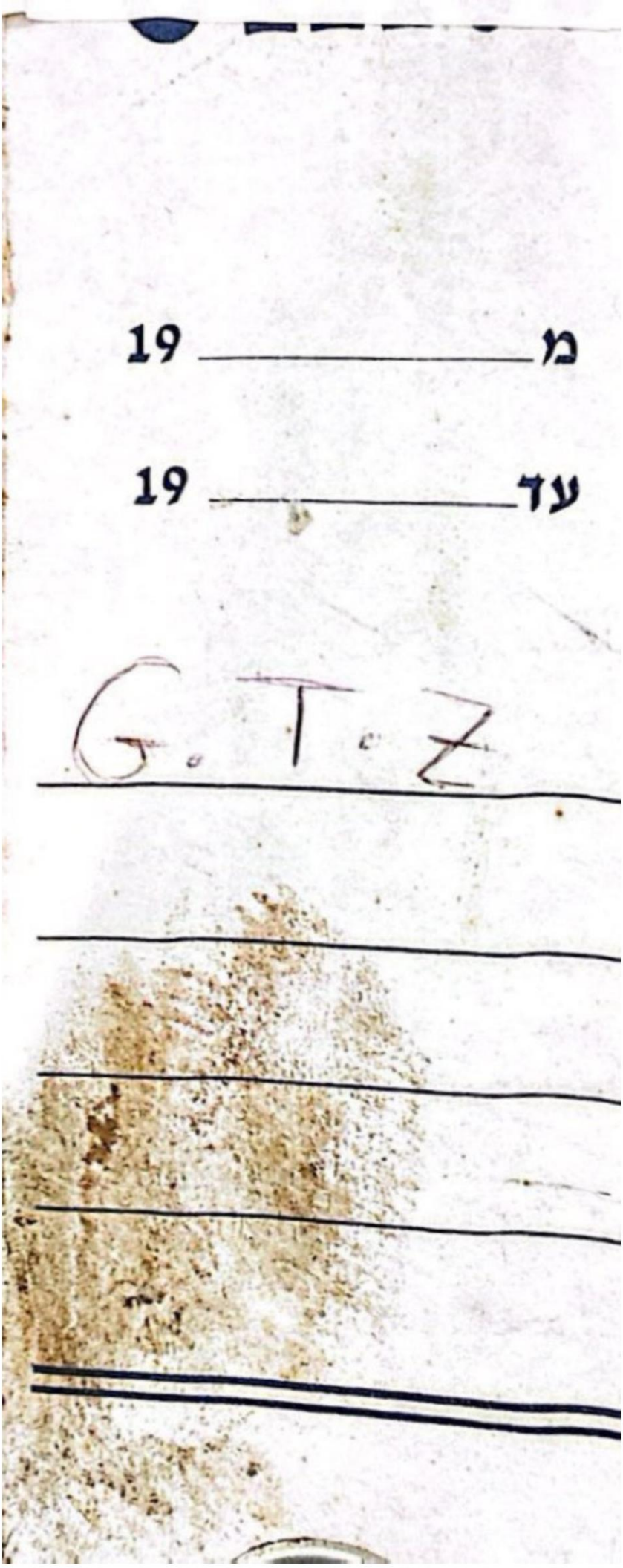
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CONCLUSION

The Extended Aeration Process is recommended for the treatment of the wastewater of Al-Bireh.

This recommendation is based on the high quality of effluent produced by this process, the simplicity of operation, the small area required, for the plant and the similar or even lower costs of construction, operation and maintenance, in comparison to other processes.

The preliminary estimate of the required capital investments is approximately 1.4 milllion US Dollars (not including VAT). The annual costs for maintenance and operation is about US $ 120.000 per year, or about 14 cents per cubic meter of treated wastewater.

The plant will include the following units:

Preliminary Units:
- Coarse and fine bar screens.
- Measuring devices.
- Grit removal.

Biological Process:
- 2 aeration tanks.
- 2 final clarifiers.
- Pumping station for return sludge.

Sludge Disposal:
- Sludge thickener.
- Sludge dewatering device or sludge drying beds.

Control Building:
- Control room.
- Electrical pannels.
- Laboratory.
- Office.
- Workshop and Store-Room.
- Facilities for the workers.

5.3. R.B.C.

Advantages

- Low energy costs.

Disadvantages

- High Construction costs.
- Large quantities of equipment required, all of which, should be supplied from abroad.
- Mechanical difficulties in operation of the equipment. (Breakage, etc...).
- Requires primary settling and anaerobic sludge digestion.

5.4. Extended Aeration

Advantages

- Higher quality of effluent.
- Less expensive in construction.
- Fewer units to maintain and operate.
- The process is not sensitive to shock loads and to improper maintenance, aerators work continuously.
- Easy to combine the effluent with tertiary treatment in the future, should this be required.
- The sludge is stabilized and it requires only dewatering and drying.
- Requires less space compared to the methods.

Disadvantages

- High annual energy costs, but the total annual expenditure compared to other methods is similar.

Disadvantages

- Requires a large area, which is unavailable for the present and future phases.

- Because of the limited amounts of local clay and the need to use concrete walls for the ponds high capital investments are required - unusually high for this type of treatment method in comparison with other plants.

- The quality of effluent discharged is below required level - 40 to 60 mg/l of BOD comapred to 20 or 30 mg/l in other methods of Activated sludge. This also affects the efficiency of chlorination.

As a result of the above mentioned reasons, it is not recommended to construct, at present, and Aerated Lagoon treatment Plant.

5.2. Trickling Filters

Advantages

- Requires less skilled manpower in operation than the extended aeration method.

- Low energy costs - for recirculation and return sludge pumps.

Disadvantages

- Lower quality of effluent.

- Higher construction and annual expenditure costs.

- A larger number of units to maintain and operate and thus higher annual expenditures.

- The process is sensitive to improper maintenance.

- It requires sludge stabilization units, as anaerobic digestion.

- Developing of filter flies etc., clogging of distributors etc. can cause environmental problems.

- If in the future more advanced treatment should be required it would be complicated and expensive to do so.

4.7. Extended Aeration

Activated sludge is a secondary sewage treatment process, in which a mixture of sewage and activated sludge -i.e., a sludge rich in active micro-organisms (biomass) - is agitated and aerated. The activated sludge is subsequently separated from the treated sewage (mixed liquor) in a settling tank; it is then partly returned to the aeration basin and partly discharged as waste.

In practice, there exists a considerable number of variants of the basic Activated Sludge process, such as Conventional and High Rates Activcated Sludge, Extended Aeration, Two Stage Activated Sludge and others. They differ in rates of loading, detention times, flow schemes, quantities of sludge produced, etc..

A simple and robust activated sludge varaint is the method known as Extended Aeration. In this method, detention times in the aeration tank are much longer than in the conventional activated sludge method. As a result, its aeration basins are larger and require more area but it can handle raw sewage without prior treatment. The sludge separated from the process is stabilized and it needs only dewatering and drying. The effluent is of high quality.

The expected quality of the effluent of this case is 20 mg/l of BOD and SS.

5. COMPARISON BETWEEN THE VARIOUS METHODS

In order to choose between the various processes, all aspects should be taken into consideration, e.g. feasibility of construction, availability of area, simplicity of operation and maintenance, reliability of the process to perform as designed, cost of construction and maintenance and environmental impact. In view of the above mentioned aspects for consideration, these method scan be divided into two main groups. First, the Aerated Lagoon method; and second the other methods (Trickling Filters, RBC and Extended Aeration).

5.1. Aerated Lagoons

Advantages

- Easier to operate and maintain.

- Requires less skilled manpower for operation.

- The process is less sensitive and can suffer shock loads and inferior quality wastes.

The process has only been in use in the last few years thus is not yet in wide-spread use. However, because of its characteristic modular construction, low hydraulic head loss and shallow excavation, which make it adaptable to new or existing treatment facilities.

This process can be vulnerable to climatic changes and low temperature if not housed or covered. Performance may diminish significantly at temperatures below 12 Centigrade. Enclosed units can result in considerable wintertime condensation if heat is not added to the enclosure. High organic loadings can result in first stage septicity and supplemental aeration may be required. Use of dense media for early stages can result in media clogging. Alkalinity deficit can result from nitrification, supplemental alkalinity source may be required.

This process requires primary treatment and sludge stabilization (anaerobic) as well as secondary clarification and disinfection.

4.6. Aerated Lagoons

Aerated Lagoons consist of earth or paved basins, into which air is introduced, mostly by mechnical surface aerators, to oxidize and stabilize the organic matter in the sewage. In aerated Lagoons, the biological process is somewhat similar to that in activated sludge, but separation and return of sludge (biomass) is not applied. Consequently, aeration process requires a considerably longer time.

Effluent from an aerated Lagoon, although almost oxidized and stabilized, still contains a high concentration ofsolids in the form of the biomass. Thus it is required to remove this biomass and dispose of only the clear effluent, or the biomass can be separated in settling basins, in which SS settle. Sludge is accumulated in these basins. Clean-out of this basin every year is required.

It should be mentioned here that an aerated lagoons plant was planned in 1982 to be constructed in Al-Bireh. As the available are is limited it was suggested that concrete walls should be used for the lagoons. It was also suggested that in the future this plant will be converted to an extended aeration plant as no additional area is available. As eight years past since them, the quantities of wastewater increased and the required quality of the effluent is much higher, it is suggested today that a more sophisticated and intensive process should be considered.

The expected effluent quality of the Aerated Lagoons process is 40 to 60 mg/l BOD and SS values which are higher than the required ones.

It should be mentioned that the existing, newly published, health regulations demand that such a quality of the effluent will be discharged from any Wasterwater Plant.

The possible alternatives for the process to be used are discussed hereafter.

4.4. Trickling Filters

Trickling filters have been widely used for secondary treatment units up to recent times. With the advances made by the more sophisticated activated sludge process, fewer trickling filter plants have been built, but where economically feasible they can still be considered.

Trickling filters consist of artificial beds of media usually stone or plastics. Sewage which has undergone treatment in primary sedimentation tanks is applied to the surface of the bed in the form of spray. The liquid flows slowly over the surfaces of the filter media to the bottom of the bed and passes on to final sedimentation tanks.

The method of primary sedimentation including settling and separate sludge stabilization in anaerobic sludge digesters requires an expensive system - both in construction and operation.

In Al-Bireh, since the composition of raw sewage is very high in BOD, about 400mg/l, it is impossible to reach the required effluent quality in a single stage, and thus a two-stage trickling filters method is required. But even then the expected effluent quality is between 30 to 40 mg/l of BOD and SS.

4.5. Biological Contactors, Rotating (RBC)

The process is a fixed film biological reactor consisting of plastic media mounted on a horizontal shaft and placed in a tank. Common media forms are disc type made of styrofoam and a denser lattice type made of polyethylene. While wastewater flows through the tank, the media are slowly rotaed, partialy immersed, for contact with the wastewater for removal of organic matter by the biological film that develops on the media. Rotation results in exposure of the film to the atmosphere as a means of aeration. Excess biomass on the media is stripped off by rotational shear forces and the stripped solids are maintained in suspension by the mixing action of the rotating media. Multiple staging of RBC's increases treatment efficiency. A complete system could consist of two or more parallel trains each train consisting of multiple stages in series.

c. Aerated Lagoons, or Aerated Ponds (which is the method employed in Ramallah's Treatment Plant) which combine the economy of construction of simple earth ponds with the positive control of the biological treatment by mechanical aeration - followed by settling ponds.

d. Extended Aeration, one of the activated sludge process family, which is high intensity, relatively short detention, highly mechanized, energy intensive method.

Stabilization ponds method (or oxidation ponds) is an unsuitable process in this case, because of the nature and size of the area required. Such a large and flat area is not available.

The choice of the method for the tretment of sewage is based upon several factors which include:

(1) Effluent quality requirements.
(2) Local climatic conditions.
(3) Local environmental conditions and proximity to residential areas.
(4) Availability of suitable land.
(5) Economics. Comparison between the various processes.
(6) The ease of operation and maitenance of the treatment plant units, when compared with the availability of skilled personnel.

4.2. Effluent Disposal

The disposal of the effluent of the treatment plant of Al-Bireh can be done in two ways (see attached map).

a. Disposing of the effluent into the Wadi El-Ein and Wadi Kilt.

b. Conveying the effluent in a gravity pressure pipe, 9.0 Km long and 250 mm in diameter to Deir Debwan area where the effluent will be stored in an earth reservoir and will be used for agricultural irrigation.

4.3. Quality of the Effluent

in order to be able to dispose the effluent into the Wadi and eliminate contamination of ground water, or to irrigate crops in Deir Debwan area, the quality of the effluent must be of high standard and it should be disinfected before disposal. Other reasons for the need of high quality effluent is in order to protect the long disposal pressure pipe against corrosion caused by the production of sulfides and to eliminate the environmental muisance caused by odours that can be emitted from the reservoir.

All the reasons mentioned above lead to the conclusion that secondary treated effluent is required and the BOD and SS content should be not more than 20-30 mgl.

Table No. 1

EXPECTED LOADS ON THE TREATMENT PLANT

I T E M	First Phase	Second Phase
Number of Inhabitants	26 000	41 000
Sewered Population	20 000	35 000
Specific Flow (l.p.c.d.)	120	140
Sewage - daily flow cu.m/d	2 400	5 000
Pollutant Contribution BOD and SS (g.p.c.d.)	50	60
Pollutant Load (Kg/d)	1 000	2 100
Pollutant Concentration (mg/l)	400	420

4. TREATMENT PROCESS

4.1. General

Four basic methods can be considered as representative of the biological processes which can produce high quality effluent. Their technical and economic aspects should be studied and compared in order to find the most suitable method of sewage treatment. These methods are:

a. Trickling Filters - A method in which air is introduced naturally and not mechanically into the wastes, and has proven itself, in operation, in many places over the world for many years.

b. Rotating Biological Contactors (R.B.C.) - A process based on a fixed film biological reactor consisting of plastic media mounted on a horizontal shaft and placed in a concrete basin. This process is proceeded by primary settling and followed by secondary clarifiers. It requires additional stabilization of the sludge.

AL-BIREH WASTEWATER TREATMENT PLANT

TECHNICAL REPORT

1. GENERAL

At present the wastewater from the area of Al-Bireh flows to Wadi El-Ein and through it to Wadi Kilt and the Jordan River. The old existing treatment plant in Wadi El-Ein has been abanded for the last two decades.

In Wadi El-Ein - as the name indicates - there are many springs extant. In order to minimize the possibility of groundwater contamination, the quality of the effluent must be of high standard and should be disinfected.

The location of the existing plant is not adequate anymore because its proximity to the residential area.
The new site chosen for the construction of a new plant is 1.5 Km down stream the wadi (see attached map).

2. PHASES OF CONSTRUCTION

The treatment plant will be erected in phases, according to the expected loads and populations served during the design period. Two phases that were studied are: the first phase which will serve an expected sewered population of 20 000, and a second phase, at the end of the design period, which will serve a population of 35 000 people. The second phase may be further subdivided into intermediate phases, according to the actual growth of sewered population.

The estimate for the sewered population was based on a gradual growing rate of development of the sewerage scheme.

The first phase of development will cater to about 75% of the expected population while the final phase will cater to about 85% of the total population. It is assumed that the remainder will be served by private systems.

3. DESIGN LOADS

The projected loads - hydraulic and sanitary - in the treatment plant - according to the phases mentioned above are as follows:

MUNICIPALITY OF AL-BIREH

WASTEWATER TREATMENT PLANT

TECHNICAL REPORT

BALASHA-JALON, CONSULTANTS & ENGINEERS LTD.

P.O.Box 1727, Tel.: 04-520221, Fax: 04-514381, Haifa

JUNE 1990
P.N. 2632

MUNICIPALITY OF AL-BIREH

WASTEWATER TREATMENT PLANT

TECHNICAL REPORT

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Project Planning Matrix (PPM)	Project Title: Al-Bireh sewage recycling project Project Number: 87.3564.9-01.100	Duration of project: 3 years Country: Israeli occupied territories	Date: 05.11.92 Page: 3
Summary of objectives/activities	**Inputs/costs specifcation**		**Important assumptions**
04.02 Train agricult. staff to operate farm			
04.03 Involve farmers in training & education in the farm			
05.01 Define monitoring and evaluation needs and criteria			
05.02 Define responsibilities and decision-making process			
05.03 Define and implement monitoring and evaluation procedures			

Project Planning Matrix (PPM)	Project Title Al-Bireh sewage recycling project Project Number 87.3564.9-01.100	Duration of project 3 years Country Israeli occupied territories	Date: 05.11.92 Page: 2
Summary of objectives/activities	**Objectively verifiable indicators (OVI's)**	**Means/sources of verification**	**Important assumptions**
Activity	**Inputs/costs specifcation**		
01.01 Collect data on wastewater quantities & composition	I. Palestinien contribution --- * Land for treatment plant * Infrastructure to reach location of the treatment plant * Engineering and consulting expenses * Vehicles (2-3) * Equipment (!) * Lab facilities * Personnel - project manager - for supervision and construction (3 - 4) - for operating unit (5 - 6) - extension staff (4) - Local exptertise		
01.02 Construct and operate experimental plant			
01.03 Implement temporary measures for sewage disposal in Wadi Al-Ein			
01.04 Establish design criteria and select process (type of plant) * It was agreed on the following general criteria: - Meet regulations - Water should be usable for irrigation - Water should be transportable any where			
01.05 Design the treatment plant	II. ANERA ---		
01.06 Get design approval from all concerned parties	* Experimental and demonstration farm ; Up to $ 600.000 but only for * Hydraulic infrastructure for irrigation; irrigation		
01.07 Construct the treatment plant			
02.01 Define training goals	III. German contribution ---		
02.02 Find instructors and places of training			
02.03 Employ capable personnel	* Personnel - 1 long-term advisor up to 24 MM - Short-term advisors up to 13 MM . Pilot scheme 3 MM . Design 1 MM . Construction (E,M) 2 MM . Laboratory 1 MM . Feasibility study <6 MM		
02.04 Carry out training			
02.05 Specify parameters to be monitored			
02.06 Establish lab facilities	* Funds for training (to be specified)		
02.07 Define concept for future cost recovery			
03.01 Elaborate Terms of Reference	* Construction costs treatment plant (civil works); Up to 5 Mio DM * Equipment for the treatment plant (electromech. ; to be verified incl. spare parts) ;		
03.02 Conduct feasibility study (for sewage reuse and disposal)	* Laboratory equipment		
03.03 Find financial and personnel resources for implementation	* Maintenance equipment + operation		
03.04 Define a concept for O+M cost recovery	* Vehicle(s)		
04.01 Find experimental and demonstration farm for irrigation trials	* Construction equipment pilot scheme		

Project Planning Matrix (PPM)	Project Title Al-Bireh sewage recycling project Project Number 87.3564.9-01.100	Duration of project 3 years Country Israeli occupied territories	Date: 05.11.92 Page: I
Summary of objectives/activities	**Objectively verifiable indicators (OVI's)**	**Means/sources of verification**	**Important assumptions**
Overall goal			
OG Environmental and health hazards within the region are reduced and the agricultural production is increased			
Project purpose			
PP Sewage of Al-Bireh is adequately treated and preconditions are fulfilled for implementation of irrigation and of safe disposal systems	01 Effluent quality is according to design criteria by the end of first project phase 02 Concept for implementing the second phase is approved by all concerned parties by the end of the first phase		
Result			
R 01 Appropriate treatment plant is properly constructed	01.01 Quality of effluent meets standards according to required option 01.02 Percentage of contract carried out (cost) 01.03 Percentage of contract carried out (work) 01.04 Final tender documents are approved by 12/1993		
R 02 Qualified management unit is in place	02.01 Required personnel is employed by		
R 03 Feasibility study for sewage reuse and disposal is available & financing is ensured	03.01 Alternatives for reuse and disposal		
R 04 Experimental and demonstration plots for irrigation are in operation	04.01 Extension messages for farmers		
R 05 Monitoring and evaluation system is established	05.01 Management information available on managerial, operational, technical ... performance 05.02 Time schedule is met		

15. Workshop evaluation

Positive

- Very well conducted
- Important to achieve comprehensive solution, agreed on by all participants
- Pretty moderation
- The planning session gave us a wide ranged knowledge of different aspects of the project
- Helpful and useful
- Good methodology
- The workshop was excellent
- The place and the participation was good
- The plan had very much theoretical details, but it was convenient
- Unique team, new experience gained, both techn. and admin.
- Knowing how people approach defining problems
- Good discussions
- Nice place
- Nice people
- I learned very much
- Excellent room
- It is thorough, deep and conprehensive and of course fruitful
- Good atmosphere

Negative

- Time is very much compacted
- Should have more time
- Should have more participants
- Time was short
- Sometimes confusing

13. Objectives of the first phase (3 years)

Project purpose:

Sewage of Al-Bireh is treated and preconditions are fulfilled for implementation of irrigation and of safe disposal systems

14. Project Planning Matrix (PPM)

Remarks on monitoring and evaluation:

Monitoring should cover

- Experimental station
  - . Process of treatment
  - . Adaptability of process to local condititions
- Design of treatment plant
  - . Design criteria
  - . Design feasibility
  - . Laws and regulations
- Construction of treatment plant
  - . Quality & quantity control
  - . Time schedule
  - . Cost control
- Performance of the treatment plant
  - . Maintenance aspects
  - . Treatment efficiency
  - . Environmental impact
  - . Staff performance
  - . Operation costs and income
- Experimental farm
  - . Crop production
  - . Eco-feasibility
  - . Environmental impact
  - . Quality of crops
  - . Farmers reaction
- Overall project
  - . Management performance
  - . Project progress
  - . Monitoring of assumptions
  - . Overall cost control
  - . Training efficiency

Part C: Disposal

- Disposal system(s) identified
- Disposal system(s) designed
- Disposal system(s) implemented

Other objectives:

- Monitoring system for irrigation is ensured
- Soil fertility is maintained
- Agric. products are healthy !!

Overall goal of the project:

Environmental and health hazards within the region are reduced and the agricultural production is increased

Project purpose:

Treated sewage from Al-Bireh is provided for irrigation & excess water is safely disposed

Project duration:

ca. 5 years

Project phases:

Phase 1 --> - Planning & construction
- Feasibility study on irrigation and disposal

Phase 2 --> - Operation and monitoring
- Construction of irrigation and disposal systems

12. Objectives of the project

Main objectives:

- Water transmission and irrigation system is in place and in operation
- Treated sewage is used for irrigation
- Final disposal of excess water is ensured
- Plan and proposals for wastewater reuse and for disposal of excess water are available

Part A: Waste treatment

- Land for treatment plant is available
- Design criteria are defined
- Preliminary design is completed
- Sewage treatment plant is dsigned (design according to laws, regulations and to maximise crop cultivation)

- Funds are available
- Appropriate treatment plant is properly constructed
- Start-up operations (test) are fulfilled
- Manpower development is ensured
- Operating unit is in place

- Appropriate treatment plant is properly operated
- O+M fees are defined and regularly collected
- Monitoring of treatment efficiency is secured

- Sewage of Al-Bireh is adequately treated

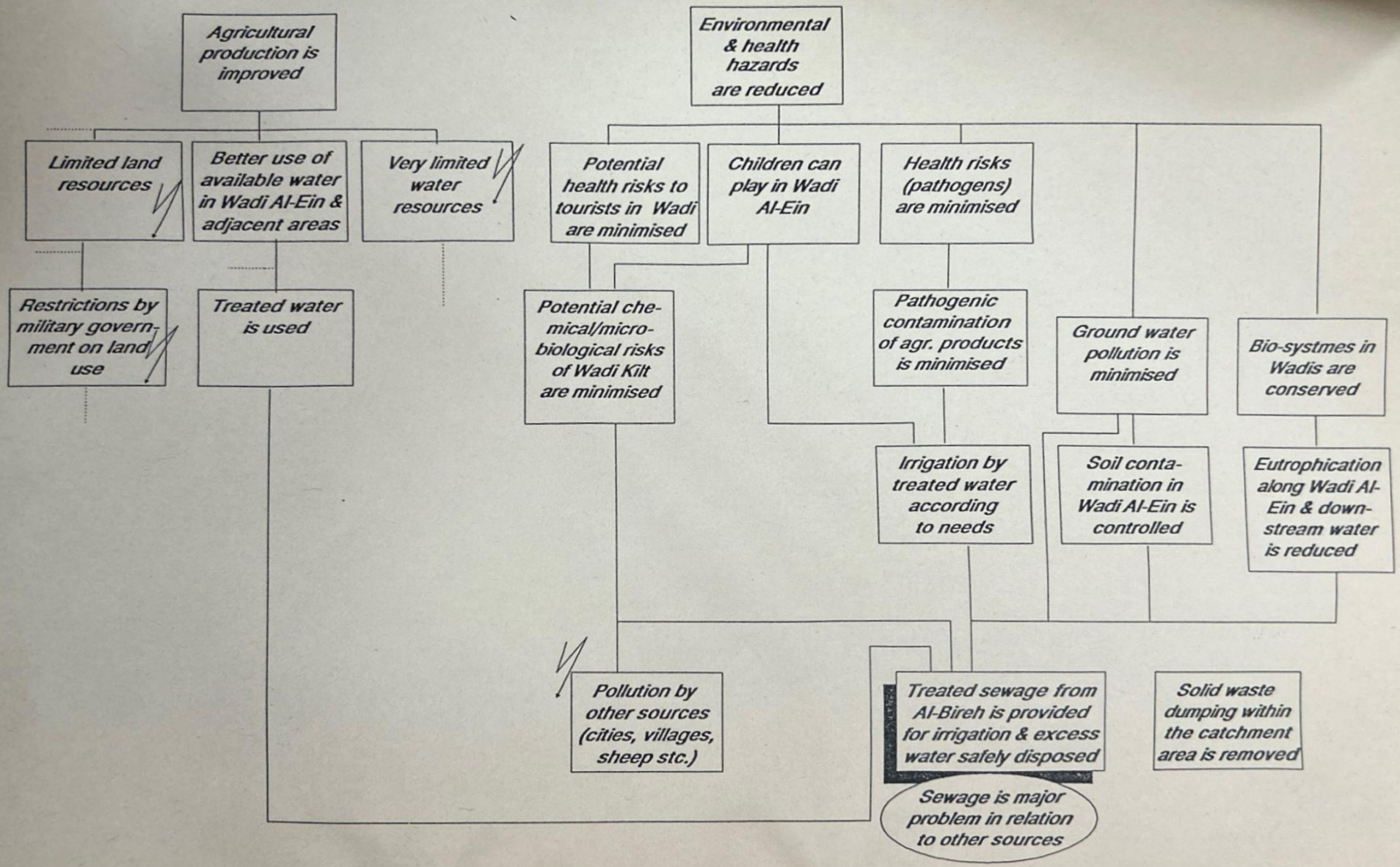
* Indicators* - Organic pollutants are minimised
- Cell numbers are reduced according to needs

Part B: Irrigation

- Irrigation potentials/possibilities are identified
- Irrigation system(s) is (are) designed
- Farmers are organised to use treated water for irrigation
- Training/education of farmers regarding irrigation by treated water is carried out
- Major infrastructure for irrigation is implemented
- Field irrigation system is implemented

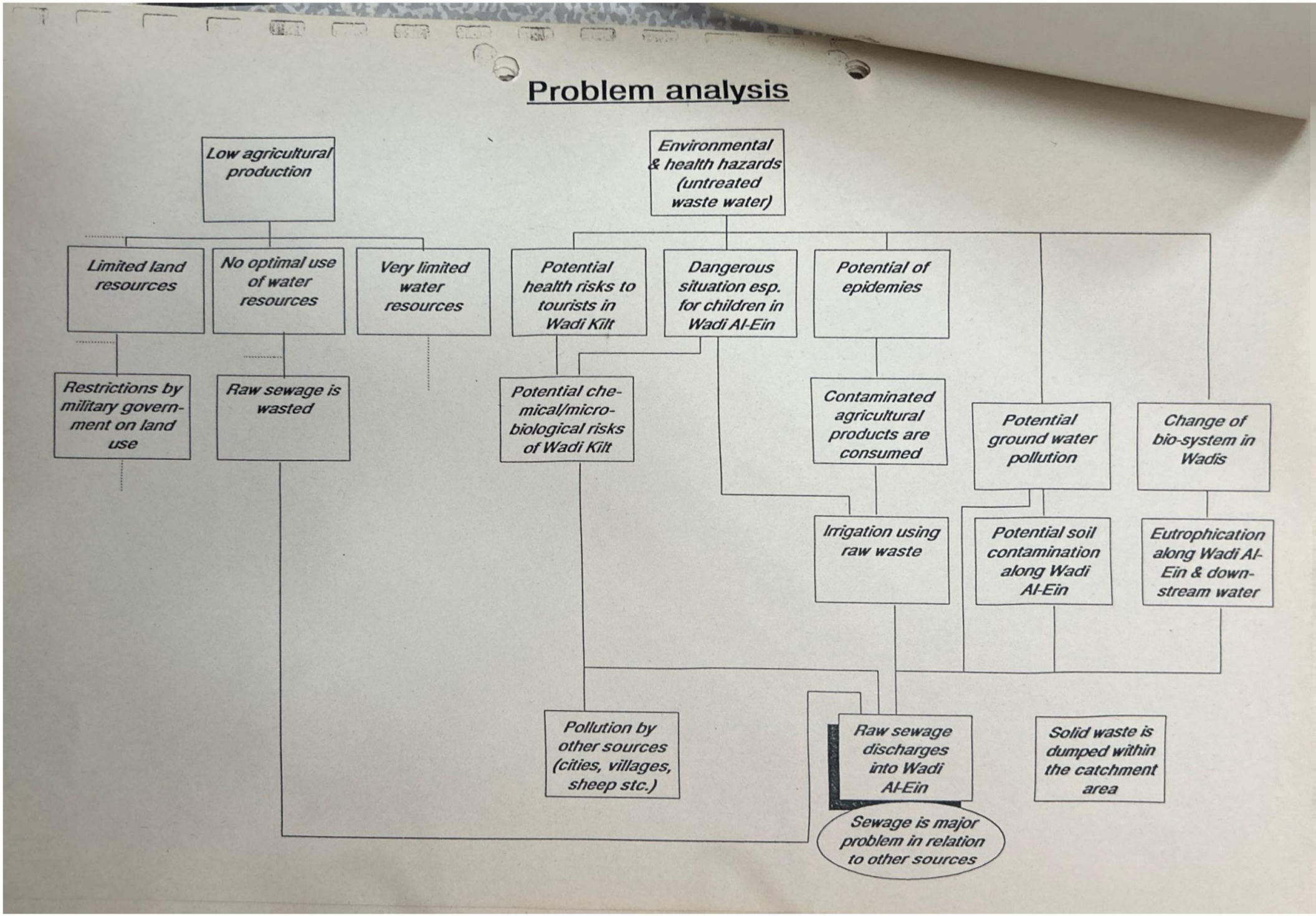
* Indicator * - Reduce # pathogen to a level safe for irrigation

Objectives analysis



11. Objectives analysis

Problem analysis



10. Problem analysis

Municipality of Al-Bireh

Potentials:
- Able to manage the project
- Water resources available
- Sewage collection system available
- Provision of resources according to ability
- Maintenance fees available
- Pilot project aspect
- Committment to improve sewage situation
- Backing of authorities
- Land needed is available

Constraints:
- Limited financial and personnel resources
- Lack of equipment
- Lack of know how

fears:
- Add value of transport will not be recovered

Expectations:
- Agr. department be engaged in irrigation development
- Developing management structure for irrigation
- Developing agr. land in Al-Bireh
- Maintain quality over time

Analysis of main benificiaries

Population

Expectations:
- Avoid bad smell and health hazards
- Sound environment
- Development of down-stream area

Fears:
- High running costs
- Increase of fees

Population of down-stream area

expectations:
- Agricult. development
- Increase of income
- Reuse of water
- Control of diseases
- Economic development

Fears:
- Failure of the disposal pipe
- Diseases
- Insufficient (irregular) supply

Consumers of agric. products

expectations:
- Unpolluted products
- Agric. independence
- Control of diseases

Higher prices !!!!

