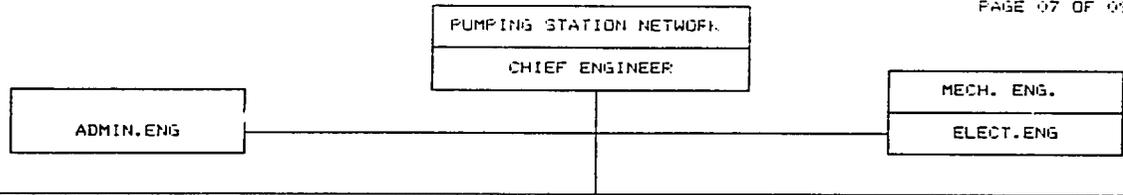
172

TREATMENT PLANT
CHIEF ENGINEER

LABORATORY											
JOB TITLE				JOB TITLE				JOB TITLE			
CHEMIST											
ASSISTANT CHEMIST											
LAB. TECH.											
LABORER											

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PUMP STATION OPERATION											
JOB TITLE				JOB TITLE				JOB TITLE			
SHIFT SUP.											
PUMP MECHANIC											
STATION SCREENING LAB											
PUMP ELECT.											
LABORERS											

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PUMPING STATION NETWORK
CHIEF ENGINEER

PUMP STATION MAINTENANCE											
JOB TITLE			JOB TITLE			JOB TITLE					
SUP. PUMP STATION M.											
FOREMAN ELECT. M.											
FOREMAN MECH. M.											
ELECT. I PUMP STN.											
ELECT. II PUMP STN.											
MECH. I PUMP STN.											
MECH. II PUMP STN.											
TRUCK DRIVER,											
CLEANING & COLLECT.											
LABORER											

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FORCE MAINS AND GRAVITY SEWAGE MAINTENANCE						SEWER CONNECTIONS				
JOB TITLE				JOB TITLE			JOB TITLE			
SUPERVISOR, PIPELINE MAINTENANCE				SUPERVISOR, SEWER CLEANING			SUPERVISOR SEWER CONNECT'N			
FOREMAN, MAINS AND SEWER MAINTENANCE				FOREMAN, SEWER CLEANING			SUP.HOUSE BLDG CONNECTIONS			
SUPERVISOR, SEWER REPAIR				BUCKET MACHINE OPERATOR			BACKHOE OPER., NEW CONNECTIONS			
MASON				JET CAR			BACKHOE OPER.			
PIPEFITTER				OPERATOR			REPAIR			
PLUMBER				BACKHOE OPERATOR			LABORER			
CLAMB SHELL				REPAIR						
LABORER				LABORER						

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CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Training Priority & Specific Training Needs

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To identify which occupations in a particular Water or Wastewater Plant are in need of short term training and which require sustained long term training. To identify the specific training needs of each occupation by Plant.

INSTRUCTION: Listed below are the steps to be followed to collect data on training priorities and specific training needs by occupation.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. This form is a complex and time consuming, however it is probably the most important one in the assessment package. A detailed explanation of how to prioritize training according to six month increments is required. Samples are attached.

Step 3. Plant management should be made aware that operational considerations such as release of staff from the work site or from specific

duties to obtain training should have little bearing on assessments of priority. If a manager believes that all of the employees in a particular occupation require training immediately, he should be instructed to answer accordingly. Explain that this does not mean that he has agreed to release them all for training at the same time.

Step 4. Expect a tendency for plant managers to prefer OJT over Formal Training which will probably be held off-site. Again, managers should be encouraged to separate training from operational concerns.

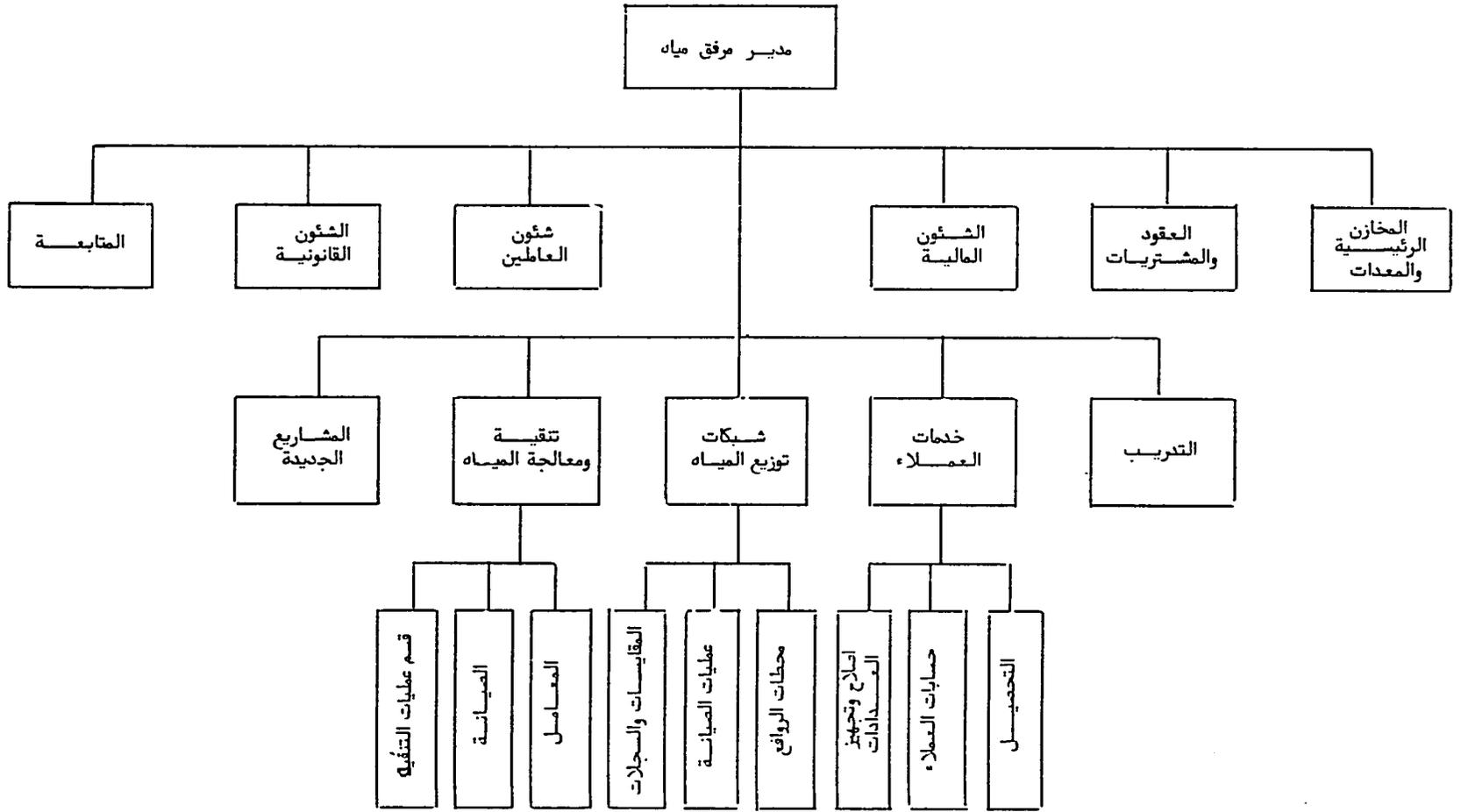
Step 5. A critically important part of this form is the section for Description of Training Required. This section should receive adequate attention by the interviewer and interviewee alike.

COMMENTS: This form, in its current format, is very difficult to use and significant modifications are required to correct it. First, it assumes that a high degree of standardization in position description duties and qualifications exists throughout the sector. The WWISP teams determined that this is not the case, and therefore, training needs for each position will differ from plant to plant based upon the duties assigned.

Second, the form assumes a level of management sophistication which expects concerned supervisors to determine the criticality of training needs by position on a a time scale basis. The accuracy of data collected using this approach is suspect.

A complete review of position descriptions for the sector is required. Future assessments should augment the generic organizations with generic position descriptions or job task lists. Although these will require that a lot of paper be carried into the field, they would help to clearly identify the skills required of a specific position at a specific plant and assist supervisors in stating specific training needs.

In addition, the method for rating criticality of training should be simplified. A point scale rating system (3 to 5 point range) indicating relative need for training among particular positions would be more easily understood and accurate.



DC 4-a W

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احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : مدير المرفق

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								مدير المرفق	
								مساعد اداري	
								كاتب آلة كتابة	

احتياجات التدريب لمحطات المياه

اسم المحطة : _____ المتابعة : ادارة : _____ التاريخ : _____
 موقع المحطة : _____ قسم : _____ أسماء الخبراء : _____
 اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				أعداد المطلوب تدريبهم الآن	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيفة	تدريب نظري	بـ					
			٢٤	١٨	١٢	٦		
								مدير المتابعة
								مراقب المتابعة
								جامع بيانات للمتابعة

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احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : المتابعة

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم الممنه أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بشهر						
			٢٤	١٨	١٢	٦			
								فنيون	
								كاتب آلة كتابة	

احتياجات التدريب لمحطات المياه

التاريخ :

الشؤون القانونية

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مندوب التحقيقات	
								مساعد الشؤون القانونية	
								كاتب آلة كتابة	

احتياجات التدريب لمحطات المياه

التاريخ :

شئون العاملين : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير شئون العاملين	
								كاتب لشئون الأفراد	
								كاتب آلة كاتبة	
								كاتب للمرتبات والأجور	

احتياجات التدريب لمحطات المياه

التاريخ :

الشؤون المالية : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								مدير الشؤون المالية	
								محاسب	
								كاتب	

احتياجات التدريب لمحطات المياه

التاريخ :

الشؤون المالية :

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								محاسب للميزانية	
								كاتب	
								كاتب آلة كاتبة	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : العقود والمشتريات

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـساعات				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير العقود والمشتريات	
								مساعد الشؤون الادارية	
								أخصائي العقود	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : العقود والمشتريات

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشمهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيف	بـ						
			٢٤	١٨	١٢	٦			
								كاتب للمشتريات	
								كاتب آلة كاتبة	

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احتياجات التدريب لمحطات المياه

التاريخ :

المخازن الرئيسية والمعدات للمحطة : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل :لقائم بـه
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير المخازن	
								أمين مخزن	
								كاتب آلة كتابة	
								كاتب مخازن	

احتياجات التدريب لمحطات المياه

التاريخ :

المخازن الرئيسية والمعدات للمحطة : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								رئيس مخازن المعدات	
								ميكانيكي	
								كهربائي	
								عمال	

احتياجات التدريب لمحطات المساه

التاريخ :

المشاريع الجديدة : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								كبير مهندسي المشروعات	
								مهندس تقنيّة	
								مهندس شبكات / محطات	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

قسم : عمليات التنقية أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي بلوظيفة	بعمد						
			٢٤	١٨	١٢	٦			
								ملاحظ المصافي وفصل الرمال	
								ملاحظ تحضير وحقن جرعة الشبه	
								ملاحظ أحواض الترسيب	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

قسم : عمليات التنقية أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيف	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								ملاحظ المرشحات	
								ملاحظ التعقيم (اضافة الكلور)	
								ملاحظ محطات طلمبات	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

قسم : عمليات التنقية أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهر				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بمستوى						
			٢٤	١٨	١٢	٦			
								عامل تشغيل محطة طلعبات (أ) محطة مياه العكره	
								عامل تشغيل محطة طلعبات (ب) محطة المياه المرشحة	
								عمال	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

قم : الصيانة أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	اعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مشرف صيانة	
								كهربائي ممتاز	
								ميكانيكي ممتاز	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

قسم : الميانة أضاء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد الطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيفة	تدريب نظري	بـعد						
			٢٤	١٨	١٢	٦			
								مشرف الصيانة للمباني والحوائق	
								عمال حوائق	
								عامل تليفون	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

قسم : الميانة أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالساعات				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بمعد						
			٢٤	١٨	١٢	٦			
								بناء	
								نقاش	
								أنتورجي	

احتياجات التدريب لمحطات المياه

التاريخ :

تنقية ومعالجة المياه : ادارة :

اسم المحطة :

الميانة : قسم : أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم الهيئة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								أمن بوابنة	
								عامل صيانة الطرق	
								تجار	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : تنقية ومعالجة المياه

اسم المحطة :

المعائن : أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								كبير الكيماويين	
								مساعد كيميائي	
								عامل للشبه	
								عامل معمّل	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه

اسم المحطة :

أسماء الخبراء :

قسم : المقاييسات والسجلات

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهر				الآن	إعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بعدد						
			٢٤	١٨	١٢	٦			
								مهندس شبكات	
								فني مقاييسات وتوصيلات	
								رمام	
								كاتب سجلات	

احتياجات التدريب لمحطات المياه

التاريخ :

شبهكات توزيع المياه : ادارة :

اسم المحطة :

قسم : الصيانة أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								رئيس عمال المياه العكرة	
								فنيون	
								مهني شبكات	

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احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه

اسم المحطة :

أسماء الخبراء :

قسم : الصيانة

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								عامل عادي	
								رئيس شبكة توزيع	
								عامل صيانة الصمامات (محابس)	

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احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه

اسم المحطة :

أسماء الخبراء :

قسم : الصيانة

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								رئيس الحملة (السيارات)	
								ميكانيكي سيارات	
								كهربائي سيارات	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه

اسم المحطة :

قسم : الصيانة أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معضي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيف	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								حداد	
								سائق	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه

اسم المحطة :

قسم : الروافق أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم بسببه
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								ملاحظ الوردية الاولى	
								ملاحظ الوردية الثانية	
								ملاحظ الوردية الثالثة	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه

اسم المحطة :

أسماء الخبراء :

رقم : الروافع

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد الطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيف	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								عامل تشغيل محطة رفع	
								مساعد رئيس محطات الرفع	
								عمال	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : شبكات توزيع المياه
قسم : الروافع
أسماء الخبراء :

اسم المحطة :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								عمال صيانة محطات الرفع	
								رئيس الصيانة الميكانيكي	
								مساع رئيس الصيانة الميكانيكي	
								سائق	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : خدمات العملاء

ام المحطة :

أسماء الخبراء :

قسم : اصلاح وتجهيز العدادات

موقع المحطة :

ام مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهر				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بعدد						
			٢٤	١٨	١٢	٦			
								رئيس عمال	
								عامل اصلاح العدادات	
								عمال	

احتياجات التدريب لمحطات المياه

التاريخ :

ادارة : خدمات العملاء

اسم المحطة :

أسماء الخبراء :

قسم : حسابات العملاء

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيفة	تدريب نظري	بشهر						
			٢٤	١٨	١٢	٦			
								رئيس قسم العملاء	
								قارئ العدادات	
								كاتب حسابات العملاء	

احتياجات التدريب لمحطات المياه

التاريخ :

امارة : خدمات العملاء

اسم المحطة :

أسماء الخبراء :

قسم : التحصيل

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهر				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								محمل	
								كاتب آلة كتابة	

احتياجات التدريب لمحطات المياه

التاريخ :

التدريب : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			د	ح	ج	ب			
			٢٤	١٨	١٢	٦			مدير التدريب
									مهندس أخصائي العمليات
									مهندس أخصائي الصيانة
									كاتب آلة كتابة
									رسم

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : GENERAL
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
DIRECTOR									
ADMINISTRATIVE ASSISTANT									
CLERK/TYPIST									

2/2

TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: FELLOW - UP

YEAR: -----
 DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	PRIORITY TRAINING					TYPE OF TRN'G		DESCRIPTION OF TRAINIG REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MANAGER FOLLOW UP								
INSPECTOR								
COLLECTING DATA FOR FOLLOW UP								
TECHNICIANS								
CLERK								
TYPIST								

DC 4-b W

214

TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.:LEGAL AFFAIRS

YEAR: -----
 DATE:-----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	PRIORITY TRAINING					TYPE OF TRN'G		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MANAGER FOR THE LEGAL AFFIARS								
ADMINISTRATIVE ASSISTANAT								
CLERK/TYPIST								

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: PERSONNEL AFFAIRS

YEAR: -----
 DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAININGH REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MANAGER - PERSONNEL								
CLERK								
CLERK/TYPIST								
CLERK PAYFOLL								

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
LOCATION : -----

DEPT.: FINANCIAL AFFAIRS

YEAR: -----
DATE: -----
INTERVIEW TEAM : -----
INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MANAGER FINANCE								
ACCOUNTANT								
BOOKEEPER								
BUDGET ACCOUNTANT								
CLERK								
CLERK/TYPIST								

217

TRAINING REQUIREMENTS - WATER PLANTS

YEAR: -----

PLANT : -----
 LOCATION : -----

DEPT.: CONTRACTING AND PROCUREMENT DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MANAGER PURCHASING/CONTRACTING								
ADMINISTRATION ASSISTANT								
CONTRACTING SPECIALIST								
CLERK PURCHASING								
CLERK/TYPIST								

218

TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.:MAIN WAREHOUSE
 EQUIPMENT FOR THE PLANTS

YEAR: -----
 DATE:-----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MANAGER STOPE								
STOREKEEPER								
CLERK/TYPIST								
STORE CLERK								
EQUIPMENT FOREMAN								
MECHANICS								
ELECTIRCIAN								
LABOPERS								

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.:NEW PROJECTS

YEAR: -----
 DATE:-----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	DJT	
CHIEF ENGINEER FOR NEW PROJECTS								
TREATMENT ENGINEER								
DISTRIBUTION ENGINEER								

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: WATER PURIFICATION AND TREATMENT
 SEC. : WATER PURIFICATION-OPERATION

YEAR: -----
 DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
SUPERVISOR, SCREENING AND GRIT REMOVAL								
SUPERVISOR, COAGULANT, PREPARATION DOSING								
SUPERVISOR, SETTLING								
SUPERVISOR FILTRATION								
SUPERVISOR CHLORINATION								
SUPERVISOR PUMPING STATION								
OPERATION I PUMPING STATION								
OPERATION II PUMPING STATION								
LABORERS								

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.:WATER TREATMENT
 SEC. :MAINTENANCE

YEAR: -----
 DATE:-----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
MAINTENANCE SUPERVISOR								
CHIEF ELECT. -								
CHIEF MECHANIC								
BUILDINGS AND GROUNDS SUPERVISOR								
GARDEN LABORERS								
TELEPHONIST								
MANSON								
INTERIA PAINTER								
FURNITURE FINISHER								
SECURITY								
FOAD MAINTENANCE								
CARPENTER								

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: WATER PURIFICATION AND
 TREATMENT
 SEC. : LABORATORY

YEAR: -----
 DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
CHIEF CHEMIST								
CHEMIST								
ALUMINUM SULPHATE HELPER								
LAB BOY								

TRAINING REQUIREMENTS - WATER PLANTS

YEAR: -----

PLANT : -----
 LOCATION : -----

DEPT.: WATER DISTRIBUTION NETWORKS
 DIVISION: WATER DISTRIBUTION
 SEC. : RECORDS

DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
WATER NETWORKS ENGINEER								
TECHNICIANS								
TECHNICIAN /CONNECTIONS								
DRAFTSMAN								
CLERK/BOOKEEPING								

TRAINING REQUIREMENTS - WATER PLANTS

YEAR: -----

PLANT : -----
 LOCATION : -----

DEPT.: WATER DISTRIBUTION NETWORKS
 DIV. : WATER DISTRIBUTION
 SECT.: MAINTENANCE

DATE: -----
 INTERVIEW TEAM : -----
 INTERVIEWEE: -----

JOB TITLE	priority training					type of trn'g		DESCRIPTION OF TRAINING REQUIRED
	0	6	12	18	24	FORMAL	OJT	
CREW CHIEF								
TECHNICIANS								
ZONE LABORERS								
LABORERS								
FOREMAN (NETWORK)								
VALVE MAINTENANCE								
VEHICLES SUPERVISOR								
VEHICLES MECH								
VEHICLES ELECT								
IRON WORKER								
DRIVERS								

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PLANT : -----
 LOCATION : -----

DEPT. : WATER DISTRIBUTION NETWORKS
 DIV. : BOOSTER
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
FIRST SHIFT SUPERVISOR									
SECOND " "									
THIRD " "									
BOOSTER OPERATION									
ASSIST BOOSTER OPERATION									
LABORERS									
MAINTENANCE SUPERVISOR BOOSTER OPER.									
LEAD MECH. MAINTENANCE									
MECH SUBST. FOR OPERATOR									
DRIVER									

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TRAINING REQUIREMENTS - WATER PLANTS

PLANT :-----
LOCATION :-----

DEPT.: CUSTOMER SERVICES
DIV. : METER INSTALLATION AND REPAIR
SEC. :

YEAR:
DATE:
INTERVIEW TEAM :
INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
METER REPAIR									
FOREMAN									
LABORER									

227

TRAINING REQUIREMENTS - WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: CUSTOMER SERVICES
 DIV. : CUSTOMER ACCOUNTS
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
CHIEF CUSTOMER SERVICES									
METER READER									
CUSTOMER ACCOUNTS CLERK									

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TRAINING REQUIREMENTS - WATER PLANTS

YEAR:
DATE:
INTERVIEW TEAM :
INTERVIEWEE:

PLANT :-----
LOCATION :-----

DEPT.: CUSTOMER SERVICES
DIV. : COLLECTION
SEC. :

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
CASHIERS									
CLERK/TYPIST									

DC 4-q W

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TRAINING REQUIREMENTS - WATER PLANTS

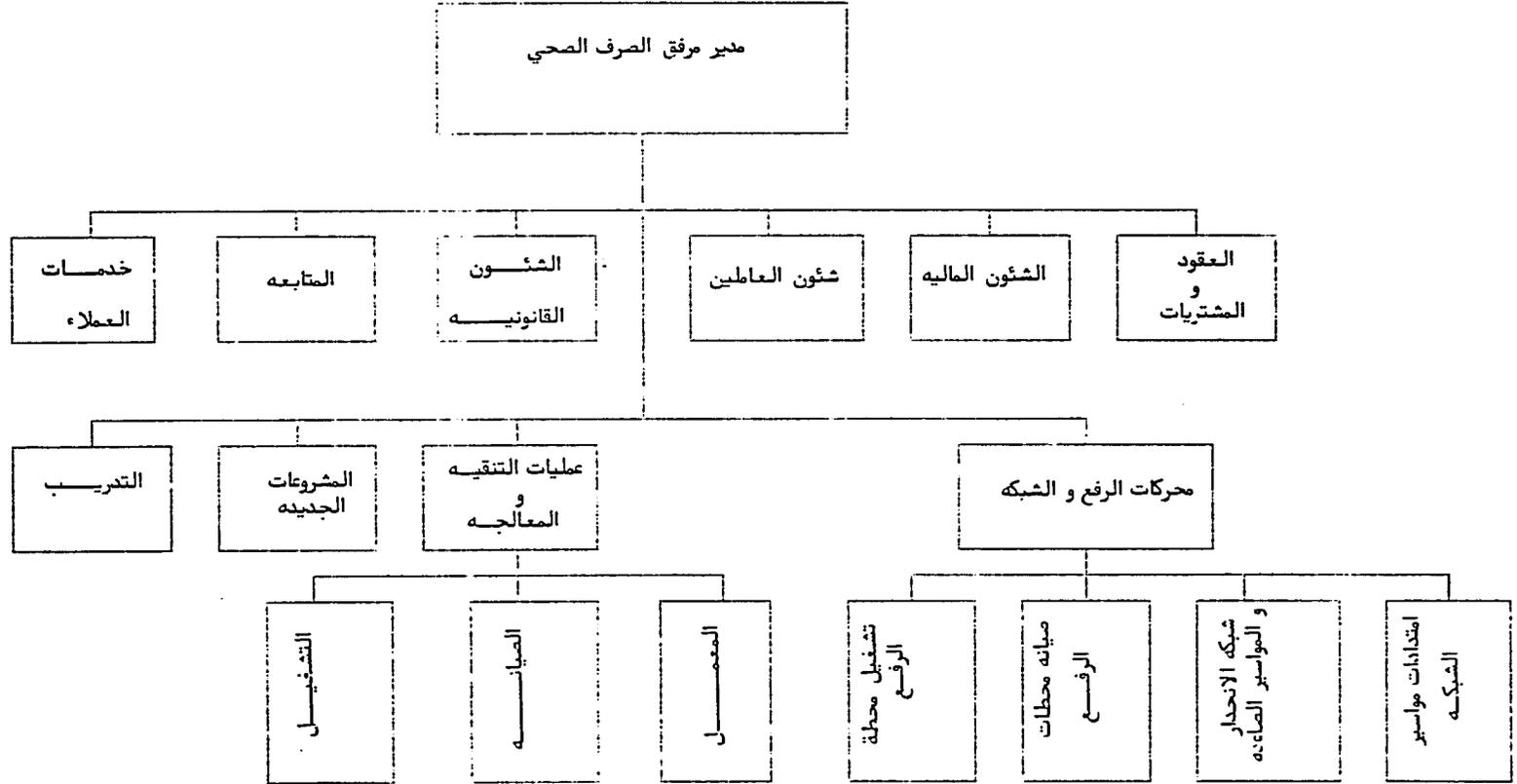
PLANT : -----
 LOCATION : -----

DEPT. : TRAINING
 DIV. :
 SEC. : OPERATION

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER TRAINING									
ENG. SPECIALIST OPERATION									
ENG. MAINTENANCE SPECIALIST									
CLERK/TYPIST									
DRAFTSMAN									

11/20



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احتياجات التدريب للصرف الصحي

التاريخ :

مدير عام

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتأهيفة	بشهر						
			٢٤	١٨	١٢	٦			
								مدير	
								مساعد اداري	
								كاتب آلة كاتبة	

مدير عام

احتياجات التدريب للمصرف المحمي

التاريخ :

ادارة : خدمة العملاء

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشمس				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								رئيس قسم العملاء (التويميلات)	
								مساعد رئيس التوصيلات	
								كاتب آلة كاتبة	

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احتياجات التدريب للمصرف المحمي

التاريخ :

المتابعة

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب

نوع التدريب

أولوية التدريب بالشهور

أعداد
المطلوب
تدريبهم

اسم المهنة أو العمل القائم به

تدريب
عملي للتوظيف

تدريب
نظري

بعـد

الآن

٢٤

١٨

١٢

٦

مدير المتابعة

مراقب متابعة

جامع بيانات للمتابعة

احتياجات التدريب للمركز الصحي

التاريخ :

المتابعة

إدارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								فنيون	
								كاتب آلة كاتبة	

احتياجات التدريب للمرفأ المحكي

التاريخ :

الشئون القانونية

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشمهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مندوب التحقيقات	
								مساعد الشئون القانونية	
								كاتب آلة كاتبة	

احتياجات التدريب للمصرف المحمي

التاريخ :

شئون العاملين : ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشمهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير شئون العاملين	
								كاتب لشئون الأفراد	
								كاتب للمرتبات والأجور	
								كاتب آلة كتابة	

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احتياجات التدريب للمركز المحاسبي

التاريخ :

شئون مالية

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير الشؤون المالية	
								محاسب	
								كاتب	

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احتياجات التدريب للمصرف الصحي

التاريخ :

شئون مالية

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								محاسب للميزانية	
								كاتب	
								كاتب آلة كاتبة	

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احتياجات التدريب للمصرف الصحي

التاريخ :

العقود والمشتريات

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـشهور				الآن	أعداد المطلوب تدريبهم	اسم الهيئة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير العقود والمشتريات	
								مساعد للشئون الادارية	
								اخصائي عقود	

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احتياجات التدريب للمركز الصحي

التاريخ :

ادارة : العقود والمشتريات

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	إعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								كاتب مشتريات	
								كاتب آلة كتابة	

احتياجات التدريب للمصرف المحمي

التاريخ :

التدريب : _____

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الان	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								مدير التدريب	
								مهندس أخصائي عمليات	
								مهندس اخصائي صيانة	

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احتياجات التدريب للمصرف الصحي

التاريخ :

التدريب

: ادارة :

اسم المحطة :

أسماء الخبراء :

: قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـشهور				الان	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								كاتب آلة كاتبة	
								رسام	

احتياجات التدريب للسرف المحمي

التاريخ :

المشروعات الجديدة

ادارة :

اسم المحطة :

أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								كبير مهندسي المشروعات	
								مهندس تخطيط	

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احتياجات التدريب للمرفأ الصحي

التاريخ :

عمليات التقية

ادارة :

اسم المحطة :

أسماء الخبراء :

التشغيل

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								رئيس عملية التقية	
								ملاحظ أحواض تصفية/رواسب رملي وتغيير الشبك	
								ملاحظ أحواض ترسيب ابتدائي	

احتياجات التدريب للمصرف المحمي

التاريخ :

عمليات التتقيسة

ادارة :

اسم المحطة :

أسماء الخبراء :

التشغيل

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـسـهور				الآن	أعداد الطلوب تدريبهم	اسم المهنة أو العمل القائم بـه
	تدريب عملي للوظيفة	تدريب نظري	بـعد						
			٢٤	١٨	١٢	٦			
								ملاحظ مرشحات التهوية	
								ملاحظ أحوالي تجفيف الحماة	
								عمال أحوالي تجفيف الحماة	

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احتياجات التدريب للصرف الصحي

التاريخ :

ادارة : عمليات التقييم

اسم المحطة :

أسماء الخبراء :

قسم : التشخيص

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								ملاحظ غرفة تقييم	
								ميكانيكي محطة مياه معالجة	
								ميكانيكي محطة رفع الحمأة	

احتياجات التدريب للمرفأ المحي

التاريخ :

عمليات التقيمة

ادارة :

اسم المحطة :

أسماء الخبراء :

التشغيل

قم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل التائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								كهربائي محطة مياه معالجة	
								كهربائي رفع الحمأة	
								كهربائي تشغيل زحانات	
								سائق سيارة مهمات	

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احتياجات التدريب للمرفأ المحسى

التاريخ :

