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DANIDA;
Environmental Information and Monitoring Programme (EIMP) Air Quality Monitoring Component
Mission 8 Report

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1 Introduction

The eight mission to Egypt covered the period February -May 1998. The mission was undertaken by Leif Marsteen (3 February to 12 May 1998) and Bjarne Sivertsen (16 March to 15 May 1998).

The EIMP project is funded by Danida and headed by COWI. The new Project leader Morten C Andersen took over for Jan Hassing on 1 March 1998.

The total project includes four components:

- Coastal Water monitoring (responsible VKI (Danish Water Quality Institute) and COWI)
- Air pollution monitoring (responsible NILU),
- Reference laboratory (responsible VKI) and
- Pollution sources and emissions (responsible COWI).

The work undertaken during the Spring of 1998 included the preparations, establishment and start up of monitors, on-the-job training data evaluation and reporting and passive sampling. Monitors and samplers are being checked and installed, one new site were selected in Cairo, due to changes in the building environments.

The Air Quality Monitoring Team consisted of B Sivertsen, Mohamed Nassar and Leif Marsteen. The following tasks are being undertaken, referring to the work programme activities :

A. Institutional support
   Describing work functions for new experts
B. Design of monitoring programme
   Modify sites in Cairo and new sites in Upper Egypt, agreements etc.
C. Procurement
   Final specifications, changes in specifications, arrival of equipment.
   Prepare instruments for installation
D. Data management
   Establish data retrieval and local database for monitoring data at Monitoring Laboratory, problems with System Manager.
E. Training
   On-the-job training at Reference Laboratory and Monitoring Laboratories.
F. QA/QC

Specify instrument calibration procedures/standard operational procedures (SOP). Design QA/QC procedures at Monitoring Laboratory. Establish SOPs as part of on-the-job training

G. Monitoring

Start monitoring programme and data retrieval. Establish monitors in Cairo and Alexandria. Start evaluating data, editing and reporting.

H. Reference Laboratory

Installation of laboratory environment sensors at Reference Laboratory. Calibration of monitors. Train Reference Laboratory personnel in use of monitors and calibration

I. Component Co-ordination

Various reporting, memos, status reports, meetings etc.

The time schedule referring to the various activities including installation procedures and sequences were followed as described in Mission Report no. 7. Preparations of SOPs and QA/QC procedures continued, and the main part of this task was finalised.

The responsible personnel at the various institutions involved, as well as some of the persons we met during mission 8 are presented in Appendix A.

A list of abbreviations can be found in Appendix J.

2 A. Institutional support

2.1.1 Activity A.2.2 Assist in describing work functions for new experts

In addition to the earlier prepared job descriptions, the work to be undertaken by new experts to be engaged in data bases and data handling at EEAA were described and presented in Appendix A2.

The personnel selected for the various tasks at the Monitoring Institutions at Cairo University (CEHM) and at Alexandria University (IGSR) is presented in Appendix A.

3 B.Design of monitoring programme

3.1.1 Activity B.2.1 Select representative monitoring sites for air quality measurements

Most of the sites in Cairo was selected during earlier visits. One site had, however, to be changed due to changes in the buildings surrounding the site at Al Quolaly. At some areas in the Delta and in Upper Egypt details concerning sites around historical monuments were decided during the passive sampling undertaken in April 1998. New sites were selected in Assyut and in NagHammadi. (See Appendix B2.1).

3.1.2 Activity B.2.2 Define site characteristics

For the new monitoring sites the surrounding area, local sources and possible impacts have been described in Appendix B. The site descriptions also include detailed maps, co-ordinate specifications and photos where available.

3.1.3 Activity B.2.8 Establish agreements with monitoring site owners

Agreements with the site owners about the use of their sites have been negotiated orally. A letter to some site owners has been prepared to describe the location of the instruments. An example of such letter is shown in Appendix B2.8 for the station at Qulaly square. This letter has been signed by the Chairman of EEAA and the Deputy of the Governor of Cairo.

4 C.Procurement of equipment, hardware and software

4.1.1 Activity C.2.1 Procure instruments and equipment

Technical evaluation of air quality monitoring equipment was undertaken in Phase 2 of the programme. Evaluations for the sequential samplers and dust fall samplers have been undertaken in the present phase.

Specifications have further been prepared for the two filter samplers and the passive samplers. Two suppliers were invited to bid. Upon the arrival of only one bid, it was clear that price exceeded EIMP estimates and it was decided to invite for a second bid. (See Appendix C.2.1)

4.1.2 Activity C.2.2 Prepare instruments for installation

All instruments arrived in Egypt, and stored at Tabbin institute will be checked and verified before transferred to the Monitoring Laboratory (in some case the Reference Laboratory) or to the field stations. All monitors are being calibrated prior to the installation in the field.

Preparations and calibrations are briefly described in the work summary for the installation phase as presented in Appendix G3.

5 D.Data management

5.1.1 Activity D.1.1 Specify data collection and data transfer

Different types of data will be collected by the monitoring programme. The first specifications of the data collection procedures were developed in Phase 1.

For the air quality monitoring stations each site will be equipped with a data logger unit including a Station Manager that will collect and store data at each site. Hourly average data will be transferred as raw data via modem and telephone lines to the central computer unit. In cases where telephone lines have not been made available it will be possible to retrieve data via diskettes.

The System Manager, at the Monitoring Laboratory will enable data to be controlled and stored. The System Manager was first installed at CEHM in November 1997. However, problems and inadequate operability resulted in a complete replacement. The comments presented as an attachment to a letter for Kontram can be found in Appendix D1.1.a.

Data will also be retrieved at the Monitoring Laboratory in Alexandria. The procedures for data quality assurance has not been decided in details. However, it is anticipated that the Monitoring Laboratory at ISGR in Alexandria will retrieve, quality check and edit their own data. (see Memo Appendix D.1.1. b.)

5.1.2 Activity D.1.2 Specify data retrieval and local data base at Monitoring Laboratory

Details concerning specifications of data scaling, data storage, data quality control etc. have been established based on specifications given in the System Manager.

Training of expert personnel for this operation at the data retrieval computer was based upon System Manager specifications. However, a preliminary data base including a simple graphical and statistical tool was developed based upon MS Excel. The Monitoring Laboratory experts were trained in the use of this tool for preparing the first quarterly report.

After solving the problems linked to the operations of the Station Manager and the System Manager after 12 April 1998, some training was performed in the

use of the System Manager. However, the Manuals were not adequately updated and will have to be supplied later.

Specification of data retrieval and data control and editing was specified and agreed upon as part of the on-the-job training. Routine control of all data retrieved is essential on a daily basis.

The data base delivered with the System Manager is being used to store all data with averaging times of one minute and one hour, as well as calibration values, errors, "flags", power breaks etc. This data base will also contain the final one hour average data after check, corrections and editing. The final version of the System Manager was installed at CEHM in April. A similar system is envisaged for IGSR in Alexandria.

5.1.3 Activity D.1.3 Specify data quality check and control procedures

Data quality control applies both to the automatic monitoring data and to semi automatic and manually collected data. An initial description of the quality control procedures was prepared during Phase 1.

Data quality control has been introduced at several levels (see also Ch. 7, Quality Assurance). In summary quality control includes:

- Zero span check and calibration in field,
- data control, corrections and editing at the Monitoring Laboratories during the daily retrieval at the System manager,
- Data corrections following statistical evaluation and data handling.

In addition monitors will be taken to the Monitoring Laboratory at CEHM for calibrations once a year. Random calibrations of monitors will also be undertaken by the Reference Laboratory, as well as annual audits to selected sites. The Reference Laboratory will also support some calibrations of Monitors in the Alexandria and in the Delta area. Both the Reference Laboratory and the Monitoring Laboratory have been equipped with reference gases.

The technical tools will be supported by quality control descriptions , manuals and reporting procedures. Log books are being established for each instrument. The laboratory routine data monitoring, retrieval ,storage and quality control has been started as part of the calibration and installation of the first instruments. The training includes staff at air quality data collecting institutions as on-the job training.

Manuals and reporting procedures for collected samples analysed in the analytical lab will be developed. This development will take place at the end of 1998.

5.1.4 Activity D.1.5 Telecommunication lines

Dr M. Nassar had meetings with the National Authority for Communication (NAC) concerning lines for data transfer.

Several possibilities for data transfer via networks have been investigated. In April it was decided that the public telephone network was to be used, and 5 lines were ordered. These lines were to be used at CEHM, IGSR, Tabbin, El Gamhoriya and Shoubra el Kheima.

5.1.5 Activity D.2.1 Prepare database for manually analysed data

A laboratory database for samples that are being prepared for chemical analyses, quality controls and calibration will be prepared. Preliminary data will be entered into a data base for automatic control.

Final data approvals have to be issued before the data are entered into the main data base. This main data base may be the same system at EEAA and at the Monitoring institutions. A GIS based data base combined with statistical, numerical and graphical presentation tools has been proposed. A final decision on data base format will be made during the summer of 1998.

Descriptions and manuals for reporting of chemical data will be prepared for use at the Monitoring Laboratory at the end of 1998.

5.1.6 Activity D.2.2 Local database for monitor data the Monitoring Laboratories

A local data base for the data retrieved from the monitoring system is part of the System Manager. This database includes in addition to raw data and corrections, the final product of the one hour average cleaned data as performed by the System Manager.

The local database will contain all one-hour average data; concentrations of gases and particles as well as all meteorological data. These data will be quality assured and controlled in the final version of the local database. The data will represent the basis for the development of quarterly reports and aggregated data transferred to the EEAA database.

The frequency and methods for this transfer included back up and safety back-up procedures have been described in a memo (see Appendix D.2.2).

5.1.7 Activity D.3.1 EEAA data base

The data base for statistical handling of ambient air quality data and preparation of annual reports has been proposed. The Norwegian developed air quality and information system (AirQUIS) is under consideration as one of several options. This system is based on a Geographical Information System (GIS) and will act as a data base and a presentation tool well suited for the

purpose of generating a final Air Quality status report for EEAA. The statistical and graphical tools delivered as part of this data base will also be adequate for the Monitoring institutions for preparing quarterly and annual reports.

The choice of ambient air pollution data base will be decided after the Summer of 1998 and established at EEAA during 1999.

6 E.Training

6.1.1 Activity E.1.1 Assess training needs for Phase 3

Training needs have been evaluated for the Air Monitoring Laboratories and the Reference Laboratory Air. Training started in the second phase by seminars and work shops, and continued with on-the-job training during the third phase in 1998. The need for basic training work shops and seminars will be evaluated further during the next Mission.

6.1.2 Activity E.2.1 Prepare on-the-job training

An important part of the training programme is based upon on-the-job training. It is essential that the personnel at the Monitoring Laboratories, who will have the responsibility for the future monitoring system, follow the installations and are involved in operations of the monitors and samplers as soon as instruments are being installed, and the different monitoring sites are set in operation.

Training has been undertaken both at the Reference Laboratory and at the Monitoring Laboratory and will continue through the third and fourth phase.

6.1.3 Activity E.2.2 Training programme for instrument operation and maintenance.

The following topic has been included in the training programme for instrument operations and maintenance :

- Instrument installations,
- instrument calibrations,
- control and maintenance,
- data transfer procedures ,
- data retrieval programme,
- data handling at the Monitoring Laboratory,
- data storage and presentation.

The work started in 1997, but the main part of this training is being undertaken during phase 3. An important part of this training programme is to learn to install and operate the various types of monitors.

6.1.4 Activity E.2.3 On-the-job training at the Monitoring Laboratories

The training in the installation and calibration of instruments was undertaken by the instrument supplier at the beginning of 1998. The monitor expert from EIMP (NILU) has continuously performed on-the-job training for the Monitoring Laboratory personnel during preparation, installation and calibration of instruments.

This training included installation and use of monitors as well as check, calibration and controls. Similar training was performed for selected experts from the monitoring institutions both in Cairo and in Alexandria.

Concerning the sampling equipment included in the programme, training in chemical analyses and use of laboratory equipment will be given by EIMP experts for personnel at the Monitoring Laboratory during the Autumn 1998.

6.1.5 Activity E.2.4 Support training to Reference Laboratory personnel

The first training in the use of monitors and in the calibration of monitors was undertaken during installation, tests and calibrations. Experts from the Reference Laboratory also participated in training given to the Monitoring Laboratory personnel.

The responsible for the Reference Laboratory participated in the calibration of the instruments for IGSR, as part of the training programme. The monitor for Soubra el Kheima was calibrated by the Reference Laboratory personnel.

6.1.6 Activity E.5.1 Use of data base at System Manager

Some training in the use of the System Manager at the Monitoring Laboratory was undertaken by the supplier in 1997. However, the System Manager never operated according to Manuals and instructions given during the short introduction ("training"). After the installation of a new System Manager 6 to 10 April 1998 the training was repeated and the application of the System Manager started on 20 April 1998.

The main part of this training, including practical use of the system, remote calibrations, data quality controls, cleaning of data, data plots and storage of raw data are being undertaken as on-the-job training during applications.

6.1.7 Activity E.5.2 Training in use of EEAA data base

The EEAA ambient air pollution data base, will have to include statistical programmes designed for air quality and meteorological data and a report generator. This data base will be installed in the beginning of 1999. During and after this installation training will be given to the relevant EEAA/EIMP staff.

Most of the training will have to be under taken as part of the practical work with the data base in 1999 and beyond.

In the meantime training is given in the interpretation of the results as presented in the quarterly report presented by the Monitoring Laboratory. A summary report has been developed based upon these simple statistical data. The aim of this report has been to present the air quality situation in Egypt as seen from the EIMP network data, and to illustrate the possible input to a future State of the Environment report for Egypt.

6.1.8 Activity E.6.1 Sample preparations

A major part of the air quality sampling programme is based on integrated sampling on various types of filter materials. "Clean" filters and impregnated filters will have to be prepared in the laboratory.

Training in the preparation and use of filters will be undertaken at the Monitoring Laboratory during the Fall of 1998.

6.1.9 Activity E.6.2 Chemical analyses of various filters

As part of the training high volume filters have been collected at Tabbin since the end of 1997. These filters have up till now only been analysed gravimetric for total suspended particles.

Further training will be undertaken when the laboratory expert arrives in October 1998 to also undertake training in the preparation, handling and analyses of all type of filter materials.

7 F.QA/QC

7.1.1 Activity F.2.1 Instrument calibration procedures

Specifications for instrument calibration and descriptions of measurement and sampling procedures (SOP; Standard Operation Procedures) has been developed. An example is presented in Appendix F2.3.

7.1.2 Activity F.2.2 Design QA / QC procedures at Monitoring Laboratory

Well defined descriptions of day by day analytical routines, including quality control, are essential for generating reproducible results. The monitoring laboratory will have to handle both automatically monitored data received via telephone communication direct to the local computers and manually collected samples that will be analysed by wet chemical or other analytical methods.

The QA/QC procedures developed to handle the air quality monitoring programme contains several levels of controls.

In field operations we have established:

- Station Manuals including Standard Operational Procedures (SOP) for instrument installations, maintenance, controls etc. (See F.2.3),
- zero span checks and calibration routines (see F.3.1).

At the Monitoring Laboratory data are controlled:

- at daily retrieval using the System Manager,
- by graphical presentations and editing,
- as part of the reporting of data.

Every day data are being checked, corrected and edited. Power failures, calibration values and instrument malfunctions are taken into account and data are being corrected. These corrections are part of the application of the System Manager.

The Monitoring Laboratory personnel at CEHM have been trained in these operations. After statistical analyses of the data, systematic errors or trends can be discovered. It is the responsibility of the QA Manager and the Air Quality Manager to undertake these final corrections of the data before entering them into the Quarterly Report, which represents the basis for final data to be stored in the EEAA data base.

During the Spring visit (Mission 8) all levels of QA/QC were presented and discussed. Even if a new System Manager was installed in April, the first Quarterly Report was generated using the simplifies MS Excel programme developed for this purpose.

A control of the QA/QC procedures will be developed as an Audit Programme, to be undertaken by the Reference Laboratory. For the sampling system the EIMP Reference Laboratory Manager will support the design of QA/QC procedures for the analytical programme.

7.1.3 Activity F.2.3 Establish Standard Operational Procedures as part of QA/QC

Standard Operational Procedures (SOP) has been developed as an important part of the QA/QC procedures. A list of SOPs and forms available at the end of Mission 8 is presented in Appendix F 2.3.

All SOPs and schemes for the operation of the monitoring stations have been presented as part of the Station Manuals. An example of a SOP for the dynamic calibration of a SO_2 monitor is shown in Appendix F 2.3.

All procedures to be undertaken at the sites have been collected in a Station Manual. A typical Table of contents for a Station Manual is presented in Appendix F.2.3.b. At the Monitoring Laboratory a historical log for each of the stations has been established. The historical log for all instruments at the stations are to be found in this log book.

7.1.4 Activity F.3.1 QC and calibration routines as part of the on-the-job training

The Monitoring Laboratory personnel will have the responsibility for the operation of monitors and samplers, and for undertaking weekly controls in field. All procedures for controls and calibrations have been presented to the Monitoring Laboratory experts, but will have to be trained (on-the-job) as part of the further development and operations of the instruments.

For monitors the procedure for zero and span controls, flow controls and various check lists is given in the Station Manuals and the SOPs. Manuals and check lists will have to be followed at every visit and all detailed information has to be stored in the historical logbook forms. These forms have been developed, presented, used and repeated during the training in field.

For the first sites operated since the end of 1997, it seems as if the SOPs and the Manuals have been adequately used by the Monitoring Laboratory personnel.

8 G. Monitoring

8.1.1 Activity G.2.1 Specify sampling programme procedures

The sampling programme consists of integrated (sequential or individual) samplers, from which samples have to be collected and brought to the laboratory for analyses. A list of parameters including sampling times and frequencies was presented in Phase 1. The sampling programme starts at the end of 1998 and will be updated to meet the future requirements of a total air quality monitoring programme.

The Egyptian Air Quality Standards already indicate some of the averaging times requested for reporting the air quality in Egypt. These specifications have also been applied in the design procedures.

8.1.2 Activity G.2.2 Specify monitoring programme procedures

A list of parameters including sampling times and frequencies was developed in phase 1 and 2 of the project. The sites selected and the procedures developed for the operation of the monitoring programme meet the QA/QC requirements. Detailed procedures for operation of the programme weres developed parallel to the installations of the first monitoring sites in Cairo and in Alexandria.

8.1.3 Activity G.2.3 Start monitoring programme and data retrieval

The first monitoring stations were installed and started in 1997 at Tabbin Institute and at Gomhoriya street in central Cairo. The station at Giza (Cairo University) was started in the beginning of 1998. Recalibration of the SO_2 monitor was undertaken at the end of March 1998, while the NOx monitor was not operating properly at the end of the Mission (15 May).

An important part of this phase of the monitoring programme has been to train the operational personnel at Cairo University (Monitoring Laboratory) to participate in and to undertake installations and calibrations of the different type of monitors. Also personnel at the monitoring institution in Alexandria (IGSR) have participated in the installation and start up of the IGSR station.

For further information about the installation and start up of the monitoring programme see Activity G.3.2.

8.1.4 Activity G.3.1 Establish monitoring station infrastructure

During the site inspections and site visits monitoring site preparations, clearing, building infrastructure etc. were described and the site layout was designed. The EEAA counterpart, Dr Nassar, has taken the responsibility for undertaking all these preparations. He is also responsible for agreements, communication lines, shelters and all kind of infrastructure at the sites.

The whole air quality monitoring programme has been designed to use a total of 15 shelters, which is being constructed on site or in Cairo for transport to the site. A typical design of such shelter is shown in Appendix G 3.1.

A list of task to be undertaken by the EEAA counterpart Dr M. Nassar during the Summer of 1998 is presented in Appendix g.3.1.b.

8.1.5 Activity G.3.2 Install monitors in Cairo and Alexandria

The installation of monitors in Cairo started in 1997. The installation programme follows a schedule that was established in October 1997. An updated version of the monitoring programme and the installation schedule is presented in Appendix G.3.2.a.

At the end of 1998 the monitoring personnel will have to share time between operation, installation, calibration and maintenance. A considerable work load may be placed on these personnel, and we will have to consider during phase 3 and 4, whether the number of people operating the system is adequate.

The sites installed and set in operations at the end of Mission 8 is presented in Table 8.1.

Table 8.1. The sites operated as of 15 May 1998.

	Site name	Area type		SO_2	NO_x	PM	HC	CO	Met	TSP
	Cairo									
1	Cairo city El Qualaly	Urban centre	S	1	1	1				
2	El Gomhoriya street	Street canyon		1	1		1	1		
6	Tabbin	Industrial		1	1	1			1	1
10	Shoubra el Kheima.	Industrial		1		1			(1)	1
11	Giza, Cairo University.	Residential		1	1				1	
	Monitoring Laboratory			1	1	1	1	1		1
	Reference Laboratory			1	1	1	1	1		
	Alexandria									
30	IGSR, Alex University	Urban/road side	S	1	1	1	1	1	1	

S = shelter ,(2m x 2m x 2.10 m)

Work summaries for the installation phase at all sites have been prepared and are presented in Appendix G.3.2.b.

As of the end of Mission 8 there are several tasks to be undertaken by CTS, as presented in a Fax dated 4 May 1998. (See Appendix G.3.2.c). These tasks were discussed in the weekly air quality staff meeting on Sunday 10 May, and agreed upon. Further tasks to be considered undertaken during the Summer 1998 were summerized and presented to the Project manager (see Appendix G.3.2.d).

8.1.6 Activity G.4.1 Maintenance and calibrations at the monitoring stations

The monitoring sites that have been installed and set in operation need maintenance and calibration. Weekly visits are made to all monitoring sites from the Monitoring Institutions. IGSR in Alexandria will have the responsibility for the operations of sites in Alexandria and in the Delta. IGSR will be supported by CEHM and the Reference Laboratory concerning basic calibrations of monitors, as stated in the memo (Appendix D.1.1.b). CEHM at Cairo University will have the responsibility for the rest of the stations in Egypt.

A maintenance and visit schedule will have to be developed by the monitoring institutions, including support from institutions outside CEHM and IGSR, where this is necessary. This will in particular be necessary for the sites in Upper Egypt.

8.1.7 Activity G.4.2 Service and repair

As part of the weekly visits to the stations, together with the daily quality controls undertaken by the monitoring institutions, the need for repair and service will be evaluated by the instrument experts.

Already in the very first phase of the monitoring programme we have seen the necessity for trained personnel to take care of this. It may take years to fully train the monitoring experts to handle all instruments. In the mean time we have established a one year warranty period with the supplier from the time of the installation of the instrument.

Examples of work related to service and repairs undertaken already in the beginning of 1998 are:

- The PM_{10} monitor delivered in Alexandria had to be changed due to automatic start up problems or errors.
- The CO monitor delivered at IGSR had to be changed due to hang up at start up.

- The CO reactor had to be changed due to errors in the span gas pressure indicator.

Monitors and samplers will be taken to the laboratory for repair whenever necessary. In some cases simple repairs will be undertaken at the station. The instruments with errors have to be replaced by the suppliers within the warranty period.

8.1.8 Activity G.5.1 Data retrieval and data evaluation

As soon as the data are retrieved at the monitoring laboratory daily data evaluation starts. First of all calibration factors will have to be checked. Next span check points, errors, peak values, false data and other peculiarities in the retrieved data have to be taken out.

Time plots of the data are being produced, first of all at the Monitoring Laboratory at Cairo University. This will also be possible at IGSR in Alexandria, to evaluate the diurnal, weekly and spatial variation in concentrations.

Training in the assessment of concentration levels and units started during the Mission 8 visits and will continue throughout 1998.

The tool for checking the data quality on a daily basis is the System Manager installed at the Monitoring institutions. All the problems that we have had in the operations of the System Manager, which were not solved until the end of April 1998, resulted in a difficult situation concerning data quality checks and controls

The cleaning of data and preparation of the first quarterly report thus had to be undertaken using a simple data handling system developed in Excel. Data from Tabbin and from Gomhoryia street were retrieved via diskettes (as no telephone lines were available). The data were manually loaded into the Excel programme on a weekly basis and cleaned according to data quality flags given in the Station Manager or by visual information and experience. At the end of Mission 8 the System Manager was still not fully operated.

8.1.9 Activity G.5.2 Data presentation

Air quality data have been presented in various forms and for various purposes during the early stages of the monitoring programme. The measured air pollution levels are normally compared to the "Maximum limits for outdoor air pollutants" as given by Annexe 5 of the Law number 4 for 1994, Law for the Environment, Egypt. (See Appendix G.5.2.a).

Data listings and simple graphical presentations have been produced every week since the end of October 1997. An example of a daily report issued for meteorological data is shown in Appendix G.5.2.b.

A memo was prepared describing the air quality in the Cairo area based upon the first data available from the EEAA/EIMP air quality monitoring network. These data were supported by results of passive sampling of SO_2 and NO_2 The Memo is presented in Appendix G.5.2.c.

Based upon a combination of meteorological data and air quality data it is possible to produce wind roses and pollution wind direction frequency distributions to identify possible sources for air the air pollution. An example is shown in Appendix G.5.2.d. for SO_2 and wind direction. The wind directions in the Figure have not been corrected. It shows an under representation of winds from north, due to an error in the averaging procedure. This was corrected at the end of April.

8.1.10 Activity G.6.3 Passive sampling

The first data collection as part of the programme scheduled for passive sampling at historical monuments and tourist sites was undertaken in April 1998. A total of 20 samples of SO_2 and 20 samples of NO_2 were collected.

A summary of the different sampling sites is presented in Table 6.3.

Table 6.3. Sampling sites for passive sampling of SO_2 and NO_2 at historical monuments and tourist sites , April 1998.

Site , area	Location	SO_2	NO_2
Hurghada	Super jet bus station	1	1
Luxor	Karnak Temple office	1	1
	Luxor Temple near gate	1	1
	Ramses III inside, west side	1	1
	Valley of the Kings	1	1
	Luxor city, Governm. Office	1	1
Edfu	Edfu Temple at roof	1	1
ComOmbo	Temple at entrance	1	1
	City centre agricult.office	1	1
Aswan	City centre, unfinished stela	1	1
	Elefantine Island, museum	1	1
Sharm el Sheik	Novotel hotel front side	1	1
	Katarakt, across the street	1	1
	EEAA park office	1	1
	Novotel (for 5 days only)	1	1
Giza	Kufu (office)	1	1
	Sphinx area	1	1
Sakkara	Pyramid area	1	1
Memphis	Museum	1	1
ElMaadi	Residential area	1	1
TOTAL		20	20

More detailed descriptions of sampling points and sampling periods including maps are presented in Appendix G.6.3.

8.1.11 Activity G.7.1 Quarterly reports

The first quarterly report was produced at the beginning of 1998 and contained a very limited amount of air quality data. However, information on the monitoring programme and the instrumentation was part of this first report.

The second quarterly report containing data from 2 sites was produced in April 1998. A brief summary report was also produced based upon the quarterly report. This summary report was submitted to the Dr. Ibrahim Abdel Gelil on 13 May 1998. The summary report is also found in Appendix G.7.1.

8.1.12 Activity G.7.2 Annual reports

An annual report including some simple statistical evaluation of the data, description of the present monitoring programme and summary comments to the air quality situation in Egypt will be prepared at the end of 1998.

A first summary Memo was produced based upon the quarterly report, as part of the training on interpretation of data. Air pollution levels were compared to Air Quality Limit values given in the Environmental Law no. 4 for Egypt. Exceedances of the limit values was discussed. The first fully recognised annual report will be issued at the end of the year.

9 H.Reference Laboratory

9.1.1 Activity H.2.1 Training of Reference Laboratory personnel

Training has been carried out for the personnel at the Reference Laboratory Air at NIS (National Institute for Standardisation). Selected experts have participated in the training of operation, calibration and maintenance of monitors.

Most of the calibrations of monitors and of travelling standard gases have been undertaken at NIS until May 1998. This has given the NIS personnel an excellent opportunity to participate and to learn by doing (on-the-job training).

10 I. Component Co-ordination

10.1.1 Activity I.2.1 Follow up and administration

A number of meetings were held during the Task Manager's mission to Egypt. The Minutes from the last meeting in a series of weekly meetings in the air quality monitoring group is presented in Appendix I.2.1.a. Minutes from the Weekly staff meetings is presented in Appendix I.2.1.b.

Morten C. Andersen took over as Project Manager of the EIMP programme from 15 February 1998. A Danida Review Mission that visited the EIMP in September 1997 presented a number of conclusions that will influence the continuation of the programme.

In a Draft Revised Project Document for EIMP it is indicated that the period 1998 to 2003 will comprise three phases:

1. A Commissioning Phase of one year (1998) with intensified input from expatriate consultants emphasising training, initial data production and data interpretation and management.

2. A Consolidation Phase of two years (1999-2000) with decreasing expatriate input and during which validated data are produced and stored in EEAA data management system. These data will form a basis for EEAA's production of annual State of the Environment reports. (EIMP will not be responsible for the production of these reports).

3. A Phasing out Period of three years (2001-2003) with limited support from expatriate experts and no Danida contribution for operational or equipment costs.

For the air quality monitoring component it will cause a change leading to a new instrument expert supporting Leif Marsteen in the preparations, calibrations, installations and training during approximately one year from September 1998. This will also facilitate a shortening of the installation period that was originally scheduled to be completed by October-November 1999. The revised schedule operates with completion by July 1999.

Several comments to questions related to air quality or to other related matters linked to the EIMP programme were prepared and presented during the 8th mission to Egypt:

- A preliminary memo on the air pollution situation was developed as presented in Appendix G.5.2.c.
- Communication with the World Health Organisation /WHO) concerning air quality data from Egypt was followed up. (See Appendix I.2.1.d.)
- Participation in parts of a seminar held by USAID Cairo Air Improvement project (CAIP), including a presentation of the EIMP monitoring station (CEHM). (Appendix I.2.1.e)

Status reports and Component output from the beginning of the programme was also produced. Examples presented in Appendix I.2.1.are;

- Weekly air quality staff meetings, Appendix I.2.1.a.
- Weekly EIMP staff meetings, Appendix I.2.1.b.
- Various outputs Appendix I.2.1.f.

A list of reports available from the EIMP air pollution monitoring component is presented in Chapter 11, References.

11 References

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Appendix A

People and colleagues - Job descriptions

EIMP

People and colleagues (Feb-May 1998)

EIMP office,3 EEAA Building, 30 Helwan Str.Maadi, Cairo (behind Sofitel hotel) ,
Tel. 202 525 6442, Fax: 202 525 6467 ,E-mail: eimp@intouch.com
Staff: Morten C Andersen (Project Manager), Mohammed Fathi,(PM),
Dina, Lydia, Hassan, Mahmoud, Emad
Air: B Sivertsen (Task Manager), L Marsten, Dr Mohammed Nasar (AQ) , tel 351 5174
CEHM / Cairo Univ, tel 571 9688, Fax; 571 9687: Dr Sharkawi,
Dr Tarek El Arabi (Project Manager), Dr. Hesham ElArabi (QA Manager)
Staff: Ashraf Saleh (data retrieval), Essam Abdel Hallin (data retrieval), Mahir Sayed Hafez (Tabbin st.), Ahmed Sayd (Qualaly, Gemhoroya), Yassin Fathi (Giza CU, Fumm al Kahlig), Kamela (Mon.lab., Shoubra), Ahmed Sulamen (Chem lab head), Ameni Taher (Chem. Anal.).
IGSR Alex Univ, tel:03422 7688, lab: 422 5007, Fax 203 421 5792: Dr M El-Raey, Dr. El Sayed Shallaby, Ashraf A Zahran, Shawkat K. Guirguis (QA) (Shawkat@alex.eun.eg), Mohamed Mamdoua, Mohamed Rashad, Sekri,
SharmElSheik, EEAA Nat. Park Office, Dr. Omar Hassan,
Wael Roger Karkour (passive sampl.)
Data Management: Jacob Andersen, Mohammed Zaki, Samir
Procurement: Anwar Ahmed
Coastal Water: Arne Jensen, Erling, Sherine Khaliw
Reference Lab: Ulla Lund, (Street 13 Maadi), Fleming Boysen, Kirsten, Suzanne, Jill, Vibecke.
Emissions: Douglas Clark, Jørn Rødkær

EEAA,Dr. Ibrahim Abdel Gelil (Chairman)
Dr. Mohamed el Zarka (Head of EEAA Env, Qual. Department)
Dr. Abdil Latif Hafez (Air Quality respons.), Ms Heba Mohammed Adly, (Env. researcher).
Mrs Hoda Hanaffi (head of GIS),
SharmElSheik: Omar Hassan 660 668
NIOF: Dr.Ali Beltagy

Embassies:
Norge: Al Gazira al Wusta str.
Amassadør: Mette Ravn, 2.sekr.Kathrine Rath, tel.340 3340 , fax: 342 0709
Danmark: 12 Hassan Sabri, Zamalek, John Carstensen 378 2040
COWI: 00 45 45 97 22 11
Leif Marsteen 10 street 86, apt. 10, Maadi, Cairo, tel 351 3226, Magde 351 1359
Alec Estlander (FINIDA/EPAP) 012 214 2733
USAID - CAIP: Jim Howes, Jennifer Baker (Training) , Kirk Stopenhagen (CH2M HILL)
CTS: Amr ElSoueini, tel: 355 2560, mob. 012 216 6670, Ali Hamed
EMC(Env. Monitoring Company inc.): Bill Hayes, Steve Gersh (Vice President),
Fax:805 544 1824, (sgersh@emcslo.com)

EIMP

Job descriptions
Air Pollution Data Bases and Data Handling

Experts have to be assigned to be responsible for the data bases and the statistical treatment and presentations of data both at the Monitoring Institutions and at EEAA. Job descriptions have been developed as part of the contract with the Monitoring Institutions. For EEAA the following job description has been developed:

Position at EEAA: ***Database and Data Presentation Manager***

Responsibilities and duties

- Manage, plan and be responsible for the air quality data bases including statistical data treatment and reporting.
- Be responsible for the development and updating of the air quality data base for monitor data and sampling data at EEAA.
- Prepare data for EEAA high level reporting.
- Participate in preparations of reports and report to EEAA and to other organizations,
- Work closely with the monitoring institutions to assure good data quality,
- Keep updated records of all data available at EEAA.

Qualifications:

University degree (PhD) with at least ∘ years of experience in scientific oriented work or a Sivil Engineer/ MSc with at least ten years experience. Preferably the person should also have experience in computers data handling and some background in data base technology. The person should also have some background related to environmental issues.

For the data base manager for the Monitoring institutions, the following job descriptions was developed as part of the contract:

Position at Air Pollution Monitor Laboratory: ***Database Manager***

Responsibilities and duties

- Assure that all assigned duties from the Client in relation to the computer laboratory will be carried out in time and without interference with CEHM activities,

- supervise data extraction, transfer, reduction, aggregating primary data into secondary data, format verification, archiving documentation, and file copy,
- work closely with the chemistry Lab Director and the Air Monitor Director on developing and implementing quality assurance procedures,
- work with the chemistry Lab Director and the Air Monitor Director on the preparation of reports (e.g., quarterly and annually).
- keep updated records for the stations measurements, maintenance records, equipment list in a well organized database,
- provide the Client with the data on quarterly basis on CD's and diskette.

Qualifications:

University degree (PhD) with at least ∘ years of experience in scientific oriented work or a Sivil Engineer/ MSc with at least ten years experience. Preferably the person should also have experience in computers data handling and some background in data base technology. The person should also have some background related to environmental issues.

Appendix B

Monitoring Programme

B.2.1 Siting studies
B.2.8 Agreement

B.2.1 Siting studies

Air quality monitoring network
Site visit report

Site Name: Assyut Azhar school
Co-ordinates:. UTM:

Access/ availability: The site is inside the Azhar school in central Assyut.

Buildings and rooms available: .A room will be asked for samplers if necessary.

Area description: Urban / residential area.

Local sources: Traffic on nearby roads.

Representativity: Representative for central urban area of Assyut.

Parameters to be measured: SO_2 and PM_{10} (two filter sampler?), NO_2 (passive), dust fall.

Measurement equipment: Passive and two filter sampler.

Infrastructure: Power: Available
Telephone lines: Lines not needed.
Sampler/monitor locations: In a shelter? - or in a room?.
Air intake: 4 m above the ground.

Personnel:. Chemist George Waheep can service this site also.

EIMP Air Quality Monitoring, NagHammadi.

Air quality monitoring network
Site visit report

Site Name: NagHammadi
Co-ordinates:. UTM:

Access/ availability: Inside ElAzhar School, 30 March Street,near central station

Buildings and rooms available: A room for the sampler will be made available.

Area description: Residential urban centre with traffic

Local sources: Traffic, Aluminium factory about 15 km away (south?) and sugar factory about 5 km to the SW.

Representativity: Representative for a residential area of NagHammadi.

Parameters to be measured: Particles and SO_2 (with passive samplers). In the future it may be interesting to measure HF

Measurement equipment: Samplers.

Infrastructure: Power: available
Telephone lines: not needed
Sampler/monitor locations: In a room (on second floor??).
Air intake: 4 m above the ground.

Personnel:. To be contacted later

Air quality monitoring network
Site visit report

Site Name: Qulaly square 3326.65
Co-ordinates:. UTM: 330.2 , 3327.0

Access/ availability: A shelter will be placed on the security room on the corner between El Sherifa road and Shoubra street, north of the fly over road .

Buildings and rooms available: The shelter will be placed on a 3 m high small building belonging to the Local governerate.

Area description: Urban centre with dense traffic on the street coming from Shoubra and crossing streets into Al Quolaly and to Ramses station.

Local sources: The area is expected to be highly polluted from traffic in the main railway station area of Cairo. There are small industries north of the site and the whole Shoubra area is located upwind in prevailing wind direction.

Representativity: Representative for the urban central part of Cairo.

Parameters to be measured: SO_2 ,NO_2 , PM_{10}, TSP, plus more.

Measurement equipment: Monitors and samplers located in a shelter.

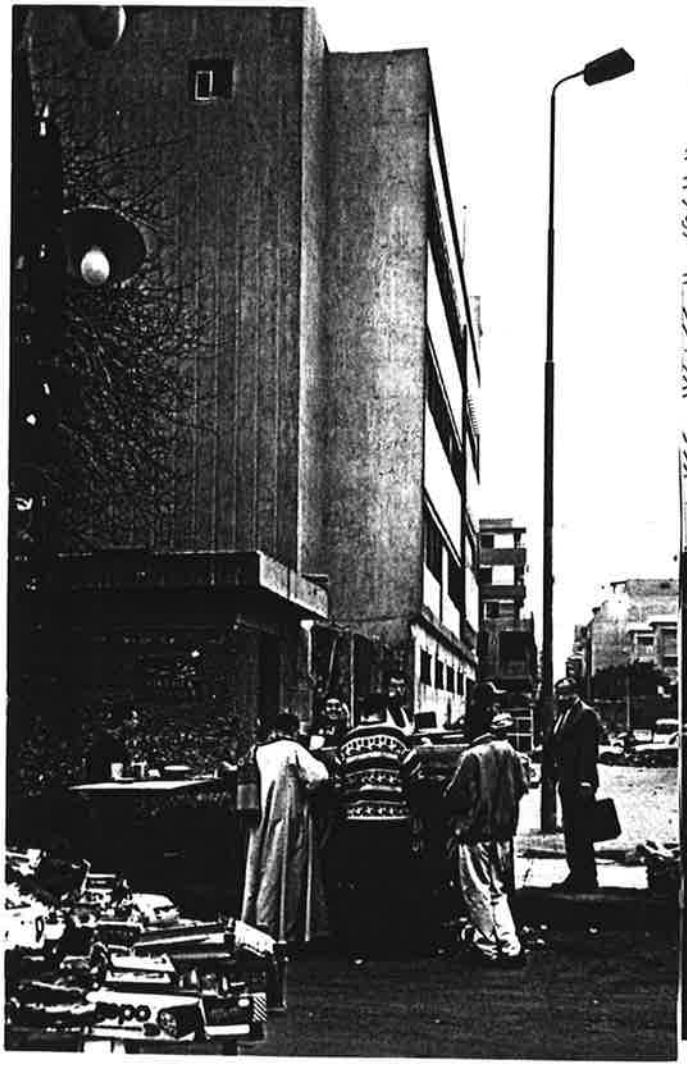
Infrastructure: Power: available
Telephone lines: Has to be obtained.
Sampler/monitor locations: In shelter.
Air intake: 4 m above the ground.

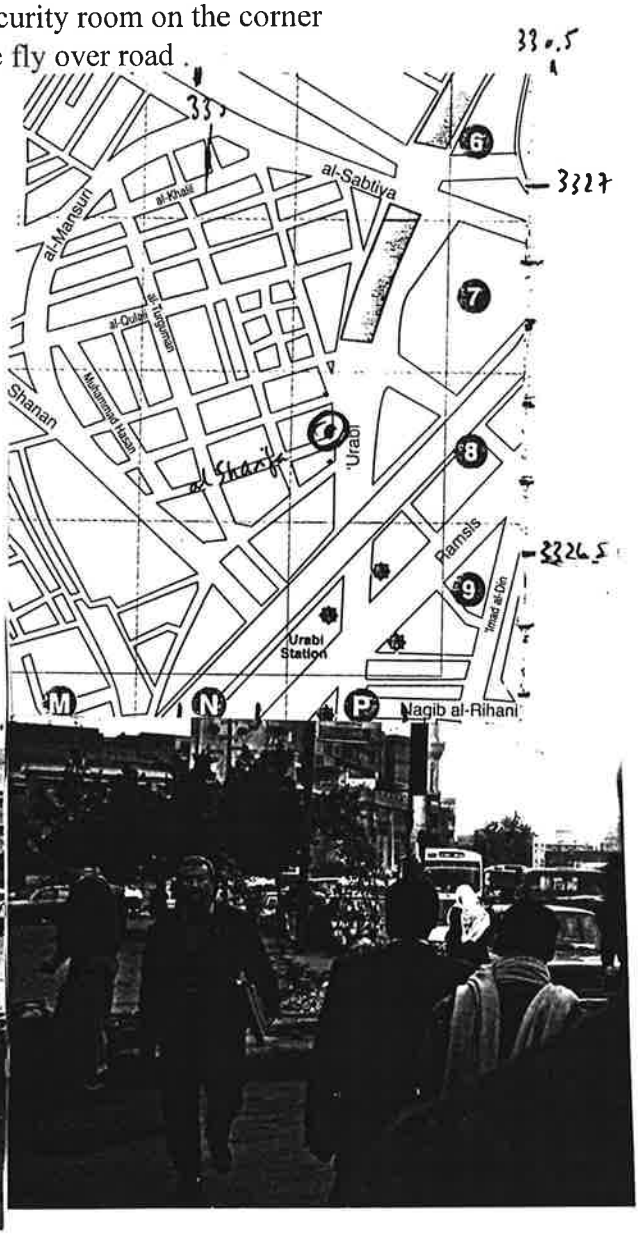
Personnel:. The Governorate will be contacted later.

Air quality monitoring network
Site visit report

Site Name: Qulaly square
Co-ordinates:. UTM: 330.2 , 3327.0

Access/ availability: A shelter will be placed on the security room on the corner between El Sherifa road and Shoubra street, north of the fly over road .



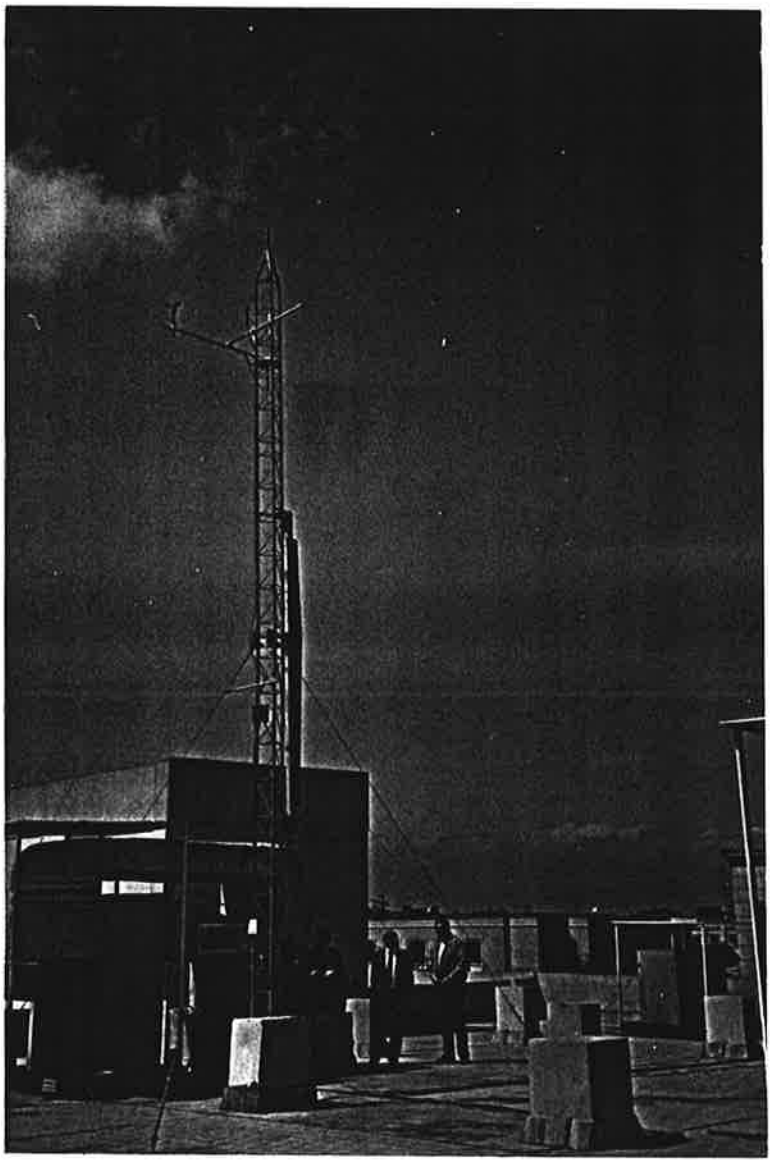


Air quality monitoring network
Site report

Site Name: Giza, Cairo university , Meteorological Tower

Coordinates: UTM: X: 326.9, Y: 3324.1

Access/ availability: The 12 m. high tower is located on the CEHM building about 15 m above the ground.
Parameters: WS, WD, T, RH, rad (W/m2)



Personnel: Monitoring Laboratory personnel at Cairo University (CEHM).