Participants	Expectations	Fears
Land owners	Increase agr. products; Raise of land value;	Health hazards and environmental hazards; Further confiscation of land; Poor maintenance of the plant;
Farmers in the area between Al-Bireh & Jordan valley	Increase of productiv.; Education programme;	Malfunctioning of sewage treatment plant; Restriction of crops Health/environm. risks; Tenure system may change;
Beduins	Better qual. of water; Additional fodder is available;	Tightening movement freedom; Reduction of water quantity;
Environmentalists in Wadi Kilt	Need for information; Not organised;	Prevention of water pollution in Wadi Kilt;
Jerusalem Water Undertaking	Clear ground water; Safe discharge of surface water in Wadi Al-Ein;	Salinity & Nitrate
Co-operatives of farmers	Safe water for irrigation; Funds available for irrigation (infrastr.);	Running costs !
Engineers & consultants Other Municipalities	Transfer of practical know how (learning by doing);	
Civil Administration	Reduction of the gov. dudget (through foreign resources); Compliance with regul.; Control of diseases; No irrigation water for settlements; Reuse of treated water for irrigation;	Continuation of raw sewage disposal; Spread of diseases;
Tourists in Wadi Kilt	Clean water; Bath in the water;	

Sheperds
Beduins

Universities
ANERA

Co-operatives of farmers (Al-Bireh, Dabwan, Mikmas)

Analysed participants

Participants	Strengths	Weaknesses
Land owners		
Farmers in the area between Al-Bireh and Jord. Valley	Use of waste water;	Lack of awareness concerning environm. & health hazards; No experience with irrigation farming;
Beduins	Can provide information on biological indicators in Wadi Kilt;	
Environmentalists Wadi Kilt	Supportive potential;	
Jerusalem Water Undertaking	Know how, management & operations; Knowledge of hydrological situation;	
Co-operatives of farmers	Organisational framework for irrigation exists;	No experience in irrigation management;
Engineers & consultants Other Municipalities	Theoretical know how is available;	Lack of practical experience in such projects;
Civil Administration	Power; Existing plans can be discussed (agr. reuse);	Decisions without local citizens; Poor enforcement; Inflexibility;
Tourists in Wadi Kilt		Risks to the environment;

Mr. Hartmann explained briefly what biological water treatment means and some questions of participants were answered. One main result of his explanations was that the treatment process has different stagesd and that the intended use of treated water determines kind and number of treatment stages. One further factor was mentioned by the participants which is the valid by-laws and regulations concerning treated water.

Further results of the explanations and discussions were summarised as follows:

- Polluted water is going to national reserved area

- Degree of pollution is strongly decreasing after ca. 5-6 km from the sewage outlet (whole distance to Wadi Al-Kilt = ca. 15 km)

- It can't be determined now if and how far ground water will be contaminated if sewage water will further flow

- Contaminated water is used in Wadi Al-Ein for irrigation by a couple of farmers

- 4 % of the water resources of the West-Bank come from Wadi Al-Kilt

- Other villages/cities/settlements are discharging unknown amounts of sewage into Wadi Al-Kilt. Further "pollution" is caused by sheep;

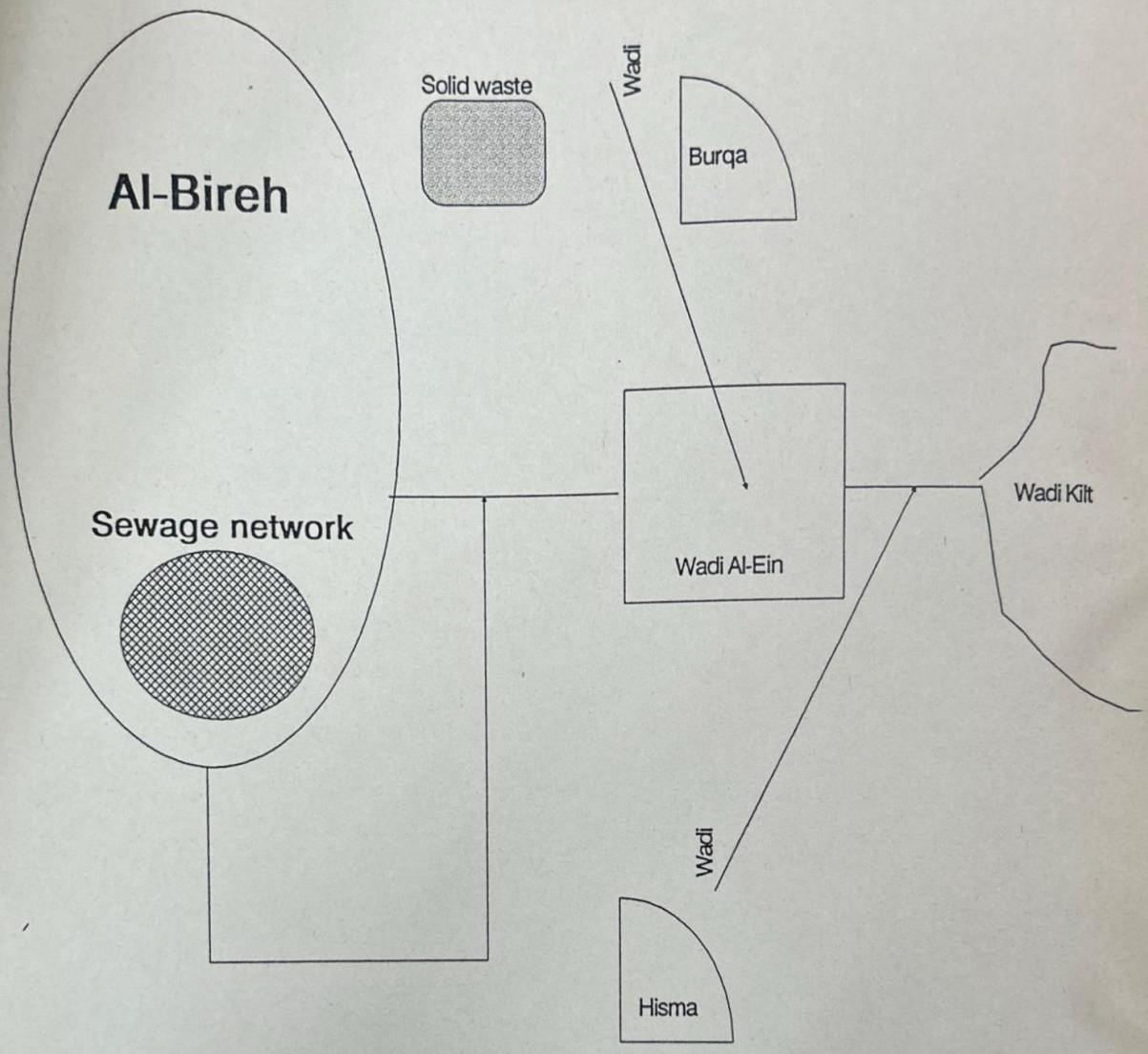
- Shortage of water in the area

9. Participant analysis

Municipality of Al-Bireh
Local organisations
Agricult. Department of Ramallah District
Health Department of Ramallah District
Çivil Administration
Jerusalem Water Undertaking
BMZ/GTZ

Drinking water consumers
People of Jericho
Settlements
Population of Al-Bireh
Population of down-stream areas
Consumers of agricult. products
Environmentalists in Wadi Kilt
Engineers and consultants
Tourists in Wadi Kilt
Land owners
Farmers and future farmers

Sewage path



3. Visualisation of the general project objective (as outlined in the project proposal and desired by the participants)

The general obective identified was:

To improve the present situation = Polluted water from Al-Bireh discharges into Wadi Al-Ein

4. Explanantion of the methodology using flipcharts
5. Explanations of procedures

see GTZ booklet

6. Discussion of and decision on the time schedule

08.30 - 10.00	first session
10.00 - 10.15	break
10.15 - 11.45	second session
11.45 - 12.00	break
12.00 - 13.00	third session
13.00 - 13.30	lunch break
13.30 - 14.30	fourth session
14.30 - 14.45	break
14.45 - 16.00	fifth session

7. Description of the present situation in Al-Bireh and in the related area, concerning sewage: Status quo by Dr. Gilles, Dr. Petermann and Prof. Hartmann
8. Visualisation of the results

The present situation was firstly descriped by using a drawing illustrating the path of sewage

List of participants

Name	*Function/Institution*
1. Reinhard Meierjohann	German Advisor project Betlehem/GTZ
2. Eliezer Balasha	Balasha-Jalon Consulting Engineers
3. Samih Abid	Faculty of Eng./University of Birzeit
4. Bassam Bamieh	Director of Department of Agriculture/Ramallah
5. Alfred Abd Rabbo	Water chemist/Betlehem University
6. Br. Andrew J. Winka	Environm. engineer/Betlehem University
7. Mohammed Sbeih	Irrigation consultant/ANERA
8. Omar Zimmo	Environm. Engineer/University of Birzeit
9. Abdelkarim Asaad	General Manager/Jerusalem Water Undertaking
10. Nassr Abu Halaweh	Deputy manager/Water Dep.
11. Fawzi Salem	Civil engineer/Municipality Al-Bireh
12. Klaus-P. Gilles	Member of appraisal mission/o.b.o. GTZ
13. Ludwig Hartmann	Member of appraisal mission/o.b.o. GTZ
14. Ernst Döring	Planning Officer/GTZ HQ
15. Munif Treish	City Engineer/Municipality of Al-Bireh
16. Thomas Petermann	Member of appraisal mission/o.b.o. GTZ
17. Jabr Yousef Rajab	Surveyer/Municipality of Al-Bireh
18. Nathan Grauer	Balasha-Jalon Consulting Engineers
19. Hasan Tawil	Mayor of Al-Bireh
20. Raja Shehada	Legal advisor/Al-Bireh Municipality
21. Nizar Moghrabi	Civil engineer/Municipality of Debwan

1. Opening

The workshop was opened by the City Engineer of the city Al-Bireh Mr. Munif Treish and, on behalf of the German side by Mr. Ernst Döring.

Mr. Munif stressed on the objectives of the desired project. He mentioned first the tratment of sewage, stressing that this is the main objective of the city of Al-Bireh. Two further objectives were mentioned: preventing that water goes to Wadi Al-Ein and using treated water for irrigation. The two last objectives were more or less considered as desirable by-products of the project. Mr. Munif mentioned further the "plans and wishes" of the Israeli side: The consultant Buero Balasha worked out a master plan of the project area where the treated water is transported to areas far from the city of Al-Bireh. Mr. Munif higlighted the wish of the Palestinien side to use the treated water for the palestinien inhabitants in the area of Al-Bireh.

Mr. Döring explained that the outcome of the workshop will be a suggestion for the decision-making parties involved (Palestinien as well as german part).

2. Introduction of the participants

Al-Bireh Project

Workshop Documentation

Workshop steps

1. Workshop opening (Mr. Munif Treish and Mr. Ernst Döring)
2. Introduction of moderator and participants
3. Visualisation of the general objective of the project as outlined in the project proposal and desired by the participants
4. Explanantion of the methodology using flipcharts
5. Explanations of procedures
6. Discussion of and decision on the time schedule
7. Description of the present situation in Al-Bireh and in the related area, concerning sewage: Status quo by Dr. Gilles, Dr. Petermann and Prof. Hartmann
8. Visualisation of the results
9. Participant analysis
10. Problem analysis
11. Objectives analysis
12. Objectives of the project
13. Objectives of the first phase
14. Project Planning Matrix (PPM)
15. Workshop evaluation

ZOPP - Report

Al-Bireh / IOT

30.10. - 04.11.1992

4 -

①. stabilization of sludge

---

1. Role Activated sludge → trickling filter - without
F/M (1.5 - 2)

oxidize organic
remove free floating Bacteria

degradation to biomass
1 - 2 Hour.
2/3 | element

don't - 5-10 mg/L.

---

to Reduce energy cost
to Reduce volume

Element chlorination unit from All suggestion

only non restricted - crops should use chlorine

---

construction period 2 year

Tactic solution | financing only treatment plant
and to

pipe will be designed according to the following flows:

DESIGN WASTEWATER FLOWS IN THE DISPOSAL PIPE

Stage/Year	I - 2000	Ultimate - 2010
Ave. Daily Flow (m3/d)	2,100	3,850
Max. Daily Flow (m3/d)	3,150	5,775
Ave. Hourly Flow in Max. Day (m3/h)	130	240

The effluent will be discharged from the balancing reservoir at a rate of 240 cu.m/h, which is an average hourly flow in a maximum day.

The effluent pipe diameter will be 250 mm.

The preliminary cost estimate for the construction of the pipe is about I.S. 3,250,000.

The cost of the seasonal reservoir and the irrigation system is not included here.

• 27-9. / visiting the treatment plant.

OF ALTERNATIVES (contd.)

בריכות אירור Aer. Lagoons		מרבגים ביולוגים Trick Filt		אירור נמשך Ext. Aerat		
שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	
						ערך נוכחי ממוצע של הפעלה, החזקה והחזר השקעות Ave. Present Value of O & M plus recovery capital investment
						- - - - - - - - - - - - - -
526	725	665	946	716	971	אלפי ש"ח לשנה - 10^3 I.S./year
0.56	1.02	0.71	1.33	0.77	1.37	ש"ח למ"ק שפכים - I.S/m3
1.10	1.99	1.31	2.45	1.34	2.39	ש"ח לק"ג צח"ב מסולק - I.S./Kg BOD removed

E. EFFLUENT DISPOSAL PIPE

The treated effluent will be used for irrigation of suitable agricultural crops.

The effluent will flow through the disposal pipe to a seasonal storage reservoir which will be constructed in the vicinity of the proposed irrigated area. An outfall pipe for excess water will be laid from the reservoir to Wadi Abu-El-Feed. The disposal of excess effluent to Wadi Abu-El-Feed was approved in principle by the authorities.

The proposed effluent and the discharge pipes will be a pressure pipes. The total length of the pipe from the treatment plant to the discharge point in Wadi Abu-El-Feed will be about 10,250 m.

A balancing reservoir will be constructed at the treatment plant site. The purpose of this reservoir is to regulate the flows and velocities in the discharge pipe, in order to reduce its diameter.

...MMARY OF THE ALTERNATIVES

בריכות אירור Aer. Lagoons		מרבגים ביולוגים Trick. Filt		אירור נמשך Ext. Aerat.		
שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	
38 250	26 250	38 250	26 250	38 250	26 250	אוכלוסיה מבוריבת Sewered Popultion
3 850	2 560	3 850	2 560	3 850	2 560	ספיקה יומית (מק"י) Design Daily Flow (cu.m/d)
2 280	1 520	2 280	1 520	2 280	1 520	עומס צח"ב יומי (קג"י) Daily BOD Laod (Kg/d)
						איכות קולחים Effluent Quality
20>	20>	30>	30>	10>	10>	-צח"ב מומס Sol. BOD(mgl)
75>	15>	50>	50>	20>	20>	-צח"ב כללי Tot. BOD(mgl)
120>	120>	40>	40>	30>	30>	-מ"מ S.S. (mgl)
6 650	4 970	10 790	7 625	9 855	6 990	עלות הקמה (אלפי ש"ח) Capilal Investment (10^3 I.S)
174	189	282	290	258	266	עלות השקעה לנפש (ש"ח) Cost per Capita (I.S.)
						ערך נוכחי ממוצע של עלות הפעלה והחזקה Ave. O & M Present Value
262	301	227	254	327	363	- אלפי ש"ח לשנה 10^3 I.S./Year
0.25	0.34	0.22	0.29	0.32	0.41	ש"ח למ"ק שפכים I.S./m3
0.49	0.66	0.40	0.53	0.55	0.71	ש"ח לק"ג צח"ב מסולק I.S./Kg BOD removed

PRESENT VALUE OF TREATMENT COST

(THOUSANDS I.S.)

	Alternative No. 1 Extended Aeration		Alternative No. 2 Trickling Filters		Alternative No. 3 Aerated Lagoons	
	First Stage	Ultimate Stage	First Stage	Ultimate Stage	First Stage	Ultimate Stage
Present value of capital costs, operations and maintenance	9,709	14,327	9,460	13,309	7,245	10,516
Ave. present value of operation & maintenance:						
I.S/CU.M	0.41	0.32	0.29	0.22	0.34	0.25
I.S/kg BOD removed	0.71	0.55	0.53	0.40	0.66	0.49
Ave. value of operations, maintenance & capital investments:						
I.S/CU.M	1.37	0.77	1.33	0.71	1.02	0.56
I.S/kg BOD removed	2.39	1.34	2.45	1.31	1.99	1.10

LAGOONS (contd.)

ELEMENT	PARAMETER	UNITS	VALUE
Aerated Lagoon First Stage	No. of Units	nos.	1
	Hydraulic Load	kg/d	760
	Volume of the Lagoon	m3	2,560
	Hydraulic Detention Time	d	2
	Water Depth	m	4
	O2 demand	kg/d	450
	Aerators Power	hp	23
	Dissolved Bod in Effluent	mgl	100
	SS in Effluent	mgl	245
Aerated Lagoon Second Stage	No. of Units	nos.	1
	Organic Load	kg/d	130
	Volume of Lagoon	m3	3,840
	Hydraulic Detention Time	d	3
	Water Depth	m	4
	O2 demand	kg/d	100
	Aerators Power	hp	6 - 5
Chlorination	No. of Units	nos.	1
	Max. Flow Detention Time	min.	20
	Volume of Tanks	m3	60
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Total Water Depth	m	4
	Operational Water Depth	m	3
	Aeration Power	hp	4
	in Secondary Lagoons	kg/year	34,000
Effluent Quality	Dissolved BOD	mgl	18 >
	Total BOD	mgl	75 >
	Total SS	mgl	120 >

C. COST ESTIMATES

SUMMARY OF CAPITAL INRESTMENTS IN THE THREE ALTERNATIVES

(THOUSANDS I.S.)

	Alternative No. 1 Extended Aeration	Alternative No. 2 Trickling Filters	Alternative No. 3 Aerated Lagoons
First Stage	6,990	7,625	4,970
Completion of ult. stage	2,865	3,165	1,680
Total	9,855	10,790	6,650

The main components of the treatment plant are as follows:

A. Pre Treatment & Flow Measurement -

Including mechanical bar screen and a Parshall flume.

B. Biological Treatment -

Including the first and the second stage aerated lagoons.

C. Chlorination & Balancing Reservoir -

Including chlorination tank and balancing reservoir which enables to regulate the flow and velocity in the discharge pipe thus to save pipe diameter and costs.

D. Administration Building -

A main administration building which will house the electricity and control panels, operation room and a diezel generator as an alternative power source.

The design data of the major units are given in the following table:

TWO STAGE AERATAED LAGOONS

E L E M E N T	P A R A M E T E R	U N I T S	V A L U E
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg/d	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Bar Screen		Mechanical - Vertical or Inclined
	No. of Units	nos.	1
	Openings between bars		1" - 2"
	Max. Velocity Flow	m3/sec.	1
Flow Measurement	Type of Flume		Parshall
	Width of Throat	cm.	15
	Max. Water Depth	cm.	30

& BIOLOGICAL FILTERS (contd.)

ELEMENT	PARAMETER	UNITS	VALUE
Biological Filters	No. of Units	nos.	1
	Type of Filter		High Rate
	Type of Media		Stone
	Volume of Media	m3	660
	Depth of Media	m	1.7
	Diameter of Filter	m	22
	Organic Load	kg/m3	0.75
	Recirculation Ratio	%	150
Final Clarifiers	No. of Units	nos.	1
	Water Surface Area	m2	76
	Ave. Hydraulic Load	m/h	0.7
	Diameter of Clarifier	m	9.8
	Water Depth	m	4 - 4.5
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Water Depth	m	4
	Operational Water Depth	m	3
	Aeration Power	hp	4
Sludge Dewatering	No. of Units	nos.	1
	Weight of Sludge	kg/d	340
	Concentration of Sludge	%	1.5
	Volume of Sludge	m3/d	23
	Solids load on Dewatering Facilities @ 50 hrs. weekly	kg/h	48
	Hydraulic Load @ 50 hrs. weekly	m3/h	3.2
	Method of Dewatering		Belt Filter Press
	Solid concentration in dried sludge	%	35
	Volume of Dried Sludge	m3/d	1
Effluent Quality	Dissolved BOD	mgl	30 >
	Total BOD	mgl	50 >
	Total SS	mgl	40 >

B.5 TWO STAGE AERATED LAGOONS - ALTERNATIVE 3

A general plan of the wastewater treatment plant, as well as a flow scheme of the aerated lagoons treatment process, are given in the attached drawing no. B-3.

esign data of the major units are given in the following table:

IMHOFF TANKS & BIOLOGICAL FILTERS

GENERAL DESIGN DATA FOR ONE MODULE

ELEMENT	PARAMETER	UNITS	VALUE
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Screen		Mechanical - Vertical or Inclined
	No. of Units	nos.	1
	Openings between Bars		1" - 2"
	Velocity at Max. Flow	m3/sec.	1
Flow Measurement	Type of Flume		Parshall
	Throat Width	cm.	15
	Max. Water Depth	cm.	30
Imhoff Tanks	No. of Units	nos.	2
	Surface area in each unit	m2	62.5
	Total Surface Area	m2	125
	Ave. Hydraulic Load	m/h	0.43
	Max. Hydraulic Load	m/h	1.36
	Volume of Sludge Chamber	m3	250
	Total Digestion Volume	m3	500
	Total Depth	m	8.5
	BOD Removal	%	35
	Weight of BOD Removal	kg/d	228
	SS Removal	%	65

B.4 IMHOFF TANKS & BIO FILTERS - ALTERNATIVE 2

A general plan of the wastewater treatment plant, as well as a flow scheme of the trickling filters process, are given in the attached drawing no. B-2.

The main components of the treatment plant are as follows:

A. Pre-Treatment & Flow Measurement -

Including mechanical bar screen and a Parshall flume.

B. Primary Treatment -

Including primary sedimentation basins within Imhoff tanks.

C. Biological Treatment -

Including recirculated high rate trickling filters, final clarifiers and effluent recirculation pumping station.

D. Chlorination & Balancing Reservoir -

Including chlorination tank and balancing reservoir which enables to regulate the flow and velocity in the discharge pipe thus to save pipe diameter and costs.

E. Sludge Treatment -

Including sludge (primary and secondary pumped sludge) stabilization in the Imhoff tanks, mixing and equalization tank, sludge feeding pumps, sludge dewatering machine and a belt conveyer to discharge the sludge cake into a container.

F. Administration Building -

A main administration building which will house the electricity and control panels, operation room and a diezel generator as an alternative power source.

ELEMENT	PARAMETER	UNITS	VALUE
Aeration Tanks	No. of units	nos.	1
	Volume	m3	1,600
	Water Depth	m	4
	Hydraulic Detention Time	days	1.25
	VSS Concentration	mgl	3,200
	Biological Load (F/M)	kgd/kg	0.15
	Sludge Age	d	20
	Oxygen Demand	kg/d	1,400
	Aeration Power	hp	63
	Excess Sludge	kg/d	315
Final Clarifiers	No. of units	nos.	1
	Water Surface area	m2	88
	Hydraulic Load	m/h	0.6
	Tank Diameter	m	10.6
	Water Depth	m	4 - 4.5
	Methods of Sludge Withdrawal		continuous
Chlorination	No. of units	nos.	1
	Detention Time (Max. flow)	min.	20
	Volume	m3	60
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Water Depth Total	m	4
	Effective Water Depth	m	3
	Aeration Power	hp	4
Sludge Dewatering	No. of Units	nos.	1
	Dry Solids Weight	kg/d	280
	Solids concentration	%	0.75
	Sludge Volume	m3	37
	Solids Load @ 50 hrs. a week	kg/h	39
	Hydraulic Load @ 50 hrs. a week	kg/h	5.2
	Dewatering Method		
	Solid concentration in dewatered sludge	%	18% - 20%
	Volume of Dry Sludge	m3/d	1.5
Effluent Quality	Dissolved BOD	mgl	10 >
	Total BOD	mgl	20 >
	Total SS	mgl	30 >
	O2 concentrated	mgl	2 >

Sludge Treatment -

Including mixing and equalization tank, sludge feeding pumps, sludge dewatering machine and a belt conveyer to discharge the sludge cake into a container.

E. Administration Building -

A main administration building which will house the electricity and control panels, operation room and a diesel generator as an alternative power source.

The design data of the major units are given in the following table:

EXTENDED AERATION - GENERAL DESIGN DATA FOR ONE MODULE

ELEMENT	PARAMETER	UNITS	VALUE
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg/d	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Bar screens		Mechanical - Vertical or Inclined
	No. of units	nos.	1
	Openings between bars		1" - 2"
	Max. Velocity	m/sec.	1
Flow Measurement	Type of Flume		Parshall
	Throat Width	cm.	15
	Max. Water Depth	cm.	30
Selector	No. of units	nos.	1
	Water Volume	m3	15
	Ave. Detention Time	min.	17
	Mixers power	hp.	1/2

Return of sludge 1:1
pumps capacity for sludge > 1:1

[redacted]ants will consist of three modules. Two will be constructed for the first stage and the third one will be added for the ultimate stage.

DESIGN DATA FOR ONE MODULE OF THE PLANT

PARAMETER	UNIT	VALUE
Ave. Daily Flow	m3/d	1,280
Max. Daily Flow	m3/d	1,925
Max. Hourly Flow	m3/h	170
BOD Load	Kg/d	760
BOD Concentration	mgl	593
Nitrogen Load	Kg/d	130
Nitrogen Concentration	mgl	101
Sus. Solid Concentration	mgl	500

TREATMENT CAPACITY OF THE PLANT

PARAMETER	UNITS	Design Data for One Module	Stage I 2000	Ultimate Stage 2010
No. of Modules	nos.	1	2	3
Daily Flow	m3/d	1,280	2,560	3,840
Hourly Flow	m3/d	170	340	510
Total BOD	kg/d	760	1,520	2,280
Total Nitrogen	kg/d	130	260	390

B.3 EXTENDED AERATION PLANT - ALTERNATIVE 1

A general plan of the wastewater treatment plant, as well as a flow scheme of the extended aeration treatment process, are given in the attached drawing No. B-1.

The main components of the treatment plant are as follows:

A. Pre-Treatment & Flow Measurement -

Including mechanical bar screen and a Parshall flume.

B. Biological Treatment -

Including selectors, aeration tanks, final clarifiers and return sludge pumping station.

C. Chlorination & Balancing Reservoir -

Including chlorination tank and balancing reservoir, which enables to regulate the flow and velocity in the discharging pipe thus to save pipe diameter and costs.

The area is rocky and steep and the cost of excavation and earth works will be tremendously expensive. As the area is rocky ground water contamination is expected. The blanketing of the bottom of the ponds is impractical, in such a large area.

Another difficulty is that there is not enough soil, available in the area, suitable for the construction of the dikes required for the ponds.

As a result three more suitable methods of treatment were suggested and preliminary designed:

1. Extended Aeration
2. Imhoff Tanks and Trickling Filters
3. Aerated Lagoos (with concrete walls)

A summary of the findings concerning these methods is given in the following clauses:

2 GENERAL DATA

The following tables include the basic design data of the various plants:

POPULATION FORECAST

Stage/Year	1992	I - 2000	ULT.- 2010
Total Population (cap.)	28,000	35,000	45,000
Sewered Population (cap.)	15,000	26,250	38,250

WASTEWATER FLOWS

Stage/Year	I - 2000	ULTIMATE - 2010
Ave. Daily Flow (m3/d)	2,100	3,850
Max. Daily Flow (m3/d)	3,150	5,775
Max. Hourly Flow(m3/h)	280	510

BOD & NITROGEN LOADS

Stage/Year	Total BOD (kg/d)	Total Nitrogen (kg/d)
I - 2000	1,400	260
Ult. - 2010	2,280	385

ENGINEERS LTD.

Water Resources Development & Hydraulic Works
Water Supply , Sewerage , Irrigation & Drainage

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3rd March 1992

AL-BIREH WASTEWATER TREATMENT & DISPOSAL

A. GENERAL

In November 1985 a report examining the disposal of the wastewater from Al-Bireh was submitted to the Municipality of Al-Bireh and the concerned Authorities.

The recommended solution for the disposal of the wastewater of Al-Bireh was to discharge it after treatment to the area of Muchmas and Deir Debwan to store it there and utilize it for agricultural use (see attached map). This form of disposal will eliminate the flow of wastewater in the Wadies leading to the Jordan Valley, as demanded by the Hydrological Service and the Public Health Authorities.