عمليات التتقىة

ادارة :

اسم المحطة :

أسماء الخبراء :

الميانة

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أحداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظفة	تدريب نظرى	بـ						
			٢٤	١٨	١٢	٦			
								رئيس الصيانة لعملية التتقىة	
								ملاحظ مباني ميكانيكي	
								ملاحظ كهربائي	

احتياجات التدريب للمصرف الصحي

التاريخ :

عمليات الترقية :

ادارة :

اسم المحطة :

أسماء الخبراء :

الصيانة :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـساعات				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتطبيق	عدد						
			٢٤	١٨	١٢	٦			
								ميكانيكي أول الصيانة	
								ميكانيكي ثاني الصيانة	
								كهربائي أول	

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احتياجات التدريب للمصرف المحمي

التاريخ :

عمليات التقييم

ادارة :

اسم المحطة :

أسماء الخبراء :

الصيانة

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								كهربائي ثاني	
								ميكانيكي سيارات	
								جنبايني	

احتياجات التدريب للمصرف الصحي

التاريخ :

عمليات التقييم :

ادارة :

اسم المحطة :

أسماء الخبراء :

المصارنة :

قم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف انتدرب الطلوب	نوع التدرب		أولوية التدرب بالشهور				الآن	أعداد الطلوب تدربهم	اسم المهنة أو العمل القائم به
	تدرب عملي للوظيفة	تدرب نظري	بـ						
			٢٤	١٨	١٢	٦			
								أمن	
								عامل تليفون	
								سائق	
								عمال	

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احتياجات التدريب للمصرف الصحي

التاريخ :

عمليات التتقيئة

ادارة :

اسم المحطة :

أسماء الخبراء :

المعمل

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الان	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للتوظيفة	تدريب نظري	بـعد						
			٢٤	١٨	١٢	٦			
								كيميائى	
								مساعد معمل	
								عامل معمل	
								عامل	

احتياجات التدريب للعرف المحمي

التاريخ :

محطات الرفع والشبكة

انارة :

اسم المحطة :

أسماء الخبراء :

تشغيل محطة الرفع

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشمس				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								رئيس وريسة	
								ميكانيكي تشغيل طلمبات	
								كهربائي تشغيل محركات	

احتياجات التدريب للمركز التحسي

التاريخ :

محطات الرفع والشبكة

انارة :

اسم المحطة :

أسماء الخبراء :

تشغيل محطة الرفع

تم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								عامل تطهير الشبكة	
								عامل عادي	

احتياجات التدريب للمصرف المحسى

التاريخ :

محطات الرفع والشبكة

ادارة :

اسم المحطة :

أداء الخبراء :

الصيانة

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								رئيس الصيانة	
								ملاحظ كهربائي	
								ملاحظ ميكانيكي	

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احتياجات التدريب للصرف الصحي

التاريخ :

محطات الرفع والشبكه

ادارة :

اسم المحطة :

أسماء الخبراء :

الميانة

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب عملي للوظيفة	تدريب نظري	بـ						
			٢٤	١٨	١٢	٦			
								كهربائي أول	
								كهربائي ثاني	
								ميكانيكي أول	

احتياجات التدريب للمصرف الصحي

التاريخ :

محطات الرفع والشبكة

إدارة :

اسم المحطة :

أسماء الخبراء :

الصيانة

قم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولية التدريب بالشهور				أعداد المطلوب تدريبهم الآن	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بشهر					
			٢٤	١٨	١٢	٦		
							ميكانيكي ثاني	
							سائق عربية رواسب	
							عامل عادي	

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احتياجات التدريب للمعرف المحيي

التاريخ :

محطات الرفع والشبكة

ادارة :

اسم المحطة :

شبكة الانحدار والمواسير الصاعدة أسماء الخبراء :

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـساعات				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	عدد						
			٢٤	١٨	١٢	٦			
								رئيس الشبكة	
								ملاحظ ترميمات	
								ملاحظ صيانة المواسير	

DC 4-cc WW

2020

احتياجات تدريب الكرف الصحي

التاريخ :

ادارة : محطات الرقع والشبكة

اسم المحطة :

قسم : شبكة الانحدار والمواسير الصاعدة أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بشهر						
			٢٤	١٨	١٢	٦			
								بناء	
								سباك	
								لحام	

احتياجات التدريب للمصرف المحمي

التاريخ :

اسم المحطة : محطة الرفع والشبكة

قسم : شبكة الانحدار والمواسير الصاعدة أسماء الخبراء :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـساعات				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	عدد						
			٢٤	١٨	١٢	٦			
								عمال	
								ملاحظ تطهير الشبكات	
								ميكانيكى آلة تسليك بالجرادل	

DC 4-ee WW

2021

احتياجات التدريب للمركز الصحي

التاريخ :

إدارة : محطات الرفق والشبكة

اسم المحطة :

قسم : شبكة الانحدار والمواسير الصاعدة أسماء الخبراء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالـشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـعد						
			٢٤	١٨	١٢	٦			
								سائق ناقلورى	
								مهني تشغيل ناقلورى	
								عامل	

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احتياجات التدريب للمركز الصحي

التاريخ :

ادارة : محطات الرفع والشبكة

اسم المحطة :

قسم : امتدادات مواسير الشبكة أسماء الخبثاء :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشمهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للتوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								ملاحظ امتدادات	
								ملاحظ توصيلات مباني	
								سائق سيارة نقل مهمات	

احتياجات التدريب للمصرف الصحي

التاريخ :

محطات الرفع والشبكة

ادارة :

اسم المحطة :

أسماء الخبراء :

امتدادات مواسير الشبكة

قسم :

موقع المحطة :

اسم مدير المحطة أو معطي البيان :

وصف التدريب المطلوب	نوع التدريب		أولوية التدريب بالشهور				الآن	أعداد المطلوب تدريبهم	اسم المهنة أو العمل القائم به
	تدريب نظري	تدريب عملي للوظيفة	بـ						
			٢٤	١٨	١٢	٦			
								سائق سيارة اصلاحات	
								عمال	

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: DIRECTOR
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
DIRECTOR									
ADMINIST. ASSISTANT.									
CLERK/TYPIST									

2/10/10

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: CUSTOMER SERVICES
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER CUSTOMER SERVICES (CONNECT'NS)									
ADMIN. ASSIST.									
CLERK/TYPIST									

DC 4-b WW

2/12

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : FOLLOW-UP
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER FOLLOW-UP									
INSPECTOR, FOLLOW UP									
TECHNICIAN, FOLLOW-UP									
TECHNICIANS									
CLERK/TYPIST									

2063

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: LEGAL AFFAIRS
 DIV. :
 SEC. :

YEAP:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER, LEGAL AFFAIRS									
ADMIN. ASSISTANT									
CLERK/TYPIST									

2/10/11

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: PERSONNEL AFFAIRS
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER, PERSONNEL									
CLERK, PERSONNEL									
CLERK, PAYROLL									
CLERK/TYPIST									

279

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: FINANCE
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER, FINANCE									
ACCOUNTANT									
BOOKEEPER									
BUDGET AND ACCOUNTING CLERK									
CLERK PAYROLL									
CLERK/TYPIST									

271

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: CONTRACTING AND PURCHASING
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER, CONTRACTING AND PURCHASING									
ADMIN. ASST									
CONTRACTING SPECIALIST									
CLERK, PURCHASING RECORDS									
CLERK/TYPIST									

2/2

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: TRAINING
 DIV. :
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER TRAINING									
TRAINING SPECIALIST, OPERATIONS									
TRAINING SPECIALIST, MAINTENANCE									
CLERK/TYPIST									
DRAFTSMAN									

273

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: NEW PROJECTS
 DIV. : FACILITY RECORDS
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
MANAGER, PROJECT RECORDS									
PLANNING ENGINEER									

214

TRAINING REQUIREMENTS - WASTE WATER PLANTS

YEAR:

PLANT :-----
 LOCATION :-----

DEPT.: TREATMENT
 DIV. :
 SEC. : OPERATIONS

DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
SUPERVISOR, TREATMENT PLANT									
SUPERVISOR, SCREENING AND GRIT REMOVAL									
SUPERVISOR, PRIMARY SETTLING									
SUPERVISOR AERATION SYSTEMS									
SUPERVISOR, DRYING BEDS									
LABORER OF DRYING BEDS									
SUPERVISOR CHLORINATION									
MECHANIC FOR TREATED WATER									
MECHANIC FOR SLUDGE PUMPS									
ELECT. RETURNBACK WATER									

200

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : TREATMENT PROCESSES DATE: _____
 DIV. : _____
 SEC. : MAINTENANCE

YEAR: _____
 INTERVIEW TEAM : _____
 INTERVIEWEE: _____

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
SUPERVISOR, PLANT MAINTENANCE & TRANSPORT									
FOREMAN MECHANICAL MAINTENANCE									
FOREMAN ELECT. MAINTENANCE									
MECHANIC I, MAINTENANCE									
MECHANIC II, MAINTENANCE									
ELECT. I									
ELECT II									
MECHANIC, AUTOMOTIVE EQUIP. MECHANIC									
GARDENER									
WATCHMAN									

275

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : TREATMENT
 DIV. :
 SEC. : OPERATIONS

DATE: YEAR:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
ELECT. SLUDGE PUMPS									
ELECT. OPERATOR OF SCRAPER									
DRIVER									

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277

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT.: TREATMENT OPERATIONS
 DIV. : MAINTENANCE
 SEC. :

DATE: YEAR:

INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
TELEPHONE OPERATOR									
DRIVER									
LABORER									

23

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT :-----
 LOCATION :-----

DEPT.: TREATMENT
 DIV. : LABORATORY
 SEC. :

DATE: YEAR:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
CHIEF CHEMIST									
ASSIST CHEMIST									
LAB TECHNICIAN									
LAB JANITOR									
LABORER									

27

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : PUMPING STATION
 DIV. : OPEFATION
 SEC. :

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
SHIFT SUPERVISOR									
PUMP STATION, MECHANIC									
PUMP STATION, ELECTRICIAN									
LABORER									

250

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : PUMPING STATION
 DIV. :
 SEC. : MAINTENANCE

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUE- ST- ING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
SUPERVISOR, PUMPING STATION MAINTENANCE									
FOREMAN, ELECT. MAINTENANCE									
FOREMAN, MECH. MAINTENANCE									
ELECT. I , PUMP STATION									
ELECT. II, PUMP STATION									
MECHNIC I, PUMP STATION									
MECHANIC II, PUMP STATION									
TRUCK DRIVER, CLEANING & COLLECTION									
LABORER									

281

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. : PUMP STATION
 DIV. :
 SEC. : FORCE MAINS AND GRAVITY
 SEWAGE MAINTENANCE

YEAR:
 DATE:
 INTERVIEW TEAM :
 INTERVIEWEE:

JOB TITLE	NUMBER REQUESTING TRAINING	PRIORITY FOR TRAINING					TYPE OF TRAINING		DESCRIPTION OF TRAINING REQUIRED
		0	6	12	18	24	FORMAL	OJT	
SUPERVISOR, PIPELINE MAINTENANCE									
SUPERVISOR, SEWER REPAIR									
FOREMAN, MAINS AND SEWE MAINTENANCE									
MANSON									
PIPEFITTER									
WELDER									
LABORER									
SUPERVISOR, SEWER CLEANING									

2011

TRAINING REQUIREMENTS - WASTE WATER PLANTS

PLANT : -----
 LOCATION : -----

DEPT. :
 DIV. :
 SEC. : SEWER CONNECTIONS

YEAR :
 DATE :
 INTERVIEW TEAM :
 INTERVIEWEE :

JOB TITLE	NUMBER REQUESTING TRAIN'G	PRIORITY FOR TRAIN'G					TYPE OF TRAIN'G		DESCRIPTION OF TRAIN'G REQUIRED
		0	6	12	18	24	FORMAL	OJT	
SUPERVISOR SEWER CONNECTIONS									
SUPERVISOR, HOUSE BUILDING CONNECTIONS									
BACKHOE OPERATOR, NEW CONNECTIONS									
BACKHOE OPERATOR, REPAIRS									
LABORER									

253

CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Projected Manpower Needs (10 Year)

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To determine the estimated manpower quantity requirements of a Water or Wastewater Plant by job categories for the next ten years.

INSTRUCTION: Listed below are the steps to be followed to accurately determine the specific manpower needs of a plant in the future.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. Explain that this form require information based on Job Groups instead of specific occupations. Samples are attached.

Step 3. Explain that this is a ten year projection. The first 5 years are treated independently and years 6-10 are dealt with as lump sum.

Step 4. The interviewee should be encouraged to justify his future manpower needs in the Remarks section.

COMMENTS: The key factor in determining changes in manning levels is the completion of expansions to current plants and construction of new plants. Manning factors related to facilities are not available to local plant managers who must rely on NOPWASD to determine quantities of additional manpower for expansions and new plants. Therefore, the NOPWASD system for assigning manning levels should be evaluated and the CDT should received figures directly from within NOPWASD for the purposes of manpower projections linked to construction completions.

The data provided by plant managers usually reflected a combination of filling shortages and receiving additional surpluses. These data are valuable, but represent a small percentage of the increased manning attributable to construction completions.

تدريجات القوى العاملة لعشر سنوات (محطة مياه)

اسم المحطة : ادارة : التاريخ :
 موقع المحطة : قسم : اسم مدير المحطة أو معطي البيان :
 أسماء الخبراء :

ملاحظات (مشروعات جديدة ، توسعات ، الخ)	العدد المطلوب لكل سنة					الفئة
	١٩٩٥	١٩٩٤	١٩٩٣	١٩٩٢	١٩٩١	
						ادارة عليا
						مهندسين
						كيميائيين
						مفتش / مشرف
						تقني / فني
						رسام
						مشغل مياه
						محاسبين
						اخصائي أول تدريب أفراد
						اداري
						اخصائي امداد وتموين / خازن
						قانوني
						اقتصادي /
						كاتب
						عامل عادي
						جملة

PLANT: -----
 LOCATION: -----

10-YEAR MANPOWER PROJECTION
 TYPE: WATER

DATE: -----
 INTERVIEWEE: -----
 INTERVIEW TEAM: -----

JOB GROUP	NUMBER REQUIRED BY YEAR						REMARKS (NEW PROJ. S, PLANTS, EXPANS.)
	1990	1991	1992	1993	1994	1995 2000	
TOP MANAGEMENT							
ENGINEER							
CHEMIST							
SUPT/INSPECTOR							
TECHNICIAN							
DRAFTSMAN							
WATER PUMP OPERATOR							
ACCOUNTANT							
PERSONNEL AND TRAINING OFFICER							
ADMINISTRATION OFFICER							
SUPPLIES OFFICER/ STOREMAN							
LEGAL OFFICER							
ECONOMIST							
CLERCK							
LABORER							
TOTAL							

251

PLANT: -----
LOCATION: -----

10-YEAR MANPOWER PROJECTION
TYPE: WATER

DATE: -----
INTERVIEWEE: -----
INTERVIEW TEAM: -----

JOB GROUP	NUMBER REQUIRED BY YEAR						REMARKS (NEW PROJ.S, PLANTS, EXPANS.)
	1990	1991	1992	1993	1994	1995 2000	
SENIOR SUPERVISOR							
SUPERVISOR/FOLLOW-UP							
MECHANIC I & II							
ELECTRICIANS I & II							
TOTAL							

288

المدته: _____

السكن: _____

تقديرات القوى العاملة لمشروع سنوات

الشارح: _____

مدير المحط او معطي البيانات: _____

فريق الخبراء: _____

(صرف صحي)

ملاحظات (مشروعات جديده ، توسعات ٠٠٠ الخ)	عدد البطون لكل سنة					الفئة
	١٩٩٥	١٩٩٤	١٩٩٣	١٩٩٢	١٩٩١	
						مدير
						مهندس
						كبير مشرفين
						مشرف / ملاحظ
						كماش / ميكانيكي / فني منزل
						قانوني
						محاسب / كاتب
						اخصائي امداد و تعوين
						افراد / تدريب
						ممثل محطه ضخ
						ميكانيكي
						كهربائي
						سائق معدات ثقيله
						حرفي (براد - سباك - لحام - الخ)
						كاتب
						فني (ماح - رسام)
						خفيير
						تأمل تادي
						الجنس

PLANT: -----
 LOCATION: -----

10 YEAR MANPOWER PROJE...
 TYPE: WASTEWATER

DATE: -----
 INTERVIEWEE: -----
 INTERVIEWER: -----

JOB GROUP	NUMBER REQUIRED BY YEAR						REMARKS (NEW PROJECTS, PLANTS, EXPANSIONS, ...ETC.)
	1990	1991	1992	1993	1994	1995 2000	
MANAGEMENT							
ENGINEER							
SENIOR SUPERVISOR							
SUPERVISOR/FOREMAN SPECIALIST							
CHEMIST/BACTERIOLOGIST/LAB TECH.							
LEGAL							
ACCOUNTANT/BOOKER PERSON							
PURCHASING/CONTRACTING/STOREKEEPER							
PERSONNEL/TRAINING							
PUMP STATION							
PUMP STATION OPERATOR							
MECHANIC (I & II)							
ELECTRICIAN (I & II)							
HEAVY EQUIPMENT OPERATOR							
CRAFTSMAN (WELDER/PLUMBER, FITER, ETC.)							
CLERICAL							
TECH. (DRAFTSMEN, SURVEYOR)							
WATCHMAN							
LABORER							
TOTALS							

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CENTRAL DEPARTMENT FOR TRAINING DATA COLLECTION PROCEDURE

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Entry Level Skills

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To identify the Entry Level Skills by job categories for new employees joining the sector.

INSTRUCTION: Listed below are the steps to be followed to collect data concerning Entry Level Skills.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. No special instructions required. Samples are attached.

COMMENTS: This form is very simple and straight forward. Managers tended to respond with what was required by governmental education standards and avoided identifying specific skills to be developed during pre-employment training at the secondary level for technicians and the at university level for engineers, administrators and managers.

بيان مؤهلات الالتحاق بالوظائف

اسم المحطة : انارة : التاريخ :
 موقع المحطة : تم : اسم مدير المحطة أو معطي البيان :
 أسماء لخبراء :

ملاحظات	مدتالدراسة بعدالقانون العامه	رخصى قيادة المعدة السيارة	شهادات الخبرة والرخصى	سنوات الخبرة	مستوى التعليم	اجادة اللغة العربية	الوظيفة
							مهندس
							كيمياوى
							قانوني
							محاسب
							خازن
							فني
							ميكانيكي
							كهربائي
							حرفي
							سائق
							كاتب
							رجل أمن
							عامل

MINIMUM SKILL LEVELS FOR JOB ENTRY

PLANT:-----
 LOCATION:-----

INTERVIEWEE:-----
 INTERVIEW TEAM:-----

DATE:-----

JOB CATEGORY	ARABIC LITERACY	EDUC. LEVEL	EXPERIENCE	CERTIFICAT'N & LICENSING	VEH.OPER. LICENSE	VOC. TR'NG POST SEC.	REMARKS
ENGINEER							
CHEMIST							
LEGAL							
ACCOUNTANT							
STOREKEEPER							
TECHNICIAN							
MECHANIC							
ELECTRICIAN							
CRAFTSMAN							
DRIVER							
CLERK							
WATCHMAN							
LABORER							

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**CENTRAL DEPARTMENT FOR TRAINING
DATA COLLECTION PROCEDURE**

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Personnel Practices Review

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To determine the criticality of specific sector problems which were documented in previous studies to the management of individual Water and Wastewater Plants.

INSTRUCTION: Listed below are the steps to be followed to conduct an on-site Personnel Practices Review.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. Explain that this is a time consuming form to complete and will require considerable discussion. Samples are attached.

Step 3. Explain the use of the Addendum form which requires the completion of follow-up questions for all issues rated highly critical.

COMMENTS: The scope of subjects covered by this form can be overwhelming. A specialized personnel practices assessment which would

allow adequate time for full discussion of each major issue should be initiated in the future.

استقضاء اجراءات شئون العاملين

- ١ - الادارة
- ٢ - التشغيل والصيانة
- ٣ - الانتاجية
- ٤ - التدريب
- ٥ - تطوير المسار العملي
- ٦ - تحسين كفاءة المدربين
- ٧ - الانتقاء والتعيين في الوظائف
- ٨ - العجز
- ٩ - الفائض
- ١٠ - معيار الانهاء والتقييم
- ١١ - الترقية
- ١٢ - الرواتب وهيكل الاجور
- ١٣ - الامتيازات
- ١٤ - الحوافز والمكافآت
- ١٥ - الانضباط والاجراءات التأديبية

استقصاء اجراءات شؤون العاملين

فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به •
المطلوب هو أن تتفضل بقراعتها ووضع علامة (✓) في الخانة التي ترى أنها تمثل اجابتك على السؤال بحيث يتضح من ذلك
ما اذا كانت هذه المشكلة :

- ذات خطورة قصوى
- متوسطة الخطورة
- غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
ضئيلة أو منعدمة	متوسطة	قصوى	
			<p>١ - <u>الادارة</u> :</p> <ul style="list-style-type: none">١/١ تصنيف مسؤوليات المديرين والمشرفين •٢/١ منح المديرين المزيد من السلطات وتحميلهم المزيد من المسؤوليات ، مثل :<ul style="list-style-type: none">- الترقيات- اتخاذ القرارات بشأن تخطيط المسار العملي- اعتماد جداول العمل وتعديلها ، والاجازات والعمل الاضافي

استتصاء اجراءات شئون العاملين

فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به .
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- متوسطة الخطورة
- غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
ضئيلة أو منعقدة	متوسطة	قصوى	
			<p>١ - <u>الإدارة</u> :</p> <p>١/١ تصنيف مسؤوليات المديرين والمشرفين .</p> <p>٢/١ منح المديرين المزيد من السلطات وتحميلهم المزيد من المسؤوليات ، مثل :</p> <ul style="list-style-type: none">— الترقيات— اتخاذ القرارات بشأن تخطيط المسار العملي— اعتماد جداول العمل وتعديلها ، والإجازات والعمل :لاضافي

٢٤٧

استقصاء اجراءات شؤن العاملين

- فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به •
المطلوب هو أن تتفضل بقراءتها ووضع علامة (✓) في الخانة التي ترى أنها تمثل اجابتك على السؤال بحيث يتضح من ذلك ما اذا كانت هذه المشكلة :

- ذات خطورة قصوى
— متوسطة الخطورة
— غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			<p>٢ - <u>التشغيل والصيانة</u> :</p> <p>١/٢ انشاء برنامج فعال للصيانة الوقائية والالتزام باستمراره وفعاليتها الحد من مشكلات الصيانة غير المخططة أو غير المجدولة •</p> <p>٢/٢ توفير قطع الغيار عند الحاجة اليها •</p> <p>٣/٢ الحد من تلف المعدات وتعطلها • ومن اصابات الأفراد •</p>

استقصاء اجراءات شؤون العاملين

- فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به •
المطلوب هو أن تتفضل بقراءتها ووضع علامة (/) في الخانة التي ترى أنها تمثل اجابتك على السؤال بحيث يتضح من ذلك ما اذا كانت هذه المشكلة :

- ذات خطورة قصوى
— متوسطة الخطورة
— غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قوى	متوسطة	ضئيلة أو منعدمة	
			<p>٣ - الانتاجية :</p> <p>١/٣ المحافظة على انتاج المرفق وفعاليتته بالرغم من ارتفاع نسبة الغياب •</p> <p>٢/٣ تحسين بيئة العمل •</p> <p>٣/٣ علاج ظاهرة ارهاق العاملين الذين يشتغلون بأعمال أخرى •</p> <p>٤/٣ تكوين شعور بالانتماء والاعتزاز بالعمل ورفع الروح المعنوية •</p> <p>٥/٣ علاج ظاهرة عدم الرضا عن العمل •</p>

استقصاء اجراءات شؤون العاملين

فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به .
المطلوب هو أن تتفضل بقراءتها ووضع علامة (✓) في الخانة التي ترى أنها تمثل اجابتك على السؤال بحيث يتضح من ذلك ما اذا كانت هذه المشكلة :

— ذات خطورة قصوى

— متوسطة الخطورة

— غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصى	متوسطة	ضئيلة أو منعدمة	
			<p>٤ - <u>التدريب</u> :</p> <p>١/٤ تحديد الاحتياجات للتدريب لكل وظيفة .</p> <p>٢/٤ الأخذ بنظام التراخيص ومواصفات الوظائف .</p> <p>٣/٤ توفير مطبوعات التدريب لخدمة جهود التدريب داخل العمل .</p> <p>٤/٤ تحديد برامج التدريب الخارجية التي تناسب احتياجات العاملين بالقطاع والمشرفين والمديرين .</p> <p>٥/٤ عقد برامج لاعادة المدربين .</p> <p>٦/٤ عقد برامج التدريب للفنيين والمهندسين في المعاهد ومنشآت التدريب لرفع المستوى وتحسين الأداء .</p> <p>٧/٤ ايفاد البعثات التدريبية الى الولايات المتحدة ودول أوروبا لفترات طويلة وقصيرة حسب الحاجة .</p> <p>كم عدد من أوفدوا من العاملين في المرفق ؟</p> <p>٨/٤ صعوبة ايفاد الأفراد للتدريب بسبب عدم القدرة على الاستغناء عن كفاءاتهم ولزومها لاستمرار العمل .</p>

استقصاء اجراءات شئون العاملين

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- ذات خطورة قصوى
— متوسطة الخطورة
— غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			٥ - <u>تطوير المسار العملي :</u> ١/٥ تحديد مراحل وخطوات التقدم والتطور بالنسبة لكل وظيفة أو مهنة • ٢/٥ تطبيق نظام منح شهادات اعتماد أو تراخيص مهنية لمختلف الوظائف ذات الأهمية •

استقصاء اجراءات شؤون العاملين

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- ذات خطورة قصوى
- متوسطة الخطورة
- غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصور	متوسطة	ضئيلة أو منعدمة	
			<p>٦ - <u>تحسين كفاءة المديرين والمشرفين :</u></p> <p>١/٦ تزويد المديرين والمشرفين بالبرامج التي تكفل انماء قدراتهم كقادة .</p> <p>٢/٦ تمكينهم من استخدام مهارات جديدة ومتطورة لتدريب العاملين تحت قيادتهم ، وتبادل ارجاع الاثر ، والتحفيز وممارسة مختلف الأساليب تخطيط العمل .</p>

استقصاء اجراءات شؤون العاملين

فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرئق الذي تعمل به .
المطلوب هو أن تتفضل بقراءتها ووضع علامة (✓) في الخانة التي ترى أنها تحل اجابتك على السؤال بحيث يتضح من ذلك
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- متوسطة الخطورة
- غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			<p>٧ - <u>الانتقاء والتعيين في الوظائف :</u></p> <p>١/٧ انتقاء أفراد أكفاء لملء الوظائف التي تخلو بسبب تقاعد القدامى .</p> <p>٢/٧ تحقيق المزيد من انشغال الادارة بجهود الانتقاء . والمزيد من ادراك حقائق سوق العمل والتعامل معه . والحصول على التعاون من جانب أسواق العمل المحلية .</p> <p>٣/٧ العناية بانتقاء العاملين الجدد والوثوق من كفاءتهم قبل تعيينهم .</p> <p>٤/٧ اجتذاب العناصر الممتازة من الخريجين ومن بين العاملين أنفسهم .</p> <p>٥/٧ التحقق من أن اختبارات الانتقاء تعطي النتائج التي تمكن من تحقيق التوافق بين الأفراد ووظائفهم .</p>

استتقاء اجراءات شئون العاملين

- فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو العرق الذي تعمل به .
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- ذات خطورة قصوى
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 - غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			<p>٨ - العجز ز :</p> <p>١ / ٨ التغلب على مشكلات النقص في وظائف الادارة والوظائف الفنية ذات المهارة العالية .</p> <p>٢ / ٨ جعل جداول الوظائف أكثر واقعية ومناسبة للاحتياجات الفعلية .</p> <p>٣ / ٨ خلق الحوافز التي تجعل الأفراد أكثر قابلية للاشتغال بالانعمال التي هي عادة مكروهة أو غير مرغوبة .</p>

استتضاء اجراءات شؤون العاملين

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- ذات خطورة قصوى
 - متوسطة الخطورة
 - غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	نشيلة أو منعدمة	
			9 - الفئائى : 1 / 9 عدم التصرف في فائى العمالة قبل التأكد من اعداد الأفراد لأعمالهم . 2 / 9 نقل اللافراد الزائدين عن الحاجة الى قطاعات عمل أخرى . 3 / 9 الاسراف في توزيع الأفراد على وظائف التشغيل والصيانة .