B.2.8 Agreement

Arab Republic of Egypt
Cabinet of Ministers
Egyptian Environmental Affairs Agency

جمهورية مصر العربية
رئاسة مجلس الوزراء
جهـاز شئـون البيـــئة

السيد اللواء / احمد امام سلطان

نائب محافظ القاهرة للمنطقة الغربية

تحية طيبة وبعد

اتشرف باحاطة سيادتكم بان جهاز شئون البيئة بصدد انشاء شبكة قومية لرصد ملوثات الهواء علي مستوي الجمهورية وذلك تنفيذا للقانون رقم ٤لسنة ١٩٩٤ وقد تم اختيار مبني حي عابدين بشارع نفق السبتية بالقللي لوضع اجهزة الرصد

برجاء التفضل بالتوجية باتخاذ اللازم لوضع هذة الاجهزة بمبني حي عابدين بالتعاون مع مندوبي جهاز شئون البيئة واذ نشكر لسيادتكم تعاونكم الصادق من اجل حماية بيئة مصرنا العزيزة نتمني لكم التوفيق

وتفضلو بقبول وافر التحية

الرئيس التنفيذي

د.م/ ابراهيم عبد الجليل

٣٠ طريق مصر حلوان الزراعى ـ خلف فندق سوفيل المعادى ت : ٣٥١٠٩٧٠ فاكس : ٣٧٨٤٢٨٥
30 Misr Helwan El-Zyrae Rd.. Maadi Cairo-Egypt Tel.: 3510970 Fax: 3784285

Appendix C

Procurement

EIMP

Note

Subject	Bids on 2-filter sampler and passive sampler
Date	29 Mar 1998
To	Anwar Ahmed
Copy	BS, MN, MCA, MF
From	LM

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 5256 439
Fax: +202 5256 467

E-mail: eimp@intouch.com

Only two suppliers, NILU Products and AGL, where invited to bid on the 2-filter sampler and the passive samplers. We received an offer from NILU Products only. However the price for the offered 2 filter sampler is much higher then our estimates. The bid price is DKK 30,614 for each instrument. Our estimate was DKK 10,000. Because of the large difference in the bid price compared to our estimate I suggest that we invite more suppliers in a second invitaion to bid on the 2-filter sampler and passive samplers. I am preparing a list of five possible suppliers including NILU Products and AGL.

Mail to Shiraz A. Dar, COWI

Subject: Additional suppliers of 2-filter sampler and passive samplers

Date: 98.04.01

Hello Shiraz

Here is the list of additional suppliers of 2-filter sampler and passive samplers. I hope this second invitation can be finnished quickly so we do not loose time.

Best regards,

Leif M.

Group ?, 2-filter sampler and passive samplers

2-filter sampler
Passive sampler

Companies:

Rupprecht & Patashnick

Rupprecht & Patashnick Co., Inc.
25 Corporate Cirlce
Albany, NY 12203
USA
P: (518)452-0065
F: (518)452-0067

Oleico AB
Box 4011
181 04 Liding
Sverige
P: 08-731 54 20
F: 08-731 70 73

URG

URG
116 S. Merritt Mill Road
Chapel Hill, NC 27516
USA
P: 919-942-2753
F: 919-942-3522

AGL

AGL Engeneering
1A Verulam Road
Hitchin
Hertfordshire SG5 1QA
England
P: (01462) 459350
F: (01462) 422540

Norwegian Institute for Air Research (NILU)

Norwegian Institute for Air Research
P.O. Box 100
N-2007 Kjeller
Norway
P: +47 63 89 80 00
F: +47 63 89 80 50

AIRmetrics

Airmetrics
225 5th street Suite 501
Springfield, Oregon 97477
USA
P: (541) 726-0560
F: (541) 726-1205

email: sales@airmetrics.com
Website: www.airmetrics.com

Appendix D

Data Management

D.1.1 a. System Manager problems
b. Air quality handling and reporting from IGSR
D.2.2 Data back up procedures
D.3.1 The final GIS based data base

D.1.1 a. System Manager problems

Att: Amr El Doemi

EIMP

Fax Transmission

To	Kontram
Fax no.	00358961543222
Attention	Jarmo Kiukkaien
No. of pages	4 (incl. this page)

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
Fax: +202 525 6467

E-mail: eimp@intouch.com

Date
22 Mar 1998
Our ref.

System Manager - inadequate delivery

The EIMP Air Quality Monitoring System, including the data retrieval system, has been delivered by Kontram. Since the first installation in Egypt in October 1997, there has been several problems identified to the Station Manager and to the System Manager. These problems have been presented to Kontram/CTS and to EMC. Several attempts have been tried to correct errors, but none of these have worked according to specifications. We do not believe that the local agent at CTS will be able to install the System Manager successfully.

The Station Manager is working, but with a few malfunctions, that makes it inconvenient to operate. The System Manager, however, is not working, and has never been working, neither according to the procurement specifications nor to the specifications presented at delivery and in the Manual. For further details please see the attached Memo.

The operations are at present 5 months delayed relative to the first installation promised in October 1997. Danida and the EIMP programme is therefore requesting Kontram to take all steps necessary to finally deliver a product that can be used by the EIMP programme. A new System Manager has to be installed by EMC experts at the Monitoring Centre at Cairo University within two weeks of the receipt of this letter.

It has been brought to our attention that there are alternative data retrieval systems available, which could cancel the remaining deliveries from Kontram, should you fail to take the necessary and appropriate action.

Yours sincerely,

Morten C Andersen
EIMP Team Leader

Bjarne Sivertsen
Task Manager

EIMP
Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: **Morten C. Andersen**
Copy: **Dr. ElZarka, A ElSoueini, M Nassar, L Marsteen, T ElAraby**
From **Bjarne Sivertsen**
Date: **19 March 1998**

System Manager (SM) - inadequate delivery

The System Manager delivered to the Monitoring Laboratory of the EIMP programme (at Cairo University, CEHM) has never been operating properly. The problems in the applications of the System Manager have been pointed out several times to Kontram / Chemical and Technical Services (CTS). The problem was first notified in mid-November 1997, during a meeting with Jarmo Kiukkainen of Kontram. Also Bill Hayes of Environmental Monitoring Company (EMC) visited Cairo in November to check the Station Managers, but no comments were made concerning the System Manager.

Corrections, modifications and improvements to the System Manager have been attempted more or less continuously since 12 November 1997 until recently. On 12 February 1998 a second version was installed at Cairo University, but the problems (new and old ones) were not solved. The so called "upgrade" was not successful, and even new problems were identified.

On 19 March 1998 the Air Pollution Monitoring Task Manager was informed in details about the various problems. The following comments were made:

The Manual:

- The manual is incomplete, full of errors and mistakes, it includes old texts not appropriate to the version of the SM delivered,
- the manual is dated 1996 (Jan-May-Aug) and is version 1.02, while the SM delivered is version 3.1
- for instance: the Main Menu, Figure 3.2. is NOT the same as in SM version 3.1,
- descriptions of "Administration", "System Utilities" and "Remote Control" are missing in the manual.

Several comments more could be made to the content of the manual.

Operations

Several basic options in the operation of the System Manager is NOT functioning properly. The many malfunctions are so serious that it will NOT be possible to use the present version of the SM for data control and data presentations.
A few examples are given below (there are many more points that could be mentioned):

In the System Utilities:

- "Upgrade" indicate that the information is given from the Station Manager not from the System Manager,
- the DOS version does not function at all,
- when using the File Manager from System Utilities, the version seems to be a NT 3.1 and not the NT 4.0 , on which it is installed,
- the Notepad is not accessible,
- data can NOT be imported to the SM via diskettes,
- data transfer from the station manager does not always work, the functionality seem to be random, a lot of testing is needed,

In the System Administration:

- When defining users, old users can not be deleted, instead there are duplications of present entries to eternity,
- the edit function is not working.

The Data Editor

- The data editor can not be operated properly, various applications seem to give different modifications of the data,
- changes can only be performed once, if restoring changes are attempted,
- quality assurance is not possible with the present operation of the data editor.

We believe that it will NOT be possible to undertake any more modifications to the present version of the System Manager. We will therefore request that Kontram will contact EMC to have a US expert install a NEW and UPDATED version of the System Manager at the EIMP Monitoring Laboratory at Cairo University.

The delivery of this unit has already been 5 months delayed, since the installation was promised in October 1997. The EIMP programme is now under ways. Five monitoring sites have been installed and in operation, and there are strict requirements for data quality control and assurance, data presentations. This can not be achieved without having the System Manager operating properly. We therefore have to request that the System Manager will be in operation before 6 April 1998.

Station Manager

There are also some comments to the operations of the Station Manager.
After start up of the Station Manager a "background programme" is continuously interrupting the operator's work on the Station Manager. This occurs every 5 second! The programme has to be terminated manually, but reappear next time the Programme

Manager is turned on. This malfunction does not seem to affect the logging functionality.

The "exit" button in the Menu on the screen are occasionally replaced by the "log" button. This problem seems to be randomly appearing. Choosing the "log" on the "exit" place will log off the programme, and it is not possible to return to the previous menu as expected.

At random, when returning from the sub menu, a dialogue box give information about an error, which should evidently not be there.
These errors or malfunctions do not seem to influence the data, but makes it inconvenient to operate the Station Manager.

Alternative data retrieval systems

If Kontram/EMC can not deliver a complete and properly operating data retrieval system, EIMP will have to consider alternative data retrieval systems. We have checked that the SUMX/ETC and the Dasibi data retrieval system can be used as part of the EIMP air quality monitoring programme. In this case it will also be possible to use alternative data loggers at the sites where Kontram has not delivered yet.

EIMP

Fax Transmission

To	Kontram
Fax no.	00358961543222
Attention	Jarmo Kiukkaien
No. of pages	1 (incl. this page)

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
Fax: +202 525 6467

E-mail: eimp@intouch.com

Date
23 Mar 1998
Our ref.

Subject: System Manager - Comment from CTS.

We are referring to the comments made by Dr.Amr El Soueni at CTS dated 23 March 1998.

We would like to clearly emphasise that it is the responsibility of Kontram to see that a new and fully operative system manager will be delivered to EIMP within two weeks. it is not a question of resolving "tiny discrepancies".

Yours sincerely,

Bjarne Sivertsen
Task Manager

cc:Amr El Seouni

C.T.S

CHEMICAL & TECHNICAL SERVICES
شركة الخدمات الفنية والكيميائية

FAX NO. : 3551356 23-03-98 12:23P P.01

Page 1 of 3

To : Mr. Morten C. Anderson — EIMP TEAM LEADER
CC. : Mr. Bjarne Sivertsen — EIMP TASK MANAGER
CC. : Mr. Jarmo Kuikainen — KONTRAM
From : Dr. Amr El-Soueni — C.T.S.
Fax.# : 136/98

Subject: Your fax Message to Kontram dated March 22nd, 1998. regarding System Manager.

Please find hereunder our response on your a/m fax and attachments

STATION MANAGER

The Station Manager is functioning properly and does neither exhibit any failures nor confusions. The malfunction reported is not a malfunction. It has been explained by our trainers that the communication program in the Station Manager, checks the presence of a modem periodically, if the modem is not connected or powered off, this communication program could be suspended by removing it from the "Start-up" of Windows-95. This step was clearly demonstrated to the trainees.

As a result the Station Manager is functioning properly and completely conform with the quoted specifications.

SYSTEM MANAGER

- Manuals

You are perfectly right, we have requested EMC to Update the manual to incorporate all the new version Software since two weeks. EMC promised to mail the modified manual by April 20 ÷ 25, 1998.

- Operation

*** System Utilities**

- Upgrade : is not included in Specifications and has no effect on the operation of the System Manager. If it causes any confusion "Upgrade" can be removed from the screen.

٤ شارع معمل السكر جاردن سيتي – القاهرة / ت : ٣٥٥٢٥٦٠ / س . ت : ٢٧٤٣ / فاكس : ٣٥٥١٣٥٦
ADDRESS : 4, MAAMAL EL SOKKAR ST., GARDEN CITY, CAIRO / TEL. : 3552560 / RCC. : 2743 / FAX. : 3551356

- DOS Version does Function at all:

The Icon "DOS" in the System Manager Menus does not necessarily means that it can be run from this Icon but always you can run it from Windows NT.

- When Using the File Manager from System Utilities the version seems to be NT 3.1 and not NT 4.0, on which it is installed.

Please Specify the problem. the way the file Manager appears on the screen has no effect on the performance of the System Manager.

- Notepad is not accessible

Is also accessible from Windows NT.

- Data cannot be Imported via diskettes

This is not a specification item, but as a gesture, EMC managed to incorporate this function. This is functioning and demonstrated to Monitor Lab Personel as follows.

- To export data on a diskette from a station to the Station Manager in Monitor Lab and then by polling the latter, data are exported to System Manager.
- Data from El-Gomhoureya Station Manager have been collected on a Diskette and then exported to the System Manager.

- Data Transfer from the Station Manager does not always work. The funtionallity seems to be random. A lot of testing is needed.

Per our trials with Monitor Lab Personel and Trainees, Data Transfer is performing properly. Please specify problems

C.T.S FAX NO.: + 3551356 23-03-98 12:24P P.

- System Administration.

- It has been realized that the old users can not be deleted by system Manager Administration, but can be deleted by Access. This is true and we asked EMC to resolve this problem.
- The Edit Function is not working.
  The Edit Function is working fine and without a single problem.

- The Data Editor

- You are right, still there are few problems in this operation. None of the applications gave different modifications of the data.

As a conclusion, both the Station Manager and the System Manager are Functioning. There are very tiny matters that would have to be resolved completely so that the System Manager is fully operational. We, Kontram, and EMC are Fighting the time to resolve these tiny discrepancies, as soon as possible.

Sincerely yours

Dr. Amr El-Soueni C.T.S.

T. KONTRAM OY :25- 3-98 : 17:19 : → +20 2 378 5478:# 1/ 2

TELEFAX

kontram P.O. BOX 88, FIN-02201 ESPOO, Tel. +358 9 615 4300, Fax +358 9 615 43222

Date : 25.03.98
No of pages: 2

To : EIMP / EEAA - DANIDA - COWI
Fax: + 202 3785478

Attn : Morten C. Andersen, EIMP Team Leader
Copy: Bjarne Sivertsen, Task Manager

From : Jarmo Kiukainen

Subject : System Manager

Dear Sirs,

with reference to your telefaxes concerning EMC Data Acquisition System we inform that Mr. Steve Gersh from EMC will arrive in Cairo on 3rd April 98. Dr. Amr El-Soueni from CTS will inform you more about details of Mr. Gersh's trip later on.

Kindest regards

Jarmo Kiukainen

Answer on fax

text on

P \ " Air \ corresp \ "kontram 190398"

FAX

EMC Environmental Monitoring Company, Inc.
183 Prado Rd. San Luis Obispo, CA 93401 USA
Tel (805) 544-2037 Fax (805) 544-1634 Internet emc@emcsio.com

Date	24 Mar 98
From	Bill Hayes
Attn:	Mr. Jarmo Kiukainen
Company/Organization	KONTRAM
Fax Number Sent To	011 45 4492 4092

EMC Travel to Cairo, Egypt

Dear Jarmo:

Steve Gersh will fly to Cairo on 2 April 98. He will depart Toronto Canada at 2 pm on 2 April 98 and arrive in Cairo at 4:25 pm on 3 April 98.

Regards,
Bill Hayes

Number of Pages in this fax	1

EIMP

Fax Transmission

To	Kontram
Fax no.	00358961543222
Attention	Jarmo Kiukaien
No. of pages	1 (incl. this page)

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
Fax: +202 525 6467

E-mail: eimp@intouch.com

Subject: EIMP System Manager

Date
29 Mar 1998
Our ref.

We appreciate your immediate reaction to our System Manager problems. Upon arrival from Alexandria this morning I received your Fax dated 25 March 1998, indicating that Mr Steve Gersh will arrive in Cairo on 3 April. As ind - cated in our Fax we would prefer that the installation of the new System Manager included training was finalised before 6 April. On 6 April the Fiest starts in Egypt, the offices are closed and people will not be available until 12 April.

We will thus suggest that, if you can not finalise the training before 6 April (installation should start on 1 April?), you will have to arrive in Cairo after the Fiest to start training (for 2 days) on 14 April 1998.

Please give us a feedback on this proposal as soon as possible.

arrive on 3 April
CTS training
need access to computer
7-8 April at CTS

Yours sincerely

Bjarne Sivertsen

Task Manager Air Monitoring

202 526 1153

TT. KONTRAM OY : 1 4 98 : 15:10 : 002 02 5261155:# 2

TELEFAX

KONTRAM P.O. BOX 88, FIN-02201 ESPOO, Tel. +358 9 615 4300, Fax +358 9 615 43222

Date : 01.04.98 No of pages: 2

To : EIMP / EEAA DANIDA COWI Fax: + 202 3705478

Attn : Morten C. Andersen, EIMP Team Leader Copy: Bjarne Sivertsen, Task Manager

From : Jarmo Kiukainen

Subject : System Manager

Dear Sirs,

with reference to our correspondence concerning System Manager we are obliged to keep the timetable we informed to you which means that Mr. Stevo Gorch from EMC shall arrive on 3rd April 1998. If it's not possible to arrange training before 6th April 1998 and none of EIMP people has not possibility for training during the Fiest then the training will be done later on a date which can't be confirmed at the moment. We need to have access to those computers with System and Station Managers which are at Cairo University. If we can't go to Cairo University then C.T.S. must have those computers against the receipt. We really appreciate your co-operation ! As ter your request to Dr. Amr El-Soueni if you want to go personally through System Manager with Mr. Steve Gersh he will be available on 7th and 8th April 1008 at C.T.S. or at Sofitel Maadi Hotel.

Kindest regards

Jarmo Kiukainen

FAX from Cairo

EIMP

Environmental Information and Monitoring Programme
EEAA Building, 30 Misr Helwan St, Maadi, Cairo, Egypt
Tel. +202 5256 439, Fax +202 5256 467, email eimp@intouch.com
Privat: Leif Marsteen, 10 Road 86, Maadi, Cairo. Tel. +202 351 3226, email marsteen@hotmail.com

To:	**CTS**	**Date:**	**98.04.01**
Fax:	**355 1356**		
Att:	**A. El Soueni, Aly, Esam, etc.**	**No pages:**	**1**
Copy:	**MN, BS**		
From:	**Leif Marsteen**		
Our ref:	**EY980401-CTS**		

SUBJECT: PM10 monitor at Monitoring lab - Zero flow

The PM10 monitor inside the Monitoring Laboratory at Cairo University was started 31 March. It was checked today 1 April. It had reported 0.0 ugram/m^3 since yesterday. The troubleshooting procedure was run and the flow check failed. It was found that the tube from the monitor to the pump had been folded and squeezed together with a piece of thread. According to Cairo University staff this was done by CTS during calibration to reduce the flow. This is not an acceptable way of regulating the flow of the PM10 monitor and not documented in the manual. The restriction was removed and a new troubleshooting procedure run. The monitor passed the flow check. CTS will have to calibrate the flow again, this time according to the procedure in the manual.

Cairo University station

The Cairo University station was inspected 31 March by EIMP. It was found that the tubes from the intake manifold to the monitors were not fixed at the connection inside the cabinet. The tubes had only been pushed into the nuts but the ferrules were loose. The monitors have probably measured a mix of ambient air and cabinet air. The connections are now made in a proper way.

An attempt was made to calibrate the NOx monitor using a travelling gas standard cylinder. The response was 0.0 ppb NO, NO2 and NOx respectively. The stored data was checked and it showed that the monitor had been reporting 0.0 +- 1.5 ppb NO, NO2 and NOx respectively since the monitor was started by CTS in January. Cairo University reported the suspicious constant zero level reading to CTS. CTS reported back that the monitor was OK and that there is no NOx in this area. The monitor is obviously not in order. The flows seemed to be OK (0.5 l/min sample and 0.1 l/min ozon), the ozon generator seemed to be working (ozon could be smelled at the exhaust port, the 12 V ozonator power supply was OK), the ozon and sample flow restrictors seemed to be OK.

Best regards,

Leif Marsteen

D.1.1 b. Air quality handling and reporting from IGSR

EIMP

Note

Subject: **Air Quality Monitoring**

Monitoring Laboratory IGSR, data reporting facilities

Date: 5.5.1998

To: Morten C Andersen

Copy: LM, MN

From: B Sivertsen

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

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Air Quality Data Handling and Reporting from IGSR

Introduction - TWO Monitoring Laboratories

At the time IGSR (at Alexandria University) was appointed the second Monitoring Laboratory for air pollution in the EIMP programme (in addition to CEHM, Cairo University) the procurement of equipment had already been decided. The EIMP programme was originally designed with ONE Monitoring Laboratory for air pollution measurements and data reporting. The second Monitoring Laboratory at IGSR was designed at request from EEAA, and without the attendance of the air pollution task manager.

In the agreement with IGSR dated April 1997 it is stated that IGSR should be able to retrieve data automatically, and undertake their own quality control and editing of data. IGSR is also assumed to deliver their own quarterly and annual data reports including data summaries. In the list of equipment one computer with printer, for the computer centre at IGSR, had been specified.

However, there has been no mentioning of the tool necessary to retrieve data and to control and edit data from monitors. There are also no numerical or statistical programmes available for handling and presentation of data.

The System Manager

At the Monitoring Laboratory at CEHM in Cairo one System Manager has been purchased and installed as part of the originally planned data retrieval and data control system. This system has, as of May 1998, not yet been ordered for the installation at IGSR.

To enable the complete data control and data editing at IGSR a new System Manager will have to be purchased. This will involve a server and one client PC. The price is roughly estimated at 100 000 DKK (including software, computers, modems and printers).

With this system the Monitoring Laboratory at IGSR will be able to retrieve, control, edit and present daily plots of all air quality and meteorological data. The local data base which is part of the System Manager, will also serve the basis for data back up and for the development of a final data base for EEAA.

Data presentation tools and graphics

As for CEHM, also IGSR has received a simple Excel based graphical data presentation including some simple statistical soft ware. This may be used as a beginning, as long as the Monitoring Laboratory only has one or two stations.

In the future IGSR will operate 8 monitoring stations and 2 sampling stations. At that time IGSR will need a data base, a statistical/numerical data handling and graphical presentation tool. The design and potential purchase of such a system is at present being discussed within the EIMP project.

Calibrations and instrument maintenance

As stated in the contract, daily and weekly controls and span checks of monitors will be undertaken by the Monitoring Laboratory at IGSR. Basic annual instrument calibrations and maintenance will be supported by the Reference Laboratory . The Reference Laboratory will also provide and control new gas cylinders, and undertake controls during the audit visits.

D.2.2 Data back up procedures

EIMP

Note	Data Management
Subject	Backup for Cairo University
Date	7th May, 1998
To	Bjarne, Nassar
Copy	MCA, A.Seoud, Zaki
From	SAS

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

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Maadi, Cairo, Egypt

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1 Introduction

A meeting was held as per request from Bjarne to assist the CEHM to establish a backup policy for the data from the system manager. SAS visited the premises and met with Tarek El Araby to discuss the needs and use of the system.

2 Backup policy

The following had been suggested to be followed in order to maintain moderate level of security and backup.

- Purchase of an alternate tape ~~drive~~ to prevent the loss of backed up data in case of tape damage.
- The two tapes will be used alternatively so as to ensure the even distribution of data between the two tapes.
- A full backup is done at the first time for the whole system. An incremental backup is to be done weekly for the system manager data (at the server side). The stations hold their daily data in their local drives.
- At the end of the year, the whole data and system and corresponding reports and charts are to be backed up in one .
- A diskette is to be used to backup the institutions data on a daily basis to ensure the availability of data in case of hard disk failure.

3 Conclusion

Get quotation for the IMATION TR-3 MiniCartridge tape (Operates with Travan tape drive) with 1.6GB, uncompressed, and purchase two tapes (Annual and alternate tapes)

D.3.1 The final GIS based data base

EIMP
Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

Ambient Air Pollution Data Base and Presentation Tool for EIMP/EEAA

1. Introduction

Air quality data collected by the air pollution monitoring system at EIMP/EEAA will be automatically transferred to the Monitoring Laboratory. Quality assurance and quality controls are performed by the System Manager at the Monitoring Laboratory. Data are then stored in the local data base (at the System Manager), which is the basis for data presentation and statistical treatment of data. However, the System Manager itself does NOT contain any tools for data presentation and handling in a way that is normal for air quality information systems. It will also not function as the final approved data base for the Monitoring Laboratory or for EEAA.

Quarterly data reports will have be produced by the Monitoring Laboratory based upon analyses of data performance data availability and some simple statistics. The first quarterly data report was produced using simple Excel based programmes developed for this purpose. In the future more advanced Geographical Information Systems (GIS) containing various plots, scatter diagrams, statistics and graphs will have to be available, both at the Monitoring Laboratory and at EEAA.

The final evaluation and presentation of the results of the air quality measurements will be produced for the Authorities, for planners and for the public by EEAA personnel. These reports may be used by decision makers and may support specification of measures to reduce air pollution loads.

For this work the EEAA will need a data base with statistical and numerical tools, included a Geographical Information System.

2. Data bases and presentation tools

Air quality data bases, including statistical tools for presentation of data, are available in a number of institutions responsible for the collection of air pollution information world wide. However, commercially available tools adequate to meet the needs of EEAA in the future are very scarce. An investigation has revealed that most of these

data bases have been specially designed to meet the well defined questions asked by specific users; institutions, authorities or organisations.

The Airviro system developed by Indic, now available at SMHI/Indic in Norrkøping, Sweden, is limited by its non-modularity, the requirements of a UNIX workstation and the fact that the system should be designed from scratch to meet the specific requirements of this system.

Other data bases and data presentation tools investigated have been designed to meet national or international monitoring programmes and will usually not be easily transformed to the needs of EEAA.

AirQUIS is part of the ENSIS system, which is an integrated GIS-based environmental data management systems developed by Norwegian Research institutions. AirQUIS has been implemented in Norwegian cities and internationally. AirQUIS operates in several modules, including ambient air quality data, air emission data, dispersion and exposure modelling and a user friendly presentation system. It has the ability of adaptation to specific user needs.

3. AirQUIS

COWI has the ENSIS group to describe and prepare a proposal for establishing parts of the AirQUIS (Air Quality Information System) in connection with the EIMP project. The technical background for the implementation of AirQUIS as part of the EIMP programme has been presented by the team leaders; for emission sources by Douglas Clark and for ambient air pollution by Bjarne Sivertsen. A brief outline of AirQUIS is given below.

AirQUIS is developed for air quality surveillance and planning, and includes:

- module for data acquisition and quality control
- manual data entering application
- database for storing measured data
- database for storing emission inventories
- emission models
- dispersion models
- population exposure models
- statistical tools and graphical presentation tools
- An user friendly interface including an integrated GIS (Geographical Information System) interface

A schematic presentation of the system is given in Figure 1.

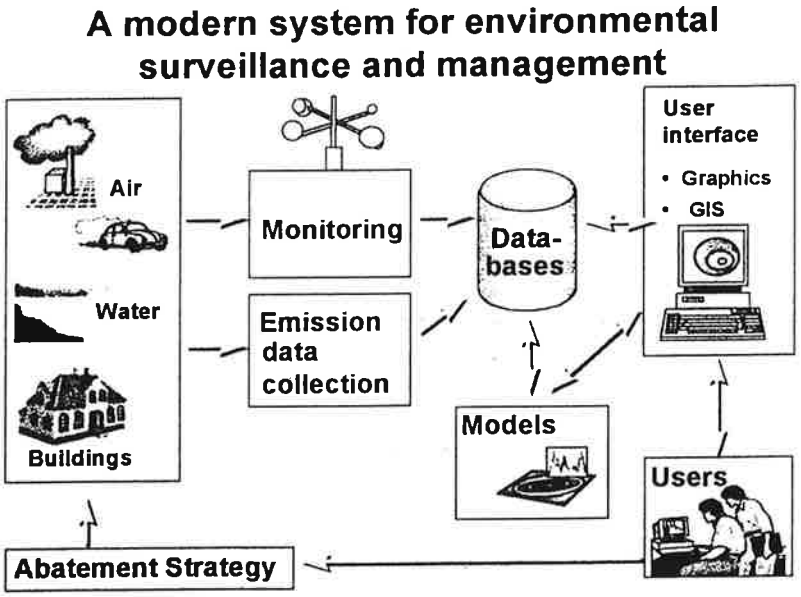

Figure 1 : A Simple layout illustrating the content of the ENSIS system

AirQUIS constitutes the air pollution part of ENSIS (Environmental Surveillance and Information System). ENSIS also contains a corresponding module for water quality called WaterQUIS (Water Quality Information System).

4. Scope of Work

4.1. An overview

COWI asked the ENSIS group for a price quotation for a database for storing point source emission data. This includes the AirQUIS company registers and functionality for storing, editing and reporting data for the various industrial processes, cleaning devices and stacks at any number of industrial sites. All relevant geographical locations and physical dimensions of the stacks are stored, as well as any consumption, production and/or measured emission data. The integrated GIS user interface will further enhance the user friendliness of the system, as well as its reporting possibilities. An emission model may be included to calculate total emissions in a selected area.

At present the most urgent need at EIMP/EEAA is the ability to store and present ambient air quality data as part of the EIMP/ EEAA programme. We propose that the AirQUIS measurement database be used for this purpose. This database is an integrated part of AirQUIS, and is running under the same user interface as the emission database discussed above. The solution will save the users from having to relate to two different systems, and will provide them with the opportunity to present measured data and emission data with the same functionality. Financially it is reasonable to choose this integrated solution, as the installation costs should be less than that of two separate applications.

4.2. The Ambient Air Data Base and Presentation Tool

In this document, however, we propose to install the following modules under the EIMP project:

- database for storing measured data
- data statistics and presentation tools
- user interface including integrated GIS

The emission inventory database has been taken out, but may of course be included later, also with area-distributed data and traffic data if needed. This proposal includes the installation of AirQUIS on one server and up to eight PC clients. This computer functions as an application server, serving client installations on other computers in the EEAA internal network. If such client installations are desired to make the system more available to the EEAA staff, the associated time costs and licenses should be discussed before a final agreement can be made.

In addition to installation of the above mentioned software, the proposed work includes the 'on site' training of project personnel as well as any necessary software customising to comply with given formats on input data. Also, an automatic functionality for on line transfer of measured data from the data acquisition system must be customised for communication with the measurement database.

The ENSIS data automatic acquisition module is not included in this proposal. If, however, this should be chosen as a tool for automatic data collection and quality control, this would facilitate the communication between the data acquisition database and the measurement database at the EEAA.

5. The Project Tasks

The various tasks of the proposed work are specified in further detail below. The work includes the installation of AirQUIS 2.0 according to the time schedule given below.

5.1. Start-up Visit to EEAA by an AirQUIS Expert

As an initialisation of the project, an AirQUIS database expert will visit Egypt. During this visit, AirQUIS will be introduced, with special focus on the ambient measurement database. Further, structuring and formatting will be discussed. One set of data for import to the AirQUIS database must be available before this start up visit Any necessary modifications and adaptations to the AirQUIS system to meet the local requirements will be identified. A detailed work plan for the remainder of the project will be constructed in co-operation between the Egyptian and Norwegian partners.

5.2. Establishing the EEAA AirQUIS 2.0 Installation in Norway

This includes customising and testing of the AirQUIS 2.0 version to meet special needs concerning import and export of measured data. It also includes the application of base maps, territorial units, demographic data and other geographical data that EIMP can provide in the correct formats prior to the work in this task. The PC on which the system will be installed may serve as an application server at the EEAA. However, it should be clear that AirQUIS will give a substantial load on this machine,

and we can take no responsibility for problems that arise from running or installing other applications on this PC. The server and on client in question should be purchased in Norway and its approximate price is included in the proposed budget.

5.3. Installation of AirQUIS 2.0 at EEAA

The PC AirQUIS server with a complete and adapted AirQUIS installation will be brought to EEAA, and put in use. The AirQUIS Site Acceptance Test (SAT) will be performed. This task will terminate in EEAA's official acceptance of the AirQUIS installation.

5.4. Training of EEAA Personnel

It is assumed that key personnel will take part in the installation of the system, so that this will constitute a part of the 'on the job' training. The training sessions will deal with both data system handling in addition to relevant theory and practical use of the system.

5.5. Further Customizing

There may arise a need to modify AirQUIS further to sustain local systems beyond basic data import or export. In this case, the ENSIS group will provide the necessary resources up to one man-month.

5.6. Possible Future Establishment of the Point Source Emission Inventory

If, in the future, it will be of interest to EEAA, the ENSIS group experts will support the new emission personnel in organising and structuring the collected point source emission data. Also, support may be given in importing these data into the AirQUIS emission database and reporting the contents of the resulting point source emission inventory.

6. Time schedule

Figure 2 describes a proposed time schedule for the tasks that are described above.

	Month								
Task	1	2	3	4	5	6	7	8	Man weeks
Preparations	X								1
Start up visit Egypt	x								2
Server/client adaptation in Norway		x	x	x					3
AirQUIS 2.0. installation at EEAA					x				3
Configuration, import/export etc..					x	x			4
Perform SAT						x			1
Training personnel at EEAA/Monlab						x	x		3
Supportive work Norway					x	x	x		3
Total									20

Figure 2: Work load and time schedule

7. Budget

The total cost estimates related to the proposed work as specified in ch. 6. It includes costs for purchasing of hardware and some of the necessary third party software. It also includes the AirQUIS license and maintenance agreement costs, as well as cost associated with work and travels.
The AirQUIS license described is a 'server/CPU license' located on one server at the EEAA. That is, up to three simultaneous client users can use the software, presuming that they have installed the client as specified below. Additional user, up to eight users will have a client cost of 10% of the site license.

Additional server/CPU licenses may be purchased and are priced as follows:

- License number 2 is 50% of license number 1.
- Additional licenses are 25% of license number 1.

Table 1: Budget (based on 1 DKK = 1.095 NOK). Costs are rounded to the closes 1000 DKK.

		Costs (1000 DKK)
Hardware:	One Dual Pentium II Database Server	40
	One PC client	20
	Total, Hardware	**60**
AirQUIS PC site license: (Eight simultaneous users)	Measurement Database, including the Manual Data Entering Application	25
	AirQUIS Basics, including user interface, integrated GIS, import/export and reporting facilities and user administration module.	85
	Total, First License	**110**
Licenses for other software that will be provided:	Oracle, one license for up to eighth users.	40
	Windows NT, Server	20
	Windows NT Client, per unit	3
	Total, Other software licenses	**63**
Travel:	First start-up visit (Task 1)	18
	Second visit. Travel for 2 persons, Subsistence for 4.5 man months.	132
	Total, Travels	**150**
Sum:		**383**

The cost of man hours presented in Figure 2 have been estimated to:
For work to be undertaken in Norway: 35 days x 4375 DKK =**153** kDKK
For work undertaken in Egypt: 3.3 months x 95 000 DKK =**314** kDKK

Total cost for the project as described above, included server and client for one user and software for three simultaneous users is **DKK 850 000,-**

In addition to the above sum, there are costs related to any work under the optional task "further customizing" (ch.5.5.). These will be charged for the actual number of work hours needed to perform the task. The upper limit is DKK 95.000,-, which corresponds to one man month. Travel costs and subsistence associated with any necessary visits to Egypt by ENSIS expert personnel in connection with this task will be charged in addition to the above sums.

A Maintenance Agreement should be discussed. Annual maintenance for each module cost approximately 20% of the module license cost, with a minimum of NOK 20.000,-. This should cover assistance per telephone and/or Internet, and the hourly rates for work performed by ENSIS personnel in Norway or in Egypt. If a visit to Egypt is necessary for maintenance, the associated travel costs and subsistence will be covered by EIMP. This scheme is merely a first suggestion and must be discussed further to yield a formal Maintenance Agreement between the parties.

This budget does not include costs related to the purchase or installation of any necessary third party software other than that mentioned in Table 1.

The cost estimate is based on prices for the year 1998. Prices are normally adjusted every year from 1st January. For work carried out after the turn of the year, an increase in the prices may be expected.

8. Conditions

The estimates of time consumption and costs in this proposal is given on the basis of the following conditions:

- The EIMP project will provide format specifications and input data example files for data import design and testing when required.
- Input data files are on an ASCII format.
- Input data are in English.
- Geographical (map) data are delivered in a format that AirQUIS can handle without having to do any conversions. Examples of suitable files are Shape files. The existing hardware and software at the EEAA satisfy the technical specifications given above.
- No work will be performed by ENSIS group personnel in connection with installing, configuring or supporting any necessary hardware or software that are not included in Table 1.

The following assumptions are relevant if the Measurement Database:

- If the selected data acquisition system is not the ENSIS Automatic Data Acquisition System the import of measured data from this system is from ASCII files. The format of these files will be documented so that the construction of a data transfer between the data acquisition system and the AirQUIS installation at the EEAA is straightforward. Examples of these files will be provided so that a test of the transfer functionality in Norway can be performed during the work of Task 2.

- The data acquisition system is such that all measured and administrative data are stored in one place and in a self-consistent manner, that is, all data of the same type is stored in the same way.

The data structures of all input data, and the configuration and communication possibilities of the data acquisition system, must be known before a final cost estimate can be made.

10. Technical Specifications

This section describes the hardware and third party software that must be purchased and installed by EIMP personnel prior to the AirQUIS installation. The costs of these items are not included in the budget of this proposal.

Hardware/Software	Specifications
Network communication at the EEAA	• 10 Mbits Ethernet • Twisted Pair Cabling • TCP/IP protocol • There are only computers running Windows operative systems in the network.

For Client installations more than the one included in the delivery, it is required that EIMP has a IBM-compatible PC Pentium II with 64 Mbyte RAM, 1.0 Gb Hard disc and CD player.

Appendix E

Training

EIMP

Note

Subject	Specification of Training
Date	4 Mar 1998
To	All Task Managers and Counterpart Staff
Copy	Dr. M. ElZarka
From	MCA

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

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Maadi, Cairo, Egypt

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Fax: +202 525 6467

E-mail: eimp@intouch.com

Training is becoming an increasingly important part of the EIMP activities now when actual data collection is about to gain momentum. It will be essential to the EIMP that our training activities are focused, explicitly described, systematised and documented since fulfilment of our requirements to our collaborating institutions largely depends on availability of trained staff at these institutions.

The EIMP has discussed with the EETP staff how to arrange for such documentation of training and the EETP has proposed the attached formats to be used by the EIMP (the three forms will be supplemented with a fourth which will specify contributions and commitments from EIMP and the participating institution(s) respectively).

It is important that the forms TC1, TC3 and the "Commitment form" (mentioned above) are filled in and cleared with the EETP and the receiving institution(s) prior to start of the training.

Form TC2 is a course evaluation form which should be completed at the end of the training. This training evaluation should serve as part of the documentation but should also bee seen as a way of identifying needs for further training.

PROGRAMME OBJECTIVES	**TC1**
PROGRAMME TITLE:	
INSTRUCTOR'S NAME:	
PROGRAMME DATES (from - to):	
VENUE (TIMS, NIOF):	
IMPORTANT NOTE: *Objectives are important training indicators. Please state all the objectives in your training event and number each objective for reference purposes.*	

No	Objective
	By the end of the training the participants will be able to:
1	

A:\EIMPCONT.MGB - 2 March 1998

OBJECTIVES ACHIEVED RECORD PROGRAMME TITLE:										**TC2**
INSTRUCTOR'S NAME:		DATES(from-to)			VENUE (TIMS, NIOF)					
IMPORTANT NOTE: The achievement of training objectives by the participants is an important training indicator. TC1 lists the objectives by number. On this form tick against each participant when that person achieves an objective.										
Objective No										
Participant's Name	Job (Manager, Supervisor, Chemist, Technician etc)	Organisation (TIMS, NIOF, other etc)								

DAILY SCHEDULE	**TC3**
PROGRAMME TITLE:	
DATE:	
INSTRUCTOR'S NAME:	
IMPORTANT NOTE: *Please complete one of these for each training day. This is a record of work carried out. State where the work was carried out: laboratory, training room, workshop etc. If a site visit or field visit please state this. State the topics of the training covered and which objective the participants were trying to achieve. State outcome.*	

TIME	ACTIVITY

Appendix F

QA/QC

F.2.1 Example SOP, dynamic calibration of CO monitor
F.2.3 List of SOPs and forms

F.2.1 Example SOP, dynamic calibration of CO monitor

Quality Handbook - *PRELIMINARY EDITION* **EIMP**

Standard Operations Procedures Manual Dynamic calibration of a TEI model 47C CO monitor	Page Date	: :	1 of 3 98.01.23
Monitoring Lab	Issue No	:	001

Dynamic calibration of a TEI model 47C CO monitor

Purpose of SOP

To establish the linearity of the monitor respons over the measurement range.

A dynamic calibration consists of a two point calibration to verify the monitor response followed by 4 other concentrations in between to verify the linearity of the response. The two point calibration may include changing the monitor response while the dynamic calibration includes no alteration of monitor settings only recording of observations. The span level of the two point calibration should be at 80% of the measurement range while the other four gas concentrations should be chosen to be at 70%, 60%, 50% and 40%. The lower concentrations are avoided because the calibrator may not be linear and that region.

Applicability and description of equipment

This SOP applies to dynamic calibration of monitors in the laboratory.

The calibrator uses zero air to dilute the reference gas to appropriate concentrations. Reference gas is taken from the high concentration reference standard gas cylinder. An air compressor supplies ambient air to various filters to remove pollutants before supplying the air to the calibrator.

It is assumed that the zero air generator and reference standard gas cylinder is connected to the calibrator. It is also assumed that the zero air generator and calibrator is running and has been given a minimum of 1 hour warmup time.

It is assumed that the monitor has been given a minimum of 1 hour warmup time.

Before using high concentration CO gas make shure the CO detector and alarm is turned on and functioning. CO at high concentrations is dangerous to your health!

Responsibilities

Quality assurance personnel performing calibration of gas monitors in the laboratory will be thoroughly knowledgeable of the contents of this SOP and will comply with its requirements when performing calibration of gas monitors.

Authors:	Authorized by:	Managing Director	Quality Manager

Instrumentation

This SOP assumes the following instrumentation:

- Gast air compressor
- TEI model 1150 CO reactor with silica gel, purafil and activated charcoal filters
- TEI model 146 multipoint calibrator
- TEI model 48C CO monitor

Documentation

Form: Dynamic Calibration - CO Monitor

File: MonDynCal-CO-nn-yymmdd.XLS where nn is the monitor serial number and yymmdd is the date of the calibration. Additional calibrations on the same date is stored in separate with a, b, etc. after the date.

Sheet: CO

The reference values and monitor responses are entered into the sheet. A calibration curve and the goodness of fit is calculated using the method of least squares. The first line of the statistics results called **Scale f** includes the scale factors a and b of the equation y=ax+b based on a two point calibration using the results from the two point calibration (first and last concentration value in the table). The line called **r2** displays the correlation factor or goodness of fit based on all concentration values in the table. It will typically equal 0.999... .

Cleaning and adjustments

If the purpose of the calibration is to document the instrument status after a period of field operation it must be calibrated without any cleaning or adjustments made to the monitor prior to the calibration. The background correction and span coefficient must be left unchanged.

If the monitor is calibrated before use or shipping to field operation it must be cleaned prior to calibration and adjustments should be made as necessary. The background correction and span coefficient must be changed if necessary.

Calibration procedure

Registration of instrumentation:

1. Open the MonDynCal spreadsheet and select the **CO** sheet.
2. Enter the Guest information including owner, monitor model and its serial number and date of calibration in the **Owner, Monitor, Ser. no** and **Date** fields in the form.

3. On the monitor press the **MENU** pushbutton to enter the monitor menu and select **RANGE** using the arrow buttons. Press **ENTER** to enter the **RANGE** menu. The range mode should be **SINGLE.** Enter the **RANGE** values in the **Range** field in the form. Press **RUN** to return to the Run screen.
4. Press the **MENU** pushbutton to enter the monitor menu and select **CALIBRATION FACTORS** using the arrow buttons. Press **ENTER** to enter the **CALIBRATION FACTORS** menu. Enter the **BKG** values in the **Cal. Bkg** fields and the **COEF** values in the **Cal. Cof** fields. Press **RUN** to return to the Run screen.
5. Enter the name of the calibrating institution in the **Cal. lab** field in the form.
6. Enter the calibrator model and its serial number in the **Calibrator** and **Ser. no** fields respectively.
7. If the purpose of the calibration is to document the monitor status enter **Status** in the **Purpose** field. If the purpose of the calibration is to calibrate the monitor (change calibration factors) enter **Calibrate.**
8. Enter the name of the reference gas producer, its serial number and concentration in ppm in the **Gas std**, **Ser. no** and **CO** fields respectively.

Zero air unit preparations:

1. On the compressor close the compressed air output valve.
2. Cover the drain plug with a beacon and open the water drain plug slowly and completely to drain the compressor.
3. Close the drain plug.
4. Check for water in the air outlet water trap. If there is water present unscrew the plastic bulb and dry it and tubings as necessary. Refit the bulb.
5. Check the color of the silica gel in the air dryer. If more then ¾ of the silica gel is pink it should be changed.
6. Open the compressed air output valve.
7. Adjust the air compressor output pressure to 45 psi.
8. On the TEI model 1150 CO reactor adjust the pressure to 45 psi.
9. Open the main valve on top of the reference standard gas cylinder.
10. Turn the large pressure control knob clockwise till the secondary pressure gauge indicator begins to move and indicates 20 psi. If reading becomes higher then 20 psi close the pressure control knob and wait for the pressure to go down. Adjust pressure again.
11. Open the secondary pressure outlet valve by turning it counter clockwise.

12. On the calibrator press the **ZERO AIR** pushbutton to output zero air.
13. Make shure that all other pushbuttons are in the out position.
14. Adjust the **SET FLOW - ZERO AIR** thumbwheels until the reading in the **ZERO AIR FLOW** display equals 8.00 LMP.
15. Adjust the **SET FLOW - GAS** thumbwheels to 000.
16. On the monitor connect the calibrator outlet tube to the sample input port.