Another alternative that was examined and ruled out was to pump the wastewater of Al-Bireh to Ramallah and to dispose the wastes of both towns to the sewerage scheme of the City of Jerusalem.

The recommended solution was adapted and approved by the Advisory Committee for Sewerage in its meeting of 12.3.1986. The decision of this Committee states that the disposal of the wastewater of the two towns (Al-Bireh and Ramallah) will be carried out separately, and that the system of Al-Bireh will consist of the completion of the collection system upto the suggested location for the Treatment Plant, the construction of the Treatment Plant (as required by Health Authorities), and the disposal of the effluent into agricultural areas to be selected for irrigation.

The project will consist of three components:

- The construction of a Wastewater Treatment Plant and Balancing Reservoir.
- The construction of a disposal gravity pressure pipe 10 km long to the Deir Debwan area and to Wadi Abu-El-Feed. ?
- The construction of a seasonal Reservoir for the effluent to be used for irrigation.

B. THE WASTEWATER TREATMENT PLANT

B.1. GENERAL

The use of low technology treatment plants such as unaerobic, facultative or aerobic land lagoons were disregarded in this case for the following reasons:

The size of the area located for the plant is about one tenth of the required area for earth ponds.

We hope that the GTZ will assist the Municipality to implement this project which is, of utmost importance for the protection of the environment and the utilization of the effluent in this area.

Very truly yours,

E. Balasha

cc : Mr. Munif Treish, Municipal Engineer,
Al-Bireh Municipality, Fax: 02-954431

EB/es

March 3, 1992 110/2397/12

Mr. R. Meierjohann
GTZ Representative
Jerusalem

Fax: 02-743606

Dear Mr. Meierjohann,

Following your request, we are enclosing a summary of our report on the feasible alternatives for the treatment and disposal of the wastewater of Al-Bireh, including the design data and cost estimates of these alternatives. The full report and study has been transmitted recently to the Municipality and to the relevant authorities.

① As shown in the last table, Aerated Lagoons is the least expensive plant in capital investments, but not in O&M costs. The difficulties that we envisaged in applying this method are, the removal of the sludge and the sealing of the bottom of the ponds so as not to contaminate ground water. Please note that these ponds have concrete walls rather than earth walls because of the topography of the site and the small total area available.

② * Extended Aeration is the most sophisticated method and its O&M costs are the highest, due to the high energy input required. However, the effluent quality is superior compared to the other alternatives.

③ Imhoff tanks followed by Bio filters are simple to operate and maintain. The energy required is low. Therefore, the O&M costs are the lowest. The capital investments in this plant are higher by about 10% than that of the Extended Aeration. The effluent quality is inferior to that of the Extended Aeration plant.

Not as good as

A decision, which alternative to adopt, will be made after discussion of the matter with the Municipality and the relevant authorities.

AL-BIREH אל-בירה

SEWERAGE SCHEME מערכת הביוב

WASTEWATER TREATMENT PLANT מכון למיפול בשפכים

ALTERNATIVE No. 1 חלופה מס'

EXTENDED AERATION איוור נמשך

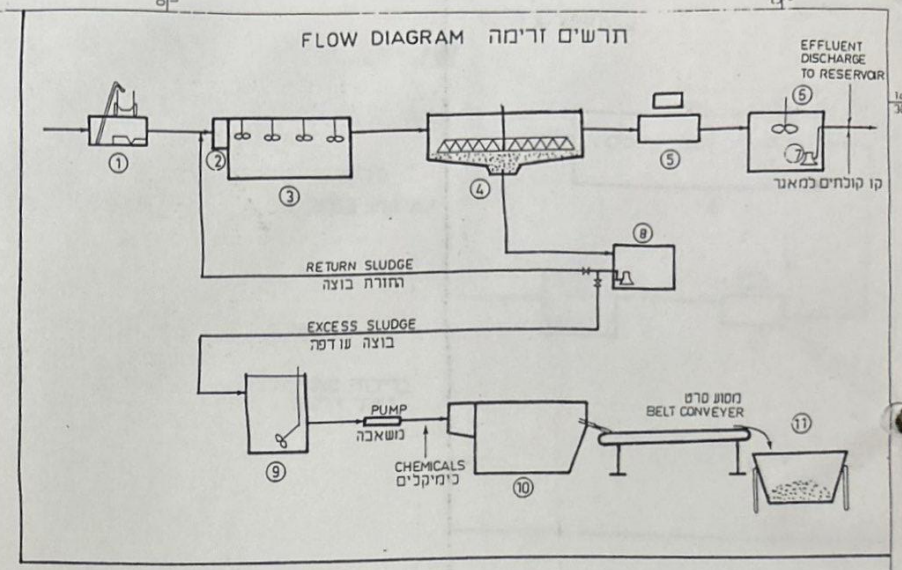
1. MECHANICAL BAR SCREEN & PHARSHAL FLUME
2. SELECTOR
3. AERATION TANK
4. FINAL CLARIFIER
5. CHLORINATION TANK
6. EFFLUENT REGULATING TANK
7. EFFLUENT PUMPING UNIT
8. RETURN & EXCESS SLUDGE PUMPING STATION
9. SLUDGE MIXING & EQUALIZATION TANK
10. SLUDGE DEWATERING MACHINE
11. DRIED SLUDGE CONTAINER
12. CONTROL & ELECTRICITY BUILDING

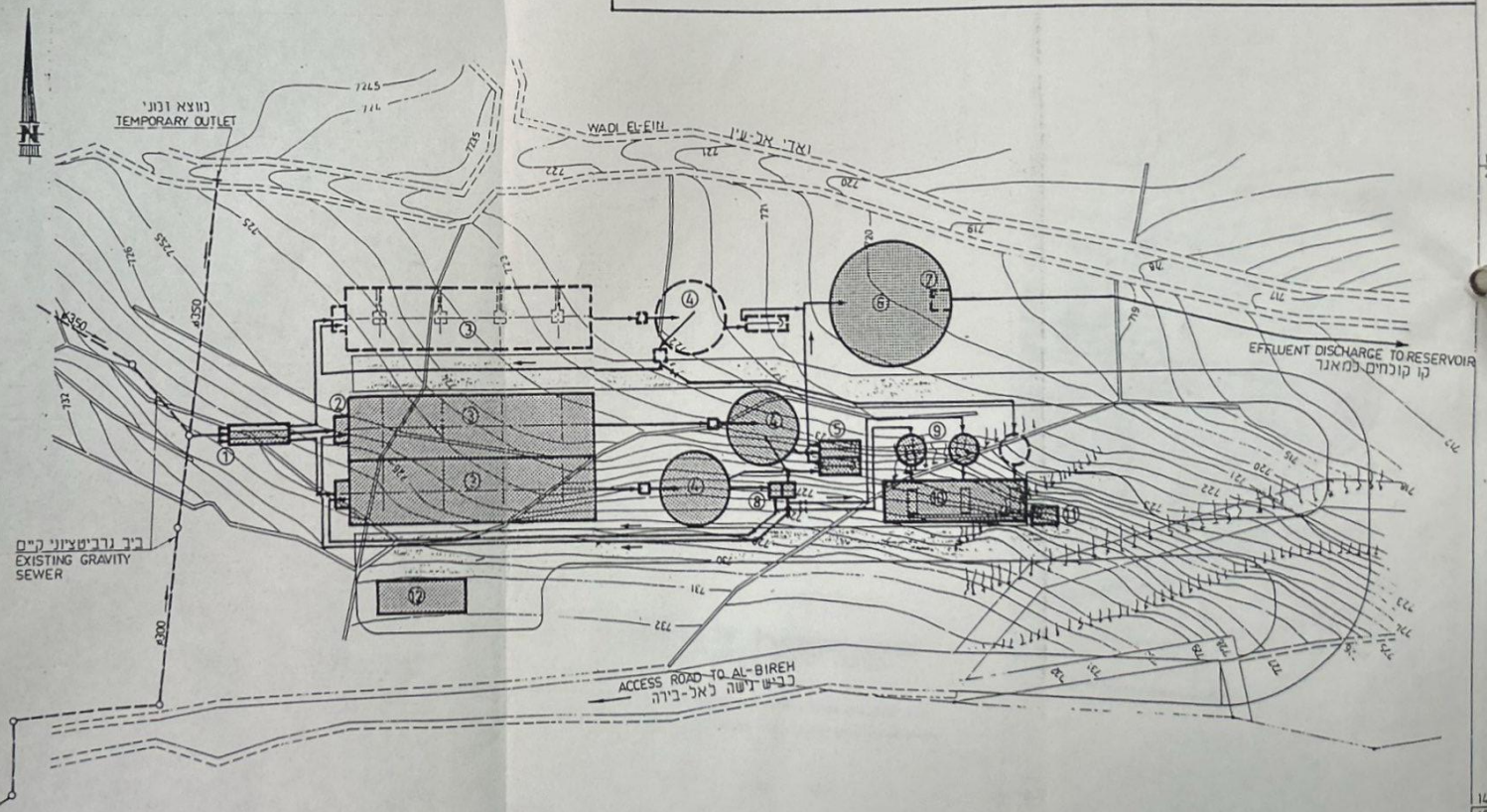
1. מגוב מכני + מדרם פרשל
2. סלקטור
3. אגן איוור
4. אגן שקוע סופי
5. אגן כלורינציה
6. אגן ויסות קולחים
7. יחידת שאיבת קולחים
8. תחנת שאיבה למחזור בוצה וכבוצה עודפת
9. מיכל ערבול וייסות בוצה
10. מתקן "יבוש בוצה
11. מכולה לבוצה יבשה
12. מבנה בקרה וחשמל

FIRST STAGE CONSTRUCTION
בניה בשלב ראשון

ULTIMATE STAGE CONSTRUCTION
בניה בשלב סופי

FLOW DIAGRAM תרשים זרימה





BALASHA-JALON CONSULTING ENGINEERS
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SCALE 1:500 קנ"מ

DRAWING No. B-1 שרטוט מס'

JANUARY 1992

AL-BIREH אל-בירה

SEWERAGE SCHEME מערכת הביוב

WASTEWATER TREATMENT PLANT מכון לטיפול בשפכים

ALTERNATIVE No. 3 חלופה מס'

TWO STAGE AERATED LAGOONS בריכות מאווררות בשתי דרגות

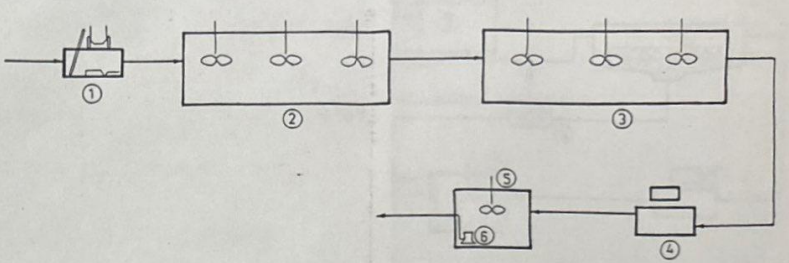
1. MECHANICAL BAR SCREEN & PHARSHAL FLUME
2. FIRST STAGE AERATED LAGOON (COMPLETE MIX)
3. SECOND STAGE AERATED LAGOON (PARTIAL MIX)
4. CHLORINATION TANK
5. EFFLUENT REGULATING TANK
6. EFFLUENT PUMPING UNIT
7. CONTROL & ELECTRICITY BUILDING

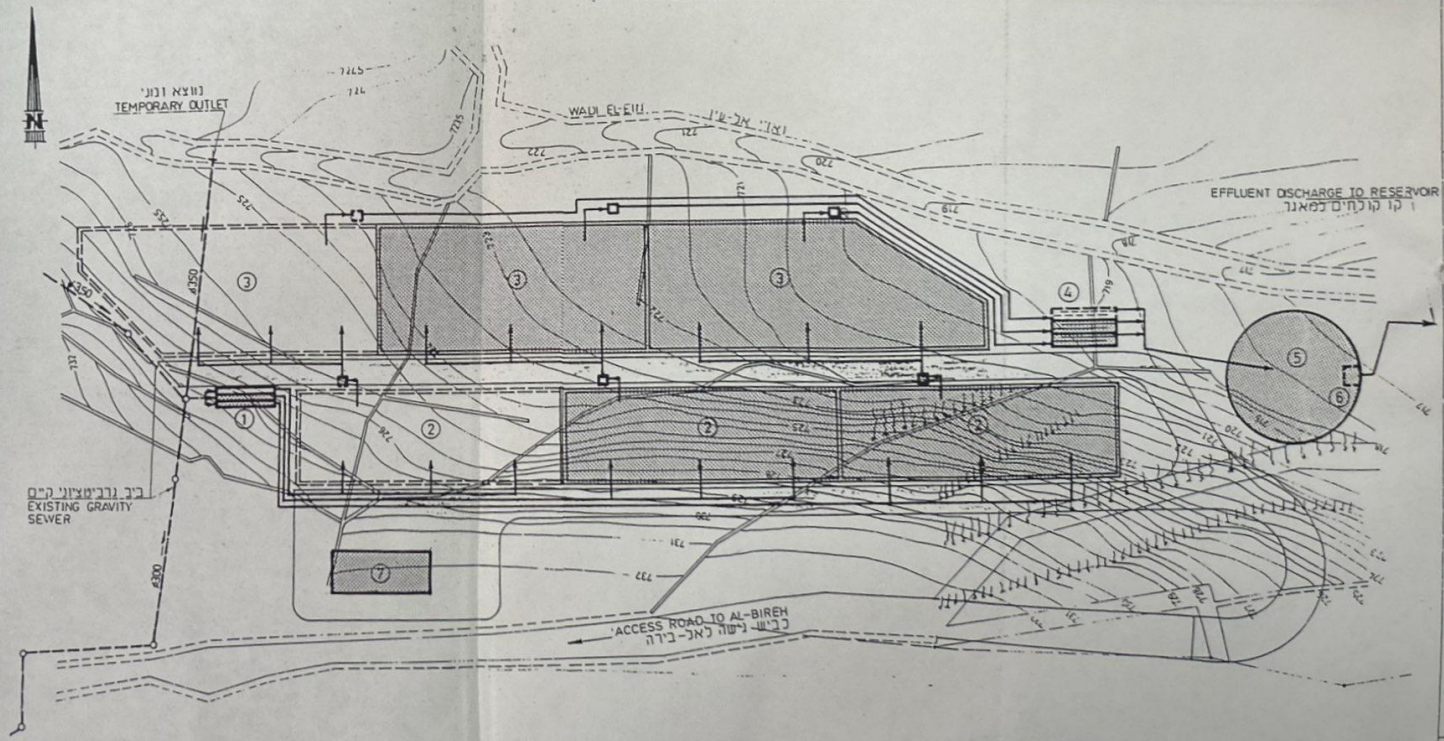
1. מגוב מכני + מדרם פרשל
2. בריכה מאווררת דרגה ראשונה (ערבול מושלם)
3. בריכה מאווררת דרגה שניה (ערבול חלקי)
4. אגן כלורינציה
5. אגן ויסות קולחים
6. יחידת שאיבת קולחים
7. סבנה בקרה וחשמל

FIRST STAGE CONSTRUCTION
בניה בשלב ראשון

ULTIMATE STAGE CONSTRUCTION
בניה בשלב סופי

FLOW DIAGRAM תרשים זרימה





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DRAWING No. B-3 שרטוט מס'

JANUARY 1992

AL-BIREH אל-בירה

SEWERAGE SCHEME מערכת הביוב

WASTEWATER TREATMENT PLANT מכון לטיפול בשפכים

ALTERNATIVE No. 2 חלופה מס'

TRICKLING FILTERS מרבדים ביולוגיים

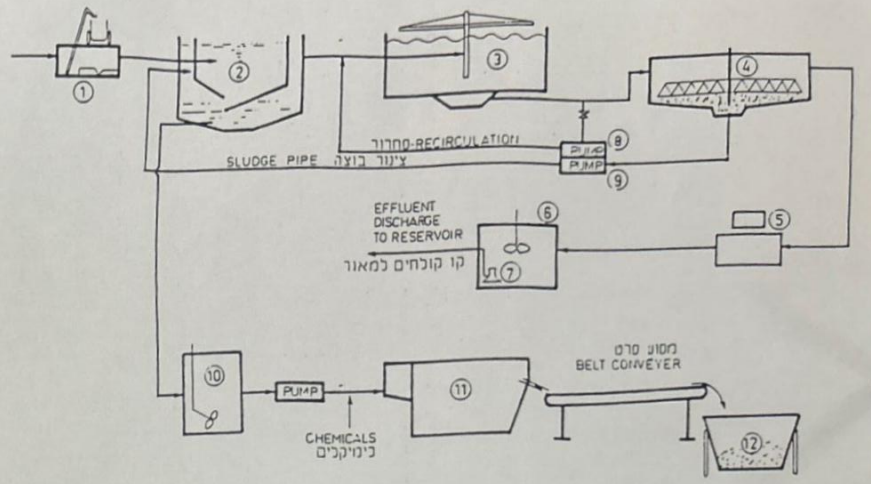
1. MECHANICAL BAR SCREEN & PHARSHAL FLUME
2. IMHOFF TANK
3. TRICKLING FILTER
4. FINAL CLARIFIER
5. CHLORINATION TANK
6. EFFLUENT REGULATING TANK
7. EFFLUENT PUMPING UNIT
8. RECIRCULATION PUMPING STATION
9. SECONDRY SLUDGE PUMPING STATION
10. SLUDGE MIXING & EQUALIZATION TANK
11. SLUDGE DEWATERING MACHINE
12. DRIED SLUDGE CONTAINER
13. CONTROL & ELECTRICITY BUILDING

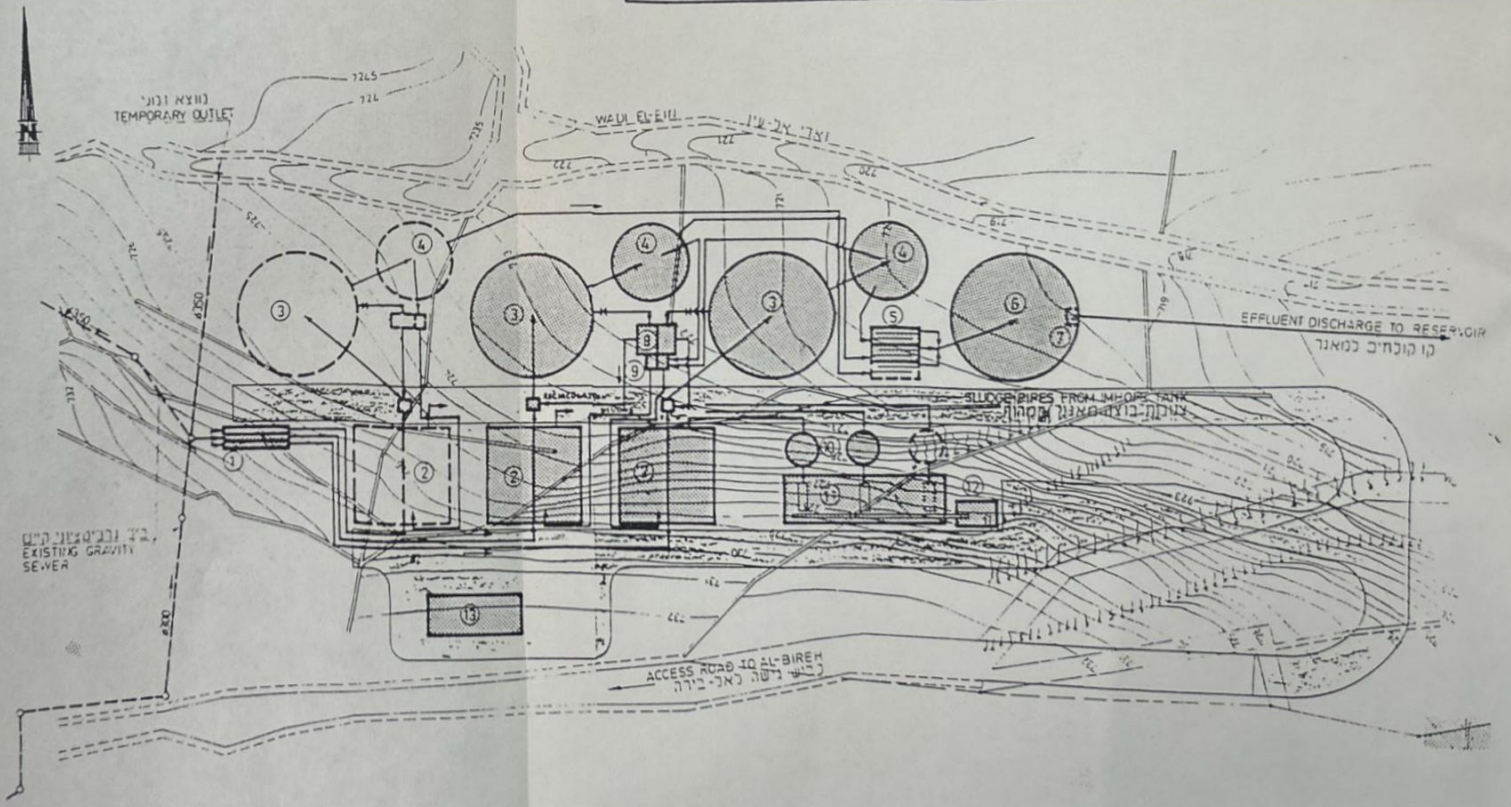
1. סוגר מכני+ מדדם פרשל
2. אגן אימהוף
3. מרבד ביולוגי
4. אגן שקוע סופי
5. אגן כלורינציה
6. אגן ויסות קולחים
7. יחידת שאיבת קולחים
8. תחנת שאיבה למחזור קולחים
9. תחנת שאיבה למבוצה שניונית
10. מיכל ערבול וויסות בוצה
11. מתקן יבוש בוצה
12. מכולה לבוצה יבשה
13. מבנה בקרה וחשמל

FIRST STAGE CONSTRUCTION
בניה בשלב ראשון

ULTIMATE STAGE CONSTRUCTION
בניה בשלב סופי

FLOW DIAGRAM תרשים זרימה





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SCALE 1:500

DRAWING No. B-2

JANUARY 1992

E. EFFLUENT DISPOSAL PIPE

The treated effluent will be used for irrigation of suitable agricultural crops.

The effluent will flow through the disposal pipe to a seasonal storage reservoir which will be constructed in the vicinity of the proposed irrigated area. An outfall pipe for excess water will be laid from the reservoir to Wadi Abu-El-Feed. The disposal of excess effluent to Wadi Abu-El-Feed was approved in principle by the authorities.

The proposed effluent and the discharge pipes will be a pressure pipes. The total length of the pipe from the treatment plant to the discharge point in Wadi Abu-El-Feed will be about 10,250 m.

A balancing reservoir will be constructed at the treatment plant site. The purpose of this reservoir is to regulate the flows and velocities in the discharge pipe, in order to reduce its diameter.

The pipe will be designed according to the following flows:

DESIGN WASTEWATER FLOWS IN THE DISPOSAL PIPE

Stage/Year	I - 2000	Ultimate - 2010
Ave. Daily Flow (m3/d)	2,100	3,850
Max. Daily Flow (m3/d)	3,150	5,775
Ave. Hourly Flow in Max. Day (m3/h)	130	240

The effluent will be discharged from the balancing reservoir at a rate of 240 cu.m/h, which is an average hourly flow in a maximum day.

The effluent diameter pipe will be 250 mm.

The preliminary cost estimate for the construction of the pipe is about I.S. 3,250,000.

The cost of the seasonal reservoir and the irrigation system is not included here.

SUMMARY OF ALTERNATIVES (contd.)

בריכות אוויר Aer. Lagoons		מרבגים ביולוגים Trick Filt		אוור נמשך Ext. Aerat		
שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	
						ערך נוכחי ממוצע של הפעלה, החזקה והחזר השקעות Ave. Present Value of O & M plus recovery capital investment
526	725	665	946	716	971	-אלפי ש"ח לשנה 10^3 I.S./year
0.56	1.02	0.71	1.33	0.77	1.37	-ש"ח למ"ק שפכים I.S/m3
1.10	1.99	1.31	2.45	1.34	2.39	-ש"ח לק"ג צח"ב מסולק I.S./Kg BOD removed

D. SUMMARY OF THE ALTERNATIVES

בריכות איוור Aer. Lagoons		מרבגים ביולוגים Trick. Filt		איוור נמשך Ext. Aerat.		
שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	שלב יעד Final Stage	שלב א' First Stage	
38 250	26 250	38 250	26 250	38 250	26 250	אוכלוסיה מבוייבת Sewered Popullition
3 850	2 560	3 850	2 560	3 850	2 560	ספיקה יומית (מק"י) Design Daily Flow (cu.m/d)
2 280	1 520	2 280	1 520	2 280	1 520	עומס צח"ב יומי (קג"י) Daily BOD Laod (Kg/d)
						איכות קולחים Effluent Quality
20>	20>	30>	30>	10>	10>	-צח"ב מומס Sol. BOD(mgl)
75>	15>	50>	50>	20>	20>	-צח"ב כללי Tot. BOD(mgl)
120>	120>	40>	40>	30>	30>	-מ"מ S.S. (mgl)
6 650	4 970	10 790	7 625	9 855	6 990	עלות הקמה (אלפי ש"ח) Capilal Investment (10^3 I.S)
174	189	282	290	258	266	עלות השקעה לנפש (ש"ח) Cost per Capita (I.S.)
						ערך נוכחי ממוצע של עלות הפעלה והחזקה Ave. O & M Present Value
262	301	227	254	327	363	- אלפי ש"ח לשנה 10^3 I.S./Year
0.25	0.34	0.22	0.29	0.32	0.41	ש"ח למ"ק שפכים I.S./m3
0.49	0.66	0.40	0.53	0.55	0.71	ש"ח לק"ג צח"ב מסולק I.S./Kg BOD removed

C. COST ESTIMATES

SUMMARY OF CAPITAL INRESTMENTS IN THE THREE ALTERNATIVES

(THOUSANDS I.S.)

	Alternative No. 1 Extended Aeration	Alternative No. 2 Trickling Filters	Alternative No. 3 Aerated Lagoons
First Stage	6,990	7,625	4,970
Completion of ult. stage	2,865	3,165	1,680
Total	9,855	10,790	6,650

PRESENT VALUE OF TREATMENT COST

(THOUSANDS I.S.)

	Alternative No. 1 Extended Aeration		Alternative No. 2 Trickling Filters		Alternative No. 3 Aerated Lagoons	
	First Stage	Ultimate Stage	First Stage	Ultimate Stage	First Stage	Ultimate Stage
Present value of capital costs, operations and maintenance	9,709	14,327	9,460	13,309	7,245	10,516
Ave. present value of operation & maintenance:						
I.S/CU.M	0.41	0.32	0.29	0.22	0.34	0.25
I.S/kg BOD removed	0.71	0.55	0.53	0.40	0.66	0.49
Ave. value of operations, maintenance & capital investments:						
I.S/CU.M	1.37	0.77	1.33	0.71	1.02	0.56
I.S/kg BOD removed	2.39	1.34	2.45	1.31	1.99	1.10

AERATED LAGOONS (contd.)

E L E M E N T	P A R A M E T E R	U N I T S	V A L U E
Aerated Lagoon First Stage	No. of Units	nos.	1
	Hydraulic Load	kg/d	760
	Volume of the Lagoon	m3	2,560
	Hydraulic Detention Time	d	2
	Water Depth	m	4
	O2 demand	kg/d	450
	Aerators Power	hp	23
	Dissolved Bod in Effluent	mgl	100
	SS in Effluent	mgl	245
Aerated Lagoon Second Stage	No. of Units	nos.	1
	Organic Load	kg/d	130
	Volume of Lagoon	m3	3,840
	Hydraulic Detention Time	d	3
	Water Depth	m	4
	O2 demand	kg/d	100
	Aerators Power	hp	6 - 5
Chlorination	No. of Units	nos.	1
	Max. Flow Detention Time	min.	20
	Volume of Tanks	m3	60
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Total Water Depth	m	4
	Operational Water Depth	m	3
	Aeration Power	hp	4
	in Secondary Lagoons	kg/year	34,000
Effluent Quality	Dissolved BOD	mgl	18 >
	Total BOD	mgl	75 >
	Total SS	mgl	120 >

B.5 TWO STAGES AERATED LAGOONS - ALTERNATIVE 3

A general plan of the wastewater treatment plant, as well as a flow scheme of the aerated lagoons treatment process, are given in drawing no. B-3.

The main components of the treatment plant are as follows:

A. Pre Treatment & Flow Measurement -

Including mechanical bar screen and a Parshall flume.

B. Biological Treatment -

Including the first and the second stage aerated lagoons.

C. Chlorination & Balancing Reservoir -

Including chlorination tank and balancing reservoir which enables to regulate the flow and velocity in the discharge pipe thus to save pipe diameter and costs.

D. Administration Building -

A main administration building which will house the electricity and control panels, operation room and a diezel generator as an alternative power source.

The design data of the major units are given in the following table:

TWO STAGE AERATAED LAGOONS

E L E M E N T	P A R A M E T E R	U N I T S	V A L U E
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg/d	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Bar Screen		Mechanical - Vertical or Inclined
	No. of Units	nos.	1
	Openings between bars		1" - 2"
	Max. Velocity Flow	m3/sec.	1
Flow Measurement	Type of Flume		Parshall
	Width of Throat	cm.	15
	Max. Water Depth	cm.	30

IMHOFF TANKS & BIOLOGICAL FILTERS (contd.)