استتقاء اجراءات شؤون العاملين

- فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو العرفق الذي تعمل به •
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— متوسطة الخطورة
— غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			<p>١٠- <u>معايير الأداء والتقييم :</u></p> <p>١/١٠ العناية بتسجيل تقييم أداء الأفراد بقصد التعرف على الاكفاء منهم • ٢/١٠ ارساء معايير لتقييم الأفراد والجماعات • ٣/١٠ استخدام هذه المعايير في تحديد الحاجة الى التدريب • ٤/١٠ تعويد المشرفين وتدريبهم على تقييم مروضيهم والابلاغ بنتائج مفيدة •</p>

استقصاء اجراءات شئون العاملين

فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به •
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درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			11- الترقية : 1/11 اللجوء الى نظام الترتي القائم على الكفاءة وليس مجرد الاقدمية • 2/11 العاملون الاكفاء تتأخر ترقياتهم بسبب بطء حركية العمالة وطول الفترات الزمنية في الدرجات الوظيفية •

استقصاء اجراءات شؤون العاملين

فيما يلي قائمة بمشكلات التدريب التي تتمثل في المحطة أو المرفق الذي تعمل به .
المطلوب هو أن تتفضل بقراءتها ووضع علامة (/) في الخانة التي ترى أنها تمثل اجابتك على السؤال بحيث يتضح من ذلك ما اذا كانت هذه المشكلة :

- ذات خطورة قصوى
- متوسطة الخطورة
- غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
ضئيلة أو منعدمة	متوسطة	قصوى	
			<p>١٢- الرواتب وهيكل الأجور :</p> <p>هل توجد مثل هذه المشكلات ؟</p> <p>١/١٢ هل يلقي المزيد من المسؤوليات على العاملين دون تزويدهم بأجور تناسب مراكزهم الجديدة ؟</p> <p>٢/١٢ هل تجتنب الصناعات الأخرى العناصر الممتازة بما تمنحه من أجور أفضل ؟</p> <p>٣/١٢ هل توجد تناقضات في نظام الأجور الحالي ؟ مثل :</p> <p>١/٣/١٢ بعض الأشغال المنخفضة المهارة يمنح القائمون بها أجورا عالية نسبيا .</p> <p>٢/٣/١٢ العمل الإضافي هو ما يزيد على ٦٠ ساعة وتقتصر مكافأته على ١٥٪ من الأجر .</p> <p>٣/٣/١٢ النهايات القصوى للرواتب تسبب التوقف عند حد معين لعاملين أكفاء وقدماء .</p> <p>٤/١٢ نظام الأجور في مجموعه لا يتسم بالعدالة . لا يرتبط بالأداء .</p> <p>٥/١٢ العاملون الأقل كفاءة لديهم فائز في الوقت بينما الأكفاء يظلمون بسبب صعوبة وتعقيد أعمالهم وضخامة المطلوب منهم .</p>

استقصاء اجراءات شئون العاملين

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درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قصوى	متوسطة	ضئيلة أو منعدمة	
			<p>١٢- الامتيازات :</p> <p>قد تتخذ أشكالاً غير الاجر ، مثلا :</p> <ul style="list-style-type: none">- الاسكان- الرعاية الصحية- التأمين على الحياة- معاشات التقاعد

استتقاء اجراءات شئون العاطلين

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درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قوى	متوسطة	ثييلة أو منعدمة	
			<p>١٤- <u>الحوافز والمكافآت</u> :</p> <p>هل هناك مشكلات كهذه :</p> <p>١/١٤ لا توجد الوسيلة للمكافأة على حسن الأداء .</p> <p>٢/١٤ الحوافز فقدت فاعليتها وأصبحت جزءا من الراتب .</p> <p>٣/١٤ العارلون في ظروف قاسية أو مناطق نائية لا ينالون التعويض الكافي عن ذلك .</p> <p>٤/١٤ نظام الحوافز لا يحقق الاستفادة من العناصر الممتازة .</p> <p>٥/١٤ الحوافز تمنح على أساس فردي أو جماعي بينما العكس قد يكون أكبر أثرا .</p>

استقصاء اجراءات شئون العمالين

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— غير ذات أهمية كبيرة أو بلا أهمية

درجة الخطورة (ضع علامة واحدة فقط)			المشكلات
قسي	متوسطة	خفيفة أو منعدمة	
			<p>١٥- <u>الانضباط والاجراءات التأديبية</u> :</p> <p>هل هناك مشكلات بشأن ؟</p> <p>١/١٥ وجود المبررات والأدلة التي تمكن من اعفاء من تكرر منهم المخالفات .</p> <p>٢/١٥ مجازاة المخطئين والمقصرين .</p>

ملحق

لاستقصاء اجراءات شئون العاملين

اشرح فيما يلي الاسباب التي جعلتك تعتبر بعض المشكلات ذات خطورة أو أهمية قصوى ، وما الذي

توصي باتخاذها لعلاج هذه المشكلات ؟

— المشكلة رقم

— وصف المشكلة

— لماذا هي خطيرة ؟ وما الصعوبات التي تنشأ عن وجودها (صف باختصار) ؟

— ما هي الحلول التي توصي بها ؟

PERSONNEL PRACTICES QUESTIONNAIRE

MANAGEMENT

OPERATIONS AND MAINTENANCE

PRODUCTIVITY

TRAINING

CAREER DEVELOPMENT

MANAGER/SUPERVISOR DEVELOPMENT

RECRUITMENT

SHORTAGES

SURPLUS

PERFORMANCE STANDARDS AND EVALUATION

PROMOTION

SALARY AND PAY GRADES

BENEFITS

INCENTIVES AND BONUSES

DISCIPLINE AND TERMINATION

A. MANAGEMENT ISSUES

PROBLEMS

1. CLARIFYING THE RESPONSIBILITIES OF MANAGERS AND SUPERVISORS
2. GIVING MANAGERS MORE RESPONSIBILITY SUCH AS ;
 - A. PROMOTIONS
 - B. CAREER DEVELOPMENT DECISIONS
 - C. APPROVING WORK SCHEDULES, SHIFT WORK, LEAVES, OVERTIME
....ETC.

B. O & M

PROBLEMS

1. KEEPING AN EFFECTIVE PREVENTIVE MAINTENANCE PROGRAM GOING?
REDUCING UNSCHEDULED MAINTENANCE PROBLEMS?
2. GETTING SPARE PARTS WHEN NEEDED ?
3. REDUCING DAMAGES TO EQUIPMENT OR INJURY TO PEOPLE ?

C. PRODUCTIVITY

PROBLEMS

1. MONITORING PLANT EFFECTIVENESS IN SPITE OF HIGH ABSENTEEISM?
2. IMPROVING ENVIRONMENTAL CONDITIONS AT WORK ?
3. DEALING WITH WORKERS WHO ARE TOO TIRED FROM SECOND JOB ?
4. DEVELOPING A SENSE OF PRIDE IN WORK/WORKER'S MORALE ?
5. DEALING WITH WORKER DISSATISFACTION WITH JOB.

D. TRAINING

PROBLEM

1. DETERMINING THE SPECIFIC TRAINING IN NEEDS OF EACH PLANT JOB.
2. CERTIFYING/LICENSING OF EMPLOYEE ON SPECIFIC SKILLS/JOBS.
3. GETTING ACCESS TO TRAINING MANUALS IN ORDER TO CONDUCT EFFECTIVE OJT PROGRAMS
4. FINDING TRAINING PROGRAMS SUITABLE FOR THE NEEDS OF W/WW EMPLOYEES, SUPERVISORS AND MANAGERS
5. ENROLLING EMPLOYEES IN TRAIN-THE-TRAINER PROGRAMS.
6. ENROLLING SKILLED EXPERIENCED TECHNICIANS AND GRADUATE ENGINEERS IN W/WW SPECIFIC CONTINUING EDUCATION/VOCATIONAL PROGRAMS.
7. SPARING PEOPLE OFF THE JOB TO GO TO TRAINING PROGRAMS (DUE TO SKILL SHORTAGES).
8. SENDING PEOPLE OVERSEAS (US, UK, ETC.) FOR LONG AND SHORT TERM TRAINING ? HOW MANY PEOPLE FROM YOUR PLANT HAVE GONE OVERSEAS FOR TRAINING IN THE LAST TWO YEARS ?

E. CAREER DEVELOPMENT

PROBLEMS

1. ESTABLISHING A CLEAR PATH OF TRAINING AND PROMOTIONS FOR EACH POSITION I.E. A WELL DEFINED CAREER PROGRESSION ?
2. USING A SYSTEM OF CERTIFYING QUALIFIED WORKERS SO THAT THEY CAN BE LICENSED FOR VARIOUS OPERATING POSITIONS ?

F. MANAGEMENT/SUPERVISION DEVELOPMENT

PROBLEMS

1. GETTING MANAGERS AND SUPERVISORS PROPERLY TRAINED AS LEADERS
2. GETTING MANAGERS AND SUPERVISORS TO USE NEW SKILLS SUCH AS COACHING, PROVIDING EMPLOYEE FEEDBACK, MOTIVATING EMPLOYEES, AND USING PROPER WORK PLANNING TECHNIQUES ?

G. RECRUITMENT

PROBLEMS

1. FINDING QUALIFIED PEOPLE IN TIME FOR THEM TO LEARN THEIR JOBS AS REPLACEMENT BEFORE WORKERS RETIRE ?
2. GETTING MORE MANAGEMENT INVOLVEMENT IN RECRUITING, GETTING RECRUITING NEEDS INTO LABOR EXCHANGE ?
3. HAVING TO ACCEPT NEW PEOPLE WITHOUT BEING ABLE TO INTERVIEW/SCREEN THEM ?
4. ATTRACTING QUALIFIED PEOPLE FROM THE LOCAL WORK POOL AND VOCATIONAL TRAINING CENTERS ?
5. FINDING THAT SELECTION TEST RESULTS AND STATED QUALIFICATIONS DO NOT MATCH THE PERFORMANCE REQUIRED OF NEW WORKERS ?

H. SHORTAGES

PROBLEM

1. OVERCOMING SHORTAGES IN MANAGEMENT AND SKILLED TECHNICIANS, AND CRAFTSMEN.
2. ESTABLISHING MANNING LEVELS CONSISTENT WITH THE ACTUAL NEEDS OF THE PLANT.
3. ASSIGNING PEOPLE TO THE DISTRIBUTION SYSTEMS AND OTHER UNDEVISABLE JOBS.

I. SURPLUS

PROBLEM

1. HAVING TO USE PEOPLE IN JOBS THEY ARE NOT TRAINED FOR BECAUSE YOU HAVE SURPLUS WORKERS ?
2. TRANSFERRING SURPLUS WORKERS TO OTHER SECTORS OR LEAVING UNNEEDED POSITIONS EMPTY WHEN PEOPLE DEPART ?
3. HAVING TOO MANY PEOPLE FOR PLANT O & M ?

J. PERFORMANCE STANDARDS AND EVALUATIONS

PROBLEM

1. USING PERFORMANCE REVIEWS AS A METHOD OF IMPROVING INDIVIDUAL PERFORMANCE AND IDENTIFYING PEOPLE WITH POTENTIAL.
2. SETTING PERFORMANCE STANDARDS FOR GROUP AND INDIVIDUAL JOBS
3. USING PERFORMANCE REVIEWS TO DETERMINE TRAINING NEEDS
4. GETTING SUPERVISORS TO RENDER OBJECTIVE PERFORMANCE EVALUATIONS OF EMPLOYEES AND TO COUNSEL THEM EFFECTIVELY.

K. PROMOTION

PROBLEM

1. PROMOTING PEOPLE BASED ON PERFORMANCE VS. OTHER FACTORS SUCH AS SENIORITY, AND CURRENT POSITION.
2. RETAINING GOOD PEOPLE DUE TO THE LONG TIME PERIODS BETWEEN PROMOTIONS.

L. SALARY AND PAY GRADES

PROBLEMS

1. GIVING PEOPLE MORE RESPONSIBILITIES WITHOUT BEING ABLE TO PROVIDE THEM WITH MORE PAY.
2. LOSING PEOPLE TO BETTER PAYING JOBS SUCH AS THE CONSTRUCTION INDUSTRY.
3. USING THE PRESENT PAY SCALES AND GRADE STRUCTURES ? FOR EXAMPLE:
 - A. SOME JOBS WITH LESS SKILL REQUIREMENTS GET MORE PAY THAN SOME WITH HIGHER SKILLS.
 - B. OVERTIME REQUIRES MORE THAN 60 HOURS AND IS LIMITED TO 15% OF SALARY.

- C. NEED TO PROVIDE APPROPRIATE COMPENSATIONS AFTER THEY REACH SALARY LIMIT. ALSO, LENGTH OF TIME (15 - 20 YEARS) TO REACH LIMIT.
- 4. USING PAY SCALES AND GRADES THAT UNFAIR TO THE BETTER WORKERS, I.E. THEY ARE NOT BASED ON PERFORMANCE.
- 5. PROMOTING GOOD PERFORMANCE BECAUSE LESS EFFECTIVE WORKERS HAVE MORE TIME/SENIORITY ?

M. BENEFITS

PROBLEM

PROVIDING BENEFITS WHICH ARE EFFECTIVE TO RETAIN EMPLOYEES.
 HOUSING
 MEDICAL
 LIFE INCREASES
 COMPETITIVE
 PENSION/RETIREMENT

N. INCENTIVES/BONUSES

PROBLEMS

- 1. FINDING WAYS TO REWARD GOOD PERFORMANCES ?
- 2. REWARDING WORKERS BASED ON SYSTEM-WIDE/PRODUCTIVITY/PERFORMANCE /
- 4. WORKERS WHO EXPECT AUTOMATIC BONUSES RATHER THAN REWARDS BASED ON THEIR PRODUCTIVITY OR PERFORMANCE
- 5. OFFERING STEP INCREASES WITHIN A GRADE LEVEL TO ATTRACT AND RETAIN EMPLOYEES.

O. DISCIPLINE/TERMINATION

PROBLEMS

- 1. GATHERING PROPER EVIDENCE OR DOCUMENTATION TO JUSTIFY THE TERMINATION OF AN EMPLOYEE ? REPEATED OFFENDERS ;
- 2. PUNISHING EMPLOYEES WHO DO THINGS AGAINST THE LAW

ADDENDUM

PERSONNEL PRACTICES QUESTIONNAIRE

PLEASE PROVIDE REASONS FOR HAVING CHECKED CERTAIN PROBLEMS AS HIGHLY CRITICAL. ALSO YOUR RECOMMENDATIONS WOULD BE GREATLY APPRECIATED ON HOW YOU BELIEVE THE PROBLEM COULD BE SOLVED

PROBLEM NO -----

PROBLEM STATEMENT -----

WHY IS THIS A HIGHLY CRITICAL PROBLEM ? WHAT DIFFICULTIES IS IT CAUSING ? (DESCRIBE BRIEFLY)

WHAT WOULD BE YOUR RECOMMENDED SOLUTION(S) TO THIS PROBLEM ?

**CENTRAL DEPARTMENT FOR TRAINING
DATA COLLECTION PROCEDURE**

PROCEDURE NAME: Collecting Data at a Water or Wastewater Plant -
Work for the Skills Survey: Electrician, Mechanic,
Chemist Tests

REVISION NUMBER: 001

DATE: 6/89

PURPOSE: To objectively measure the current skill levels and deficiencies of three critical professional/technical job specialties: Electricians, Mechanics, and Chemists.

INSTRUCTION: Listed below are the steps to be followed to administer exams at Water and Wastewater Plants.

Step 1. Follow the general steps provided in CDT Procedure-Collecting Data at the Governorate and City Level.

Step 2. Explain the types of questions on the exam and distribute exams to plant managers who should call for volunteers to be tested. Exams are attached.

Step 3. Collect exams for grading at the Cairo office.

COMMENTS: The conditions of exam administration should be more highly controlled in the future. The testing should more occupations and participants. Plant management should be encouraged to make testing mandatory instead of the voluntary participation allowed in this initial assessment. A formal setting for testing should be identified in each plant and a member of the team should monitor the test administration.

(ميكانيكا)

اسم المحطة : ادارة : التاريخ :
المكان : قسم : مدة الخبرة في العمل :
آخر شهادة دراسية حاصل عليها : الوظيفة الحالية :

=====

س ١ : مرفق قطاع في طلمبة رأسية طاردة مركزية ، مطلوب الآتي : (انظر الصفحة التالية)

- أ - كتابة رقم الجزء من الطلمبة (القطعة) أمام اسمها .
- ب - كتابة الرقم المناسب لجزء الطلمبة أمام ما يؤديه هذا الجزء من غرض .

س ٢ : اختر الاجابة الصحيحة بكتابة كلمة صح أمام العبارة الصحيحة وكلمة خطأ أمام العبارات الغير صحيحة :

- أ - يلزم احكام مانع التسرب تماما بحيث لا تمر منه أى قطرة مياه .
- ب - يلزم عدم احكام مانع التسرب احكاما تاما ، ويجب ترك بعض المياه تتساقط منه .
- ج - لا يلزم تحضير الطلمبة اذا كانت تعمل تحت منسوب سطح المياه .
- د - يلزم تحضير الطلمبة اذا كانت تعمل تحت منسوب سطح المياه .
- هـ - ينجح تحضير الطلمبة دائما مهما كان منسوب سطح المياه أسفل الطلمبة .
- و - في الطلمبة الطاردة المركزية يزداد التصرف كلما زاد وضع الطلمبة .

س ٣ : ارسم المنحنى الذى يبين العلاقة بين التصرف والرفع في الطلمبة الطاردة المركزية ، وبين كيف يتأثر شكل المنحنى بزيادة عدد الحوارى في مروحة الطلمبة .

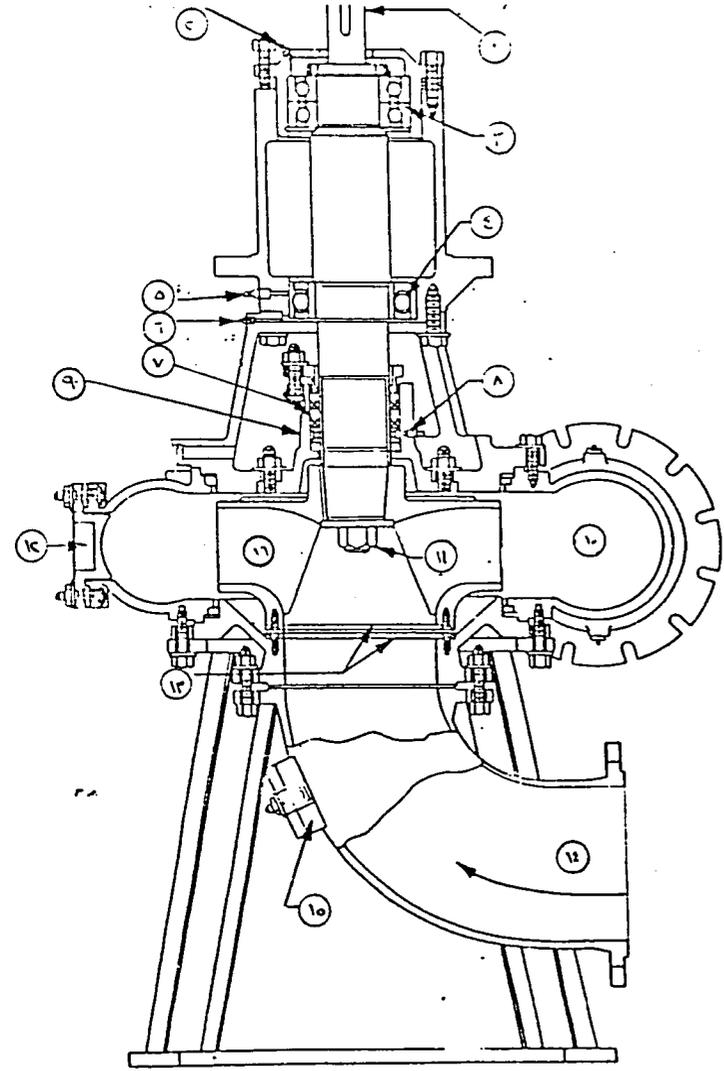
س ٤ : انكر لماذا (تهتز) الطلمبة بشكل ملحوظ عند ادارتها ومحبس الطرود موقوف ، وهل تهتز في حالة انكسار خط الطرد ، ولماذا ؟

١ - اسم الجزء رقم الجزء في الرسم

- ١ - عمود الطلمحة .
- ٢ - رولان بلي (حمل) .
- ٣ - رولان بلي (دليل) .
- ٤ - تجهيزات حقن الشحم .
- ٥ - تجهيزات انزراج الشحم الزائد .
- ٦ - فتحة الطرد .
- ٧ - فتحة السحب .
- ٨ - فتحة نظافة .
- ٩ - حلقات انزلاق .
- ١٠ - العروحة (الريشة) .
- ١١ - سامولة زيتق .
- ١٢ - الجنسند .
- ١٣ - حقن مياه الحيس .
- ١٤ - سارى مسطرة للحيس .

ب - الفرض من الجزء رقم الجزء في الرسم

- ١ - الجزء المتخصص لحمل العمود والريشة .
- ٢ - توجيه عمود الطلمحة .
- ٣ - نظافة بدن الطلمحة .
- ٤ - نظافة كوع الس .
- ٥ - تجهيزات الحيس .
- ٦ - تقليل التآكل بالاحتكاك .



تخاع راسى فى طلمحه العمبارى

٣٠٣

(٢)

س ٥ : أذكر الأسباب المحتملة لانخفاض تصريف وضغط الظلمة الفجائي •

س ٦ : أذكر الأسباب المحتملة لارتفاع درجة حرارة بدن الظلمة أثناء دورانها •

س ٧ : ما هي مظاهر سقوط مروحة الظلمة (الريشة) ، كيف يمكن ضبط المكان المناسب للمروحة داخل بدن الظلمة ؟

DC 8-c M

(٣)

س ٨ : كيف تتأثر كفاءة الطلمبة بعدد الحواري في المروحة ، ولماذا يكون عدد الحواري في طلمبات المجارى أقل منه في طلمبات مياه الشرب ؟

س ٩ : لماذا تفسر أن قطر فتحة السحب في بعض الطلمبات أكبر من قطر فتحة الطرد ؟

س ١٠ : هل تصلح الطلمبة الطاردة المركزية في ضخ الحمأة لمسافات طويلة ؟ ولماذا ؟
ما هي أنسب الطلمبات لانداء هذا الغرض ؟ ولماذا ؟

DC 8-d M

كلمة

MECHANICAL TEST DESCRIPTION

One test was developed for examining Mechanics, Qualified Mechanical Technicians and Mechanical Engineers. The test contained ten questions of different difficulty levels.

- Four questions (#2, 5, 6, 7) are written at the Mechanic level or lowest difficulty level. Mechanics score 100% if they answer these questions correctly.
- Two questions (#1, 4) are written at the Qualified Mechanical Technician level. Qualified Mechanical Technicians score 100% if they correctly answer these 2 questions plus the questions at the Mechanic level.
- The remaining four questions are written at the Engineer level. Questions 8 and 10 are theoretical and 3 and 9 are practical. Engineers must answer all ten questions correctly to score 100%.

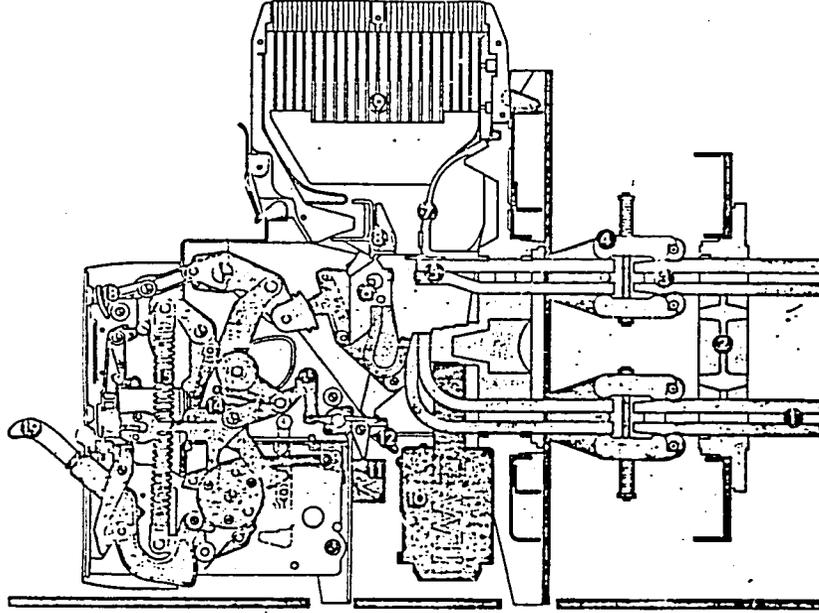
كهرباء

اسم المحطة :
المكان :
آخر شهادة دراسية حاصل عليها :
ادارة :
مدة الخبرة في العمل :
التاريخ :

س 1 : المرفق قطاع في مفتاح كهربائي اتوماتيكي ، المطلوب كتابة رقم الجزء أمام وصفه :

الرقم

وصف الجزء



- وصف الجزء
- ممتق (ريلاي) زيادة التيار
 - نقطة خمد الشرارة
 - ملاصات الشرارة المتحركة
 - ملاصات الشرارة الثابتة
 - أطراف التوصيل (ترامل)
 - القاعدة الثابتة
 - ملاصات العزل الثابتة
 - ممتق (ريلاي) الفصل عند انقطاع الجية
 - قضيب الفصل
 - تجهيزات القفل الميكانيكية
 - سوست القفل
 - أزرار القفل والفتح
 - يد شحن السوستة
 - ملاصات العزل المتحركة
 - الملاصات الرئيسية الثابتة
 - الملاصات الرئيسية المتحركة

قطاع في مفتاح كهربائي اتوماتيكي

DC 8-e E

527

- س ٢ : ضع علامة صح أمام العبارات الصحيحة وعلامة خطأ أمام العبارات الغير صحيحة التالية :
- أ - تتراوح شدة تيار بدء الادارة في المحرك الكهربائي التائيري الصغير بين ٥ الى ٨ مرات قدر تيار الحمل الكامل .
- ب - تتراوح شدة تيار بدء الادارة في المحرك الكهربائي التائيري الكبير بين ٦ الى ١٢ مرة قدر تيار الحمل الكامل .
- ج - تبدأ ادارة المحرك الكهربائي موصلا دلتا عند استخدام مفتاح شعار / دلتا لبدء تقويم المحرك .
- د - يمكن أن تصل سرعة دوران المحرك التائيري الى سرعة التزامن .
- هـ - يستخدم مفتاح شعار / دلتا لتقويم المحرك التائيري قدرة ٥ حصان .
- و - تستخدم السكينة الكهربائية الفاصلة لقطع دائرة كهربائية يسرى فيها تيار الحمل الكامل .
- ز - تعتبر المفاتيح الكهربائية الهوائية أنسب في الاستخدام بمحطات الصرف الصحي من المفاتيح الزيتية . علل لما تقول .
- ح - الامبيرومتر هو جهاز قياس شدة التيار الكهربى ، ويوصل في الدائرة على التوالي ، وهو ذو مقاومة داخلية صغيرة .
- ط - الفولتمتر هو جهاز قياس الجهد الكهربى ، ويوصل في الدائرة على التوالي ، وهو ذو مقاومة داخلية كبيرة .
- ى - الميجر هو جهاز قياس كثافة الفيض الضوئي .
- ك - يمكن عكس اتجاه دوران المحرك التائيري ثلاثة الأوجه لعكس توصيل نقطتي تغذية مع بقاء نقطة التوصيل الثالثة بمكانها بدون تغيير .

(٣)

س ٣ : مما تتكون غرفة قطع الشرارة المستخدمة في المفاتيح الكهربائية الهوائية ؟
• وضع كيف تساعد على خمد الشرارة الكهربائية .

س ٤ : أذكر بالتقريب الفترة الزمنية التي يلزم تغيير زيست المفاتيح خلالها .

س ٥ : اشرح طريقة اختيار شدة عزل المحرك الكهربائي الثلاث ، وانكر قسيم العزل المناسبة
اذا كان جهد التشغيل ٣٨٠ فولت .

DC 8-g E

(٤)

س ٦ : أذكر الأعطال المحتملة التي قد تكون سببا لعدم دوران المحرك الكهربائي الثلاث التأهيري
ذو النقص الفجائي عند توصيله لمصدر تيار كهربائي – وبدون حمل .

س ٧ : احسب شدة تيار الحمل الكامل لمحرك كهربائي ثلاث قدرته ٧ر٥ حصان يعمل من مصدر
للتيار الكهربائي جهده الاسمي ٣٨٠ فولت ، علما بأن معامل القدرة للمحرك هو ٨٧ % .

س ٨ : ما هي القيمة المقبولة لشدة عزل عينة من الزيت الكهربائي العازل يجرى اختبارها بالاعتماد
الخزفي باستخدام الجهد العالي متدرج الشدة .

(٥)

س ٩ : هل يصلح المحرك الكهربائي جهد ٣٨٠/٢٢٠ فولت للتشغيل بطريقة شعاع / دلتا
إذا كان جهد المصدر ٣٨٠ فولت ؟

ELECTRICAL TEST DESCRIPTION

One test was developed for examining Electricians, Qualified Electrical Technicians and Electrical Engineers. The test contained ten questions of different difficulty levels.

- Four questions (*1, 2, 5, 6,) are written at the level or lowest difficulty level. Electricians score 100% if they answer these questions correctly.
- Two questions (*4, 10) are written at the Qualified Electrical Technician level. Qualified Mechanical Technicians score 1000% if they correctly answer these 2 questions plus the questions at the Mechanic level.
- The remaining four questions are written at the Engineer level. Questions 7 and 9 are theoretical and 3 and 9 are practical. Engineers must answer all ten questions correctly to score 100%.