Two point calibration:

1. Let the monitor measure zero air for 20 minutes. The reading should be 0.00 ± 0.1 ppm. Skip the following subsection if you are documenting the instrument's status (background correction and span coefficient left unchanged).
    2. On the monitor press the **MENU** pushbutton to enter the monitor menu and select **CALIBRATION** using the arrow buttons. Press **ENTER** to enter the **CALIBRATION** menu.
    3. Select **CALIBRATE ZERO** using the arrow buttons. Press **ENTER** to enter the **CALIBRATE ZERO** menu.
    4. Press **ENTER** to calibrate the zero level. Wait 10 seconds then press **RUN** to return to the Run screen. The monitor is now zero level calibrated.
5. Enter the value displayed in the calibrator **ZERO AIR FLOW** display in column **Parameter CO - Zero air** in the form.
6. Enter 0.0 in column **Parameter NO - Gas**. There is no reference gas.
7. Enter the monitor response in the first line of column **Parameter CO - Guest**.
8. On the calibrator press the **C** pushbutton to start blending reference gas with zero air.
9. Enter the **CalcConc** sheet to calculate the gas flow of the desired concentration.
10. Enter the gas cylinder concentration and the zero air flow in the **Gas cylinder conc (ppm)** and **Dillution air flow (LPM)** fields respectively.
11. Enter a value equal to 80% of the measurement range in the **Desired output conc (ppb)** field. The necessary calibrator gas flow is calculated and displayed in the **Cal. gas flow (SCCM)** field.
12. Adjust the **SET FLOW - GAS** thumbwheels until the reading in the **GAS FLOW** display equals the value in the **Cal. gas flow (SCCM)** field.
13. Adjust the **SET FLOW - GAS** thumbwheels until the reading in the **GAS FLOW** display equals the value in the **Cal. gas flow (SCCM)** field.

14. Let the monitor measure the reference gas for 20 minutes. The reading should be stable within ± 0.1 ppm. Skip the following subsection if you are documenting the instrument's status (background correction and span coefficient left unchanged).

    15. Press the **MENU** pushbutton to enter the monitor menu and select **CALIBRATION** using the arrow buttons. Press **ENTER** to enter the **CALIBRATION** menu.

    16. Select **CALIBRATE CO** using the arrow buttons. Press **ENTER** to enter the **CALIBRATE CO** menu.

    17. Using the arrow push buttons set the **SET CO TO** value equal to the reference gas concentration.

    18. Press **ENTER** to span calibrate the monitor.

19. Enter the value displayed in the calibrator **ZERO AIR FLOW** display in column **Parameter CO - Zero air** in the form.

20. Enter the value displayed in the calibrator **GAS FLOW** dispaly in column **Parameter CO - Gas**.

21. Enter the monitor response in column **Parameter CO - Guest**.

    22. Skip this subsection if you are documenting the instrument's status (background correction and span coefficient left unchanged). If not introduce zero air to the monitor to verify that the zero level is still valid. Recalibrate the zero level if necessary.

    23. Introduce reference gas at a concentration of 80% of the measurement range to verify that the span level is still valid. Recalibrate the span level if necessary. The two point calibration must be repeated until a valid zero and span reading have been obtained. It is the last valid zero and span calibration that should be recorded in the form.

Dynamic calibration:

1. On the calibrator press the **C** pushbutton to start blending reference gas with zero air.

2. Use the **CalcConc** sheet to calculate the gas flow corresponding to a concentration equal to 70% of the measurment range.

3. Adjust the **SET FLOW - GAS** thumbwheels until the reading in the **GAS FLOW** display equals the value of the calculated gas flow.

4. Let the monitor measure the reference gas for 20 minutes. The reading should be stable within ± 0.1 ppm.

5. Enter the value displayed in the calibrator **ZERO AIR FLOW** display in column **Parameter CO - Zero air** in the form.
6. Enter the value displayed in the calibrator **GAS FLOW** dispaly in column **Parameter CO - Gas**.
7. Enter the monitor response in column **Parameter CO - Guest**.
8. Repeat steps 2 - 7 for three other concentrations equal to 60%, 50% and 40% of the measurement range respectively. The results must be entered into the table in decending order, the zero concentration in the first line and the maximum concentration in the last line. Do not use calibration gas flows below 10 SCCM as the mass flow controller is not stable under these conditions.

Calculating the results:

1. Choose Calibrate Monitor from the Excel File menu. The Calibrate Monitor dialog box appears, see Figure 3. Choose the OK button to calculate the dynamic calibration statistics

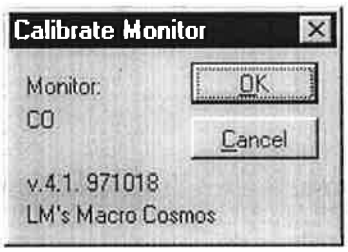


Figure 3. The Calibrate Monitor CO dialog box.

Shutting down calibration system:

1. Disconnect the calibrator outlet tube from the monitor.
2. On the calibrator press the **ZERO AIR** pushbutton to output zero air.
3. Adjust the **SET FLOW - ZERO AIR** thumbwheels too 100.
4. Adjust the **SET FLOW - GAS** thumbwheels to 000.
5. On the compressor close the compressed air output valve.
6. On the reference gas cylinder close the cylinder valve.
7. Close the output needle valve by turning it clockwise.
8. Close the regulator adjusting knob by turning it counterclockwise until it runs freely.

Laboratory environment:

1. Enter the room temperature, pressure and relative humidity in the **Temp, Press** and **Rel. h** fields in the form.

Finalising the form:

1. Save the form in a file using the appropriate file name.
2. Make a printout of the form.
3. Sign the form in the **Init** field.
4. Store the form in the history log.

Dynamic Calibration - CO Monitor

Guest

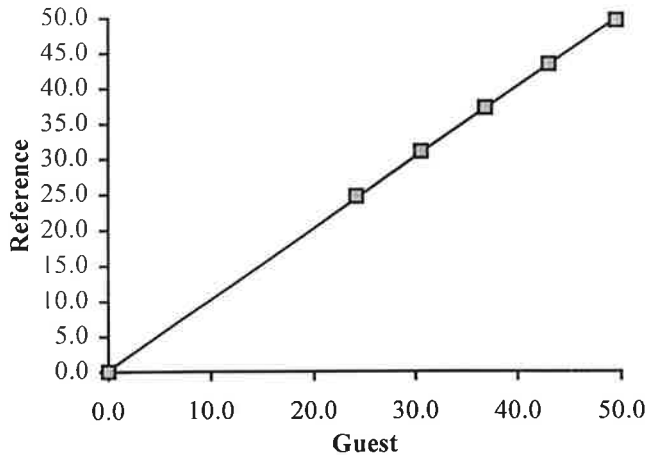
Owner: Cairo U. CO
Monitor: TEI 48C Range: 100 ppm
Ser. no: 58152-317 Cal. bkg: 1.120 ppm
Date: 98.03.08 Cal. Cof: 1.079

Reference

Cal. lab: Ref.lab Gas std: Scott, CO, 1%
Calibrator: TEI 146 Ser. no: ALM063542
Ser. no: 57545-317 CO: 4995.1 ppm
Purpose: Calibrate

Parameter CO

Zero air [LPM]	Gas [SCCM]	Ref. [ppm]	Guest [ppm]	G - R [ppm]	Statistics, y=ax+b	a	b
8.00	0.0	0.0	0.0	0.0	Scale f:	1.000	0.000
8.01	39.8	24.7	24.2	-0.5	Regression		
8.01	50.0	31.0	30.6	-0.4	Scale f:	1.001	0.207
8.01	60.1	37.2	36.9	-0.3	St. error:	0.006	0.207
8.01	70.2	43.4	43.1	-0.3	St. error y estimate:		0.233
8.01	80.3	49.6	49.6	0.0	r2:	0.99986	



Laboratory environment

Temp: _____ °C
Press: _____ mm Hg
Rel. h: _____ %

Init: LØL

F.2.3 List of SOPs and forms

Sheet Number:

LIST OF SOPs AND FORMs

SOP - Monitoring lab.	Issue No	FORM
Dynamic calibration of a TEI 42C NOx monitor	Dec. 97	Dynamic calibration - NOx monitor
Dynamic calibration of a TEI 43C SO2 monitor	— " —	Dynamic calibration - SO2 monitor
Two point calibration of a TEI 42C NOx monitor	— " —	Two point calibration - NOx monitor
Two point calibration of a TEI 43C SO2 monitor	— " —	Two point calibration - SO2 monitor
Routine maintenance on a TEI 42C NOx monitor	— " —	Routine maintenance. TEI 42C NOx monitor
Routine maintenance on a TEI 43C SO2 monitor	— " —	Routine maintenance. TEI 43C SO2 monitor
Installing a reference standard gas cylinder	— " —	None
Installing a Travelling or working standard gas cylinder	— " —	None

Sheet Number:

LIST OF SOPs AND FORMs

SOP - Reference lab.	Issue No	FORM
Dynamic calibration of a TEI 42C NOx monitor	Dec 97	Dynamic calibration - NOx monitor
Dynamic calibration of a TEI 43C SO2 monitor	— " —	Dynamic calibration - SO2 monitor
Two point calibration of a TEI 42C NOx monitor	— " —	Two point calibration - NOx monitor
Two point calibration of a TEI 43C SO2 monitor	— " —	Two point calibration - SO2 monitor
Routine maintenance on a TEI 42C NOx monitor	— " —	Routine maintenance. TEI 42C NOx monitor
Routine maintenance on a TEI 43C SO2 monitor	— " —	Routine maintenance. TEI 43C SO2 monitor
Installing a reference standard gas cylinder	— " —	None
Installing a Travelling or working standard gas cylinder	— " —	None

Sheet Number:

LIST OF SOPs AND FORMs

SOP - Giza University	Issue No	FORM
Routine maintenance on a TEI 42C NOx monitor	Dec. 97	Routine maintenance. TEI 42C NOx monitor
Routine maintenance on a TEI 43C SO2 monitor	—"—	Routine maintenance. TEI 43C SO2 monitor
Installing a Travelling or working standard gas cylinder	—"—	None

Sheet Number:

LIST OF SOPs AND FORMs

SOP - Tebbin	Issue No	FORM
Station manual	001 98.01.23	Station visit log
Log-book station	001 98.01.23	
Routine maintenance of a TEI model 42C NOx monitor	001 98.01.23	Routine maintenance. TEI 42C NOx monitor
Routine maintenance of a TEI model 43C SO2 monitor	001 98.01.23	Routine maintenance. TEI 43C SO2 monitor
Routine maintenance of a TEI model 650 PM10 monitor	001 98.01.23	Routine maintenance.TEI model 650 PM10 monitor
Routine maintenance of a TEI model 610 TSP high volume sampler	001 98.01.23	Routine maintenance. TEI model 610 TSP high volume sampler
Installing a Travelling or working standard gas cylinder	001 98.01.23	None

Sheet Number:

LIST OF SOPs AND FORMs

SOP - IGSR	Issue No	FORM
Station manual	001 98.01.23	Station visit log
Log-book	001 98.01.23	Station log-book Log-book for each instrument
Routine maintenance on a TEI model 43C SO2 monitor	001 98.01.23	Routine maintenance. TEI model 43C SO2 monitor
Routine maintenance on a TEI model 42C NOx monitor	001 98.01.23	Routine maintenance. TEI model 42C NOx monitor
Routine maintenance on a TEI model 48C CO monitor	001 98.01.23	Routine maintenance. TEI model 48C CO monitor
Routine maintenance on a TEI model 55C HC monitor	001 98.01.23	Routine maintenance. TEI model 55C HC monitor
Routine maintenance on a TEI model 650 PM10 monitor	001 98.01.23	Routine maintenance.TEI model model 650 PM10 monitor
Installing a Travelling or working standard gas cylinder	001 98.01.23	None

Appendix G

Monitoring

G.3.1 a) Monitoring station infrastructure
b) Matters to be prepared by Dr. Nassar
G.3.2 Installations
a) Location of instruments
b) Time schedule for installations
c) Work summary - installations
d) Matters to be solved by CTS
e) Tasks to be considered, Summer 98
G.5.2 Data presentations
a) Maximum limits for outdoor air pollutants
b) Daily meteorological report as presented at CEHM
c) Air quality in Egypt, a brief discussion of the first EIMP data
d) Air pollution (SO_2) for Tabbin 1-17 April 1998

G.6.3 Passive sampling
G.7.1 Quarterly report

G.3.1 a)Monitoring station infrastructure
b)Matters to be prepared by Dr. Nassar

Misr Helwan Road Bldg. 30
Maadi, Cairo, Egypt
Tel.: 350-7573 / 351-6134 / 375-1469
375-0954 / 375-1245
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E-Mail caip@intouch.com

CAIRO AIR IMPROVEMENT PROJECT
Managed by Chemonics Consortium
مشـــروع تحســـين هـــواء القاهـــرة
إدارة مجمـــــــوعة كيمونكـــــــس

15 February, 1998

Mr. Jan Hassing
Team Leader, Air Pollution Monitoring
Environmental Information and Monitoring Programme
EEAA Building
30 Misr Helwan Road
Maadi, Cairo, Egypt

Dear Mr. Hassing:

I am pleased to confirm my approval of the arrangements negotiated by Mohamed Nassar of the EIPM staff, and Jim Howes, of the CAIP staff, for the joint use of equipment shelters at the following seven (7) DANIDA/EIMP monitoring sites.

1. Meteorological Institute
2. Nasr City
3. Fum Al-Khalig
4. Tebbin South
5. Cairo University/Giza
6. 6 October
7. 10 Ramadan

It is my understanding that Mr. Nassar will be responsible for design and construction of the shelters and will coordinate these activities with Mr. Howes. The shelter design will include separate compartments for the EIMP and CAIP monitors/samplers. The compartments will have separate locked access doors, lighting, and power outlets for the monitor/sampling equipment operation. Temperature of the shelter environment will be controlled by a heater/air conditioner in the EIMP section of the shelter. Openings will be placed in the partition between the two compartments to permit air exchange. A drawing showing the proposed joint shelter design is attached.

In consideration for the shelter space, the CAIP program will pay the greater of: a) 35 percent of shelter construction cost; or b) the cost calculated according to the following formula.

CAIP Cost = CAIP Compartment Floor Area / Total Floor Area of the Shelter

CAIRO AIR IMPROVEMENT PROJECT

I also agree to sharing the shelter operating costs (primarily for electrical power) in the same proportion as the construction costs.

Thank you for entering into this cooperative effort between the EIMP and CAIP monitoring programs. The sharing of these monitoring facilities and sites has several significant advantages that include: cost savings by eliminating duplication of effort, enhancement of the monitoring data available at the collocation sites, and the opportunity to compare particulate monitoring data obtained by the two programs.

We look forward to working cooperatively with you in other efforts such as training programs and the EIMP Reference Laboratory Program. If you approve of the cost sharing arrangement proposed in this letter, please sign where indicated below and return a signed copy of this letter to me.

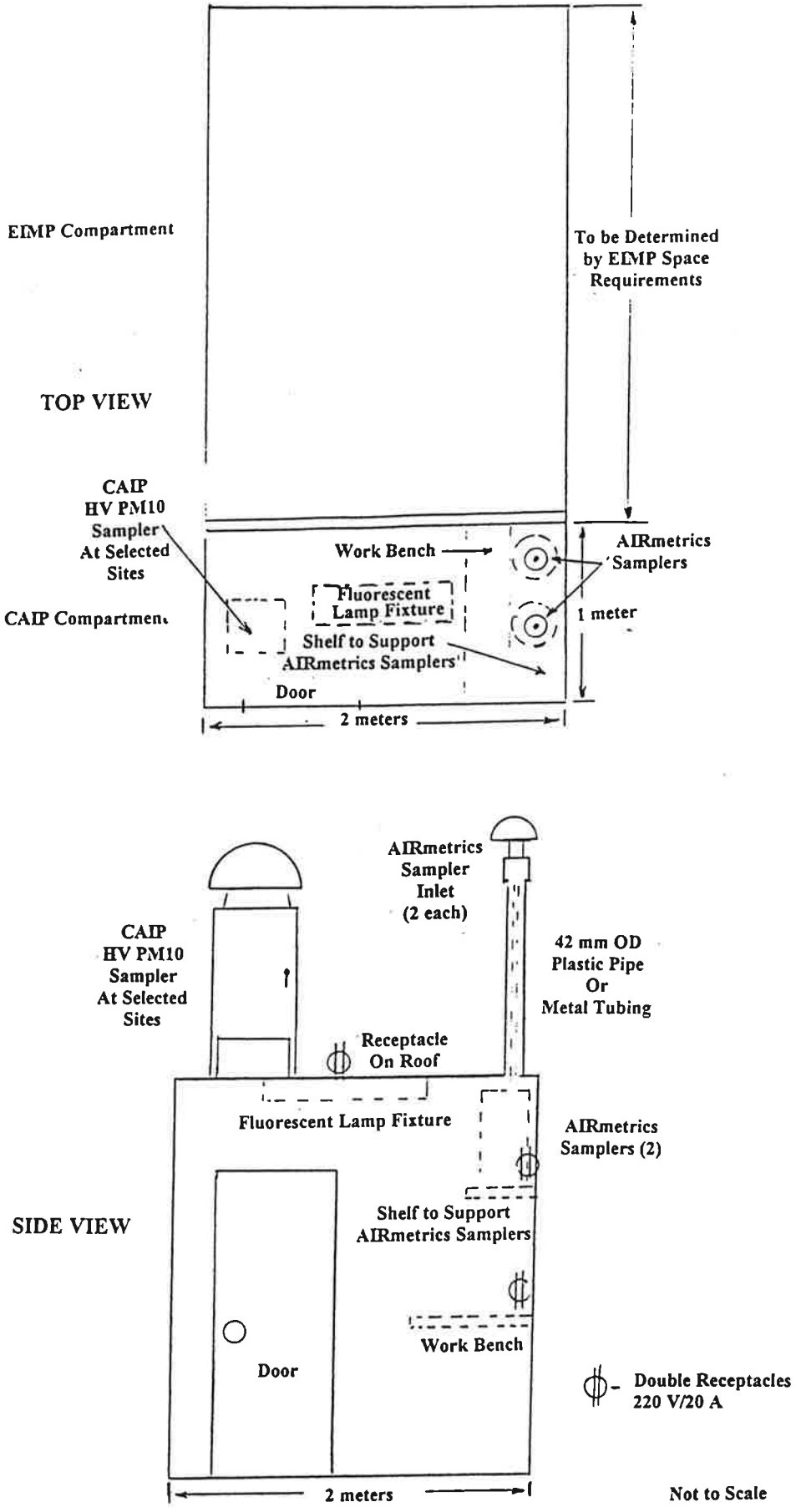
Sincerely,

Stasys V. Rastonis
Chief of Party
Cairo Air Improvement Project

Agreement Approved by: _____
Jan Hassing, Team Leader EIMP

Date 27 Febr. 1998

Cc: Dr. Mohamed El Zarka
Dr. Ahmed Gamal Abdel-Rehiem
Mohamed Nasser
James E. Howes, Jr.
Dr. Mounir Labib

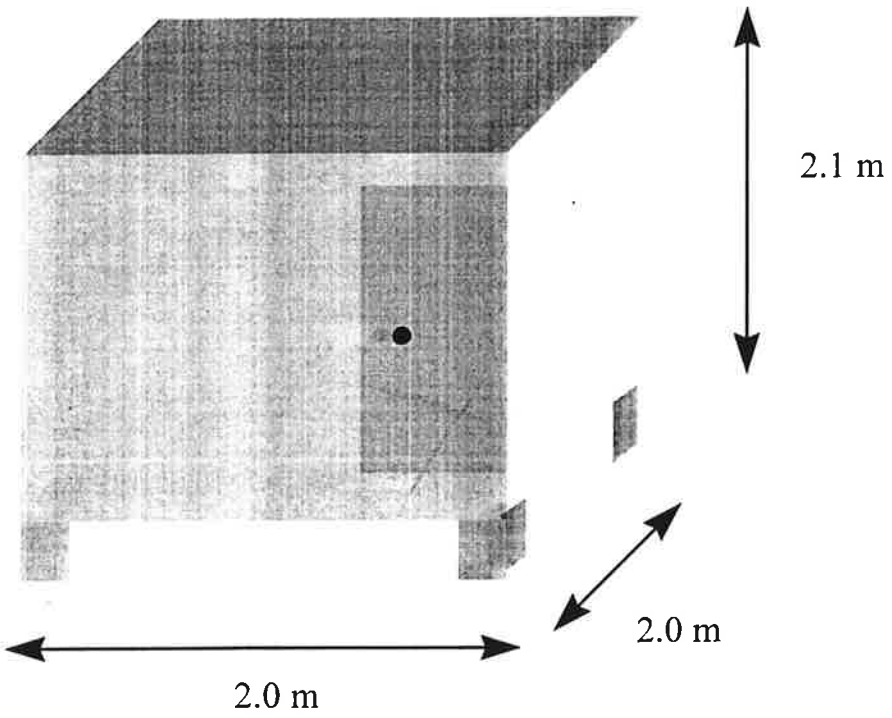


PROPOSED JOINT EIMP/CAIP SHELTER DESIGN

EIMP Shelter Design : -

L= 2 m. W=2 m. H= 2.1 m.
Double Receptacles 220 V./ 20 A
All The Walls Made From 2 mm Steel Painted White Outside And 18 mm Wood Inside
With At least 20 mm Isolation Between
Unit Price = 10000 LE

The Price Increase OR Decrease According To The Shelter Space



Approved
9/3

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EIMP Air Pollution Monitoring Component

EEAA has contracted Environmental Hazard Mitigation Centre (EHMC)at Cairo University as a central monitoring laboratory to cover Greater Cairo ,Canal Zone and Upper EGYPT And Institute of Graduate Studies and Research at Alex. Un. (IGSR) to cover Alexandria and Delta .

A Total of 39 Station are planned on a National basis these are distributed within Grater Cairo (12) Canal Zone (3) Upper Egypt (9) Sinai (1) Delta (8) and Alexandria (6).

Cairo Un. contract singed on 30 July 1997 ,Started on 1 Sep. 1997 and finalised on 31 December 1998 With a value of 287507 LE == 57501 LE paid in advance .
Alex. Un. Contract singed and finalised at the same time with a value of 126500 LE == 25300 LE paid in advance

Three Station in Cairo have been stalled and the staff at Cairo Un. Trained on operation and calibration and the first station at Alex. Will start on12 March

The First Quarterly Air Quality Progress Report have been received

EIMP G.3.1.b.

Note

Subject: **Air Quality Monitoring**

Date: May 1998

To: Mohammed Nassar

Copy: LM, MCA

From: B Sivertsen

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6442
Fax: +202 525 6467

E-mail: eimp@intouch.com

Tasks to be undertaken during the Summer 1998 by the Air Quality Monitoring EEAA counterpart

Several tasks will have to be undertaken by the Task Manager counterpart, M Nassar during May-August 1998. These tasks will serve as a preparation of further installations of air quality monitoring and sampling instruments in Egypt to be undertaken from 1 September 1998.

1. Final clarifications/agreements with the Meteorological Authorities concerning use of their site as one of the EIMP/EEAA monitoring stations, and also a possible future agreement concerning co-operation. (ref: Ahmed A. El Seoud)

2. Shelters have to be prepared for a number of sites; Maadi, Tebbin South, Fum ElKhalig, , ElMax, El-Azafra, Gheat El-Enab, Abu Keir.

3. Gomhoriya station has to be prepared with AirCon, and instruments moved and re-calibrated (support by CTS)

4. The following sites will have to be prepared in the Greater Cairo area (in priority sequence): Maadi, Tebbin South, Fum El Khalig, Nasr City, 10 Ramadan City, 6 October City, Meteorological Authority, Abu Zabel.

5. The following sites have to be prepared in Alexandria:, NIOF, Abu Keir College, ElMax, ElAzafra-ElAzhar Univ., Gheat El-Inab.

6. Follow up ordering and installations of telephone lines.

7. Take out filters for High Volume samplers and distribute to CEHM and follow up High Volume sampling undertaken by CEHM personnel.

8. Prepare equipment for balance for filter gravimetric analyses at CEHM.

9. Undertake passive sampling where necessary using the remaining passive samplers.

10. Follow up operations and prepare reports at EEAA.

11. Prepare Diary as input to monthly status report for EIMP. (to be delivered to Morten at the beginning of the month).

12. To Alexandria: N2 gas, printer, PM_{10} display (bring Ali to check PM_{10})

13. Follow up purchase of GPS (geopositioning) for Air Component

14. Report to Task Manager at NILU on development.

G.3.2 Installations

EIMP Air Quality Monitoring Programme
Location of instruments

				Monitors							Samplers							
	Site name	Area type		SO2	NOx	PM	HC	O3	CO	Met	PM	TSP	VOC	SO2	NO2	2F	PS	DF
	Cairo																	
1	Cairo city El Qualaly	Urban centre	S	1	1	1						1	1					
2	El Gemhoroya street	Street canyon		1	1		1	1	1							1		
3	Meteorological Inst	Urban / Res.		1				1		1								
4	Nasr City	Residential									1			1	1			
5	Maadi(police station)	Residential	S	1	1	1												
6	Tabbin	Industrial		1	1	1				1		1						1
7	Tabbin south	Industrial	Sc									1	1	1				1
8	Fum Al-Khalig	Road side/urban	Sc	1	1		1		1		1							
9	Abu Zabel	Industry/res															2	1
10	Shoubra el Kheima.	Industrial		1								1	1		1	1		1
11	Giza, Cairo University	Residential		1	1			1		1								
12	Gizapyramid	Regional															2	
13	6 October	Res/industrial									1			1	1			
14	10 Ramadan	Res/industrial									1			1			2	1
	Canal area																	
15	Suez	industrial/res.	S	1	1							1						1
16	Port Said	Residential														1	2	
17	Ismailia	residential														1	2	
	Upper Egypt																	
18	El Fayum	urban															2	1
19	El Minya	Res./ Industrial														1	2	1
20	Assyut 1	industrial/ res.	S	1	1	1				1								
21	Assyut 2	residential/urban															2	1
22	Naga Hammadi	industrial/res														1		1
23	Luxor	urban/residential												1			2	1
24	Edfu	Industry/urban.												1			2	1
25	Kom Ombo	industrial														1	2	
26	Aswan	urban/residential.		1				1		1							1	1
	Sinai Area																	
27	Sharm ElSheik	background						1								1		1
	Number of instruments *(this page)*			11	8	4	2	5	2	5	4	5	3	6	3	8	23	14

EIMP Air Quality Monitoring Programme
Location of instruments

			Monitors							Samplers							
Site name	Area type		SO2	NOx	PM	HC	O3	CO	Met	PM	TSP	VOC	SO2	NO2	2F	PS	DF
Alexandria																	
28 Abu Keir College	Industrial		1	1						1							1
29 El-Max Petrogas	Industrial	ss								1		1	1	1			1
30 IGSR, Alex University	Urban/road side	S	1	1	1	1		1	1								
31 El-Azafra-El Azhar Un	Residential	ss											1	1	1		
32 Gheat El-Inab school	Residential	ss								1			1	1			
33 NIOF	outside city						1										
Delta Area																	
34 Damanhur	industrial/res	ss											1		1	1	1
35 Kafr el Zayet	industrial/res	S	1	1	1												1
36 Tanta	urban												1		1		
37 ElMahalla El Kubra	industrial/res.	S	1		1												1
38 El Mansura	industrial/res.	S	1	1					1			1					1
39 Domyat	resid									1			1				1
Instr. Alex+Delta			5	4	3	1	1	1	2	4	0	2	6	3	3	1	7
Instr Cairo+C+UE+S			11	8	4	2	5	2	5	4	5	3	6	3	8	23	14
Instr. at Ref Lab			1	1		1	1	1									
Instr. at Mon Lab			1	1		1		1									
Instr. at other institutions			1	1			2		1								
Backup instr.			1	1	1		1		1	1		1	1	1	1		1
Number of instruments needed			18	14	8	5	6	5	7	9	5	6	13	7	12	24	22
Instrum ordered			18	14	9	5	7	5	7	10	5		*13*	*7*	*12*		*22*

S = shelter; (2.1m x 2.1m x 2.1 m)
Sc=shelter (joined with CAIP) (2.1mx3.0m.2.1m)
ss =shelter for samplers (1.5mx1.5mx2.1m)

b)

EIMP Air Quality Monitoring Programme

Time schedule for installations

Site name		N	D	1998 (month) J	F	M	A	M	J	J	A	S	O	N	D	1999 (month) J	F	M	A	M	J	J	A	S	O	N
Cairo																										
1 Cairo city El Qualaly.	S							m																		
2 El Gemhoroya street				m																						
3 Meteorological Inst															m											
4 Nasr City												s														
5 Maadi(police station)	S												m													
6 Tabbin		m																								
7 Tabbin south	Sc											s														
8 Fum El Khalig	Sc											m														
9 Abu Zabel													s													
10 Shoubra el Kheima.							m																			
11 Giza, Cairo University.		m			m																					
12 Gizapyramid							p							p												
13 6 October														s												
14 10 Ramadan													s													
Canal area																										
15 Suez	S															m										
16 Port Said															s											
17 Ismailia															s											
Upper Egypt																										
18 El Fayum																s										
19 El Minya																	s									
20 Assyut 1	S																			m						
21 Assyut 2																		s								
22 Naga Hammadi																				s						
23 Luxor							p							p					s							
24 Edfu							p							p					s							
25 Kom Ombo							p							p						s						
26 Aswan							p							p						m						
Sinai Area																										
27 Sharm ElSheik							p										m									

EIMP Air Quality Monitoring Programme

Time plan for installations

				1998												1999										
Site name		**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**
Alexandria																										
28 Abu Keir College														m												
29 El-Max Petrogas	ss													s												
30 IGSR, Alex University	S				m																					
31 El-Azafra-El Azhar Univer	ss													s												
32 Gheat El-Inab school	ss													s												
33 NIOF												m														
Delta Area																										
34 Damanhur	ss															s										
35 Kafr el Zayet	S															m										
36 Tanta																	s									
37 ElMahalla El Kubra	S																m									
38 El Mansura	S																	m								
39 Domyat																		s								
Instr. at Ref Lab		m	m																							
Instr. at Mon Lab		m																								

m = monitoring station (monitors)
s = sampling station
p = passive sampling

S = shelter (2.1m x 2.1m x 2,1 m)
ss = sampler shelter (1,5 m x 1,5m x 2 m)
Sc = shelter joint CAIP (2.1mx3.0mx2.1m)

	y:1998				y:1999							
Numbers of sites to install	S	O	N	D	J	F	M	A	M	J	J	A
Monitoring station	2	1	1	1	1	2	1	1	1	1		
Sampling station	2	2	4	1	1	2	2	2	1	1		

G 3.2.6

EIMP

Work Summary - installation phase

Giza - CU (Cairo University)

Brief summaries of progress and events during the Mission 8 period (installation phase) at Giza - Cairo University is presented below.

98.03.23 Went to the Cairo University station to calibrate the SO2 and NOx monitors. CTS had installed a tiny German to Egyptian 220 V plug converter to connect the complete instrumentation to a single 220 V wall socket. The converter plug was melting. The instrumentation was turned off and Yasin at the University was asked to fix a better connection.

98.03.31 Calibrated SO2 and NOx monitor at the Cairo University station.

SO2 monitor response had fallen approx. 10%. Not bad.

The NOx monitor showed 0.0 response! A check in the data showed that the monitor has not been working since CTS installed it in January.

The intake manifold to monitor tubes was not fixed at the connection inside the cabinet. The tubes were only pushed into the nuts but the ferrules were loose. The monitors have probably measured a mix of ambient air and cabinet air.

The intake manifold was dismantled and brought to the lab for cleaning. The intake tube is mounted horizontally. Dust blows into the intake. It must be bent down to a vertical position.

98.04.01 CAIP (Cairo Air Improvement Project) visited Cairo University. They visited the Computer centre, Monitoring lab and Met. tower.

The PM10 monitor inside the lab. had reported 0.0 $\mu g/m^3$ since start-up yesterday. It was found that the tube from the monitor to the pump had been folded and squeezed together with a piece of thread. CTS reported back that this was only temporary and that they would install a permanent restriction inside the tube to adjust the flow. According to CTS this method has been approved by Thermo.

EIMP

Work Summary - installation phase

IGSR Alexandria

Brief summaries of progress and events during the Mission 8 period (installation phase) at IGSR Alexandria University is presented below.

98.02.10 Prepared instrumentation at Tabbin for transfer to Ref.lab.

98.02.12 Transfer of instruments for IGSR and NIOF stations from Tabbin to Ref. lab. for calibration and test installation.

98.02.21 Calibrated SO2 and NOx monitors.

The SO2 and NO working gas cylinders were calibrated.

98.03.02 CTS supplied the regulator for the N2 carrier gas cylinder. The HC monitor was started successfully. It was left for warm up and will be calibrated on Wednesday 4 March.

The CO monitor refused to pass the self test when turned on. It will be returned to Tabbin tomorrow. The CO alarm is still not installed by CTS.

98.03.03 The CO monitor was returned to Tabbin. The storage at the top floor was sorted. Instruments of the same kind stored together.

98.03.08 The HC monitor for IGSR was calibrated OK.

The IGSR and Ref.lab. CO monitors were calibrated OK. The CO alarm is still not installed by CTS.

98.03.12 IGSR installation, trip 1. All equipment for the IGSR station except for the Met. sensors were transported to Alexandria.

98.03.13 All equipment was installed in the racks.

98.03.14 The holes through the roof for the gas monitor and PM10 monitor intakes and the hole through the wall for the CO span gas tube was made by workers from IGSR.

Installed the glass manifold, air intake and solenoid valves. Completed the Teflon tube and electrical connections. Started the SO2, NOx and CO monitors.

98.03.15 Started zero and span calibration of the SO2 and NOx monitors. The TEI 145 was calibrated.

98.03.16 The CO span gas cylinder was fixed on the outside wall of the station.

A box was made to lift the PM10 sampler closer to the ceiling. The PM10 intake was fixed to the monitor. The hole in the roof for the intake was closed with silicon.

The station is not water proof. Rain was dripping in everywhere. Silicon was added around the air condition. More silicon is necessary.

The PM10 monitor will not start according to schedule. The monitor was left off. CTS will be contacted.

The HC monitor was left off. There was no time to start it.

98.03.25 - 98.03.28 IGSR installation, trip 2. BS, MN and LM visited IGSR, Alexandria.

The data logger has stopped every night during automatic zero/ span check. The reason was that the O3 parameter was defined in the calibration sequence table but not in the initialisation table. The system does not check for consistency in the selections which means that illegal combination of selections are possible resulting in system hang up. The problem was solved and the system tested OK.

The H2 generator and N2 cylinder were connected to the HC monitor. The HC monitor was started.

98.03.27 The zero air pressure indicator on the TEI 102S-2 calibrator is not working. It is stuck at 3 psi.

It is not possible to get a good zero reading during zero/ span check on the CO and HC monitors. The temperature on the CO converter was increased from 345 to 450 degrees Celsius and an active charcoal filter inserted after the compressor. No change.

The HC monitor reports 0.00 Methane and 0.32 ppm NMHC.

The CO monitor reports 1.485 ppm.

The detection limit for the HC monitor is 0.050 ppm and the accuracy 2% (0.4 ppm) of full scale (20 ppm). The Methane reading is 0.00 but the NMHC reading is 0.32 ppm which is too high. Increased the carrier pressure from 38.8 psi (factory setting) to 43.4. The zero reading dropped to 0.23 ppm. Decreasing the carrier pressure below 38.8 caused an increase in the zero reading. Removing the charcoal filter and setting carrier pressure to 43 resulted in a 0.19 ppm zero reading. An increase in carrier pressure to 46 resulted in an unstable flame (flame out). Carrier pressure set to 44 resulted in a 0.18 ppm zero reading. The increased carrier pressure resulted in a permanent 0 ppm methane reading, regardless of input concentration. Carrier pressure left at 38.8 psi. Tried to dry the H2 with silica gel but the H2 generator reported massive leak, Maby silica gel canister too big - sudden pressure drop.

The CO monitor reports 1.485 ppm when measuring zero air from the CO reactor. The active charcoal filter did not make any difference.

98.03.28 The data logger stopped again during automatic zero/ span check. The reason was that the O3 parameter was defined in the calibration sequence table but not in the initialisation table. The system does not check for consistency in the selections which means that illegal combination of selections are possible resulting in system hangup. The problem was solved and the system tested OK.

The people at IGSR were trained on the HC monitor.

Left for Cairo. BS moved into the flat.

98.04.19 Went to Tabbin to see how the met. sensors were fixed to the tower. Transfered to NIS new TEI 102S-2 calibrator, N2 gas cylinder, rods for mounting met. sensors for IGSR. The rods are probably at IGSR already. Borrowed permetion tube chamber from a SO2 monitor in the storage. Will be used at Shoubra.

Went to NIS and tested PM10 monitor OK.

MN went to IGSR to prepare the met. tower installation.

98.04.21 LM went to NIS to transfer the equipment to IGSR. LM went to Alexandria. Installed and started PM10 monitor, CO reactor and TEI 102S-2 calibrator. The LC display on the PM10 monitor seems to be out of order. It is difficult to read it.

98.04.22 Installed met. tower and sensors.

The extension cables should be 5 pair multithreaded with shield and the junction box should be approx. 15 by 15 cm.

The met. sensor mounting rods were not found at IGSR. Will look for them at NIS again.

98.04.23 Calibrated CO and HC monitors and their working gas standard cylinders. CO monitor deviation ????????

IGSR reported a fall in the sample pressure of the SO2 monitor from approx. 760 mm Hg to 500 mm Hg. The monitor was checked. After changing the intake filter the pressure returned to approx. 720 mm Hg which is normal. The intake filter had not been changed since three weeks. The filter was partly covered with the usual black dust from pollution but also completely covered with a layer of light brown dust probably from sand. It was probably this sand layer which clogged the filter causing the sample pressure to drop.

Installed the met. cables and data logger. The met. data logger was installed in a small room on the roof. MN had not provided proper extension signal cables. IGSR provided a two threaded cable with shield. Each thread consisted of a single hard core that broke easily. The quality/ resistance of the cable is not known. Must be changed later. The junction box provided by MN was too small and should also be changed later.

The Station manual and History log was updated with sheets for the new equipment.

The replaced PM10 monitor, CO reactor, calibrator and CO and HC travelling standard gas cylinders were shipped back to Tabbin.

EiMP

Work Summary - installation phase

Shoubra el-Kheima

Brief summaries of progress and events during the Mission 8 period (installation phase) at Shoubra El-Kheima is presented below.

98.04.05 Prepared instrumentation at Tabbin for transfere to Ref.lab.

98.04.14 Went to NIS to prepare for calibration of SO2 monitor for Shoubra. Installed SO_2 monitor in rack and made all electrical and tube connections. Tried two different data logger hardware interfaces and three different data loggers without getting correct logged values. The analog input channel was shorted out to check the zero value. But instead values between -1 and +1 Volt were reported.

The internal SO2 permeation tube chamber broke when the permeation tube was inserted. The tube slipped to fast into the chamber and broke the bottom.

98.04.15 Went to NIS to continue preparation of instrumentation. The data loggers are probably OK. The instantaneous values do vary but the 1 minute and 5 minute values are correct.

Finished the wiring and programming of the Shoubra data logger. NIS performed a dynamic calibration of the SO2 monitor. The monitor came out 30 ppb below 800 ppb before calibration. The Ref. lab. SO2 monitor measured 40 ppb below at the same level.

98.04.28 Transferred equipment for Shoubra from NIS to Shoubra. Hole for SO2 intake missing at station. The metal plate covering the manhole in the roof is not dustproof. MN suggested a rubber sealing.

98.04.29 Went to Shoubra. Installed SO2 monitor and data logger. Installed port. met. tower on the roof. Prepared fixing holes in the roof for the TSP HiVol sampler. Made hole in the roof for intake. Manhole in the roof will be sealed with cement. Entrance to the roof will be over the fence and onto the roof of the staircase. Not seccure - four floors down.

98.04.30 Went to Shoubra. Calibrated SO2 monitor together with Kamela. Power supply and battery charger for port. met. missing - could not start it. TSP HiVol fixed to the roof. 220 V power plug missing on TSP HiVol. Manhole in roof sealed with cement. New entrance over fence and roof behind staircase.

EIMP

Work Summary - installation phase

El Quolaly

Brief summaries of progress and events during the Mission 8 period (installation phase) at El Quolaly, central Cairo is presented below.

98.05.03 Went to Tebbin together with Yassin and Mohammed to assemble equipment for the Quolaly station. Equipment transfered to NIS. NIS people started NOx and SO2 monitors.

Air condition at Tebbin not working. Very hot inside station. Temperature alarm on NOx monitor.

98.05.04 Went to NIS with Yassin. Yassin assembled the rack. NIS started calibration of SO2 monitor. High zero level (105 ppb). Assembled the data logger and electrical connections. CTS notified.

98.05.05 SO2 monitor returned to Tebbin and a new one picked up. Transefered to NIS and started. NIS calibrated NOx monitor.

Went to Tebbin to change the wind direction averaging method from usual arithmetic to Scalar WS. The wrong averaging method chosen by CTS caused the data logger to record no wind from north-north west and additional wind from south-south east. IGSR must be notified.

98.05.06 Went to NIS with Yassin. NIS calibrated SO2 monitor. Started programming of data logger. Software too old, v. 5.0. Two software versions in shipment.

98.05.07 Went to NIS with Yassin. Updated software in data logger to v. 5.3. After update the data logger reports an error in EMCCOML at startup. Tested the data logger and electrical connections. OK.

Went to Tebbin to prepare the rest of the equipment for the transfere to the new storage in Maadi.

98.05.10 Transfered equipment from NIS to Quolaly station. The PM10 monitor will was not transfered from NIS. It will be installed later when the long intakes are received. Installed the NOx and SO2 monitors and the calibrator in the rack. The shelter is not stable. The roof on which it stands was not cleared before the shelter was put in place. The roof is full of the usual rubbish.

G.3.2.d

EIMP

Fax Transmission

To	**Kontram**
Fax no.	**00358961543222**
Attention	**Jarmo Kiukaien**
No. of pages	**1** (incl. this page)

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
Fax: +202 525 6467

E-mail: eimp@intouch.com

Date
6 May 1998
Our ref.

Subject: EIMP Equipment

Please find enclosed correspondence with CTS which we should have for-warded to you directly.

Installation of equipment you delivered is under way, but you will see that not everything is going according to specifications. Malfunctions and odd deliveries represent daily problems.

There also are a number of details to be clarified with CTS, which we hope you will be able to follow up.

MR. Bjarne Sivertsen and Leif Marsteen will leave Cairo next week.

Yours sincerely,

Bjarne Sivertsen

Task Manager Air Monitoring

Fax from EIMP

Environmental Information and Monitoring Programme
EEAA Building, 30 Misr Helwan St, Maadi, Cairo, Egypt
Email: eimp@intouch.com, Tel. 202 525 6442 Fax: +202 526 6467

To: CTS, att: Dr A ElSoueini **+ 202 355 1356**

Date: 4.5.98

No pages:3

Ref: Matters to be solved by CTS

Mr L Marsteen and Mr B Sivertsen will be leaving Cairo next week. There are still several remaining problems that have been reported in earlier Faxes or by communications and in meetings, that have been summarised in the Memo attached.

There will be an Air Pollution Monitoring Staff Meeting on Sunday 10 May 1998 at 14:00 in the EIMP office. We anticipate that you will participate in this meeting, so that a time schedule for the tasks can be agreed upon.

Looking forward to seeing you next Sunday.

Yours sincerely

Morten C Andersen
Project Manager

Bjarne Sivertsen
Task Manager, EIMP Air

EIMP

Note

Subject	Status CTS and tasks for EIMP
Date	3 may 1998
To	BS
Copy	MCA, MN, Anwar
From	LM

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 5256 442
Fax: +202 5256 467

E-mail: eimp@intouch.com

As of 3 may 1998 the following matters are not solved by CTS:

CO monitor (ser. no. 57596-317): Did not pass selftest at startup - returned to Tebbin

PM_{10} monitor (ser.no 58031-315): intake tube not part of delivery, missing!

PM10 monitor (ser. no. 58033-315): Did not start automatically according to programming - returned to Tebbin

PM_{10} monitor Gomhoriya : malfunction due to pump?

PM_{10} monitor IGSR (ser.no. 58030-315): Display out of order.

CO reactor (ser. no. 58275-317): Right pressure gauge indicator not working.

Calibration of PM10 monitors: We need a complete list showing which monitors (serial numbers) have been calibrated and what kind of adjustments that have been made to them including the results.

PM10 HiVol sampler at Tebbin: It is still not fixed to the roof.

Temperature sensor Met. Tower Tebbin: Fan not working. Should be connected to 220 Volt power. Is it connected to 12 V at translator??

System/ Station Manager: We still miss the original software diskettes and last version of the manuals. Are all Station Manager data loggers at Tebbin updated?

Station Manager at Monitoring Laboratory is recording power failure (missing data!) when there are no power failure.

Air intake manifold at Tebbin: When will CTS mount it vertically?

Manifold blower at Monitoring lab: When will it be replaced?

Environment sensors at NIS: When will they be connected to the data logger?

NOx monitor at Cairo University: PMT power supply failure. Status?

SO2 monitor at Cairo University: Values not correct in data logger. Status?

Rain gauge at Cairo University: When will it be installed on the met. tower.

Portable met. tower power supply: Where is the 220 to 12 volt power supply?

FAX from Cairo

EIMP

Environmental Information and Monitoring Programme
EEAA Building, 30 Misr Helwan St, Maadi, Cairo, Egypt
Tel. +202 5256 439, Fax +202 5256 467, email eimp@intouch.com
Privat: Leif Marsteen, 10 Road 86, Maadi, Cairo, Tel. +202 351 3226, email marsteen@hotmail.com

To:	**CTS**	**Date:**	**98.05.04**
Fax:	**355 1356**		
Att:	**A. El Soueni, Aly, Esam, etc.**	**No pages:**	**1**
Copy:	**MN, BS**		
From:	**Leif Marsteen**		
Our ref:	**ey980504a-CTS**		

SUBJECT: Malfunctioning SO2 monitor

The SO2 monitor (ser. no. 57604-314) was started today at NIS. It reported a zero level of 105 ppb. The level was too high to calibrate. The span response was 800 ppb at 817 ppb. The factory set calibration factors are SO2 bkg = 28.2 ppb, SO2 coef = 1.000 which is normal. The monitor will be returned to Tabbin tomorrow. Will you please look into it.

Best regards.

Leif Marsteen

EIMP

Note

Subject	Upgrade of Station Manager
Date	6 may 1998
To	BS
Copy	MN
From	LM

Environmental Information and Monitoring Programme

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30 Misr-Helwan Street
Maadi, Cairo, Egypt

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In a meeting with CTS and EMC on 8 April 1998 CTS agreed to upgrade all data logger PCs to the latest version of Station Manager. Still some of the PCs at the storage in Tabbin have not been upgraded.