ELEMENT	PARAMETER	UNITS	VALUE
Biological Filters	No. of Units	nos.	1
	Type of Filter		High Rate
	Type of Media		Stone
	Volume of Media	m3	660
	Depth of Media	m	1.7
	Diameter of Filter	m	22
	Organic Load	kg/m3	0.75
	Recirculation Ratio	%	150
Final Clarifiers	No. of Units	nos.	1
	Water Surface Area	m2	76
	Ave. Hydraulic Load	m/h	0.7
	Diameter of Clarifier	m	9.8
	Water Depth	m	4 - 4.5
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Water Depth	m	4
	Operational Water Depth	m	3
	Aeration Power	hp	4
Sludge Dewatering	No. of Units	nos.	1
	Weight of Sludge	kg/d	340
	Concentration of Sludge	%	1.5
	Volume of Sludge	m3/d	23
	Solids load on Dewatering Facilities @ 50 hrs. weekly	kg/h	48
	Hydraulic Load @ 50 hrs. weekly	m3/h	3.2
	Method of Dewatering		Belt Filter Press
	Solid concentration in dried sludge	%	35
	Volume of Dried Sludge	m3/d	1
Effluent Quality	Dissolved BOD	mgl	30 >
	Total BOD	mgl	50 >
	Total SS	mgl	40 >

The design data of the major units are given in the following table:

IMHOFF TANKS & BIOLOGICAL FILTERS

GENERAL DESIGN DATA FOR ONE MODULE

E L E M E N T	P A R A M E T E R	U N I T S	V A L U E
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Screen		Mechanical - Vertical or Inclined
	No. of Units	nos.	1
	Openings between Bars		1" - 2"
	Velocity at Max. Flow	m3/sec.	1
Flow Measurement	Type of Flume		Parshall
	Throat Width	cm.	15
	Max. Water Depth	cm.	30
Imhoff Tanks	No. of Units	nos.	2
	Surface area in each unit	m2	62.5
	Total Surface Area	m2	125
	Ave. Hydraulic Load	m/h	0.43
	Max. Hydraulic Load	m/h	1.36
	Volume of Sludge Chamber	m3	250
	Total Digestion Volume	m3	500
	Total Depth	m	8.5
	BOD Removal	%	35
	Weight of BOD Removal	kg/d	228
	SS Removal	%	65

B.4 IMHOFF TANKS & BIO FILTERS - ALTERNATIVE 2

A general plan of the wastewater treatment plant, as well as a flow scheme of the trickling filters process, are given in the attached drawing no. B-2.

The main components of the treatment plant are as follows:

A. Pre-Treatment & Flow Measurement -

Including mechanical bar screen and a Parshall flume.

B. Primary Treatment -

Including primary sedimentation basins within Imhoff tanks.

C. Biological Treatment -

Including recirculated high rate trickling filters, final clarifiers and effluent recirculation pumping station.

D. Chlorination & Balancing Reservoir -

Including chlorination tank and balancing reservoir which enables to regulate the flow and velocity in the discharge pipe thus to save pipe diameter and costs.

E. Sludge Treatment -

Including sludge (primary and secondary pumped sludge) stabilization in the Imhoff tanks, mixing and equalization tank, sludge feeding pumps, sludge dewatering machine and a belt conveyer to discharge the sludge cake into a container.

F. Administration Building -

A main administration building which will house the electricity and control panels, operation room and a diezel generator as an alternative power source.

EXTENDED AERATION (contd.)

ELEMENT	PARAMETER	UNITS	VALUE
Aeration Tanks	No. of units	nos.	1
	Volume	m3	1,600
	Water Depth	m	4
	Hydraulic Detention Time	days	1.25
	VSS Concentration	mgl	3,200
	Biological Load (F/M)	kgd/kg	0.15
	Sludge Age	d	20
	Oxygen Demand	kg/d	1,400
	Aeration Power	hp	63
	Excess Sludge	kg/d	315
Final Clarifiers	No. of units	nos.	1
	Water Surface area	m2	88
	Hydraulic Load	m/h	0.6
	Tank Diameter	m	10.6
	Water Depth	m	4 - 4.5
	Methods of Sludge Withdrawal		continuous
Chlorination	No. of units	nos.	1
	Detention Time (Max. flow)	min.	20
	Volume	m3	60
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Water Depth Total	m	4
	Effective Water Depth	m	3
	Aeration Power	hp	4
Sludge Dewatering	No. of Units	nos.	1
	Dry Solids Weight	kg/d	280
	Solids concentration	%	0.75
	Sludge Volume	m3	37
	Solids Load @ 50 hrs. a week	kg/h	39
	Hydraulic Load @ 50 hrs. a week	kg/h	5.2
	Dewatering Method		
	Solid concentration in dewatered sludge	%	18% - 20%
	Volume of Dry Sludge	m3/d	1.5
Effluent Quality	Dissolved BOD	mgl	10 >
	Total BOD	mgl	20 >
	Total SS	mgl	30 >
	O2 concentrated	mgl	2 >

D. Sludge Treatment -

Including mixing and equalization tank, sludge feeding pumps, sludge dewatering machine and a belt conveyer to discharge the sludge cake into a container.

E. Administration Building -

A main administration building which will house the electricity and control panels, operation room and a diesel generator as an alternative power source.

The design data of the major units are given in the following table:

EXTENDED AERATION - GENERAL DESIGN DATA FOR ONE MODULE

ELEMENT	PARAMETER	UNITS	VALUE
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg/d	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Bar screens		Mechanical - Vertical or Inclined
	No. of units	nos.	1
	Openings between bars		1" - 2"
	Max. Velocity	m/sec.	1
Flow Measurement	Type of Flume		Parshall
	Throat Width	cm.	15
	Max. Water Depth	cm.	30
Selector	No. of units	nos.	1
	Water Volume	m3	15
	Ave. Detention Time	min.	17
	Mixers power	hp.	1/2

The plants will consist of three modules. Two will be constructed for the first stage and the third one will be added for the ultimate stage.

DESIGN DATA FOR ONE MODULE OF THE PLANT

PARAMETER	UNIT	VALUE
Ave. Daily Flow	m3/d	1,280
Max. Daily Flow	m3/d	1,925
Max. Hourly Flow	m3/h	170
BOD Load	Kg/d	760
BOD Concentration	mgl	593
Nitrogen Load	Kg/d	130
Nitrogen Concentration	mgl	101
Sus. Solid Concentration	mgl	500

TREATMENT CAPACITY OF THE PLANT

PARAMETER	UNITS	Design Data for One Module	Stage I 2000	Ultimate Stage 2010
No. of Modules	nos.	1	2	3
Daily Flow	m3/d	1,280	2,560	3,840
Hourly Flow	m3/d	170	340	510
Total BOD	kg/d	760	1,520	2,280
Total Nitrogen	kg/d	130	260	390

B.3 EXTENDED AERATION PLANT - ALTERNATIVE 1

A general plan of the wastewater treatment plant, as well as a flow scheme of the extended aeration treatment process, are given in the attached drawing No. B-1.

The main components of the treatment plant are as follows:

A. Pre-Treatment & Flow Measurement -

Including mechanical bar screen and a Parshall flume.

B. Biological Treatment -

Including selectors, aeration tanks, final clarifiers and return sludge pumping station.

C. Chlorination & Balancing Reservoir -

Including chlorination tank and balancing reservoir, which enables to regulate the flow and velocity in the discharging pipe thus to save pipe diameter and costs.

Another difficulty is that there is not enough soil, available in the area, suitable for the construction of the dikes required for the ponds.

As a result three more suitable methods of treatment were suggested and preliminary designed:

1. Extended Aeration
2. Imhoff Tanks and Trickling Filters
3. Aerated Lagoos (with concrete walls)

A summary of the findings concerning these methods is given in the following clauses:

B.2 GENERAL DATA

The following tables include the basic design data of the various plants:

POPULATION FORECAST

Stage/Year	1992	I - 2000	ULT.- 2010
Total Population (cap.)	28,000	35,000	45,000
Sewered Population (cap.)	15,000	26,250	38,250

WASTEWATER FLOWS

Stage/Year	I - 2000	ULTIMATE - 2010
Ave. Daily Flow (m3/d)	2,100	3,850
Max. Daily Flow (m3/d)	3,150	5,775
Max. Hourly Flow(m3/h)	280	510

BOD & NITROGEN LOADS

Stage/Year	Total BOD (kg/d)	Total Nitrogen (kg/d)
I - 2000	1,400	260
Ult. - 2010	2,280	385

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Civil, Environmental & Agricultural Engineering
Water Resources Development & Hydraulic Works
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3rd March 1992

AL-BIREH WASTEWATER TREATMENT & DISPOSAL

A. G E N E R A L

In November 1985 a report examining the disposal of the wastewater from Al-Bireh was submitted to the Municipality of Al-Bireh and the concerned Authorities.

The recommended solution for the disposal of the wastewater of Al-Bireh was to discharge it after treatment to the area of Muchmas and Deir Debwan to store it there and utilize it for agricultural use (see attached map). This form of disposal will eliminate the flow of wastewater in the Wadies leading to the Jordan Valley, as demanded by the Hydrological Service and the Public Health Authorities.

Another alternative that was examined and ruled out was to pump the wastewater of Al-Bireh to Ramallah and to dispose the wastes of both towns to the sewerage scheme of the City of Jerusalem.

The recommended solution was adapted and approved by the Advisory Committee for Sewerage in its meeting of 12.3.1986. The decision of this Committee states that the disposal of the wastewater of the two towns (Al-Bireh and Ramallah) will be carried out separately, and that the system of Al-Bireh will consist of the completion of the collection system upto the suggested location for the Treatment Plant, the construction of the Treatment Plant (as required by Health Authorities), and the disposal of the effluent into agricultural areas to be selected for irrigation.

The project will consist of three components:

- The construction of a Wastewater Treatment Plant and Balancing Reservoir.
- The construction of a disposal gravity pressure pipe 10 km long to the Deir Debwan area and to Wadi Abu-El-Feed.
- The construction of a seasonal Reservoir for the effluent to be used for irrigation.

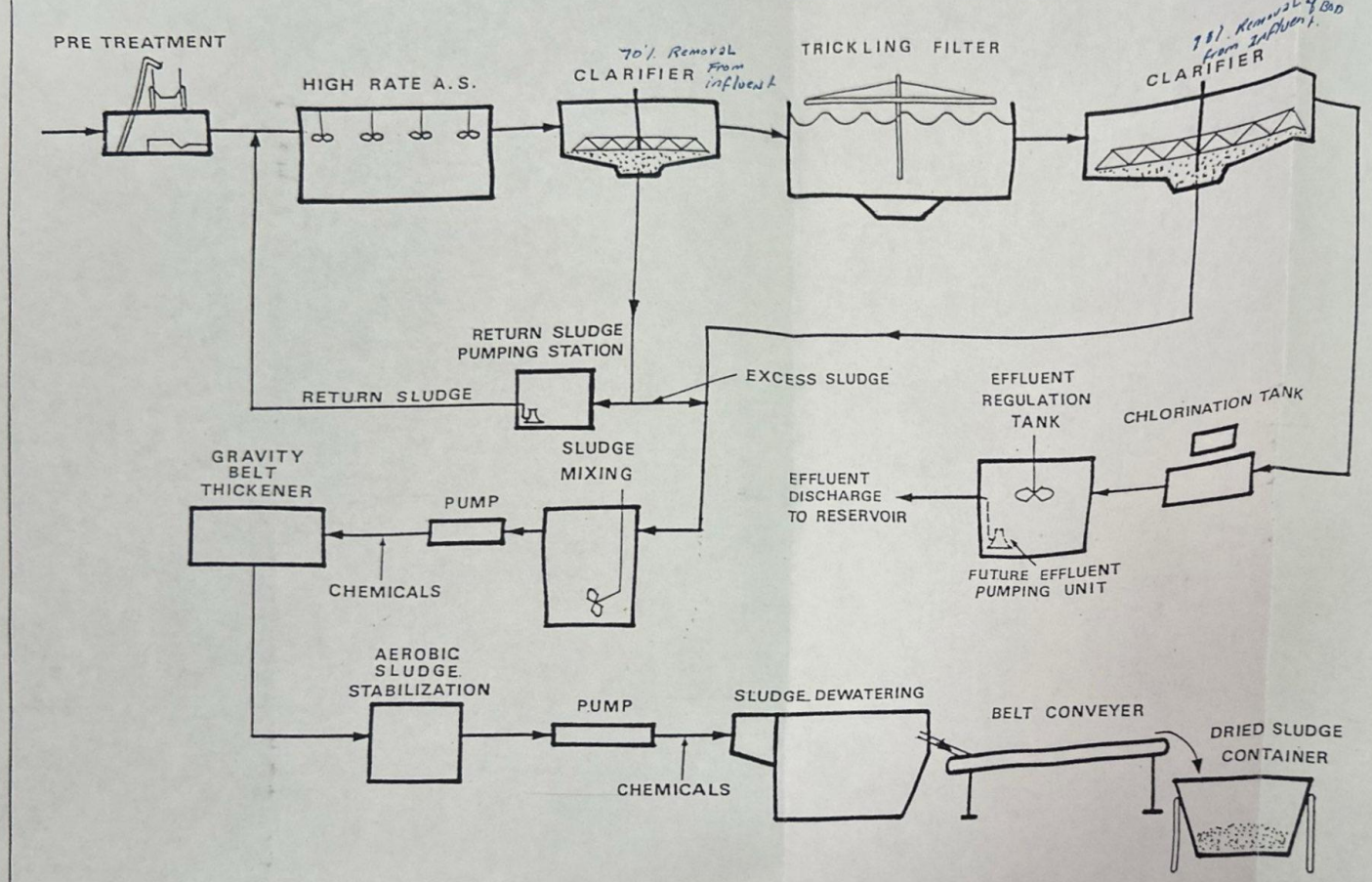
B. THE WASTEWATER TREATMENT PLANT

B.1. G E N E R A L

The use of low technology treatment plants such as unaerobic, facultative or aerobic land lagoons were disregarded in this case for the following reasons:

The size dof the area located for the plant is about one tenth of the required area for earth ponds.

The area is rocky and steep and the cost of excavation and earth works will be tremendously expensive. As the area is rocky ground water contamination is expected. The blanketing of the bottom of the ponds is impractical, in such a large area.



FLOW DIAGRAM

AL-BIREH

SEWERAGE SCHEME

WASTEWATER
TREATMENT PLANT

ALTERNATIVE No. 4

TWO STAGE PLANT
HIGH RATE A.S.+TRICKLING FILTER

BALASHA-JALON CONSULTING ENGINEERS

P.O. BOX 1727 HAIFA 31016 • ISRAEL • TEL. 04-520 221 • FAX 04-514

NOVEMBER 92

DRAWING No. B-

-JALON, CONSULTING ENGINEERS
HAATZMAUT ROAD, P.O.B. 1727
HAIFA, ISRAEL
Tel. 04-520221-5 Fax: 04-514381

TABLE No. 24 - ALTERNATIVE No. 4 - TWO STAGE PLANT: HIGH RATE A.S. + TRICKLING FILTERS
CAPITAL INVESTMENTS AND OPERATION & MAINTENANCE EXPENDITURES

YEAR No.	YEARS	WASTEWATER QUANTITIES MILLION CU.M./YEAR	B.O.D. REMOVED MILLION KG./YEAR	* CAPITAL INVESTMENTS MILLION N.I.S.	OPERETION & MAINTENANCE EXPENDITURES ANNUAL COST (MILLION N.I.S.) SALARIES	MAINTENANCE	CHEMICALS	ENERGY	TOTAL ANNUAL EXPENDITURES	PRESENT VALUE OF O & M EXPEND.	WASTEWATER TREATMENT COST (O & M ONLY) N.I.S. / CU.M.	N.I.S. / KG. B.O.D.	PRESENT VALUE OF CAPITAL INVESTMENTS & O & M EXPENDITURES MILLION N.I.S.
1	1992			3.685									3.685
2	1993			3.685									3.493
3	1994	0.83	0.476		0.240	0.010	0.032	0.073	0.355	0.319	0.428	0.747	0.319
4	1995	0.85	0.487		0.240	0.052	0.033	0.074	0.398	0.339	0.468	0.817	0.339
5	1996	0.88	0.504		0.240	0.052	0.034	0.074	0.400	0.323	0.454	0.792	0.323
6	1997	0.89	0.510		0.240	0.052	0.034	0.075	0.400	0.306	0.450	0.785	0.306
7	1998	0.90	0.516		0.240	0.052	0.034	0.075	0.401	0.291	0.445	0.777	0.291
8	1999	0.91	0.521		0.240	0.052	0.035	0.075	0.401	0.276	0.441	0.770	0.276
9	2000	0.92	0.527		0.240	0.052	0.035	0.075	0.402	0.262	0.437	0.762	0.262
10	2001	0.92	0.527		0.240	0.052	0.035	0.075	0.402	0.248	0.437	0.762	0.248
TOTAL		7.10	4.068	7.370	1.920	0.371	0.271	0.596	3.159	2.363			9.541
11	2002	0.95	0.546	1.562	0.300	0.052	0.036	0.076	0.464	0.271	0.486	0.849	1.186
12	2003	0.99	0.568	1.562	0.300	0.063	0.037	0.105	0.505	0.280	0.509	0.889	1.147
13	2004	1.03	0.591		0.300	0.073	0.038	0.106	0.518	0.273	0.503	0.877	0.273
14	2005	1.08	0.620		0.300	0.073	0.040	0.108	0.521	0.260	0.481	0.840	0.260
15	2006	1.13	0.645		0.300	0.073	0.041	0.109	0.523	0.247	0.465	0.812	0.247
16	2007	1.17	0.671		0.300	0.073	0.042	0.110	0.526	0.236	0.449	0.784	0.236
17	2008	1.22	0.698		0.300	0.073	0.044	0.111	0.529	0.224	0.434	0.758	0.224
18	2009	1.28	0.733		0.300	0.073	0.046	0.113	0.532	0.214	0.416	0.726	0.214
19	2010	1.33	0.762		0.300	0.073	0.047	0.114	0.535	0.204	0.402	0.702	0.204
20	2011	1.38	0.792		0.300	0.073	0.049	0.116	0.538	0.195	0.389	0.679	0.195
TOTAL		18.663	10.694	10.494	4.920	1.013	0.691	1.666	8.350	4.767			13.726

*-INCLUDING 15% FOR CONTINGENCIES & 15% FOR ENGINEERING EXPENDITURES
**-BASED ON: 1% PER ANNUM FOR ELECTRO-MECHANICAL WORKS,
0.5% PER ANNUM FOR CIVIL ENGINEERING WORKS

We would like to draw your attention that the costs estimates shown above based on the same unit rates which were prevailing in December 1991, when the I.S. was 2.35 for one Dollar. This is in order to compare the cost of Alternatives No. 4 to the other Alternatives.

Table No. 24 indicates capital investment and O&M costs is attahced.

The required capital investment for Alternative No. 4, based on Prof. Hartman's design parameters, is for stage 1 I.S. 7,370,000, compared to that of the conventional Extended Areation Plant which is I.S. 6,990,000.

The capital cost of the Civil Engineering works in Alternative 4 is I.S. 4,195,000 and the Electro-mechanical works (mostly imported from abroad), is I.S. 3,175,000, compared to I.S. 5,250,000 & I.S. & 2,375,000 for the same works in the Extended Aeration Plant.

The average annual maintenance & operation costs for Alternative No. 4 is I.S. 295,000, compared to 363,000 in the Extended Aeration one, and this is due to the lower energy consumption required for the two stage plants.

As requested during our meetings, we would appreciate it if we could receive additional information about existing wastewater plants using the two stage - Activated Sludge and Trickling Filters process - their performance, efficiency, specific loads, description of units & number of plants using this process.

Thank you for your cooperation.

Sincerely yours,

E. Balasha

E. Balasha

Encl. Flow Diagram
Table No. 24

cc: Mr. M. Treish, City Engineer, Municipality of Al-Bireh - Fax 02-954431

TABLE NO. 23 - ALTERNATIVE 4: TWO STAGE PLANT
CAPITAL COST (THOUSANDS I.S.)

TREATMENT UNIT	FIRST STAGE (TWO MODULES)			SECOND STAGE (ADDITIONAL ONE MODULE)		
	CIVIL	E-M	TOTAL	CIVIL	E-M	TOTAL
1.BAR SCREEN & FLOW MEASUREMENT	45	165	210	20	70	90
SUBTOTAL (1)	45	165	210	20	70	90
2.BIOLOGICAL TREATMENT						
2.1 Aeration Basins	145	145	290	75	75	150
2.2 Clarifiers	225	315	540	115	160	275
2.3Trickling Filters	190	205	395	95	100	195
2.4 Final Clarifiers	260	330	590	130	165	295
2.5 Sludge Pumping	140	95	235	70	45	115
SUBTOTAL (2)	960	1090	2050	485	545	1030
3.CHLORINATION & EFFLUENT REGULATION						
3.1Chlorination Tank	155	80	235	70	25	95
3.2 Regulation	245	25	270	--	--	--
SUBTOTAL (3)	400	105	505	70	25	95
LIQUID TREATMENT TOTAL (1)+(2)+(3)	1405	1360	2765	575	640	1215
4.SLUDGE TREATMENT						
4.1 Mixing & Thickening	190	375	565	95	185	280
4.2 Aerobic Digestors	140	65	205	70	35	105
4.3 Sludge Dewatering	140	470	610	70	235	305
SLUDGE TRT-TOTAL (4)	470	910	1380	235	455	690
5.MISCELLANEOUS						
5.1 Control Building	235	--	235	45	--	45
5.2 Site Development	470	--	470	115	--	115
5.3 Electricity & Control	175	175	350	95	80	175
5.4 Pipe Works	470	--	470	165	--	165
SUBTOTAL (5)	1350	175	1525	420	80	500
CAPITAL COST TOTAL	3225	2445	5670	1230	1175	2405
15% Engineering	485	365	850	185	175	360
15% Contingencies	485	365	850	185	175	360
GRAND TOTAL	4195	3175	7370	1600	1525	3125

TABLE NO. 22 - GENERAL DESIGN DATA FOR ONE MODULE (contnd.)

ELEMENT	PARAMETER	UNITS	VALUE
Biological Filters	No. of Units	nos.	1
	Type of Media		Stone / plastic
	Area of Filter	m2	71
	Volume of Media	m3	130
	Depth of Media	m	1.7
	Diameter of Filter	m	9.5
	Hydraulic Load	m/h	0.75
	Organic Load	Kg/m3/d	0.6
Final Clarifiers	No. of Units	nos.	1
	Water Surface Area	m2	76
	Ave. Hydraulic Load	m/h	0.7
	Diameter of Clarifier	m	9.8
	Water Depth	m	4
Balancing Reservoir (Regulating Tank)	Volume	m3	1,000
	Water Depth	m	4
	Operational Water Depth	m	3
	Aeration Power	hp	4
Sludge Treatment - Thickening, Stabilizing & Dewatering	No. of Units	nos.	1
	Weight of Sludge	kg/d	244
	Concentration of Raw Sludge	%	0.9
	Volume of Sludge	m3/d	28.5
	Solid Concentration in Dried Sludge	%	20
	Volume of Dried Sludge	m3/d	1.3

The design data of the major units are given in the following table:

TABLE NO. 22 - GENERAL DESIGN DATA FOR ONE MODULE

ELEMENT	PARAMETER	UNITS	VALUE
Design Data	Ave. Daily Flow	m3/d	1,280
	Ave. Hourly Flow	m3/h	53
	Max. Daily Flow	m3/d	1,925
	Max. Hourly Flow	m3/h	170
	Total BOD Load	kg/d	760
	Total BOD Concentration	mgl	593
	Total Nitrogen Load	kg/d	130
	Total Nitrogen Concentration	mgl	100
Mechanical Bar Screen	Type of Bar Screens		Mechanical - Vertical or Inclined
	No. of Units	nos.	1
	Openings between bars		1" - 2"
	Max. Velocity	m/sec.	1
Flow Measurement	Type of Flume		Parshall
	Throat Width	cm.	15
	Max. Water Depth	cm.	30
Aeration Tanks	No. of Units	nos.	1
	Volume	m3	125
	Water Depth	m	3
	Hydraulic Detention Time	hrs	2.3
	VSS Concentration	mgl	3500
	Biological Load (F/M) (F-Soluble)	kgd/kg	1.2
	Sludge Age	d	3
	Oxygen Demand	kg/d	415
	Aeration Power	hp	20
	Excess Sludge	kg/d	116
1st Stage Clarifiers	No. of Units	nos.	1
	Water Surface Area	m2	53
	Hydraulic Load	m/h	1.0
	Tank Diameter	m	8.2
	Water Depth	m	4
	Methods of Sludge Withdrawal		Continuous

ALTERNATIVE 4: A TWO STAGE PLANT:

HIGH RATE ACTIVATED SLUDGE AND TRICKLING FILTERS

A general flow diagram of the suggested treatment process, is given in the attached drawing No. B-10.

The main components of the treatment plant are as follows:

A. **Pre-Treatment & Flow Measurement**

Including mechanical bar screen and a Parshall flume. + Sand Removal

B. **High Rate Activated Sludge Stage**

Including aeration tanks, clarifiers and return sludge pumping station.

C. **Trickling Filter Stage**

Including trickling filters and final clarifiers.

D. **Chlorination & Balancing Reservoir**

Including chlorination tank and balancing reservoir, which enables to regulate the flow and velocity in the discharging pipe thus to save pipe diameter and costs.

This was included here in order to compare alternatives on the same basic assumptions.

E. **Sludge Treatment**

Including gravity belt thickner, aerobic sludge digestor and belt press for dewatering the stabilized sludge. This includes sludge feeding pumps and a belt conveyor to discharge the sludge cake into a container.

F. **Administration Building**

A main administration building which will house the electricity and control panels, operation room and a diesel generator as an auxiliary power source.

TABLE NO. 21 - TREATMENT CAPACITY OF THE PLANT

PARAMETER	UNITS	Design Data for One Module	Stage I 2000	Ultimate Stage 2010
No. of Modules	nos.	1	2	3
Daily Flow	m3/d	1,280	2,560	3,840
Hourly Flow	m3/d	170	340	510
Total BOD	Kg/d	760	1,520	2,280
Total Nitrogen	Kg/d	130	260	390

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61 HAATZMAUTH RD. P.O.B. 1727. HAIFA 31016, ISRAEL. TEL: 972-4-520221 [5 LINES] FAX: 972-4-514381

November 17th, 1992 110/2397/18

Mr. E. Doring
Deutsche Gesellschaft
Fur Technische Zusammenarbeit
(GTZ) GmbH
Dag-Hammarskjold-Weg 1-2
Postfach 5180
D-6263 Eschborn 1 bei Frankfurt/Main
West Germany

Fax: 00-49-6196-79-7202
79-1115

Dear Mr. Doring,

As requested during the workshop held in Al-Bireh, we prepared a preliminary cost estimates for the treatment plant based on two stage-high rate activated sludge and trickling filters, as suggested by Prof. L. Hartmann.

Based on the parameters of design suggested by Prof. Hartmann, which are different and more lenient compared to the ones being used in common practice, a summary of the computation is submitted herewith.

1. Design data, flows, loads etc. are identical to those used in the preliminary design of the other alternatives examined for the treatment of the wastewater of Al-Bireh, mentioned in our letter of March 3rd, 1992.

   The plant will consist of three modules. Two will be constructed in the first stage and the third one will be added in the ultimate stage.

TABLE NO. 20 - DESIGN DATA FOR ONE MODULE OF THE PLANT

PARAMETER	UNIT	VALUE
Ave. Daily Flow	m3/d	1,280
Max. Daily Flow	m3/d	1,925
Max. Hourly Flow	m3/h	170
BOD Load	Kg/d	760
BOD Concentration	mgl	593
Nitrogen Load	Kg/d	130
Nitrogen Concentration	mgl	101
Sus. Solid Concentration	mgl	500

Sludge Treatment Units:

- Thickening of the removed sludge from the 1st stage clarifier (following the activated sludge process).
- Anaerobic digestion of all the sludge produced in the plant.
- Dewatering of the digested sludge

and Cost estimate

It was suggested we prepare a general planning of the W.W.T.P. according to the above parameters before Prof. Hartmann's visit here in mid February.

* He is not able to give any information at the moment, he give ideas during his visits

We would appreciate if you could send us as soon as possible Prof. Hartmann's remarks and approval of the parameters suggested above.-

* We would also appreciate receiving information about existing wastewater plants using this two stages process, their design criteria, performance, efficiencies, specific load, energy consumption etc. as per our request in our letter to Mr. Doering of November 9th 1992. Nothing has been Recieved as of Jan.

The suggested time table for the design and construction of the plans will be sent to you within few days.

Thanking you in advance.

Sincerely yours,

E. Balasha

Eng. E. Balasha

cc: Mr. E. Schmechel, G.T.Z. Representative,
El Bireh Municipality, P.O.Box 506, El Bireh

EB/oc

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January 5th, 1994 110/2397/24

Eng. Munif Treish
Municipality of Al-Bireh
P.O.Box 506
Al Bireh

Dear Mr. Treish,

Re: Al-Bireh - W.W.T.P.

Following our discussions with you and with Mr. E. Schmechel of G.T.Z. on December 8th, and with Mr. Schmechel here in our office, on December 27th, we hereby summarize our mutual decisions concerning the proceedings with the design of the Al-Bireh W.W.T.P.

The report on the Pilot Plant performance and Prof. Hartmann's letter of November 5th, do not include recommendations for criteria and parameters to be used in the design of the W.W.T.P. and its various units in order to reach the required quality of the effluent. Furthermore, the Pilot Plant was not achieved its original goal, i.e. effluent quality of 20/30 (BOD/SS).

In order to proceed with the general planning of the plant, Mr. Shmechel and ourselves, suggest to use the following criteria:

The BOD of the influent was found to be 600 mg/lit which is a considerable high value. According to the Pilot Plant results the required BOD/SS of 20/30 content in the effluent was not achieved.

It is our feeling that in order to use the two stages process as recommended by Prof. Hartmann, primary settling will have to be employed ahead of the biological process. This will reduce the BOD to about 400 mg/lit and reduce the SS content by about 50 to 60 percent. The values of the primary clarifier effluent will then be closer to the characteristics of the influent treated in similar process in Germany. Thus, the trickling filters will be loaded at low rate organic load and be able to nitrify its influent.

The following criteria were suggested to be used:

Primary Clarifier	-	Surface Load: 1-1.5 m/h
Aeration Basin	-	F/M 0.8 kg/kg
MLSS in the Aeration Basin	-	[illegible] mg/lit
1st Stage Clarifier	-	Surface Load: 1.0 m/h
Trickling Filters	-	Hydraulic Load: 0.75 m/h
2nd Stage Clarifier	-	Surface Load: 0.7 m/h

F/M Food-to-Microorganism Ratio

Mixed Liquor Suspended Solids

① Get the ~~oneora~~ Anera to participate in the cost of financing the pilot plan.

AL-BIREH W.W.T.P. - IMPLEMENTATION Schedule.

① General planning and approval phase is OK.

② The Tender documents must be recieved at least two weeks before public notice.

Documents will be prepared by Balasha.

③ Tenedes for equipment ~~which~~ maybe an international one if lowest bidder is international, they must provide Tehnical assistance.

installation can be done by local firms.