(كيمياء محطة المياه)

اسم المحطة : ادارة : التاريخ :
موقع المحطة : قسم / الوظيفة : مدة الخبرة بالعمل :
آخر شهاده حصل عليها :

س ١ :

- أ - اشرح الطريقه السليمه لاختذ عينة للتحليل الكيمائي ؟
ب- اذكر التجارب التي تجربها بالمعمل علي عينة مياه للتحليل الكيمائيه ؟

س ٢ :

- أ- احسب جرعة الشبه (جم/م^٣) المضافه الي مياه عكره تصرف ٧٢٠ م^٣ / ساعه . علما بأن تصرف
محلول الشبه المضاف ١٨٠ لتر/ ساعه بتركيز ١٠٪
ب- اشرح بايجاز دور المعمل في تتبع خطوات معالجه المياه في المرشحات و مواسير التوزيع

س٣:

اذكر الفروق التي يجب مراعاتها عند اخذ عينه للتحليل الكيميائي و اخرى للتحليل البكتريولوجي

س٤:

اذكر فيما تستعمل المواد الكيمائية الاتيه فى تنقيه مياه بغرض الاستهلاك الآدمي:

الشبه - الكربون المنشط - الجير - الكلور - الكلورامين

س٥:

اذكر طريقة تعقيم

ج- صهاريج

ب- خزان ارضي

أ- بئر جديد

(كيمياء صرف صحي)

اسم المحطه : ادارة : التاريخ :
موقع المحطه : قسم / الوظيفة : مده الخبره بالعمل :
آخر شهاده دراسيه حاصل عليها :

س ١ :

١- عرف C.O.D , B.O.D

ب- عرف PH الاكسجين الممتى كيميائيا بواسطة البرمنجنات

س ٢ :

أ - اسن تتكاثر البكتريا المؤكسده للمواد العضويه في عملية الحمأة المنشطه ؟

ب- ما هي اهمية التعامل الكيميائي في معالجة المخلفات الصناعيه ؟

س٣:

- أ - اذكر اسباب زيادة التعفن في شبكة المجارى ؟
- ب- اذكر دلالة ارتفاع نسبة النواذر الحر في السيب الخارج من احواض الترسيب الابتدائية و المرشحات و كذلك عدم ظهور الازوت الازوتي في سيب المرشحات ؟
- ج- اذكر دلالة ارتفاع نسبة الكبريتورات في المياه الخام و سيب الاحواض الابتدائية و النهائية ؟

CHEMISTS TEST DESCRIPTION

Two versions of the Chemists test were prepared and administered. One form was for water treatment chemical analysis and the other was for wastewater. Both tests evaluate the chemist's understanding of the process and the required chemical checks at various stages of treatment.

The tests used in the field were derived from the testing procedures currently used by the CDT to evaluate trainees at the end of the CDT Chemist courses.

B. CONCLUSIONS AND RECOMMENDATIONS

1. **Conclusion.** That the NOPWASD CDT requires a structured set of procedures for conducting manpower needs assessment activities and an operating budget sufficient to support on-going manpower assessments.

Recommendation. That the NOPWASD Chairman should place high priority on the need for the systematic collection and analysis of data for planning Manpower Development Programs throughout the sector.

2. **Conclusion.** That data collection within the Water and Wastewater Sector is a difficult and time consuming task. However, it should be regularly scheduled and the data collection instruments should continue to be refined.

Recommendation. That the CDT Director should review the Procedures developed for this initial Assessment to ensure that the difficulties discovered during their trial use and documented in the Comments section of each procedure are resolved in future assessments. That the CDT should identify Manpower Needs Assessment as a key function of the department and continue to upgrade the procedures in its on-going Manpower Needs Assessment effort.

3. **Conclusion.** That Water and Wastewater managers in the field are not universally cooperative with the assessment team's data collection efforts.

Recommendation. That NOPWASD should use its office to ensure that plant personnel provide all requested data to CDT assessment personnel. The CDT should develop a procedure for reporting cases of uncooperative plant managers to NOPWASD top management for their action.

CHAPTER 4

**RAW DATA REDUCTION
and
ANALYSIS PROCEDURES**

CHAPTER 4

DATA REDUCTION AND ANALYSIS PROCEDURES

A. ASSESSMENT PROCESS

1. **Data Reduction and Analysis.** As previously described in Chapter 3, the WWISP Manpower Needs Assessment was conducted in six steps: Assessment Design, Instrument Development, Data Collection, Data Reduction, Analysis, and Reporting of Findings.

In this chapter, procedures are presented which were used for the Reduction and Analysis of data collected from Governorate, City, Water Plant, Wastewater Plant, and Pump Station personnel. These procedures are included as a reference for CDT Counterparts in their future assessments. The findings of the Manpower Needs Assessment are reported in the remaining chapters of this report.

B. PROCEDURES

1. **Format.** Each procedure has two main components: Introduction and Instruction. (Descriptions of these standard procedural elements are found in Chapter 3).

2. **Data Reduction and Analysis Procedures:** This section contains the SR-4 Data Reduction and Analysis Procedures which were used to plan and conduct the WWISP Assessment.

- Entry Level Skills Reduction and Analysis
- Personnel Practices Review Reduction and Analysis
- Determination of Current Personnel Manning at the Job Level
- Determination of Current Personnel Manning at the Organizational Level
- Estimation of Personnel Manning for Other Plants in Urban Areas with 40,000 or More Population
- Determination of Personnel Manning for Each Function or Organizational Unit in Plants Not Visited
- Determining the Number of Personnel in Each Job Category within Each Organizational Unit
- Determination of Manpower Requirements for Water and Wastewater Plants Projected for 1990 - 2000

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Entry Level Skills Reduction and Analysis

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To reduce and analyze the data collected on Entry Level Skills.

INSTRUCTION: Described below is the process followed to reduce and analyze the data collected on Entry Level Skills.

Plant Managers indicated their Entry Level preferences in Literacy, Education, Experience, Licensing, Post Secondary Vocational Training, etc., for specific job categories. Their responses were summarized in a Job Category/Plant matrix separately for each Entry Level Skill. Then the matrix was summed for each Job Category. The final measure yielded for each Entry Level Skill was varied, i.e., under Arabic Literacy, the percent requiring a Good level and the percent wanting an Excellent level was determined for each Job Category.

For Experience prior to initial hire, the number of years desired by Plant Managers averaged across all plants to yield a single index for each Job Category.

For Education, the number of Plant Managers indicating preferences for Elementary, Secondary, Post Secondary, etc., was reduced to a percentage response for each Job Category.

All results were reduced to a Job Category/Entry Level Skills matrix to reflect the findings.

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Personnel Practices Review Reduction and Analysis

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To reduce and analyze the data collected from the Personnel Practices Review.

INSTRUCTION: Described below is the process followed to reduce and analyze the data collected from the Personnel Practices Review.

Plant Managers responded to approximately 65 items grouped into categories such as Management, Training, Recruitment, Shortages, Surpluses, Compensation, etc. These items represented problems they might be encountering which they rated on a 3-point continuum of Highly Critical, Moderately Critical and of Little or No Criticality. Their responses were summed and reduced to a percentage count to indicate the number responding at each level of criticality for a problem issue. This procedure was followed separately for Water and Wastewater.

Plant Managers also described problems in greater depth which they considered Highly Critical and provided their recommended solutions. In each case, the main points of their problem and solution were reported.

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Determination of Current Personnel Manning at the Job Level

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To Determine the Current Personnel Manning at the Job Level

INSTRUCTION: Described below is the process followed to determine the Current Personnel Manning at the Job Level.

A model organization was presented to Plant Managers with typical positions in each organizational unit or function. In the case of Water Treatment Plants, approximately 25 functions and 95 job titles under them were presented. They indicated the number holding each job title at their respective plants. Additional job titles were written in as necessary. The results for all 16 Plants were entered into a Functions/Job Title/Plant Matrix. This matrix reflected the number at each plant holding each job title and was summed vertically to show the total employees at each plant. The matrix was then summed horizontally to show the number holding the same job title for all plants.

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Determination of Current Personnel Manning at Organizational Level

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To determine Current Personnel Manning at the Organizational Level.

INSTRUCTION: Described below is the process followed to determine Current Personnel Manning at the Organizational Level.

Personnel manning by Job Title was grouped initially by organizational unit. Therefore, another Organization/Plant Matrix was prepared in which the number of employees was entered by Plant and by organizational unit as shown in the model organization. Sub-divisions within Treatment and Distribution also were reflected in the number of employees. This matrix was then summed horizontally to determine the Total number employed in each function, i.e., Treatment/Maintenance, Distribution/Booster Operations, etc., for all 16 Plants. Total manning was determined by summing the matrix vertically for each Plant and then verifying the grand total against the summed horizontal arrays. Then the personnel manning for each function was reduced to a percentage of the total manning for all plants. With a

total manning of 3965 found for all Water Treatment Plants, the number employed in Treatment functions, for example, equalled 42%.

A similar procedure was followed in reduction of manpower data for Wastewater Plants.

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Estimation of Personnel Manning for Other Plants in
Urban Areas with 40,000 or More Populations

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To determine an estimate of Personnel Manning for Other Plants which were not visited in Urban Areas with 40,000 or More Populations.

INSTRUCTION: Described below is the process followed to Estimate Personnel Manning for Other Plants in Urban Areas with 40,000 or More Populations.

Forty-eight Water Treatment Plants were found in urban areas with populations of 40,000 or more which were not included in the field assessment. To estimate personnel manning for these plants, results of a statistical analysis were applied from the Provincial Cities Water Supplies Project (Binnie & Partners). A statistically significant relationship had been established between design capacities and personnel manning. These data were re-run by WWISP and verified. From those data a linear equation ($Y = 35.41 + 0.4353 X$) was established. WWISP had already determined the design capacities and so was able to obtain the best predicted personnel

manning using this equation for 48 Water Treatment Plants thereby increasing the reported results to 64 Plants.

In the case of Wastewater Plants no data were available from previous studies on personnel manning and design capacities. Therefore, a linear equation ($Y = 165.345 + 0.1864 X$), when Y equals the estimated personnel manning and X equals known design capacities, was established for those plants visited in the assessment. This equation was used for personnel estimates for an additional eight Wastewater Plants, increasing the number to be reported upon to 25 Plants.



CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Determination of Personnel Manning for Each Function or Organizational Unit in Plants Not Visited

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To determine Personnel Manning for Each Function or Organizational Unit in Plants Not Visited.

INSTRUCTION: Described below is the process to determine Personnel Manning for Each Function or Organizational Unit in Plants Not Visited.

Total manning for all plants visited was added to personnel manning estimates derived through linear equations for plants not visited. In the case of Water Plants, a total of 3965 personnel for plants visited increased to 7080 personnel for all 64 plants. For Wastewater Plants, the total of 4532 personnel for plants visited was increased to 5917 for all 25 plants.

The percentage breakout for the number of personnel in each organizational unit had already been determined for all plants visited. These same percentages were used to estimate the number serving each organizational function throughout the sector. Separate percentage tables were applied to

Water and Wastewater, respectively, as found from the analysis of field data from plants visited.

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Determining the Number of Personnel in Each Job Category within Each Organizational Unit

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To Determine the Number of Personnel in Each Job Category within Each Organizational Unit.

INSTRUCTION: Described below is the process followed to determine the Number of Personnel in Each Job Category in Each Organizational Unit.

A Job Classification System of 15 job categories was established into which the numerous positions in Water and Wastewater, respectively, were merged. In the case of Water Plants, it enabled the reporting of jobs in 15 categories rather than by about 100 job titles. The number and percent of jobs falling into each category (Clerical, Admin., Skilled Technician, etc.) was determined for plants visited, respectively, for Water and Wastewater, and at the organizational unit level as adopted in the model organizations for both kinds of plants. The same percentages were extended to all plants being reported in the assessment. That is, 7080 personnel in Water Plants are being reported in 15 Job categories within the organizational

breakdown. Also, 5917 personnel estimated to be employed in Wastewater Plants are being reported in the same way.

CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Determination of Manpower Requirements for Water and Wastewater Plants Projected for 1990-2000

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To determine Manpower Requirements for Water and Wastewater Plants Projected for 1990-2000.

INSTRUCTION: Described below is the process followed to determine Manpower Requirements for Water and Wastewater Plants Projected for 1990-2000.

NOPWASD provided WWISP with data on plants scheduled for completion during the time period of 1990 - 2000. From their design capacities, a best predicted estimate of their personnel manning requirements was determined. The linear equation ($Y = 35.41 + .4353 X$) derived from earlier Binnie & Partners reports was applied where $Y =$ predicted manning and X equals design capacity. Plants were arrayed for the year they were scheduled for completion of construction (contracted date) in 1990, 1991, and 1992 according to NOPWASD information. Beyond 1992, personnel needs were combined up to the year 2000 since completion dates were not available during that time period.

Totals for all plants scheduled to come on line each year were reduced to the number of personnel who would be required in each of 15 job categories such as Management, Engineer, Chemist, etc. The percentages used for each Job Category were similar to those found in the WWISP Manpower Assessment. This procedure enabled a determination of the technical manpower which should be recruited and trained to operate the new plants. Job categories were summed from the top, i.e, Management, to the Semi-Skilled Technician level to determine where the main emphasis should be for training, including a 5% additive for growth of the workforce and attrition (2.5 % attrition, 2.5% growth factors provided by CAPMAS for government employees generally).

Data were aggregated down to the Semi-Skilled Technician level for all years including 1992 - 2000 to gain a full perspective of training requirements for that time period. Personnel requirements at the Unskilled level were added to this aggregate to determine the full requirement for personnel although they would not necessarily require formal training.

A similar procedure was followed for the Wastewater plants coming on line during the same period. The exception is that the linear equation ($Y = 165.345 + 0.1864 X$) was taken from the relationship between design capacities and personnel manning as found from the data on Wastewater Plants surveyed during the WWISP Manpower Assessment.

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CENTRAL DEPARTMENT FOR TRAINING DATA REDUCTION PROCEDURE

PROCEDURE NAME: Master Training Requirements List (MTRL)

REVISION NUMBER: 001

DATE: 8/89

PURPOSE: To provide a method for determining training priorities from responses of Plant Managers to training needs.

INSTRUCTION: Described below is the procedure for determining training priorities from responses of Plant Managers to the Training Priority and Needs form. These procedures were employed to develop the Master Training Requirements List (MTRL) which reflects the number of personnel by job title who will require training immediately or during the next two years.

During the WWISP assessment, Plant Managers responded to a list of job titles typical of positions held by their own personnel and indicated the number who would require training immediately or at specified intervals during the next two years. They also described briefly the training content which should be provided in each case. This information was aggregated, separately for Water and Wastewater, for all plants visited so that a total picture of training requirements could be derived.

The above information was merged with data on personnel manning so that training requirements could be compared with the number of personnel listed against each job title. This procedure was followed to determine criticality of training needs, i.e. instances where the number requiring training approached the total number in a position would be flagged as critical, especially if there was an immediacy of the training need. Training requirements also were merged with the Job Classification System so they could be reported by Job Category.

An example of a line item in the MTRL is presented on the next page to show the merger of data and the determination of training requirements as critical or deferred.

In the example, 30 Water Networks Engineers were found in the Water Plants visited and a total of 29 Engineers, or 97%, required training immediately or during the next 6 months. Their training needs would be flagged as critical since a majority need training with minimum delay.

This procedure was followed for 80 jobs in Water Plants and for 95 jobs in Wastewater Plants. Using the same criteria described above, all jobs were classified as requiring immediate training or to be deferred. Then they were sorted into Job Categories established separately for the two types of plants.

Plant Managers also described briefly the training content which should be provided for each job. This information was organized by functional categories such as Administration, Treatment - Electrical, Treatment - Mechanical, etc. so that it could be related to relevant job categories.

MASTER TRAINING REQUIREMENTS LIST (MTRL) - WORKSHEET

JOB CATEGORY	JOB TITLE	TOTAL NO. IN ALL PLANTS VISITED	NO. REQUIRING TRAINING	% TOTAL NO. TO BE TRAINED	NO. REQUIRING TRAINING IMMEDIATELY OR WITHIN 6 MONTHS	%	NO. REQUIRING TRAINING IN NEXT 12 -24 MONTHS	%
Water Distribution <u>Records</u>								
2	Water Networks Engineer	30	29	97	18	62%	11	38%

Fig. 4-1 a

0997

C. CONCLUSIONS AND RECOMMENDATIONS

1. **Conclusion.** That the NOPWASD CDT requires a structured set of procedures for reducing and analyzing data collected from manpower needs assessment activities and an operating budget sufficient to acquire a computer for the CDT and support on-going manpower assessments.

Recommendation. That NOPWASD place high priority on the need for the systematic collection and analysis of data for planning Manpower Development Programs throughout the sector and support these efforts with sufficient funding.

2. **Conclusion.** That the process of collecting, reducing and analyzing field data is complex and time consuming. With the WWISP Data Collection and Reduction Procedures, NOPWASD has the foundation for continuing Manpower Assessment activities.

Recommendation. That NOPWASD and donor agencies recognize that the WWISP Manpower Assessment has established a structure and baseline for conducting assessments of the sector and that there is no need to fund another future assessment effort which begins again from zero. NOPWASD should ensure that future assessments are continued using the WWISP framework as a basis.

PA APE 7/16

**NATIONAL ORGANIZATION FOR POTABLE WATER
AND SANITARY DRAINAGE**

(NOPWASD)

COPY & OF 29 COPIES

SR-4

MANPOWER NEEDS ASSESSMENT

**WATER and WASTEWATER INSTITUTIONAL
SUPPORT PROJECT**

(WWISP)

USAID NO.263-0176

**VOL 3
DRAFT VERSION**

NOVEMBER 1989

ANALYSIS and FINDINGS

**JOINT VENTURE OF
BOYLE ENGINEERING CORPORATION
AND
NATIONAL EDUCATION CORPORATION**

**IN ASSOCIATION WITH
DR.A.ABDEL WARITH/TEAM MISR,
ROBERT R.NATHAN ASSOC'S INC,AND
ECO-REOURCES INCORPORATED**

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Boyle Engineering and
National Education (J.V.)
in Association with A.A.W/TEAM MISR
Water & Wastewater Institutional
Support Project (WWISP)

الهيئة المشتركة من شركتي
بويل انجنيرينج وناشيونال ايدوبوكيشن
بالتعاون مع شركتي عبد الوارث وتيم مصر
مشروع الدعم التنظيمي لقطاع الامداد
بالمياه والصرف الصحي

Eng. Abdel Salam El-Rafie
Deputy Chairman - NOPWASD
96 Ahmed Orabi St.- 16th Floor
Mohandseen, Cairo

29 November 1989
WWISP/00246/HS/em/LTR

Subject: Report No SR-4: Manpower Needs Assessment
WWISP-USAID Project No. 263-0176

Dear Eng. El-Rafie,

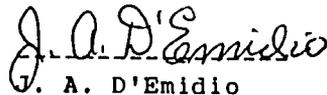
Under the provisions of para 4, article II, reports, of our contract (USAID Project No. 263 - 0176), five copies of SR-4, Manpower Needs Assessment are submitted for your review and comment.

This report is the first of the six reports to be delivered to NOPWASD as a part of Task B2, "Manpower Development and Training". Report SR-4 provides NOPWASD with the findings, conclusions and recommendations resulting from the national Manpower Needs Assessment conducted by WWISP. As part of this effort, WWISP personnel visited 20 cities throughout Egypt each with a Water and Wastewater Plant. Data collected from this sample along with findings of previous studies, were used to determine current and projected manpower levels in Urban water and wastewater facilities. In addition, a Training Requirements Survey and Personnel Practices Review were conducted. The findings indicated a great need to improve training throughout the sector for the current estimated 9000 semi-skilled to management employees and the projected potential training population of at least 24,000 by the year 2000.

Under the terms of the contract, your comments are required within 30 days of the date of this letter. In the meantime, we look forward to reviewing this report with you.

Warm personal regards.

Sincerely,



J. A. D'Emidio
Resident Project Manager

Attached: Five Copies
cc: USAID w/5 copies
MHPU w/5 copies

**NATIONAL ORGANIZATION FOR POTABLE WATER
AND SANITARY DRAINAGE
(NOPWASD)**

SR-4

MANPOWER NEEDS ASSESSMENT

**WATER and WASTEWATER INSTITUTIONAL
SUPPORT PROJECT
(WWISP)**

USAID NO.263-0176

**VOL 3
DRAFT VERSION**

NOVEMBER 1989

ANALYSIS and FINDINGS

**JOINT VENTURE OF
BOYLE ENGINEERING CORPORATION
AND
NATIONAL EDUCATION CORPORATION**

**IN ASSOCIATION WITH
DR.A.ABDEL WARITH/TEAM MISR,
ROBERT R.NATHAN ASSOC'S INC,AND
ECO-REOURCES INCORPORATED**

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FOREWORD

This Report **SR-4, Manpower Needs Assessment** has been prepared under contract between the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the Joint Venture Firms of Boyle Engineering Corporation/National Education Corporation in association with subcontractors TEAM International, AAW (Dr. Ahmed Abdel Warith), Robert R. Nathan Associates, Inc., and ECO-Resources Inc. It supports efforts by the Arabic Republic of Egypt and the U.S. Agency for International Development (USAID) to provide Technical Advisory Services and Institutional Development for NOPWASD. The project is entitled **Water and Wastewater Institutional Support Project (WWISP)**.

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CHAPTER 5

CURRENT and PROJECTED MANPOWER LEVELS

CHAPTER 5

CURRENT AND PROJECTED MANPOWER LEVELS

A. MANPOWER ASSESSMENTS OF THE SECTOR

1. **Purpose.** Determining the number of employees (Semi-Skilled to Management) currently working in the sector and projected for the next ten years is a primary component of the Manpower Needs Assessment.

Estimates of the current workforce and predictions of future manpower needs should provide NOPWASD with valuable data for master planning and training budgets. These data are critical for justifying the spending increases required by NOPWASD to provide sector-wide training.

2. **Background.** The WWISP Manpower Needs Assessment is the first major national survey conducted in close association with NOPWASD. CDT Counterparts were involved in all preparations for data gathering and analysis. NOPWASD Project Implementation personnel provided coordination in the twenty cities visited for the assessment. The WWISP Assessment provided CDT Counterparts the opportunity to learn survey methods and how raw data should be compiled and interpreted. They also were made aware of the current difficulties in collecting accurate data

from the sector and of the need to establish reasonable estimates from field data.

In previous assessments, other researchers have indicated that their results were best estimates and that variances would exist with their findings. The excerpt below taken from a 1985 United Nations report provides a brief review of previous assessments.

"Quite a few attempts have been made to assess the sector manpower situation in Egypt over the past 8-10 years. The results have been highly contradictory ...

The reasons are not hard to find: the collection, storage and reporting of manpower statistics are at once a low priority and a difficult task for most government agencies.

There appears to be little or no emphasis on establishing offices of manpower statistics as a key function for planning and decision-making.

The Binnie and Taylor World Bank report, a comprehensive survey of the water sector, done at the start of the Decade (1980), made a conservative estimate that 5000 more professional and skilled workers would be needed by 1990 to strengthen the water sector.

Since then, water and sewerage have been combined and WHO consultant Dr. Layton estimated that at least 23,600 trained water and sanitation workers would need to be added by 2000.

The National Water and Wastewater Committee carried out its own survey (and also reported receiving little or no data from the governorates), and concluded that the water sub-sector was facing a shortage of 38,838 workers (63.3% shortfall) ..."
(Heegard, page 2)

The WWISP Manpower Needs Assessment was conducted under similar conditions. Therefore, WWISP and the CDT must also report that although measures were taken to ensure the accuracy of the SR-4 findings, the results should be interpreted as best estimates.

2. **Scope.** The WWISP Manpower Needs Assessment concentrated on manning levels of urban Water and Wastewater plants. However, manpower information is also provided on the Ministry of Reconstruction and Housing (MRH), NOPWASD, and the at Governorate and City levels.

The data and their interpretation are provided below according to each organization subject to assessment. (Methods used to collect, reduce and analyze the data are provided in Chapters 3 and 4.)

B. MRH

1. **Minister.** The Ministry of Housing and Public Utilities and the Ministry of Reconstruction and New Communities are currently under the authority of a single Minister. The Ministry of Reconstruction and Housing (MRH) is used to refer to these combined responsibilities. The Minister of MRH presides over NOPWASD, the Governorates and Cities for technical matters regarding Water and Wastewater while the Ministries of Planning and Finance review sector funding.

A number of Ministry offices are concerned with the Water and Wastewater and should be included in a determination of overall sector manpower.

- General Administration for Internal and External Contacts
- Public Relations Department
- Technical Office
- General Department for Legal & Legislative Affairs
- Central Department for Public Utilities
- General Administration for Utilities
- Central Department for External Relations
- General Administration of International Cooperation & Loans
- General Administration for Foreign Investment

The WWISP Assessment placed emphasis on NOPWASD and the plants in the 24 governorates for which NOPWASD is responsible. A future assessment should focus on MRH manpower level and training needs.

2. CDPU. The Central Department for Public Utilities (CDPU) within the Ministry has direct responsibility for Water and Wastewater. Personnel of the CDPU has been detailed in WWISP Subtask A3.3 Report OS-4, Immediate Personnel Needs Analysis MRH - CDPU.

To summarize OS-4, the CDPU has a planned manning of twelve professionals. Five of the positions are filled, however three are on extended leave. WWISP recommended a CDPU with forty positions as a long range manning goal. Difficulties in attracting and retaining qualified staff have kept the CDPU undermanned.

C. NOPWASD

1. Current Manning. FIGURE 5-1, NOPWASD MANNING shows the distribution of 1118 employees by occupational groupings in May/June 1989 as provided by the NOPWASD General Departments of Personnel, Administration, and Organization and Management. The table shows NOPWASD under authorized/budgeted strength by 22% with significant shortages in Administrators. A 9% shortage also exists in Engineers.

FIGURE 5-1

NOPWASD MANNING - MAY/JUNE 1989

<u>OCCUPATIONAL GROUP</u>	<u>PLANNED</u>	<u>AUTHORIZED</u>	<u>ACTUAL</u>	<u>EDUCATION</u>
1. TOP MANAGEMENT	37	29	29	UNIVERSITY
2. ENGINEERING	288	335	304	UNIVERSITY
3. SCIENCE	18	7	6	UNIVERSITY
4. LEGAL	13	17	10	UNIVERSITY
5. ACCOUNTING/FINANCE	51	59	50	UNIVERSITY
6. ADMINISTRATION	70	54	38	UNIVERSITY
7. TECHNICAL ASSISTANT	62	168	98	2 YR POST SEC/SEC
8. CLERICAL	210	281	235	SECONDARY
9. CLERICAL-UNQUALIFIED	-	41	36	NONE
10. CRAFTSMAN	123	246	165	SECONDARY
11. SERVICES	<u>137</u>	<u>182</u>	<u>147</u>	NONE
TOTALS:	1009	1419	1118	

Fig. 5-1

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2. **Manning Patterns and Trends.** The General Manager of the NOPWASD General Department of Administration provided input regarding the following NOPWASD manning issues.

- **Job Attrition.** NOPWASD has an annual attrition rate of 2 to 3% attributable to termination, resignations, deaths, health reasons, and unauthorized absences.
- **Resignations Attributable to Pressure from Private Sector.** The effect of the private sector is considered negligible especially after the third year of employment. Recently hired Engineers are the only group which is affected.
- **Attracting Qualified Candidates.** NOPWASD is currently experiencing difficulties recruiting in areas of Shortage.
- **Shortages.** The vacancies in Accounting (10%) and Administration (30%) are considered critical while shortages of Craftsmen and Technical Assistants are not.
- **Surpluses.** A comparison of Planned and Actual Manning levels shows that NOPWASD is currently carrying a surplus of approximately 100 people. NOPWASD is about 400 employees below the Authorized level and NOPWASD officials indicated that their goal was to totally eliminate any surplus.

- **Growth Rate.** NOPWASD is stabilized at its current manning level. The Non-Qualified Clerical positions are being phased out, while recruiting is active to fill shortages. NOPWASD projects a stable manning unlikely to exceed the Authorized strength shown in FIGURE 5-1.

D. LOCAL GOVERNMENT

1. **Governorate.** The WWISP Assessment did not include Sector related personnel at local government levels. However meetings were held with local government officials and they provided an understanding of their organization.

Each Governorate has an Undersecretary for Housing and an Engineering General Department. In addition, support departments such as Planning, Finance and Personnel have a role in Water and Wastewater.

2. **City.** Each city has Departments for Engineering, Public Utilities and Administrative Support .

A future assessment should be directed at the Local Government manning levels and training needs. Local Governments are key contributors to the Sector planning and funding process and should be considered when training needs are assessed.

E. URBAN WATER FACILITIES - CURRENT MANNING

1. Methodology. Under the WWISP Manpower Needs Assessment the requirement existed to determine current personnel manning of Water Plants in urban areas. For study purposes, this was narrowed to areas having populations of 40,000 or more outside of Cairo, Alexandria and the Canal Cities.

Within logistical constraints of the project, the decision was made to focus on urban areas with both Water and Wastewater Treatment Plants. Twenty Water Plants were identified for visitation and instruments were designed for recording the personnel manning in each plant at the position level.

A model plant organization was developed and job titles typical of each organizational unit were listed. Plant managers then indicated the number of personnel in each job and entries were also made for job titles which were missing. Of the twenty Water Plants, 16 provided useful data for the WWISP Assessment.

The data were aggregated across all plants visited and summed by job title, organizational unit, and total Plant manning. Then a final aggregate was determined for all plants. The number and percentage of workers in each organizational unit was determined for all 16 plants as shown in FIGURE 5-2.

FIGURE 5-2 PERSONNEL ALLOCATION BY ORGANIZATION, AGGREGATED FOR ALL 16 PLANTS VISITED

DIVISION/SECTION	No.	%
DIRECTOR	33	0.9
FOLLOW-UP	26	0.7
LEGAL	11	0.3
PERSONNEL	74	2
FINANCE	26	0.7
PURCHASING/CONTRACTING	14	0.3
MAIN STORES & EQUIPMENT	66	2
NEW PROJECTS	57	2
TREATMENT DIVISION	1543	42
OPERATIONS	986	27
MAINTENANCE	451	12
LABORATORY	106	3
WATER DISTRIBUTION	1346	36
RECORDS	154	4
MAINTENANCE	972	26
BOOSTER OPERATIONS	220	6
CUSTOMER SERVICES	497	13
METER INSTALLATION & REPAIR	103	3
CUSTOMER ACCOUNTS	260	7
COLLECTION	134	3
TRAINING	2	0.1
TOTAL	3695	100

Fig. 5-2

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- To determine the personnel manning for 48 urban Water Plants serving populations similar in size, the findings were applied as found in the Provincial Water Supplies Project (Binnie & Partners). A substantial relationship was found in that study between plant design capacities and personnel manning. Using data from Binnie & Partners, a linear equation was established to gain best estimates of personnel manning from known plant capacities (liters/second). (See Chapter 4, Data Reduction and Analysis for an expression of this equation.)