All data loggers delivered by Kontram do not have the same software version installed. The oldest version we have found so far which has not yet been upgraded by CTS is 5.00. This version is not compatible with the setups of later versions.

Because of this incompatibility and CTS' failure to upgrade the software as promissed the installation of the Kolaly station may be delayed until September. This will cause a loss of 4 months data.

G.3.2.a

EIMP

Note

Subject: **Air Quality Monitoring**

Date: May 1998

To: Morten C Andersen

Copy: LM, MN

From: B Sivertsen

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

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Tasks to consider Spring/Summer 1998

(Air Quality Monitoring)

Several decisions have to be taken during the Spring/Summer 1998 concerning the further development of the EIMP air pollution monitoring programme.

1. A System Manager has to be ordered for IGSR in Alexandria. See attached Memo.

2. Precipitation monitor, similar to the one at Cairo University has to be ordered for IGSR in Alexandria. Anwar has to check specifications at CEHM, or from A ElSoueini. If any problems contact BS at NILU.

3. Station Managers break down after short power failures could be avoided with inexpensive APC equipment. (300 W?). Two systems (for CEHM and IGSR) should be ordered.

4. A GPS (geopostioning) system for Air Component has to ordered. The only one originally bought for EIMP was for air. It was borrowed by Coastal Water and disappeared!

5. A data base and data handling/presentation tool has to be considered, discussed and ordered before 1 August 1998. This has to be installed during first half of 1999.

6. CEHM wants a bager to communicate with the service personnel at stations. (Dr ElAraby will by from his own pocket a mobile phone to be used at the othe end.). The request is relevant and should be considered. Price?

7. A fax machine and a color printer has also been requested from CEHM. The fax is supposed to be part of the delivery, however, I would put priority on the color printer.

8. Final clarifications/agreements with the Meteorological Authorities concerning use of their site as one of the EIMP/EEAA monitoring stations, and also a possible future agreement concerning co-operation. (ref: Ahmed A. El Seoud)

9. Shelters have to be ordered and prepared for a number of sites; Maadi, Tebbin South, Fum ElKhalig, ElMax, El-Azafra, Gheat El-Enab, Abu Keir.

10. The following sites will have to be prepared in the Greater Cairo area (in priority sequence): Maadi, Tebbin South, Fum El Khalig, Nasr City, 10 Ramadan City, 6 October City, Meteorological Authority, Abu Zabel.

11. The following sites have to be prepared in Alexandria: Abu Keir College, NIOF, ElMax, ElAzafra-ElAzhar Univ., Gheat El-Inab.

12. For the operations of monitors (to facilitate the filling procedure of gas) two extra gas bottles has to be purchased.

The last 5 items is also followed up by Dr Nassar, as stated in the Memo concerning tasks to be undertaken by the Air Quality counterpart.

1.

Appendix G.5.2 Data presentation

a) Maximum limits for outdoor air pollutants
b) Daily meteorological report as presented at CEHM
c) Air quality in Egypt, a brief discussion of the first EIMP data
d) Air pollution (SO_2) for Tabbin 1-17 April 1998

9)

ANNEX 5

MAXIMUM LIMITS OF OUTDOOR AIR POLLUTANTS (micrograms/ m^3)

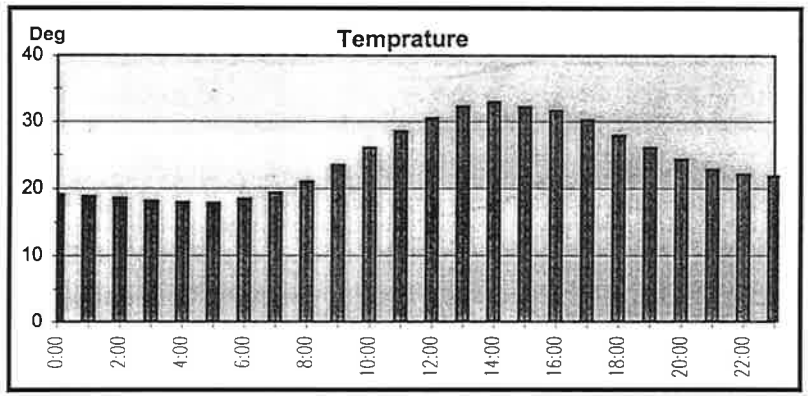
POLLUTANT	MAXIMUM LIMIT	EXPOSURE PERIOD
Sulfur Dioxide	350	1 hr
	150	24 hrs
	60	1 year
Carbon Monoxide	30 mg/m^3	1 hr
	10 mg/m^3	8 hrs
Nitrogen Dioxide	400	1 hr
	150	24 hrs
Ozone	200	1 hr
	120	8 hrs
Suspended Particulates	150	24 hrs
(To be measured as black smoke)	60	1 yr
Total Suspended Particulates	230	24 hrs
	90	1 yr
Thoracic Particles (PM 10)	70	24 hrs
Lead	1	1 yr

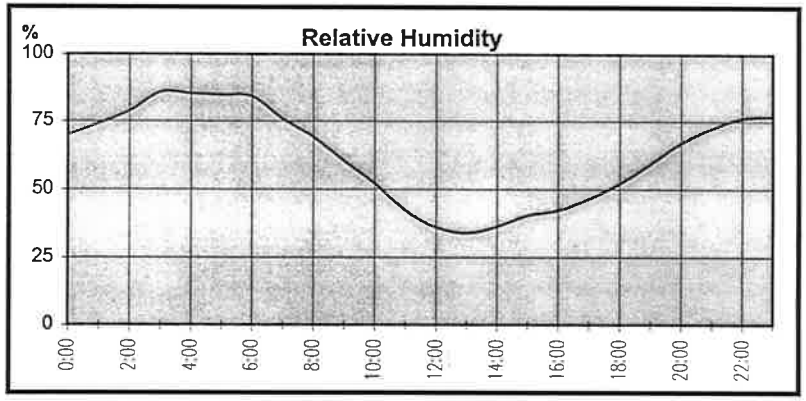
10 Apr 1998

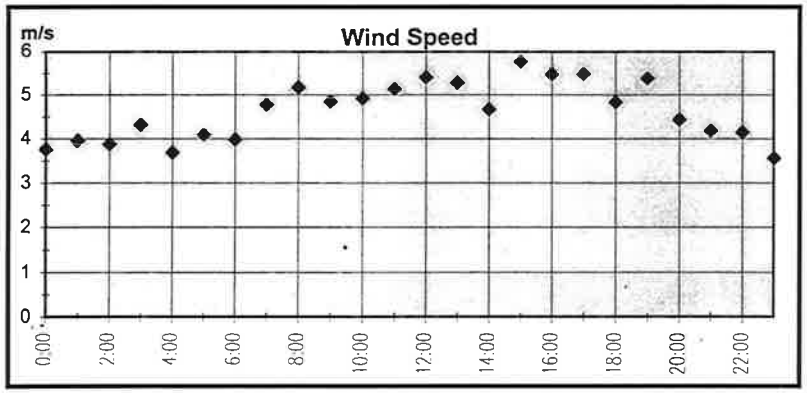
Meteorological Data

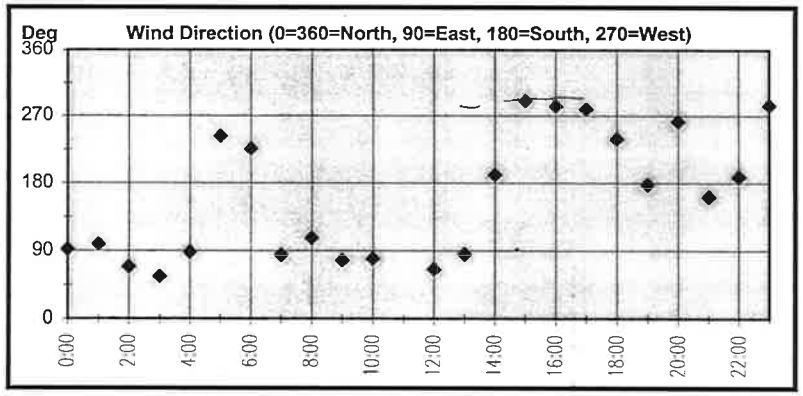
	Temperature (Deg)	Time	Relative Humidity (%)	Time	Wind Speed m/s	Time	Net Radiation W/m2	Time	Barometric Pressure mmHg	Time
Minimum	17.8	500	34.0	1300	3.6	2300	-31.3	1900	759.6	400
Maximum	33.0	1400	85.9	300	5.8	1500	415.5	1200	764.3	1200
24 hour Average	24.2		62.6		4.6		118.6		761.8	

Dominant Wind Direction from East ±45°









Cairo University

Hazard Mitigation Center

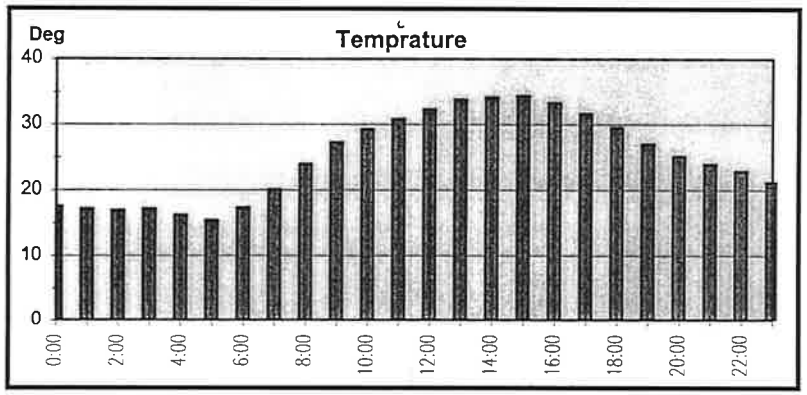
b.

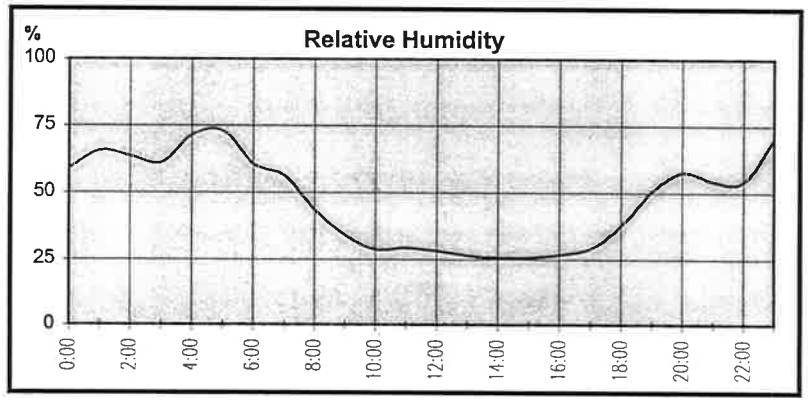
10 Apr 1998Tabbin

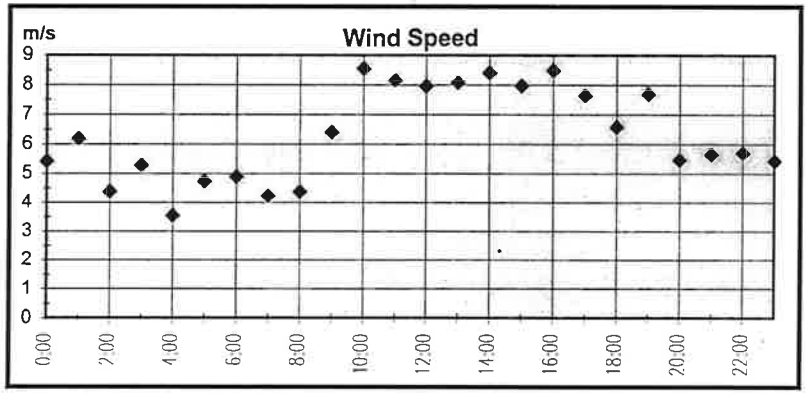
Meteorological Data

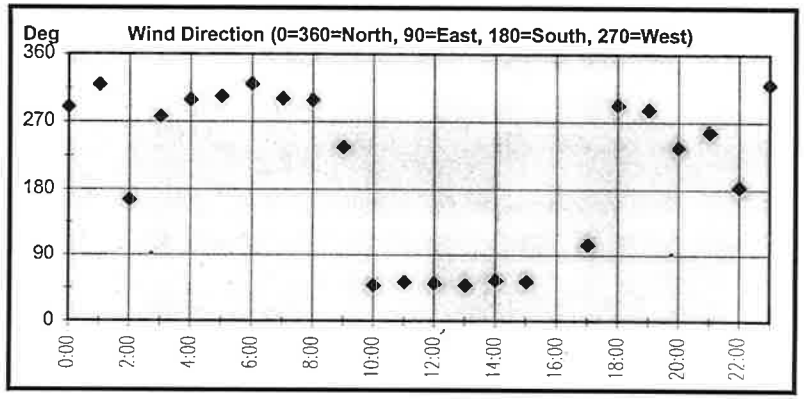
	Temperature (Deg)	Time	Relative Humidity (%)	Time	Wind Speed m/s	Time	Net Radiation W/m2	Time	Barometric Pressure mmHg	Time
Minimum	15.4	500	25.7	2900	3.5	400	0.0	27600	0.0	27600
Maximum	34.4	1500	73.0	500	8.6	1000	0.0	27600	0.0	27600
24 hour Average	24.9		47.2		6.3		#DIV/0!		#DIV/0!	

Dominant Wind Direction from West ± ٩٥°









EIMP

Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Air quality in Egypt

A brief discussion of the first EIMP air quality data

Bjarne Sivertsen, Task Manager, air pollution monitoring

Introduction

This memo briefly discuss some of the first results of the air quality data collected by the EIMP programme. Details concerning instruments, site selections, representativity, data handling etc. can be found in the EIMP Air Pollution Monitoring component Mission reports 1-7.

The first monitoring station was opened at the end of October 1997 at Tabbin. During the end of 1997 two more stations; at Gemoroya street in Central Cairo and at Cairo University started measuring selected air quality indicators. Samples have also been collected using simple passive samplers located at several sites in the greater Cairo area. During the first week of March 1998 the first complete monitoring site in Alexandria was set in operation.

SO_2 and NO_2 concentrations in Cairo (passive sampling)

Results from passive sampling of SO_2 and NO_2 is presented in the attached Memo from NILU OR 1/98.
From the SO_2 sampling in Cairo it can be seen that the highest SO_2 concentrations during the period was found in downtown Cairo, around Garden City. Weekly average concentrations of more than 200 $\mu g/m^3$ can be expected in central parts of Cairo. This was also supported by a weekly average of 258 $\mu g/m^3$ SO_2 measured in the Ramses square area. High concentrations are also extending into Shoubra and Shoubra El-Kheima, where we found concentrations of SO_2 around 150 $\mu g/m^3$. The Egyptian Law of 150 $\mu g/m^3$ as a 24 h average have been exceeded in large parts of Cairo.

Gomhoriya street

The monitoring site in Gomhoriya street is representative for a typical downtown street canyon of Cairo. Figure 2 (attached) show a typical concentration distribution with time, indicating large diurnal variations in concentrations of SO_2 , NO_2 , PM_{10} and CO . The highest concentration of all parameters occurred during the morning rush hours at around 0900 hrs.
The morning hours of 3 and 5 February 1998, with low variable winds, show that maximum one hour average concentrations of SO_2 and NO_2 are around 200 to 250 $\mu g/m^3$. The 24 h average concentrations varied between 20 and 105 $\mu g/m^3$. The daily

averages of PM_{10} varied between 150 and 420 $\mu g/m^3$. The main source of these pollutants are the traffic in the street, which is supported by the fact that CO concentrations were recorded at 20 mg/m^3 .

From these very preliminary results from Gomhoriya street, it can be seen that:

- SO_2 concentrations due to the use of diesel in buses, may approach, and even in some special conditions, exceed the air quality standards of Egypt,
- NO_2 concentrations also may approach the standards, but have not exceeded them so far,
- the CO standards of 10 mg/m3 as an 8h-average are exceeded frequently in the streets,
- the PM_{10} concentrations are frequently exceeding the air quality standards, in some cases with more than a factor of 5.

The Helwan area (Tabbin)

The air quality in the Helwan area was studied in details in 1991-92 as part of a World Bank project. It was already at that time concluded that suspended particles and dust was the main air pollution problem in the region, and that SO_2 and NO_2 concentrations were low compared to international air quality standards and guidelines. The main source for the dust is the cement industries in the area. Also the steel and iron factory together with the small smelters contributes to the smallest particles (PM_{10} and $PM_{2,5}$).

High concentrations of toxic elements (such as Pb, Zn, Mn and Cr) were also found downwind from some of the smelter areas in the region.

The first data from the EIMP monitoring programme, based upon measurements from our site at Tabbin Institute, support the fact that suspended dust (PM_{10}) is a major air pollution problem in the area. An example taken from the week 26 Nov to 5 Dec 1997 (see Figure 2 attached) show 1h-average PM_{10} concentrations ranging from 10 to more than 1500 $\mu g/m^3$. Also data taken from 17 to 19 October (Figure 3) show that the PM_{10} concentrations can reach daily average concentrations of more than 400 $\mu g/m^3$, which is 6 times the air quality standard value for Egypt.

SO_2 concentrations have in some cases, when it was blowing from south (from the iron and steel factories in Tabbin), reached 150 $\mu g/m^3$ as 1h-averages. We recorded on 11 March 1998 (in a similar situation) 250 $\mu g/m^3$. Figure 4 show the SO_2 concentrations as a function of wind directions. These data collected from 28 Nov to 4 Dec 1997 reconfirm that the highest SO_2 concentrations are recorded with winds blowing from around south, and in one case from north-west. The latter may reflect emissions from a brick factory.

The daily averages of SO_2 have not exceeded the air quality standards, even if the impact downwind from the smelter areas occasionally is expected to approach the standards. A new monitoring station to be located south of Tabbin at the end of 1998, may confirm these assumptions.

NO_2 concentrations typically range between 10 and 40 $\mu g/m^3$ as daily averages. The air quality standards of NO_2 for Egypt have not been exceeded.

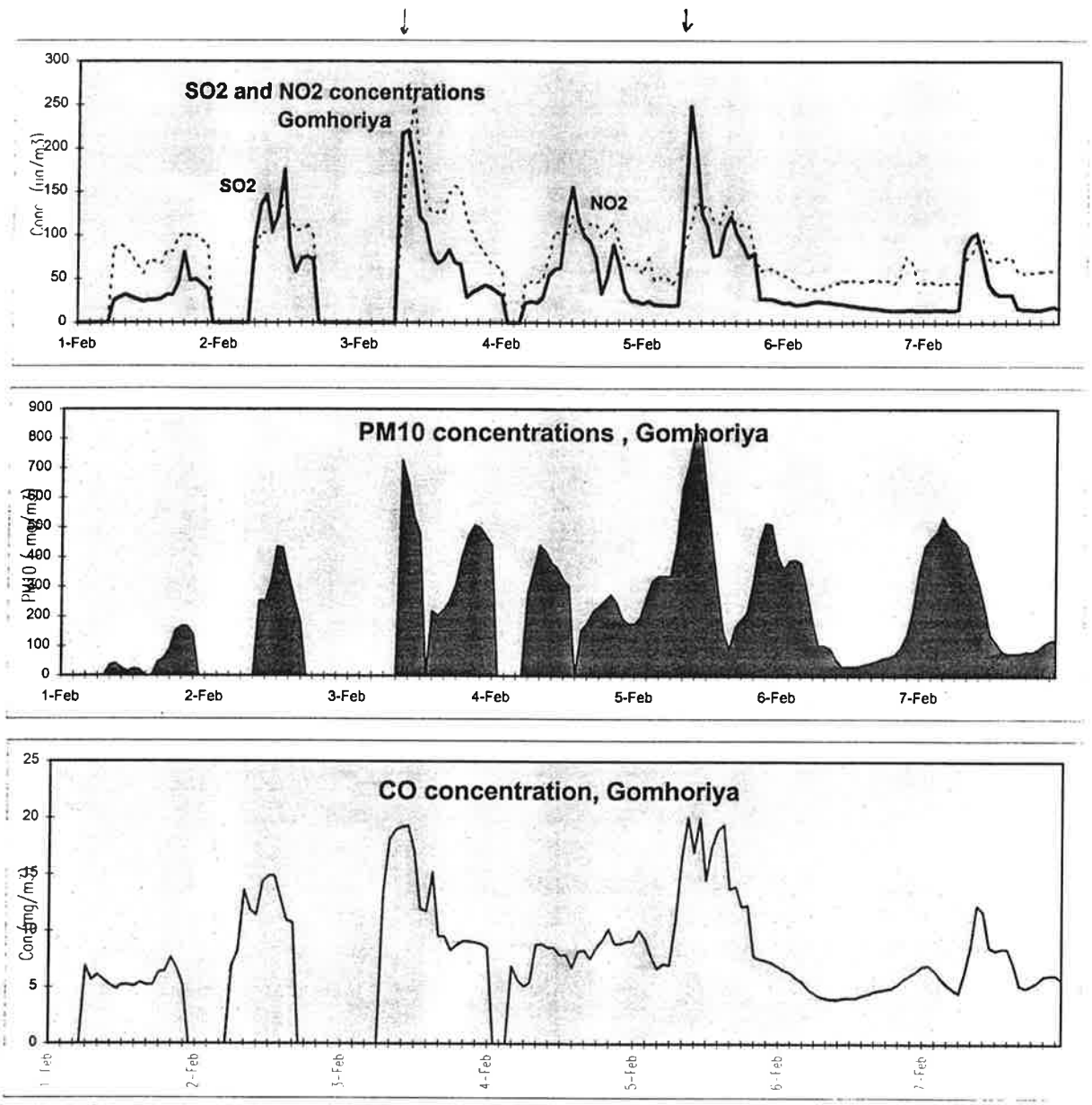
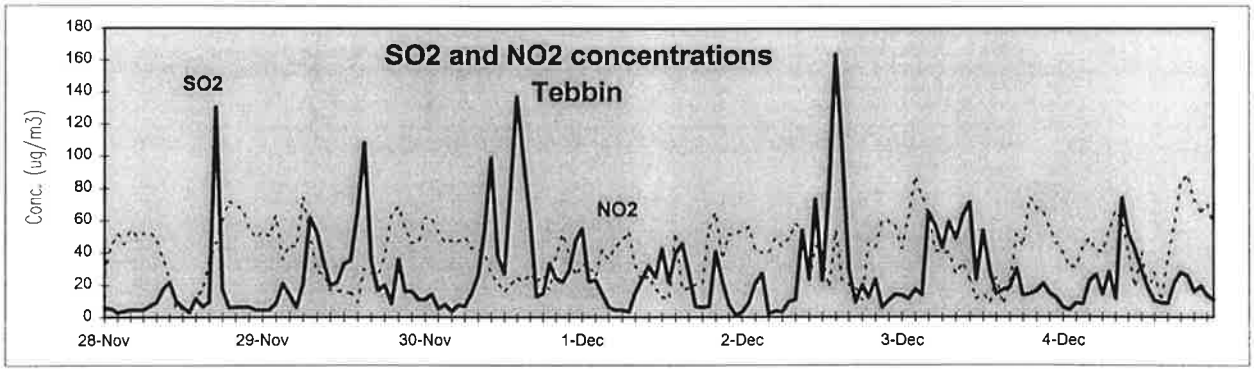
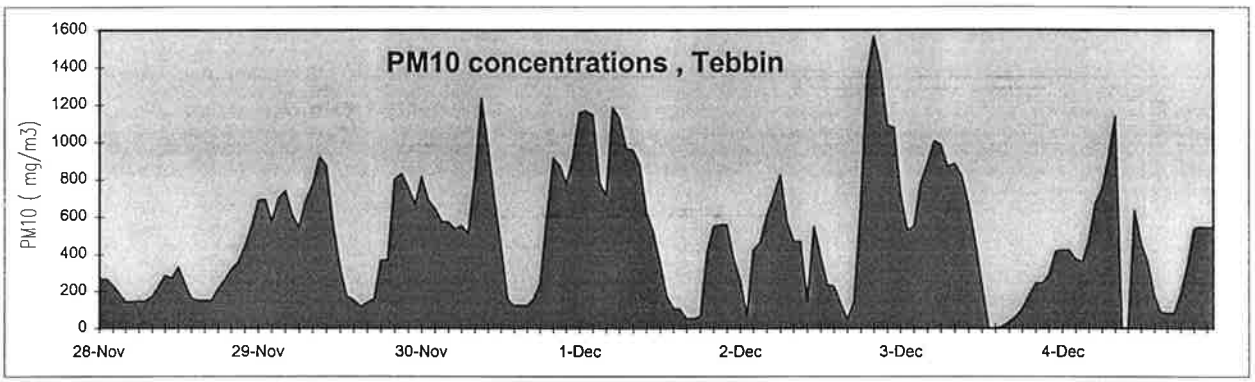
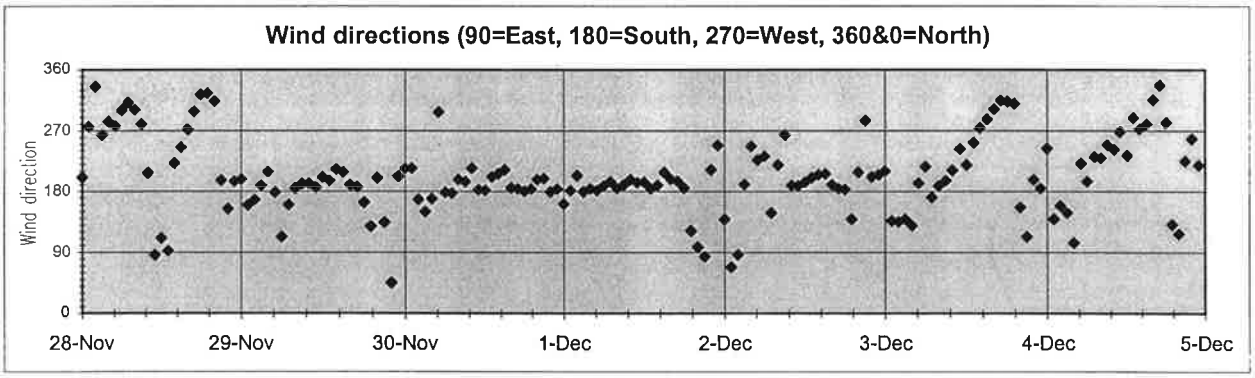
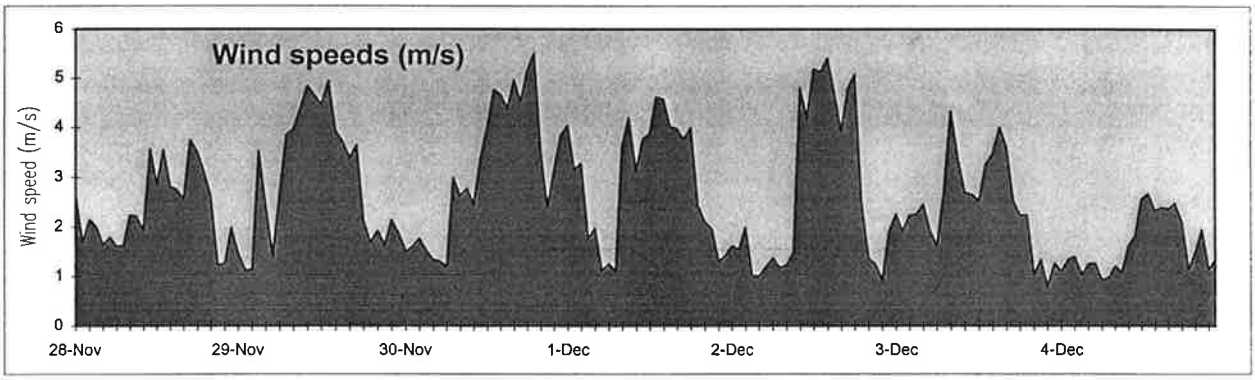

SO2 and NO2 concentrations
Gomhoriya
SO2
NO2
Conc (µg/m3)
300
250
200
150
100
50
0
1-Feb
2-Feb
3-Feb
4-Feb
5-Feb
6-Feb
7-Feb
PM10 concentrations , Gomhoriya
PM10 (mg/m3)
900
800
700
600
500
400
300
200
100
0
1-Feb
2-Feb
3-Feb
4-Feb
5-Feb
6-Feb
7-Feb
CO concentration, Gomhoriya
Conc(mg/m3)
25
20
15
10
5
0
1-Feb
2-Feb
3-Feb
4-Feb
5-Feb
6-Feb
7-Feb

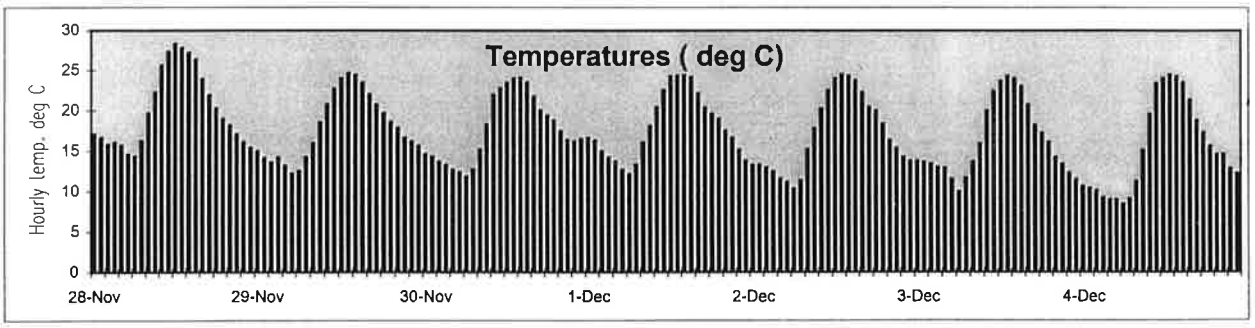
FIGURE 1.











Tebbin Station

FIGURE 2

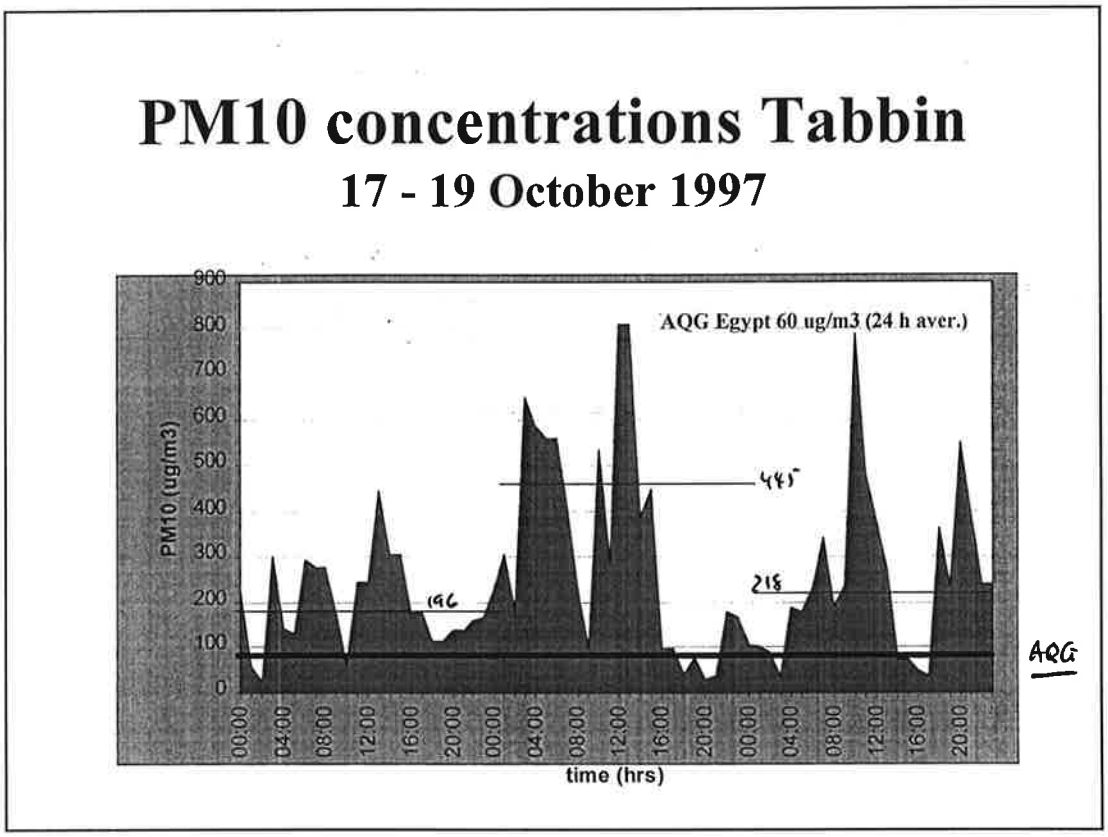

PM10 concentrations Tabbin
17 - 19 October 1997
AQG Egypt 60 ug/m3 (24 h aver.)
PM10 (ug/m3)
900
800
700
600
500
400
300
200
100
0
196
445
218
AQG
00:00
04:00
08:00
12:00
16:00
20:00
time (hrs)

FIGURE 3.

26 Nov - 4 Dec. 1997

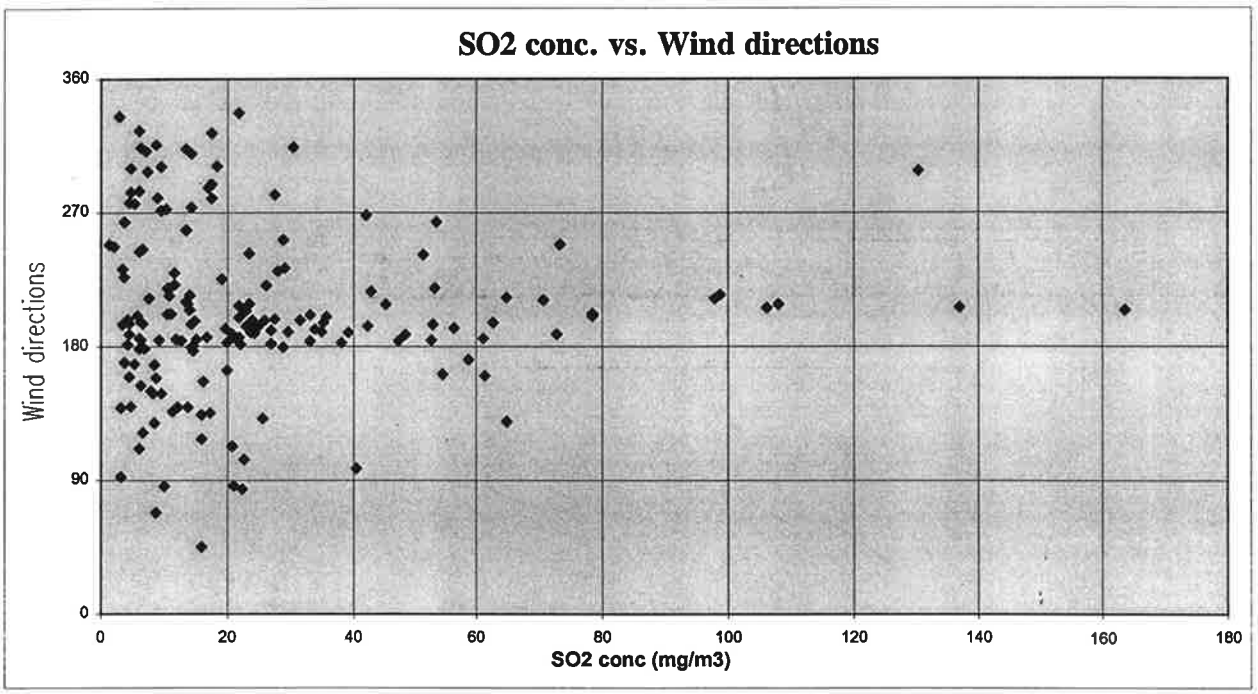


Figure 4

EIMP

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Memo

Air Quality Sampling in Shoubra El-Kheima area September 1997

Bjarne Sivertsen, Mohamed Nassar EEAA/EIMP

Introduction

Simple integrated samples of SO_2 and NO_2 have been collected using passive samplers in the Cairo area during two separate periods in June 1996 and in September 1997. The June 1996 data is attached and has been presented to the EIMP working group meeting.

The results from June 1996 covered the central and southern part of Cairo adequately. It was, however, pointed out that further information should have been collected in the northern areas of Cairo and particularly in the Shoubra El-Kheima area. The samples collected in September 1997 attempted to fill this gap of information.

The samples were collected by B Sivertsen and M Nassar as part of the EIMP/EEAA siting study for air quality monitoring stations in greater Cairo area. The samples were analysed at NILU.

The passive samplers

A sensitive diffusion sampler for SO_2 and NO_2 has been used in several investigations undertaken by NILU. One of these studies using the SO_2 sampler covered the Helwan area south of Cairo.

The sampler includes an impregnated filter inside a small plastic tube. Gases are transported and collected by molecular diffusion. The uptake rate is only dependent upon the diffusion rate of the gas. The collection rate is thus 31 l/24h for SO_2 and 36 l/24h for NO_2 .

The typical measuring ranges are 0,1-80 ppb for SO_2 for a sampling period of one month. The corresponding range for NO_2 is 0.02-40 ppb. After exposure the samplers

are brought to NILU for analyses. SO_2 is determined as sulphate by ion chromatography. NO_2 is determined by spectrophotometry.

Sampling points

The measurements in the northern part of Cairo were carried out for five days from 3 September to 8 September 1997. Eleven sampling points were selected for SO_2 measurements; seven in the south eastern Shoubra El-Kheima area, one in AbuZabel, one in Al-Qulaly and one in Gemoroya street. Eight of the samples were retrieved. Four sampling points for NO_2 were selected, three of them were retrieved. (see attached sketch of map).

Results

As shown in Table 1 the SO_2 concentrations ranged from 29 $\mu g/m^3$ at Abu Zabel to 554 $\mu g/m^3$ Ismailia Canal 400 m south of Arab Contractors at the Water Treatment plant in Northern Cairo.

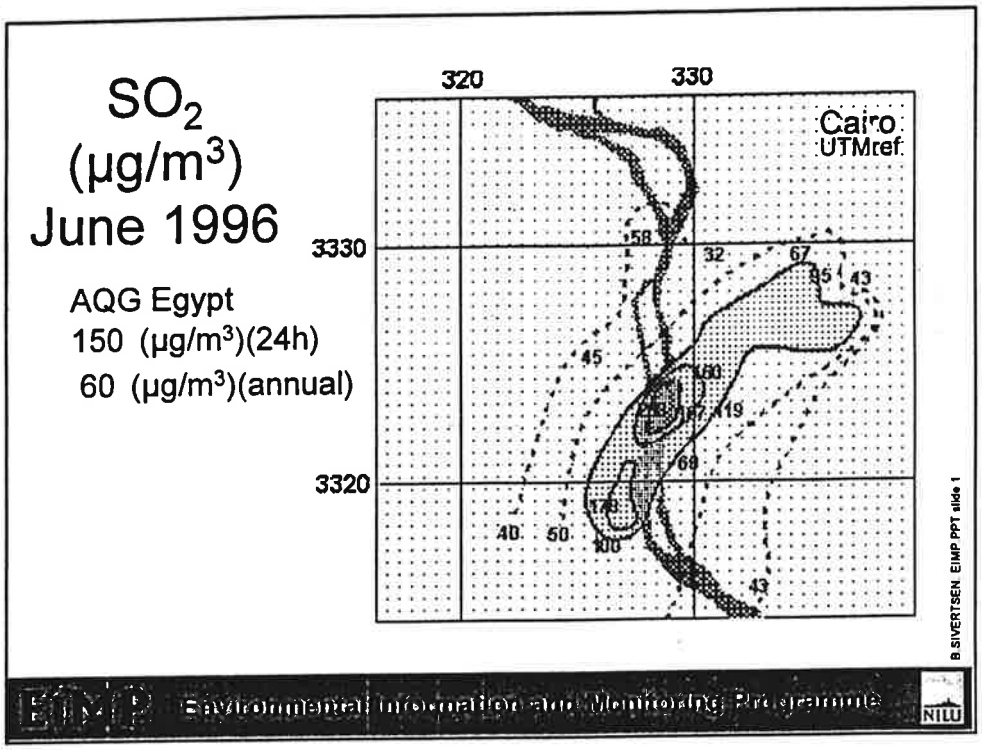
Table 1: Concentrations of SO_2 and NO_2 ($\mu g/m^3$) analysed in passive samples collected from 3 September to 8 September 1997

Measurement site	UTM reference X	UTM reference Y	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
Ahmed Shahalan school	641.0	3332.4	148	31
Arab Contractors	641.2	3332.45	72	-
Ismailia canal, water treatm.	641.3	3332.2	554	-
Ismailia canal 700 m west	640.7	3332.1	188	-
Al Qulaly	638.2	3326.7	258	-
Gemoroya street	638.5	3325.4	137	109
Abu Zabel			29	22

The winds were mainly from northern directions during the sampling period.

The typical average SO_2 concentration expected in the northern Shoubra area, south of Shoubra ElKheima will range between 150 and 500 $\mu g/m^3$, and the 24 h average or one hour average concentrations can be expected to exceed these concentrations.

The NO_2 concentrations were only around 30 $\mu g/m^3$ as a five day average. Diurnal variations are expected due to changes in traffic. In Gomorya street the five day average was as high as 109 $\mu g/m^3$.



The measurements of SO2 using passive samplers from NILU was undertaken during one week; 7 to 14 June 1996.

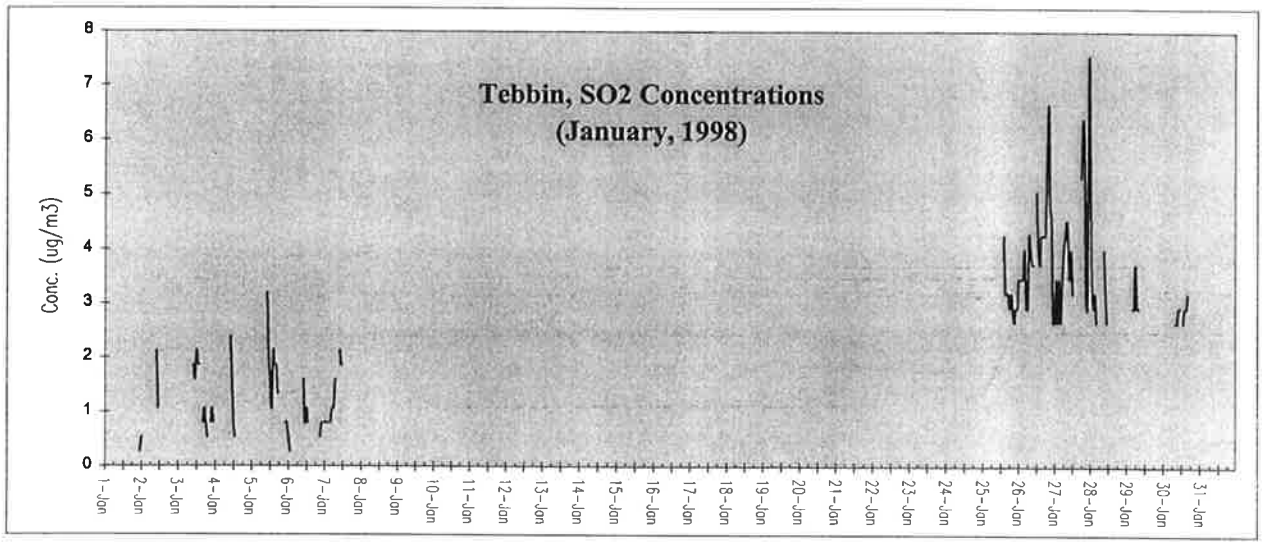
The meteorlogical conditions for the period was typical for summer conditions in Cairo with predominant northerly winds.

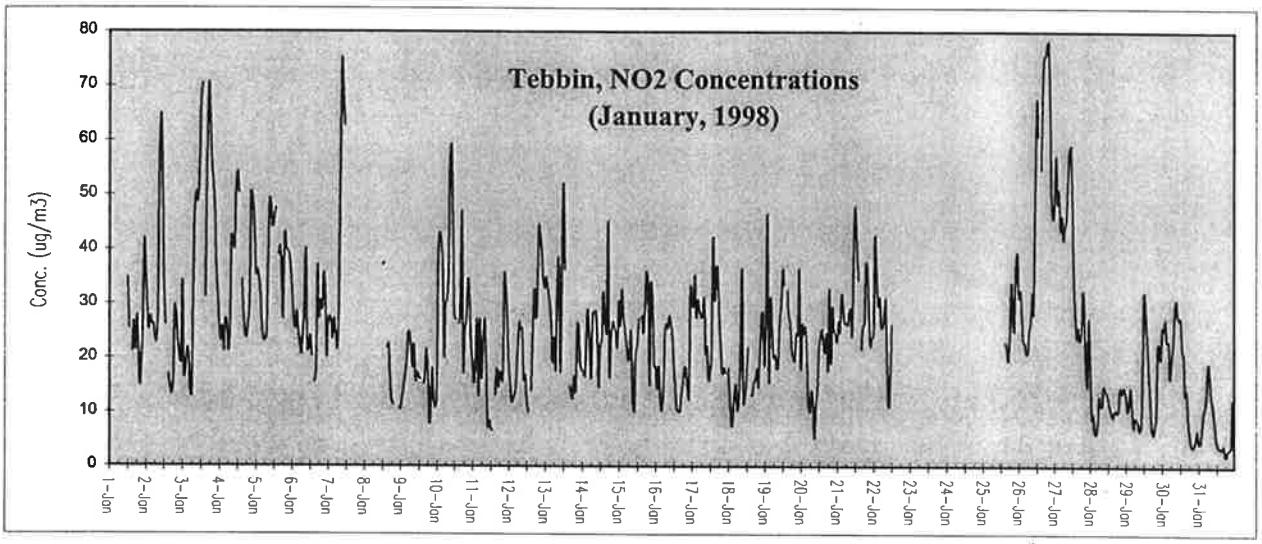
The maximum impacted area was found down-wind from the urban city centre of Cairo, around Garden City. A secondary maximum was detected in the area of Umm al-Misryin close to the railwaystation on the western bank of the Nile river, about 4 km south of the Cairo University in Giza. The sampler at this location could be impacted by local emissions.