④ Construction of CE work can be done by local Contractors.

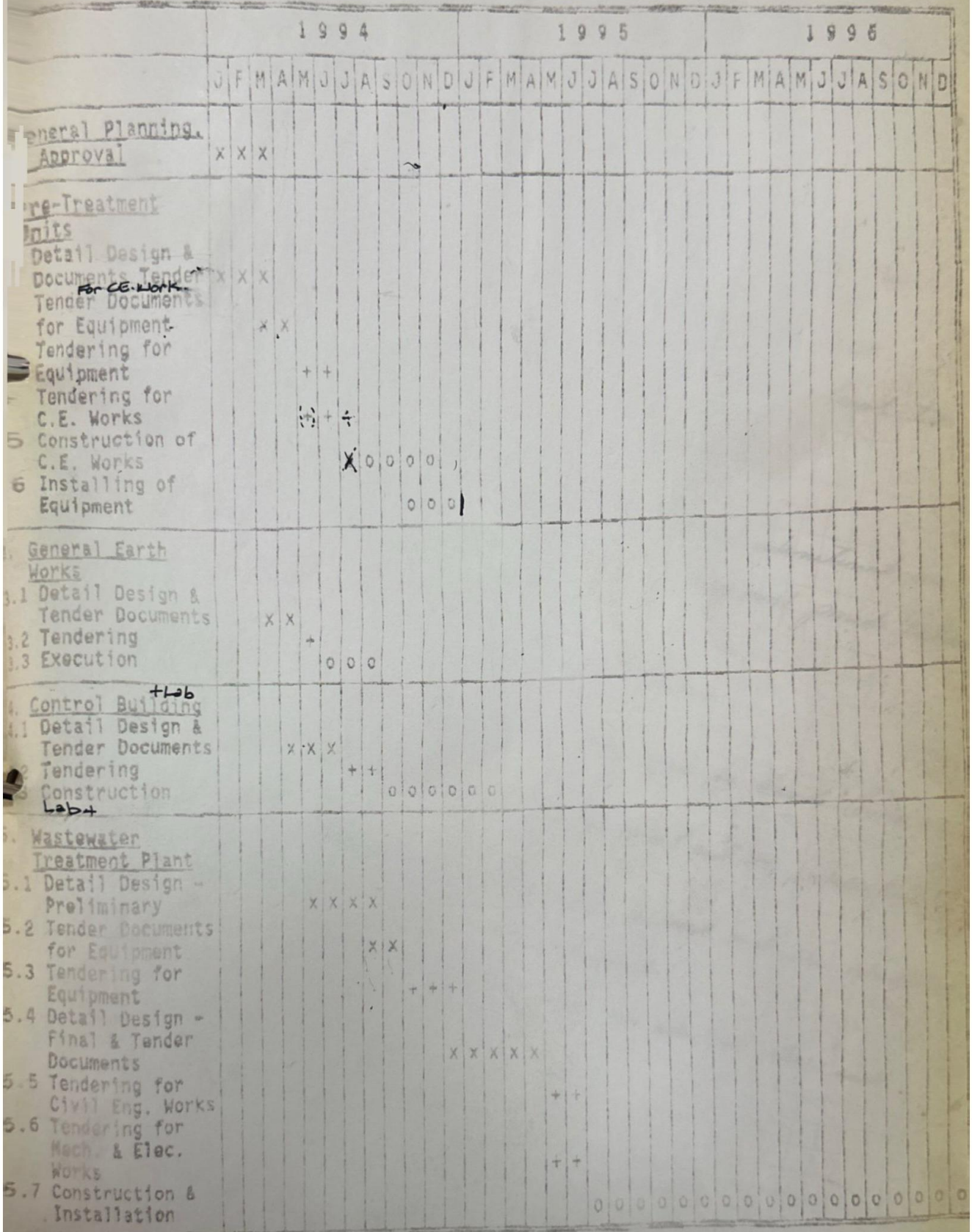
⑤ one contract shall include the equipement and its installation

⑥ The time between awarding the equipment Contract and the installation of those equipments need to be discussed.

equipment, installation can be started Dec. 1 and done by Jan 1.

January 9th, 1994

AL-BIREH W.W.T.P. - IMPLEMENTATION SCHEDULE



ngineering: xxxx Tendering: ++++ Construction: oooo

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January 9th, 1994 110/2397/25

Mr. M. Treish
City Engineer
Municipality of Al-Bireh
P.O.Box 506
Al-Bireh

Dear Sir,

We submit herewith a proposed time schedule for the design and construction of the Waste Water treatment Plant for Al-Bireh.

The implementation period is to last three years based on the assumption that no unseen factors or situation will cause a delay in the activities involved.

Sincerely yours,
E. Balasha
Eng. E. Balasha

Encl.

cc: Mr. E. Schmechel - G.T.Z. Representative, Al-Bireh Municipality

EB/oc

TWO STAGES PROCESS - COMPARISON OF FIRST PHASE CAPITAL COST BETWEEN THE PRESENT ESTIMATES AND THE ESTIMATES OF 11/92

TREATMENT UNIT	ESTIMATES 1/94 $ x 10^3	ESTIMATES 11/92 $ x 10^3	DIFFERENCE $ x 10^3	REASON FOR DIFFERENCE
5. **Sludge Treatment**				
5.1 Mixing & Thickening	240	240	--	
5.2 Stabilization	230(a)	87(b)	143	(a)Anaerobic Digestion (b)Aerobic Stabiliz.
5.3 Sludge Dewatering	260	260	--	
SLUDGE TREATMENT - TOTAL (5)	730	587	143	
6. **Miscellaneous**				
6.1 Control Building	100	100	--	
6.2 Site Development	200	200	--	
6.3 Electric & Control	150	150	--	
6.4 Pipe Works	300	200	100	Process Diagram
SUBTOTAL (6)	750	650	100	
CAPITAL COST - TOTAL	3,140	2,417	723	
15% Engineering	470	362	108	
15% Contingencies	470	362	108	
GRAND TOTAL	4,080	3,142	939	

TWO STAGES PROCESS - COMPARISON OF FIRST PHASE CAPITAL COST BETWEEN THE PRESENT ESTIMATES AND THE ESTIMATES OF 11/92

TREATMENT UNIT	ESTIMATES 1/94 $ x 10^3	ESTIMATES 11/92 $ x 10^3	DIFFERENCE $ x 10^3	REASON FOR DIFFERENCE
1. Bar Screen Grit Removal, & Flow Measurement	175	90	85	Adding a Grit Removal Unit
SUBTOTAL (1)	175	90	85	
2. Primary Clarifier	210	--	210	Adding Primary Clarifiers
SUBTOTAL (2)	210	--	210	
3. Biological Treatment				
3.1 Aeration Basin	140	125	15	Different F/M
3.2 Clarifiers	230	232	-2	
3.3 Trickling Filters	245	168	77	Different Volume & Media
3.4 Final Clarifiers	245	250	-5	
3.5 Return Sludge P.S	100	100	--	
3.6 Low-Lift P.S to T.F	100	--	100	Height of Filters
SUBTOTAL (3)	- 1,060	875	185	
4. Chlorination & Effluent Regulation				
4.1 Chlorination Tank	100	100	--	
4.2 Regulation Tank	115	115	--	
SUBTOTAL (4)	215	215	--	
LIQUID TREATMENT - TOTAL (1)+(2)+(3)+(4)	1,650	1,180	480	

HIGH RATE ACTIVATED SLUDGE + TRICKLING FILTERS TREATMENT PLANT

CAPITAL INVESTMENTS - 10^3 DOLLARS

TREATMENT UNIT	FIRST PHASE			SECOND PHASE		
	Civil	E-M	TOTAL	Civil	E-M	TOTAL
1. Bar Screen Grit Removal, & Flow Measurement	30	145	175	15	60	75
SUBTOTAL (1)	30	145	175	15	60	75
2. Primary Clarifier	75	135	210	35	65	100
SUBTOTAL (2)	75	135	210	35	65	100
3. Biological Treatment						
3.1 Aeration Basin	70	70	140	35	35	70
3.2 Clarifiers	95	135	230	45	70	115
3.3 Trickling Filters	160	85	245	80	45	125
3.4 Final Clarifiers	110	135	245	55	70	125
3.5 Return Sludge P.S	60	40	100	30	20	50
3.6 Low-Lift P.S to T.F	60	40	100	30	20	50
SUBTOTAL (3)	555	505	1,060	275	260	535
4. Chlorination & Effluent Regulation						
4.1 Chlorination Tank	65	35	100	30	10	40
4.2 Regulation Tank	105	10	115	--	--	--
SUBTOTAL (4)	170	45	215	30	10	40
TOTAL LIQUID TREATMENT (1)+(2)+(3)+(4)-	830	830	1,660	355	395	750
5. Sludge Treatment						
5.1 Mixing & Thickening	80	160	240	40	80	120
5.2 Anaerobic Digestor	200	30	230	--	50	50
5.3 Sludge Dewatering	60	200	260	30	100	130
TOTAL SLUDGE TREATMENT (5)	340	390	730	70	230	300
6. Miscellaneous						
6.1 Control Building	100	--	100	20	--	20
6.2 Site Development	200	--	200	50	--	50
6.3 Electric & Control	75	75	150	40	35	75
6.4 Pipe Works	300	--	300	100	--	100
SUBTOTAL (6)	675	75	750	210	35	245
CAPITAL COST - TOTAL	1,845	1,295	3,140	635	660	1,295
15% Engineering	275	195	470	95	100	195
15% Contingencies	275	195	470	95	100	195
GRAND TOTAL	2,395	1,685	4,080	825	860	1,685

ELEMENT	PARAMETER	UNITS	VALUE
1st Stage Clarifiers	No. of Units	nos.	2
	Water Surface Area	m^2	2 x 53
	Average Hydraulic Load	m/h	1.0
	Tank Diameter	m	8.2
	Water Depth	m	4
Biological Filters	BOD Load	kg/day	205
	No. of Units	nos.	2
	Type of Media		Plastic
	Area of Filter	m^2	2 x 71
	Volume of Media	m^3	2 x 213
	Depth of Media	m	3
	Diameter of Filter	m	9.5
	Hydraulic Load	m/h	0.75
	Organic Load	$kg/m^3/d$	0.48
Final Clarifiers	No. of Units	nos.	2
	Water Surface area	m^2	2 x 76
	Average Hydraulic Load	m/h	0.7
	Diameter of Clarifier	m	9.8
	Water Depth	m	4
Chlorination	No. of Units	nos.	2
	Minimum Contact Time	min.	15
	Volume	m^3	2 x 60
Balancing Reservoir (Regulating Tank)	Volume	m^3	1,000
	Water Depth	m	4
	Operation Water Depth	m	3
	Aeration Power	hp	4
Sludge Dewatering	Type		Belt Thickener
	Excess Activated Sludge	kg/day	1,100
	Sludge Concentration	%	0.75
	Excess Sludge Volume	m^3/day	146
	Thickened Sludge Concentration	%	5
	Volume of Thickened Sludge	m^3/day	22
Anaerobic Digestors	FED Sludge Weight (Thickened A.S. + Primary + T.F. Sludge)	kg/day	2,060
	FED Sludge Volume	m^3/day	40
	Digestors Volume	m^3	2 x 600
	Retention Time	d	30
	V.S.S. Decreased during Digestion	kg/day	660
	Digested Sludge Weight	kg/day	1,400
	Digested Sludge Concentration	%	3.5
Sludge Dewatering	Type		Belt Filter
	Sludge Rate assuming 50 operating hrs/week	kg/hr	200
	" " "	m^3/hr	6
	Dewatered Sludge Concentration	%	25
	Dewatered Sludge Volume	m^3/day	6

Prof Hartmann's idea
meeting with Bolash on 1/31/94

HIGH RATE ACTIVATED SLUDGE + TRICKLING FILTERS TREATMENT PLANT

GENERAL DESIGN DATA FOR THE 1ST PHASE

ELEMENT	PARAMETER	UNITS	VALUE
Design Data	Ave. Daily Flow	m^3/d	2,560
	Ave. Hourly Flow	m^3/h	106
	Max. Daily Flow	m^3/d	3,850
	Max. Hourly Flow	m^3/h	480 *
	Total BOD Load	kg/d	1,536
	Total BOD Concentration	mgl	600
	TKN Load	kg/d	260
	TKN Concentration	mgl	100
	Total S.S. Concentration	mgl	500
Mechanical Bar Screen	Type of Bar Screens		Mechanical - Vertical or Inclined
	No. of Units	nos.	1
	Openings between Bars		1" - 2"
	Max. Velocity	m/sec.	1
Grit Removal	Type		Vortex
	No. of Units		1
	Capacity	m^3/hr	600
Flow Measurement	Type of Flume		Parshall
	Throat Width	inch	9"
Primary Clarifier	No. of Units		2
	Surface Area	m^2	2 x 51
	Average Overflow Rate	$m^3/m^2/hr$	1.04
	Peak Overflow Rate	$m^3/m^2/hr$	4.7
	BOD Removal	%	33
	BOD Removal	kg/day	507
	S.S. Removal	%	55
	S.S. Removal	kg/day	704
Aeration Tanks	BOD Load	kg/day	1,029
	Influent BOD Concentration	mgl	400
	No. of Units	nos.	2
	Volume	m^3	2 x 150
	Hydraulic Detention Time	hrs	2.8
	MLVSS Concentration	mgl	3,400
	Biological Load (F/M)	kg/kg	1.0
	Sludge Age	d	1
	Standard Oxygen Demand	kg/d	1,100
	Aeration Power	hp	40
	Excess Sludge	kg/d	1,100

* Including Infiltration.

① - clarifier is need in both system.

②. Sand removal is needed in both system.

③. if clarifier is need then anaerobic sludge treatment is required.

④ more than that we believe an anaerobic sludge treatment is needed, whether we have clarifier or not.

so the final capital cost for extended aeration will be as follow:

cost as indicated in Saleh report

$$\frac{\$ 9.855{,}000}{2.35} = \$ 4.193 \text{ m}$$

in addition of 1+2+3+4

clarif	210,000
sand rem	85,000
anaerobic dig.	85,000
	380,00
slow	143
	523
piping and other	100
	\$ 4.623,000

\$ 4.823 ⟹ 4.79

HARTMAN

1st ⇒ 3.196 # [4.080]

Capital invest
Total
final

4.516 # [5.760]

BALASha.

[2.974]

[4.194]

in addition

2.974
.623

Total 1st phase cost as regu

[3.597]

† O.M. Exp. is expected to be higher than this value due to additional Regid Equipments.

1. Prices Are in Million U.S. Dollars (1 U.S. Dollar = 2.35 N.I.S.)

. Summary Table.

System .	Capital Inv. 1st Stage	Capital Inv. 2nd Stage	O.M. 1st stage	O.M. 2nd Stage
High Rate Activated Sludge + Trickling Filters	4.080	5.765	1.538	4.14
Extended Aeration	3.554*	4.774*	1.649†	4.397†

* Capital Inv. Cost = Inv. Cost Calculated By Balash + Additional Cost for Additional Req'd Equipments

= 2.974 + .58 =

Additional Cost for Additional Req'd Equipments : .58 M.

1. Grit Removal Unit $ 85,000
2. Primary Clarifier $210,000
3. Biological Treatment $185,000
   A. Aeration Basin
   B. Trick. Filters
   C. P.S. to T.F.
4. Additional Pipework $100,000

JONES+ATTWOOD GRIT REMOVAL SYSTEMS

The JETA

Grit removal combined with screening is a pre-requisite of waste-water treatment to make the ongoing effluent a manageable and consistent medium entering the next phase of treatment. Ideally screening or comminution of the main flow will be performed prior to grit removal. In cases where grit is removed from entirely raw sewage, additional washing and classification is necessary before dewatering.

The new Jeta grit trap is designed to provide the highest grit removal performance possible.

The Jeta is a compact, circular trap located in the mainstream of the inlet system. Effluent enters tangentially, flows around the tank and exits parallel to the inlet. Grit settles within the lower hopper and is transferred by a pumping system to washing/classification and dewatering plant.

The Jeta tank, with its sloping sides and specially arranged impeller provides the most ideal situation for maximum separation of the heavy mineral solids (grit) whilst rejecting the larger and light solids which remain in the water flow.

Two positive zones are set up within the inlet chamber, the outer zone being quiescent thus allowing the grit and other light solids to move to the inclined floor of the chamber.

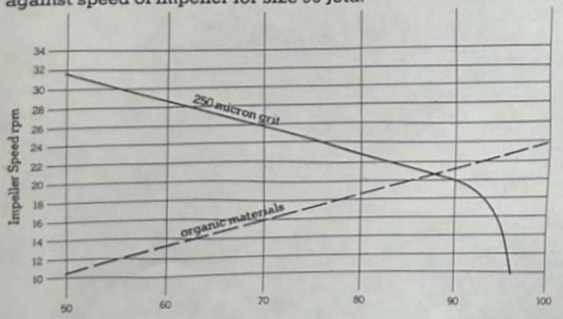
The impeller has a predetermined speed which produces radial forces that allow the grit to fall into the collection hopper. This force acts on the lighter solids preventing them from entering the hopper and thus they are retained in the water flow.

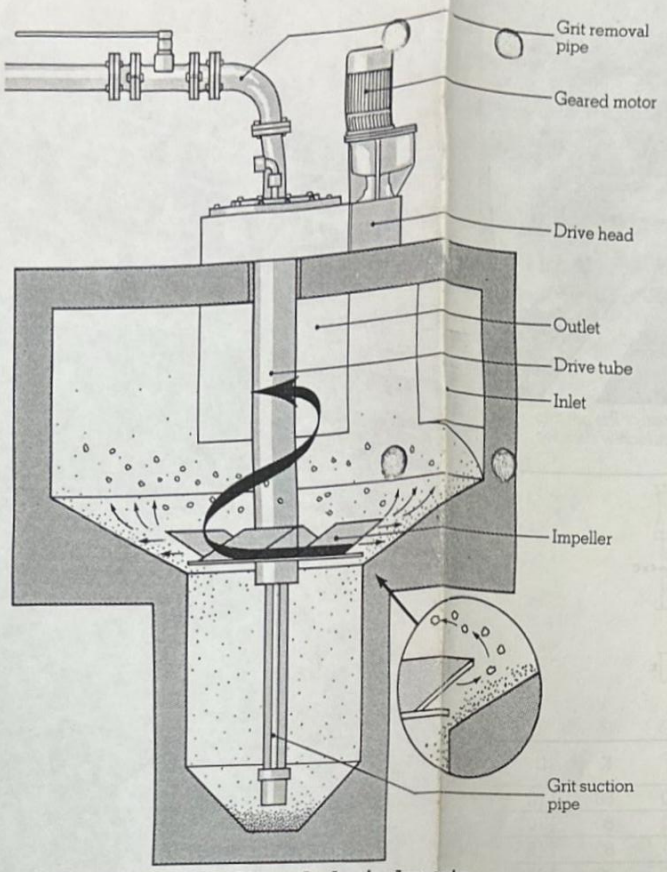
The inner zone is made to spiral and provide an uplift current for lighter solids. These elevated solids then exit the trap.

The classifying effect produced can be controllable by adjusting impeller speed.

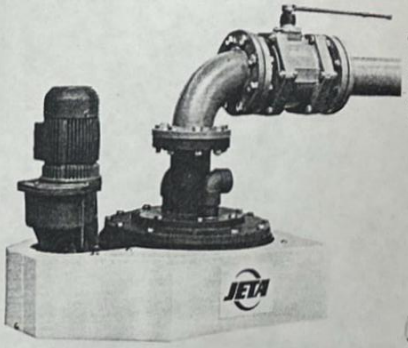
Extensive model and full scale tests have shown that critical speeds exist for successful grit trapping whilst maintaining an ability to reject other solids. The graph below illustrates one condition created in our full size test facility using quartz sand 250 microns dia and with a specific gravity of 2.65 and also shows the rejected light solids (paper towelling).

Grit settlement/organics rejection efficiencies against speed of impeller for size 50 Jeta.



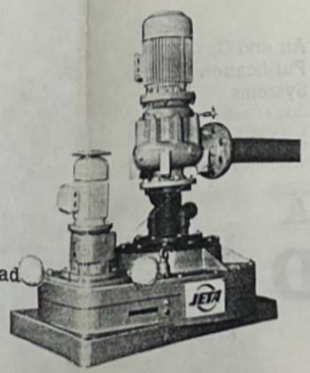


The illustration shows the basic elements and flow currents created within the Jeta.



Jeta Standard Drive Head

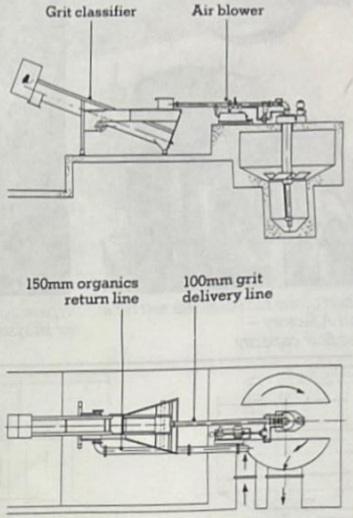
A robust heavy duty drive head comprising a large diameter slewing ring and positive toothed belt and pulley transmission.



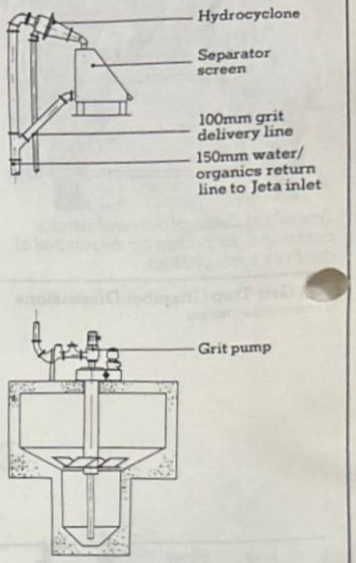
Jeta Submersible Drive Head

A heavy duty sealed construction and air-bell protected drive head, housing a slewing ring bearing and helical spur gearing transmission.

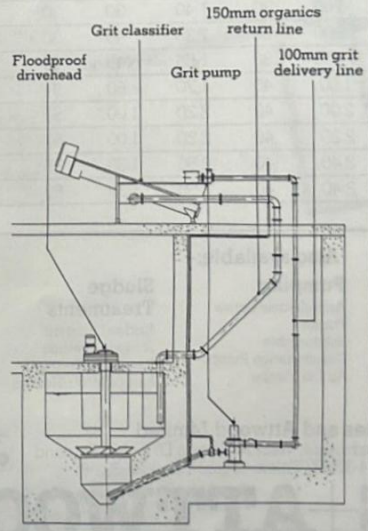
Jeta and inclined screw classifier with air lift pump grit removal.



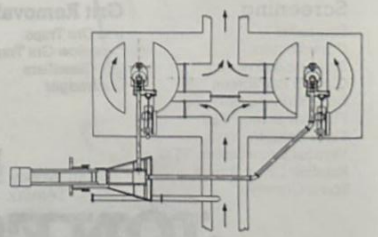
Jeta with hydrocyclone classifier and inclined dewatering screen. Grit removal through vacuum primed vortex pump.

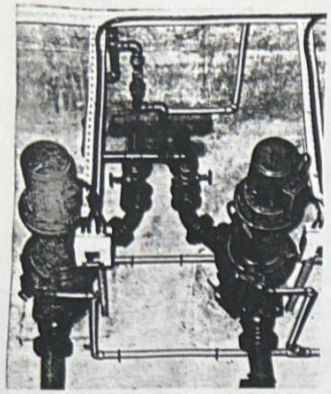


Jeta arranged for submersible conditions with inclined screw classifier. Grit removal through low level centrifugal grit pump.



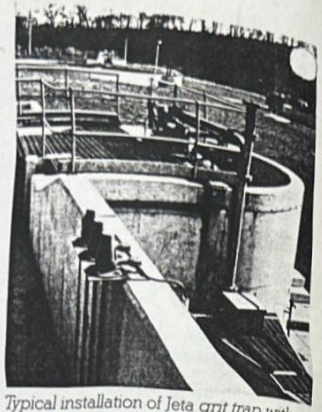
Twin Jeta installation shown with grit classifier and air lift pump systems.





Typical installation of duty and standby centrifugal grit pumps for the removal of grit from a Jeta grit trap.

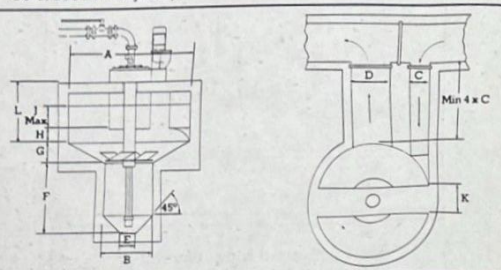
Installation of the full scale Jeta test rig at the J and A factory — 50 1/sec flow capacity.



Typical installation of Jeta grit trap with air lift system and screw classifier.

Jeta Grit Trap Chamber Dimensions

(Dimensions in metres)



Jeta Size	Flow L/S	A	B	C	D	E	F	G	H	J	K	L
50	50	1.83	1.0	.305	.610	.30	1.40	.30	.30	.20	.80	1.10
100	110	2.13	1.0	.380	.760	.30	1.40	.30	.30	.30	.80	1.10
200	180	2.43	1.0	.450	.900	.30	1.35	.40	.30	.40	.80	1.15
300	310	3.05	1.0	.610	1.200	.30	1.55	.45	.30	.45	.80	1.35
550	530	3.65	1.5	.750	1.50	.40	1.70	.60	.51	.58	.80	1.45
900	880	4.87	1.5	1.00	2.00	.40	2.20	1.00	.51	.60	.80	1.85
1300	1320	5.48	1.5	1.10	2.20	.40	2.20	1.00	.61	.63	.80	1.85
1750	1750	5.80	1.5	1.20	2.40	.40	2.50	1.30	.75	.70	.80	1.95
2000	2200	6.10	1.5	1.20	2.40	.40	2.50	1.30	.89	.75	.80	1.95

Also available:–

Screening
Screezers
Comminutors
Screenings Presses
Curved Bar Screen 'CBS'
Back Raked Screen 'BRS'
Fine Bar Screen 'FBS'
Filter Screen
Vertical Drum Screen 'VDS'
Rotafine Drum Screen
Spiral Conveyor

Grit Removal
Jeta Grit Traps
Crossflow Grit Traps
Grit Classifiers
Unidredger

Pumping
Archimedian Screw Pumps
Submersible Disintegration Pumps
Air Lift Pumps

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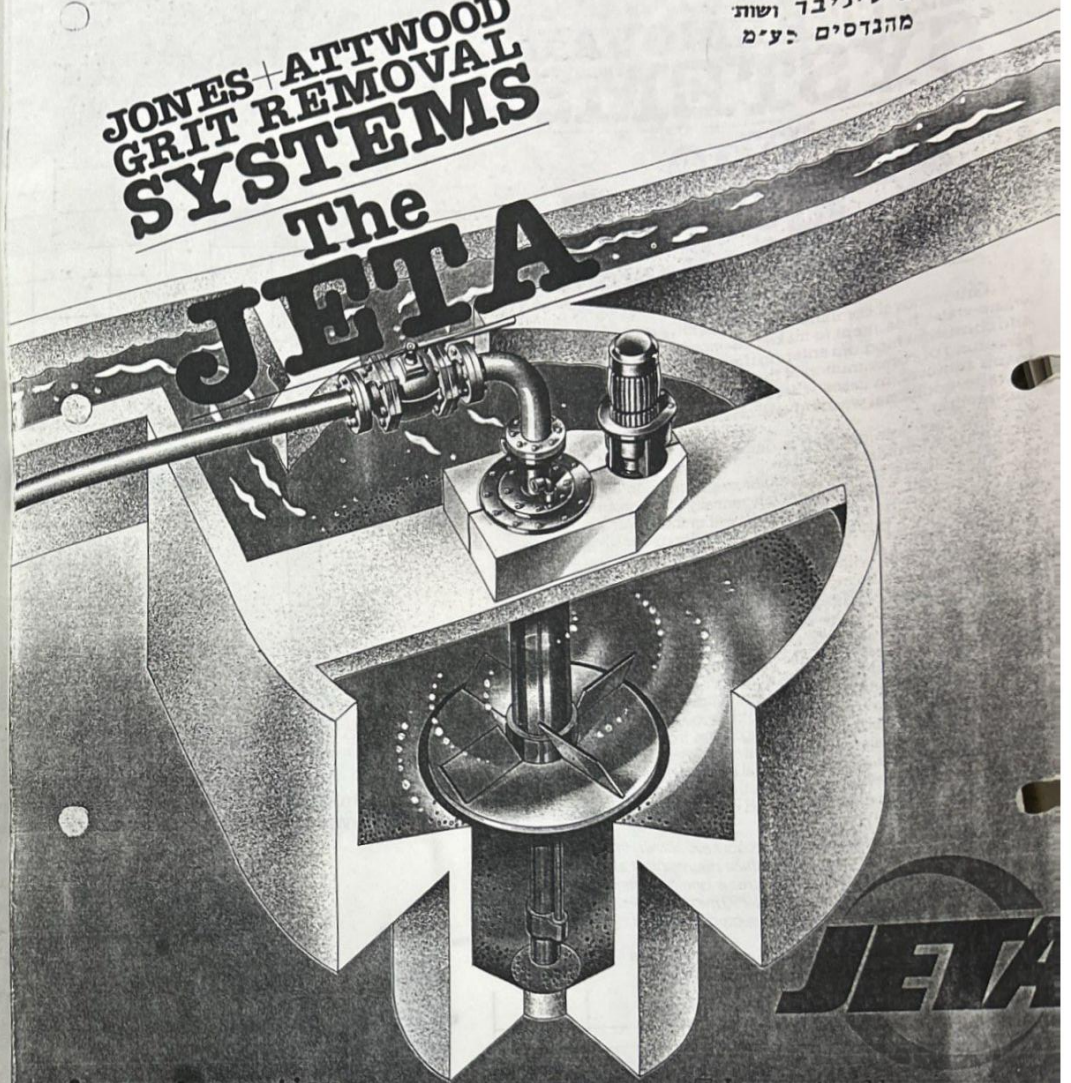
JONES+ATTWOOD GRIT REMOVAL SYSTEMS