The findings to be reported here are taken from FIGURE 5-3 which reflects the organizational breakout and personnel manning aggregated for 64 Water Plants.

FIGURE 5-3 CURRENT MANNING LEVELS - WATER FACILITIES

WATER (64 Plants)	Management		Engineer		Chemist		Legal		Accountant		Public Relations		Quality Control	
	*	%	*	%	*	%	*	%	*	%	*	%	*	%
ORGANIZATION														
TREATMENT Operations Maintenance Laboratory					174									
					174	0.03								
DISTRIBUTION Records Maintenance Mains & Serv. Booster Operations			53											
			53											
CUSTOMER SERVICES Meter Install & Repair Customer Accounts Collection														
NEW PROJECTS			140	0.72										
SUB-TOTALS			193	0.03	174	0.03								
MGNT. & ADMIN. SUPPORT	114								11					46
TOTALS	114		193		174				11					46
Est. No. Tech. Supvr. with Engrg. Degree (20%)														
Adjusted Est. of Eng., incl. Tech. Supvr. with Engrg. Degree			508											

Fig. 5-3 a

FIGURE 5-3 CURRENT MANNING LEVELS - WATER FACILITIES

Purchasing/ Contracting	Personnel/ Training		Admin.		Clerical		Technical Supervision		Skilled Technician		Semi-Skilled Technician		Unskilled		Totals		
	*	%	*	%	*	%	*	%	*	%	*	%	*	%	*	%	
								1226	0.78	437	0.28	614	0.44	496	0.37	2947	0.45
								719	0.46	320	0.21	437	0.31	419	0.31	1895	0.29
								507	0.32	117	0.07	177	0.13	41	0.03	842	0.12
													36	0.03	210	0.04	
						90		286	0.19	846	0.55	479	0.35	771	0.55	2525	0.39
					90	0.33			135	0.09					278	0.04	
								127	0.08	580	0.38	421	0.31	697	0.5	1831	0.28
								159	0.11	125	0.08	58	0.04	74	0.05	416	0.07
						182		62	0.03	263	0.17	277	0.21	128	0.08	912	0.14
								36	0.02	74	0.05	36	0.03	66	0.04	212	0.03
						182	0.67	26	0.01	189	0.12	75	0.07	62	0.04	492	0.08
												146	0.11			208	0.03
																140	0.02
								272	0	1574	0.24	1546	0.23	1370	0.21	1395	0.22
																6524	1.00
2		22		18		245		14		44		40				556	
2		22		18		517		1588		1590		1410		1395		7080	
						315											

Fig. 5-3 b

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2. General Findings.

- The recorded findings for the 16 plants visited summed to a total of 3695 people, When personnel estimates were added for 48 additional plants, the total was increased to 7080 people. The same organizational model was used to extend general manning as had been used for the field survey.

FIGURE 5-3 reflects mainly the O & M divisions and other activities such as Customer Services which is closely allied to Water Plants. Responses on management and administrative support functions were highly varied in the field. These functions were located away from the plant, and seemed to be serving other sectors as well. These are shown separately in FIGURE 5-3.

All percentages are of column totals and all O & M and closely allied functions have been summed to the Sub-Total level. In Sub-Totals, the percentages are of the total 6524 personnel found in directly related functions. This has been done to allow comparisons among the number in each job category for all 64 plants.

- 6524 personnel is an estimate of those in directly related plant functions or which account for a substantial number such as

3695
7080

Customer Services. If Management and Administrative Support functions are added, the total aggregate equals 7080 personnel.

- Management and support functions account for 556 personnel or 8% of the total manning.
- New projects activities across all 64 plants were estimated to employ about 140 personnel, or 2% of 6524 personnel engaged in directly related O & M functions.
- The total number of current Water Plant employees who are in job categories from Semi-Skilled to Management is 5685 people. This number is the difference when 1395 Unskilled Workers are subtracted from the total of 7080 people estimated for the 64 Water Plants studied. These 5685 represent the current population of potential trainees in Water Plants.

A description of personnel findings in the major organizational units is presented below.

3. Treatment.

- The largest number of over 2900 people (45%) was found in Treatment activities. Within these activities, the largest group of over 1800 employees was estimated for operations activities,

followed by about 840 in maintenance, and 210 personnel in laboratory work.

- In comparing the spread of personnel by Job Category, Technical Supervisors seem to predominate the Treatment manning structure with over 1200 personnel, followed by Semi-skilled Technicians of about 600 personnel. Unskilled personnel follow with about 500 people, with the least number of about 435 to be found in Skilled Technicians. (See Appendix B for the Job Classification System which lists the Job Titles under each Job Category.)
- With their number exceeding 1200, Technical Supervisors account for 78% of supervisors in all plant functions.
- More Semi-skilled Technicians are employed in Treatment activities than elsewhere in Water Treatment Plants and account for 44% of all employed in this Job Category.

4. Water Distribution

- The Water Distribution function is estimated to employ over 2500 people, or 39% of all employed in the 64 plants.

- The largest number of over 1800 personnel are employed in Maintenance Mains and Services, followed by over 400 employed in Booster Operations.

- Technical Supervisors do not appear in their number to dominate Water Distribution activities, since they account for about 285 personnel or 19% of all Technical Supervisors employed in the system. This is in marked contrast with the large number in the same Job Category who are assigned to Treatment functions.

- More Skilled Technicians are employed in Water Distribution activities than elsewhere in the Sector. They account for 55% of all who are employed in this Job Category.

- Unskilled personnel also are employed in a greater number in Water Distribution since they account for 55% of all similarly employed personnel.

5. Customer Services

- Apart from New Projects personnel, Customer Services has the least number of about 900 or 14% of all employees in major functions.

- Clerical personnel are employed in the greatest number in Customer Services, with about 180 in this Job Category and comprising 67% of all clerical personnel.
- A greater number are classified as Skilled or Semi-skilled Technicians since each has over 260 employed in Customer Services activities.
- Unskilled personnel are in least number as compared with other Plant functions since they account for only 8% of over 1300 employed in similar occupations.

6. Comparisons of Job Categories

- For those in directly related functions, of the total of 6524 employees, the following are the estimated employees in descending order for the leading Job Categories:

<u>Job Category</u>	<u>No.</u>	<u>%</u>
Technical Supervisor	1574	24
Skilled Technician	1546	23
Unskilled Technician	1395	22
Semi-skilled Technician	1370	21



These four Job Categories include about 90% of all Water Treatment personnel reported in this assessment.

7. Estimates of Degree Holders in Engineering.

- Since many Technical Supervisors hold Engineering degrees, an estimate was made that of 1574 in this category, 20% or 315, might be degree holders. When added to over 190 Engineers employed elsewhere in the system, the total estimate of graduate engineers would equal 500.

F. URBAN WASTEWATER FACILITIES - CURRENT MANNING

1. General Findings

- 18 Wastewater Plants were visited and their total current manpower was found to be 4532 personnel.
- By establishing a prediction equation between plant capacities and the manning estimates for Wastewater Plants visited, estimates of manpower were obtained for an additional 7 plants. This equation yielded an estimated additional estimate of 1385 people were derived. Similar percentages of manpower found for each function in the plants visited were applied to the additional plants for which the estimates were made. Total estimated

manpower, therefore, for 25 Wastewater Plants stands at 5917 people and is the basis upon which FIGURE 5-4, CURRENT MANNING LEVELS - WASTEWATER FACILITIES has been prepared.

- FIGURE 5-4 reflects the distribution of manpower primarily among the Operations and Maintenance (O & M) functions, followed by New Projects and Administrative Support (Customer Services, Personnel, Finance, Follow-Up etc.). Data for Administrative Support have been kept separate from O & M functions.
- All percentage breakouts are of the column totals (shown in the Sub-Total row) reflecting job categories assigned primarily to O & M functions.
- Percentages shown in Sub-Totals are of the total of 5682 personnel engaged in O & M functions and reflect the proportion employed in each job category employed there.
- The total number of current Wastewater Plant employees who are in job categories from Semi-Skilled Technician to Management is 3222 people. This number is the difference when 2695 Unskilled Workers is subtracted from the total of 5917 people estimated for the 25 Wastewater Plants under the jurisdiction of NOPWASD. These 3222 represent the current population of potential trainees in Wastewater Plants.

FIGURE 5-4 CURRENT MANNING LEVELS - WASTEWATER FACILITIES

WASTEWATER (25 Plants)	Management		Engineer		Chemist		Legal		Accountant		Public Relations		Quality Control	
	*	%	*	%	*	%	*	%	*	%	*	%	*	%
ORGANIZATION														
TREATMENT Operations Maintenance Laboratory					65	1.00								
COLLECTION Pump Station Ops. Pump Station Maint. Force Mains Sew. Maint. Sewer Connections					65	1.00								
NEW PROJECTS	9	1.00	44	1.00										
SUB-TOTALS	9	0.002	44	0.01	65	0.01								
ADMIN. SUPPORT	59		-		-		-		6		-		10	
TOTALS	68		44		65		-		6		-		10	
Est. No. Tech. Supvr. with Engrg. Degree														
Adjusted Est. of Eng., incl. Tech. Supvr. with Engrg. Degree			244											

Fig 5-4 a

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FIGURE 5-4 CURRENT MANNING LEVELS - WASTEWATER FACILITIES

Purchasing/ Contracting		Personnel/ Training		Admin.		Clerical		Technical Supervision		Skilled Technician		Semi-Skilled Technician		Unskilled		Totals	
*	%	*	%	*	%	*	%	*	%	*	%	*	%	*	%	*	%
								145	0.14	215	0.16	129	0.25	372	0.14	926	0.16
								121	0.12	117	0.09	23	0.05	189	0.07	450	0.09
								24	0.02	98	0.07	106	0.2	165	0.06	393	0.06
													18	0.01	83	0.01	
								848	0.85	1123	0.82	392	0.75	2323	0.86	4686	0.83
								228	0.24	630	0.46			893	0.33	1751	0.31
								198	0.19	111	0.08	192	0.37	118	0.04	619	0.11
								345	0.35	293	0.23	52	0.1	1034	0.38	1724	0.31
								77	0.08	89	0.06	148	0.28	278	0.11	592	0.1
										17	0.01					70	0.01
								993	0.17	1355	0.24	521	0.09	2695	0.47	5682	1.00
3		19		32		88		-		9		9		-		235	0.04
3		19		32		88		953		1364		530		2695		5917	1.00
								200									

Fig. 5-4 b

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2. Collection

- For 5682 personnel estimated to be engaged primarily in O & M functions, the majority of over 4600 (83%) are to be found in Collection functions. This large number is due to the presence of about 2300 Unskilled personnel who are Laborers predominantly. They comprise about 86% of all people engaged in Collection functions.
- Within the Collection function, over 1700 people are assigned respectively, to Pump Station Operations and Force Mains Sewage Maintenance. Each of those accounts for about 35% of all personnel assigned to Collection and comprise over 70% of the Collection workforce in all Wastewater Plants.

3. Treatment

- Treatment functions accounted for 926 or 16% of all O & M manpower reflected in FIGURE 5-4.
- Unskilled personnel are not as heavily involved in Treatment functions as in Collection, but they still account for 40% of Treatment employees.

4. Allocation According to Job Classification

- The 15 job category system was used to group all job specialties which formed the basis of the field assessment. The row of Sub-Totals presents the percentages found in each category. For 5682 people found in O & M functions, the following job categories accounted for about 97% of the workforce: Technical Supervision (17%), Skilled Technicians (24%), Semi-Skilled Technicians (9%) and Unskilled personnel (47%).

5. Management and Administrative Support

- From an analysis of survey results, only 4% of the workforce was found in management and administrative support functions. People in these categories are normally found in City Council or Governorate offices. All plants did not uniformly report their number. Therefore, they have been reported separately in FIGURE 5-4.

6. Estimate of Graduate Engineers

- Assessment results showed a minimal number of 44 Engineering degree holders. These findings were studied further in conjunction with NOPWASD. It was concluded that, as a conservative estimate, about 20% of those serving in Technical Supervision might be

graduate Engineers. This estimate would increase their number to 244 Engineers all Wastewater Plants.

G. URBAN WATER FACILITIES - PROJECTED MANNING

1. Methodology

- The statistical process used to estimate projected manning levels for Water and Wastewater Plants can be found in Chapter 3, under Determination of Manpower Requirements for Water and Wastewater Plants Projected for 1990 - 2000.

- FIGURE 5-5, URBAN WATER FACILITIES - PROJECTED MANNING 1990 - 2000, provides estimates of the manning levels in the 15 Job Categories of the WWISP Job Classification System for the next decade.

- The total number of projected Water Plant employees who are in job categories from Semi-Skilled to Management is 8025 people for the 10 years period from 1990 - 2000. These 8025 plus the 5685 current employees represent a projected total population of 13,710 potential trainees in Water Plants within the next 10 years.

FIGURE 5-5 URBAN WATER FACILITIES - PROJECTED MANNING 1990 - 2000

WATER JOB CATEGORY	%	YEAR					SUB-TOTAL 1990 - 94	SUB-TOTAL 1995 - 99	TOTALS
		1990	1991	1992	1993	1994			
MANAGEMENT	1.6	42	16	8	-	-	66	87	153
ENGINEER	2.7	70	26	14	-	-	110	147	257
CHEMIST	25	65	24	13	-	-	102	136	257
LEGAL	-	-	-	-	-	-	-	-	-
ACCOUNTANT	0.2	5	2	1	-	-	8	11	19
PUBLIC RELATIONS	-	-	-	-	-	-	-	-	-
QUALITY CONTROL	0.6	16	6	3	-	-	25	33	58
PURCHASING/ CONTRACTING	-	-	-	-	-	-	-	-	-
PERSONNEL/ TRAINING	0.3	8	3	2	-	-	13	16	29
ADMINISTRATIVE	0.3	8	3	2	-	-	13	16	29
CLERICAL	7.3	189	71	37	-	-	297	398	695
TECHNICAL SUPERVISION	22.4	581	219	113	-	-	913	1215	2128
SKILLED TECHNICIAN	22.5	583	220	114	-	-	917	1226	2143
SEMI-SKILLED TECHNICIAN	19.9	516	194	101	-	-	811	1084	1895
SUB-TOTAL	80	2083	784	408	-	-	3275	4369	7644
5 % GROWTH + ATTRIT.		104	39	20	-	-	163	218	381
ADJUST. SUB-TOTAL		2187	823	428	-	-	3437	4587	8025
UNSKILLED	19.7	509	193	99	-	-	801	1080	1881
5 % GROWTH + ATTRIT.		26	10	5	-	-	41	54	95
ADJUST. SUB-TOTAL		535	203	104	-	-	842	1134	1976
TOTALS	100	2722	1026	532	-	-	4279	5721	10031

Fig. 5-5

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WWISP estimates that actual manning levels could exceed the projection by as much as 25% if funding becomes available to support the ambitious construction goals held by NOPWASD for the next 10 years.

Estimated manning levels are based upon three factors: (1) New plant openings, (2) Attrition in the workforce, and (3) Growth in the workforce.

- **New Plant Openings** - The NOPWASD Design, Execution, and Follow-Up Departments provided lists of new plant construction and upgrades with available contract completion dates. Although the NOPWASD Execution Department reported at least a 2 year delay in construction compared to contract dates, the WWISP projection relies on the contract dates. The only exception was for plants which were scheduled for completion in 1988 and 1989 but still under construction. In these cases the plants were combined with those scheduled for completion in 1990.

The majority of contract dates provided by NOPWASD for completion of construction occurred within the current 5-Year Plan which concludes in June 1992. Funding of new projects is directly tied to the Plan. Therefore, estimations of projected manning levels beyond 1992, which are based closely on new projects, must be updated when the next 5-Year Plan is available.

- **Attrition in the Workforce** - All organizations experience annual turnover of employees for various reasons. The vacancies created by attrition are usually filled, thus resulting in new hires entering the workforce on a predictable basis. CAPMAS reports that the annual attrition rate among government employees is approximately 2.5%. This rate was used as a additive constant in the calculation of projected manning levels.

- **Growth in the Workforce** - Although the GOE has succeeded in reducing the rate of growth in the governmental workforce, some growth stills exists. CAPMAS reports an annual growth rate among governmental employees of approximately 2.5%. This rate was used as an additive constant in the calculation of projected manning levels. FIGURE 5-5 shows a 5% combined attrition and growth rate being applied annually.

4. URBAN WASTEWATER FACILITIES - PROJECTED MANNING

I. Methodology

- Methods for estimating projected manning levels for Water and Wastewater Plants can be found in Chapter 3 under Determination of Manpower Requirements for Water and Wastewater Plants Projected for 1990 - 2000.

- FIGURE 5-6, URBAN WASTEWATER FACILITIES - PROJECTED MANNING 1990 - 2000, provides estimates of manning levels for the next decade according to the 15 Job Categories of the WWISP Job Classification System.

- A total of 6712 Wastewater Plant employees who are in job categories from Semi-Skilled to Management is projected for the 10 years period from 1990 - 2000. This number plus 3222 current employees in similar categories represent 9,934 potential trainees in Wastewater Plants within the next 10 years.

NOPWASD has very ambitious plans for rural areas during the next 10 years to construct an estimated 122 Wastewater projects using Oxidation Ditch and Aerated Lagoon technology. As these projects are not yet funded, their manning is not included in the WWISP projection.

WWISP estimates that actual manning levels could rapidly exceed the projection if funding becomes available to support the NOPWASD construction goals for the next 10 years.

FIGURE 5-6 URBAN WASTEWATER FACILITIES - PROJECTED MANNING 1990 - 2000

WASTEWATER JOB CATEGORY	%	YEAR					SUB-TOTAL 1990 - 94	SUB-TOTAL 1995 - 99	TOTALS
		1990	1991	1992	1993	1994			
MANAGEMENT	1.1	31	31	16	-	-	78	48	126
ENGINEER	0.7	20	20	10	-	-	50	30	80
CHEMIST	1.1	31	31	16	-	-	78	48	126
LEGAL	-	-	-	-	-	-	-	-	-
ACCOUNTANT	0.1	3	3	2	-	-	8	4	12
PUBLIC RELATIONS	-	-	-	-	-	-	-	-	-
QUALITY CONTROL	0.2	6	6	3	-	-	15	8	23
PURCHASING/ CONTRACTING	0.1	3	3	2	-	-	8	4	12
PERSONNEL/ TRAINING	0.3	8	8	4	-	-	20	13	33
ADMINISTRATIVE	0.5	14	14	8	-	-	36	22	58
CLERICAL	1.5	42	42	22	-	-	106	65	171
TECHNICAL SUPERVISOR	16.9	478	473	252	6	-	1209	735	1944
SKILLED TECHNICIAN	23.2	657	650	346	8	-	1661	1110	2771
SEMI-SKILLED TECHNICIAN	9	255	252	134	3	-	644	392	1036
SUB-TOTAL	55	1548	1533	815	17	-	3913	2479	6392
5 % GROWTH + ATTRIT.		77	77	41	1	-	196	124	320
ADJUST. SUB-TOTAL		1625	1607	856	18	-	4106	2603	6712
UNSKILLED	45.3	1282	1271	678	16	-	3247	1873	6120
5 % GROWTH + ATTRIT.		64	64	34	1	-	163	94	257
ADJUST. SUB-TOTAL		1346	1338	712	17	-	3413	1967	6377
TOTALS	100	2971	2945	1568	35	-	7519	4570	13089

Fig. 5-6

I. **RURAL FACILITIES.** Networks, Wells and Pump Stations located in areas with populations below 40,000 were not included in this assessment. A future assessment should focus on this large pool of primarily Water employees to determine their current and projected numbers and training needs.

J. **SUMMARY of FINDINGS**

1. **Water Facilities.** 8025 Water Plant employees in job categories from Semi-Skilled to Management projected for the 10 year period of 1990 - 2000. This number plus 5685 current employees in similar categories represent 13,710 potential trainees in Water Plants within the next 10 years.

2. **Wastewater Facilities.** 6712 Wastewater Plant employees in job categories from Semi-Skilled to Management are projected for the 10 year period of 1990 - 2000. This number plus 3222 current employees in similar categories represent 9,934 potential trainees in Wastewater Plants within the next 10 years.

3. **Total Current and Projected Manning Levels.** TABLE 5-1, MANNING LEVELS SUMMARY, shows the WWISP estimates of current and projected numbers of Water and Wastewater employees in the Job Categories of Semi-Skilled to Management. These totals represent the potential

population of current and projected manpower requiring training in some form (OJT or Formal).

TABLE 5-1, MANNING LEVELS SUMMARY

	<u>WATER</u>	<u>WASTEWATER</u>	<u>TOTALS</u>
<u>CURRENT</u>	<u>5,685</u>	<u>3,222</u>	<u>8,907</u>
<u>PROJECTED</u>	<u>8,025</u>	<u>6,712</u>	<u>14,737</u>
<u>TOTALS</u>	<u>13,710</u>	<u>9,934</u>	<u>23,644</u>

K. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusion. MRH and the Local Governments have key roles in the planning and funding of Water and Wastewater.

Recommendation. The NOPWASD CDT Director should ensure that assessments of these critical Sector employees is implemented within two years.

2. Conclusion. Manning levels at NOPWASD were provided by the NOPWASD Administration and Personnel Departments. Some of these data were not current.

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Recommendation. The Chairman should ensure that actions are taken to implement a computerized Personnel and Management Information System within NOPWASD so that personnel data for NOPWASD and the Sector will be immediately available for use and updating.

3. Conclusion. WWISP estimates a total of 8907 employees (5685 Water, 3222 Wastewater) currently in the Sector and potentially requiring some form of training (OJT or Formal).

Recommendation. That NOPWASD fulfill its obligation under Presidential Decree 197 to provide training to the manpower of the Water and Wastewater Sector by placing a top planning and budgetary priority on Manpower Development and Training.

4. Conclusion. WWISP estimates that at least 23,644 employees (13,710 Water, 9,934 Wastewater) will be employed in the Sector by the year 2000 and potentially requiring some form of training (OJT or Formal).

Recommendation. That NOPWASD provide strong leadership to the Water and Wastewater Sector in order to find solutions and funding for the training of a workforce which might triple in size within the next 10 years.

CHAPTER 6

WORKFORCE SKILLS SURVEY

CHAPTER 6

WORKFORCE SKILLS SURVEY

A. SECTOR SKILL LEVELS

1. Purpose. The purpose of the Workforce Skills Survey was to determine the current skill levels of employees in various key jobs. This data was used as an input for the prioritization of training needs found in Chapter 7, Master Training Requirements List.

The Workforce Skills Survey relies on data collected by WWISP teams at the water and wastewater plants found in the twenty cities visited and on the findings of previous surveys.

2. Previous Evaluation Findings. In the major previous studies of sector skill levels similar and consistent findings have been reported. The following comments were extracted from them:

"There are two main aspects to the problem of shortages of adequately trained staff; first, there is a lack of engineers with proper training in the technical and supervisory skills of water engineering and, second, the sub-professional and skilled staff have inadequate knowledge of plant and network operations. In general, levels of competence are inadequate." (Binnie & Partners, page 80)

"As more physical works approach completion, there is an awareness on the part of both AID and GOE officials that available staff do not have the expertise sufficient to ensure that the works

in place and about to "come on line" will be operated and maintained properly." (USAID-1985, page 34)

The findings of previous studies are in full agreement and directly state the inclusive scope of the workforce skills problem. Many professional and skilled personnel in the sector are performing at a low competence level and are in critical need of training.

3. **WWISP Skills Survey Approach.** The purpose of the WWISP assessment was to determine whether the findings presented above were also descriptive of the current situation.

Operations and maintenance positions of water and wastewater plants were identified as the focus of the study. Skill levels in these jobs can be more effectively measured using sampling and objective criteria than management and support positions.

Three occupational groupings were identified as a sample.

- **Electrical Occupations:** Engineers, Technicians, Workers
- **Mechanical Occupations:** Engineers, Technicians, Workers
- **Chemical Occupations:** Chemists, Lab Technicians

CDT Counterparts were instrumental in identifying the sample and developing the tests for measuring knowledge and skills. For cases of Electrical and Mechanical Occupations, one general test was developed

for each group to evaluate employees in both water and wastewater plants. For Chemical Occupations, separate tests were developed for water and wastewater.

All tests contained a gradation of basic to professional level knowledge (theory) and practical (applied) questions. Scoring of each occupational level was based on the number of questions appropriate to that level. Engineers were graded on all test items while technicians and workers were held responsible for sixty percent and forty percent of the questions respectively.

Logistics dictated the need to include the testing of employees as part of the overall Manpower Needs Assessment. This was not considered an ideal testing situation for two reasons: (1) Requesting that staff be tested could provoke a defensive response from plant management and result in an uncooperative attitude which could jeopardize the assessment as a whole, and, (2) The constraints of time and manpower precluded controlled test administration.

Testing was conducted on an anonymous and voluntary basis. It was recognized that the results would have to be interpreted according to the test conditions. (The administration procedures and tests developed for the Workforce Skills Survey are presented in Chapter 3.)

CDT Counterparts made a significant contribution to the development of test instruments by applying their knowledge of technical engineering. Their contribution gave them a feeling of ownership in the assessment and a sense of accomplishment and recognition.

4. **WWISP Skills Survey Findings.** Due to the overall circumstances of test development, administration, and evaluation, WWISP data should be considered an approximation instead of a precise measure of skill levels.

Skills tests were administered to 216 sector employees (64 Engineers, 106 Technicians, 46 Workers) in Electrical, Mechanical and Chemical occupational groupings. Data are presented separately for Water and Wastewater employees as shown in the following tables.

TABLE 6-1
 SUMMARY DATA - WORKFORCE SKILLS SURVEY
 WATER

	<u>NUMBER TESTED</u>	<u>% ABOVE CRITERIA</u>
ELECTRICAL:		
Engineer	7	57
Technician	25	40
Worker	<u>8</u>	62
Sub-Total	40	
 MECHANICAL:		
Engineer	13	45
Technician	32	55
Worker	<u>8</u>	60
Sub-Total	53	
 CHEMICAL:		
Chemist	<u>20</u>	45
Total	113	

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TABLE 6-2
SUMMARY DATA - WORKFORCE SKILLS SURVEY
WASTEWATER

ELECTRICAL:	<u>NUMBER TESTED</u>	<u>% ABOVE CRITERIA</u>
Engineer	5	0
Technician	17	58
Worker	<u>13</u>	31
Sub-Total	35	
MECHANICAL:		
Engineer	7	85
Technician	32	85
Worker	<u>17</u>	65
Sub-Total	56	
CHEMICAL:		
Chemist	<u>12</u>	25
Total	<u>103</u>	

TABLE 6-3
 SUMMARY DATA - WORKFORCE SKILLS SURVEY
 PERCENT ABOVE CRITERIA
 AVERAGES COMBINED FOR WATER AND WASTEWATER BY DISCIPLINE

	<u>WATER</u>	<u>WASTEWATER</u>	<u>AVERAGE</u>
ELECTRICAL	53%	30%	42%
MECHANICAL	53	78	62
CHEMICAL	<u>45</u>	<u>25</u>	<u>35</u>
OVERALL PASSING	48%	44%	46%

The summarized data in the above tables tend to confirm the findings of previous studies for the occupational groups examined by WWISP. The combined Water and Wastewater Chemical occupations had only 35% meeting criteria. The Electrical occupations had 42% meeting criteria, and the Mechanical had 62% meeting criteria.

In Water Plants, Electrical Technicians, Mechanical Engineers and Chemists showed the most serious skill deficiencies, while in Wastewater Plants, Chemists and Electrical Engineers demonstrated severe inadequacies in knowledge and practical application.

Although these findings were obtained from a small population under, they support the results of other evaluations of sector skill levels.

B. CONCLUSIONS AND RECOMMENDATIONS

1. **Conclusion.** That the findings of the WWISP Workforce Skills Survey generally support the results of previous surveys which have repeatedly confirmed that the skill levels of a high percentage of Water and Wastewater Sector employees need to be improved if they are to perform their jobs effectively.

Recommendation. That NOPWASD recognize that Presidential Decree 197 makes NOPWASD responsible for national training in the Water and Wastewater Sector. Immediate action should be taken to remedy the problems indicated by consistent findings in several surveys conducted of workforce skills.

2. **Conclusion.** That the data collected by the WWISP Assessment identify severe skill deficiencies in the groups surveyed, especially in the Chemical and Electrical occupations. As indicated by this Initial NOPWASD CDT survey, the low skill levels of engineers in general is cause for concern.

Recommendation. That the NOPWASD CDT Director in coordination with the WWISP ensure that Action Plan implementation of Subtask B2.2 - Manpower Development Program addresses the specific problems identified in the WWISP Workforce Skills Survey.

3. **Conclusion.** That the NOPWASD CDT is not involved in on-going Workforce Skills Survey activities and does not currently have the skill specializations to effectively evaluate sector manpower, identify specific skill deficiencies, and prioritize training needs according to occupation.

Recommendation. That the NOPWASD Chairman place high priority on the development of the CDT staff capability to evaluate employee skill levels and conduct more extensive and controlled testing throughout the sector in all professional and skilled occupations. This will require the addition of specialized training staff to develop diagnostic exams based on job task analysis and to implement rigorous testing and statistical analysis procedures on a CDT computer.

CHAPTER 7

MASTER TRAINING REQUIREMENTS LIST

(M T R L)

CHAPTER 7

MASTER TRAINING REQUIREMENTS LIST (MRTL)

A. TRAINING REQUIREMENTS ASSESSMENT

1. **Purpose.** Each occupation within the Water and Wastewater Sector should have specific responsibilities, duties, and tasks to perform. These job components require specific skills and knowledge to be carried out correctly and according to accepted procedures. If a task is not being done correctly, training may be required. The WWISP Manpower Needs Assessment attempted to determine which occupations had needs for training

The purpose of the Master Training Requirements List (MRTL) is to identify the critical short term and long term training needs by occupation for the water and Wastewater Sector. The MRTL Forms the basis for the Master Training Plan (WWISP Subtask B2.2).