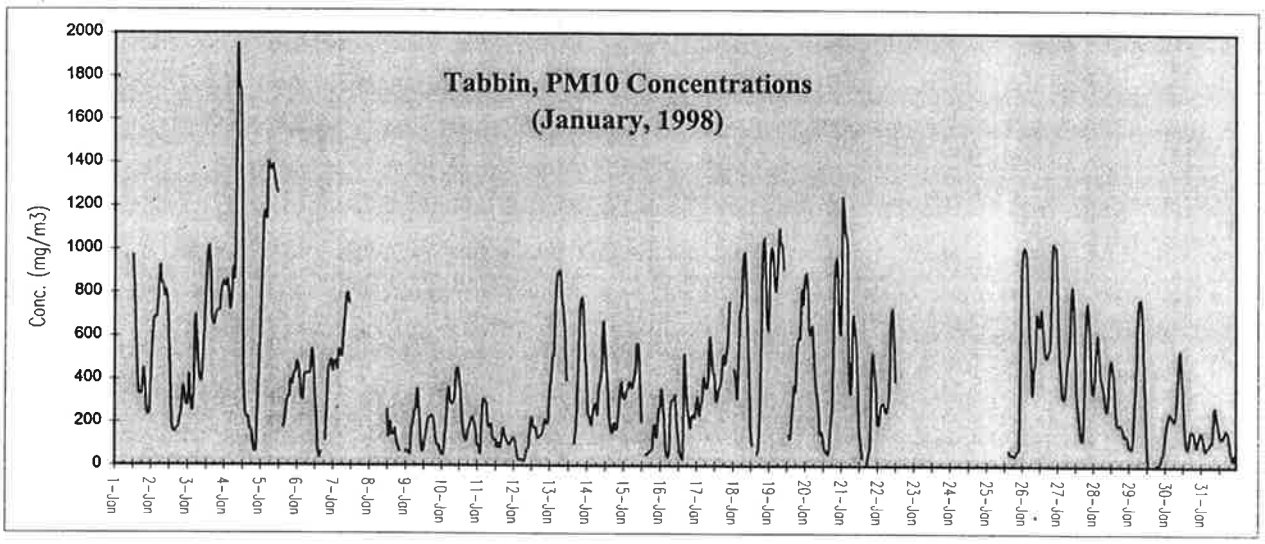
These measurements did not include data from Shoubra and areas north of Ramses square. To obtain a complete picture of Cairo more samples will be collected in September 1997.

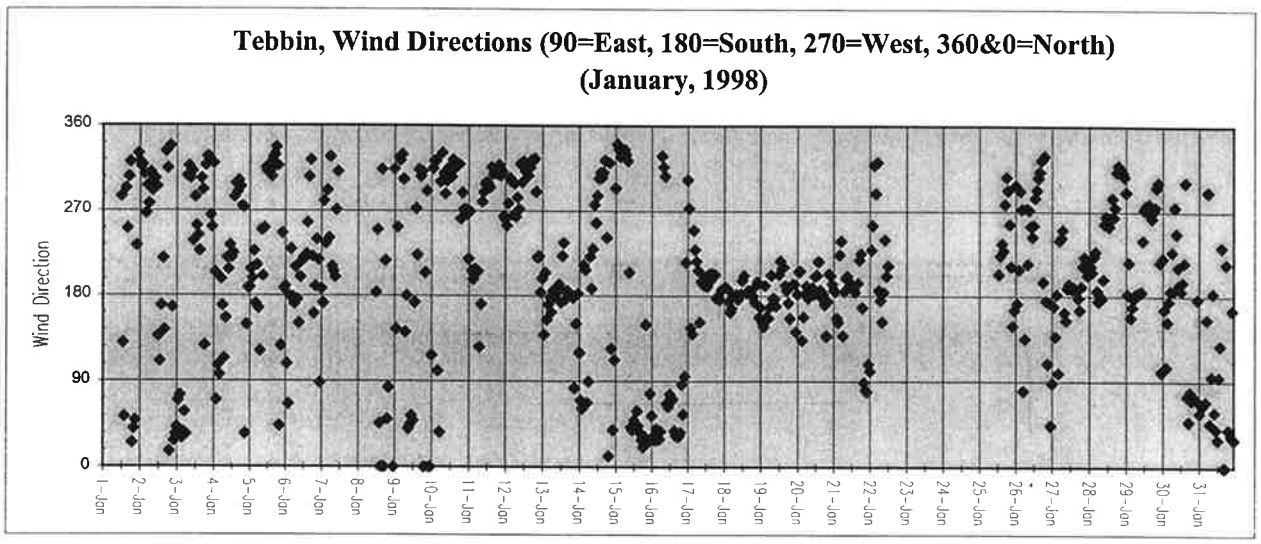
The results from measurements in June 1996 show that the area exceeding 100 ug/m3 covered about 40 km^2 of the central part of Cairo. The air quality limit given in the Egyptian Law is 150 ug/m3 (24 h average) and 60 ug/m3 (as a annual average).

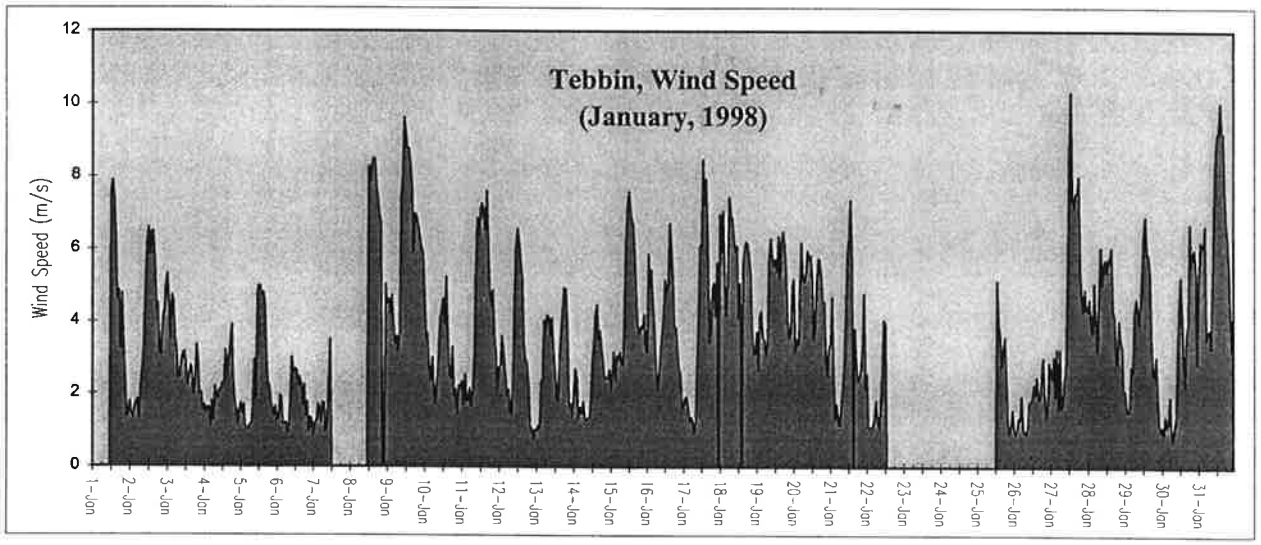
The highest weekly average concentration measured was 208 ug/m3.

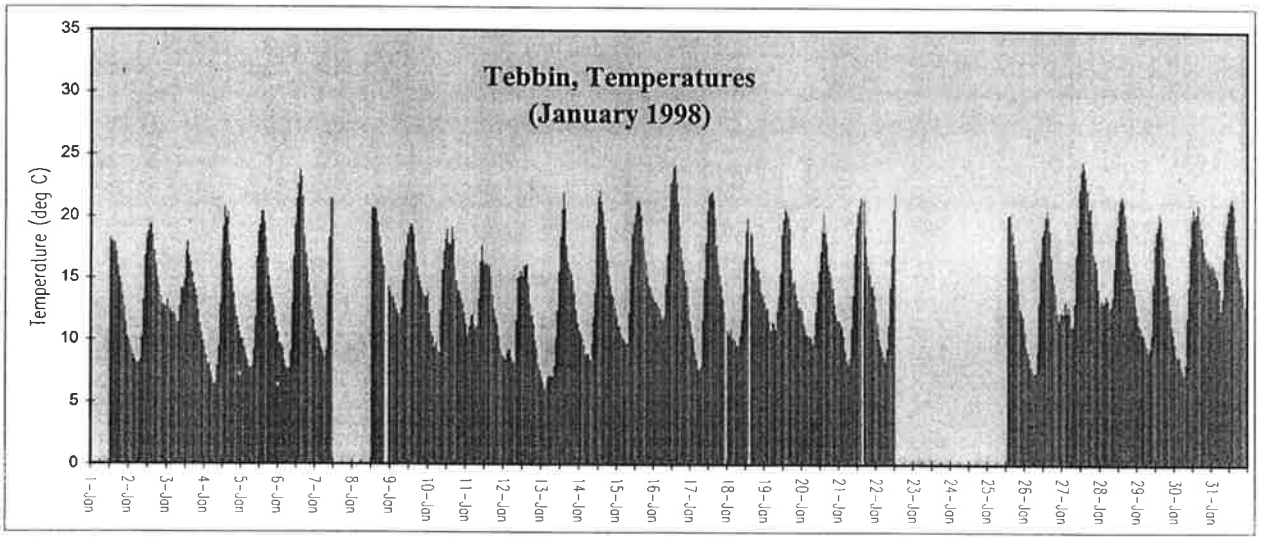

Tebbin, SO2 Concentrations
(January, 1998)
Conc. (ug/m3)
0
1
2
3
4
5
6
7
8
1-Jan
2-Jan
3-Jan
4-Jan
5-Jan
6-Jan
7-Jan
8-Jan
9-Jan
10-Jan
11-Jan
12-Jan
13-Jan
14-Jan
15-Jan
16-Jan
17-Jan
18-Jan
19-Jan
20-Jan
21-Jan
22-Jan
23-Jan
24-Jan
25-Jan
26-Jan
27-Jan
28-Jan
29-Jan
30-Jan
31-Jan


Tebbin, NO2 Concentrations
(January, 1998)
Conc. (ug/m3)
0
10
20
30
40
50
60
70
80
1-Jan
2-Jan
3-Jan
4-Jan
5-Jan
6-Jan
7-Jan
8-Jan
9-Jan
10-Jan
11-Jan
12-Jan
13-Jan
14-Jan
15-Jan
16-Jan
17-Jan
18-Jan
19-Jan
20-Jan
21-Jan
22-Jan
23-Jan
24-Jan
25-Jan
26-Jan
27-Jan
28-Jan
29-Jan
30-Jan
31-Jan

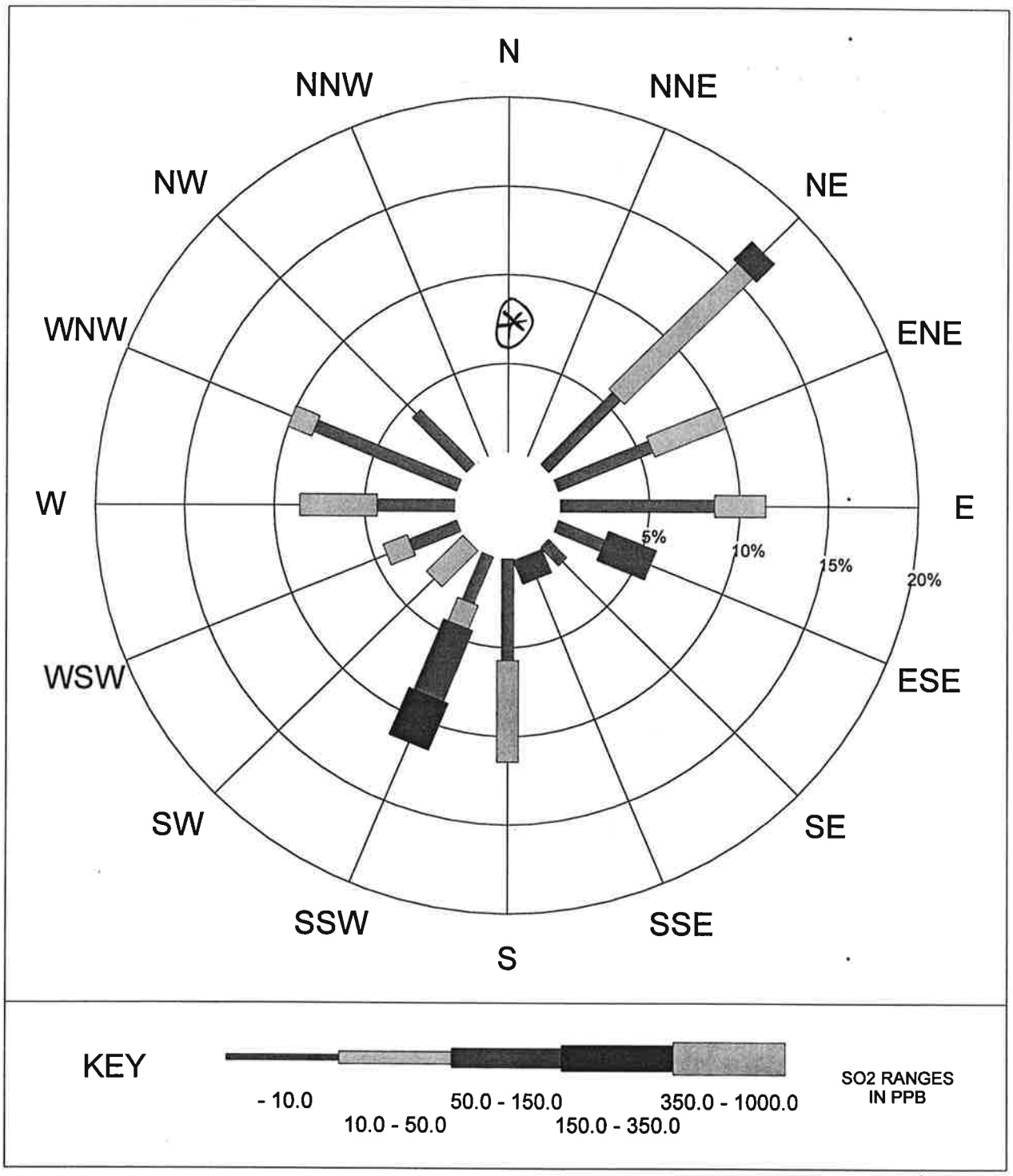

Tabbin, PM10 Concentrations
(January, 1998)
Conc. (mg/m3)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
1-Jan
2-Jan
3-Jan
4-Jan
5-Jan
6-Jan
7-Jan
8-Jan
9-Jan
10-Jan
11-Jan
12-Jan
13-Jan
14-Jan
15-Jan
16-Jan
17-Jan
18-Jan
19-Jan
20-Jan
21-Jan
22-Jan
23-Jan
24-Jan
25-Jan
26-Jan
27-Jan
28-Jan
29-Jan
30-Jan
31-Jan


Tebbin, Wind Directions (90=East, 180=South, 270=West, 360&0=North)
(January, 1998)
Wind Direction
360
270
180
90
0
1-Jan
2-Jan
3-Jan
4-Jan
5-Jan
6-Jan
7-Jan
8-Jan
9-Jan
10-Jan
11-Jan
12-Jan
13-Jan
14-Jan
15-Jan
16-Jan
17-Jan
18-Jan
19-Jan
20-Jan
21-Jan
22-Jan
23-Jan
24-Jan
25-Jan
26-Jan
27-Jan
28-Jan
29-Jan
30-Jan
31-Jan


Tebbin, Wind Speed
(January, 1998)
Wind Speed (m/s)
12
10
8
6
4
2
0
1-Jan
2-Jan
3-Jan
4-Jan
5-Jan
6-Jan
7-Jan
8-Jan
9-Jan
10-Jan
11-Jan
12-Jan
13-Jan
14-Jan
15-Jan
16-Jan
17-Jan
18-Jan
19-Jan
20-Jan
21-Jan
22-Jan
23-Jan
24-Jan
25-Jan
26-Jan
27-Jan
28-Jan
29-Jan
30-Jan
31-Jan


Tebbin, Temperatures
(January 1998)
Temperature (deg C)
35
30
25
20
15
10
5
0
1-Jan
2-Jan
3-Jan
4-Jan
5-Jan
6-Jan
7-Jan
8-Jan
9-Jan
10-Jan
11-Jan
12-Jan
13-Jan
14-Jan
15-Jan
16-Jan
17-Jan
18-Jan
19-Jan
20-Jan
21-Jan
22-Jan
23-Jan
24-Jan
25-Jan
26-Jan
27-Jan
28-Jan
29-Jan
30-Jan
31-Jan

01 Apr 98 - 17 Apr 98
Station: TABBIN
SO2 versus WD
Frequency of Occurrence (%)



* error in wind direction averaging... corrected 25 April 1998.

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FAX

Shawkat Guirguis, IGSR
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203421 5792

Dato/Date	:	Kjeller, 98.05.13
Til/To	:	EIMP 00 202 5256 467
Deres/Your ref.	:	Att. Bjarne Sivertsen
Fra/From	:	Leif Marsteen
Vår/Our ref.	:	LM/O-96013

Antall sider/No. of pages: **1** (inkl. denne side/incl. this page)

SAK/SUBJECT: Change averaging method - Met.

Hallo Bjarne!
Turen gikk greit. Her kommer prosedyre for endring av midlingsmetode for met.

Changing the averaging method for Wind Direction:

1. Choose **Initialization** from the data logger main menu. The **Initialization Menu** is displayed.
2. Choose **Initialize Parameters** from the **Initialization Menu.** The **INITIALIZE PARAMETERS** menu is displayed.
3. Chose **Edit Table.** The **EDIT MODE** bar is displayed.
4. Choose **Edit Line** from the ***EDIT MODE*** bar and choose the **WDA** parameter. The **WDA** parameter settings are displayed in the **EDIT MODE** bar.
5. Choose **Averaging Method** from the ***EDIT MODE*** bar and choose **Scalar HWD** from the drop down list. The **Averaging Method** field is updated.
6. Choose **Save Line.** The parameter settings are updated in the table.

Changing the averaging method for Wind Speed:

1. Choose **Edit Line** from the **EDIT MODE** bar and choose the **WSA** parameter. The **WSA** parameter settings are displayed in the **EDIT MODE** bar.
2. Choose **Averaging Method** from the **EDIT MODE** bar and choose **Scalar WS** from the drop down list. The **Averaging Method** field is updated.
3. Choose **Save Line.** The parameter settings are updated in the table.

Best regards,
Leif Marsteen

Leif Marsteen

Shawkat Guirguis

This came in after you left!

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Passive air pollution sampling

Field observations *Sharm ElSheik*

Observer: *B Sivertsen*

Sampling period				Site name (position)	UTMcoord.		Sampler	Comments		
From		To:					ident:	SO_2	NO_2	
date	hr:	date	hr.		X	Y		red	blue	Contacts
3.4.98	10:00	6.4.98	12:00	SharmElSheik, Novotel			3 HD	x		
3.4.98	10:00	6.4.98	12:00	SharmElSheik, Novotel			8		x	
4.4.98	10:40			Sharm-.EEAA park office			25	x		Mr Wael Roger Karkour
4.4.98	10:40						21		x	Omar Hassan, tel:+660 668
4.4.98	11:25			Sharm- opposite Kataract ht			27	x		
4.4.98	11:25						23		x	
4.4.98	11:50			Sharm- Novotel coffie shop			2 bl	x		
4.4.98	11:50						24		x	

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Passive air pollution sampling

Field observations

Observer: *M Nassar & B Sivertsen*

Sampling period				Site name (position)	UTM coord.		Sample	Comments		
From		To:					ident:	SO_2	NO_2	
date	hr:	date	hr.		X	Y		red	blue	Contacts
14.4.98	14.00			Hurghada, Superjet			22		x	Yassir. Tel: 065 54 6768
14.4.98	14.00						7	x		
15.4.98	09.30.			Karnak, entrance office			4		x	Dr Mohammed El Sohair
15.4.98	09.30						1 bl	x		dir. Culture Upper Egypt
15.4.98	10.40			Luxor temple, near entrance			1		x	Dr Mohamed Nasr (gen.dir)
15.4.98	10.40						21	x		Mrs Newal
15.4.98	11.10			Luxur city, gov. building			29		x	Eng. Laila Araf Hamid
15.4.98	11.10						13	x		tel: 372188 , 372263/88
15.4.98	12.45			Medinet Habu, Ramses III			8	x		Sabi Abdel Assis
15.4.98	12.45						11		x	
15.4.98	13.30			Valley of Kings, rest area			30	x		
15.4.98	13.30						9		x	

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Passive air pollution sampling

Field observations

Observer: *M Nassar & B Sivertsen*

Sampling period				Site name (position)	UTMcoord.		Sampler	Comments		
From		To:					ident:	SO_2	NO_2	
date	hr:	date	hr.		X	Y		red	blue	Contacts
16.4.98	10.15			Edfu Tempel Roof			9	x		Mohammed Sanan
16.4.98	10.41						25		x	
16.4.98	11.45.			ComOmbo, Upper Eg. Agr.			23	x		Abdil Gaber
16.4.98	11.45						30		x	tel: 097 50 00 22
16.4.98	12.15			ComOmbo Tempel entrance			28	x		
16.4.98	12.15						26		x	
16.4.98	13.30			Aswan Obelisk			27		x	Mohi ElDin
16.4.98	13.30						12	x		
16.4.98	14.45			Aswan, Elephantine, museu			6		x	Rag Saher Mohamed
16.4.98	14.45						26	x		

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30 Misr Helwan St. Maadi, Cairo

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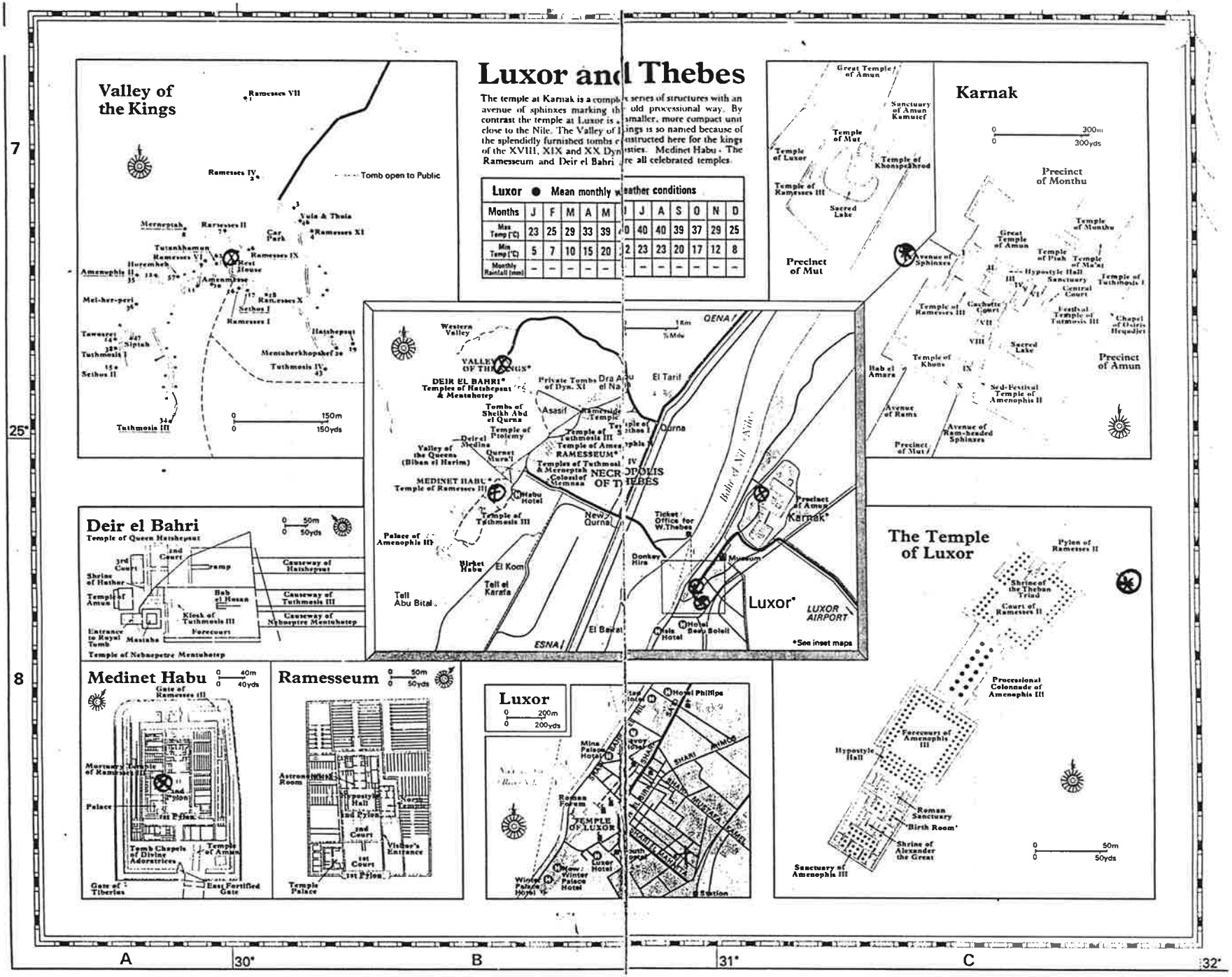
Passive air pollution sampling

Field observations

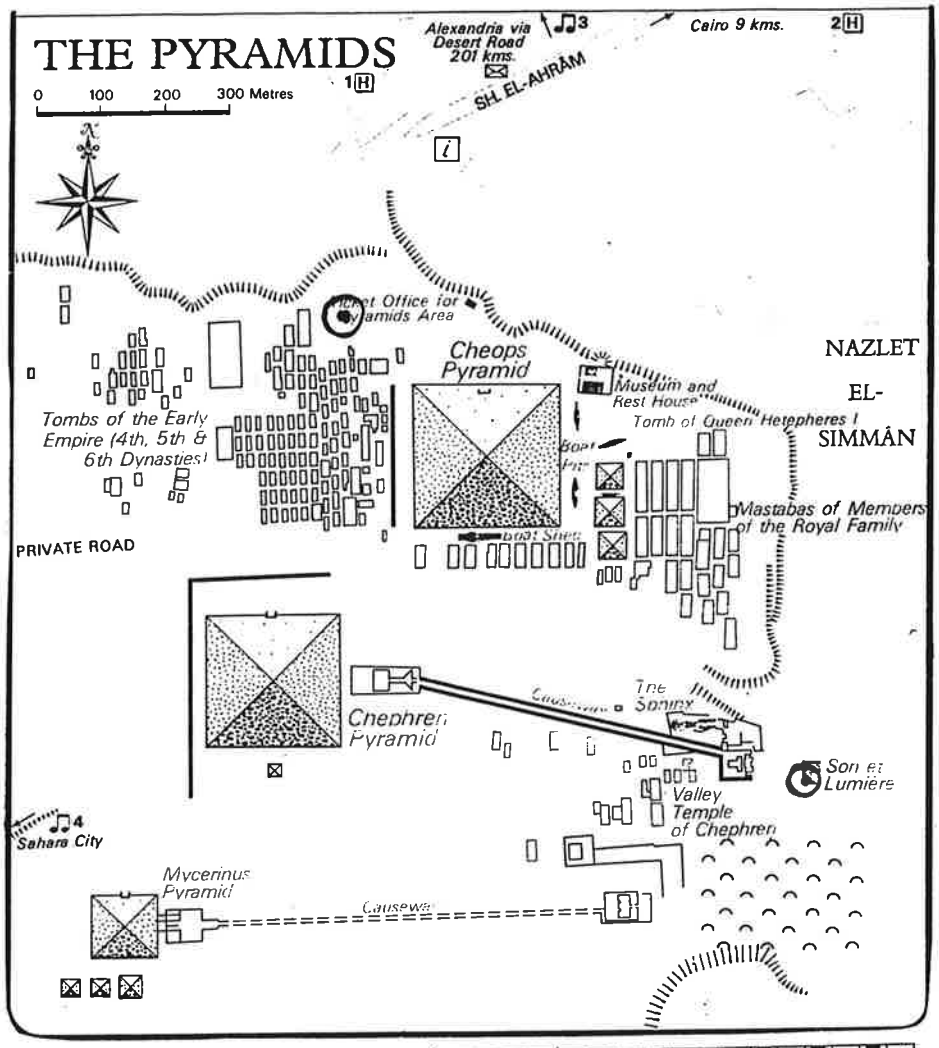
Observer: *M Nassar & B Sivertsen*

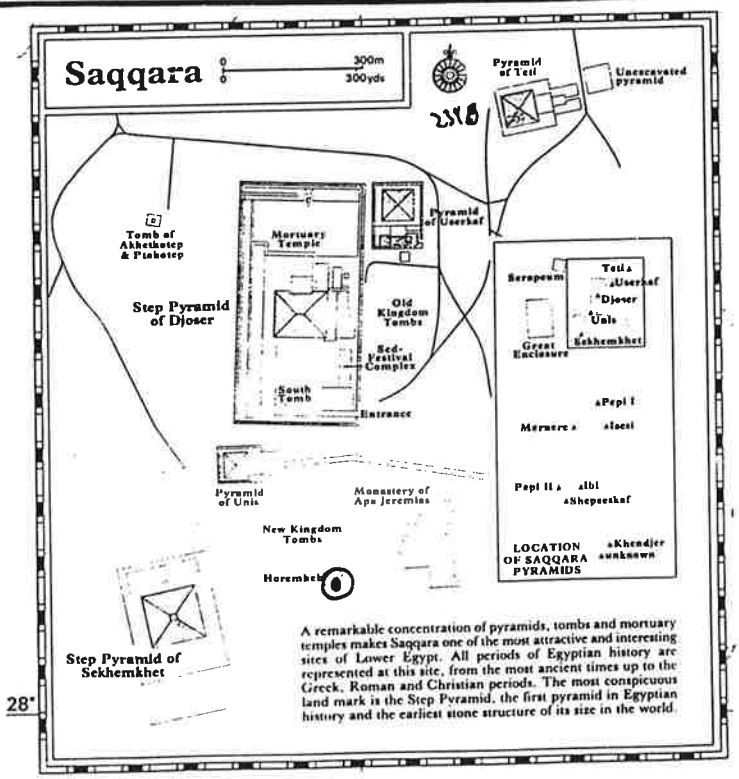
Sampling period				Site name (position)	UTMcoord.		Sampler	Comments		
From		To:					ident:	SO_2	NO_2	
date	hr:	date	hr.		X	Y		red	blue	Contacts
2.5.98	10:20			Giza pyramid office			19		x	Dr Hawas
2.5.98							16	x		Mr Ahmed El Haggar
2.5.98	10:40			Sphinx, light and sound			10		x	
2.5.98							22	x		
2.5.98	12:40			Sakkara, Horembeb tempel			28		x	Mr Hamdi Amin
2.5.98							24	x		Mohammed Hagras
2.5.98	13:30			Memphis, museum			3		x	Mr. Shakan
2.5.98							29	x		

Developed by: Norwegian Institute for Air Research (NILU), POBox 100, N-2007 Kjeller, Norway



sites for passive samplers.


THE PYRAMIDS
0 100 200 300 Metres
Alexandria via Desert Road 201 kms.
Cairo 9 kms.
SH. EL-AHRÂM
Cheops Pyramid
Museum and Rest House
Tomb of Queen Hetepheres I
NAZLET EL-SIMMÂN
Tombs of the Early Empire (4th, 5th & 6th Dynasties)
Mastabas of Members of the Royal Family
PRIVATE ROAD
Chephren Pyramid
Valley Temple of Chephren
Son et Lumière
Sahara City
Mycerinus Pyramid
Causeway


Saqqara
300m
300yds
Pyramid of Teti
Unexcavated pyramid
Tomb of Akhethotep & Pishotep
Mortuary Temple
Pyramid of Userkaf
Step Pyramid of Djoser
Old Kingdom Tombs
Sed-Festival Complex
South Tomb
Entrance
Serapeum
Teti
Userkaf
Djoser
Unis
Great Enclosure
Sekhemkhet
Pepi I
Merenre
Pepi II
Ibi
Shepseskaf
Khendjer
unknown
LOCATION OF SAQQARA PYRAMIDS
Pyramid of Unis
Monastery of Apa Jeremias
New Kingdom Tombs
Horemheb
Step Pyramid of Sekhemkhet
A remarkable concentration of pyramids, tombs and mortuary temples makes Saqqara one of the most attractive and interesting sites of Lower Egypt. All periods of Egyptian history are represented at this site, from the most ancient times up to the Greek, Roman and Christian periods. The most conspicuous land mark is the Step Pyramid, the first pyramid in Egyptian history and the earliest stone structure of its size in the world.
28°

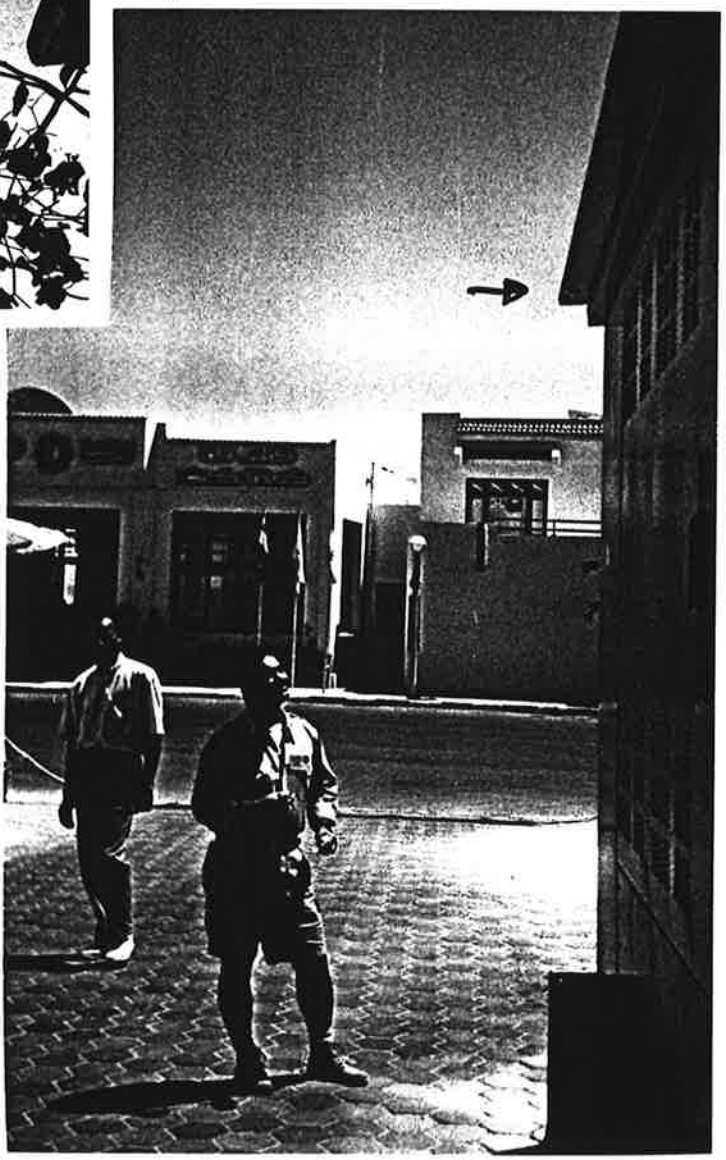
EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling

Location of samplers April - May 1998

Sharm El-Sheikh
Novotel 5 day sample

Sharm El-Sheikh
Opposite side of Katarakt hotel

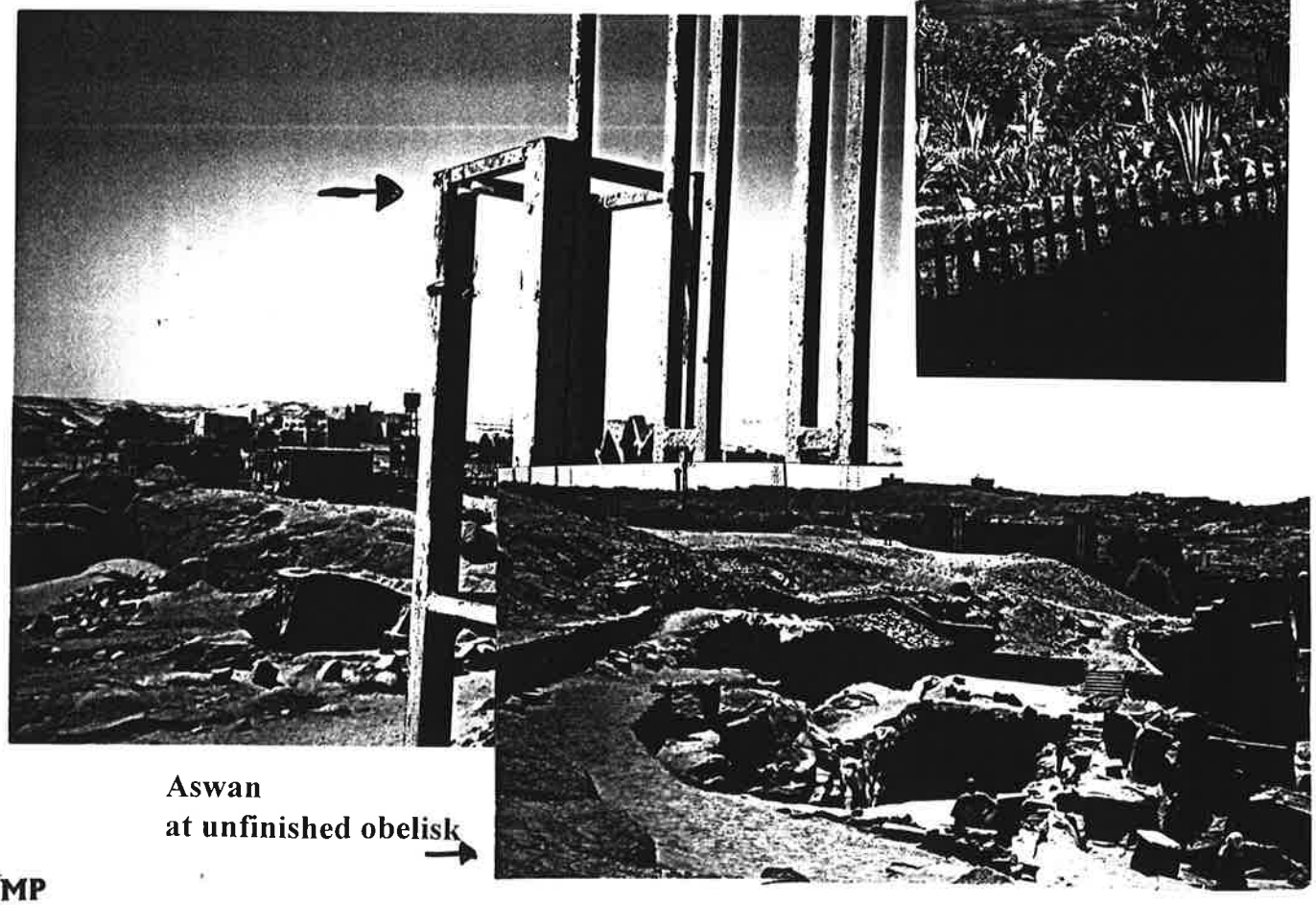


Sharm El-Sheikh
Front side, board walk

EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998

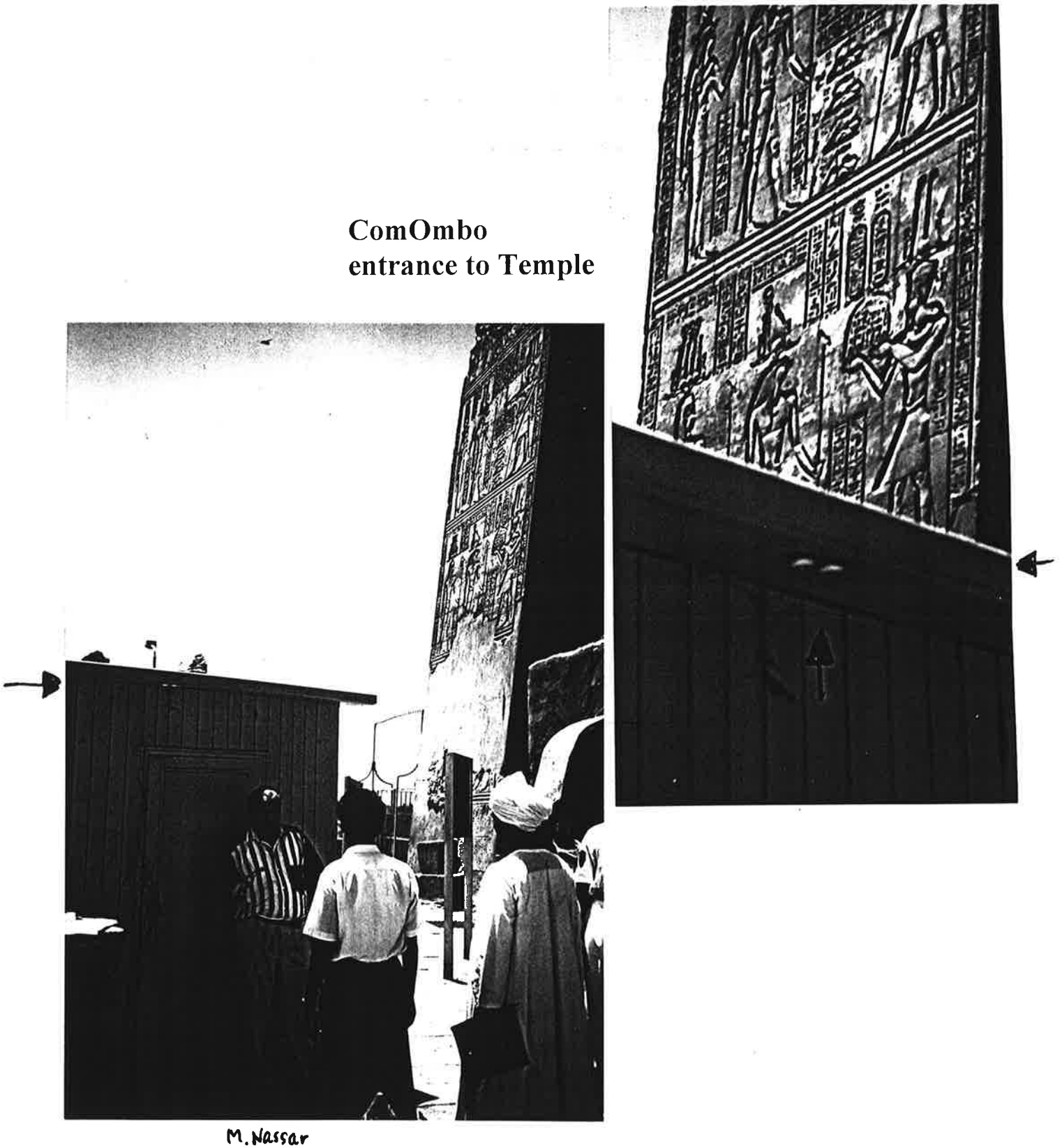
Aswan
Museum, Elephantine Island



Aswan
at unfinished obelisk

EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998



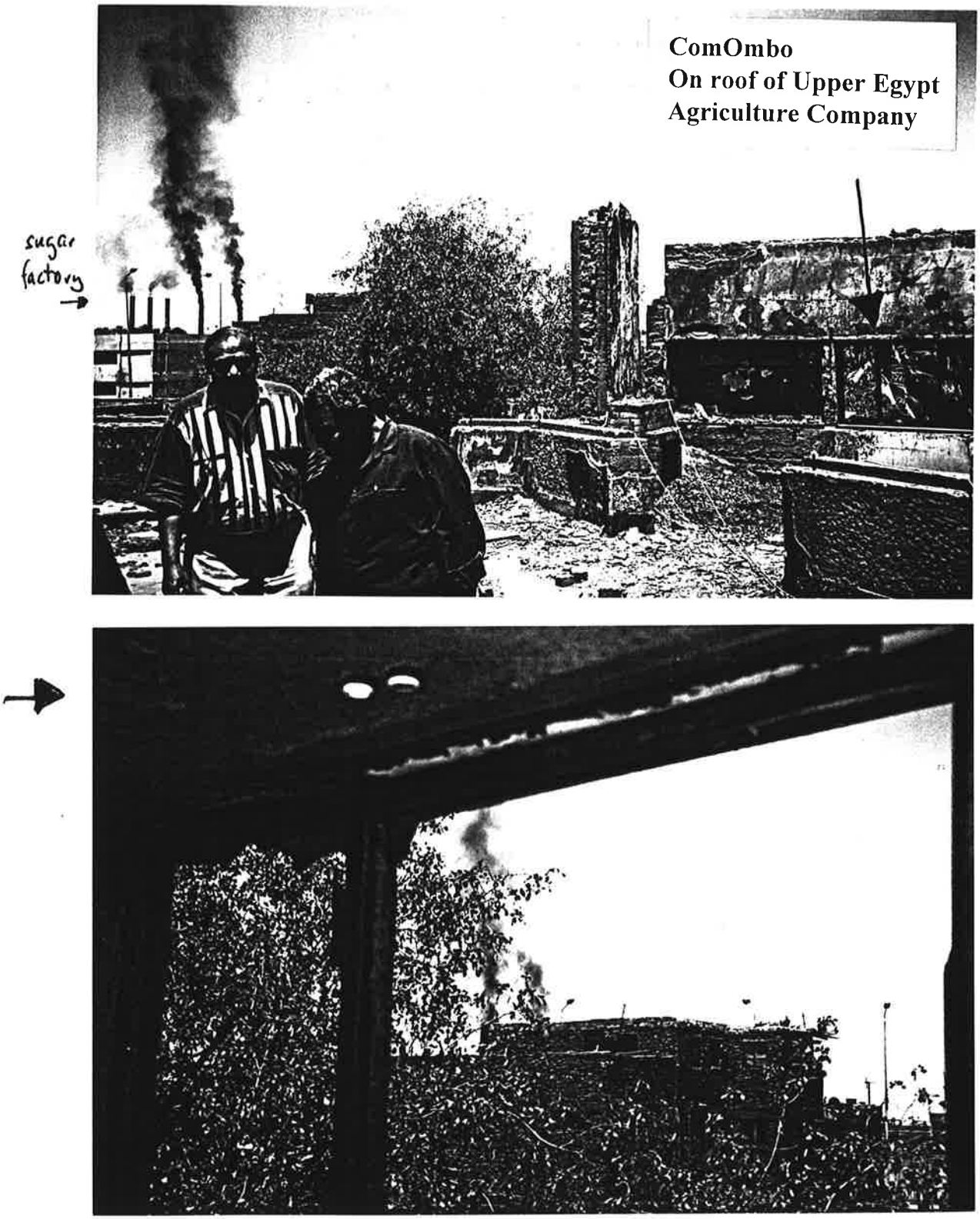
ComOmbo
entrance to Temple

M. Nassar

EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling

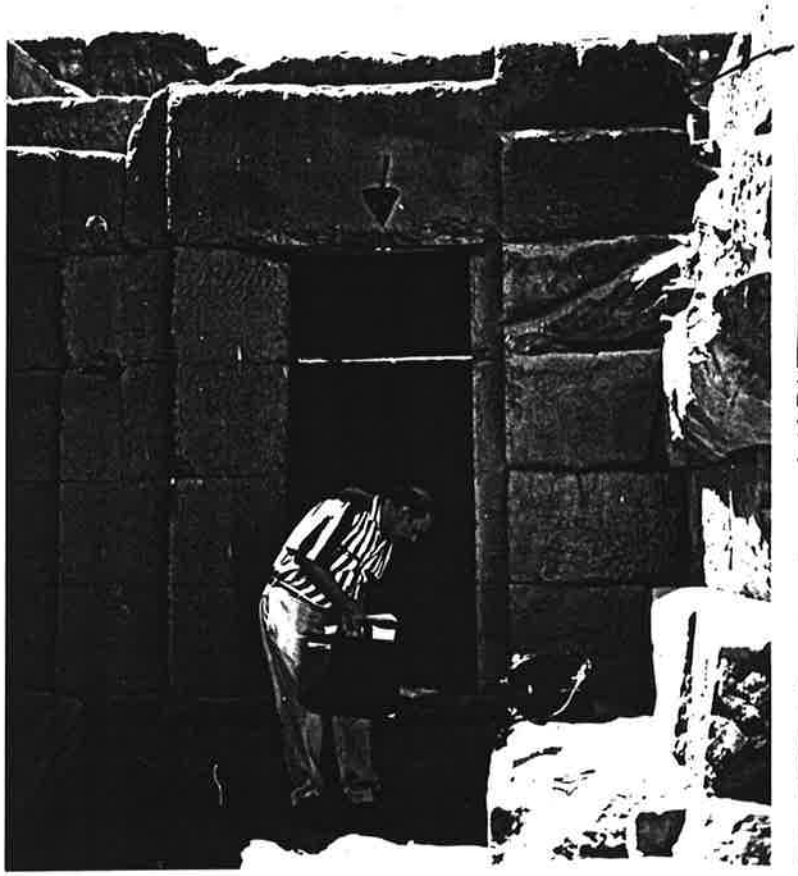
Location of samplers April - May 1998

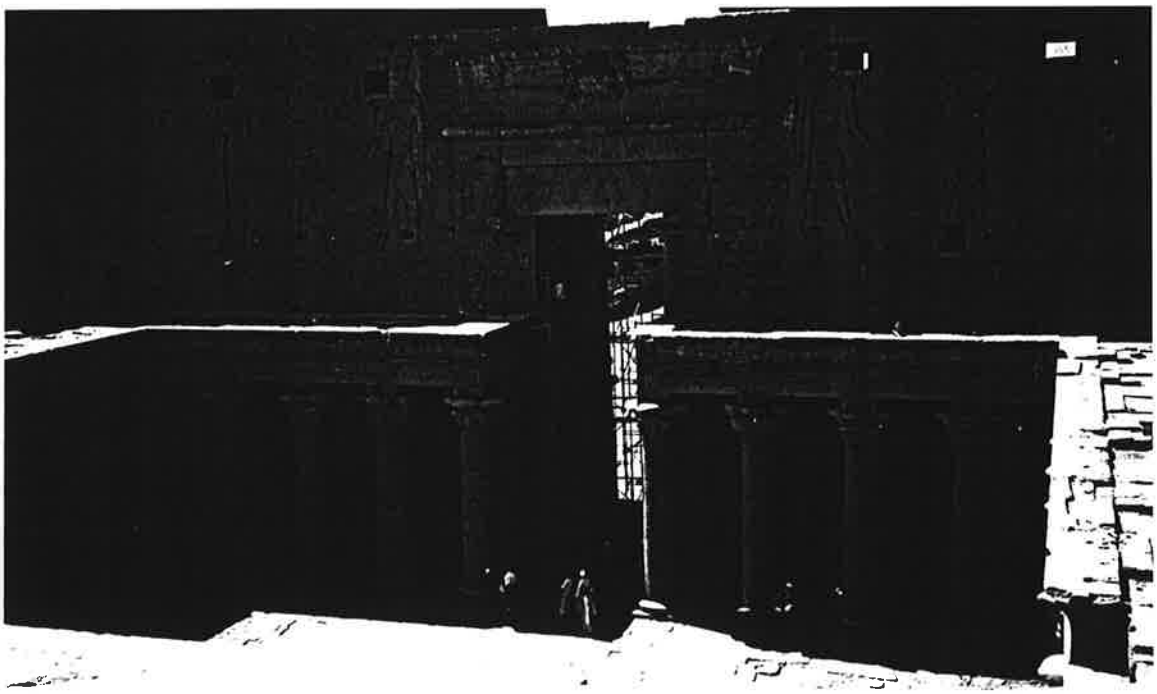


EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998

Edfu , roof of Horus temple

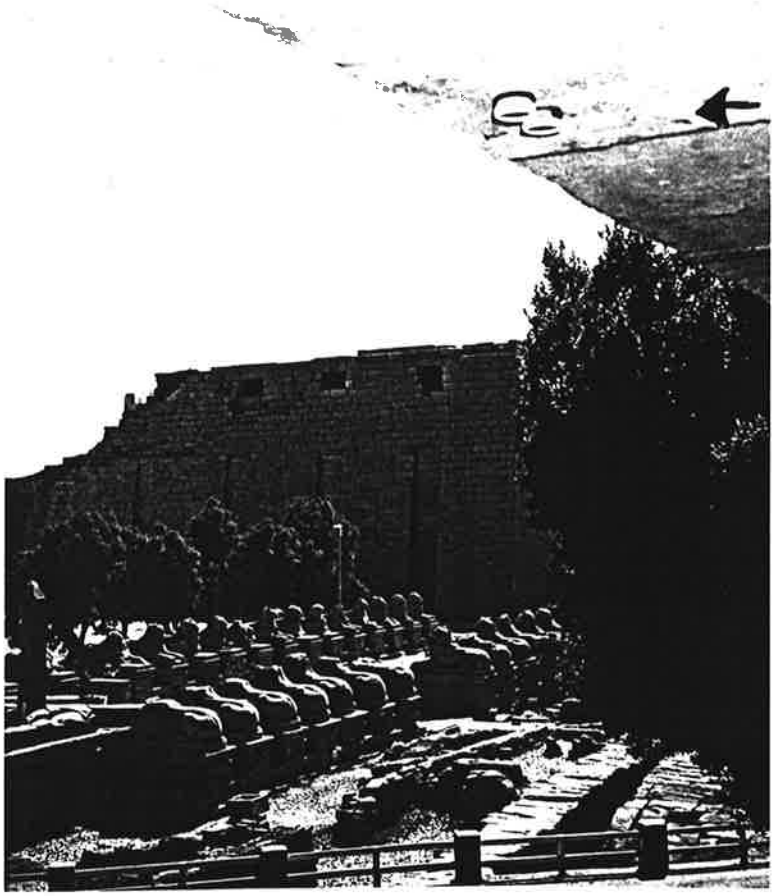




EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

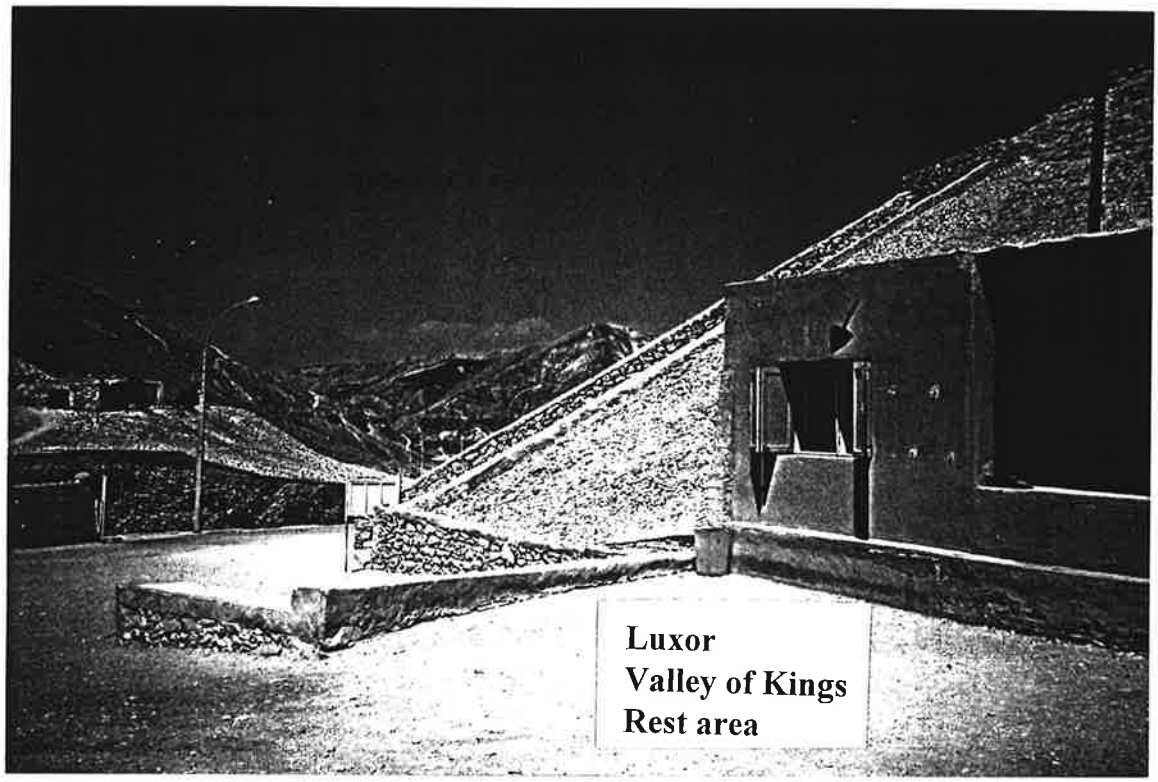
Passive air pollution sampling
Location of samplers April - May 1998

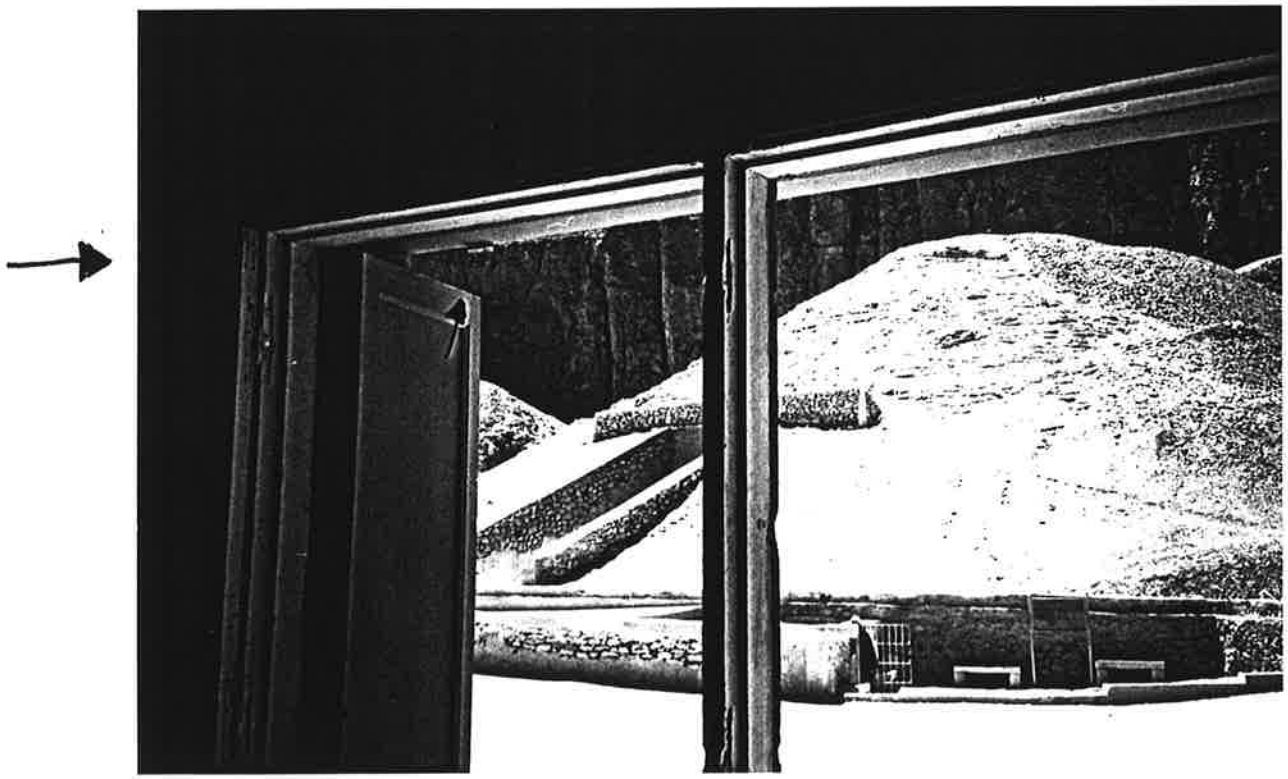
Luxor, Karnak Tempel
at entrance office →



EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998

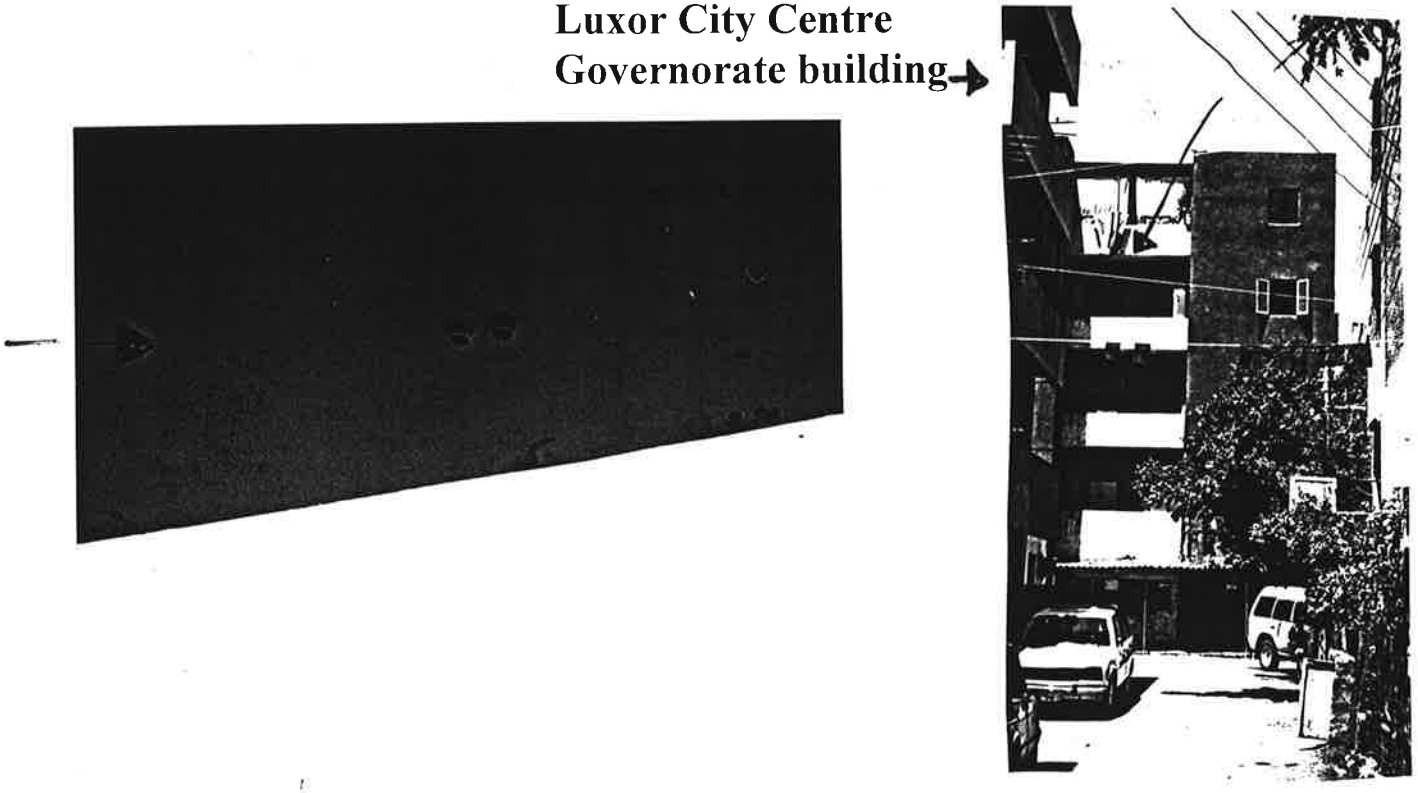




EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998

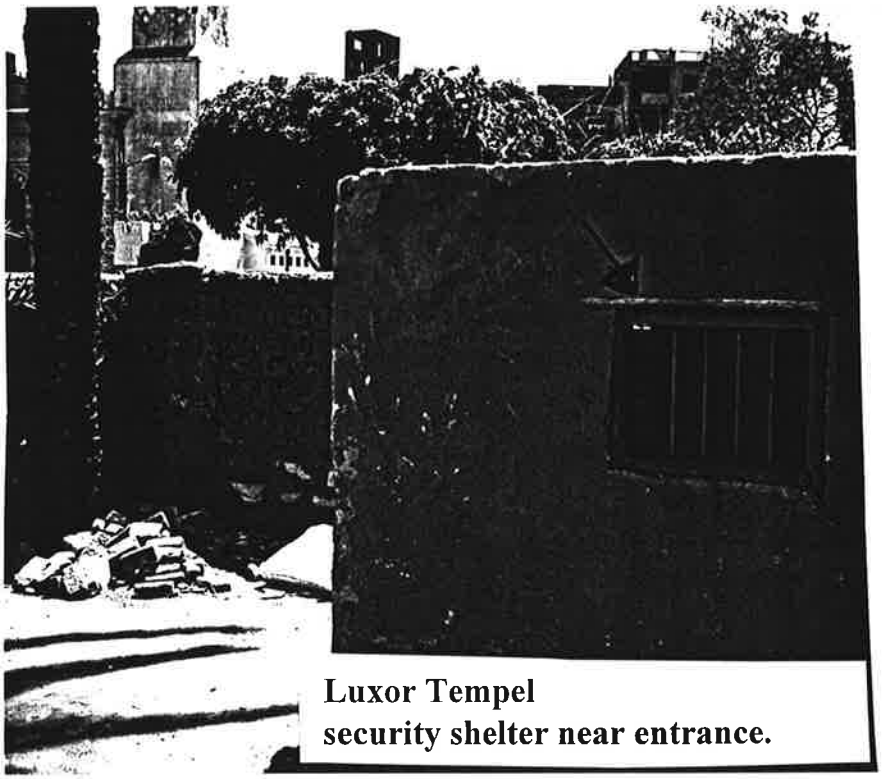
Luxor City Centre
Governorate building



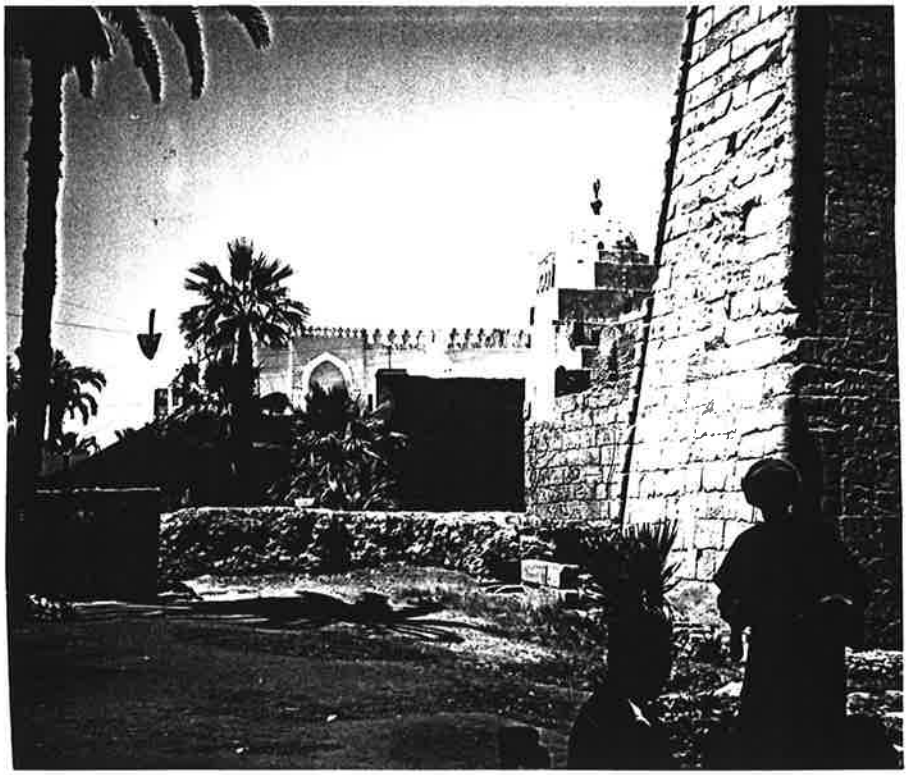
view from sampler

EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998



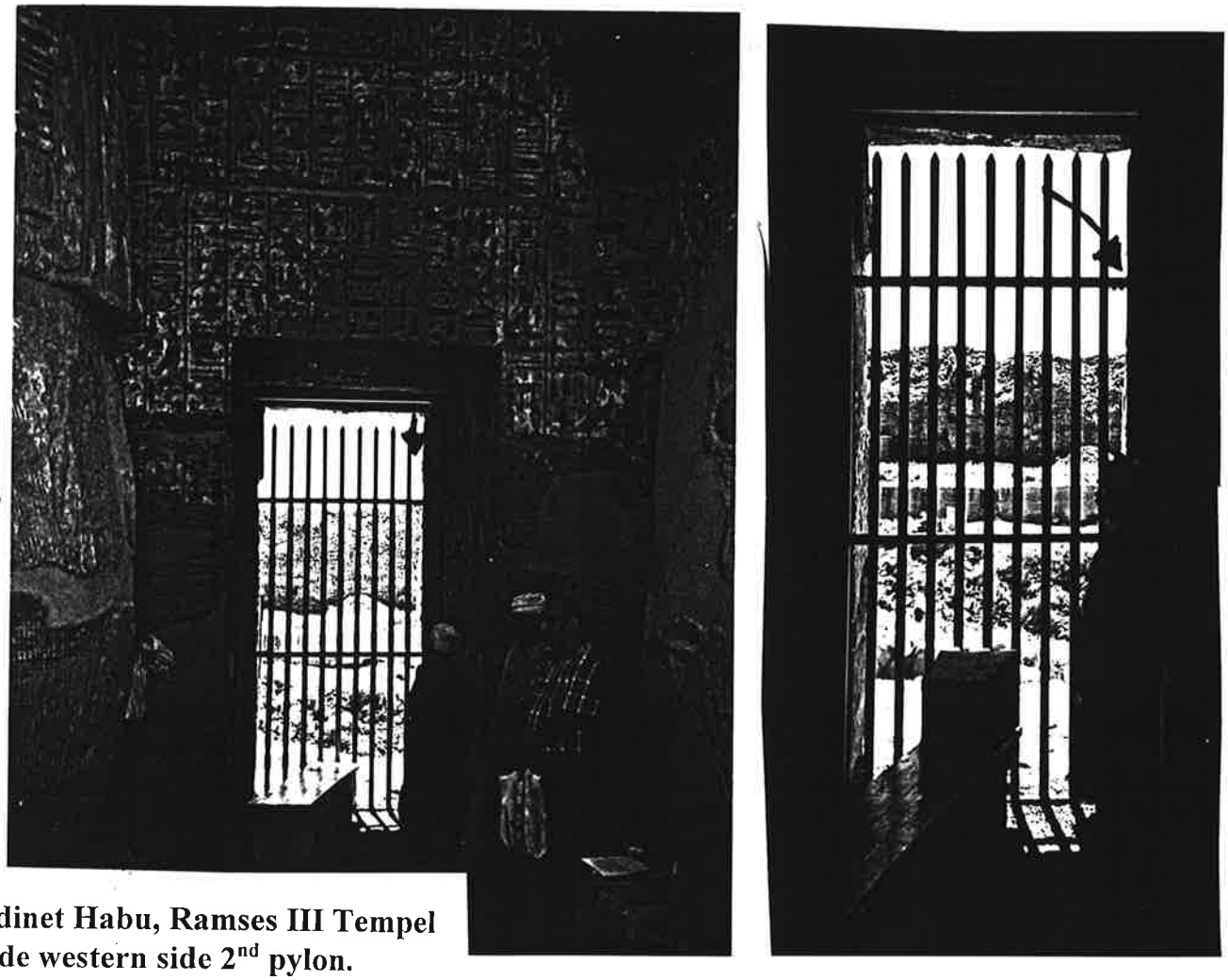
Luxor Tempel
security shelter near entrance.



EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling

Location of samplers April - May 1998



Medinet Habu, Ramses III Tempel
inside western side 2nd pylon.

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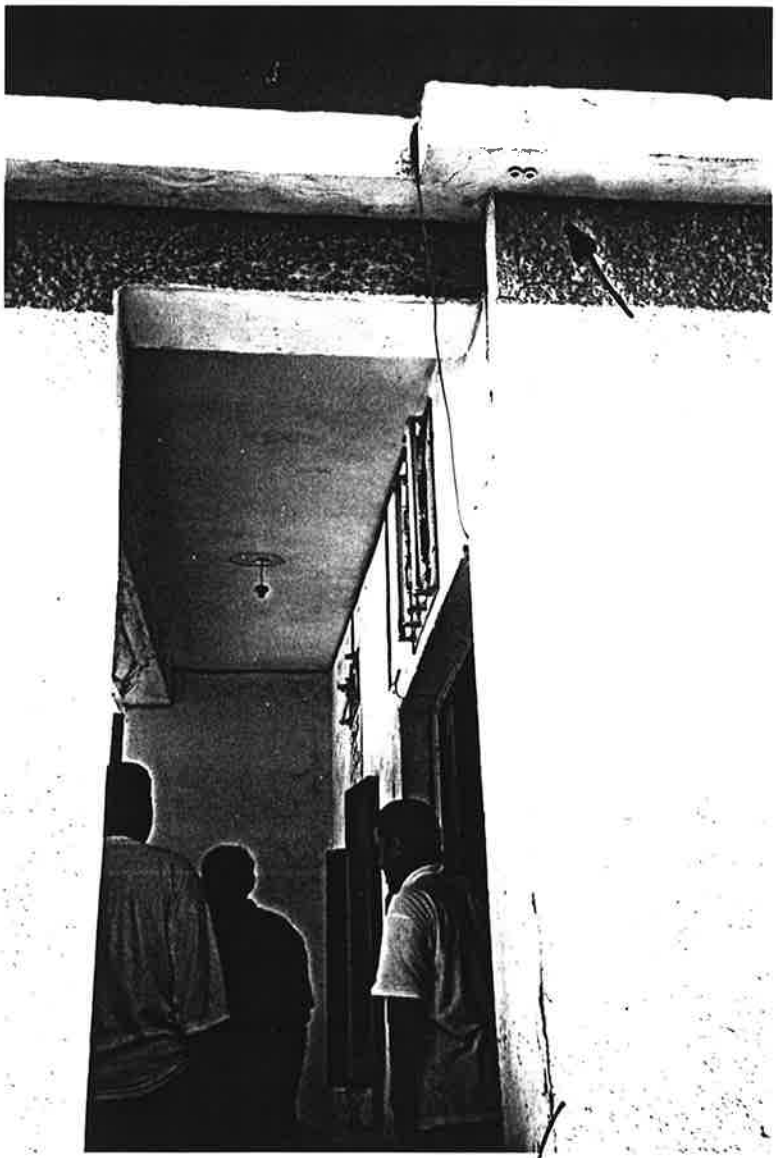
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998

Hurghada
Super Jet bus station



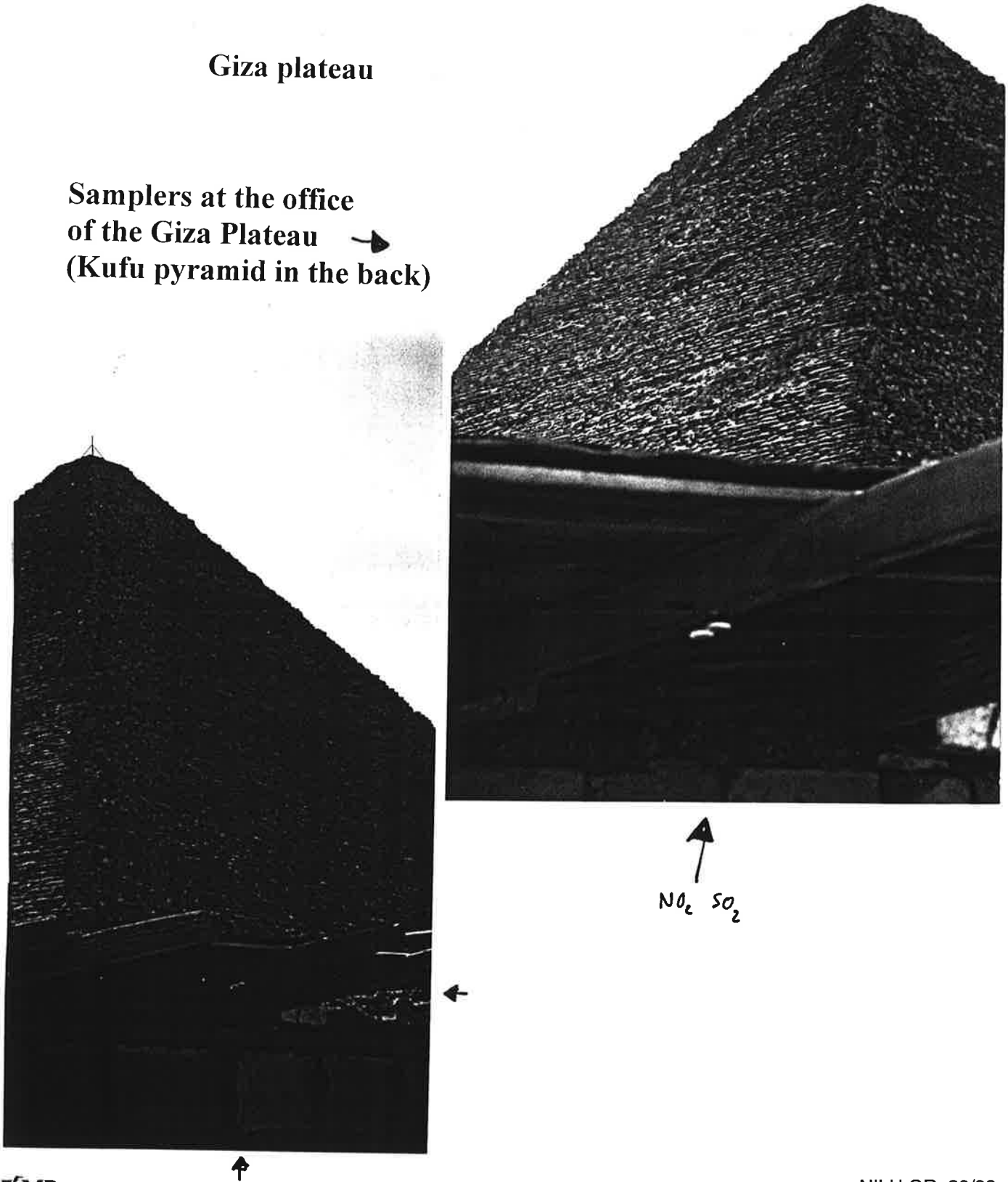
EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling

Location of samplers April - May 1998

Giza plateau

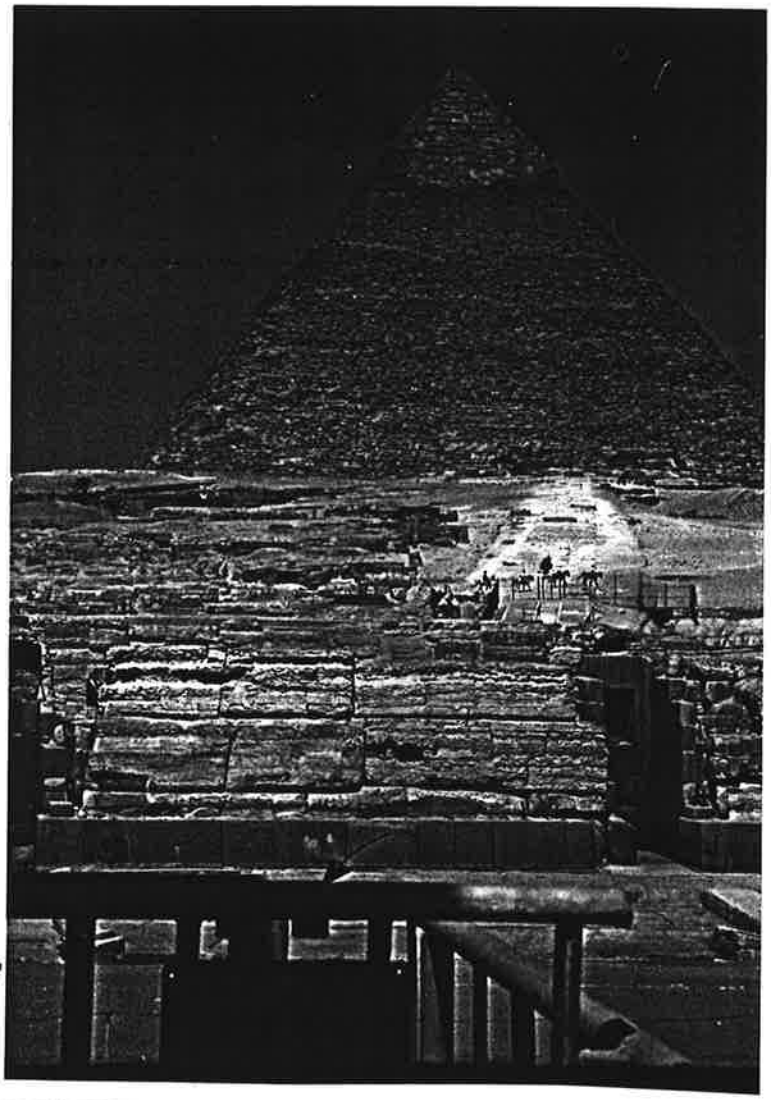
Samplers at the office
of the Giza Plateau →
(Kufu pyramid in the back)



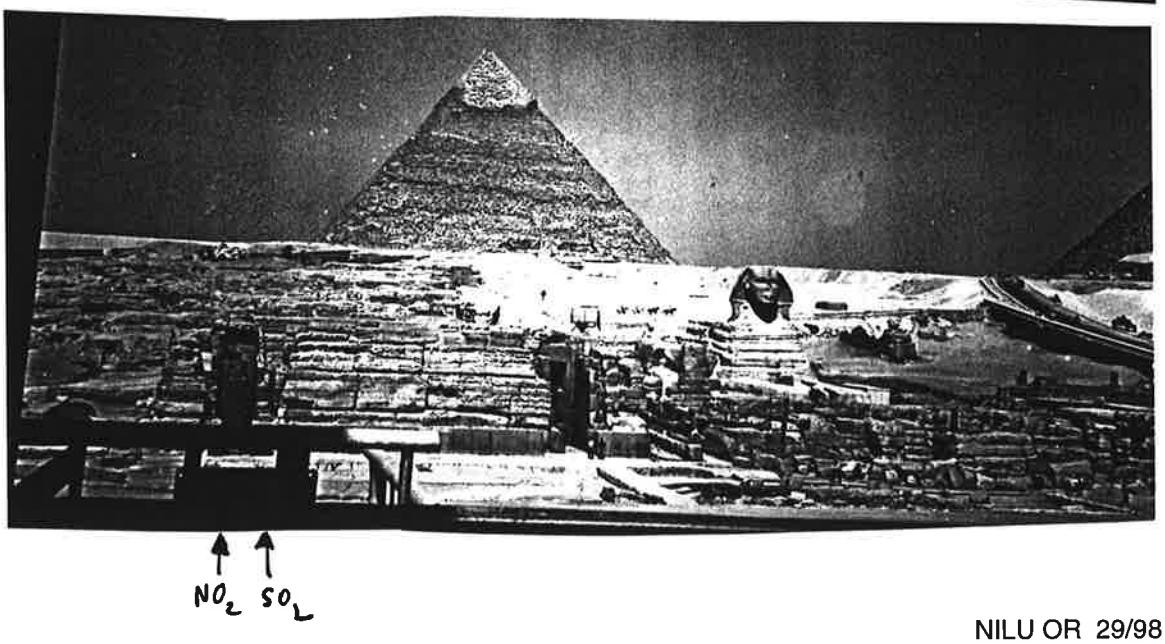
Passive air pollution sampling

Location of samplers April - May 1998

Sphinx area
Pyramid of Kafren
and Valley Temple



Samplers at Sphinx
Light and Sound
building

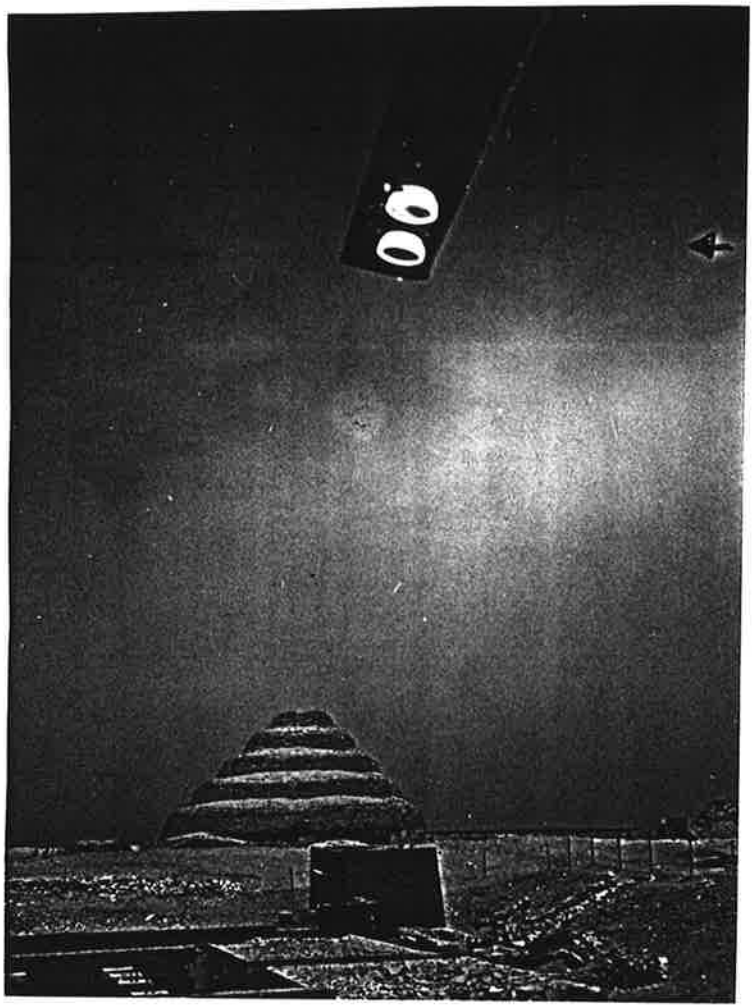


EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

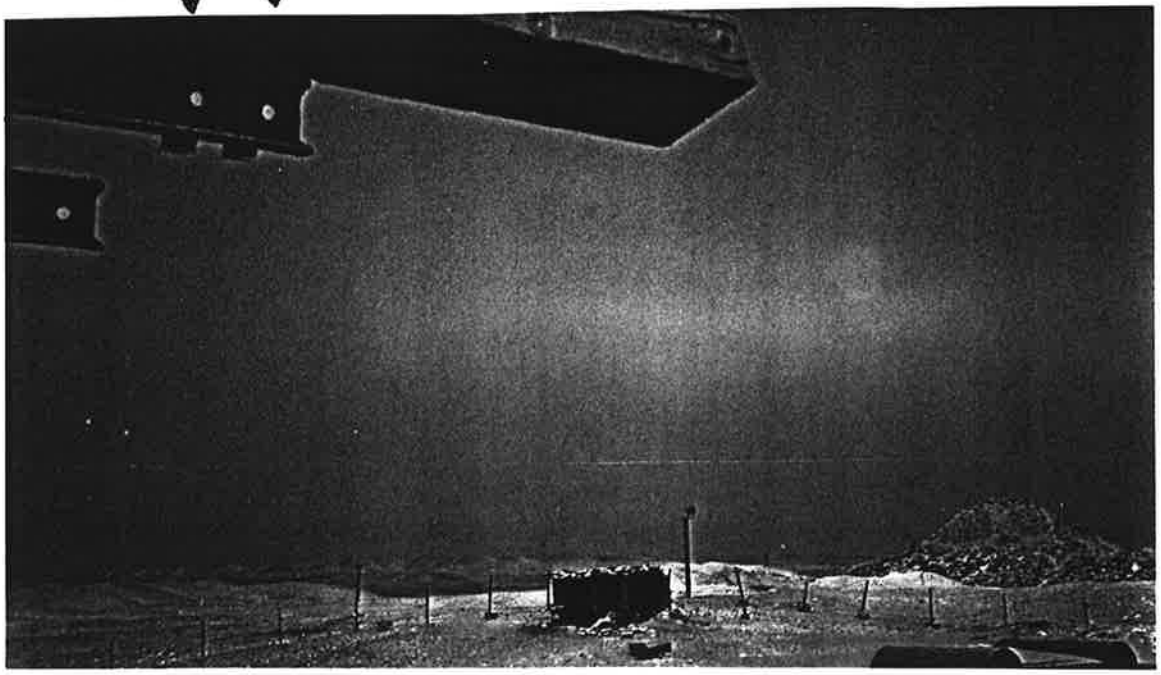
Passive air pollution sampling

Location of samplers April - May 1998

Sakkara
Step Pyramid of Djoser



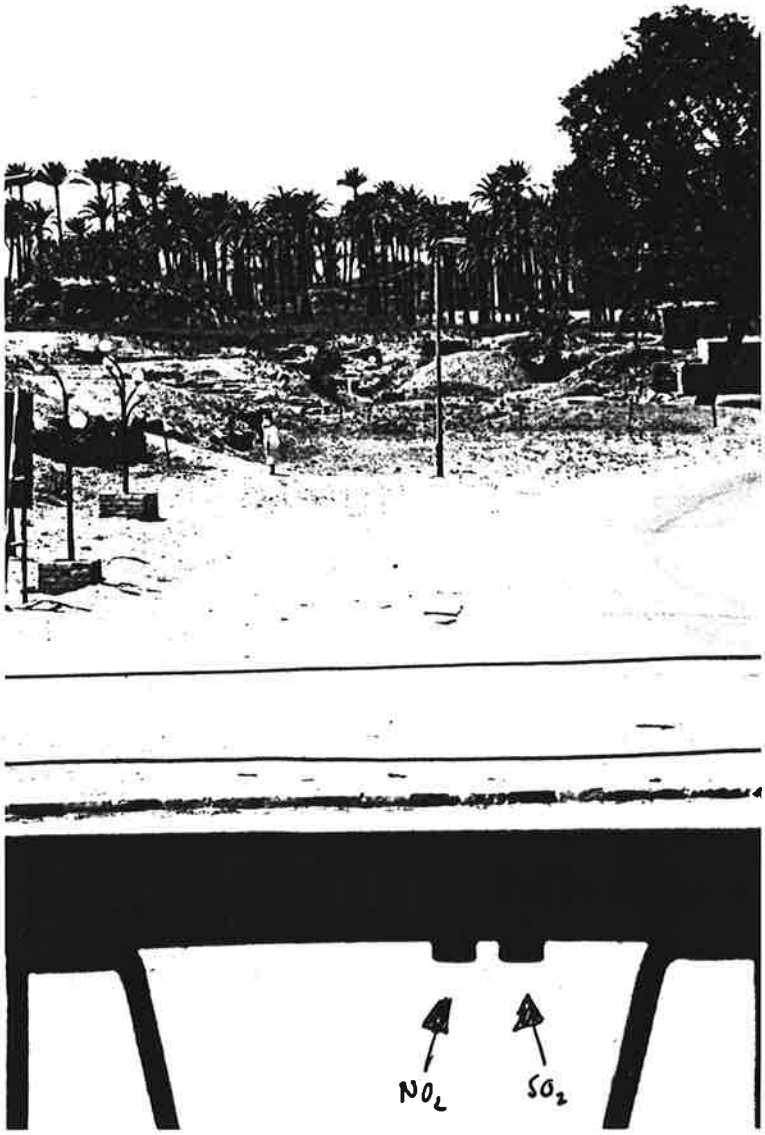
Samplers at
Horembeb Temple
Sakkara south



EIMP
Environmental Information
and Monitoring Programme
30 Misr Helwan St. Maadi, Cairo

Passive air pollution sampling
Location of samplers April - May 1998

Memphis (the old capital)



Samplers at the
Museum in Memphis

Appendix G.7.1 Summary Quarterly Report

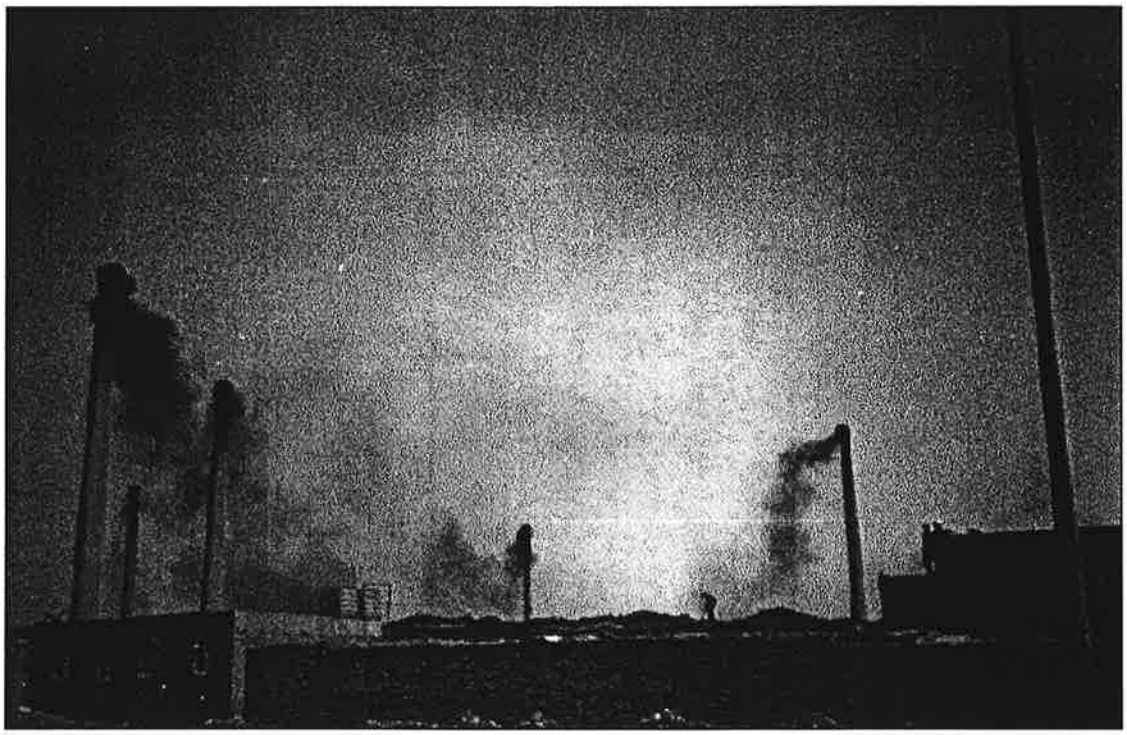
EIMP
Environmental Information and Monitoring Programme

EEAA
Egyptian Environmental Affairs Agency

Danida
Danish International Development Assistance

Summary Report

Air Quality in Egypt
Based upon EIMP air pollution monitoring data.
January - March 1998



Prepared by: Mohamed Nassar and Bjarne Sivertsen (EIMP/EEAA)

Air Quality in Egypt, Based upon EIMP air pollution monitoring data, January - March 1998

1. Introduction

A modern air quality monitoring and information system is being established for Egypt as part of the EIMP programme. The measurements will combine on-line monitoring and air quality sampling of the most important air pollution indicators as well as of meteorology. The selected pollutants are in accordance with the air quality limits given in the Environmental Law no.4 (1994) for Egypt (Ref. 1), and are also similar to the internationally recognised air pollutants as given by e.g. the World Health Organisation.