The JETA

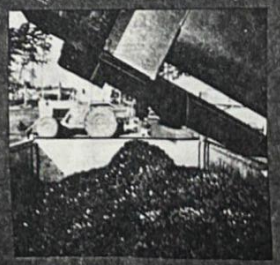


JETA

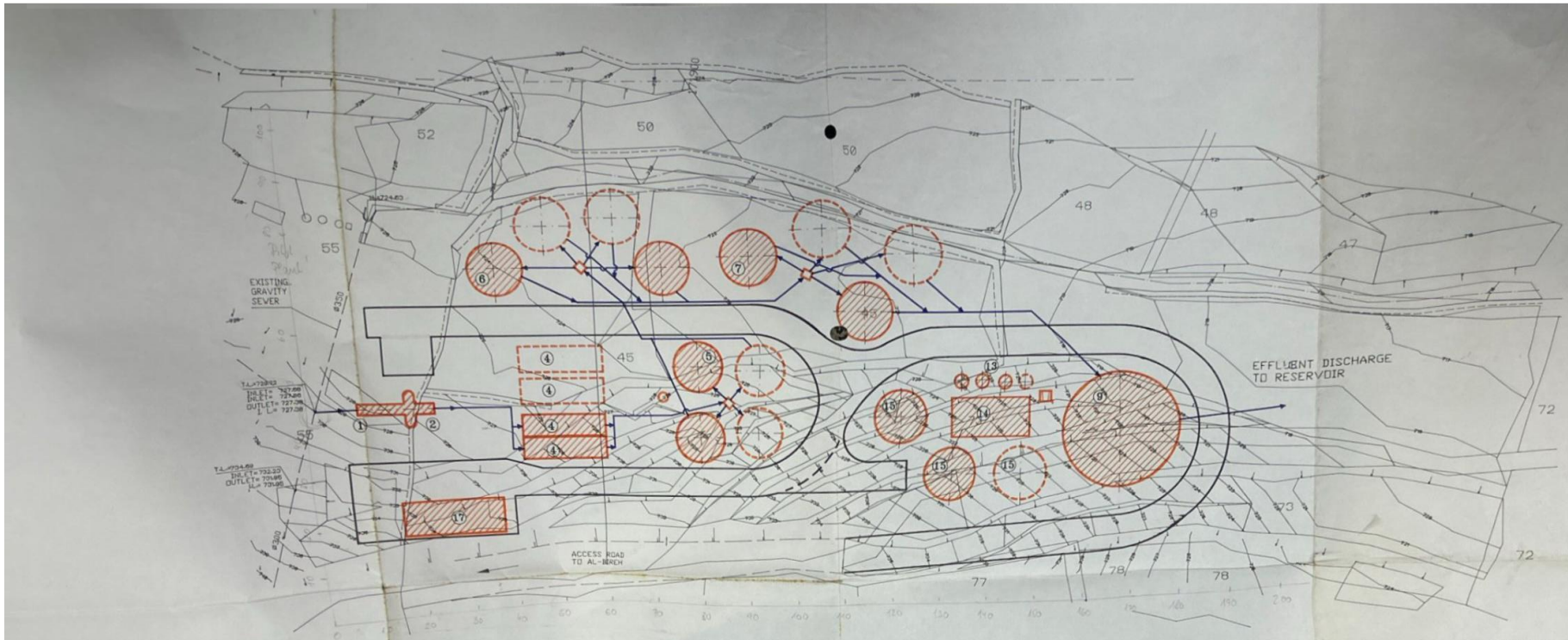
A new generation of grit trap

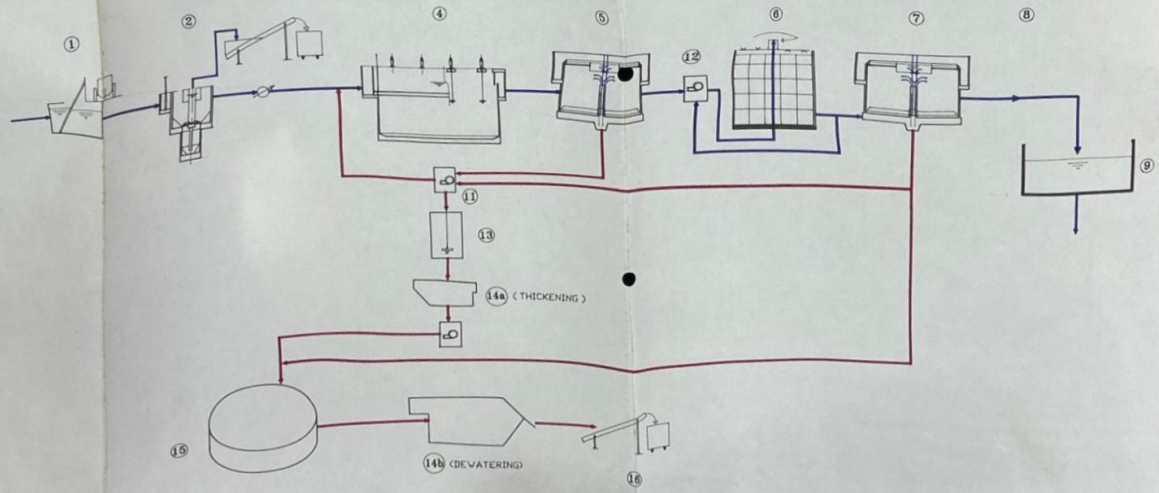
An entirely new range of circular tank grit traps to meet today's engineering demands.

Jeta is the result of thorough design and development of a system now synonymous with Jones and Attwood throughout the world.



- ☐ Low cost and low energy use
- ☐ Compact design — occupies small land area
- ☐ High efficiency — takes full advantage of gravitational settlement
- ☐ Simple, slow rotating mechanism, easy to maintain
- ☐ Wide range of options available for grit transportation cleaning and dewatering





1. MECHANICAL BAR SCREEN
2. GRIT REMOVAL & PHARSHAL FLUME
~~3. PRIMARY CLARIFIER~~
4. AERATION TANK
5. FIRST STAGE CLARIFIER
6. TRICKLING FILTER
7. FINAL CLARIFIER
~~8. CHLORINATION TANK~~
9. EFFLUENT REGULATION TANK
10. EFFLUENT PUMPING UNIT (FUTURE)
11. RETURN & EXCESS SLUDGE PUMPING STATION
12. TRICKLING FILTER PUMPING STATION
13. SLUDGE MIXING & EQUALIZATION TANK
14. SLUDGE THICKENING & DEWATERING MACHINES
15. DIGESTER
16. DRIED SLUDGE CONTAINER
17. CONTROL & ELECTRICITY BUILDING

FIRST PHASE CONSTRUCTION

ULTIMATE PHASE CONSTRUCTION

LIQUID STREAM
SLUDGE STREAM

DATE	BY	REVISIONS	No.

BALASHA-JALON CONSULTING ENGINEERS

P.O. BOX 1727 HAIFA 31016 ISRAEL TEL. 04-520 655

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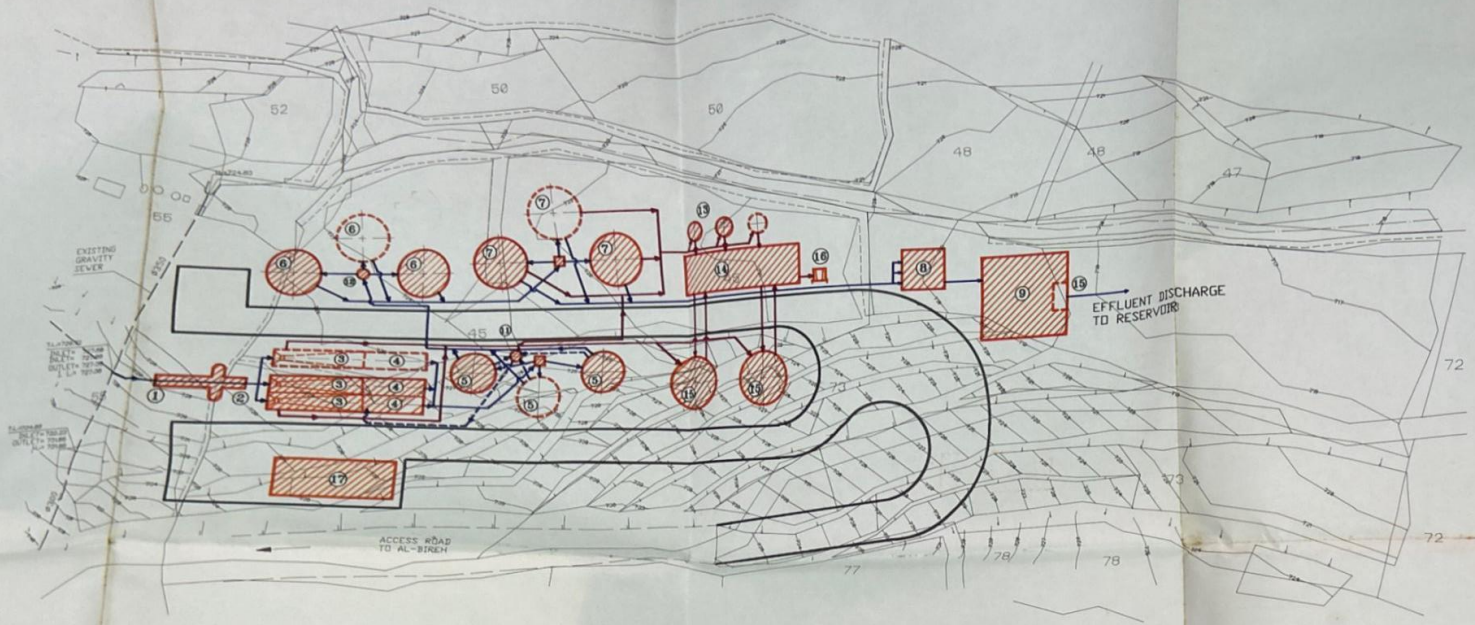

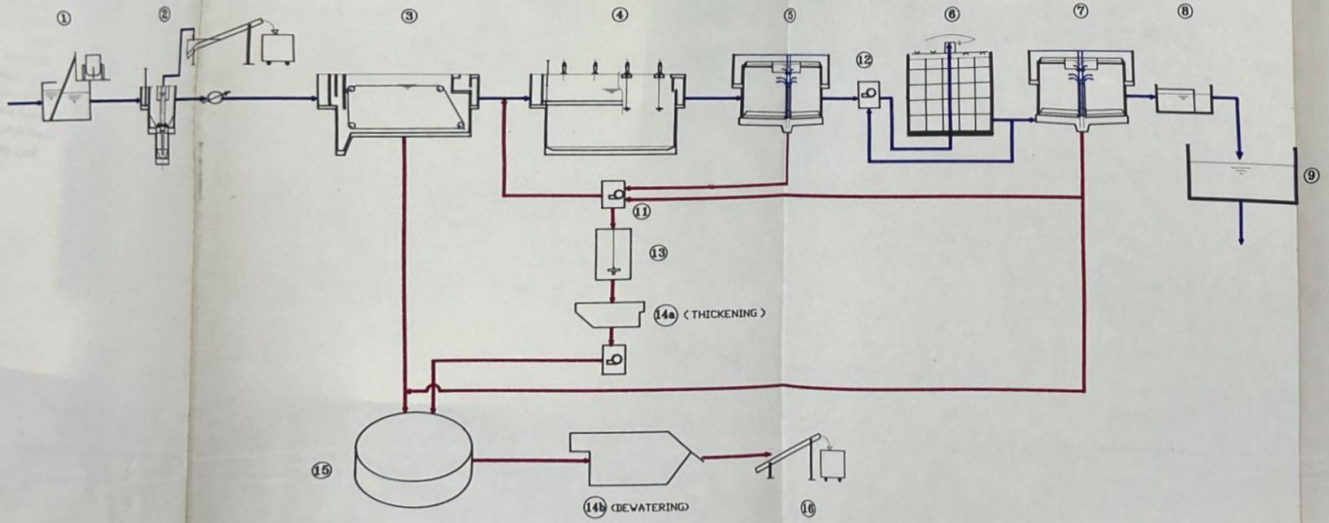

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LIQUID STREAM
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DATE	BY	REVISIONS	No.

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1/11/53

Palestinian - German Technical Cooperation

Project Status Sheet

December 1994

Project Name:	**Treatment of Waste Water Al Bireh**
Project Number:	**92.2243.1**
Project Duration:	**05.1993 - 06.1996**
Current Status:	**On-going**
German contribution implemented by:	**GTZ**
Executing Agency :	**Municipality of Al Bireh**
Other involved institutions:	**ANERA, Civil Administration**
Funding:	
Germany	**DM 6.70 Million**
Municipality Al Bireh via CIVAD	DM 1.20 Million
Third Parties (ANERA)	DM 0.10 Million
Total	**DM 8.00 Million**

Background of the Project

Sewage from Al Bireh, the settlement of Bsigost and the Amari Refugee Camp flows untreated into Wadi El Ein and further into Wadi Quilt. The latter is an endangered environment, containing springs which supply drinking water to the surrounding areas, i.e. Jericho. Its ecological and economic importance is recognised by both Palestinians and Israelis. Because of water scarcity, sewage water is being used to irrigate fruit trees and vegetables fields in Wadi El Ein, posing danger to human health.

Project Objectives

The project's objective is to treat and recycle the waste water from the water catchment areas of Al Bireh so that it may be used as irrigation water to benefit agricultural production.

The main activity of the project is to set up a treatment plant for the area. This treatment plant is unique due to its biological approach to sewage disposal. Because no similar or comparable plant exists in the occupied territories, the plant also serves as a model for similar projects in the region.

The treated water will be channeled to irrigate Palestinian farms. The recycling of sewage water for irrigation is an innovative step towards a more rational use of scarce water resources.

Hohenloher Spezialmöbelwerk
Schaffitzel GmbH + Co.
Postfach 13 60 · D-74603 Öhringen
Brechdamweg 22 · D-74613 Öhringen
Telefon 0 79 41/6 96-0
Telefax 0 79 41/6 96-116

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An G T Z

ISRAEL

zu Händen von Herrn Ing. E. Schmeckel

Telefax-Nr. 00972/2/95 28 7

Datum 04.08.94

Ihr Gesprächspartner Herr Graf

aus unserer Abteilung Export

Telefon-Durchwahl 0 79 41 / 6 96 -

TELEFAX besteht einschließlich dieses Blattes aus 11 Seit

Anfrage Ausschreibungsunterlagen
Kläranlage - Labor

Sehr geehrter Herr Schmeckel,

gerne senden wir die gewünschten Unterlagen zur Erstellung der Ausschreibung.

Diesem Text liegt ein Wasserlabor zugrunde, wie wir es tatsächlich schon eingerichtet haben.

Wir möchten Sie bitten, uns zum Termin der Angebotsabgabe zu informieren, damit wir rechtzeitig unser Angebot abgeben können.

Bei Rückfragen stehen wir gerne zu Ihrer Verfügung und verbleiben

mit freundlichen Grüßen

Hohenloher Spezialmöbelwerk
Schaffitzel GmbH + Co.

ppa. Graf

ℓ Municipality Al Bireh

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0001	1	WALL WORKING BENCH W/H/D: 3370/750/750 MM CONS. OF:		
		WORKTOP WITH PLASTIC COATING PLASTIC PERL WITH PU-EDGE PEPPLE 40 MM THICK, 0,9 MM COATED.		
	1	LENGTH 337.00 CM 750 MM DEEP		
		ALU-ENERGY CHANNEL 8/11 110 MM HIGH, 85 MM DEEP POWDER COATED, FRONT PLATES ALU, SCREWED.		
	1	LENGTH 337.00 CM		
		SAFETY SOCKET 220 V, A.C. WITH LIFT-UP LID IP 44		
	4	MOUNTED		
		WIRING 220 V FOR SOCKETS		
	1	WIRING 3 X 1,5 QMM		
		C-SHAPED SUBSTRUCTURE WITH LEVELING SCREWS. RECTANGULAR TUBE 60/30 MM PEBBLE GREY RAL 7032 UPPER CIRCUM FRAME AND LOWER CROSS-STRUT REINFORCING PROFILE DESIGNING PROFILE PEBBLE GREY RAL 7032		
	1	W/H/D: 900/700/640 MM		
		C-SHAPED SUBSTRUCTURE WITH LEVELING SCREWS. RECTANGULAR TUBE 60/30 MM PEBBLE GREY RAL 7032 UPPER CIRCUM FRAME AND LOWER CROSS-STRUT REINFORCING PROFILE DESIGNING PROFILE PEBBLE GREY RAL 7032		
	2	W/H/D: 1200/700/640 MM		
		DRAWER BASE CABINET 1 DRAWER PLATE 1 DRAWER 2 HEIGHT UNITS AND 2 DRAWERS EACH 3 HEIGHT UNITS. WITH BOW HANDLE DRAWER ON ROLLER GUIDE, 4/5 EXTENSION PLASTIC PERL WITH 3 MM PVC-EDGE 4 CASTORS		
	3	W/H/D: 450/550/575 MM COVER PLATE WITH SAFETY EDGE.		
		TOTAL PRICE		
0002	1	DOUBLE LABORATORY BENCH W/H/D: 3075/900/1675 mm CONS. OF:		
		WORK TOP WITH TILES COVERING RED BROWN.		

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0002	1	LENGTH 240.00 CM 825 MM DEEP		
		WORK TOP WITH TILES COVERING RED BROWN, 40 MM THICK WITH BEAD EDGE.		
	1	LENGTH 240.00 CM 825 MM DEEP		
		WORK TOP WITH TILES COVERING RED BROWN, 40 MM THICK WITH BEAD EDGE.		
	1	LENGTH 170.00 CM 675 MM DEEP		
		BUILT-IN DRAIN BOARD STONEWARE RED BROWN		
	2	440/445/30 MM DEEP		
		BUILT-IN SINK STONEWARE RED BROWN W. OVERFLOW, LOOSE STRAINER AND PLUG CLOSURE. EDGE RECESS ON BOTH SIDES		
	1	595/445/250 MM DEEP		
	1	SIPHON TRAP NW 50		
		STAND MIXING FAUCET 300 MM HIGH, WITH U-OUTLET AND ADDITIONAL COLD WATER CORNER VALVE. FEEDING LINE: CU-PIPE 8 MM 400 MM LONG.		
	1	OVERHANG INCL. U-OUTLET		
		ENERGY CELL DOUBLE TYPE WITH 2 LOAD SUSPENSION PROFILE STANDARDS 45/30 MM SEMICIRCULAR PROTECTION AND DESIGNING PROFILES. PEBBLE GREY RAL 7032 BOTH SIDES 2 REAGENT DEPOSITS W. RAW GLASS PLATE AND BUSHES F. STANDARD RODS WORKING HEIGHT 900 MM MODULAR ENERGY CHANNEL ALUMINIUM 160 MM HIGH. SANITARY FACING ALUMINIUM 160 MM HIGH.		
	2	W/H/D: 1200/2080/365 MM		
		CORNER VALVE, 45 DEGREES FOR UNIVERSAL GAS		
	2	WITH HOSE NOZZLE		
		CORNER VALVE, 45 DEGREES FOR COMPR. AIR UP TO 6 BAR -PRECISE ADJUSTMENT-		
	2	WITH SCREW HOSE END		
		CU-SUPPLY LINE		
	2	FOR 2 CONNECTIONS		
		SAFETY SOCKET 220 V, A.C. WITH LIFT-UP LID IP 44		
	12	MOUNTED		
		WIRING 220 V FOR SOCKETS		
	4	WIRING 3 X 1,5 QMM		

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0002		COMBI BASE CABINET UPPER 2 DRAWERS EACH 3 H.U. DRAWER ON ROLLER GUIDE, 4/5 EXTENSION 2 HINGED DOORS BOW HANDLE WITH CYLINDER LOCK PLASTIC PERL WITH 3 MM PVC-EDGE 1 REINFORCED SHELF. COVERED BASE		
	4	W/H/D: 1200/860/575 MM		
		DOOR BASE CABINET 1 HINGED DOOR HINGED TO THE RIGHT. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 2 SHELVES, COVERED BASE.		
	1	W/H/D: 600/860/575 MM		
		INTERMEDIATE FACING FOR DOUBLE LABORATORY BENCH PLASTIC PERL WITH BASE. PLASTIC PERL		
	1	HEIGHT 8 6 0 MM 500 MM WIDE		
		BASE CABINET WITH FLAP DOOR AND DIRT BIN, TIPABLE. WITH BOW HANDLE PLASTIC PERL WITH 3 MM PVC-EDGE COVERED BASE		
	1	W/H/D: 600/860/575 MM		
		TOTAL PRICE		
0003	1	WALL WORKING BENCH W/H/D: 6100/900/750 MM CONS. OF:		
		WORKTOP WITH PLASTIC COATING PLASTIC PERL WITH PU-EDGE PEPPLE 40 MM THICK, 0,9 MM COATED.		
	1	LENGTH 610.00 CM 750 MM DEEP		
		FRONT FACING, WALL TYPE FLUSH TO CASING PLASTIC PERL WITH BASE		
	1	UP TO 300 MM WIDE 860 MM CABINET HEIGHT		
		CORNER BASE CABINET RIGHT HINGED DOOR, LEFT FIXED FACING. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 2 REINFORCED SHELVES. COVERED BASE		
	1	W/H/D: 1200/860/575 MM		

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0003		COMBI BASE CABINET UPPER 2 DRAWERS EACH 3 H.U. DRAWER ON ROLLER GUIDE, 4/5 EXTENSION 2 HINGED DOORS BOW HANDLE WITH CYLINDER LOCK PLASTIC PERL WITH 3 MM PVC-EDGE 1 REINFORCED SHELF. COVERED BASE		
	1	W/H/D: 1200/860/575 MM		
		CORNER BASE CABINET LEFT HINGED DOOR, RIGHT FIXED FACING. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 2 REINFORCED SHELVES. COVERED BASE		
	1	W/H/D: 1200/860/575 MM		
		CORNER BASE CABINET RIGHT HINGED DOOR, LEFT FIXED FACING. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 2 REINFORCED SHELVES. COVERED BASE		
	1	W/H/D: 1200/860/575 MM		
		COMBI BASE CABINET WITH 1 DRAWER 3 HE DRAWER ON ROLLER GUIDE, 4/5 EXTENSION 1 HINGED DOOR HINGED TO THE RIGHT. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 1 SHELF, COVERED BASE.		
	1	W/H/D: 600/860/575 MM		
		TOTAL PRICE		
0004		HOOD FOR LOW ROOMS 150 ACC.TO DIN 12924. W/H/D: 1500/2400/920 MM SEMICIRC. PROTECTION AND DESIGN PROFILE. PEBBLE GREY RAL 7032 WORKING HEIGHT: 900 MM FIXTURE CHANNEL AND FRONT PANEL MADE OF POWDER COATED ALU.SUBSTRUCT.3 HING.DOORS PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK SLIDING WINDOW WITH HORIZONTAL SLIDING PANES OF COMPOUND SAFETY GLASS, 2-PARTS, TELESCOPIC HEIGHT ADJUSTABLE. OPENING HEIGHT: 1800 MM FIXED TO STAINL.STEEL ROPE WITH DROP SECURITY DEVICE. EXTRACT. AIR COLLECT. CASE		

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0004		ACCESSIBLE FOR CLEANING, COMBINED W.AIR DUCT PANEL, WITH LOWER, CENTER AND UPPER EXTRACTION. ILLUMINATION W.FLUORESCENT LAMP 220 V, 36 WATT AND HEAVY-DUTY REFLECTOR.		
	1	WORK TOP RED BROWN TILED. W. BASE CABINET EXTRACTION		
		NIPPLE FOR CONNEXION OF VENTILATION LINE AT CABINET		
	1	200 MM DIAMETER		
		CONTROLING AND SIGNAL DEVICE OF THE VENTILATION FUNCTION FOR HOODS ACC. DIN 12924 PART 1 COMPLETE WITH ALARM LAMP AND OSCILLATOR		
	1	MOUNTED AND WIRED		
		OFF-SWITCH, 1 POLE 220 V, A.C.		
	1	MOUNTED AND WIRED		
		TRIPLE PUSH BUTTON I-O-II WITH CONTROL FOR AERATION		
	1	MOUNTED AND WIRED		
	2	CONTACTOR WITH RELAY METAL-CLADDED.		
		SAFETY SOCKET 220 V, A.C. WITH LIFT-UP LID IP 44		
	2	MOUNTED IN THE HOOD		
		WIRING 220 V FOR SOCKETS		
	1	WIRING 3 X 1,5 QMM		
		OFF-SWITCH, 1 POLE 220 V, A.C.		
	2	MOUNTED AND WIRED		
		SAFETY SOCKET 220 V, A.C. WITH LIFT-UP LID IP 44		
	2	MOUNTED		
		WIRING 220 V FOR SOCKETS		
	1	WIRING 3 X 1,5 QMM		
	1	GENERAL MOUNTING COSTS		
		ACID RESISTENT CENTRIF.FAN THREE-PHASE CURRENT, PROTECTION IP 44, IMPELLER OF PPH, CASE OF PVC-H WITH FORMED SUCTION AND EXHAUST NOZZLE. PVC CONNEXION PIECES. SUPPORT FRAME PLASTIC COATED WITH FIXING CLIPS. SUCTION AND EXHAUST DIA 200 SPLINTER PROTECTION MOTOR SPEED 1500 R.P.M. CAPACITY 500-1400 CBM/H		
	1	STRUCTURE - FROM THE DRIVING SIDE: CLOCKWISE		

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0004		WALL CONNECTING PIECE FOR VENTILATION LINE WITH GRATE (BIRD PROTECT.) OF PLASTIC FOR 200 MM TUBE DIAMETER		
	1	VENTILATION LINE RUN. M 200 MM DIAMETER		
	5	VENTILATION LINE ARC 90 DEGREES WITH SLEEVES 200 MM DIAMETER		
	2	TOTAL PRICE		
0005	1	WALL WORKING BENCH W/H/D: 3900/750/750 MM CONS. OF.		
		WORKTOP WITH PLASTIC COATING PLASTIC PERL WITH PU-EDGE PEPPLE 40 MM THICK, 0,9 MM COATED.		
	1	LENGTH 390.00 CM 750 MM DEEP		
		ALU-ENERGY CHANNEL 8/11 110 MM HIGH, 85 MM DEEP POWDER COATED, FRONT PLATES ALU, SCREWED.		
	1	LENGTH 390.00 CM		
		SAFETY SOCKET 220 V, A.C. WITH LIFT-UP LID IP 44		
	6	MOUNTED		
		WIRING 220 V FOR SOCKETS		
	1	WIRING 3 X 1,5 QMM		
		C-SHAPED SUBSTRUCTURE WITH LEVELING SCREWS, RECTANGULAR TUBE 60/30 MM PEBBLE GREY RAL 7032 UPPER CIRCUM FRAME AND LOWER CROSS-STRUT REINFORCING PROFILE DESIGNING PROFILE PEBBLE GREY RAL 7032		
	1	W/H/D: 1500/700/640 MM		
		C-SHAPED SUBSTRUCTURE WITH LEVELING SCREWS, RECTANGULAR TUBE 60/30 MM PEBBLE GREY RAL 7032 UPPER CIRCUM FRAME AND LOWER CROSS-STRUT REINFORCING PROFILE DESIGNING PROFILE PEBBLE GREY RAL 7032		
	2	W/H/D: 1200/700/640 MM		
		DRAWER BASE CABINET 1 DRAWER PLATE 1 DRAWER 2 HEIGHT UNITS AND 2 DRAWERS EACH 3 HEIGHT UNITS. WITH BOW HANDLE DRAWER ON ROLLER GUIDE, 4/5 EXTENSION PLASTIC PERL		

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0005		WITH 3 MM PVC-EDGE 4 CASTORS		
	3	W/H/D: 450/550/575 MM COVER PLATE WITH SAFETY EDGE.		
		TOTAL PRICE		
0006	1	WALL WORKING BENCH W/H/D: 3300/900/750 MM CONS. OF:		
		WORK TOP WITH TILES COVERING RED BROWN, 40 MM THICK WITH BEAD EDGE.		
	1	LENGTH 330.00 CM 750 MM DEEP		
		BUILT-IN DOUBLE SINK STONEWARE RED BROWN W. OVERFLOW, LOOSE STRAINER AND PLUG CLOSURE. WITHOUT EDGE RECESS.		
	1	895/445/320 MM DEEP		
	1	SIPHON TRAP NW 50		
		STAND MIXING FAUCET 300 MM HIGH, WITH U-OUTLET AND ADDITIONAL COLD WATER CORNER VALVE. FEEDING LINE: CU-PIPE 8 MM 400 MM LONG.		
	1	OVERHANG INCL. U-OUTLET		
		SIDE FACING, WALL TYPE FLUSH TO CASING 19 MM THICK PLASTIC PERL WITH BASE		
	1	H E I G H T 860 MM UP TO 135 MM WIDE		
		COMBI BASE CABINET WITH 1 DRAWER 3 HE DRAWER ON ROLLER GUIDE, 4/5 EXTENSION 1 HINGED DOOR HINGED TO THE LEFT. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 1 SHELF. COVERED BASE.		
	1	W/H/D: 600/860/575 MM		
		COMBI BASE CABINET UPPER 2 DRAWERS EACH 3 H.U. DRAWER ON ROLLER GUIDE, 4/5 EXTENSION 2 HINGED DOORS BOW HANDLE WITH CYLINDER LOCK PLASTIC PERL WITH 3 MM PVC-EDGE 1 REINFORCED SHELF. COVERED BASE		
	1	W/H/D: 900/860/575 MM		
		SINK SUBSTRUCTURE WITHOUT REAR WALL, CASING AND 2 DOORS. PLASTIC PERL		