2. **Scope.** The MRTL is limited to the needs of the occupations in the Water and Wastewater Plants, Networks, and Pump Stations. A comprehensive assessment of training needs for NOPWASD fell outside the scope of the WWISP Assessment, however, NOPWASD Management Training and Computer Training are addressed.

B. NOPWASD

1. **NOPWASD Management Seminars.** NOPWASD managers (General Department Managers and higher) will require specialized sessions to keep them informed about the numerous changes that will be affecting their organization and the sector.

The Initial phase of Management Training (WWISP Subtask A3.2) for NOPWASD staff should focus on Organizational Development (OD).

In OD seminars each manager would learn new techniques for defining the Mission, Functions, and Tasks of his department. The seminars would stress Departmental Roles, Communication, and Coordination as well as Planning, Setting Goals, and Determining Priorities. This training should improve efficiency and facilitate the achievement of organizational objectives. Finally, methods for Directing and Controlling the work effort would be included to ensure proper implementation and follow-up.

2. **Computer Training.** NOPWASD in coordination with WWISP is planning and implementing a computer capability which will include: Management Information System, Cost Accounting System, Performance Monitoring System, Personnel and Finance System, and Office Automation (Word Processing, Inventories, etc.)

NOPWASD currently has few trained staff to operate these systems and equipment. WWISP Subtask A1.5, Management Information System and Financial Management will provide the initial planning of Computer Training for NOPWASD.

This training will have to be followed by a broader and highly structured program of systems and skills training which will eventually include 25% of the NOPWASD staff.

C. ENTRY LEVEL SKILLS

- I. **Water and Wastewater.** WWISP findings showed a high consistency among Water and Wastewater Managers when they were asked to indicate the minimum skills to be expected upon initial job entry. specify Their evaluation was directed to 13 job categories covering professional, skilled, semi-skilled and unskilled occupations.

The following are the main findings for each entry level skill:

- **Arabic Literacy.** A literacy level of Good is associated with completion of Elementary education, while Excellent requires completion of education at higher levels.

An Arabic Literacy level of excellent is expected for positions such as Engineer, Chemist, Legal and Accountant.

Technicians, Mechanics, Electricians, Craftsman, Drivers and Watchmen can possess either an Excellent or Good Literacy Level.

Clerks should be proficient at the Excellent level.

- **Educational Level.** Positions such as Engineer, Chemist, Legal and Accountant should be educated through university level.

Storekeepers and Technicians should have a Secondary education, at least.

Mechanics, Craftsman, Electricians and Drivers should complete their education, at least through Elementary level. However, several Plant Managers preferred that , in addition, they should attend technical school at the secondary level. Clerks should also receive full Secondary level education.

- **Experience.** Two to three years of experience beyond the University Degree is expected of those in job categories such as Engineer, Chemist, Legal, and Accountant.

Two years of experience at initial job entry also is expected of Storekeepers, Technicians and Watchmen.

Four years of experience upon job entry is expected of Electricians and Craftsmen.

For Laborers, only one year of experience is expected upon initial hire.

- **Certification/Licensing.** The licensing of Drivers was the only response obtained from Plant Managers.
- **Vocational Training/Post Secondary Training.** Post Secondary Training (Education) to a minimum of 4 years was expected of those holding positions such as Chemist, Legal, and Accountant. Five years of Post Secondary Education was expected of Engineers.

D. MTRL - URBAN WATER PLANTS PERSONNEL

1. **Methodology.** The Master Training Requirements List - Water reflects the priorities which Plant Managers place on the urgency of training for personnel in specific positions within their organizations. (The MTRL Data Reduction Procedure in Chapter 3 provides the details of the method employed.)

The list shows plant positions according to the Job Classification System and they are sorted into two groups, the first representing Highly Critical

Short Term Training Needs and the second including Long Term Sustained or Deferred Training Needs.

Highly Critical Short Term Training Needs indicate an immediate need for training. Long Term Sustained or Deferred Training Needs Indicate training required beyond a 6 month period from the time of data collection in July and August 1989. Positions in the MTRL marked with an asterisk (*) had a low number of employees reported and have been considered as having Deferred training needs.

2. Findings. Presented below are specific findings from FIGURE 7-1, MASTER TRAINING REQUIREMENTS LIST - WATER FACILITIES which lists all of the job titles used by WWISP to collect data on training needs:

**FIGURE 7-1, MASTER TRAINING REQUIREMENTS LIST
WATER FACILITIES**

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
1. <u>Management</u>	General Manager Mgr. Follow-Up Mgr. Stores	Mgr. Legal Affairs Mgr. Personnel Mgr. Finance Mgr. Purchasing/Contracting Mgr. Training Mgr. Customer Services Mgr. New Projects/Facility
2. <u>Engineer</u>	Chief Engineer, New Projects Treatment Engineer, N. P. Distribution Engineer, N. P. Engineer, Water Networks	

Fig. 7-1 a

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
	Engineer, Mechanical Engineer, Electrical	
3. <u>Chemist</u>	Chief Chemist, Laboratory Chemist, Laboratory Aluminum Sulphate Helper, Lab	
4. <u>Legal</u>		All positions distributed to other job categories.
5. <u>Accountant</u>		Accountant Bookkeeper
6. <u>Public Relations</u>		All positions distributed to other job categories.

Fig. 7-1 b

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JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
7. <u>Quality Control</u>	Inspector, Follow-Up Technician, Data Collections	
8. <u>Purchasing/Contacting</u>		Contract Specialist
9. <u>Personnel and Training</u>		Training Specialist, Operations Training Specialist, Maintenance
10. <u>Administrative</u>		Administrative Assistant
11. <u>Clerical</u>		Clerk Clerk/Typist

Fig. 7-1 c

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JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
12. <u>Technical Supervisor</u>		
A. Treatment	Sup., Screening & Grit Removal Sup., Coagulant Prep., Dosing Sup., Settling Sup., Filtration Sup., Chlorination Sup., Pumping Station Sup., Maintenance Chief/Foreman Mechanic & Electrician	Sup., Buildings & Grounds
B. Distribution	Shift Supervisor Booster Ops. Supervisor, Vehicles Foreman, Network, Maint. Mains	Supervisor, Maintenance* Crew Chief, Maintenance Mains*

* Low number of employees reported in this position.

Fig. 7-1 d

up

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
C. Customer Services	Foreman, Meter Installation & Repair	Chief, Customer Services, Accounts
D. Other		Foreman, Equipment, Main Stores & Equipment*
13. <u>Skilled Technicians</u>		
A. Main Stores & Equipment	Electrician Mechanic Storekeeper	
B. Treatment	Operator, Pump Station Ops.	Technician, Well Station Carpenter Road Maintenance Specialist

Fig. 7-1 e

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
		Painter, Interior Furniture Finisher Mason
C. Distribution	Technician, Connections Mechanic, Vehicles Tech. Electrician, Vehicles	Draftsman Technician, Networks Iron Worker, Welder Booster Operator Lead Mechanic* Mechanic, Substation Operations Meter Repairman, Install & Repair, Customer Services
D. Other		
14. <u>Semi-Skilled</u>		
A. Treatment		Operator, Pump Station Operations Assistant Road Maint. Specialist

Fig. 7-1 f

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**JOB
CATEGORY**

**SHORT TERM
TRAINING NEED**

**DEFERRED
TRAINING NEED**

B. Distribution

C. Customer Services

Asst. Carpenter

Asst. Mason

Asst. Painter, Interior

Telephone Operator

Security Guard

Asst. Iron Worker

Asst. Booster Operator

Driver, Maintenance Mains

Driver, Rooster Operations

Asst. Meter Repairman

Meter Reader

Cashier

Fig. 7-1 g

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15. Unskilled

Gardener

Laborer

7-1

Fig. 7-1 h

- Management and Administration. The General Manager, Follow-Up Manager and Stores Manager in Water Plants all have Short Term training needs. Training is shown as Deferred for employees in the remaining management positions plus positions in the categories of Legal, Accountant, Public Relations, Purchasing/Contracting, Personnel and Training, Administrative and Clerical.

Positions in these categories are typically attached to the local government or City Council. Therefore, Plant Managers did not indicate a Highly Critical training need for them. In a future assessment of these employees, it is possible that Highly Critical training needs also may be found for them.

- Engineers. All Engineer positions were identified as having Highly Critical training needs.

- Technical Supervisors. A very strong need for training at the mid-management level was expressed by Plant Managers. All Technical Supervisor positions in Treatment and Distribution (with the exception of the Supervisor, Buildings & Grounds) were considered as having Highly Critical training needs.

- Chemists. All Chemist/Laboratory positions were identified as having Highly Critical training needs.

- Skilled Technicians. In these positions, training need appears greater for Maintenance positions than for Operator positions. Mechanical and Electrical maintenance positions are about equally represented as Highly Critical for training.
- Semi-Skilled Technicians. Plant Managers showed a clear preference for training at the Supervisory and Skilled level than for Semi-Skilled or Entry Level employees since they indicated these latter positions as having Deferred training needs.

E. MTRL - URBAN WASTEWATER PLANTS PERSONNEL

1. Findings. Presented below are specific findings from FIGURE 7-2, MASTER TRAINING REQUIREMENTS LIST - WASTEWATER FACILITIES which lists all of the job titles used by WWISP to collect data on training needs:

**FIGURE 7-2, MASTER TRAINING REQUIREMENTS LIST
WASTEWATER FACILITIES**

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
1. <u>Management</u>	Director Mgr. Customer Services	Mgr. Follow-Up* Mgr. Legal Affairs Mgr. Personnel Mgr. Finance Mgr. Purchasing/Contracting Mgr. Training Mgr. New Projects/Facility

* Low number of employees reported in this position.

Handwritten mark

Fig. 7- 2a

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
2. <u>Engineer</u>	Planning Engineer	Chief Engineer, Treatment* Chief Engineer, Collection* Cost Engineer* Sanitary Engineer* Mechanical Engineer* Electrical Engineer*
3. <u>Chemist</u>	Chief Chemist, Laboratory Chemist, Laboratory Assistant Chemist Lab Technician	
4. <u>Legal</u>		All positions distributed to other job categories.

Fig. 7-2 b

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
5. <u>Accountant</u>		Accountant Bookkeeper
6. <u>Public Relations</u>		All positions distributed to other job categories.
7. <u>Quality Control</u>	Technician	Inspector, Follow-Up* Data Collection Specialist*
8. <u>Purchasing/Contacting</u>		Contract Specialist
9. <u>Personnel and Training</u>	Training Specialist	
10. <u>Administrative</u>		Administrative Assistant

Fig. 7-2 c

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JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
11. <u>Clerical</u>		Clerk Clerk/Typist
12. <u>Technical Supervisor</u>		
A. Treatment	Sup., Treatment Plant Sup., Screening & Grit Removal Sup., Primary Settling Sup., Aeration Systems Sup., Chlorination Sup., Pumping Station Sup., Plant Maintenance and Transport Chief/Foreman Mechanic Chief/Foreman Electrician	Sup., Buildings & Grounds

Fig. 7-2 d

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JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
B. Collection	Shift Supervisor Pump Station Ops. Shift Supervisor Pump Station Maintenance Foreman Elec. Maintenance, Pump Stations Foreman Mech. Maintenance, Pump Stations Supervisor, Pipeline Maintenance Supervisor, Sewer Repair Supervisor, Sewer Connections Supervisor, House, Building Connections Supervisor, Sewer Cleaning Foreman, Maintenance Mains & Sewers	

Fig. 7-2 e

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JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
13. <u>Skilled Technicians</u>		
A. Main Stores & Equipment	Storekeeper	
B. Treatment	Mechanic, Treated Water	
	Mechanic, Sludge Pumps	
	Electrician, Return Back Water	
	Mechanic, Treatment Maintenance	
	Electrician, Treatment Maintenance	
	Mechanic, Automotive Equipment	
	Electrician, Operation of Scraper	
C. Collection	Mechanic, Pump Station Opn.	Road Maintenance Specialist
	Electrician, Pump Station Opn.	Back Hoe Operator, Sewer
	Mechanic, Pump Station Maint.	Connect./Repair

Fig. 7-2 f

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**JOB
CATEGORY**

**SHORT TERM
TRAINING NEED**

**DEFERRED
TRAINING NEED**

Electrician, Pump Station Maint.

Back Hoe Operator, Sewer New
Connect

Mason

Technician, Jet Car Grav.

Sewage Maint.

Technician, Bucket Machine

Iron Worker, Welder

Pipefitter

D. Other

Technician, Follow-Up

Technician, Facility

Records/New Projects

Draftsman

Carpenter

Road Maintenance Specialist

Fig. 7-2 g

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JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
14. <u>Semi-Skilled</u>		Painter, Interior Furniture Finisher Mason
A. Treatment	Mechanic, Treatment Maintenance Electrician, Treatment Maintenance Mechanic, Automatic Equip. Telephone Operator	Mechanic, Treated Water Mechanic, Sludge Pumps Electrician, Return Back Water Electrician, Operation of Scraper Driver, Treatment Maintenance Driver, Treatment Operations Assistant Road Maintenance Specialist Asst. Carpenter Asst. Mason Asst. Painter, Interior

Fig. 7-2 h

14.

JOB CATEGORY	SHORT TERM TRAINING NEED	DEFERRED TRAINING NEED
B. Collection	Mechanic, Pump Station Cpn. Mechanic, Pump Station Maint. Truck Driver, Sewer Connect. Truck Driver, Cleaning & Collections Driver, Jet Car	Electrician, Pump Station Opn. Electrician, Pump Station Maint. Asst. Mason Asst. Pipefitter Asst. Iron Worker, Welder Asst. Booster Operator
C. Other	Security Guard	
15. <u>Unskilled</u>	Gardener	Laborer

Fig. 7-2 i

- Management and Administration. Directors and Customer Services Managers in Wastewater Plants have Short Term training needs. The remaining management positions plus the positions in the categories of Legal, Accountant, Public Relations, Clerical Purchasing/Contracting, and Administrative are shown as Deferred.

As in the case of Water Plants, these positions in are attached to the local government or City Council. Therefore, Plant Managers did not indicate a Highly Critical training need for them. In a future assessment of local government employees whose activities are related to Wastewater Plants it may be found that Highly Critical training needs also exist for them.

Although only a few Training Specialists exist within the Sector, Wastewater Plant Managers indicated that their training needs were Highly Critical.

- Engineers. With the exception of the Planning Engineer which has Highly Critical training needs, all remaining Engineer positions were reported in numbers too low to be significant. The Engineers working in the Wastewater Plants tend to be represented as Supervisors.

- Technical Supervisors. Wastewater Plant Managers were in agreement with the Managers of Water Plants in expressing a strong need for training at the mid-management level. All Technical Supervisor positions in Treatment and Collection (with the exception of the Supervisor, Buildings & Grounds) were considered as having Highly Critical training needs.
- Chemists, Skilled and Semi-Skilled Technicians. The findings in these categories were consistent with the training needs expressed by Water Plant Managers.

Overall, Water and Wastewater Plant Managers were consistent in determining the training needs of their employees. If a training strategy can be gleaned from these findings, a "Top Down" approach starting with Top and Mid-Managers and then shifting to Technical Supervisors, Chemists and Skilled Technicians would fulfill the reported training requirements.

F. TRAINING NEEDS

- I. **Plant Managers Comments.** In addition to indicating the need for training by position, Plant Managers briefly described the training content which should be provided for each job. Their comments have been organized functionally and are presented in TABLE 7-1 so that they can be related to relevant job categories.

TABLE 7-1

TRAINING NEEDS ORGANIZED FUNCTIONALLY
WATER and WASTEWATER

ADMINISTRATION/TOP MANAGEMENT

- New technologies for Water and Wastewater treatment
- Trouble-shooting mechanical and electrical equipment
- Leak detection and prevention
- Planning for Stores, Laboratory, O & M

ADMINISTRATIVE SUPPORT

LEGAL AFFAIRS

- Labor Laws
- NOPWASD Tenders

FINANCIAL AFFAIRS

- Financial Systems, Cost Accounting, filing

CONTRACTING AND PROCUREMENT

- Purchasing Regulations
- GOE Regulations for Tenders

PERSONNEL AFFAIRS

- Labor Laws

TRAINING

- Training Plans and Systems
- Preparation of Training Programs to Improve Plant O & M

FOLLOW-UP/QUALITY CONTROL

- Electrical and Mechanical Measuring Instruments and their Maintenance
- New Methods of Chemical Analysis
- Data Collection and Analysis

MAIN STORES and EQUIPMENT

- New Systems for Management of Stores
- Correct Use of Catalogues
- Correct Ordering Procedures
- Stores "Input/Output" or Receiving and Issuance Systems
- General Mechanical and Electrical Plant Maintenance

NEW PROJECTS

- Planning and Management of New Projects
- Supervising Design of Wells
- Leak Detection
- Follow-Up and Supervision of New Projects
- Design and Execution of Distribution Maps for Pipelines, Networks and Connections

TREATMENT

MECHANICAL O & M

- Periodic Preventative Maintenance
- Observing operations and determining time tables (Wastewater Scraper/Sludge Operations)
- Repair of Diesel Engines
- Aeration and Sludge Extraction Procedures
- Methods for Cleaning Filters and Screens

ELECTRICAL O & M

- Special Motors (Scrapers) O & M
- Repair of Switch Boards
- Lifting Units O & M
- Electrical Maintenance of Pumps and Aeration Systems
- Repair of Central Fuse Boxes

LABORATORY O & M

- Purification Analysis Procedures (Chemical & Bacteriological Testing)
- Preparation of Aluminum Sulfate Solutions
- Record Keeping and Reports
- Determining Schedules for Removing Sludge from Tanks

DISTRIBUTION

MECHANICAL O & M

- Emergency Maintenance
- Maintenance and Repair of Valves
- Maintenance and Repair of Vehicles
- Periodic Maintenance of Sewers and Rising Mains

ELECTRICAL O & M

- Maintenance and Repair of Electric Motors and Central Units

COLLECTION

MECHANICAL O & M

- Maintenance of Pipeline and Underground Leveling
- Maintenance of Force Main Pipes

ELECTRICAL O & M

- General Maintenance of Electrical Units

CUSTOMER SERVICES

ACCOUNTS, RECORDS

- Designing Customer Accounts Systems

METER INSTALLATION/REPAIR

- Meter Recording and Repair
- Cost Estimation for New Connections

These specific requirements plus the priorities indicated in the Water MTRL and the Wastewater MTRL will be form the basis for the Master Training Plan (WWISP Subtask 2.2)

G. CONCLUSIONS AND RECOMMENDATIONS

1. **Conclusion.** That the Sector including NOPWASD, Water and Wastewater Plants, requires a "Top Down" approach to training which places initial emphasis on the needs of management, supervisory and skilled personnel.

Recommendation. That the NOPWASD and the CDT recognize the direction to be taken from these findings and plan Sector-wide training accordingly.

2. **Conclusion.** That the Sector is not governed by a set of standardized position descriptions often making job duties and qualifications ambiguous. This lack of standards should be addressed so that Training Requirements can be more systematically and specifically reported by position.

Recommendation. That NOPWASD support the development and implementation of a Certification Program for sector employees based on Job Task Analysis and standardization of position descriptions.

CHAPTER 8

PERSONNEL PRACTICES REVIEW

CHAPTER 8

PERSONNEL PRACTICES REVIEW

A. SECTOR MANAGEMENT ISSUES ASSESSMENT

1. **Purpose.** The purpose of the Personnel Practices Review was to identify the criticality of specific management issues and general management practices throughout the Water and Wastewater Sector. Determining problem areas facing plant managers is essential to gaining insight for further study and recommendations for improvement.
2. **Approach.** In previous studies a significant number of management and personnel issues have been identified which have raised problems in the sector. A comprehensive list of sixty-five specific issues covering a broad range of management concerns was compiled into fifteen categories.

Plant managers in the twenty cities visited by WWISP teams were asked to rate the criticality of each issue: High, Moderate or Low compared to the general management, personnel administration, and, operation and maintenance situation of his plant. Where managers indicated that an issue was highly critical, a follow-up questionnaire was administered. The manager was asked to explain why the issue was a major problem and to recommend solutions.

The scope of the Personnel Practices Review was very broad. Each of the issues could justify considerable discussion. It was the last instrument to be administered by WWISP Data Collection Teams. Therefore, time was limited and discussion of issues and recommendations had to be curtailed. Although most managers responded to all issues, few were able to provide complete explanations and solutions for each rated Highly Critical because of the time shortage.

Thirty-two of the forty plant managers surveyed completed the form. Water and Wastewater were equally represented with sixteen managers responding from each group.

B. SUMMARY OF FINDINGS

1. **Ratings Summary.** In FIGURE 8-1, PERSONNEL PRACTICES REVIEW, responses are summarized from Water and Wastewater Plants. Abbreviated issues statements are used in this figure. (Procedures for the Personnel Practices Review and the complete questionnaire are in Chapter 3.)
2. **Comments Summary.** Plant Managers were asked to explain their reasons for assigning a Highly Critical rating to a specific issue and to provide recommendations. The comments made by the Managers have been combined and are summarized by issue in FIGURE 8-2. Introductory statements relate statistical data from FIGURE 8-1 to the comments.

FIGURE 8-1

**PERSONNEL PRACTICES REVIEW
RESPONSES REPORTED IN PERCENTAGES**

	Water %			Wastewater %		
	High	Mid	Low	High	Mid	Low
A. Management (General)						
1. Clarifying the Responsibilities of Managers and Supervisors	35	30	35	34	54	12
2. Manager Responsibility for Promotions	41	41	18	42	29	29
3. Manager Responsibility for Career Development Decisions	53	17	30	41	35	24
4. Manager Responsibility for Work Schedules, Leaves, Overtime, etc.	42	23	35	41	35	24
B. Operations and Maintenance						
1. Effective Preventive Maintenance Program	70	12	18	70	12	18
2. Getting Spare Parts when Needed	65	23	12	65	23	12
3. Reducing Equipment Damage & Injury	35	23	42	53	18	29
C. Productivity						
1. High Absenteeism	35	18	47	29	24	42
2. Environmental Conditions	23	35	42	47	29	24
3. Workers tired from 2nd Job	24	29	47	35	35	30
4. Worker Morale	41	24	35	47	29	24
5. Job Dissatisfaction	23	42	35	35	30	35
D. Training						
1. Job Specifications	47	24	29	41	47	12
2. Certifying & Licensing	24	35	41	41	35	24

Fig. 8-1 a

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	Water %			Wastewater %		
	High	Mid	Low	High	Mid	Low
3. Getting Training Manuals	35	53	12	59	18	23
4. Finding Suitable Training Programs	23	65	12	29	59	12
5. Train-the-Trainer Programs	29	53	18	47	41	12
6. Continuing Education Programs	24	52	24	47	41	12
7. Sparing people to attend Training	42	35	23	47	35	18
8. Off-shore training	12	35	53	47	29	24
E. Career Development						
1. Career Paths for Each Position	35	41	24	35	41	24
2. Certifying Workers for various Positions	29	29	42	35	41	24
F. Manager/Supervisor Development						
1. Leadership Training	41	47	12	65	29	6
2. Management Training	29	47	24	41	53	6
G. Recruitment						
1. Finding Qualified people to Replace Retirees	54	23	23	64	18	18
2. Direct Involvement in Recruiting	30	35	35	35	35	30
3. Accepting Staff Without Interview	47	24	29	54	23	23
4. Attracting Qualified Staff	59	29	12	53	29	18
5. Qualifications do not Match Performance	47	29	24	53	29	18

Fig. 8-1 b

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	Water %			Wastewater %		
	High	Mid	Low	High	Mid	Low
H. Manpower Shortages						
1. Professional & Skilled	53	29	18	54	23	23
2. Manning Levels Consistent with Needs	47	24	29	65	29	6
3. Assigning People to Distribution/Undesirable Jobs	82	12	6	71	23	6
I. Manpower Surpluses						
1. Using Unqualified People due to Surplus	29	29	42	35	47	18
2. Transferring Surplus	24	29	47	41	35	24
3. O&M Surplus	17	12	71	24	29	47
J. Performance Standards and Evaluation						
1. To Improve Performance	47	29	24	47	35	18
2. Identifying Standards	47	29	24	41	41	17
3. To Determine Training Needs	41	35	24	29	47	24
4. Objective Evaluations of Employee Performance	35	35	30	47	35	18
K. Promotion						
1. Based on Performance vs. Service	53	29	18	59	18	23
2. Accelerated Promotions based on Performance	65	12	23	71	29	0
L. Salary and Pay Grades						
1. Paying People for Added Responsibilities	47	23	30	82	12	6
2. Losing People to Better Paying Jobs	41	35	24	59	29	12
3. a. Inconsistencies in Grade System	23	35	42	59	29	12
b. Overtime Limit	35	35	30	65	23	12
c. Compensation Beyond Salary Limit	59	23	18	65	23	12

Fig. 8-1 c

	Water %			Wastewater %		
	High	Mid	Low	High	Mid	Low
4. Scales/Grades Unfair to Better Performers	53	29	18	71	23	6
5. Rewarding Performance vs Service	64	18	18	71	29	0
M. Benefits						
1. Housing	65	6	29	59	23	18
2. Medical	59	12	29	59	18	23
3. Life Insurance	59	6	35	53	24	23
4. Pension/Retirement	59	11	35	53	24	23
N. Incentives and Bonuses						
1. Rewarding Performance	35	42	23	64	18	18
2. Based on System-wide Productivity	41	18	41	47	29	24
3. Expecting Automatic Bonuses	35	30	35	54	23	23
4. Remote/Undesirable Locations	42	29	29	35	24	41
5. Offering Step Increases to Attract & Retain Staff	35	30	35	35	35	30
O. Discipline and Termination						
1. Justifying a Termination	23	23	54	47	41	12
2. Disciplining Employees	18	23	59	47	35	18

Fig. 8-1 d

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FIGURE 8-2

PERSONNEL PRACTICES REVIEW MANAGER COMMENTS

Management: The responses indicated a strong expression of need to be involved in the Promotion process and Career Development decisions.

Problems :

- Too much responsibility is placed directly on the Manager.
- Unclear Job Descriptions lead to failure of staff to responsibility and to make decisions.
- Performance standards cannot be determined without clear Job Descriptions.
- Lack of an organization chart causes problems.
- Interference from municipal officials who are not engineers causes delays and confusion.

Recommended Solutions:

- Design a good organization chart for the plant, network and pump station and assign a Director to each to share responsibilities with the General Manager.
- Provide a Job Description for every occupation in the accept organization.
- No Solution Provided.
- Implement organization charts.
- NOPWASD should take over plants.

Fig. 8-2 a

- If a manager does not have full authority, he can not be expected to make timely decisions.
- Promotions are sometimes poorly controlled.
- Authority must be assumed by someone. If the manager does not have authority, then the city officials should make the decisions. Now, responsibilities for the plant are not clear.
- Serious regulations should define authority and promotions.

O & M: Preventative Maintenance and Spare Parts received the highest percentages of Highly Critical ratings within the sample.

Problems:

- Failures in equipment are usually due to poor maintenance. Poor maintenance shortens the life of the equipment.
- Flow and continuity of operations depend on PMS.
- Without spares, there is no effective maintenance program.
- Delays in receiving spares causes greater problems.

Recommended Solutions:

- Establish a mandatory maintenance program.
- Establish a mandatory maintenance program.
- Provide OJT in field maintenance.
- Funds must be available to buy spares.
- A system of records for maintenance is required.
- Catalogs should be available to facilitate requisitions according to part number.
- Storekeepers must be trained to order parts.

Fig. 8-2 b

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- Workers with two jobs have bad attitudes.
- Be consistent when outfitting plants so that the number of spares can be reduced.
- Provide necessary incentives to workers.

Productivity: With the exception of Worker Morale, managers gave the other issues relatively low ratings.

Problems:

- The work environment is related to productivity.
- Low worker pride in the job causes many problems.

Recommended Solutions:

- Build the plants correctly in the first place.
- Investigate the reasons and establish incentive system to motivate the good employees.

Training: The majority of managers gave training issues moderate to high ratings.

Problems:

- We need manuals on site to train ourselves.
- We need qualified trainers.
- People should be aware of new technology.

Recommended Solutions:

- Send manuals for all equipment and procedures for the plant.
- Provide incentives for good employees to become trainers.
- Set up courses to train the trainer including "problem solving."
- Explain importance of training to top management.
- Provide English Language courses.

Fig. 8-2 c

8/3

- Provide funding.
- Establish good relations with foreign water authorities.

Career Development: These issues received moderate ratings.

Problems:

- People are frustrated that they are not trained.

Recommended Solutions:

- Provide training courses for managers to improve management skills.
- Provide training courses for technicians.

Manager/Supervisor Development: These issues received a substantial number of High to Moderate Criticality ratings, indicating a need for management training.

Problems:

- Managers and Supervisors are not trained in the improve employee performance.
- Managers cannot improve their plant without proper knowledge.

Recommended Solutions:

- Provide training courses for managers to improve procedures to management skills.

Fig. 8-2 d

8-2 d

Recruitment: The majority of these issues received Highly Critical ratings. Managers showed mixed responses to being involved in the recruiting process.

Problems:

- Replacements should be qualified.
- Losing skilled people to other industries has a negative effect on the plants and pump stations.

Recommended Solutions:

- New workers must receive training before they have any responsibility in the plants.
- Let managers choose employees and give them incentives to stay.
- Increase the salaries to attract skilled people.

Manpower Shortages: All issues had mainly Highly Critical ratings. Undesirable Jobs had the highest percentages of Highly Critical ratings in the entire survey.

Problems:

- It causes frustration when the needs are not met.
- We have shortages in people to work in undesirable jobs.
- The workers in the sewer cleaning are not issued the correct protective clothing and shoes.

Recommended Solutions:

- Determine the correct organization for a plant and fill the jobs.
- Establish an incentive system and increase salaries for undesirable jobs. Provide uniforms.