Air Quality data are collected using automatic on-line monitors and manually collected samples. A total of 40 sites covering all Egypt has been selected. The measurement sites are located in Greater Cairo (13, included the Monitoring Laboratory), Alexandria (6), Delta (8), Canal Area and Sinai (4) and Upper Egypt (9). These stations will be installed during 1998-1999. The complete network is presented in Figure 1. Further descriptions of the programme can be found in Mission reports (Ref.2, Ref.3 and Ref.4) and in a Quarterly Report dated December 1997. (Ref.5)

During January - March 1998 the first two monitoring stations were operated, and the data from these are presented in a second Quarterly Report from the Monitoring Laboratory at Cairo University, CEHM (Centre for Environmental Hazard Mitigation) (Ref. 5). The location of the two monitoring sites are shown in Figure 2. A photo of the complete monitoring station at the Monitoring Laboratory is shown in Figure 3.

Statistical, numerical and graphical presentation tools will be developed. This summary report represents a brief presentation of the first air quality data collected as part of the EIMP/EEAA programme using a preliminary data handling and presentation programme.

2. Data availability and quality

The total availability of data collected at the two first monitoring stations of the EEAA/EIMP programme during the first quartile of 1998 (1 Jan - 31 Mar 1998) is ranging between about 40 and 80 %. Missing periods have been due to power failures, power shut downs and instrument malfunctions. The power shut down problems were solved in the beginning of February. The remaining data in the data base have been cleaned, and it is believed that the data presented in these analyses are of fair quality.

3. The main air quality problems

3.1. Thoracic particles in the air

The main air pollution problem at both sites, Tebbin and El Gomhoriya street, was thoracic particles (particles less than 10 micrometer in diameter; PM_{10}). The levels frequently exceeded 5 times the air quality limit values given in Environmental Law no. 4 of Egypt. The main sources for these particles seem to be traffic at El Gomhoriya street (mainly diesel buses) and industrial emissions at Tebbin. On a few days in March 1998 high levels of PM_{10} were also generated by wind (resuspended particles from the surface).

An example of PM_{10} particles in the air is shown in Figure 4 as 24-h average concentrations measured at Tebbin in March 1998. The extremely high PM_{10} concentration observed at Tebbin on 26 and 27 March 1998 (18 times the air quality limit value!), occurred with winds blowing from around south. The main source for this impact is located at the steel and iron factory or around the coke factory in Tebbin.

3.2. Industrial emission in Tebbin

In addition to PM_{10} the only exceedance of the air quality limit values at Tebbin was registered once for SO_2 . The highest SO_2 concentrations most often occurred when the wind was blowing from the industrial sources in southern Tebbin. The highest 24-h average SO_2 concentration was also measured on 27 March 1998 with winds from the industries in the southern Tebbin area, as shown in Figure 5.

3.3. Traffic at El Gomhoriya street

At Gomhoriya street the concentrations of SO_2 and NO_2 seldom exceeded the air quality limit values. The general levels of NO_2 normally ranged between 50 and 80 % of the limit values. The PM_{10} concentrations, however, exceeded the air quality limit values by a factor of 3 to 5. The 8h average CO concentrations exceeded the air quality limit value of 10 mg/m3 in 80% of the days.

Figure 6 show the effect of traffic reductions on Fridays. All air quality indicator concentrations are reduced on Fridays compared to the average for the whole week. SO_2 and CO are about 50% of the weekly average concentration, while NO_2 is only reduced by about 10%. This means that the main traffic is moving; i.e. idling giving rise to CO emissions and SO_2 from frequently accelerating (stop/start) diesel buses are reduced, while NOx from moving private gasoline cars are only slightly reduced.

3.4. Diesel fuel in cars and buses in Cairo

The main source for the air pollution problems in central Cairo seem from this first analyses of the EEAA/EIMP air quality monitoring programme to be the diesel buses. Diesel buses are emitting SO_2 and CO, and the problem is increased during bad traffic flows. The air pollution exposure is at largest during rush hour traffic, when the data also clearly show the effects of traffic congestion, as shown in Figure 7 for SO_2 and CO.

4. References

1. "Maximum limits for outdoor air pollutants" as given by Annex 5 of the Law number 4 for 1994, Law for the Environment, Egypt.

2. Sivertsen, B. (1997) Danida/EIMP, Air Quality Monitoring Programme, Mission 5 Report. Kjeller (NILU OR44/97).

3. Sivertsen, B., Marsteen L. (1998) Danida/EIMP, Air Quality Monitoring Programme, Mission 7 Report.(+Addendum). Kjeller (NILU OR1/98).

4. Sivertsen, B. (1998) Danida/EIMP, Air Quality Monitoring Programme, Annual Summary Report 1997. Kjeller (NILU OR2/98).

5. Abdelhady, Y. , El-Araby, T., El-Araby H. (1997) Egypt, Quarterly Air Quality Progress Report. Cairo University CEHM. (Dec 1997)

6. Abdelhady, Y. , El-Araby, T., El-Araby H. (1998) Egypt, Quarterly Air Quality Progress Report Jan-Mar 1998. Cairo University CEHM. (April 1998)

Air Quality Monitoring Sites in Egypt

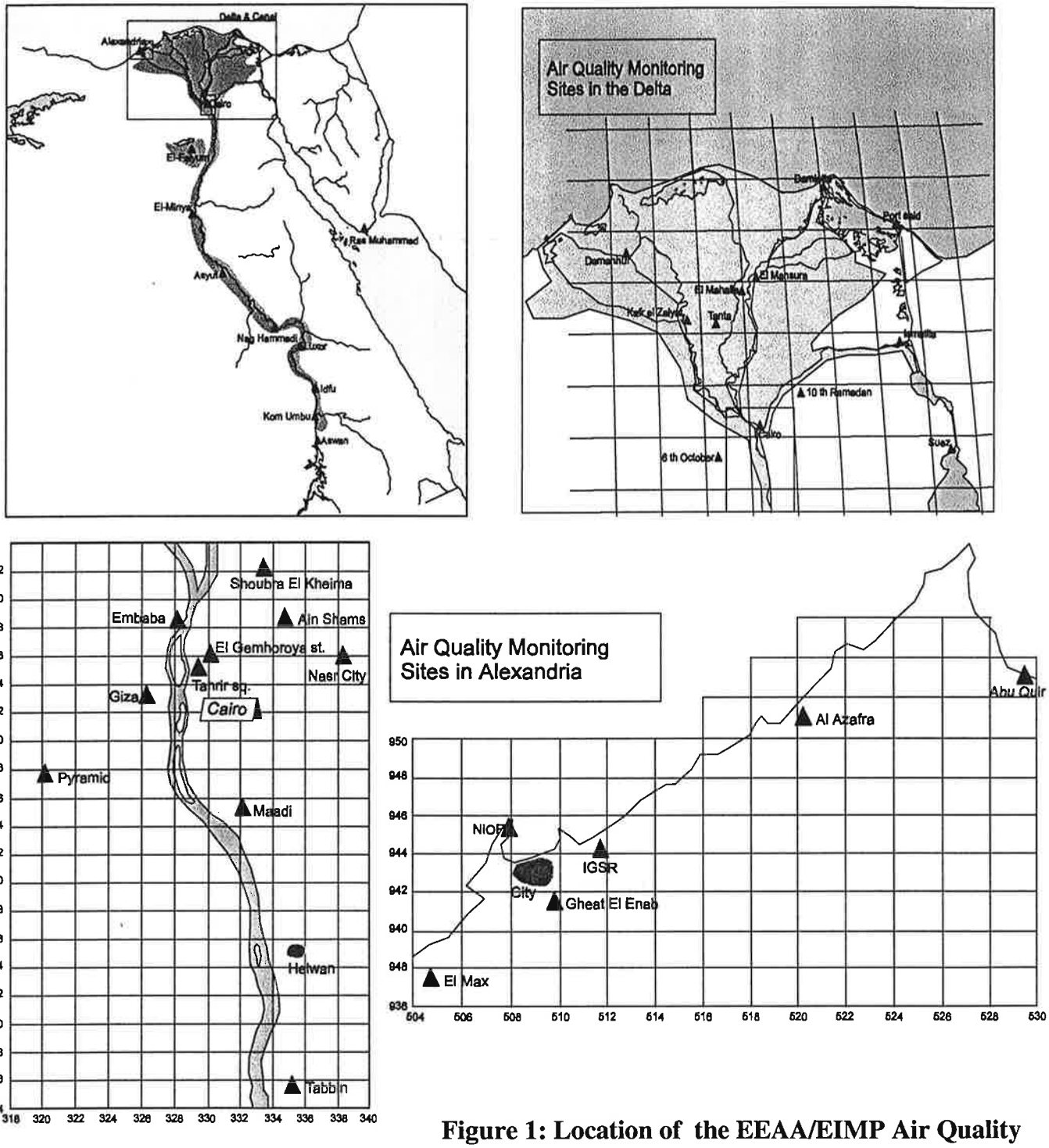


Figure 1: Location of the EEAA/EIMP Air Quality Monitoring sites in Egypt

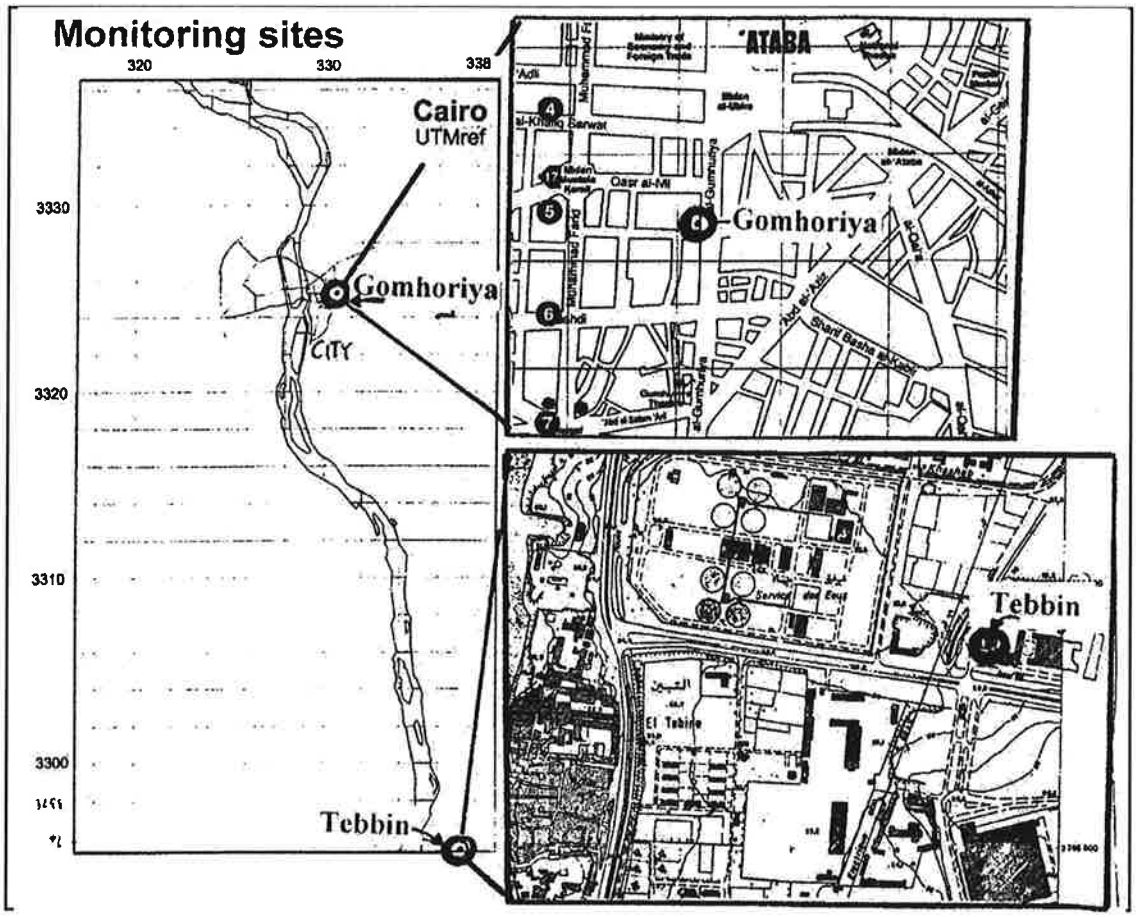


Figure 2: Location of the two EEAA/EIMP Air Quality Monitoring sites operated during 1 January - 31 March 1998

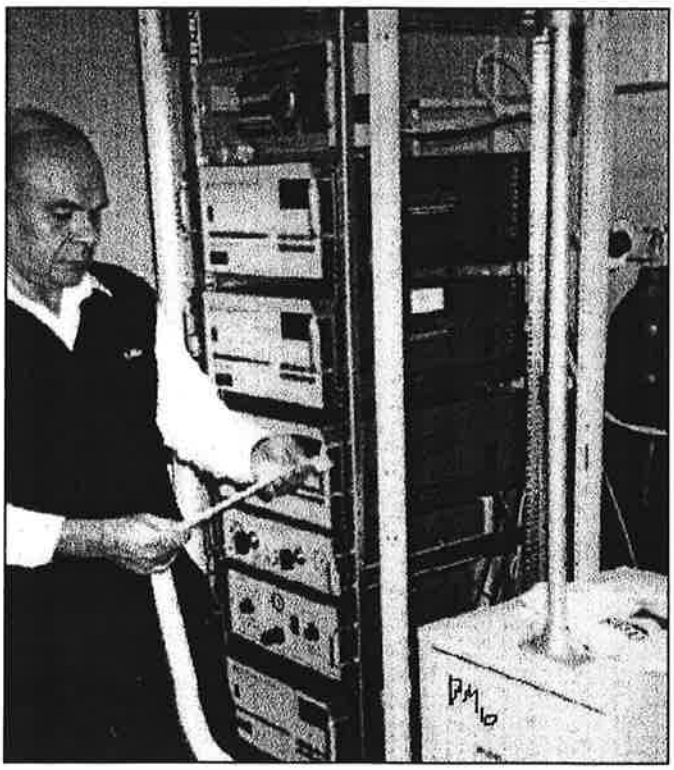


Figure 3: A complete monitoring station as shown from the Monitoring Laboratory

The station includes monitors for SO_2 , NOx, NMHC (hydrocarbons), CO, PM_{10} a calibrator and data loggers.

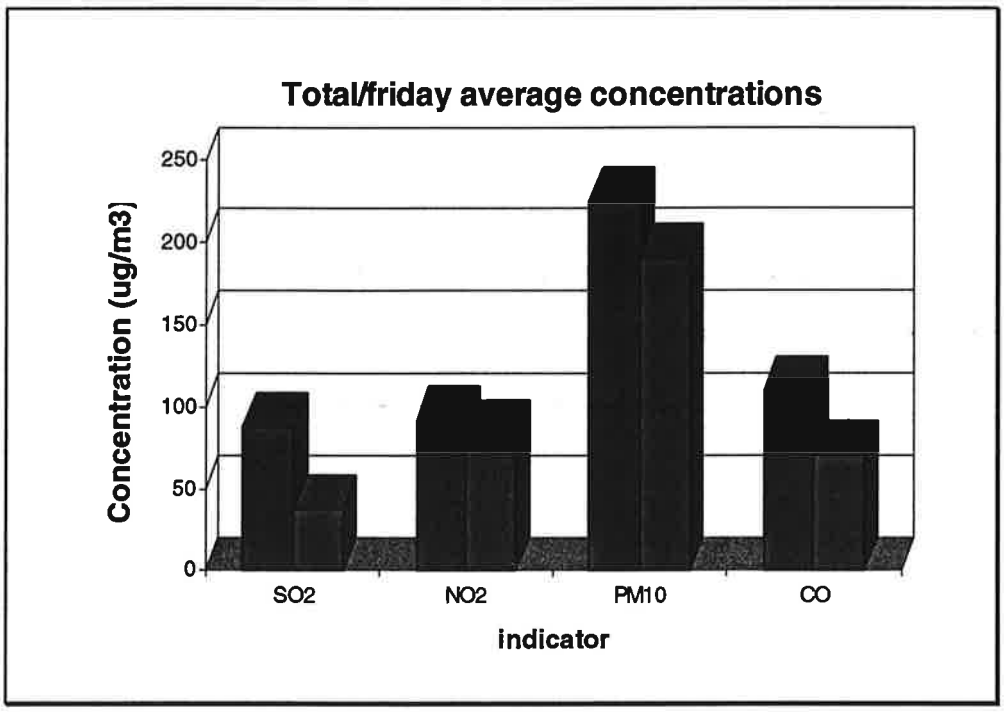


Figure 6: The effect of Friday traffic on the concentrations of SO_2 , NO_2 , PM_{10} , and CO.The average concentrations for Fridays are compared to the average for all days at Gomhoriya street , January - March 1998.

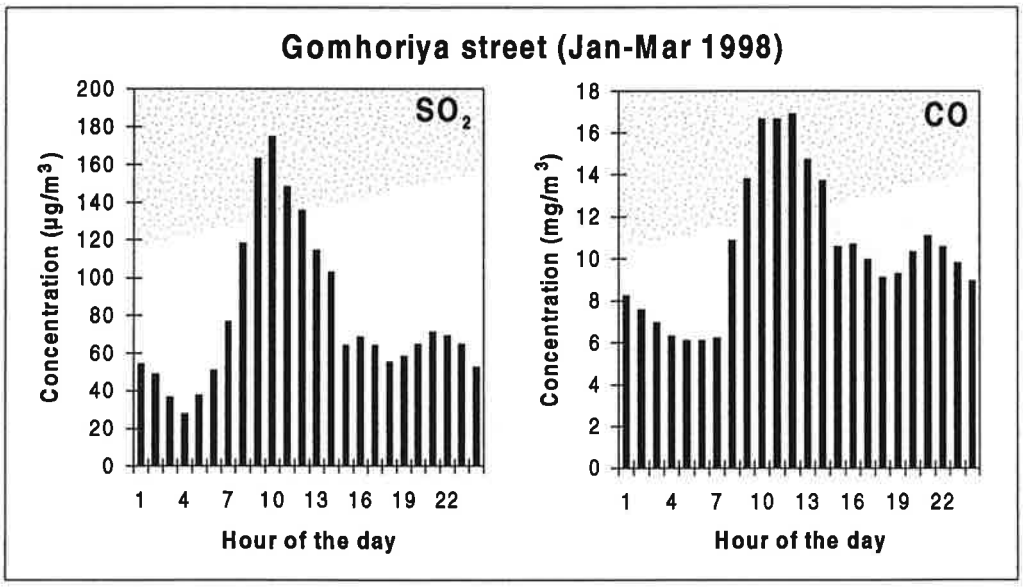


Figure 7: Average diurnal variation of SO_2 and CO concentrations at Gomhoriya street, January - March 1998

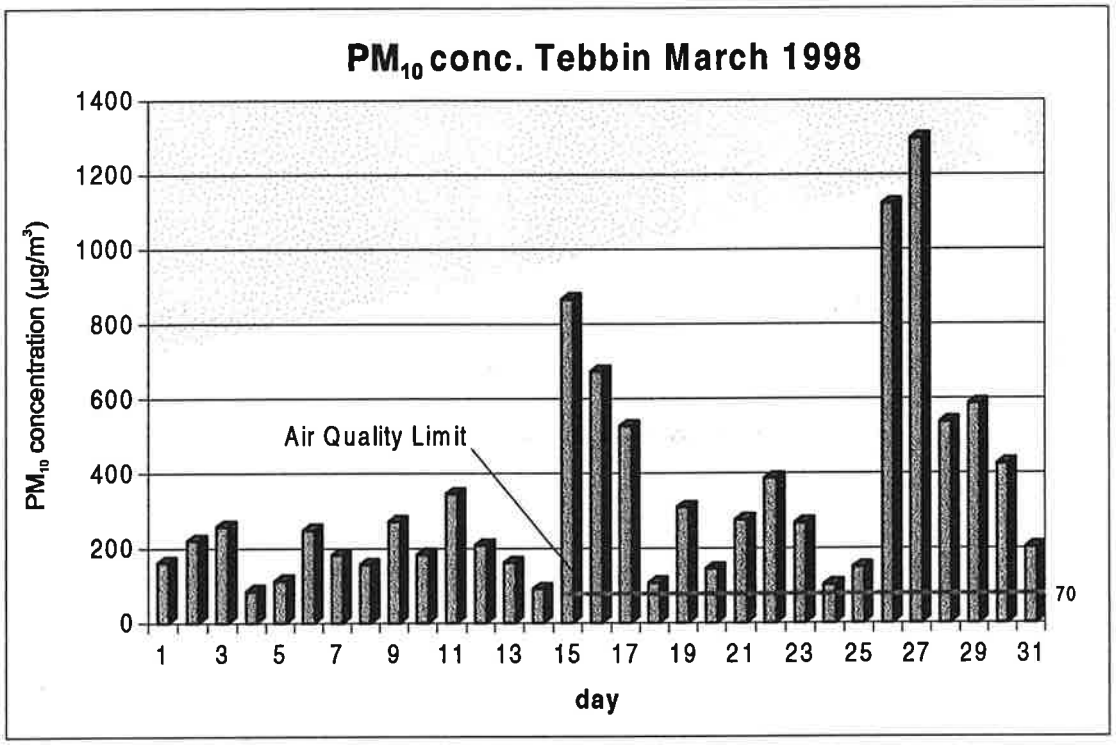


Figure 4: Daily (24-h average) concentrations of PM_{10} ($\mu g/m^3$) at Tebbin during March 1998. The Air Quality Limit value for Egypt of 70 mg/m^3 is shown.

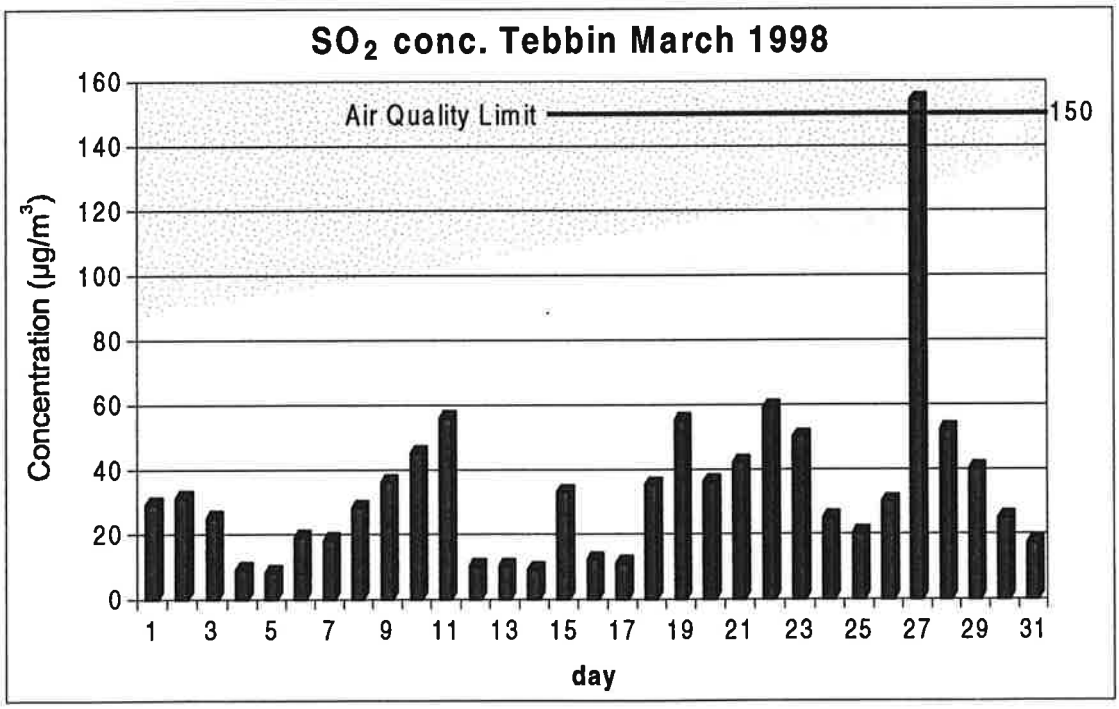


Figure 5: Daily (24-h average) concentrations of SO_2 ($\mu g/m^3$) at Tebbin during March 1998. The Air Quality Limit value for Egypt of 150 $\mu g/m^3$ is shown.

Appendix H

Reference Laboratory

Note

Subject REFERENCE LABORATORY

Meteorological Authority

Date 29 Jul 1998

To MF

Copy MN, BS

From UOL

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
Fax: +202 525 6467

E-mail: eimp@intouch.com

The possibilities for co-operation with the Meteorological Authority of Egypt (MAE) in the field of the Reference Laboratory - Air are as follows:

The data from the MAE air monitors would be a welcome addition to those produced by EIMP field sites, provided:

1. the data are produced under a quality system fulfilling the requirements of ISO Guide 25;

2. calibration of the MAE monitors is validated by an external agency at similar intervals as for the EIMP monitors; and

3. the MAE stations and connected laboratory/office facilities are audited at regular intervals.

Point 2 and 3: validation of calibration and auditing, are services offered by the Reference Laboratory - Air and could be performed by the Reference Laboratory, unless MAE has similar services ongoing from another competent institution.

Should MAE not have a quality system running, I recommend that they are offered the validation of calibration service (point 2 above) from the Reference Laboratory as a start for working towards comparability of all data produced in Egypt.

I suggest that it be seriously considered to offer the services of the Reference Laboratory free of charge to the MAE in order to get them into the game. The cost would amount to about 5000 LE per year for EEAA and in some years time when the system is well established EEAA could begin charging.

From various mails from Bjarne, I gather that the requirements for air monitoring are:

1. Access to MAE sites for establishing EIMP monitors and use of MAE experts for collecting, calibrating and controlling air monitoring data - after suitable training;

2. Climatological data for wind and temperature for about 10 sites in Egypt;

3. Ozone measurements - provided that they are produced under a suitable quality system, as described above for the Reference Laboratory;

4. A survey of radiosonde data

The top priority is number one on this list, access to MAE sites. SO_2, NO_x and TSP data are also interesting if properly quality controlled but less so than ozone.

After a consultation with Morten, the following requirement is added:

5. Data on rainfall

Appendix I

Component co-ordination

I.2.1 a) Weekly air quality
b) Weekly staff meeting
c) Monthly status report
d) Communication with WHO
e) CAIP brochure
f) Various status reports and outputs

a)

Minutes of Meeting

Subject: Ambient air monitoring

Date: Weekly planing meeting

Place: 98.04.28

Participants: EIMP

Prepared by: T. El Araby (Cairo Univ), M. Nassar (EEAA), BS (EIMP), L. Marsteen (EIMP)

Distribution: LM/

T. El Araby (fax), A. El Sueini (fax), B. Sivertsen, M. Nassar, L. Marsteen, M. Fathy, M. Andersen

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

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Next meeting: Sunday 10 May 14:00 at EIMP office

		Init.
1.	**New installations** To assure correct operation and that all necessary bits and pieces are tranferred from Tabbin all instruments except for the met. towers will be assembled, tested and calibrated at the Mon.lab. before transportation to stations. **Tabbin:** Finalised Wednesday 22 October 97. **Monitoring Laboratory:** Finalised. **El Gemhoroya street:** Finalised Tuesday 23 December 97. **Cairo University station:** Finalised. **Reference Laboratory:** Finalised. **IGSR:** Finalised Thursday 23 March 98. PC and printer for office work will be installed in the autumn when the new lab is ready. **Shoubra:** Finalised Thursday 30 April. **NIOF:** Equipment transfered from Tabbin to NIS. The station will be installed in the autumn according to original plan.	LM/MN
2.	**Status Instruments** To avoid possible dammage of instrumentation all instruments using 220 Volts should be equipped with German type electrical plug. We need more plugs and sockets. **CO monitor from IGSR:** Has failure - returned to Tabbin. Status? **CO reactor from IGSR:** Pressure gauge failure - returned to	LM/ MN CTS CTS

	Tabbin. Status?	
	PM10 monitor from IGSR: Will not start automatically - returned to Tabbin. Status?	CTS
	Check of instruments at Tabbin: CTS will check all instruments at Tabbin before the warranty period expires. A certificate will be provided for each instrument. CTS will use Tuesdays and Wednesdays every week. EEAA will provide two benches.	CTS MN
	PM10 monitor: Long intakes will be provided at the cost of transportation. Shiraz at COWI has been notified. Status?	LM
	CTS will not calibrate any more PM10 monitors. Their calibration procedures are questionable - straps on 2 pump tubes.	CTS
	Thermo suggests that the high readings are due to water condensation in the intake and on the filter. Heating of intake using the gas monitor manifold heater will be tested during parallel run. Status?	CTS
	The TSP and PM10 HiVol samplers at Tabbin were blown down during the sand storm. CTS will fix the TSP HiVol to the floor. Status?	CTS
	Portable met. tower: Installed at Shoubra. 220 to 12 Volt transformer missing	CTS
	Met. towers: Most towers will be only 6 m on roofs. A ladder and saftey belt is sufficient to maintan the sensors. CaiUni has found a man who can do the job. MN checks ladder and safety belt. 2 sensor lifts are needed. Will be ordered later.	MN
	Silica gel: New silica gel arrived at EIMP office. 1 kg will be handed over to both CaiUni. IGSR and NIS.	MN
	Balance at Mon.Lab: The stand for weighing the filters is too small. MN will make a tray.	MN/ CaiUni
	Filters: One set of silica gel. charcoal and Purafil filters necessary to replace those used at Ref.lab. Has been ordered. Status?	LM
3.	**Status Stations**	
	Computer Centre: EMC visited CTS and installed a new System Manager. It looks like it is working. Operations manual and original diskettes missing. Station Manager original diskettes missing.	CTS/ CaiUni
	Unable to load zip-files from StationManager into System Manager when the file(s) cover more then one diskette.	
	Problem when downloading 60 days from Station Manager.	

	Problem when trying to restore data in the editor.	
	System Manager backup PC and Station Manager PC on loan to CTS transfered back to CaiUni.	
	Cairo University expressed a need for a computer with Windows 95 & MS Office 97 with Arabic support and a color printer for office work and report writing. Received OK.	MN/LM/ BS
	Telephone lines: Shoubra - Nothing. CaiUni - Agreement 29 March, El Gumhorrya str. - Le 1550 extra for new line. Tabbin - Delay at telphone office.	MN
	Tabbin: The gas monitor air intake and manifold has been by-passed by a single teflon tube to reduce dirt accumulation. It is still clean. Test continues.	LM
	CTS will mount the manifold vertically. When?	CTS
	PM10 HiVol: 3 more samples necessary for parallel measurement with PM10 monitor. MN will try to provide filters.	MN
	The monitors were turned off during a heatwave. The air cond. was not working. It is OK now. If possible LM and CaiUni will calibrate the monitors before 12 may.	LM/ CaiUNi
	Monitoring Laboratory: Manifold blower not working good. Will be replaced as warranty. Status	CTS
	Extra rack will be transfered later.	MN
	The data logger stopped. Lost 24 hour of met. data.	CaiUni
	Network card necessary for printouts.	CaiUni/ MN
	Reference Laboratory: The laboratory environment sensors installed. Not connected to the data logger. Status?	CTS
	NIS claims they have not received a CO_2 gas cylinder. They have all they need.	LM
	El Gemhoroya street: The station will be moved to the ground floor.	MN
	Installation will be done by CaiUni (and CTS if necessary).	CaiUni
	HC monitor turned on again after new N2 cylinder installed.	CaiUni
	Station Manager software updated. OK.	CTS
	Flow and mass calibration of PM10 monitor done. Report has been delivered to MN. The flow was restricted by a primitive clamp on the pump tube. Result: NO FLOW! Not acceptable. Clamp removed - flow OK.	CaiUni
	Cairo University station: Zero/ Span check performed except	LM

	for O3 monitor. NOx monitor has probably had PMT voltage failure since CTS installed it. Still not fixed. Data logger records wrong SO2 values. Result: Only O3 data. Intake washed. It is horisontal with no bend. Sand blows into it. The meteorology tower installed OK. Translator installed. Connected to data logger OK. Rain gauge still not installed. Status? **Power stability:** All stations should be equipped with power stabilisers and the HC monitors and H2 generators should be equipped with UPS. 1 UPS for HC monitor at Gumhorrya ordered.	CTS LM/BS
4.	**Data collection and validation**	
	Data is now beeing collected into the System Manager via diskettes. Excel is still used to visualise data. The dayly check on the monitors is not possible due to missing telephone lines. The second quarterly report is soon finnished.	CaiUni/ BS
5.	**Training**	
	Training evaluation: El Soueni wants to know if the institutions need more training. EIMP report back when new System Manager manual is available from CTS. **Documentation and lectures:** OK **Training:** Station Manager training done. OK. System Manager training will wait until installation problems are solved. Training on the Odessa data logger started Tuesday 17 March. Status?	CTS CTS CTS
6.	**Other matters**	
	Questions to Kontram/CTS: CTS accepts a one year performance warranty period for all instruments. The performance warranty expires one year after the instrument has been put in to operation.	

EIMP b)

Minutes of Meeting

Subject:	STAFF MEETING # 34
Date:	26 April 98
Place:	EIMP Office
Participants:	MCA, Dr.Zarka, Ahmed A.El.Seoud, M.Fathy, Ulla, Nasar, Bjarne, Ayman, Naglaa, M.Zaki, Samer, Lydia
Prepared by:	Lydia Kiriacos
Distribution:	EIMP Staff (incl Dr. Mohamed El Zarka)

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- Morten started the meeting by welcoming the new Data management staff (Naglaa and Ayman).
- He also mentioned that the EIMP would prepare templates to each monitoring institution for te front page of EIMP data reports and that we need to inform the relevant institution about such templates.
- finally he asked everyone to state his/her current status of activities.

1 Procurement

Morten stated that we drafted a memo to Dr. Ibrahim AbdEl Galil to get equipment exemptions and we propose to give a format to Dr.Zarka.
Ahmed stated that this memo will be given to Dr.Zarka to be submitted and then approved by Dr. Ibrahim AbdEl Galil.
He also stated that this issue will be discussed in the next steering committee.

2 Institutional support

Zaki stated that he is introducing our IT system to the new Data Management staff (Naglaa and Ayman).
Bjarne asked if the new Data management staff will work per each component Ahmed replied that they will work together as a team on assignments and tasks related to the components.
Morten replied that it is too early to specify the work of each one because they have to known first of all about Databases and then gradually develop individual job descriptions.

He also stated that he will contact Ritsec and IGSR to choose the suitable day for the CW database training in IGSR before the 7th of May.

3 Coastal Water

Ahmed stated that he has received the end of mission reports. He asked about the status of the database. Zaki stated that the system does not work with the CTD device data. SAS stated that this might be the problem of the equipment as RITSEC had designed and developed the system according to a certain file format. He added that RITSEC will help in changing this upon request from EIMP.

Ahmed stated that UOL and Dr Anwar have tried to get confirmation and feedback that all water purification equipment has been installed at NIOF and IGSR.

4 Air Quality

Bjarne stated that the Air Quality component had taken 40 passive samples located at historical monuments in Luxor, Edfu, Aswan, Giza and Sakara . the samples will be collected next week.
Concerning the new installations, Nassar and Leif has completed installation of the new station at Alex and the data is available. He also stated that the same training for the people of Cairo university will be given to the experts at IGSR.
He also stated that he will finalize the first quarterly data report before his departure.
He also stated that Nasar and Leif installed and calibrated the new station at Shoubra . Leif has take the instruments from TIMS to NIS to prepare for monitoring at Kolaly.
Concerning the System Manager, he mentioned that it is 90% working now but we have not received the manual till now from CTS. He also stated that they are transferring the data on diskettes because there are no telephone lines and that the presentation presented in the quarterly report was based on statistics and graphs from a simple Excel sheet.
Bjarne stated that we need a high volume sampler filters. We have ordered another package of filters from NILU.
Zaki asked about the work of TIMS. He replied that everything has been checked the data percent in the quarterly report is of adequate quality.

On request from Zaki Bjarne stated that he had written a memo specifying the qualifications of the data base expert.
He also stated that both he and Leif will travel back to Norway on the 13th of May and 12th of May respectively.

Ahmed asked if anyone at Cairo university has taken a training in the use of the system manager, Bjarne confirmed that all the people at Cairo university has already taken the training.

5 Point Source

MCA stated that Heba attends a training course with Cairo Air improvement project.
He also stated that the planned monitoring activities have been completed at Thoura and National cement and the next site visit will be at Shoubra.
He also stated that some issues are still pending with TIMS and we have received the last progress report.
Ahmed stated that Heba and M.Fathy had a successful meeting at TIMS who now appears to be on the right track.

6 Reflab

Concerning the Reflab water, Ulla stated that Kirsten prepared a participants tests for her training activities at Ain Shams university.

Concerning the Reflab air, Ulla stated that Leif has calibrated the monitoring for the next station at NIS as described by Bjarne.

She also stated that EETP project had located a training course for industrial safety at Ain Shams university and she will go with them to be sure that they are satisfied with the training.

7 Miscellaneous

- SAS stated that he encourages all the staff to reduce the volume of papers by using the Microsoft exchange.
- he also stated that we have began to receive the faxes and distribute it through the Microsoft exchange
- Finally, Morten stated that Fathy left the meeting to receive the key for our new store at new Maadi and everything will be moved fromTIMS to the new store.

EIMP

Minutes of Meeting

Environmental Information
and Monitoring Programme

EEAA - Danida - COWI

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E-mail: eimp@intouch.com

Subject:	STAFF MEETING # 35
Date:	10 May 98
Place:	EIMP Office
Participants:	MCA, Ahmed A.El.Seoud, M.Fathy, Ulla, - Bjarne, Naglaa, Ayman, M.Zaki, Samer, Lydia
Prepared by:	Lydia Kiriacos
Distribution:	EIMP Staff (incl Dr. Mohamed El Zarka)

1 Procurement

Morten informed that the second incubator for IGSR had arrived. Ahmed will arrange for handing over to IGSR.

2 Institutional support

Zaki stated that he has introduced the IT system to the new staff last week.

Concerning the Coastal Water Monitoring database training, he stated that it will be held in the first week after the field trip .Comments on the database will be summarized and then sent to RITSEC. He also added that Ayman will take care of this system and act as a liaison . Morten stated that the CWMDB is established for EEAA/EIMP purposes and that we would reserve the right not to consider all comments from the monitoring institutions since such comments could reflect the institutions' wish to use the database for other than EIMP purposes.

Ahmed suggested that when RITSEC undertakes the training, Zaki could make a small work shop meeting to known their comments and filter out what was relevant to our job.
SAS asked why the Coastal Water database training at IGSR was postponed when RITSEC was ready to run the course. Ahmed replied that IGSR had an upcoming field trip and they had some arrangements to make before the field trip so they postponed the training till after the field trip.

Concerning the CWMDB, Ahmed stated that IGSR has sent their comments and it was processed. Jacob has sent an Email with some additional comments SAS suggested to hold a meeting with Morten, Ahmed and Zaki to discuss this issue.
Morten asked about the equipment Database and when it will be expected to be finished. Zaki replied that the data entry of the equipment will be ready next week.

3 Coastal Water

Ahmed stated that they (Morten, M.Fathy and himself) had a meeting on the 4th of May at IGSR and NIOF Alex. and then he gave a short brief about the main issues which were discussed with these institutions in Alexandria.
He stated that they discussed how they will cooperate to prepare for the next field mission and gave them a feedback on the experience from the last mission.
He stated that they have to discuss with Arne the request of NIOF of changing the station to El Tur city. Morten replied that NIOF should send a fax with their request.
Ahmed stated that IGSR need the additional down payment to be transferred directly to IGSR's account and not to be issued as a cheque to University of Alexandria. Morten replied that there are no problem with this as long as the account to which the money should be transferred was in the name of IGSR and not an individual person.

4 Air Quality

Bjarne stated that Leif and himself will leave on 12th and 15th of May respectively.
He stated that the installations of monitors at Shoubra El Keima was finalized last week.
He also stated that the shelter for the next station at Quolaly was inspected and found to be very good. He furthermore mentioned that the instruments for Quolaly have been prepared, calibrated and will be installed today.

He also mentioned that they are at present 7 air monitoring stations operating in addition to the 3 meteorological stations.

Concerning the Quarterly Report, he stated that it has been finalized and presented to EIMP and EEAA.
He stated that a High volume filters arrived from NILU last Wednesday, and are being installed to day for PAH analyses and element analyses at NILU.

He also stated that the reasons for missing data in April/May has been malfunction of AirCons. The company has not managed to follow up with repairs Morten replied that he has to inform Anwar about the situation in order for him to make the supplier rectify the situation or alternatively to find another supplier.
He mentioned that CTS have several unfinished duties which has been reported to CTS and Kontram. This will be taken up in the weekly air pollution meeting to day. And he also stated that QA/QC has been prepared. All SOPs for air quality monitors have been written, and Station Manuals are prepared for all the sites in operation.
He also stated that The passive samplers in Upper Egypt and in Giza/Sakkara will be collected Tuesday-Wednesday this week.
He stated that M Nassar will prepare another 3 shelters in the near future, and also make preparations for a number of monitoring and sampling stations during the Summer.
M.Fathy asked about any news concerning the System Manager. Bjarne replied

that we now only need the new manuals for the SM and furthermore that we are waiting for the telephone lines. He asked if it was possible to support the monitoring institution to speed up the process.
Ahmed stated that they'd seen the station in Alex. and that it is working properly Bjarne replied that the system manager seems to be working but we need the manual and it will not available till the end of May. Morten mentioned that the SO_2 monitor at the IGSR station showed a steady level of -3.5 ppm during the visit which indicated some malfunction.

5 Point Source

Morten stated that Heba is still attending a training course with Cairo Air Improvement Project.
Ahmed stated that Dr.Ibrahim Abdel Gelil asked to arrange a meeting with Dr.Said Khalil.

6 Reflab

Concerning Reflab water, Ulla stated that Kirsten is on vacation and she will be back on Tuesday the 12th of May to continue her training at Ain Shams University.
Concrening Reflab air, Ulla stated that she will continue the training course for Quality assurance within this week.

7 Miscellaneous

- Bjarne asked if there is a plan to move the equipment to the new store.
  Morten replied that all the equipment has been moved except the Air Quality equipment.
  M.Fathy replied that it will be packed and transferred to the new store within this week.

9

Status report Air Pollution Monitoring April 1998

Data management
The problems identified in the System Manager in March was corrected 6-10 April 1998, when an expert from the US EMC company visited Cairo. Final Manuals have not been received, but the System Manager seems to operate adequately at the Monitoring Laboratory.

The first Quarterly data report containing data from the network was, however, largely based upon a preliminary data handling system based upon Excel statistics.

Training
Personnel at the Monitoring Laboratories both in Cairo and in Alexandria have continuously received training in the use of monitoring instruments (on-the-job training). They are following the installations and have been involved in operations of the monitors and samplers at all stations operated as of April 1998.

QA/QC
Standard Operational Procedures (SOP) have been developed as an important part of the QA/QC procedures. Station Manuals including all information adequate for the operation of the sites have been developed for stations set in operatin in April.

Monitoring
Monitors and instruments for IGSR/Alexandria, Shoubra ElKheima and El Quolaly were prepared and calibrated in April.
Passive samplers were located at 20 locations at historical sites and tourist areas in Upper Egypt, Sinai and Giza/Sakkara area. The samplers will be collected for analyses of SO_2 and NO_2 in May 1998.

The monitoring sites operated in April were.
Tabbin:
Monitors and samplers operated on a routine bases. Problems with the AirCon in very hot weather caused shut down of some monitors.
Gomhoryia street:
Monitors operated and data were retrieved weekly on diskettes. NOx monitor shut down caused by over heating (no AirCon). PM_{10} monitor stopped caused by malfunction in pump.
IGSR, Alexandria
All initial malfunctions on the IGSR monitoring station were corrected in April. New PM_{10} monitor installed. The meteorological tower was built, sensors mounted and measurements set in operation.
Giza, Cairo University:
The SO_2 monitor was re-calibrated, NO_2 reading still inadequate, ozone monitor operates but need calibration. Error in the data logger?
Meteorological data are being recorded and reported daily.
The Monitoring Laboratory lab station is functioning.
Shoubra ElKheima

Instruments were prepared, calibrated and installed in April. The station also include the mobile meteorological tower. Will record wind data till October 1998.