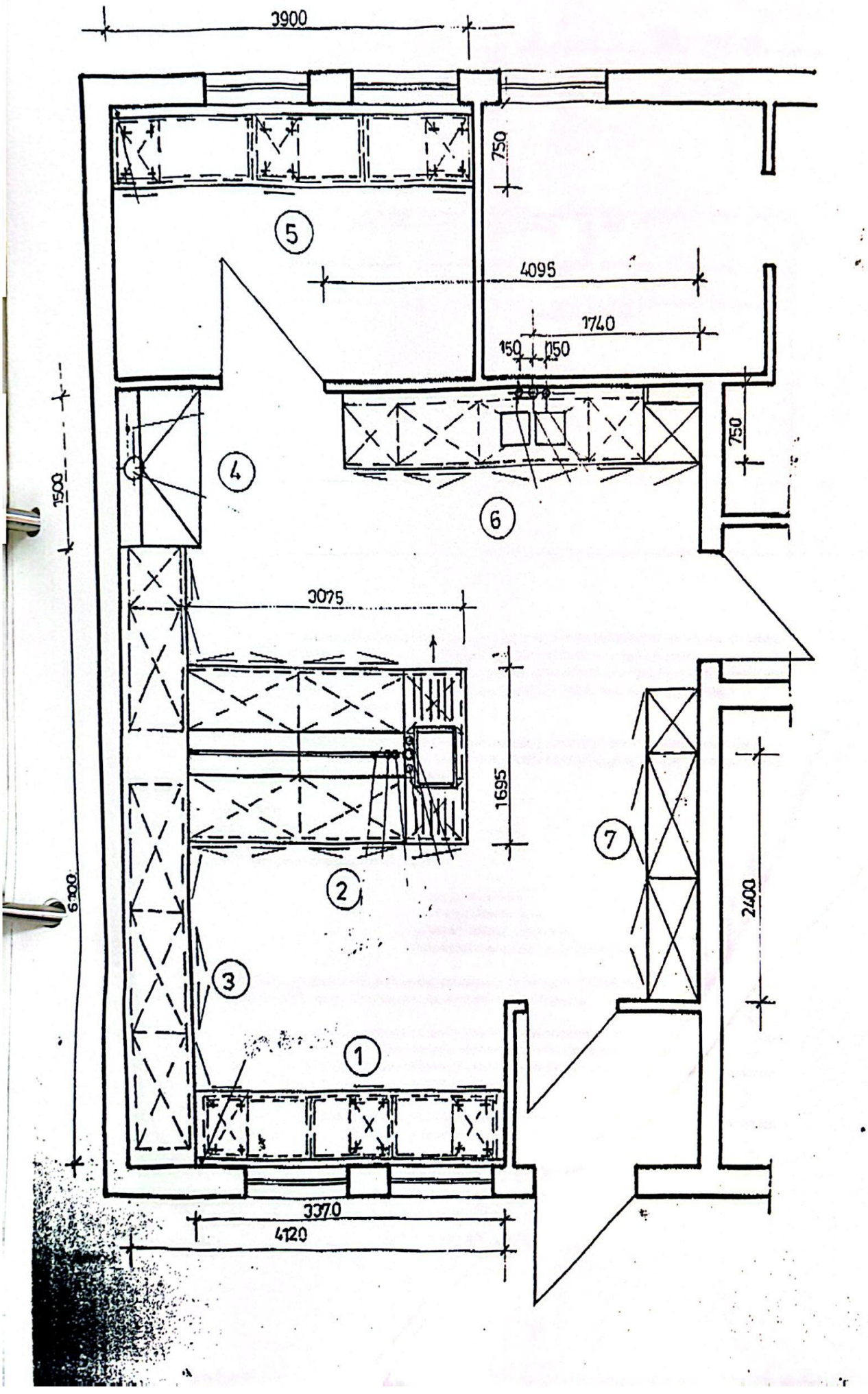
WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0006		WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK COVERED BASE		
	1	W/H/D: 1200/860/575 MM		
		COMBI BASE CABINET WITH 1 DRAWER 3 HE DRAWER ON ROLLER GUIDE, 4/5 EXTENSION 1 HINGED DOOR HINGED TO THE RIGHT. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 1 SHELF, COVERED BASE,		
	1	W/H/D: 600/860/575 MM		
	1	SIDE FACING F.WALL CABINET 650 MM SYSTEM DEPTH 1980 MM HIGH PLASTIC PERL WITH 3 MM PVC-EDGE		
	1	DRIP RACK OF HIGH SHOCK- PROOF POLYSTRENE SIZE W/H: 450/630 MM WITH 72 PEGS WHICH MAY BE DIFFERENTLY PLACED. PEG OPENINGS AT REAR CLOSED, SEAMLESS INTEGRATED COLL. GUTTER AND DRAIN TUBE. WITH MOUNTING MATERIAL FOR WALL MOUNTING		
		HIGH CABINET 1 HINGED DOOR PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 4 SHELVES.		
	1	W/H/D: 600/2080/550 MM		
	1	FRONT FACING TO WALL DIR. PLASTIC PERL FOR CABINET STACK-ON. UP TO 300 MM WIDE 1300 MM FACING HEIGHT		
		TOTAL PRICE		
0007		HIGH CABINET 2 HINGED DOORS PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 4 REINFORCED SHELVES.		
	2	W/H/D: 1200/2080/550 MM		
		CABINET UNIT 1 HINGED DOOR PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK 2 SHELVES.		
	1	W/H/D: 600/960/550 MM		

WASTE WATER TREATMENT PLANT PROJECT, AL BIREH
ISRAEL

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
0007		**TOTAL PRICE**		
0011		1 SINK UNIT W/H/D: 900/900/600 MM CONS. OF.		
		WORK TOP WITH TILES COVERING RED BROWN, 40 MM THICK WITH BEAD EDGE.		
	1	LENGTH 90.00 CM 600 MM DEEP		
		BUILT-IN SINK STONEWARE RED BROWN OVERFLOW, LOOSE STRAINER AND PLUG CLOSURE. WITHOUT EDGE RECESS.		
	1	445/445/320 MM DEEP		
	1	SIPHON TRAP NW 50		
		STAND MIXING FAUCET 300 MM HIGH, WITH U-OUTLET AND ADDITIONAL COLD WATER CORNER VALVE. FEEDING LINE: CU-PIPE 8 MM 400 MM LONG.		
	1	OVERHANG INCL. U-OUTLET		
		SINK SUBSTRUCTURE WITHOUT REAR WALL, CASING AND 2 DOORS. PLASTIC PERL WITH 3 MM PVC-EDGE BOW HANDLE WITH CYLINDER LOCK COVERED BASE		
	1	W/H/D: 900/860/575 MM		
		TOTAL PRICE		

Pos.	Stück	Bezeichnung	Einzelpreis DM	Gesamtpreis DM
		VALUE EX FACTORY		
		% TAX ON VALUE ADDED		
		TOTALS		
		TIME OF DELIVERY:		
		CONDITIONS OF PAYMENT:		
		PLACE ..... DATE		
		SEAL ..... SIGNATURE		
		Übertrag:		


3900
750
5
4095
1740
150
150
750
4
6
1500
3075
1695
2
7
2400
6100
3
1
3370
4120

BESCHAFFUNG VON SACHGÜTERN FÜR PROJEKTE 07.08.92

GTZ-Form 31-7

SAMPLE

INQUIRY	Reference No. (please quote in all correspondence)	Date
Our Reference/Telephone		
To	Name and complete address	
Project, Location		

Required items:

The GTZ is implementing Technical Cooperation measures for the above-mentioned project, on behalf of the Government of the Federal Republic of Germany. Within the framework of the Technical Cooperation programme, orders are awarded in compliance with our terms of order which are given overleaf. Orders are placed directly by the above-mentioned member of staff, on behalf and for the account of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Dag-Hammarskjöld-Weg 1, D-6236 Eschborn near Frankfurt, Federal Republic of Germany.

We invite you herewith to submit, free of charge, and without obligation on our part, an offer together with prospectuses, for the goods shown in the attached specification. The bid should take the form of a PRO-FORMA INVOICE, giving unit and total prices for each individual item. The total price should be broken down as follows:

NET PRICE ex works, loaded
COST OF PACKING for transport by ☐ road/rail ☐ air ☐ sea
TRANSPORT COSTS
TOTAL PRICE (for imported goods give the price duty unpaid)

Terms of Delivery:
☐ Ex works/Warehouse
☐ C & F (port of destination)
☐ Delivered (place of destination)
(Insurance cover is taken out by the buyer)

Please include your exact terms of payment and give a binding delivery date for the goods. We also need prior information as to the gross weight and dimensions of the cases to be shipped in the event that an order is placed.

The goods to be quoted for are scheduled to be used at the place of destination stipulated above. They must therefore be suitable for the climatic conditions encountered there and also meet any other requirements which may be demanded of the goods at that location. The form of packing must stand up to the demands made by the often very difficult transport conditions which prevail over the entire route to the project location, i.e. including final transport overland.

When assessing your offers, great consideration will be given to the specific suitability of the goods for their intended use, in relation to the price and the delivery times, importance also being placed on after-sales service in the country of destination.

If you are not able to submit an offer, we would greatly appreciate a brief indication to this effect.

Please submit your offer not later than ☐

We thank you in advance for your interest and look forward to hearing from you.

GTZ-Form 31-7-1

Enclosure: Specification

BESCHAFFUNG VON SACHGÜTERN FÜR PROJEKTE 07.08.92

GTZ-Form 31-7

INQUIRY	Reference No. (please quote in all correspondence)	Date
Our Reference/Telephone		
To	Name and complete address	
Project, Location		

SAMPLE

Required items:

The GTZ is implementing Technical Cooperation measures for the above-mentioned project, on behalf of the Government of the Federal Republic of Germany. Within the framework of the Technical Cooperation programme, orders are awarded in compliance with our terms of order which are given overleaf. Orders are placed directly by the above-mentioned member of staff, on behalf and for the account of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Dag-Hammarskjöld-Weg 1, D-6236 Eschborn near Frankfurt, Federal Republic of Germany.

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NET PRICE ex works, loaded
COST OF PACKING for transport by ☐ road/rail ☐ air ☐ sea
TRANSPORT COSTS
TOTAL PRICE (for imported goods give the price duty unpaid)

Terms of Delivery:

☐ Ex works/Warehouse
☐ C & F (port of destination)
☐ Delivered (place of destination)
(Insurance cover is taken out by the buyer)

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Please submit your offer not later than ☐

We thank you in advance for your interest and look forward to hearing from you.

GTZ-Form 31-7-1

Enclosure: Specification

بسم الله الرحمن الرحيم

بلدية البيرة

تلفون/ ٩٥٣٥٤٥-٩٥٦٤٤٥

Dear Micha - FAX # 958759

please find a copy of the fax sent to us from GTZ.

sincerly your

Munif Tuish

21-1-93

AL - BIREH MUNICIPAL COUNCIL

Tel : 956445 /
956378 / 953545
Fax : 954431
P.O. Box : 506 AL - BIREH

********** -JOURNAL- ********** DATE 21-JAN-1993 ***** TIME 11:57 **********

NO.	COM	PAGES	DURATION	X/R	IDENTIFICATION	DATE	TIME	DIAGNOSTIC
05	OK	03	00:02'56	XMT T	958759	21-JAN	11:54	840440A42800

-AL-BIREH MUNICIPAL COUNCL-

********** - 972 2 954431- **********

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

gtz

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH
Postfach 51 80, D-6236 Eschborn

FAX # 958759

Al Bireh Municipality
Mr. Munif R. Treish
City Engineer
P.O.Box 506
AL Bireh

Ihre Zeichen, Ihre Nachricht vom	Unsere Zeichen	☎ (06196)	FAX (06196)	Datum
	2011/ 414-Dö/kü	79 1277	79 7207	08.01.93

Subject: Al Bireh Sewage Recycling Project

Dear Mr. Treish

We are glad to inform you that the Project proposal which was being prepared based upon the workshop results has now been approved by the Federal Ministry for Economic Cooperation (BMZ).

Prior to project implementation an "Implementation Agreement" has to be drafted and agreed upon by the Al Bireh Municipality and GTZ. This Agreement specifies the Project Concept and the Contributions of both parties. The draft agreement will be elaborated by GTZ and then submitted to you during the forthcoming weeks.

Lateron, after re-design of the treatment plant a "Financing Agreement" will have to be agreed upon, covering the financial contributions for the construction of the plant.

Shortly after signing of the Implementation Agreement the testing unit should be installed and operated in order to verify design data and treatment process. We assume that this could take place from April to June, approximately. Support in this effort will be provided by a GTZ short term consultant.

The project description as well as the workshop report will be mailed to you in due course.

.../2

We would like to take this opportunity to thank you and your collegues for your kind cooperation during the appraisal mission in Nov. 1992.

We look forward to a future fruitfull cooperation during project implementation.

Sincerely yours

i.V. Kehr i.A. Döring

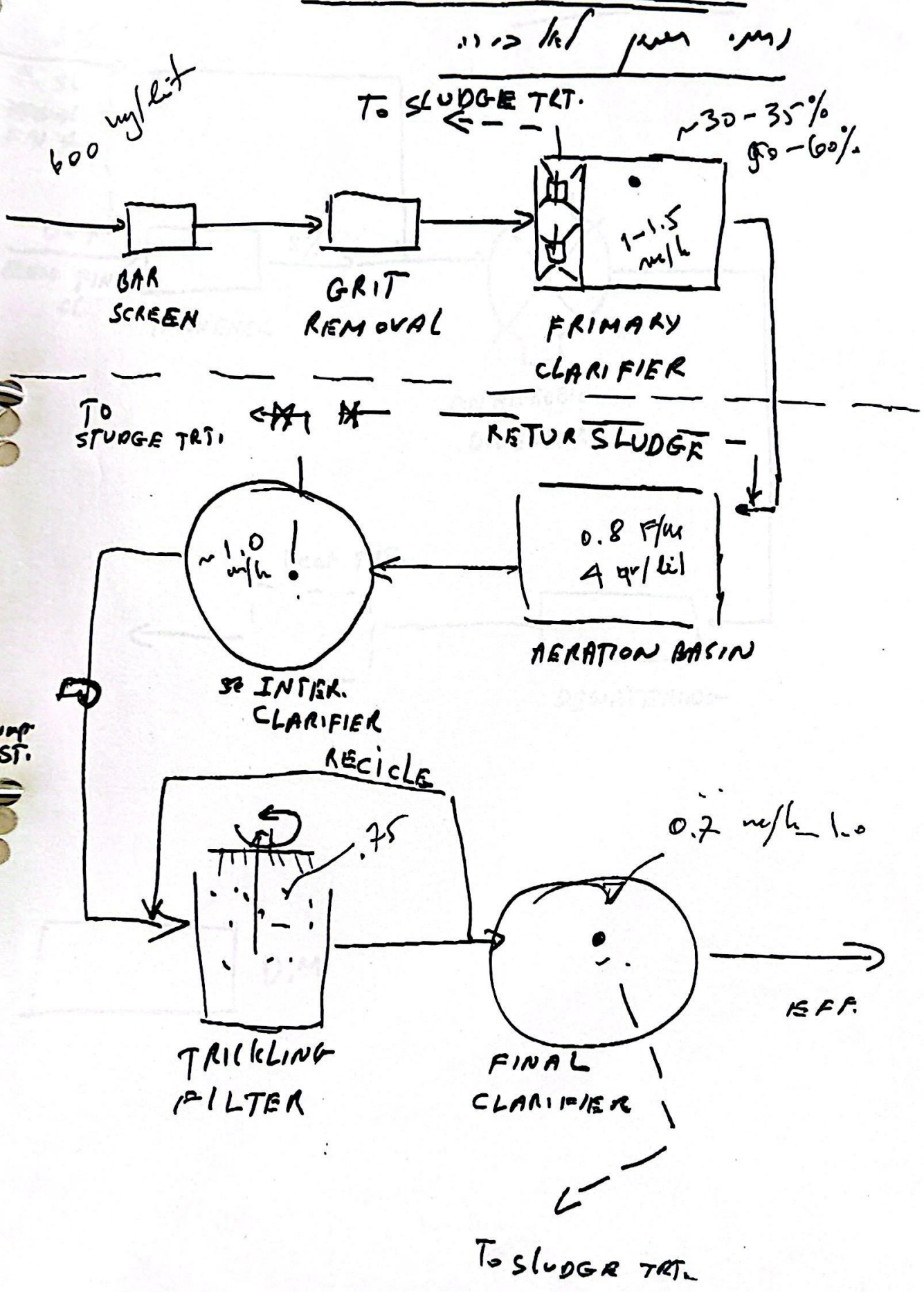
Döring

cc. Herr Meierjohann

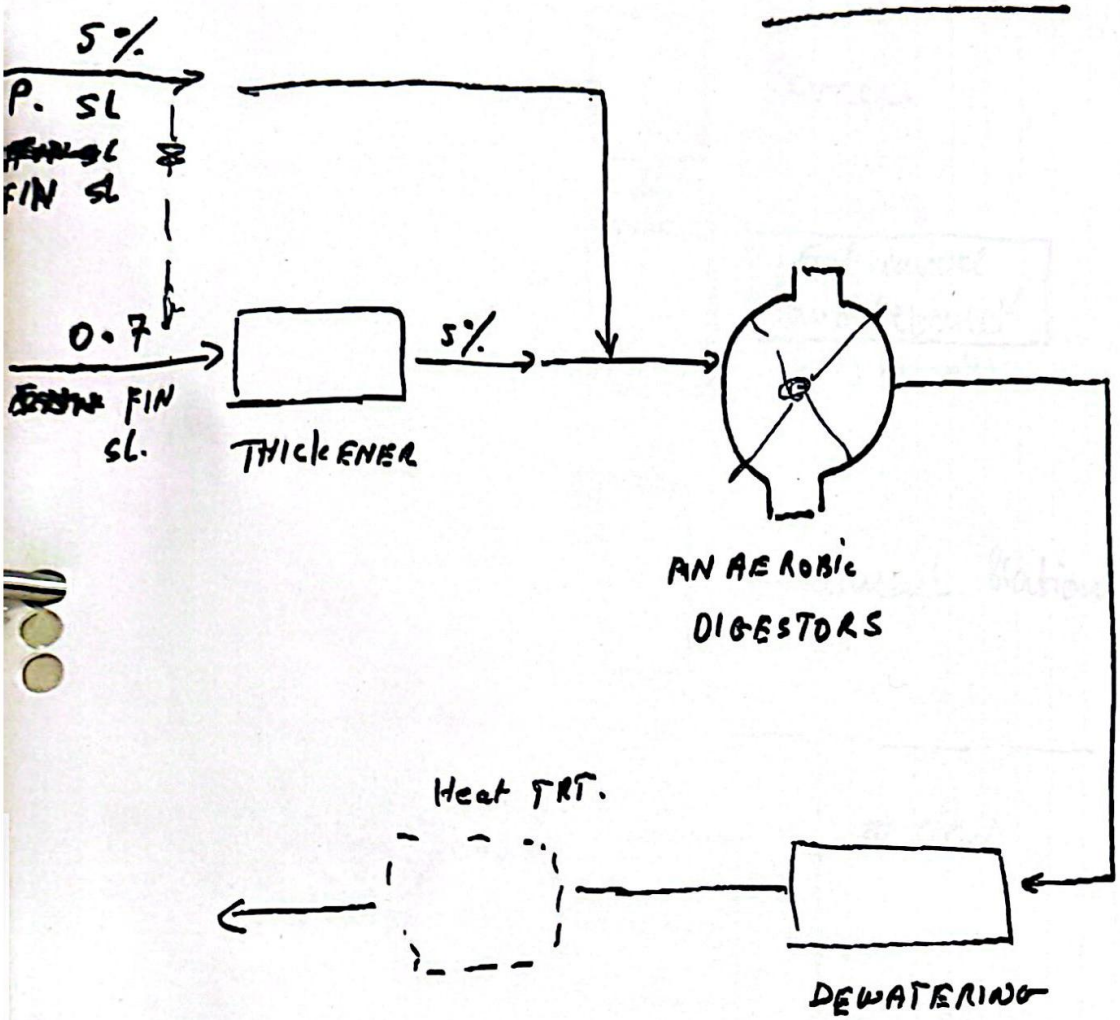
AL BIREH

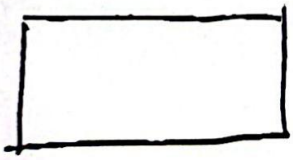
27/12/93

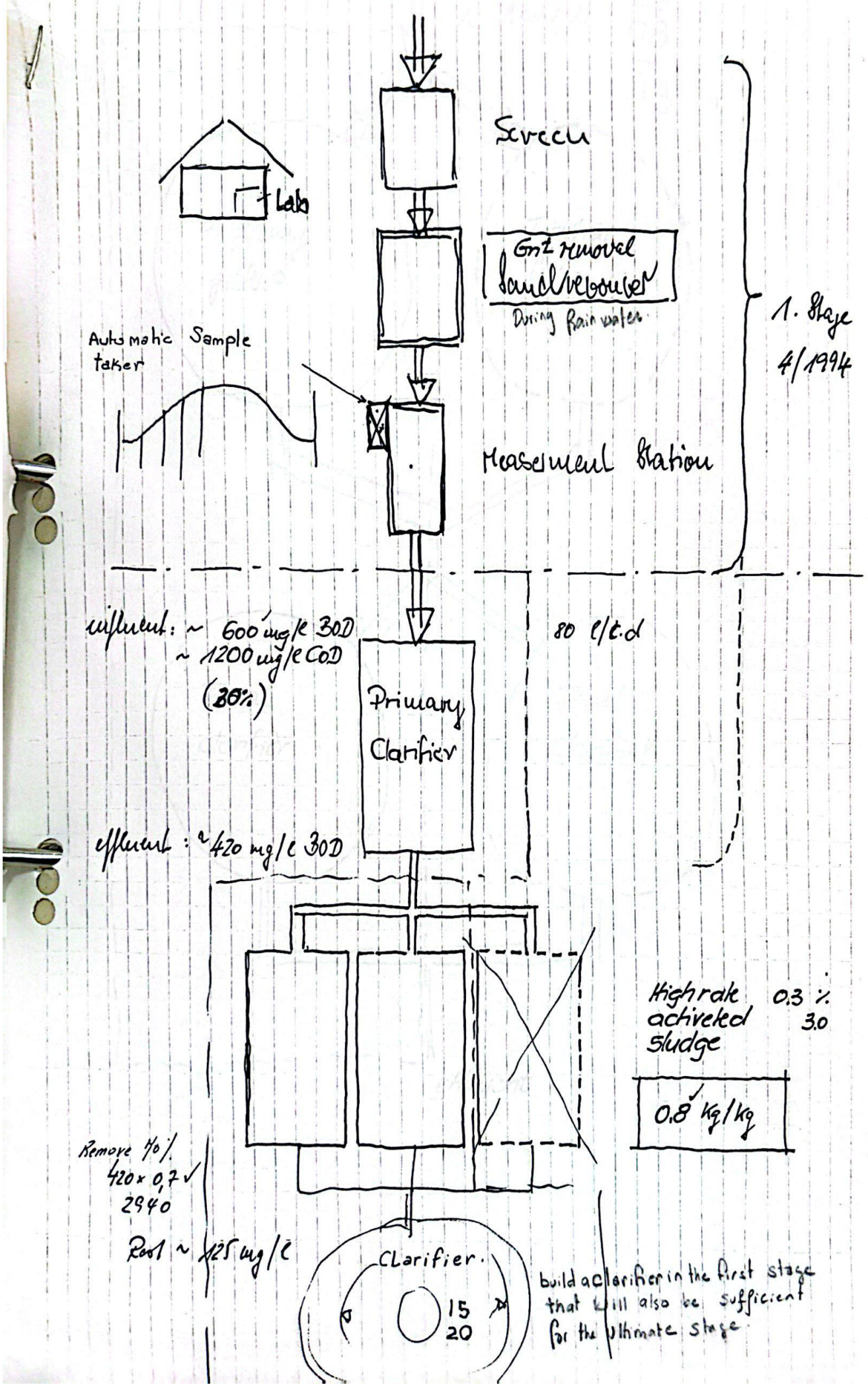
W.W.T.P - PROCESS DIAGRAM

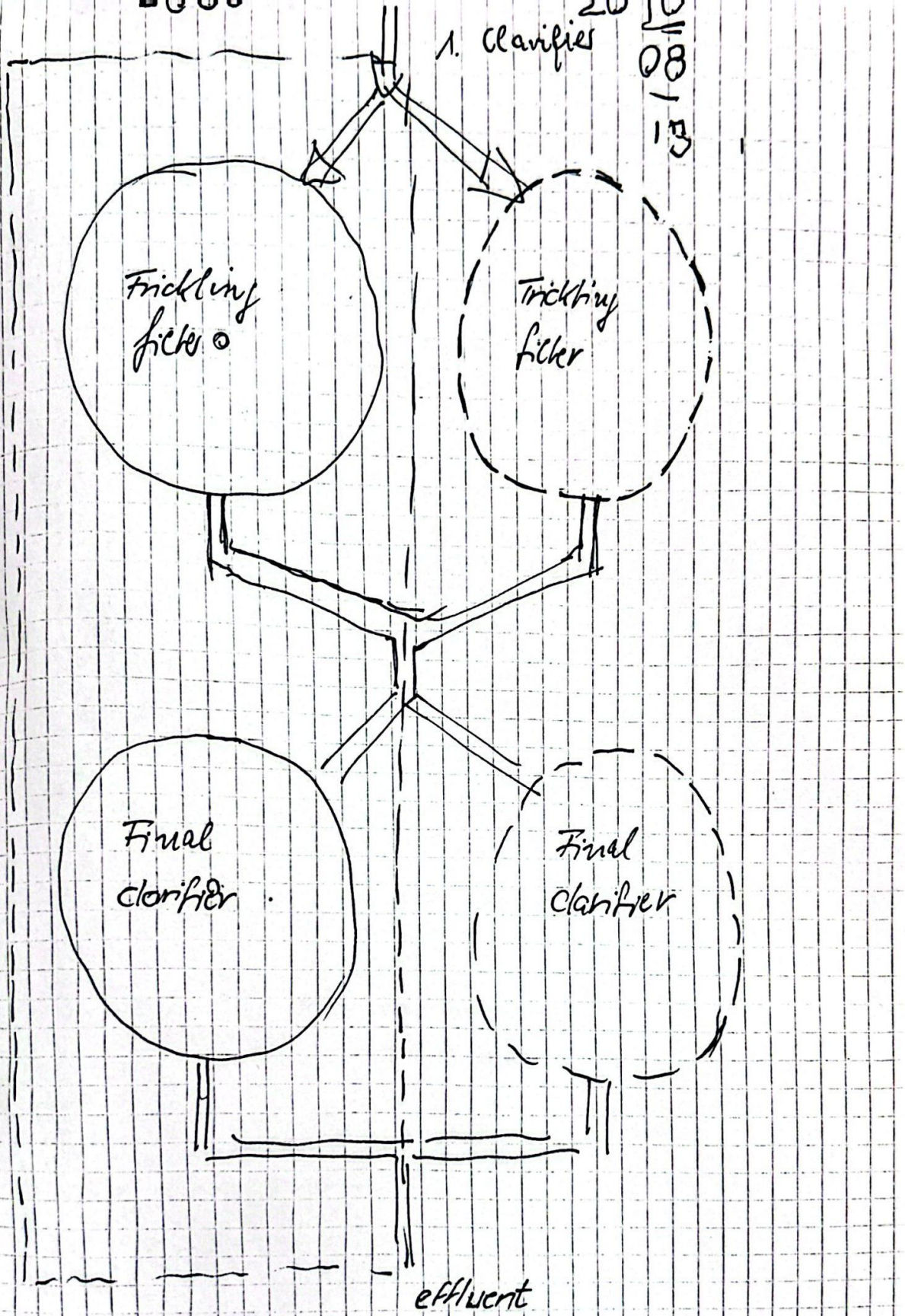


SLUDGE TREATMENT






Screen
Lab
Grit removal
sand/vegetable
During Rain water
1. Stage
4/1994
Automatic Sample
taker
Measurement Station
influent: ~ 600 mg/l BOD
~ 1200 mg/l COD
(20%)
80 l/c.d
Primary
Clarifier
effluent: ~ 420 mg/l BOD
High rate
activated
sludge
0.3 ÷
3.0
0.8 kg/kg
Remove %
420 x 0,7
2940
Rest ~ 125 mg/l
Clarifier.
15
20
build a clarifier in the first stage
that will also be sufficient
for the ultimate stage


1. clarifier
Trickling filter
Trickling filter
Final clarifier
Final clarifier
effluent

Implementation Agreement

between the

Deutsche Gesellschaft für
Technische Zusammenarbeit
(GTZ) GmbH

- hereinafter "GTZ" -

and the

Municipality of Al-Bireh
represented by the
Municipal Council,
represented in its turn by
the Mayor

- hereinafter "MAB" -

for the

Al Bireh Sewage Treatment Project

- hereinafter "the project" -

Basis of the Agreement

The Government of the Federal Republic of Germany, in conjunction with the MAB, is willing to make a contribution to the "Al Bireh Sewage Treatment" project, and has commissioned the GTZ to regulate the details of implementation in an Implementation Agreement with the MAB.

In this, the GTZ is acting pursuant to the commission it has received from the Government of the Federal Republic of Germany. On this basis, the GTZ and the MAB hereby agree on the following provisions:

1. Objective of the Ongoing Promotion Phase

The objective of the ongoing promotion phase is to build a functioning sewage treatment plant for the town of Al-Bireh, and to develop a coordinated concept for the agricultural utilization of waste water and sewage sludge.

The GTZ and the MAB are jointly committed to pursuing this objective.

2. Results of the Ongoing Promotion Phase

(1) Cooperation between the MAB and the GTZ

To achieve the objective laid down in section 1, the following results are to be achieved by the GTZ and the MAB during the project term:

* The sewage treatment plant has been built and is operational.

* A well trained operations unit has been set up.

* A coordinated concept for the agricultural utilization of waste water and sewage sludge and the non-hazardous discharge of the treated sewage has been drawn up. Palestinian farmers should utilise the waste water and the sludge.

* A management information system and a monitoring and evaluation system have been introduced.

(2) Cooperation between the MAB and American Near East Refugee Aid (ANERA)

To achieve the objective laid down in section 1, the MAB will pursue the following result in cooperation with ANERA during the project term:

* A demonstration plot for the agricultural utilisation of waste water has been set up near the planned trial plant and is in operation.

3. GTZ Inputs

(1) Secondment of experts

The GTZ shall

a) second a sanitary engineer for a period of up to 30 person-months

b) second short-term experts for a total period of up to 10 person-months, covering the fields of:

- trial plant
- planning a sewage treatment plant
- installation of electromechanical equipment
- laboratory
- a concept for waste water.and sludge utilisation

The results of the short-term experts will be submitted to the MAB in the form of appraisal reports and short reports depending on the relevant field of activity.