Fig. 8-2 e

Manpower Surpluses: All issues were rated mainly a Low Criticality. This issue is not perceived as a problem area by plant managers.

Problems:

- Surplus workers have a bad effect on the productivity of the plant.

Recommended Solutions:

- Give managers full authority to transfer surplus workers.

Promotion: All issues were substantially in the Highly Critical range.

Problem s:

- Promotion based on service is inefficient.
- Low morale due to long periods between promotions.
- Subordination to governorates delays promotions.
- The good and the bad get treated equally. All are promoted. This makes many problems in the plant.

Recommended Solutions:

- Establish a system of promotion specialized to the Sector.
- Establish a good system of career planning.
- No Solution Provided
- Promotions and incentives should match performance.

Fig. 8-2 f

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Salary and Pay Grades: Several issues received the strongest Highly Critical ratings.

Problems:

- Good workers suffer too much from taking the burden of the lazy ones.
- The rate of inflation is very high.
- Plants are very important and some jobs are dangerous.
- Better compensation is needed.

Recommended Solutions:

- Greater incentives for greater work.
- Raise the monthly fixed salary rate.
- Increase the percentage of the incentive for dangerous work.
- Incentives according to efforts.
- Pay an incentive for night work.
- Make compensation relative to effort of the employee.

Performance Standards: Although ratings show a strong consensus toward Highly Critical, no managers provided written comments in this category.

Fig. 8-2 g

Benefits: All issues were rated Highly Critical by both Water and Wastewater managers.

Problems:

- Due to shift schedule, employees need housing near plants. This should be provided.
- Some work is dangerous and shifts are difficult for health.
- Better medical plan is required.

Recommended Solutions:

- Build residences near all plants as is found already at some plants.
- Establish a better medical care system.

Incentives and Bonuses: Responses were moderate to high in Criticality.

Problems:

- Actual bonuses are 20 to 40% which is low compared private sector.
- Workers are not loyal to plant.

Recommended Solutions:

- Plants should function as companies separate from the to the governorates. Companies can provide more to employees. This will have a positive effect on all plants in the sector.
- Incentives must be determined by the supervisor who knows his men and can reward the correct ones.

Fig. 8-2 h

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Discipline and Termination: These issues received Low Criticality Ratings. Although one third considered them important they are generally viewed as beyond the control of the manager.

Problems:

- Before any action is possible against an employee, long investigations are required.
- Many workers are careless because there is no penalty for them when a problem is their fault.

Recommended Solutions:

- Establish a system to discipline employees immediately for certain infractions.
- Make the specific disciplinary actions automatic.

Fig. 8-2 i

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C. CONCLUSION AND RECOMMENDATION

1. **Conclusion.** That a significant number of the issues in the Personnel Practices Review are considered Highly Critical and that Plant Managers see them as impairing the operation, maintenance and services of their plants.

Recommendation. That the NOPWASD Chairman convene a committee of NOPWASD Personnel, Management and Organization, and Training Department representatives to further investigate these findings and identify strategies for improvements. Workshops which include Plant Managers should be conducted regionally to collect the recommendations from people with practical knowledge of personnel management problems in the sector.

CHAPTER 9

MANPOWER PROBLEMS SUMMARY

CHAPTER 9

MANPOWER PROBLEMS SUMMARY

A. PURPOSE

1. The purpose of the Manpower Problems Summary is to present major findings of the Manpower Needs Assessment, to summarize sector-wide manpower problems, and to provide preliminary recommendations for corrective action.

B. THE WATER AND WASTEWATER MANPOWER SITUATION

1. **Historic Background.** The manpower problems found in the Egyptian Water and Wastewater Sector have been documented repeatedly over the past twelve years. Studies conducted by Binnie and Partners, and Black and Veach in the late seventies contained comprehensive data and recommendations for improving the situation. Numerous USAID Sector Assessments also have identified the chronic manpower problems in Water and Wastewater plants. USAID efforts to support manpower development as part of major projects in Cairo, Alexandria, Canal Cities, and Provincial Cities have begun to show positive results in these.

In the mid-eighties USAID perceived a need to assist NOPWASD in its responsibilities. By late 1988, WWISP began operation and in June, 1989, effort was initiated on the first national Manpower Needs Assessment in close association with NOPWASD. The objective was to determine the manpower needs of the sector which would serve as concrete inputs to the other planning subtasks in the WWISP Manpower Development package.

2. **Current Manpower Conditions.** The problems summarized in SR-4 are based upon the findings of the WWISP Manpower Needs Assessment which, in July and August 1989, collected data in twenty cities, each having a water and a wastewater plant.

The WWISP assessment deals with a broad slice of the Water and Wastewater Sector. It reports the number of employees from semi-skilled and skilled to management levels currently working in plants in cities with populations of 40,000 or more and projects the manpower requirements for the next ten years. The skill levels and training needs of this workforce were also determined. (NOPWASD estimates the number of workers on compact units to be at least 2000.)

The assessment was concentrated on urban areas. It does not include thousands of sector employees in smaller population centers where well networks and compact treatment units are used.

A brief summary is presented below of circumstances found in the sector and critical assessment findings. There are four major manpower problems now affecting the sector: (1) Lack of adequate funding to support the required level of training, (2) Very large numbers of employees currently in the workforce and many more projected for the future, (3) Low skill levels in the current workforce, and (4) Many personnel practices and labor issues that have a negative effect on employee morale and performance.

- **Funding.** Under Presidential Decree 197, NOPWASD is responsible for providing manpower development and training for the Water and Wastewater Sector. The NOPWASD role has been limited by a severely restricted allocation from the national training budget of only L.E. 11,000 for the current year. NOPWASD Central Department for Training (CDT) conducts courses offered to sector employees on a tuition basis at its small training centers in the Cairo area.

Plant managers in the governorates, who rely on NOPWASD for employee training, feel that free training should be made available at regional centers or in the plants themselves. They do not to send more participants to Cairo for NOPWASD training due to the imposed fee and poor residence facilities.

- **Manpower Quantities.** Based on the sample of plants in the cities visited, WWISP estimates that there are currently 9000 employees from semi-skilled to management levels in the sector workforce (5800 in

Water, 3200 in Wastewater) and that this number will expand as new projects are completed. WWISP estimates that within the next ten years, the number will reach at least 24,000 (approximately an additional 8000 Water, 7000 Wastewater) for the cities meeting the criteria described. The worker populations outside of the larger cities will also continue to grow, especially as new projects spread to these regions.

- **Workforce Skill Levels.** Data were collected from plant managers on employee training needs. In addition, a Workforce Skills Survey consisting of written tests was used to determine the adequacy of skills and knowledge. A significant need for training was found for all occupational levels. In Table 9-1, below, critical short term training priorities are summarized by occupational group. (Detailed data are reported in Chapter 5 and 7.)

TABLE 9-1

SUMMARY OF CRITICAL SHORT TERM TRAINING NEEDS

Top and Mid-Level Managers
Technical Supervisors

Chemists and Lab Technicians
Electrical Engineers and Skilled Technicians
Mechanical Engineers and Skilled Technicians

Storekeepers

Equipment Operators

- **Personnel Practices.** Plant managers were surveyed on a variety of labor issues which affect productivity and attitudes toward training. Issues such as compensation, benefits, promotion, incentives, and shortages/surpluses warrant further inquiry than was possible in the WWISP assessment. However, data collected from plant managers support the finding that solutions to problems in these areas will improve worker morale and performance.

C. ASSUMPTIONS

1. **Discussion.** The WWISP Task - B2, Manpower Development and Training, has five subtasks. The primary purpose of Subtask B2.1, Manpower Needs Assessment, is to describe the manpower situation and associated problems. The other four WWISP subtasks have specific planning purposes and use the data from the Assessment. These subtask reports will contain detailed recommendations for review by NOPWASD. Therefore, the recommendations in this summary should be considered as preliminary because more specific recommendations will appear in later reports.

The recommendations which follow are based on two assumptions: (1) It is cost effective and beneficial to maximize the use of existing programs, courses, and facilities, and (2) Interim solutions, when available, should be used until Long Range solutions can be implemented.

D. PRELIMINARY SUMMARY OF RECOMMENDATIONS

1. **Awareness and Action.** Training is a low priority activity in the sector and funding is extremely limited. Top management at NOPWASD, in the governorates and cities, and at the Central Agency for Organization and Administration should recognize the cost effectiveness of training and give training their full support. Plants will experience reduced operation and maintenance costs when a well trained staff is in place. Training is a wise investment which leads to an improved quality of service, greater public health benefits, increased productivity, and standardization throughout the sector.

2. **Management Training - The Critical Priority.** WWISP findings from on-site visits to plants strongly support the immediate need for Management Training throughout the sector. Plant managers in the governorates have had little job relevant management training. Some of them were unable to provide accurate data on the number of their employees. Few managers had work schedules with specific duty assignments. Yet this procedure is basic to good organization and plant efficiency. These management problems can be eliminated by good management training programs.

Employees who complete training courses should return to a supportive plant environment created by a manager who wants to take advantage of their new skills. However, this rarely occurs.

If spare parts, correct tools, and necessary materials are not made available by supportive plant managers, or if new procedures are ignored, then plant efficiency will be impaired. The cost effective benefits of training in such a situation also will be limited as a consequence. Therefore, it is very important that plant managers understand the training process and how to take full advantage of their newly trained staff. NOPWASD should develop a sector-wide awareness of the values of training by providing plant personnel with Management Training stressing cost effective benefits when a supportive and receptive environment is created.

• **Model Plant Organizations and Procedures.** The Water and Wastewater Sector requires standardization in Management as well as Operations and Maintenance. NOPWASD should develop standardized Plant Management and Operations and Maintenance Procedures and pilot test them under operating conditions. When finalized, these procedures would form the basis for management and supervisory training.

NOPWASD should select one operating Water and one Wastewater Plant as Demonstration and Testing Centers where new procedures, methods and systems could be developed and tested and then disseminated to other plants.

In these Plants, managers and supervisors would be shown how to improve their operations by implementing new systems and procedures.

Systems such as Management Information, Cost Accounting, and Performance Monitoring should be developed for trial use at the Demonstration Plants. When these major systems were ready for regional implementation, the Demonstration Plants would have a key role in helping to train the users of these new and complex systems.

- **NOPWASD Management Seminars.** NOPWASD managers will also require specialized sessions to keep them informed and involved in the numerous changes that will be affecting the organization and the sector.

NOPWASD should support an initial phase of Management Training (WWISP Subtask A3.2) for NOPWASD staff which focuses on Organizational Development (OD).

In OD seminars each manager would learn for defining the Mission, Functions, and Tasks that his department is responsible for performing. The seminars should stress Departmental Roles, Communication, and Coordination as well as Planning, Setting Goals, and Determining Priorities. This training will improve efficiency and aid in the achievement of short and long range objectives. Finally, approaches for Directing and Controlling must be included to ensure proper implementation and follow-up.

3. **Standards – Certification and Licensing.** The Water and Wastewater Sector is in critical need of standardization of job descriptions and

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qualifications. Currently, positions with the same title differ greatly among plants in their duties and required skills.

Promotions are based primarily on service and few employees are required to formally upgrade their knowledge and skills as pre-requisites to promotion.

A national system of Certification and Licensing is required for enforcement of standards. Promotions must be linked to upgrading of credentials by the successful completion of training courses and the passing of standardized exams. NOPWASD should take a firm leadership role in the establishment of a Water and Wastewater Certification and Licensing Board to study this important manpower issue.

4. **Pre-Employment Training.** The Egyptian system of secondary, vocational, and higher education is the most extensively developed in the Arab world. NOPWASD should coordinate closely with the Ministry of Education, Ministry of Manpower and Training, and the Engineering Faculties of the major Universities to ensure that they provide skilled workers to the sector.

Job opportunities are growing in the Water and Wastewater Sector. If educational institutions conduct entry level training, NOPWASD can save budget for that type of training.

NOPWASD should ensure that Secondary Vocational Schools conduct courses for Entry Level sector occupations. Sanitary/Environmental Engineering Degree Programs must be coordinated with Engineering faculties to ensure that the growing number of positions for such engineers can be filled.

NOPWASD must take the leadership role in coordination with universities and represent the higher educational needs of the sector.

Finally, NOPWASD should develop and implement standardized job orientation and initial training programs for skilled technicians, Engineers, and Chemists who are currently entering the sector without specific Water or Wastewater pre-employment training.

5. **Operations and Maintenance Training.** The priorities for Operations and Maintenance Training are provided in Table 9-1. Adequate facilities for such training can be very expensive and require long lead time before opening. NOPWASD should take advantage of existing training facilities to implement critically needed Entry Level Operations and Maintenance Training.

NOPWASD should overcome the delays in opening the training center at Damanhour and both Water and Wastewater training should be provided at that facility. A date for opening the Damanhour facility should be

established and Instructors, training aids and curriculum should be in place for the inauguration of the center.

Utilization of the TOMOHAR regional centers on an interim basis for technical training of entry level workers is a cost effective option for solving immediate needs. These centers are located in all major population center and have labs which are equipped for plumbing and welding trades.

NOPWASD should enter into an agreement with TOMOHAR to use their classroom and lab facilities throughout the country as an interim solution to the need for training facilities and to avoid duplication of training programs.

Based on an evaluation of the effectiveness of using TOMOHAR centers, NOPWASD can plan the construction of permanent NOPWASD Training Centers and Mobile Training Units.

6. On-the-Job Training (OJT). Probably the most cost effective approach to technical training at the semi-skilled worker and skilled technician levels is On-the-Job Training. By training directly in the plant, the need

for expensive training aids is eliminated and the negative factors of travel and tuition are overcome.

NOPWASD should develop and implement a highly structured OJT system of procedures, curriculum, and performance tests as a major solution to the training of semi-skilled workers and skilled technicians.

Mobile Training Units (MTU) should be outfitted to support particular OJT Programs for Operations and Maintenance jobs and functions. MTU's should contain training aids, audio-visual media, and courseware which allow trainers to conduct organized and effective OJT at the plants.

As a part of this system, each Water and Wastewater plant should designate a Training Coordinator who would receive specialized training in implementing the OJT system at his plant.

7. **Train-the-Trainer Program.** NOPWASD must assist the sector in developing an internal capability to train the current workforce and be prepared to train the thousands of employees who will be entering the workforce in the future.

NOPWASD should develop and implement a sector-wide Train-the-Trainer Program beginning with the NOPWASD CDT and branching out to the governorates, cities and plants. TOMOHAR facilities should be used on an interim basis for NOPWASD CDT trainers to conduct regional Train-the-Trainer Courses focusing on the implementation of OJT programs in the plants.

8. **Manpower Needs Assessment.** The value of up-to-date information for decision making is critical to any properly managed organization. The WWISP Manpower Needs Assessment has demonstrated how this information can be collected for the Water and Wastewater Sector and has provided procedures for continuation of the activity.

NOPWASD should ensure that Manpower Needs Assessment is continued by approving WWISP Report SR-4 and implementing the attached Action Plan.

9. **NOPWASD CDT - A National Training Resource Center.** The NOPWASD Central Department for Training (CDT) should be given full support to implement the comprehensive actions required to solve the manpower development problems facing the Water and Wastewater Sector.

The CDT will be responsible for all aspects of manpower development and training: designing, developing, implementing and evaluating training programs. The CDT will establish a National Training Management Information System (NTMIS) which will maintain close contact with the field and ensure that training programs are responsive to sector needs.

A National Training Resource Center should be established to provide materials, media, assistance and direction to trainers in the field. Under the centralized authority of the NOPWASD CDT, national training, certification and licensing will be standardized, monitored and improved.

It is now being recognized that Action Plans derived from WWISP subtasks have substantial training components within them. NOPWASD should support the establishment of a centralized and structured Counterpart Program coordinated by the CDT for the development of staff capabilities and skills throughout NOPWASD.

The coordination of Off-Shore Training opportunities for NOPWASD staff and plant personnel should also be a CDT responsibility.

In order to accomplish the ambitious and challenging agenda presented in this summary, NOPWASD top management will have to make a substantial commitment to fulfilling its responsibility as the training authority and resource for the sector. This will require identifying training as a budgetary priority and developing and strengthening the CDT.

The attached Report SR-4 Action Plan describes the process which should be implemented to augment the CDT staff, facilities, equipment, and budget.

CHAPTER 10

ACTION PLAN

CHAPTER 10

ACTION PLAN

A. INSTITUTIONAL SUPPORT

1. **Planning.** The WWISP is an institutional support project. WWISP Advisors and Experts assist NOPWASD to solve problems within the organization itself and the Water and Wastewater Sector. Although most aspects of NOPWASD activity involve some degree of engineering, WWISP is not an engineering project. WWISP is an organizational and management development project. WWISP is the end result of the findings and recommendations of the numerous studies which were conducted over the past ten years. The objective of WWISP is to assist NOPWASD managers in the implementation of solutions to the various problems documented in previous studies and further investigated as part of WWISP.

Effective planning is the most critical management function in the problem solving process. Solutions which exist on paper only have no value. It is through planning, implementation and follow-up that solutions become concrete improvements. USAID has singled out planning support as one of the key areas for WWISP attention.

Each WWISP Manpower Development and Training subtask provides a planning approach to address the specific needs of NOPWASD and the Water and Wastewater Sector. Subtask reports contain an Action Plan providing a sequence and schedule for steps which should be taken to solve problems and make progress. The **Action Plan** for Report SR-4 details the steps necessary to ensure that the NOPWASD CDT develop an internal Manpower Assessment capability and that assessment activities for the Water and Wastewater Sector continue as part of the NOPWASD Manpower Development and Training Mission.

Each chapter of this report contains conclusions and recommendations for the institutional support of NOPWASD and the solution of problems identified as part of the Manpower Needs Assessment. The planning of these improvements involves the identification of a logical sequence of events so that all requirements can become part of the master implementation schedule.

2. **Implementation.** Recommendations in this report have focused on the need to elevate the priority of training within NOPWASD and the Water and Wastewater sector by supporting the CDT in its efforts to accomplish its mission. The first set of actions to be sequenced as part of the SR-4 Action Plan is associated with Strengthening the CDT. Implementation should be recognized as fundamental to the accomplishment of additional SR-4 recommendations and those which appear in other Manpower Development and Training subtasks.

The second set of actions focuses on Establishing an On-Going Manpower Needs Assessment as a function of the CDT. NOPWASD requires a long range training strategy which is based on current manpower data.

Continuation of Manpower Needs Assessment as a priority function of the CDT will ensure that the critical decision making required for implementation of Manpower Development, On-the-Job Training (OJT), and Certification and Licensing Programs will be based on sound planning data.

The two major actions, Strengthening the CDT and Establishing an On-Going Manpower Needs Assessment, are described below. The scheduling of these events is shown in the Action Plan section of this chapter.

- a. **Strengthening the CDT.** The present number of professional and support staff in the CDT is too low for the department to accomplish its Mission (Appendix A). A committee should be formed to analyze the manning needs of the CDT, develop a proposed organization and staffing plan, and begin filling required positions on a phased basis over the next two years.

The professional staff necessary to augment the CDT fall into three groups: (1) Subject Matter Expert Developer Trainers, (2) Human Resources Development Specialists, and (3) Extension Trainers. As clearly presented in Chapters 5 and 7 of this report, NOPWASD must have a large specialized CDT staff to deal with the enormous scope of the manpower needs of the sector.

The CDT requires Subject Matter Experts who can learn how to develop courses and conduct training in: Sanitary, Electrical, Mechanical Engineering; Chemistry and Lab Processes; Equipment Operation and Maintenance; Finance and Accounting; Personnel Administration; Supply & Logistics.

Human Resources Development Specialists are professionals with specific skills in the various aspects of training development and implementation. These people will have to be recruited from outside of NOPWASD or procured by contract. Specialists required include: Assessment/Evaluation; Design/Development; Media/Library; OJT/Certification; Management Training/Career Planning.

The NOPWASD CDT needs a branch which links the activities taking place in Cairo with the Water and Wastewater facilities in the Governorates. Extension Trainers able to collect data, implement programs and conduct training in the field would greatly improve the effectiveness of CDT efforts. These Extension trainers would work closely with NOPWASD Execution Department staff to ensure that contractor provided training was adequate in meeting the needs of new plants. The CDT could be manned with an Extension Trainer for each region of the country. They could be assigned to the current CDT Training Centers (Mogama, Guesr El-Suez). Adequate numbers of trained support staff (typists, clerks,

illustrator/draftsmen, drivers) must also be assigned to strengthen the CDT.

All CDT professional staff should attend Train-the-Trainer courses and specific off-shore programs should be investigated, especially for CDT senior staff and the Human Resources Development Specialists. Career Planning as a goal for NOPWASD and the sector could begin with the CDT itself.

In addition to developing the CDT staff, the facilities, equipment, and materials required to upgrade training and training development must be provided to the department. The CDT needs completely renovated offices and classrooms in Mogama. These spaces should be properly outfitted with appropriate furnishings and audio-visual equipment to support various types of training. Support equipment must include a dedicated Arabic/English computer (PC) for data control, class scheduling and word processing. Reproduction equipment and photocopying machines capable of making overhead transparencies are also required. Materials to develop training aids and paper and printing supplies must be available to the CDT. Funding to establish and maintain a growing CDT Library must be approved.

The CDT budget must be analysed to ensure that adequate funding is made available for the department to accomplish its mission. The CDT should prepare a budget for the remainder of the current

fiscal year and NOPWASD top management should secure the necessary funds. The CDT annual budget should contain extensive justification for the funding requested and should be aggressively defended when it is reviewed within NOPWASD and at the Central Agency for Organization and Administration (CAOA).

b. Establishing an On-Going Manpower Needs Assessment.

This report provides the CDT with a strong start in terms of the procedures and data necessary to continue performing Manpower Needs Assessment activities. A commitment must be made by NOPWASD top management and the CDT Director to establish data gathering and analysis as permanent tasks for the CDT. The quality of data currently available in the field is very weak, but the CDT can definitely improve the situation by conducting structured periodic assessments.

Assessment activities which are planned to begin within the next two years include:

- Continued analysis of raw data collected during the initial assessment
- Refinement of current assessment procedures and forms
- Expanding the sample used for the initial assessment, and collecting and analyzing field data

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- Coordination with the NOPWASD MIS to support the data needs of the CDT
- Conducting a Comprehensive Assessment of NOPWASD Personnel Training Needs
- Conducting a Comprehensive Assessment of MRH, Governorate and City Sector Personnel Training Needs
- Tracking New Plant Completions

All of these activities are scheduled in the SR-4 Action Plan.

3. **Follow-Up.** A good plan must include a method of monitoring progress and contain means of making adjustments and corrections when the situation changes or problems and delays are encountered.

The two key aspects of the SR-4 Action Plan are Strengthening the CDT and time. The latter can be checked by comparing actual progress against the best case estimates in the Action Plan. As soon as delays are identified, the causes must be investigated and the impediments to progress removed. The former must be monitored closely due to the potential for blockages caused by lack of funding. If problems cannot be solved, they must be brought to a higher level of authority within NOPWASD or USAID for assistance.

The NOPWASD Deputy Chairman, the CDT WWISP Counterparts, the WWISP B 2 Task Leader and Long Term Advisors, all have the

responsibility for monitoring and following-up the progress of the Action Plan implementation. Constant coordination among these people will be crucial to accomplishment of the challenging agenda presented in the Action Plan.

In addition to the key staff identified above, all departments within NOPWASD must fully cooperate in order to implement the SR-4 Action Plan. The Personnel Department and the Organization and Management Department have specific and important responsibilities regarding implementation and should be directed by NOPWASD authorities to support the WWISP objectives for improving the CDT and its capability to perform Manpower Needs Assessment. When the CDT begins work on a comprehensive review of NOPWASD training needs, all departments will be involved and cooperation will be the key to conducting a successful in-house assessment.

The SR-4 Action Plan requires that the CDT Director submit a semi-annual Progress Report to the NOPWASD Chairman to keep top management informed regarding: status of scheduled activities, planning, problems and concerns.

B. ACTION PLAN

1. **Description.** FIGURE 10-1, the SR-4 Action Plan, shows the sequence of events which must be followed within NOPWASD to Strengthen the CDT

and Establish an On-Going Assessment. The Preliminary Recommendations which appeared in Chapter 9 and the Executive Summary are not a part of the SR-4 Action Plan. The reports for Subtasks B2.1 to 2.5 will address the Preliminary Recommendations. The Action Plan identifies specific Action Agents within NOPWASD and realistic dates for each event.

APPENDICES

APPENDIX A

C D T MISSION

APPENDIX A

CENTRAL DEPARTMENT FOR TRAINING (CDT)

Mission & Responsibilities

Mission: To raise the administrative, professional and technical job performance standards of all workers in the Water & Wastewater Sector so that national public health and productivity can continue to increase along with technological developments.

Major Functions:

1. To develop and implement a **National Training System** (programs, procedures, schedules, courses, exams, training aids and devices, and qualified trainers) for all occupations within the Water & Wastewater Sector.
2. To ensure that training programs are appropriate, cost-effective, up-to-date and meet the sector requirements as detailed in an ongoing Manpower Needs Assessment.
3. To improve employees' awareness of the importance of training.
4. To establish strong coordination for the improvement of the quality of training among all sector elements including Cairo, Alexandria, Canal Cities and the Governorates currently under the jurisdiction of NOPWASD.

5. To meet the requirements of Presidential Decree 197/81 and gradually assume national responsibility for all Water and Wastewater training throughout Egypt.

Key Responsibilities:

Policy

Formulate General & Detailed Policies for National Manpower Issues with other concerned elements in NOPWASD and the Water and Wastewater Sector¹.

Formulate and Execute General and Detailed National Sector Training Policies and Procedures for Technical and Professional Training.

Assume a leadership role on the Manpower Policy Planning Committee and with other responsible departments for coordination of manpower issues such as: Recruitment, Placement, Promotion, Incentives, Career Planning, and Job Stability, etc.

¹ A Manpower Policy Planning Committee (MPPC) comprised of representatives of the NOPWASD CDT, General Dep't for Organization & Management, and General Dep't for Personnel will be formed to address and coordinate manpower issues of mutual interest to NOPWASD and the Governorates. A representative from the CDT will be the first Chairman of the MPPC.

National Assessment

Assume a leadership role in coordinating regular periodic National Manpower Needs Assessments to determine current manning, skill levels and deficiencies, and current and future needs. Assessment activities will be coordinated through the NOPWASD General Department for Management and Organization and any other related departments.

Develop and maintain a Master Training Requirements List (MTRL) which prioritizes training needs by occupation.

Training Development

Plan and develop training programs and mandatory courses for each position in the sector and document in a rolling 5-year Master Training Requirements Plan (MTRP).

Maintain an up-to-date Training Resources Requirements List detailing the specific needs to conduct training.

Formulate and periodically update a Training Resources Procurement Plan detailing the timeframes and strategies to acquire necessities.

Establish international standards for worker performance and monitor the Certification and Licensing of sector staff.

Structure and support the implementation of effective On-the-Job Training (OJT) Programs for Governorates and NOPWASD employees.

Design and conduct Management Training programs for administrators and coordinate overseas education/training for professionals and technicians as required.

Develop and conduct Train-the-Trainer programs and National W/WW Training Conferences.

Develop and maintain a Continuing Education Program for professionals and technicians who wish to seek higher certificates or degrees.

Formulate and implement plans for the Retraining of Surplus Workers in coordination with the General Department for Management and Organization.

Training Implementation

Implement training programs for positions where critical need has been determined.

Plan construction of and logistics for training centers including: equipment, curriculum, audio-visual production, printing, supplies, transport, etc.

Conduct the necessary programs to attract and motivate employees to seek out training opportunities.

Establish and maintain a centralized Training and Training Resources Center with a curriculum development and program implementation staff.

Coordination & Information

Coordinate within NOPWASD and with the Governorates on all matters pertaining to major manpower issues and training.

Coordinate with other organizations within the sector and with any other ministries, agencies and schools conducting training for the purpose of sharing and exchanging training resources.

Coordinate with local educational authorities to ensure that institutions provide appropriate pre-employment training for the needs of the sector.

Monitor current research and innovations in the training field.

Encourage local Governorate involvement in the training planning function.

Coordinate Continuing Education Programs for sector professionals and technicians with local universities and institutes.

Establish and maintain research support to universities, a comprehensive publication program, and library facilities and services.

Administration

Conduct budget analysis for annual CDT needs and submit for review.

Evaluate and follow-up the technical and contracted assistance provided to NOPWASD in the area of training and materials development.

Develop training records for each occupation which will be filled out by the trainee's local Personnel Dep't.

1978

Boyle Engineering and
National Education (J.V.)
in Association with A.A.W/TEAM MISR
Water & Wastewater Institutional
Support Project (WWISP)

الهيئة المشتركة من شركتي
بويل انجنييرينج و ناشيونال ايدوكيشن
بالتعاون مع شركتي عبد الوارث وتيم مصر
مشروع الدعم التنظيمي لقطاع الامداد
بالمياه والصرف الصحي

Eng. Saleh Moustafa
Director,
Central Department for Training
NOPWASD
Hogamma Building- 6th Floor .
Tahrir Square
Cairo, Egypt

June 21, 1989
WWISP/00166/89/VJN/em/LTR

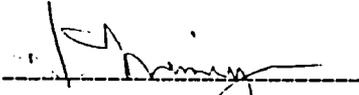
Subject : Proposed Central Department For Training: Mission
And Responsibilities

Dear Eng. Moustafa,

Attached please find a proposed Central Department for Training mission and responsibilities document. We have been working on this document for the past month with our NOPWASD counterparts to include Eng. Fathi Anis Messiha, Eng. Fatma El- Zahraa Moustafa and Eng. Asmaa Moustafa Mourad.

We would appreciate it if you would review the document. If you approve, please sign below and return. If you require additional information, please contact us at your earliest convenience. We would be happy to discuss the document with you.