El Quolaly

The Quolaly site near Ramses square was clearified, agreement with owner signed. Shelter for Quolaly was built and instruments were prepared in April. Installation is planned for beginning of May.

Tebbin South

Shelter for the sampling station, to be shared with Cairo Air Improvement Project, was started in April, and is being built in spite of problems with local power system.

WORLD HEALTH ORGANIZATION **ORGANISATION MONDIALE DE LA SANTE**

Téléphone Central/Exchange: 791. 21.11
Direct: 791 4261

In reply please refer to:
Prière de rappeler la
Your reference:
Votre référence: UEH A6/445/14 EM

Dr Mohamed Nasar
Environmental Information & Monitoring Programme
EEAA Building
30 Misr Helwan St.
Maadi, Cairo
Egypte

23 January 1998

Dear Dr Nasar,

Air Pollution Monitoring

The World Health Organization has established a new programme, the Air Management Information System (AMIS), under the umbrella of the Healthy Cities programme. AMIS is the successor of the GEMS/AIR programme which was jointly run by UNEP and WHO between 1973 and 1995.

The objectives of AMIS include:

1. act as a data and information broker;
2. produce technical documents in support of all aspects of air quality management;
3. manage the global database comprising validated data from an expanded number of cities;
4. conduct annual reviews and distribute them widely.

Attached please find a brief description of AMIS and the first edition of the AMIS CD-ROM which contains, among other information, the AMIS core database with summary data of 60 cities in the world.

We would be grateful if Egypt could contribute to the AMIS and submit selected air quality data from one or a few Egyptian cities for the purpose of extending the summary data collected. The data requested are indicated on the enclosed "Data Summary Table". The type and form of the data (annual means, high percentiles 95 or 98), and # of days WHO guideline values have been exceeded) have been kept as simple as possible to assist with reporting, but **if you are able to report annual means, this would be very welcome.**

While a range of pollutants SO_2, NO_2, CO, O_3, black smoke, SPM, PM_{10}, Pb are specified, **we kindly request you to report whatever data you have for any city. We would be pleased if you could provide data for three different sites (industrial, commercial, residential) in each city as indicated on the data sheet.**

Thank you in advance for your help, and we look forward to hearing from you.

Yours faithfully,

Dr Dietrich Schwela
Urban Environmental Health
Division of Operational Support
in Environmental Health

Direct fax n° +41.22.791.4127

1948 1998 WORLD HEALTH ORGANIZATION ORGANISATION MONDIALE DE LA SANTÉ

Data sheet for AMIS-Air Pollutants-Database

Site-Name:

City Name:

Site-Details: **Industrial ❑** **Commercial ❑** **Residential ❑**

Other ❑ **please specify: .....**

	SO_2			NO_2			CO		
Year	Annual Mean	95-Percentile	# of days exceeding WHO Guideline	Annual Mean	95-Percentile	# of days exceeding WHO Guideline	Annual Mean	95-Percentile	# of days exceeding WHO Guideline
1986									
1987									
1988									
1989									
1990									
1991									
1992									
1993									
1994									
1995									
1996									

	O_3			Annual Mean					
Year	Annual Mean	95-Percentile	# of days exceeding WHO Guideline	Black Smoke	SPM	PM-10	Pb	Other	Other
1986									
1987									
1988									
1989									
1990									
1991									
1992									
1993									
1994									
1995									
1996									

Please mail or fax this data sheet to:

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E-Mail: schwelad@who.ch

The Air Management Information System (AMIS)

and a

Global Air Quality Partnership

The Air Management Information System (AMIS) is a programme developed by WHO under the umbrella of the Healthy Cities Programme. AMIS has the objective to transfer information on air pollutant concentrations and air quality management tools between countries. In this context AMIS acts as a global air quality information exchange system. AMIS programme activity areas include

- Coordinating databases with information on air quality issues in major and megacities;
- Acting as an information broker between countries;
- Providing and widely distributing technical documents on air quality monitoring and management;
- Publishing and widely distributing Annual Trend Reviews on air pollutant concentrations;
- Providing training courses with respect to air quality monitoring and management;
- Linking donors and needy recipients for monitoring equipment;
- Running Regional Collaborative Centres to support data transfer activities, perform training courses and implement twinning projects.

AMIS is a set of user friendly MSACCESS based databases. The core database contains summary statistics of air pollution data like annual means, 95-percentiles, and the number of days on which WHO guidelines are exceeded. Any compound for which WHO air quality guidelines exist can be entered into the database. Data handling is easy and data validation can be assured with relatively little means. Diskettes and compact disks are now produced. In the existing version data (mostly from 1986 to 1995) from about 60 cities in 30 countries are represented. Moreover, a report of the data will be produced. All these items will be made available to AMIS participants and also distributed to interested non profit organisations free of charge.

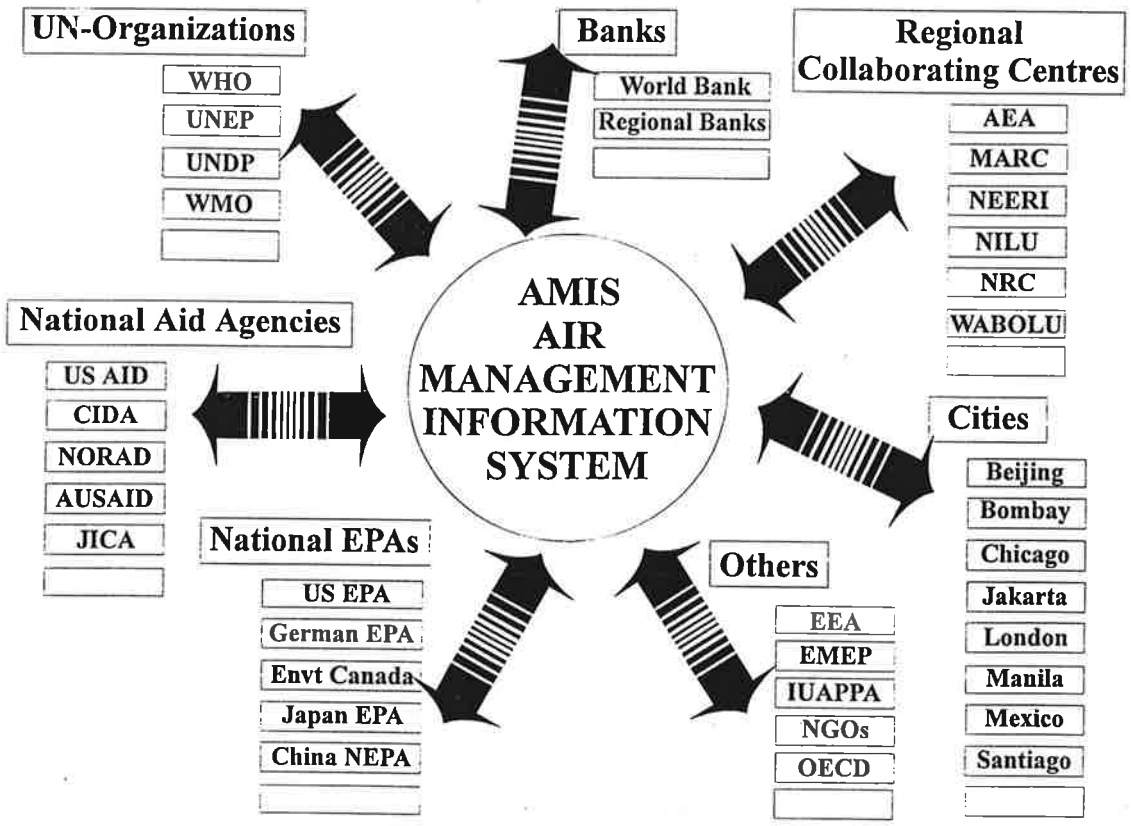
Other AMIS databases which are being planned or developed:

WHO air quality guidelines and countries' air quality standards;
Characterisation of emissions of major and megacities;
Reference to other air quality databases;
Addresses of AMIS participants;
Addresses of monitoring device manufacturers;
Addresses of training institutions;
Use and accessibility of dispersion models including information on where to access these models;
Indoor air pollution levels in urban and rural areas;
Noise pollution levels in major and megacities.
Air quality management capabilities and procedures of cities;
Control actions and magnitude of their costs;
Adverse effects on air pollution on health and magnitude of their costs.

Data for this and other AMIS databases which are being planned (see box) could be collected via WHO Regional Offices and AMIS Regional Collaborating Centres. For the core database it is intended to increase the number of contributing cities to 100 by end 1997 and 300 by end of the millennium. The following pages show the structure of the core database and characteristic outputs. The other data bases are planned to exhibit a similar structure as the core data base.

The AMIS Global Air Quality Information Exchange system is planned as a component of a Global Air Quality Partnership, which can be visualized as an information turntable provided and used by members, see figure below. It is envisaged that all members provide and have access to information.

The Global Air Quality Partnership



Fax from Cairo

EIMP
Environmental Information and Monitoring Programme
EEAA Building, 30 Misr Helwan St, Maadi, Cairo, Egypt
Email: eimp@intouch.com, Tel. 202 525 6442 Fax: +202 525 6467

To: 00 41 22 791 4127
Att: Dietrich H. Schwela

Date: 26.11.97
No pages: 1

Dear Dieter,

Referring to your letter of 23 Jan 1998, which recently arrived at our office in Cairo (letters are very slow in this country!) we appreciate all the information you provided us with. Thank you!

Historical air quality data from Egypt

We would be more than happy to contribute to the AMIS programme, submitting historical air quality data. However, these data have not been collected by EEAA (Egypt Environmental Affairs Agency), but by the Health Authorities. Secondly, the quality of these data, especially when SO_2 is concerned, is not adequate to give a fair picture of the situation in Egypt. The SO_2 concentrations have been strongly under estimated, and recent studies indicate that the levels in large parts of central Cairo may well exceed 100-150 $\mu g/m^3$. Measurements of NO_2 have just started (2 months ago).

Data for black smoke and TSP can be made available, while PM_{10} and CO measurements have just started. Ozone concentrations have been measured occasionally by various institutions (The Meteorological Organisation and others), but there is not a continuous record of such data available.

Typical levels of black smoke (soot) in Cairo was as an average of 5 sites in 1995: 54 ± 62 $\mu g/m^3$ (in central Cairo 120 $\mu g/m^3$). The annual average TSP concentration in Cairo was 600+260 $\mu g/m^3$. In Alexandria the annual average for BS was in 1995: 18+10 $\mu g/m^3$ and for TSP: 320+230 $\mu g/m^3$.

The EEAA/EIMP air quality monitoring programme

The new air quality monitoring and assessment programme for Egypt is under development at present. A total of 3 monitoring stations in Cairo and one in Alexandria is now in operation. The data are being quality assured, and a first data report is being prepared containing data collected from 1 January to 31 March 1998. It will thus not be possible to report annual means and annual statistics until the end of this year.

In the future the total programme will contain about 40 measuring sites, from which about 20 are advanced automatic monitoring stations. All the criteria pollutants have been included in the programme. The programme has been designed to meet the requirements of the WHO/AMIS programme. Sites represent areas where people live; streets, residential areas, industrial areas and background areas.

Two monitoring institutions (one in Cairo one in Alexandria) are responsible for data collection, control and reporting. You will in the future have data from Cairo, Alexandria and other cities or urban areas of Egypt. Dr Mohamed Nassar at EEAA will be responsible for the programme and data reporting at EEAA.

We hope this will be adequate information for you at the moment, but please contact us if you have further questions. You will also be able to reach B Sivertsen at the NILU E-mail address : "BS@NILU.no". Looking forward to hearing from you

Sincerely yours

Mohamed Nassar

Bjarne Sivertsen

CNG

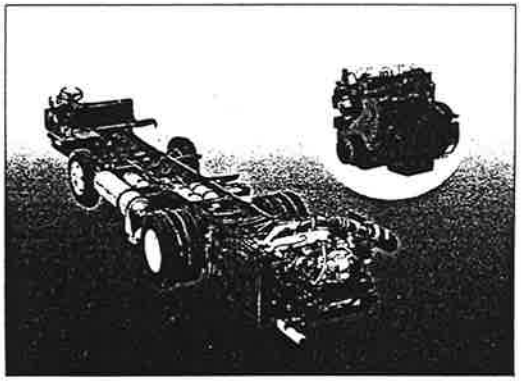
COMPRESSED NATURAL GAS

Natural gas is a combination of gases, primarily methane, found underground in "fields". Egypt has substantial reserves of high quality natural gas with discoveries still being made.

When compressed, natural gas is among the cleanest burning fuels available for vehicles.

To help reduce harmful particulate emissions into the air from diesel-fueled buses, the project's CNG team will work closely with the Cairo Transit Authority (CTA) and the Greater Cairo Bus Company (GCBC) to promote use of CNG in their bus fleets. The Ministry of Petroleum's Organization of Energy Conservation and Planning (OECP) will take the lead in this effort and also establish an emissions testing facility for CNG vehicles.

A natural gas engine and chassis.



VET

VEHICLE EMISSION TESTING

One type of vehicle emissions test.

There are more than 1,200,000 vehicles now on the streets of Greater Cairo, and that number grows by almost 30,000 each year. Egypt's Environment Law 4 of 1994 established standards for vehicle emissions to reduce the health impacts of carbon monoxide and other harmful substances.

The purpose of the Vehicle Emission Testing, Tune-Up and Certification (VET) component of the Cairo Air Improvement Project is to reduce emissions of harmful air pollutants from motor vehicles and improve fuel efficiency. Through this component, a VET system will be designed and implemented for greater Cairo. The government of Egypt will implement the VET program under CAIP, with an emphasis on tune-ups, to ensure that the city's vehicles can be certified according to the standards set under Law 4.

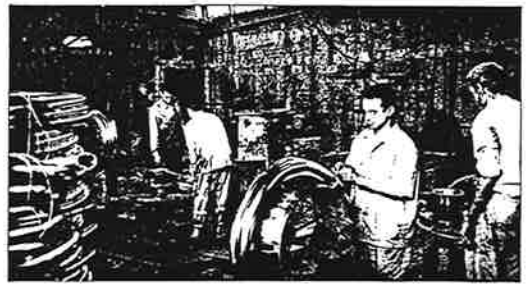
Workers at a lead smelter in Cairo.

LA

LEAD ABATEMENT

The purpose of the Lead Pollution component of the Cairo Air Improvement Project is to implement the Government of Egypt's Lead Smelter Action Plan (LSAP). Information from environmental studies done in Cairo established that lead was a major component of air pollution and was particularly harmful to human health. Lead smelters in and around Cairo have been identified as a major source of lead exposure to humans, both in the workplace and in the air. It has been found that smelters emit from 250 to 350 tons of lead into the air annually around Greater Cairo. Smelter workers are exposed to almost 100 times the recognized standards for occupational exposure.

Specifically, the Lead Pollution team will design a large private sector smelter with environmental control technologies. They will also assist a major public sector smelter company to upgrade its operations by developing a remediation plan for its property. The team will also develop specific steps to implement the LSAP, thus putting in place a long-term , enforceable solution to lead pollution in Greater Cairo. This will include assistance to small- and medium-sized lead smelters.

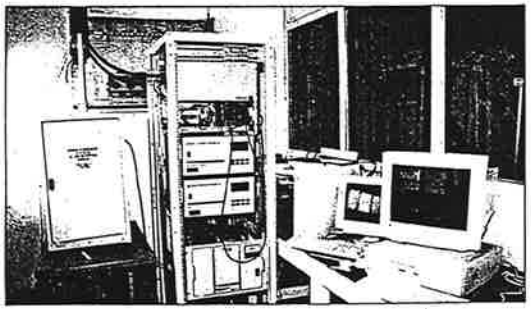


AIM

AIR MONITORING

The purpose of this component of the Cairo Air Improvement Project is to establish a system for the sampling and measurement of fine particles and airborne lead in the ambient air of Greater Cairo through 30 sampling stations and 6 local meteorological stations.The focus will be on securing periodic computerized measurement of existing levels at various geographical points of the network to provide a reference for demonstrating changes in air quality due to specific measures under CAIP. The impact of current or future measures taken by the government in Egypt will also be measured.

The air quality monitoring activities also complement those of the Egyptian Environmental Affairs Agency and the Danish aid agency (DANIDA), who began planning in 1996 a 14-site air quality monitoring network for all of Egypt. The CAIP team will also support EEAA and DANIDA by training Egyptian specialists in air monitoring procedures and reporting.



Air monitoring equipment at Tebbin (ElMR (NILU))

EiMP

THE PROJECT

The Cairo Air Improvement Project (CAIP) is a Government of Egypt program implemented by the Egyptian Environmental Affairs Agency (EEAA) with funding from the United States Agency for International Development (USAID). The CAIP program will initiate measures to reduce air pollutants found to have the most serious impacts on human health in Greater Cairo, especially suspended particulates and lead.

Through technical assistance, training, and supply of new equipment, the prime contractor, Chemonics International, will provide project management and use of a team of technical experts, specialized subcontractors, and consultants to support the government of Egypt in its interventions to:

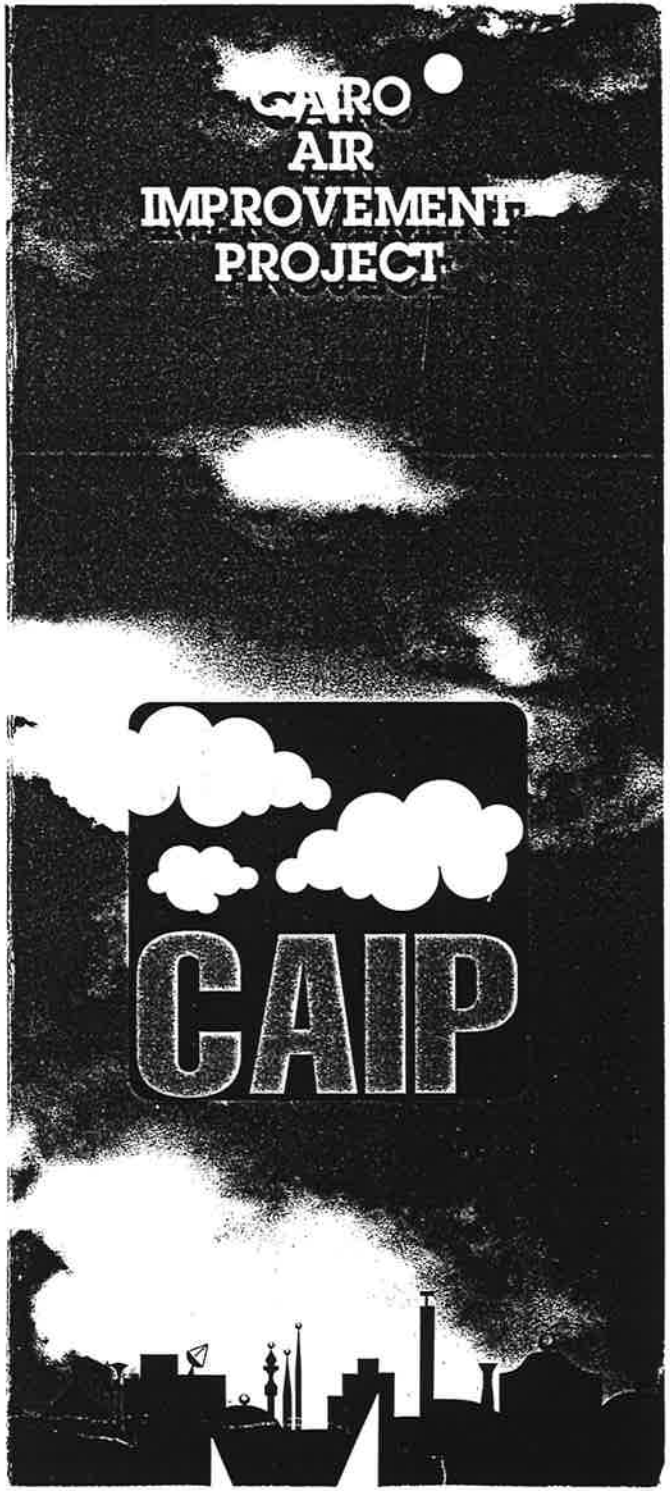
- Improve fuel efficiency and reduce exhaust emissions of gasoline-fueled vehicles through vehicle emission testing, tune up and certification (VET)
- Reduce total suspended particulate emissions from diesel-fueled buses through expanded use of compressed natural gas (CNG) in public municipal bus fleets
- Reduce airborne lead and particulate emissions in and near lead smelters
- Institute an air quality monitoring and analysis program for CAIP's interventions.

Project activities will also include public awareness and communication programs and evaluation of other air pollution prevention and reduction initiatives.

For more information call CAIP at:

Misr Helwan Road, Bldg. 30
Maadi, Cairo, Egypt
Tel. : 375-0954/ 375-1245 / 375-1469
350-7537 / 378-1293 / 378-1294 / 351-6134
Fax: 351-5137/ E-Mail: caip@intouch.com

EEAA OECP USAID



CAIRO AIR IMPROVEMENT PROJECT
Managed by Chemonics Consortium

AIR MONITORING

The widespread production and use of products containing lead (Pb) creates the potential of exposing the general population to this chemical element. Human exposure to lead may occur through intake of air, water, food, and dusts containing lead and lead compounds. One of the primary exposure pathways is the inhalation of lead-bearing particles or dusts. Inhaled lead is readily absorbed into the body from the respiratory system. When absorbed into the body, lead is a cumulative poison that affects the nervous system, immune system, kidneys, liver, and blood vessels. Young children usually have a higher dietary intake of lead and they absorb the element more readily than adults, making the risk of harmful effects of lead exposure significantly greater for children than for adults. To minimize the health risk from inhalation exposure, the World Health Organization has recommended that the lead level should not exceed 1 microgram (0.000001 gram) per cubic meter of ambient air.

One of CAIP's specific objectives is aimed at establishing an Air Monitoring Program to measure Pb and particulate matter (PM) levels in the air in the Greater Cairo area. A total of 36 stations will be installed in the Greater Cairo area and operated on a continuous basis. These CAIP measurements will provide information on amounts of Pb and PM to which the people of Cairo are exposed from the air they breath. PM and Pb data will be obtained for the particle size ranges that have the most effect upon human health. Of the dust in the air, particles with diameters less than 0.010 mm (PM10) are most readily inhaled into the human body and, therefore, have a greater impact on health. Particles with diameters less that 0.0025 mm (PM2.5) have even a greater health impact since they penetrate deeply into the lungs.

The initial objective of the CAIP Air Monitoring Program is the accurate and comprehensive determination of the current PM and Pb levels in the PM10 and PM2.5 size ranges. These data will be used as a baseline to judge the effectiveness of future programs to reduce particulate matter and lead in the ambient air. The final objective is to achieve sustained operation of the monitoring effort to be able to demonstrate the improvement of air quality resulting from future initiatives implemented by the CAIP, GOE, and private-sector air pollution mitigation programs.

A training program is another very important component of the CAIP Air Monitoring Program. The objective of the training is to prepare local personnel and agencies to assume complete administration and operation of all aspects of the Air Monitoring Program initiated under the CAIP. This goal will be accomplished by forming a team comprising CAIP personnel and local counterparts. The team, working together on a daily basis, will conduct the program during the initial two years. During the following three years, program operations will be assumed by local personnel with CAIP personnel providing support as required. After five years, the program will become the full responsibility of the appropriate GOE agency. Throughout the first two years of the project, several training courses will be presented to develop specialized skills required by project personnel, GOE agencies, lead smelting industries, and academic institutions to ensure the success of the program.

CAIRO AIR IMPROVEMENT PROJECT
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VEHICLE EMISSIONS TESTING, TUNE-UP, CERTIFICATION (VET)

There are more than 1 million vehicles now on the streets of Greater Cairo, and that number grows by almost 30,000 each year. Egypt's Environment Law 4 of 1994 established standards for vehicle emissions to reduce the health impacts of carbon monoxide and other harmful substances. Automobile emissions contribute to the production of ground level ozone and can cause serious upper respiratory ailments and cardiovascular disorders, particularly among the elderly and young children.

The purpose of the Vehicle Emissions Testing, Tune-Up and Certification (VET) component of the Cairo Air Improvement Project is to reduce emissions of harmful air pollutants from motor vehicles and improve fuel efficiency. Through this component, a VET system will be designed and implemented for Greater Cairo. The city will join the clean air efforts of other major urban areas, like Mexico City, that have successfully improved their air quality by implementing VET programs.

VET systems now operating around the world vary greatly in their design and operation. One factor that affects a country's VET program is the types and ages of vehicles tested. Sixty-five percent of the vehicle fleet in Cairo, for example, is 10 years old or older. This makes tune-ups especially important to ensure that drivers can comply with emissions standards. A pilot VET program conducted by the Government of Egypt showed that following a low-cost tune-up, hydrocarbon emissions fell by 35 percent and carbon monoxide by 62 percent. Fuel efficiency gains from the pilot program tune-ups averaged nearly 15 percent.

The Government of Egypt will implement the VET program under CAIP to ensure that the city's vehicles are certified according to the standards set under Law 4. Computerized emissions testing and certification will be done at designated testing centers. The EEAA's vehicle emissions testing and tune-up team will work with the Greater Cairo traffic departments to ensure motorist compliance with testing requirements.

Overall goals of the VET component include:

- Reducing vehicle emissions by achieving an 80 percent compliance rate among Cairo's vehicle fleet by the end of the project
- Improving the average fuel efficiency of tuned-up vehicles by 10 percent

CAIRO AIR IMPROVEMENT PROJECT
Managed by Chemonics Consortium

COMPRESSED NATURAL GAS (CNG)

Natural gas is a combination of gases, primarily methane, found underground in "fields." Egypt has substantial reserves of high-quality natural gas with discoveries still being made. When compressed, natural gas is among the cleanest burning fuels available for use in vehicles. Burning diesel fuel emits harmful carbonate particulates into the air. Health risks from exposure to particulates include respiratory disorders and a shortened overall lifespan.

The technical systems for use of CNG in vehicles are very highly developed to ensure safe delivery and usage. CNG is stored and transferred at a pressure of 200 atmospheres (3000 pounds per square inch), a much higher pressure than other fuels. The gas's density is less than air and so it diffuses rapidly when released into the atmosphere. An additive gives CNG a distinct odor for safety. Tests done in the United States showed that CNG cylinders used in automobiles remain intact under severe working conditions. Vehicles built to use CNG (dedicated) are the most fuel-efficient. Many countries around the world, and now Egypt, have found that converting vehicles to CNG can substantially reduce harmful emissions into the environment and save drivers money. Hundreds of cars, mostly taxis, in Greater Cairo are being converted to CNG each year.

To help reduce harmful particulate emissions into the air from diesel-fueled buses, the CNG team will work closely with the Cairo Transit Authority (CTA) and the Greater Cairo Bus Company (GCBC) to promote the use of CNG in their bus fleets. Technical advice will also be available to the private sector and to other agencies such as the Alexandria Transit Authority.

Also, a state-of-the-art emissions testing facility will be built at Misr Petroleum Laboratory to measure vehicle performance and emissions from CNG vehicles and diesel vehicles under the supervision of the Organization of Energy Conservation and Planning (OECP) within the Ministry of Petroleum.

Overall goals of the CNG component include:

- Establishing comprehensive safety standards and regulations for the use of CNG
- Natural gas applications training program,
- Issuing of CNG usage certificates
- Creation of a pilot fleet of 75 CNG buses, including 50 buses divided equally (25 vehicles each) between the Cairo Transit Authority and Greater Cairo Bus Company, and 25 mini-buses to be provided to CTA
- Developing a plan for large-scale, commercial CNG conversion of the selected bus fleets

CAIRO AIR IMPROVEMENT PROJECT
Managed by Chemonics Consortium

LEAD POLLUTION

The purpose of the Lead Pollution component of the Cairo Air Improvement Project is to support implementation of the Government of Egypt's Lead Smelter Action Plan (LSAP). Information from environmental studies done in Cairo established that lead was a major component of air pollution and was particularly harmful to human health. Both airborne and ingested lead can cause reduced IQ levels and learning disabilities in children, and kidney and reproductive disorders in adults.

Lead smelters in and around Cairo have been identified as a major source of lead exposure to humans, both in the workplace and in the air. It is estimated that smelters emit about 1,100 tons of lead into the air annually around Greater Cairo. It is also estimated that about 1,100 tons of lead per month are produced in Cairo Governorate, 4,000 tons per month in Kaloubia Governorate, and 400 tons per month in Giza Governorate. Smelter workers are exposed to almost 100 times the recognized standards for occupational exposure.

The Egyptian Environmental Affairs Agency (EEAA), with support from the United States Agency for International Development (USAID), developed the LSAP as part of an overall Lead Exposure Abatement Plan (LEAP). The role of CAIP will be to assist the public and private sectors to implement the LSAP.

Specifically, the Lead Pollution team will design a large private sector smelter with environmental control technologies. They will also assist a major public sector smelter company to upgrade its operations by developing a remediation plan for its property. The team will also develop specific steps to implement the LSAP, thus putting in place a long-term, enforceable solution to lead pollution in Greater Cairo. This will include assistance to small- and medium-sized lead smelters.

When the activities of the LSAP are completed, including those under CAIP, it is expected that there will be:

- A 90 percent reduction in workplace airborne lead at redesigned lead smelters
- An 80 percent reduction in lead concentrations 1 km downwind of a major public sector smelter
- A 50 percent reduction in lead concentrations downwind of private smelters.

CAIRO AIR IMPROVEMENT PROJECT
Managed by Chemonics Consortium

PUBLIC AWARENESS AND COMMUNICATIONS

The purpose of the communications component of the Cairo Air Improvement Project is to increase general awareness of air quality issues and support the project's specific objectives through targeted media and communications campaigns.

Most people in Greater Cairo know there is an air quality problem. They can see it, smell it, and in some cases feel it. Few, however, know the health risks of pollution or that they can do something to improve air quality. The communications team of CAIP will work with each project component to inform and involve the general public and decision makers in actions to support the project's initiatives.

Communication research in countries around the world, including Egypt, has shown that the mass media and interpersonal communication are valuable tools for creating awareness of environmental problems. CAIP's communications team, which includes public awareness and communications units from the Egyptian Environmental Affairs Agency (EEAA) and the Office of Energy Conservation and Planning (OECP), will design, launch, and evaluate campaigns to create support for the following project activities:

General awareness
Vehicle emissions testing and tune-up
Use of CNG as an environmentally friendly fuel
Reduction of pollution from the lead smelting industry
Air quality monitoring information

The CAIP communications program will join and strengthen the growing environmental awareness network in Egypt. Through its regular meetings, roundtables, newsletter, and information clearinghouse, CAIP will become a technical and communications resource for the media, government of Egypt agencies, and donors who are working to improve air quality.

EIMP Outputs for Ambient Air Monitoring Component

Description	Date	Presented/Undertaken by
Workshops: *Air quality monitoring programme (at CEHM)	April 1997	Bjarne Sivertsen
*Air quality monitoring and information system for Egypt	Presented at work shop in Alexandria, 20-22 May 1996	Bjarne Sivertsen
*Air quality monitoring system and application	28-30 October 1997	Bjarne Sivertsen Leif Marsteen
Installation, calibration of monitors	December 1997	Dr ElSoueini et.al, CTS
Seminars: *The EIMP Air Quality Monitoring Programme for Egypt	27 October 1997	EIMP/EEAA
Training: Air quality sampling, monitoring and analyses	4-16August 1997 (at NILU) (for EEAA counterpart)	B Sivertsen et.al. (NILU)
On Job Training on installation and calibration at Reference Laboratory	Nov 97, Mar 98, Apr 98	Leif Marsteen
On Job Training on installation and calibration of monitors at CEHM	Nov 97, Mar-May 98	Leif Marsteen
On Job Training installation and calibration at IGSR, Alexandria	Mar-Apr 1998	Leif Marsteen
On Job Training in interpretation of data, quarterly reporting CEHM	April 1998	Bjarne Sivertsen
Interpretation of air quality data for presentation at EEAA	April-May 1998	Bjarne Sivertsen

Air Monit

AC...ITY	3	4	5	6	7	8	9	10	11	12	Plan	Actual	V...
A. Institutional support													4.0%
A.1.1. Air pollution monitoring working group											0.0%	0	1.0%
A.2.2. Assist in describing work functions for new experts											100.0%	50	1.0%
A.3.1. Counterpart trained during development											17.0%	17	2.0%
B. Design of monitoring programme													2.0%
B.1.1. Evaluate existing measurement sites											50.0%	0	0.4%
B.2.1. Select monitoring sites for air quality measurements											33.0%	33	0.4%
B.2.2. Define site characteristics											0.0%	0	0.4%
B.2.5. Select sites for meteorological measurements											0.0%	0	0.4%
B.2.8. Establish agreements with site owners											12.5%	12.5	0.4%
C. Procurement, equipment, hardware and software													5.0%
C.1.1. Evaluate existing equipment											0.0%	0	1.0%
C.2.1. Procure instruments and equipment											0.0%	0	2.0%
C.2.2. Prepare instruments for installation											17.0%	17	2.0%
D. Data management													17.0%
D.1.1. Specify data collection/data transfer											40.0%	10	1.0%
D.1.2. Specify data retrieval and local database at Mon Lab											25.0%	10	2.0%
D.1.3. Specify data quality check and control procedures											29.0%	20	2.0%
D.1.4. Identify sources of supplementary data											0.0%	0	1.0%
D.1.5. Telecommunications											17.0%	10	3.0%
D.2.1. Prepare database for manual data (seq. & hivol.)											0.0%	0	4.0%
D.2.2. Establish local data base for monitoring data at MonLab											0.0%	0	3.0%
D.3.1. EEAA data base Air QUIS											33.0%	0	1.0%
E. Training													13.0%
E.1.1. Assess training needs for phase 3											0.0%	0	1.0%
E.2.1. Prepare on-the-job training											50.0%	30	1.0%
E.2.2. Prepare training programme for instrument calibration etc.											50.0%	50	1.0%
E.2.3. On-the-job training at RefLab and at MonLab											17.0%	17	1.0%
E.2.4. Support training at Reference Laboratory											50.0%	50	2.0%
E.5.1. Use of data base at System Manager											9.0%	0	2.0%
E.5.2. Training in the use of EEAA database											0.0%	0	2.0%
E.6.1. Sample preparation											0.0%	0	1.0%
E.6.2. Chemical analyses											0.0%	0	2.0%
F. QA/QC													5.0%
F.2.1. Specify instrument calibration procedures											20.0%	50	1.0%
F.2.2. Design QA/AC procedures at monitoring labs.											20.0%	20	1.0%
F.2.3. Establish Standard Oper. Procedures as part of QA/QC.											20.0%	50	1.0%
F.3.1. QC and calibration routines as part on on-the-job training.											17.0%	17	1.0%
F.4.1. Input QA from Reference Laboratory Air											0.0%	0	1.0%
G. Monitoring													30.0%
G.1.1. Prepare monitoring plan for 1999											0.0%	0	1.0%
G.2.1. Specify sampling programme procedures											0.0%	0	1.0%
G.2.2. Specify monitoring programme and data retrieval											67.0%	20	1.0%
G.2.3. Start monitoring programme and data retrieval											17.0%	17	4.0%
G.3.1. Update monitoring station infrastructures											100.0%	20	2.0%
G.3.2. Install and start monitors in Cairo and Alexandria											18.0%	18	3.0%
G.4.1. Maintenance and calibration											9.0%	10	3.0%
G.4.2. Service and repair											9.0%	10	2.0%
G.5.1. Data retrieval and data evaluation											17.0%	17	3.0%
G.5.2. Data presentations											17.0%	10	3.0%
G.6.1. Sample preparation											0.0%	0	2.0%
G.6.2. Chemical analyses											0.0%	0	3.0%
G.7.1. Quarterly reports											25.0%	10	2.0%
H. Reference Laboratory													4.0%
H.2.1. Training RefLab in use of monitors and calibration											50.0%	50	2.0%
H.3.1. Check field monitors											0.0%	0	1.0%
H.3.2. Audit programme											0.0%	0	1.0%
I. Component Follow-up and Co-ordination													20.0%
I.1.1. Prepare Annua Plan of Action for 1999											0.0%	0	2.0%
I.2.1. Follow-up, meetings and administration											17.0%	17	16.0%
I.3.1. Prepare Annual Report for 1998											0.0%	0	2.0%

Slut Feb.

END OF MISSION REPORTS FOR THE PROGRAMME 5 COMPONENTS FOR THE YEAR 1996

Programme Component / End of Mission Report	Date of Issue	Prepared by	
		Name / Company	Position
Institutional Support to EEAA			
* End of Mission Report "A"	Apr. 1996	Christian Poll / COWI	Database Expert
* End of Mission Report No. 1	Jul. 1996	Jacob Andersen / COWI	Environmental Data Specialist
* End of Mission Report No. 2	Sep. 1996	Jacob Andersen	
* End of Mission Report No. 3	Nov. 1996	Jacob Andersen	
Procurement			
* End of Mission Report No. 1	Mar.1996	Jacob Andersen / COWI	Environmental Data Specialist
Coastal Water Monitoring			
* End of Mission Report No. 1	Apr. 1996	Arne Jensen / VKI & Erling Povlsen /	Task Manager & Marine Biologist
* End of Mission Report No. 2	Sep. 1996	COWI	
* End of Mission Report No. 3	Dec. 1996	Arne Jensen	
		Arne Jensen & Erling Povlsen	
Air Pollution Monitoring			
* End of Mission Report No. 1	Mar. 1996	Bjarne Sivertsen / NILU	Task Manager & Air Pollution Specialist
* End of Mission Report No. 2	Jun. 1996	Bjarne Sivertsen	
* End of Mission Report No. 3	Nov. 1996	Bjarne Sivertsen & Leif Marsteen / NILU	
Pollution Sources Datab.& Mon.			
* End of Mission Report No. 1	Oct. 1996	LarsAndersen / COWI	Wastewater Specialist
Reference Laboratory For Standardisation & Quality Ass.			
* End of Mission Report No. 1	Mar. 1996	Ulla Lund / VKI	Task Manager
* End of Mission Report No. 2	Sep. 1996	Ulla Lund	

END OF MISSION REPORTS FOR THE PROGRAMME 5 COMPONENTS FOR THE YEAR 1997

Programme Component / End of Mission Report	Date of Issue	Prepared by	
		Name / Company	Position
Institutional Support to EEAA			
* End of Mission Report DM 4	22 Jan.	Jacob Andersen / COWI	Environmental Data Specialist
* End of Mission Report	24 Jan.	Kim Jacobsen / VKI	Database Expert
* End of Mission Report DM 5	17 Mar.	Jacob Andersen	
* End of Mission Report DM 7	30 Jun.	Jacob Andersen	
* End of Mission Report DM 8	13 Sep.	Jacob Andersen	
* End of Mission Report DM 9	11 Dec.	Jacob Andersen	
Coastal Water Monitoring			
* End of Mission Report No. 4	18 Jun.	Arne Jensen /VKI Erling Povlsen / COWI	Task Manager & Marine Biologist
* End of Mission Report No. 5	12 Sep.	Arne Jensen	
* End of Mission Report No. 6	Dec.		
Air Pollution Monitoring			
* End of Mission Report No. 4	Jan.	Bjarne Sivertsen / NILU	Task Manager
* End of Mission Report No. 5	Jun.	Bjarne Sivertsen	
* End of Mission Report No. 6	Jul.	Leif Marsteen / NILU	Air Pollution Instrumentation Specialist
* End of Mission Report No. 7			

→ + Addendum Appendix F

Jan 98 Bjarne Sivertsen & Leif Marsteen

Pollution Sources Datab.& Mon.			
* End of Mission Report PS 5	Mar.	Douglas Clark / COWI	Task Manager
* End of Mission Report PS 7	10 May	Jens Vang & Thomas Kongerslev	Air Emiss. Mon. Advisor & Wastewater Adv.
* End of Mission Report PS 8	17 Jul.	Jorn Rokkjaer & Thomas Kongerslev	Air Emiss. Mon. Special. & Wastewater Adv.
* End of Mission Report PS 9	18 Sep.	Douglas Clark	
* End of Mission Report PS 10	13 Oct.	Susanne Petersen & Thomas Kongerslev	
* End of Mission Report PS 11			
* End of Mission Report PS 12	12 Dec.	Susanne Petersen & Joern Rokkaer & Thomas Kongerslev	
Reference Laboratory For Standardisation & Quality Ass.			
* End of Mission Report	12 Jun.	Ulla Lund / VKI	Task Manager
* End of Mission Report RL 5	1 Dec.	Flemming Boison	
* End of Mission Report RL 6	18 Dec.	Kirsten Holst	
* End of Mission Report RL 7	17 Dec.	Lis Rasmussen	

Appendix J

List of Abbreviations

List of Abbreviations

A-GOSD	Alexandria General Organisation for Sanitary Drainage
APMWG	Air Pollution Monitoring Working Group
AQ	air quality
AWS	automatic weather station
BOD	biological oxygen demand
CAIP	Cairo Air Improvement Project, a new USAID project with EEAA, to start January 1997 (consultant not yet selected).
CCC	Cairo Central Center, central EEAA laboratory located in Maadi, sponsored by JICA Minilab project.
C-GOSD	Cairo General Organisation for Sanitary Drainage
CIDA	Canadian International Development Agency
CLEQM	Central Laboratory for Environmental Quality Monitoring, a new environmental laboratory being built at the NWRC, sponsored by the CIDA RNPD II project, to be opened in mid-1997.
COWI	COWI Consulting Engineers and Planners AS, Denmark, lead consultant for the EIMP project (The word COWI is derived from the initials of the founders of the company).
CTS	Chemical and Technical Services
CWMWG	Coastal Water Monitoring Working Group
Danida	Danish International Development Assistance
DRI	Drainage Research Institute, NWRC
ECEP	Energy Conservation and Environment Project, a USAID project with FEI and TIMS.
ECRI	Environment and Climate Research Institute, NWRC
EEA	European Environment Agency
EEIS	Egyptian Environmental Information System, a CIDA-sponsored project in EEAA, to start November 1996, with Canadian consultant Roche/UMA/INTELEC.
EETP	Environmental Education and Training Programme
EEAA	Egyptian Environmental Affairs Agency, Cabinet of Ministers.
EIC	Environmental Information Center, a department in EEAA.
EIMP	Environmental Information and Monitoring Programme, Danida sponsored project at EEAA, with Danish consultant COWI, 1996-2000.
EIS	environmental information system
EITS	Environmental Information Technology and Systems, a department within RITSEC.

EMOHC	Environmental Monitoring and Occupational Health Center, Ministry of Health, at Embaba. The ambient air quality monitoring institution under EIMP. Also known as "Embaba Lab".
EP3	Environmental Pollution Prevention Project, a USAID project with FEI and TIMS, with Hagler Bailly Consulting, Inc. as consultant.
EPAP	Environmental Pollution Abatement Project, a World Bank project in EEAA, 1995-
ESA	Egyptian Survey Authority
ESI	Egyptian Standardization Institute
EU	European Union
FEI	Federation of Egyptian Industries, Ministry of Industry
GEMS	Global Environmental Monitoring System
GOFI	General Organization for Industrialization, Ministry of Industry
GOSD	*see* C-GOSD or A-GOSD
GWRI	Groundwater Research Institute, NWRC
HADSERI	*see* NRI
ICES	International Council for the Exploration of the Sea
IDSC	Information and Decision Support Center, Cabinet of Ministers
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ISAG	Information System for Waste and Recyclable Material
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau, a German international financing institution, sponsor of the "Environmental Facility for the Public Sector Industry" financing programme in EEAA-TCOE, started May 1996. (associated with Friedrich Ebert Stiftung).
LFA	logical framework approach
MEDPOL	
MOH	Ministry of Health
MPWWR	Ministry of Public Works and Water Resources.
NILU	Norwegian Institute for Air Research, Norway, sub-consultant to COWI in the EIMP programme (NILU is the abbreviation in Norwegian for the name of the institute: Norsk Institutt for Luftforskning).
NIOF	National Institute for Oceanography and Fisheries, Alexandria, the coastal waters monitoring institution under EIMP.
NIS	National Institute of Standards
NOPWASD	National Organisation for Potable Water and Sanitary Drainage
NRC	National Research Center. The institution hosting the EIMP reference laboratory for quality control and standardisation.

NRI	Nile Research Institute, NWRC
NWRC	National Water Research Center, Ministry of Public Works and Water Resources
NWSRU	National Water Strategy Research Unit, RNPD II, NWRC
ODA	Overseas Development Administration, Great Britain.
OECD	Organisation for Economic Cooperation and Development
OECP	Organization for Energy Conservation and Planning, Ministry of Petroleum and Ministry of Electricity.
OSP	Organisation Support Programme, a Danida-sponsored technical assistance programme at EEAA.
PM_{10}	particulate matter smaller than 10 micrometers
PSMWG	Point Source Monitoring Working Group
RBO	Regional Branch Office
RITSEC	Regional Information Technology and Software Engineering Center, sponsored by UNDP (UN Development Programme and AFESD (Arab Fund for Economic and Social Development), hosted by IDSC.
RNPD II	River Nile Protection and Development Project, Phase II, a CIDA-sponsored project with the NWRC, with Canadian consultant SNC Lavalin Inc., 1993-1997.
SEAM	Support for Environmental Assessment and Management, an ODA project in EEAA-TCOE, with Entec as consultant, 1994-1997.
TCOE	Technical Cooperation Office for the Environment, a special department in EEAA, sponsored by several international development agencies.
THC	total hydrocarbons
TIMS	Tabbin Institute for Metallurgical Studies, Ministry of Industry
TNA	training needs assessment
TOR	terms of reference
TSP	total suspended particulates
UNEP	United Nations Environment Programme
UPS	uninteruptable power supply
USAID	United States Agency for International Development
VKI	Water Quality Institute, Denmark, sub-consultant to COWI in the EIMP programme (VKI is Danish abbreviation for the name of the institute: Vandkvalitets Institut).
VOC	volatile organic compounds
WB	World Bank, also known as International Bank for Reconstruction and Development (IBRD).
WHO	World Health Organisation
WMRI	Water Management Research Institute, NWRC

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The eight mission to Egypt on the DANIDA EIMP programme included installations, passive sampling, training and reporting. The first air quality data report was presented.

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