Sincerely yours,


Dr. Vincent Niemeyer
Senior Advisor- Task B2
"Manpower Development & Training"

Approved [✓]
Returned for additional []
Information

F. Anis
27/6/89


27-6-89

Eng. Saleh Moustafa
Director, CDT, NOPWASD

A-7

الإدارة المركزية للتدريب

المهام والمسئوليات

المهمة : رفع مستوى الأداء الوظيفي للعاملين من النواحي الإدارية التخصصية والفنية لجميع العاملين بقطاع مياه الشرب والصرف الصحي حتى يمكن الارتقاء المستمر بالصحة العامة والإنتاج لمواكبة التقدم التكنولوجي .

الأهداف الرئيسية :

- ١ - وضع وتنفيذ نظام للتدريب القومي برامج ، إجراءات ، جداول ، دورات ، امتحانات ، مواد وستنزمات التدريب ، بالإضافة الى مدربين أكفاء ، يغطي كافة الوظائف داخل قطاع مياه الشرب والصرف الصحي .
- ٢ - ضمان أن البرامج التدريبية مناسبة وذات تكلفة فعالة وحديثة ، كما أنها تلبي احتياجات القطاع التي تم توضيحها في التقديرات المستمرة للاحتياجات من القوى العاملة .
- ٣ - زيادة الوعي لدى العاملين عن أهمية التدريب .
- ٤ - وضع طرق تنسيق قوية لتحسين نوعية التدريب على مستوى هيئات القطاع بما في ذلك القاهرة - الاسكندرية - مدن القناة والمحافظات التي تقع حاليا في دائرة اختصاص الهيئة القومية لمياه الشرب والصرف الصحي .
- ٥ - تنفيذ ما ورد بالقرار الجمهوري ١٩٧ لسنة ١٩٨١ وتحمل المسؤولية تدريجيا لعمل تدريب على المستوى القومي لقطاع مياه الشرب والصرف الصحي بمصر .

المسئوليات الأساسية :

السياسة :

تشكيل سياسات عامة ومفصلة للمسائل التي تخص القوى العاملة على المستوى القومي بالتعاون مع ادارات أخرى معنية بالهيئة القومية لمياه الشرب والصرف الصحي وهيئات قطاع مياه الشرب والصرف الصحي (١) :

(١) يتم تشكيل لجنة لتخطيط ورسم سياسات القوى العاملة مكونة من ممثلي الإدارة المركزية للتدريب بالهيئة والإدارة العامة للتنظيم والإدارة - والإدارة العامة لشئون الأفراد ، وتكون مسئولية هذه اللجنة بحسب وتنسيق القضايا الخاصة بالقوى العاملة ذات الاهتمام المشترك بين الهيئة القومية لمياه الشرب والصرف الصحي والمحافظات . ويصبح مندوب الإدارة المركزية للتدريب رئيساً لهذه اللجنة .

Handwritten signature and initials.

(٢)

- تشكيل وتنفيذ اجراءات وسياسات عامة ومفصلة للتدريب المهني والفني على المستوى القومي بالقطاع .
- القيام بدور قيادي في لجنة تخطيط سياسة القوى العاملة - بالاشتراك مع الجهات المعنية - فيما يخص قضايا القوى العاملة مثل : التعيين - الاحلال - الترقى - التحفيز - تخطيط التسلسل الوظيفي - الاستقرار - الخ .

عمل تقديرات على المستوى القومي :

- القيام بدور قيادي في تنسيق عمل تقديرات دورية للاحتياجات من القوى العاملة على المستوى القومي ، مستوى الكفاءات ومواطن القصور وكذلك الاحتياجات الحالية والمستقبلية ، وتتولى الادارة العامة للتنظيم والادارة التنسيق لهذا العمل مع الادارات الفنية الأخرى فيما يخص هذا النشاط .
- عمل - والمداومة على عمل - قائمة عامة وشاملة باحتياجات التدريب والتي تضع أولويات احتياجات التدريب لكل وظيفة .

تطوير التدريب :

- تخطيط واستحداث برامج تدريبية ودورات اجبارية لكل وظيفة بالقطاع ويتم توثيق ذلك في خطة شاملة ومستمرة مدتها خمس سنوات .
- المداومة على عمل قائمة بالاحتياجات من مصادر التدريب توضح بالتحديد الاحتياجات اللازمة لعمل التدريب وتحديثها بصورة مستمرة .
- عمل وتحديث خطة مصادر مشتريات التدريب بصورة دورية والتي توضح الاوقات والطرق اللازمة للحصول على الضروريات .
- تطبيق معايير دولية لقياس أداء العاملين ومتابعة منح الشهادات والتراخيص اللازمة لمزاولة المهنة لعاملتي القطاع .
- بناء ودعم تنفيذ التدريب من خلال برامج الممارسة الوظيفية بالمحافظات بالهيئة .
- تعميم وعمل برامج تدريب الادارة للداريين وتنسيق دورات تعليمية وتدريبية خارج البلاد للمتخصصين والفنيين حسب الحاجة .
- استحداث وتنفيذ برامج تدريب المتدربين وكذلك مؤتمرات تدريبية علي المستوى القومي لقطاع مياه الشرب والصرف الصحي .
- استحداث والمداومة على عمل برامج تعليمية مستمرة للمهنيين والفنيين الذين يرغبون الحصول وعلى شهادات أو درجات عليا .
- رسم وتنفيذ خطط لاعادة تدريب الفائتي من العمالة بالتنسيق مع الادارة العامة للتنظيم والادارة .

تنفيذ التدريب :

- تنفيذ برامج تدريبية للوظائف التي يثبت وجود حاجة ملحة للتدريب بها .
- تخطيط انشاء وتعميم مراكز التدريب بالمعدات ، المناهج ، الات التصوير والطبع ، وسائل النقل ، الأثاث ، ونغيره .

Dr. K. S. A. 9

- تنفيذ البرامج الضرورية لجذب وتحفيز العاملين لاغتنام فرص التدريب .
- انشاء والمداومة على عمل مركز تدريب ومصادر تدريب مركزيه مجهز بمناهج دراسية متطورة ومواد تدريبية سمعية وبصرية وفريق لتدريس وتنفيذ هذه البرامج .

التنسيق والمعلومات :

- التنسيق داخل الهيئة ومع المحافظات فيما يخص كافة الأمور التي تتعلق بمسائل القوى العاملة والتدريب .
- التنسيق مع هيئات أخرى بالقطاع ومع وزارات أخرى ، المؤسسات والمدارس التي تقوم بالتدريب بغرض المشاركة وتبادل مصادر التدريب .
- التنسيق مع المسؤولين عن التعليم المحلي لضمان أن المعاهد تعطي تدريباً مناسباً للعاملين قبل تعيينهم لتلبية احتياجات القطاع .
- متابعة الأبحاث الحالية والطرق المستحدثة في مجال التدريب .
- تشجيع الاشتراك المحلي للمحافظات في أعمال تخطيط التدريب .
- تنسيق عمل برامج تعليمية مستمرة للمتخصصين بالقطاع والفنيين بالمعاهد والجامعات المحلية .
- الحصول والمداومة على الحصول على الدعم البحثي من الجامعات ، وعمل برامج نشرات شاملة ، وتوفير خدمات مكتبية .

الادارة :

- وضع وتحليل موازنة للاحتياجات السنوية للإدارة المركزية للتدريب مع تقديمها للعرض والمراجعة .
- تقييم ومتابعة المعونة الفنية والتعاقدية التي تنطلقها الهيئة في مجال التدريب وتطوير المواد التدريبية .
- عمل سجلات للتدريب لكل وظيفة والتي يتم ملؤها بقسم شؤون الأفراد وتحفظ بملفات المتدربين .

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APPENDIX B

JOB CLASSIFICATION SYSTEM

APPENDIX B

JOB CLASSIFICATION SYSTEM

PART 1 - WATER FACILITIES

JOB CATEGORY

JOB TITLES

1. Management

General Manager

Mgr. Follow-Up

Mgr. Legal Affairs

Mgr. Personnel

Mgr. Finance

Mgr. Purchasing/Contracting

Mgr. Stores

Mgr. Training

Mgr. Customer Services

Mgr. New Projects/Facility

2. Engineer

Chief Engineer, New Projects

Treatment Engineer, New Projects

Distribution Engineer, New Projects

Engineer, Water Networks

Engineer, Mechanical

Engineer, Electrical

- | | |
|----------------------------------|-----------------------------------------------------------------------------------|
| 3. <u>Chemist</u> | Chief Chemist, Laboratory
Chemist, Laboratory
Aluminum Sulphate Helper, Lab |
| 4. <u>Legal</u> | All positions distributed to other job categories. |
| 5. <u>Accountant</u> | Accountant
Bookkeeper |
| 6. <u>Public Relations</u> | All positions distributed to other job categories. |
| 7. <u>Quality Control</u> | Inspector, Follow-Up
Technician
Data Collection Specialist |
| 8. <u>Purchasing/Contacting</u> | Contract Specialist |
| 9. <u>Personnel and Training</u> | Training Specialist, Operations
Training Specialist, Maintenance |
| 10. <u>Administrative</u> | Administrative Assistant |

2. Technical Supervisor

A. Treatment

Sup., Screening & Grit Removal
Sup., Coagulant Preparation, Dosing
Sup., Settling
Sup., Filtration
Sup., Chlorination
Sup., Pumping Station
Sup., Maintenance
Sup., Buildings & Grounds
Chief/Foreman Mechanic
Chief/Foreman Electrician

B. Distribution

Shift Supervisor Booster Operations
Supervisor, Vehicles
Supervisor, Maintenance
Crew Chief, Maintenance Mains
Foreman, Network, Maintenance Mains

C. Customer Services

Chief, Customer Services, Accounts
Foreman, Meter Installation & Repair

D. Other

Foreman, Equipment, Main Stores &
Equipment

10. SKILLED TECHNICIANS

- A. Main Stores & Equipment Mechanic
 - Electrician
 - Storekeeper

- B. Treatment
 - Operator, Pump Station Operations
 - Technician, Well Station
 - Carpenter
 - Road Maintenance Specialist
 - Painter, Interior
 - Furniture Finisher
 - Mason

- C. Distribution
 - Draftsman
 - Technician, Connections
 - Technician, Networks
 - Mechanic, Vehicles
 - Tech. Electrician, Vehicles
 - Iron Worker, Welder
 - Booster Operator
 - Lead Mechanic
 - Mechanic, Substation Operations

- D. Other
 - Meter Repairman, Install & Repair,
 - Customer Services

14. Semi-Skilled

A. Treatment

Operator, Pump Station Operations
Assistant Road Maintenance Specialist
Asst. Carpenter
Asst. Mason
Asst. Painter, Interior
Telephone Operator
Security Guard

B. Distribution

Asst. Iron Worker
Asst. Booster Operator
Driver, Maintenance Mains
Driver, Booster Operations

C. Customer Services

Asst. Meter Repairman
Meter Reader
Cashier

15. Unskilled

Gardener
Laborer

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JOB CLASSIFICATION SYSTEM
PART 2 – WASTEWATER FACILITIES

JOB CATEGORY

JOB TITLES

1. Management

General Manager
Mgr. Follow-Up
Mgr. Legal Affairs
Mgr. Personnel
Mgr. Finance
Mgr. Purchasing/Contracting
Mgr. Stores
Mgr. Training
Mgr. Customer Services
Mgr. New Projects/Facility
Director

2. Engineer

Chief Engineer, Treatment
Chief Engineer, Collection
Plumbing Engineer
Cost Engineer
Sanitary Engineer
Mechanical Engineer
Electrical Engineer
Engineer, New Projects

3. Chemist Chief Chemist, Laboratory
Chemist, Laboratory
Assistant Chemist
Lab Technician
4. Legal All positions distributed to other job categories.
5. Accountant Accountant
Bookkeeper
6. Public Relations All positions distributed to other job categories.
7. Quality Control Inspector, Follow-Up
Technician
Data Collection Specialist
8. Purchasing/Contacting Contract Specialist
9. Personnel and Training Training Specialist, Operations
Training Specialist, Maintenance
10. Administrative Administrative Assistant

11. Clerical

Clerk

Clerk/Typist

12. Technical Supervisor

A. Treatment

Sup., Treatment Plant

Sup., Screening & Grit Removal

Sup., Primary Settling

Sup., Aeration Systems

Sup., Chlorination

Sup., Pumping Station

Sup., Plant Maintenance and Transport

Sup., Buildings & Grounds

Chief/Foreman Mechanic

Chief/Foreman Electrician

B. Collection

Shift Supervisor Pump Station Operations

Shift Supervisor Pump Station Maintenance

Foreman Elec. Maintenance, Pump Stations

Foreman Mech. Maintenance, Pump Stations

Supervisor, Pipeline Maintenance

Supervisor, Sewer Repair

Supervisor, Sewer Connections

Supervisor, House, Building Connections

Supervisor, Sewer Cleaning

Foreman, Maintenance Mains & Sewers

13. Skilled Technicians

A. Main Stores & Equipment Storekeeper

B. Treatment
Mechanic, Treated Water
Mechanic, Sludge Pumps
Electrician, Return Back Water
Electrician, Operation of Scraper
Mechanic, Treatment Maintenance
Electrician, Treatment Maintenance
Mechanic, Automotive Equipment

C. Collection
Mechanic, Pump Station Operation
Electrician, Pump Station Operation
Mechanic, Pump Station Maintenance
Electrician, Pump Station Maintenance
Road Maintenance Specialist
Mason
Technician, Jet Car Grav. Sewage Maint.
Technician, Bucket Machine
Back Hoe Operator, Sewer Connect./Repair
Back Hoe Operator, Sewer New Connect.
Mechanic, Vehicles
Tech. Electrician, Vehicles
Iron Worker, Welder
Pipefitter

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D. Other

Technician, Follow-Up
Technician, Facility Records/New Projects
Draftsman
Carpenter
Road Maintenance Specialist
Painter, Interior
Furniture Finisher
Mason

14. Semi-Skilled

A. Treatment

Mechanic, Treated Water
Mechanic, Sludge Pumps
Electrician, Return Back Water
Electrician, Operation of Scraper
Mechanic, Treatment Maintenance
Electrician, Treatment Maintenance
Mechanic, Automotive Equipment
Driver, Treatment Maintenance
Driver, Treatment Operations
Assistant Road Maintenance Specialist
Asst. Carpenter
Asst. Mason
Asst. Painter, Interior
Telephone Operator

B. Collection
Mechanic, Pump Station Operation
Electrician, Pump Station Operation
Mechanic, Pump Station Maintenance
Electrician, Pump Station Maintenance
Asst. Mason
Asst. Pipefitter
Asst. Iron Worker, Welder
Asst. Booster Operator
Truck Driver, Sewer Connections
Truck Driver, Cleaning & Collections
Driver, Jet Car

C. Other
Security Guard

15. Unskilled
Gardener
Laborer

APPENDIX C

CURRENT and NEW WATER FACILITIES

APPENDIX C URBAN WATER FACILITIES - PART 1 - CURRENT

Region	Governorate Name	Location	Cap. M/l	Cap. L/Sec	Plants	Water Source
East Delta	Dakahlia	Mansura	M	700	2	Surface
East Delta	Qakubia	Benha	I	730	1	Surface & Wells
East Delta	Dakahlia	Simbillawein	M	115	1	Surface & Wells
East Delta	North Sinai	El Arish	M	150	1	Wells
Mid Egypt	Fayoum	Fayoum	I	360	2	Surface
Mid Egypt	Beni Suef	Beni Suef	I	400	2	Surface & Wells
Mid Egypt	Menia	Minya	M	74	2	Surface & Wells
Mid Egypt	Assuit	Assuit	I	580	2	Surface & Wells
Mid Egypt	Menia	Maghagha	M	55	2	Wells
Mid Egypt	Menia	Samalut	M	60	2	Surface & Wells
Mid Egypt	Beni Suef	Biba	I	200	1	Surface & Wells
Mid Egypt	Beni Suef	Fashn	M	60	1	Surface & Wells
Mid Egypt	Menia	Mallawi	M	87	1	Surface & Wells
Mid Egypt	Menia	Beni Mazar	M	67	1	Surface & Wells
Mid-Delta	Gharbia	Samannud	I	270	3	Wells
Mid-Delta	Gharbia	Zifta	M	365	3	Wells
Mid-Delta	Menoufia	Shibin el Kom	I	640	3	Surface & Wells
Mid-Delta	Gharbia	Tanta	M	600	2	Surface
Mid-Delta	Gharbia	Mahalla el Kubra	I	670	2	Surface
Mid-Delta	Gharbia	Basgun	M	145	2	Wells
Mid-Delta	Menoufia	Minuf	I	1200	2	Surface & Wells
Mid-Delta	Damietta	Damietta	I	600	1	Surface
Mid-Delta	Kafr el Sheikh	Kafr el Sheikh	M	400	1	Surface
Mid-Delta	Sharkia	Zagazig	M	451	1	Surface & Wells
Mid-Delta	Kafr el Sheikh	Disuq	I	100	1	Surface
Mid-Delta	Gharbia	Kafr el Zaigat	I	100	1	Surface & Wells
Mid-Delta	Sharkia	Faqus	M	127	1	Surface & Wells
Mid-Delta	Menoufia	Ashmun	M	100	1	Surface & Wells
Upper Egypt	Qena	Qena	I	425	3	Surface & Wells
Upper Egypt	Suhag	Tahta	I	250	2	Surface & Wells
Upper Egypt	Qena	Luxor	I	260	2	Surface & Wells
Upper Egypt	Aswan	Aswan	M	460	2	Surface & Wells
Upper Egypt	Suhag	Suhag	I	200	2	Surface
Upper Egypt	Suhag	Akhmin	I	100	2	Surface
Upper Egypt	Aswan	Kom Ombo	I	200	1	Surface & Wells
Upper Egypt	Suhag	Girga	I	100	1	Surface
Upper Egypt	Suhag	Manshah	M	23	1	Wells
Upper Egypt	Qena	Isna	M	162	1	Surface & Wells
Upper Egypt	Qena	Qus	I	150	1	Surface & Wells
Upper Egypt	Qena	Dishna	M	131	1	Surface & Wells
Upper Egypt	Aswan	Idfu	I	30	1	Surface & Wells
West Delta	Beheira	Damanhur	M	312	1	Surface
West Delta	Beheira	Kafr el Dawwar	I	400	1	Surface
West Delta	Marsa Matrouth	Marsa Matrouth	M	35	1	Cisterns, Tankers

Capacity Represents the Total for the City & Surrounding Service Areas

M = Maximum, I = Installed; Max Demand = 70% Installed, Average Demand = 50% Installed

APPENDIX C URBAN WATER FACILITIES - PART 2 - NEW

Region	Governorate Name	Location	Project Type	Cap. L/Sec	Water Source	Est. Date of Completion*
East Delta	Qalubia	Khanka	New	200	Surface	1988
Mid-Delta	Kafr El Sheikh	Fawa	Upgrade	800	Surface	1989
Upper Egypt	Qena	Safaga	Upgrade	250	Surface	1989
Upper Egypt	Qena	Luxor	Upgrade	400	Surface	1989
Mid-Delta	Gharbia	Zifta	New	200	Surface	1990
Mid-Delta	Damietta	El Adleia	New	600	Surface	1990
Mid-Delta	Damietta	Damietta	Upgrade	600	Surface	1990
Mid-Delta	Damietta	El Bostan	Upgrade	1200	Surface	1990
East Delta	Dakahlia	Talkha	New	400	Surface	1990
East Delta	Dakahlia	El Gamalia	New	600	Surface	1990
Mid Egypt	Beni Suef	El Fashen	New	200	Surface	1990
Mid Egypt	Beni Suef	Bebba	New	200	Surface	1990
Mid Egypt	Beni Suef	Masara Nasan	New	200	Surface	1990
Mid-Delta	Sharkia	El Abbasa	Upgrade	1400	Surface	1991
East Delta	Dakahlia	Mitfares	New	400	Surface	1991
Upper Egypt	Aswan	Edfu	New	200	Surface	1991
Upper Egypt	Qena	Qena	New	600	Surface	1992
Upper Egypt	Qena	Deshna	New	400	Surface	1992
West Delta	Beheira	Kafr El Dawar	Upgrade	600	Surface	
West Delta	Beheira	Edfina	New	400	Surface	
West Delta	Beheira	El Nobaria	New	400	Surface	
East Delta	Qalubia	Bonha	--	400	Surface	
Mid-Delta	Kafr El Sheikh	El Hamool	New	500	Surface	
Mid-Delta	Kafr El Sheikh	Kafr El Sheikh	Upgrade	1000	Surface	
Mid-Delta	Kafr El Sheikh	Mahalla Abu Ali	Upgrade	1000	Surface	
Mid-Delta	Sharkia	El Saffia	New	600	Surface	
Mid-Delta	Sharkia	Faqus	New	600	Surface	
Mid-Egypt	Fayoum	Fayoum	New	300	Surface	
Upper Egypt	Qena	Magha Hamady	New	400	Surface	
Upper Egypt	Sohag	Sohag East	New	400	Surface	
Upper Egypt	Sohag	El Manshah	New	400	Surface	
Mid Egypt	Minya	Minya	New	300	Surface	
Mid Egypt	Minya	Matai	New	400	Surface	
Mid-Delta	Damietta	Demiat El Ghdida	New	1000	Surface	
East Delta	Dakahlia	Belkass	New	400	Surface	
Mid Egypt	Beni Suef	Beni Suef	New	300	Surface	
Upper Egypt	Aswan	Komombo	New	400	Surface	
East Delta	Ismailia	West Ismailia	New	400	Surface	
East Delta	North Sinai	Kantra Shark	New	600	Surface	

* **NOVYASD CONTRACT DATES, A 2 YEAR DELAY WAS REPORTED BY EXECUTION DEPT**

APPENDIX D

CURRENT and NEW WASTEWATER FACILITIES

APPENDIX D URBAN WASTEWATER FACILITIES - PART 1 - CURRENT

Region	Governorate Name	Location	Treatment Plants	Process Type #	Capacity L/Sec.	Pumping Stations	In Operation 1989
East Delta	Port Said	Port Said	1	PS, TF	--	11	No
East Delta	Dakahlia	Mansura	1	SA	285	9	No
East Delta	Qalubia	Benha	1	SA	200	9	Yes
East Delta	North Sinai	El Arish	1	OD	40	0	N/A
East Delta	South Sinai	South Sinai	1	OD	30	0	N/A
East Delta	Damietta	Damietta	1	SA	150	19	No
East Delta	Suez	Suez	1	--	--		No
East Delta	Ismailia	Ismailia	1	TF	700	8	Yes
East Delta	Dakahlia	Simbillawein	1	--	--		No
Mid-Delta	Gharbia	Mahalla el Kubra	1	SA	200	10	No
Mid-Delta	Gharbia	Tanta	1	SA	400	5	Yes
Mid-Delta	Gharbia	Kafr el Zaiyat	1	SA	90	5	No
Mid-Delta	Gharbia	Samannud	1	SA	208	2	No
Mid-Delta	Sharkia	Zagazig	1	SA	125	2	No
Mid-Delta	Menoufia	Misuf	1	SA	220	3	No
Mid-Delta	Kafr el Sheikh	Kafr el Sheikh	1	TF	250	5	No
Mid-Delta	Menoufia	Shibin el Kom	1	TF	240	3	No
Mid-Egypt	Fayoum	Fayoum	1	SA	220	7	Yes
Mid-Egypt	Beni Suef	Beni Suef	1	TF	240	8	Yes
Mid-Egypt	Menia	Miaya	1	TF	200	5	No
Mid-Egypt	Assuit	Assuit	1	TF	110	8	No
Upper Egypt	Aswan	Aswan	1	SA	230	4	No
Upper Egypt	Suhag	Suhag	1	TF	145	3	Yes
Upper Egypt	Qena	Luxor	1	TF	150	2	Yes
Upper Egypt	Qena	Qena	1	TF	145	3	Yes
West Delta	Behaira	Damanhur	1	SA	830	4	No

PS = Primary Sedimentation, SA = Surface Aeration,
TF = Tricking Filters, OD = Oxidation Ditches

APPENDIX D URBAN WASTEWATER FACILITIES - PART 2 - NEW

Region	Governorate Name	Location	Project Type	Process Type*	Capacity L/Sec.	Pumping Stations	Est. Date of Completion*
West Delta	Beheira	Shubra Khit	New	Unknown	200	2	1989
West Delta	Beheira	Abu El Matamir	New	TF	315	4	1989
Mid-Egypt	Fayoum	Fayoum	New	SA	695	--	1989
Mid-Delta	Gharbia	Tasta	New	SA	1040	--	1990
Mid-Delta	Gharbia	Mahala El Kuba	New	SA	1390	--	1990
Mid-Delta	Gharbia	Samanoud	New	TF	2080	--	1990
West Delta	Beheira	Kafr El Dawar	New	SA	695	6	1990
East Delta	Damietta	Damietta	Upgrade	SA	1045	17	1990
Mid-Delta	Kafr El Sheikh	Kafr El Sheikh	Upgrade	SA	465	--	1990
East Delta	Port Said	Port Fouad	New	SA	230	--	1990
Mid-Delta	Gharbia	Basoun	New	SA	580	8	1991
West Delta	Beheira	El Mahmoudia	New	SA	210	4	1991
East Delta	Qalubia	Qaliob	New	Unknown	1620	--	1991
East Delta	Qalubia	Shibin El Kanater	New	SA	230	4	1991
East Delta	Qalubia	Toekh	New	Unknown	280	4	1991
East Delta	Qalubia	Kafr Shoker	New	Unknown	175	3	1991
East Delta	Damietta	Ras El Baar	New	SA	465	--	1991
East Delta	Damietta	El Zarka	New	SA	150	6	1991
East Delta	Damietta	Ezbah El Bourg	New	OD	290	3	1991
East Delta	Damietta	Kafr Saad	New	SA	210	3	1991
East Delta	Damietta	Faraskor	New	SA	245	4	1991
Mid-Delta	Menoufia	Shibin El Kom	Upgrade	TF	1090	2	1991
Mid-Egypt	Minya	Minya	Upgrade	Unknown	230	4	1991
West Delta	Beheira	Eldengat	New	OD	90	2	1992
West Delta	Beheira	Damanhour	New	SA	1850	5	1992
Upper Egypt	Aswan	Aswan	Upgrade	SA	243	--	1992
Upper Egypt	Qena	Luxor	Upgrade	TF	280	3	1992
Upper Egypt	Sohag	East Sohag	New	SA	1300	--	1992

APPENDIX D URBAN WASTEWATER FACILITIES - PART 2 - NEW

Mid-Egypt	Minya	El Fekria	New	Unknown	510	--	1992
Mid Egypt	Assuit	Assuit	Upgrade	Sa	1390	--	1993
Upper Egypt	Qena	Qena	Upgrade	SA	465	--	1994
Mid-Delta	Gharbia	Kafr El Zayat	New	Unknown	200	--	
West Delta	Beheira	Mashia El Horia	New	TF	470	3	
East Delta	Qalubia	Benha	New	SA	1390	3	
East Delta	Dakahlia	Mansoura	Upgrade	SA	1390	--	
Mid-Delta	Menoufia	Minauf	New	SA	465	3	
Mid-Delta	Sharkia	Zagazig	Upgrade	SA	1450	--	
Upper Egypt	Red Sea	Ghorgda	New	Unknown	350	--	
Upper Egypt	Sohag	West Sohag	Upgrade	SA	650	4	
East Delta	Port Said	Port Said	New	Unknown	2315	--	
East Delta	Ibmailia	Ibmailia	New	Unknown	1735	--	
East Delta	Suez	Suez	New	Unknown	3240	--	

* NOPWASD CONTRACT DATES, A 2 YEAR DELAY IS REPORTED BY THE EXECUTION DEP'T

PS = Primary Sedimentation, SA = Surface Aeration,

TF = Trickling Filters, OD = Oxidation Ditch

APPENDIX E

RESEARCH DATA LIST

Appendix E

RESEARCH DATA LIST

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APPENDIX F

KEY INDIVIDUALS CONTACT RECORD

Appendix F

CONTACT RECORD

NOPWASD:

Chairman

Deputy Chairman

Central Department for Training

Director: Eng. Saleh Moustafa

Counterparts: Eng. Fathi Anis, Eng. Fatma El-Zahraa Moustafa,
Eng. Asmaa Moustafa

Central Department for Planning

Technical Support & Requirements General Department

Central Department for Finance & Administration

Personnel General Department

Administration General Department

Central Department for Design

Hydraulic Design General Department

Central Department for Implementation of Projects - Delta & Canal Cities

Central Department for Implementation of Projects - Mid & Upper Egypt

Organization & Management General Department

Information Center General Department

MINISTRY OF RECONSTRUCTION & HOUSING:

Central Department for Public Utilities

General Organization for Physical Planning

MINISTRY OF MANPOWER & TRAINING:

Cairo Governorate

GENERAL ORGANIZATION FOR SANITARY DRAINAGE, CAIRO. (GOSDC)

Deputy Chairman

Central Department for Training

Sahara Training Center

TOMO HAR – GESAR EL SUEZ, 10th RAMADAN:

Director of Center

GOVERNORATE, CITY, WATER AND WASTEWATER PLANT

AUTHORITIES:

Aswan, Luxor, Assuit, Minya, Qena, Sohag, Benha, Zagazig, Kafr El-Zalat.

Damanhour, South Sinal, Port Said, Beni Suer, Fayum, Domlat, Mansoura,

Tanta, Minuf, Kafr El-Sheikh, Mahalla El-Kubra

Damanhour Training Center

O.R.D.E.V.

Sakara Training Center

, UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT:

WWISP Coordinator - Sally Patton

Wastewater Specialist - K. Kawatta

TEAM MISR

Headquarters and Training Resources and Development Facility

AAW (Dr. Ahmed Abdel Warith)

Headquarters