The short-term experts shall perform their duties along with the counterpart specialists.

c) assume the following costs thereby

- remuneration of the seconded experts
- accommodation for the seconded experts
- outward and homeward travel of the seconded experts
- official journeys of the seconded experts within the Israeli occupied territories and outside the territories

(2) Supplies of materials and equipment

The GTZ shall

a) supply

- materials for construction of a trial plant
- a project vehicle ✓
- the equipment for a sewage laboratory
- expendables ✓

b) assume the costs of transporting and insuring the materials and items of equipment listed in a) (supra) to the project location. It shall not, however, assume port dues, import and export duties and other official charges, or warehouse charges and the costs of storage during customs clearance.

c) undertake the processing of warranty claims, insurance claims, and procurement of replacement items.

The materials and items of equipment supplied shall become the property of the Municipality of Al-Bireh on their arrival in Al-Bireh.

The project vehicle shall be at the unrestricted disposal of the long-term expert pursuant to section 3 (1) a) in the performance of his duties.

The material and the items of equipment shall be supplied at the times specified in a plan of operations to be drawn up jointly with the MAB.

(3) Basic and further training outside the project

The GTZ shall assume the costs of local MAB specialists attending training courses in the field of "operating a sewage plant" in the West Bank and outside the West Bank, depending on the options available and the actual requirements, up to a maximum amount of DM 117,000 (in words: one hundred and seventeen thousand Deutsche Mark).

(4) Financial contribution

The GTZ shall grant the MAB a financial contribution not exceeding DM 4,500,000.00 (in words: four million, five hundred thousand Deutsche Mark) to build and equip an operational sewage treatment plant.

The utilisation of this sum and the terms of disbursement shall be regulated in a Financing Agreement between the GTZ and the MAB.

This Agreement shall be governed by the law applicable in the Federal Republic of Germany.

4. MAB Inputs

(1) Provision of specialists, local consultants and auxiliary staff

The MAB shall

a) provide a sufficient number of suitably trained specialists at its own expense to work in the project and for purposes of project management, including monitoring, and shall assume other related costs. In detail:

- 1 project manager
- 3 - 4 specialists for the execution and supervision of construction work
- 5 - 6 specialists as operating staff for the sewage plant

b) employ local consultants to perform the technical planning and consultancy at its own expense

c) ensure that the duties of the seconded experts are transferred to local specialists as soon as possible, but no later than upon completion of the GTZ inputs

d) provide a sufficient number of suitably trained specialists for basic and further training pursuant to section 3 (3). It shall ensure that the families of the selected specialists receive any support they need for the duration of the training course.

(2) Provision of office space

The MAB shall provide adequate office space and pertinent equipment for the seconded experts within the municipal council building.

(3) Costs, Funds

The MAB shall

a) assume the operating and maintenance costs of the project

b) ensure the timely budgeting of the costs to be stipulated in detail in the plan of operations, in particular for fuel, repairs and office materials.

(4) Materials and equipment

The MAB shall provide vehicles, tools and materials for its own staff where these are not supplied by the GTZ.

(5) Provision of land

The MAB shall

a) provide the land for the construction of the sewage plant and for the trial plant to the project free of charge

b) assume the costs of site development (foundation exploration, surveying, installing utilities connections, building service roads)

(6) Support for the seconded experts

The MAB shall ensure that the seconded experts are given the administrative, logistical and other support they may need to perform their duties, and shall give them access to all necessary papers and documents.

(7) Customs clearance

The MAB shall assume all costs entailed by licenses, port dues, import and export duties and other public charges, as well as warehousing charges and the costs of storage for the materials listed in section 3 (2). The MAB shall make every effort to ensure rapid customs clearance and to have costs of customs clearance and other public charges reimbursed by the authorities responsible.

(8) Procurement of all necessary permits

The MAB shall ensure that all necessary permits for the implementation of the project, including the residence and work permits for the seconded experts, as well as any import permits required for the materials and items of equipment are procured in good time, in line with the progress of the project, pursuant to the plan of operations.

(9) Charges

The MAB shall introduce charges which cover costs.

(10) Coordination

The MAB shall coordinate the activities of all parties concerned and the relevant local and international institutions and organizations.

5. Duties of the Experts, Status

(1) Duties

a) The seconded long-term expert pursuant to section 3 (1) shall be at the disposal of the MAB to provide technical support within the project. The long-term expert shall advise the MAB in particular on the following topics:

- project management
- planning a sewage treatment plant
- technical supervision of construction work
- operation and maintenance
- processing the financial contribution
- organisational development
- finance and accounting
- further training.

The terms of reference and the times of the short-term expert assignments shall be determined by mutual consent by the MAB and the GTZ.

(2) Status of the seconded experts

The seconded experts shall perform their duties independently and on their own responsibility; they shall be obliged to cooperate with the specialists of the MAB in a spirit of mutual confidence.

6. Time Schedule

The measures planned within the scope of this Agreement for the ongoing promotion phase are to be completed within a period of three years. One year has been planned for the planning phase and two years for the construction of the sewage plant.

7. Power of Disposal, Right of Use

The materials and items of equipment supplied or employed by the GTZ shall be used for the purpose intended; they shall be at the unrestricted disposal of the project and the seconded experts for the performance of their duties.

8. Evaluation

(1) The GTZ shall be entitled to undertake an evaluation of the project during or after the implementation of this Agreement. To this end the GTZ shall second appraisers to the project. The MAB shall participate in the evaluation. The MAB shall, in any case, assist the appraisers in their work and allow them access to all necessary papers and documents.

(2) The MAB shall be informed of the results of the evaluation in the form of a report.

9. Suspension of Inputs and Terms of the Agreement

(1) The GTZ shall only be entitled to suspend its inputs, should

a) the MAB fail to meet commitments under the terms of this Agreement or under the terms of agreements pertaining to this Agreement, or should

b) exceptional circumstances arise, which preclude or seriously jeopardise the purpose of the project or the implementation thereof.

(2) Should a set of circumstances described in paragraph (1) (supra) arise, and persist for longer than a period to be laid down by the GTZ, which may not however, be shorter than 30 days, or should the situation not have been remedied within this period, the GTZ may prematurely terminate the Agreement with the approval of the Government of the Federal Republic of Germany.

10. Final provisions

(1) Term

This Agreement shall be valid for the duration of the processing of the German contribution and the inputs pledged by the MAB agreed on under the terms of the Agreement.

(2) Written form

Any alterations and additions to this Agreement, and any other important statements and notifications of importance to the handling of the Agreement must be made in writing. Statements and notifications to the GTZ may be delivered to the seconded expert pursuant to section 3 (1).

(3) Plan of operations

The MAB and the GTZ shall stipulate in writing further details pertaining to the processing of the project in a plan of operations which shall be binding for both parties to the Agreement or in another suitable way, and shall adapt this if necessary to bring it into line with the development of the project.

The American Near East Refugee Aid (ANERA) shall be involved in drawing up the plan of operations.

(4) Applicable law

This Agreement shall be subject to the law applicable in the Federal Republic of Germany.

(5) Coming into force, number of copies

This Agreement shall come into force on the day it is signed by both parties to the Agreement. it shall be drawn up in duplicate in English and in German, whereby each of the two versions shall be equally binding.

Frankfurt am Main, date 1993-05-10

Deutsche Gesellschaft für
Technische Zusammenarbeit
(GTZ) GmbH

Dr. Eylers B. Kehr

Al-Bireh, date 10-06-93

Municipality of Al-Bireh

إتفاقيـــة سارية المفعول

بيـــن

المؤسسة الألمانية للتعاون في الاعمال الفنية المساهمة المحدودة

- ويُشار اليها هنا بالاختصار (جيه تيه تست) -

و

بلديـــة البيـــرة

الممثلة فـــي

مجلسهـــا البلـــدي

والممثل بدوره في

رئيـس البلديـــة

- ويشار اليه هنا ب "أم إيه بي"

وذلك من أجل معالجة وتنفيذ

مشروع مجاري بلدية البيرة

المُشار اليه هنا ب "المشروع"

ms

أساس الاتفاقية

ترغب حكومة المانيا الفدرالية، بالتعاون مع بلدية البيرة، في ان تشترك بمشروع "معالجة وانجاز شبكة مجاري بلدية البيرة". وقد أوكلت البلدية المذكورة للمؤسسة المعنية هنا بأن تضع بالتعاون معها الخطط والتفاصيل اللازمة لتنفيذ هذا المشروع.

وفي هذه الحالة فإن المؤسسة الألمانية للأعمال الفنية تتصرف في عملها بموجب التعليمات والارشادات التي تلقتها من حكومة المانيا الفدرالية. وعلى هذا الأساس فأن المؤسسة الألمانية وبلدية البيرة متفقتان على ما يلي:-

١- هدف المرحلة التحضيرية المستمرة:

ان الهدف هنا هو في بناء شبكة لمجاري لبلدية مدينة البيرة وتطوير مشروع للاستفادة من المياه العادمة في اغراض ري الاراضي الزراعية. ويطلب من المؤسسة الالمانية للاعمال الفنية وبلدية البيرة العمل معا في تحقيق هذا المشروع الحيوي.

٢- نتائج استمرارية المرحلة التحضيرية:

ا- التعاون فيما بين بلدية البيرة والمؤسسة الالمانية للأعمال الفنية وذلك لتحقيق الهدف المنصوص عليه في رقم ١ - ولعمل هذا، فأنه يجب تحقيق الأمور التالية اثناء فترة القيام بالمشروع:-

- ان تكون الشبكة قد أنجزت وتعمل بشكل عادي.
- قد وُضعت وحدة عمليات مدربة جيدا.
- ان تكون هناك وحدة عمل متكاتفة لاستغلال المياه العادمة وللتأكد من أن هذا الموضوع وضع موضع التنفيذ، وبأن المزارعين الفلسطينيين يستفيدون فعلا من هذه المياه العادمة ومن الطمي والوحل في زراعاتهم.
- بأن يكون قد أدخل نظام اداري لتلقي المعلومات ونظام للتنسيق وتقييم الامور.

ب- التعاون بين بلدية البيرة وبرنامج المساعدات الاميركية للشرق الأدنى (أنيرا)

ولتحقيق الهدف المذكور في بند ١، فأن بلدية البيرة سوف تسعى - بالتعاون مع أنيرا - للوصول الى وضع خطة شاملة لاستغلال هذه المياه العادمة في اغراض الريّ الزراعي وان المزارعين قد باشروا العمل فعلا بموجب هذه الخطة.

٣- توظيف المؤسسة الألمانية:

ا- توظيف المختصين والخبراء:

يتوجب على المؤسسة الالمانية توظيف مهندس للشؤون الصحية لمدة تعادل عمل ٢٠ شخص شهريا

ب- توظيف خبراء لمدد اقصر تصل بمجموعها الى مدة تعادل عمل ١٠ اشخاص شهريا ويشمل العمل المواضيع التالية:

- التجارب في حقل العمل
- التخطيط لعمل مشروع يعالج شؤون المجاري
- وضع الاجهزة الالكترونية بشكل جاهز في مكانها.
- شؤون المختبر
- مشروع او خطة لاستغلال المياه العادمة في ري الاراضي واستغلال الوحل كذلك لنفس الهدف.

وستقدم تقارير لبلدية البيرة بخصوص مشروع توظيف خبراء لمدد قصيرة وسوف يقوم الخبراء بتنفيذ مهامهم وواجباتهم بالتعاون مع المختصين في مجالات العمل.

ج- العمل على دفع التكاليف التالية المترتبة على العمل:-
- التعويض على الخبراء الموظفين
- الاهتمام بايجاد المساكن الملائمة للخبراء
- دفع اجور السفر اثناء دخولهم الى وخروجهم من منطقة العمل
- دفع اجور الرحلات بعمل رسمي للخبراء الموظفين داخل وخارج الاراضي المحتلة

٢- تجهيز المواد اللازمة والمعدات:
ا- يترتب على المؤسسة الفنية تجهيز:
- مكان للعمل والتجارب
- سيارة للمشروع
- معدات مختبر خاص بمشروع المجاري
- مصروفات اخرى

ب- دفع رسوم النقل والمواد والتجهيزات المذكورة في ا) وايصالها لمكان العمل، هذا باستثناء رسوم الموانىء، رسوم التصدير والاستيراد، وغيرها من الرسوم الرسمية المترتبة او رسوم التخزين اثناء تخليص البضاعة من الجمارك ..الخ.

ج- التعهد بانجاز معاملات الكفالة والتأمين وتصفيتها.

وسوف تصبح الادوات والمعدات المزود بها العمل ملكا لبلدية البيرة حال وصولها مدينة البيرة

توضع سيارة المشروع تحت تصرف الخبراء والفنيين لمدد غير محددة وطويلة كما جاء في قسم ٣ (١) (ا) اعلاه وذلك لتمكينهم من القيام بعملهم.

تزود المعدات والمواد اللازمة بموجب الخطة والاتفاقية المبرمة بتعاون بلدية البيرة مع المؤسسة الالمانية الفنية.

٣- التدريب الاساسي والاضافي خارج نطاق المشروع:

سوف تعمل المؤسسة الالمانية على القيام بتجهيز تكاليف الفنيين والمختصين المحليين التابعين لبلدية البيرة والذين يحضرون دورات تدريبية في حقل "تشغيل منشأة مجاري" في الضفة الغربية، وذلك طبقا للخيارات المتاحة والمتطلبات الفعلية، الى حد اقصى تبلغ قيمته -،١١٧٠٠٠ مارك الماني (بالكلمات: ماية وسبعة عشر ألف مارك الماني)..

٤- المساهمة المالية

تمنح المؤسسة الالمانية بشكل مساهمة مالية مبلغا لا يتجاوز -،٤،٥٠٠،٠٠٠ مارك الماني (بالكلمات: اربعة ملايين وخمسماية ألف مارك الماني) لبناء وتجهيز محطة او مركز دائم العمل لمعالجة امور شبكة المجاري. ويتفق على استثمار هذا المبلغ وطرق توزيعه في اتفاقية خاصة تعقد بين المؤسسة الفنية الالمانية وبلدية البيرة، وذلك طبقا للشروط المعمول بها في جمهورية المانيا الفدرالية.

٤- توظيف الكوادر العاملة:

١) توظيف المتخصصين والمستشارين المحليين ومجموعة اخرى تابعة لها.
وتقوم هذه الكوادر:
ا) بتجهيز عدد كاف من الكوادر والمتخصصين المدربين بشكل مناسب، وذلك على نفقتهم الخاصة، للعمل في المشروع وادارته، بما فيه التصوير والتخطيط، وبالتفصيل:

- مدير مشروع واحج
- ٣ - ٤ متخصصين في تنفيذ ومراقبة اعمال البناء
- ٥ - ٦ متخصصين كمجموعة عاملة ادارية في مشروع المجاري.

ب) استخدام مستشارين محليين للقيام باعمال التخطيط الفنية وامور الاستشارة وذلك على نفقة المستخدِمين الخاصة.

ج) التاكد من ان مسؤوليات المهرة الموظَفين تُنقل وباسرع وقت ممكن الى المتخصصين المحليين.

د) تزويد العمل بعدد كاف من المتخصصين المدربين والملائمين للعمل، وذلك لتدريب كوادر اخرى طبقا للمادة ٣ (٣). ويجب التأكد كذلك من ان عائلات هؤلاء المتخصصين تحصل على الدعم الكافي خلال فترة تدريبهم.

٢) تزويد مكان للمكاتب:

تقوم بلدية البيرة بتزويد العمل بالمكان المناسب لبناء المكاتب عليه وتزويد المهرة الموظفين بالمعدات اللازمة داخل بناية المجلس البلدي.

٣) التكاليف والاموال اللازمة:

يترتب على بلدية البيرة:

ا) ان تهتم بتزويد العمل بالتكاليف اللازمة للأدارة والصيانة.
ب) ان ترى بأن التكاليف المذكورة بالتفصيل في الخطة الادارية للعمل، وخاصة الوقود والتصليحات ولوازم المكاتب، تدخل جميعها في الميزانية المقررة.

٤) المواد والتجهيزات:

تزود بلدية البيرة العمل بالسيارات والادوات والمواد اللازمة لطاقم عملها حيث ان هذه الاشياء لا تزوّدها المؤسسة الالمانية.

٥) تحضير او تجهيز الارض:
يترتب على بلدية البيرة ان:

ا) تجهز الارض اللازمة لبناء مشروع المجاري ومشروع التجارب بدون مقابل.
ب) تأخذ على عاتقها تكاليف تطوير (تأسيس، مسح، تركيب وبناء ما يلزم وتأمين خدمات الطرق، الى غير ذلك)

٦) مساعدة الخبراء المعيّنين:

تهتم بلدية البيرة بمساعدة الموظفين اداريا وفكريا وبتقديم اي مساعدة اخرى يحتاجونها للقيام بعملهم وتفسح لهم المجال برؤية الاوراق والوثائق اللازمة ٠

٧) تخليص البضاعة في الجمارك:
تهتم البلدية بدفع التكاليف المترتبة على الرُخص ورسوم الموانىء والتصدير والاستيراد ورسم اخرى عامة بما فيها رسوم تخزين البضاعة كما في ٣ (٢) وتعمل على اتمام هذه المعاملات بالسرعة الممكنة ٠

٨) تحضير الاذونات الضرورية:
تعمل البلدية على تحضير جميع الاذونات اللازمة للمشروع بما فيها اذن الاقامة والعمل للموظفين المعينين، بما في ذلك اذن الاستيراد وذلك لجلب ما يلزم في الوقت المحدد ٠

٩) الرسوم:
يترتب على البلدية فرض الرسوم التي تغطي التكاليف ٠

١٠) التعاون:
تلتزم البلدية بالتعاون مع جميع الاطراف المعنية بما في ذلك المؤسسات المحلية والعالمية ٠

٥) واجبات المتخصصين ووضعهم:

١) الواجبات:
ا) يترتب على الموظفين لمدة طويلة بموجب الفقرة ٣ (١) ان يكونوا تحت الطلب من قبل البلدية وذلك لتزويد ما يلزم من مساعدة فنية ضمن المشروع ويترتب على الموظف المتخصص الدائم تقديم النصح والارشاد للبلدية فيما يخص:

- ادارة المشروع
- التخطيط وطرق معالجة المشروع
- المراقبة الفنية في العمل البناء
- ادارة العمل والصيانة
- تتبع ادارة صرف المبالغ المالية
- التطوير التنظيمي
- المالية والمحاسبة
- التدريب المستمر لكوادر اخرى ٠

وسوف تعين اوقات استخدام الموظفين المتخصصين من قبل المؤسسة الالمانية والبلدية معا ٠

(٢) وضع الموظفين المتخصصين:

يجب على الفنيين القيام بواجباتهم بشكل مستقل وعلى مسؤوليتهم الخاصة ويجب عليهم التعاون مع المتخصصين في بلدية البيرة بروح الثقة المتبادلة ٠

٦- برنامج الوقت:
يجب ان يتم العمل خلال ٣ سنوات بموجب ما هو مخطط بالاتفاقية ٠ وخُصصت سنة واحدة للتخطيط وسنتان لاتمام العمل ٠

٧- السلطة وحق الاستعمال:
تستعمل المواد والمعدات التي تزودها المؤسسة الالمانية للهدف الذي تاتي من اجله ويجب ان تبقى تحت استخدام ما يلزم في المشروع وتبقى تحت تصرف المهرة الموظفين وذلك للقيام بواجبهم على اكمل وجه ٠

٨- تقييم:
يحق للمؤسسة القيام بتقييم المشروع خلال او بعد فترة انتهاء الاتفاقية وتعين المؤسسة من تراهم مناسبين لذلك ويترتب على البلدية المشاركة في التقييم وتساعد البلدية المقيمين في عملهم وتسمح لهم برؤية الوثائق اللازمة ٠

(٢) يتم اعلام البلدية عن التقييم بشكل تقرير ٠

٩- تعليق ما يضاف للعمل وشروط الاتفاقية:
(١) يحق للمؤسسة التعليق فقط في حالة:
ا- فشل البلدية من القيام بشروط والتزامات هذه الاتفاقية او
ب- عند نشوء حالات شاذة تعرقل سير العمل في المشروع ٠

(٢) اذا نشأ هناك ما هو تحت بند (١) وتحمل العمل مدة إكثر مما تتوقعه المؤسسة والذي لا يكون اقصر من ٣٠ يوما على اية حال، وهنا يمكن للمؤسسة انهاء العمل بالاتفاقية، بموافقة جمهورية المانيا الفدرالية ٠

١٠- شروط نهائية:
(١) شرط: يستمر مفعول الاتفاقية طالما ان هناك مشاركة من المانيا في ذلك ووضع وتوظيف ما يلزم للمشروع ضمن شروط الاتفاقية

(٢) الصيغة الكتابية:
يقدم كل تغيير بشكل كتابي وكذلك اية ملاحظات مهمة وتسلم للفني الموظف وللمؤسسة بموجب الفقرة ٣ (١)

(٣) خطة العمل:
تتفق البلدية والمؤسسة بشكل خطي على تفاصيل اخرى متعلقة بسير المشروع والذي يكون ملزما للطرفين بموجب الاتفاقية وبشكل يتمشى مع مصلحة المشروع ٠ ويُطلب من أنيرا العمل على تحضير الرسم اللازم لخطة المشروع

(٤) القانون المطبّق:
يجب ان تخضع هذه الاتفاقية لقانون جمهورية المانيا الفدرالية ٠

(٥) صلاحية الاتفاقية - عدد النسخ:
تعتبر هذه الاتفاقية صالحة ابتداء من اليوم الذي توقّع فيه من قبل الطرفين ويجب ان تكون على نسختين: المانية وانجليزية ويجب الالتزام بجميع بنودها ٠

فرانكفورت/ ماين - التاريخ:

البيرة - التاريخ:

المؤسسة الالمانية _____ بلدية البيرة

Vertretungsbüro
der Bundesrepublik Deutschland
Representative Office
of the Federal Republic of Germany

Ramallah, 11.12.2000
Ge/

File No.: WI 445 TZ 06
(Please quote)

H.E.
Dr. Nabil Shaath
Minister of Planning and International Cooperation
Gaza - Fax: 07-2824090

cc: Mr Hisham Mustapha
Director General - Head of Western Europe Dept.
Fax: 02-296 1857
DD GTZ-Büro Fax 02 240 07 41 z.K.

Subj.: Technical Cooperation
here: „Waste Water Project Al Bireh„
Ref.: Summary Record of Negotiations on Palestinian-German Cooperation, Ramallah on 02 March, 1999

Dear Minister,

it is my pleasure to inform you that the Federal Ministry for Economic Cooperation and Development (BMZ) has made available the amount of 980.000.- German Marks to contribute to the financing of the aforementioned project. Since it is a project of technical cooperation, the PA will receive this amount in goods and services.

I would like to inform you that the German contribution is subject to the exchange of notes. The GTZ (Gesellschaft für Technische Zusammenarbeit) has been charged with the implementation of the project.

Mr. Minister, please accept the assurance of my highest consideration.

Sincerely

Dr. Horst Freitag
Head of the Representative Office

12.12.00

Adresse
P.O.B. 1854
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GESAMT SEITEN 01

RECEIVED DATE : 12/11 16:02'00 FROM :

AIDE-MEMOIRE

Draft

Mission of Project Progress Review

TREATMENT OF WASTEWATER AL BIREH

1. PREFACE

The purpose of the Project Progress Review (PPR) was to analyse the actual progress of the project on the basis of the original planning and to determine the contributions achieved and the development impacts, originated by the project and other factors. The mission took place at Al Bireh, Palestine, from February 2 to February 16, 2000. During the days February 12 to 14 a planning workshop, ZOPP 5, was conducted with all involved actors, defining the contents of a 6 months prolongation of the actual phase till December 31, 2000. Planning for a complementary phase 2 of Technical Cooperation for a duration of 1,5 years (01.01.01 to 30.06.02) was also described. The objective was to conclude the Technical Cooperation component of the project in the utmost successfull way.

The participants of the PPR were the following professionals:

Uwe Putzar	Technical evaluator and Team Leader
Andreas Kanzler	Technical Department GTZ HQ (as from 09.02. to 16.02.00)

Mr. Adnan Ghosheh, GTZ-Advisor for the Projects of Al Bireh and Salfeet, acted as resource person and mission assistant. The ZOPP 5-Workshop was moderated by Mr. Nadim Mulhem.

2. PROJECT HISTORY AND CONCEPT

The Technical Cooperation between the Municipality of Al Bireh and GTZ was initiated in 1992. The implementation agreement was signed in June 1993. The purpose of this project is to enable the Municipality of Al Bireh to operate the sewerage system including the wastewater treatment plant according to the technical and economical requirements, and to elaborate and indroduce an agreed concept for the reuse of the treated wastewater and sludge in the agriculture. Due to the condition to avoid any contamination to the natural recipient Wadi Qilt, of which the catchment area is intensively used for drinking water purposes, it had to be planned to transfer the effluents of the wastewater treatment plant to the adjacent Dier Dibwan area, where it could be used for irrigation and fertilizing purposes in the agricultural activities of Palestinian landowners and farmers.

The concept of the project included the extension and completion of the sewerage system of Al Bireh and the construction of a modern biological wastewater treatment plant including effluent pipes and storage tank for the reuse of the treated wastewater. As a main target of the Technical Cooperation it included also to build up a qualified institutional structure within the Municipality of Al Bireh for an adequate operation and maintenance of the sewer network and wastewater treatment plant through training of the required operational personnel.

The period of the project, from 12/1992 as well as the following period from 07/1993 to 06/1996 included a series of activities which can be summerized as follows:

1. Erection and operation of a pilot treatment plant in 1992;
2. Preliminary final design of the activated sludge treatment plant till 12/1994;
3. Contracting of a Joint Venture German/local consultant in 06/1995 for final design and supervision;
4. Final design for the treatment plant in 11/1995;
5. Completion of the international tender documents till 11/1995;
6. Precalification for contractors till 10/1995;
7. Long term advisory services by a German sewage expert (Technical Advisor) as from 12/1993 to the Municipality including selection and training of future operation personnel.

With the establishment of the Palestinian National Authority, and within the scope of the bi-lateral (Palestinian/German) negotiations, it was decided in 1996 to finance the investment costs for the extension of the sewer network and the wastewater treatment plant in Al Bireh in the framework of the Financial Cooperation through KfW, the German Bank for Reconstruction and Development. The corresponding agreements were signed in 12/1996 and 08/1997 and included the construction and connection of a sewer network with pumping station in the Lower South suburb of Al Bireh. The two German institutions (GTZ and KfW) concluded a cooperation agreement in view of concentrating their efforts to achieve the project purpose within the accorded time schedule.

The on-going second period of the project, from 07/1996 to 06/2000 includes within the framework of the Technical Cooperation the major part of the training activities in 3 blocks according to an agreed training programme for the designated personnel of the Sewage Section and for the operation of the sewerage system. Furthermore, it contains the elaboration and – partially – implementation of special studies such as the organizational and manpower study, tariff study and preparation of a by-law, wastewater and sludge reuse study and the preparation of an industrial wastewater cadastra. These activities are coordinated and accompanied by the Technical Advisor who simultaneously is in charge of three other technical cooperation projects in the area.

The Financail Cooperation component of the project included the construction of the sewer network and pumping station at Lower South catchment area which was concluded in 1999, and the wastewater treatment plant that is still under construction. Furthermore it is planned to extend the sewer network to Upper North, which will be implemented shortly.

It should be mentioned that due to various reasons the finalization of construction of the wastewater treatment plant was in delay for 18 to 21 months. The main reasons were identified as follows:

- External influences due to the political situation;
- Tendering procedure included invitation to offer alternative treatment processes, requiring a longer submission period;
- Evaluation of offers took more time because of the presentation of alternative treatment processes;

- Managerial problems of the leading contractor and coordination problems with the subcontractor lead to delays;
- The contract period of 18 months for the construction of the treatment plant was unrealistically short and should have been of 24 months.

It is intended that the wastewater treatment plant will go into operation in the second trimestre of 2000, just before the conclusion of the actual phase of Technical Cooperation. That means that the programmed assistance during two years of operation of the plant through the Technical Advisor could not take place within the actual phase.

3. RESULTS OF THE PPR

The planning of the Technical Cooperation component had been established in accordance with the Project Planning Matrix of 1993 and 1996. The Operation Plan for the execution of the different activities was lastly actualized in 01/1999 and covered the period till 12/1999. These documents have served during the PPR-mission as reference for the evaluation, taking well into account the accumulated delay of the overall project of 18 to 21 months.

Project Purpose:	The City of Al Bireh is enabled to operate its sewerage system properly and cost effectively; a tuned concept for controlled agricultural utilization of wastewater and sewage sludge has been developed and introduced.

The project purpose has only been achieved partially, mainly due to the delayed finalization of construction of the wastewater treatment plant and the non-implementation of the reuse concept as proposed in the corresponding concept study of 1998. Nevertheless it can be confirmed that important preconditions within the Municipality, especially regarding the technical operation of the already used sewer network and pumping stations, have been fulfilled. Additionally it should be highly recognized that, regardless of the delay of nearly 2 years, the Municipality of Al Bireh is continuing to contribute to the success of the project maintaining available the complete personnel for the operation of the treatment plant.

Therefore it can be stated that the project purpose will, probably, be achieved once construction activities are finalized, the entire sewerage system is operated and the concept for the reuse of the treated wastewater and sludge is introduced.

Result 1:	The sewerage system including the wastewater treatment plant of Al Bireh City is operated properly.

To achieve this result, it was planned to prepare the corresponding technical standards and guidelines, identify and compile the industrial and commercial polluters including the establishment of a wastewater cadastra, introduce an effective operation and control system and improve the working and administrative routine within the Sewage Section of the Municipality. Furthermore it was agreed to qualify the technical operation personnel through theoretical and practical training, to contract additional personnel according to the requirements for an adequate operation, to train future operational and administrative personnel, and to accompany the operation of the treatment plant during an initial period of two years.

This result, regarding the part of the sewerage system already in operation, has been achieved. All preconditions for a successful operation through the Sewage Section have been fulfilled, waiting at the moment for the completion of construction of the treatment plant. An important positive aspect is furthermore, that the key operational staff has been involved in design and construction matters of the complete sewerage scheme, having obtained extended knowledge about constructional particularities of the different installations.

Result 2:	Tariff and fee collection system have been introduced to cover operation and depreciation costs.

It was planned to adjust and introduce the wastewater fee ordinance, to improve the accounting and auditing system within the Municipality, elaborate proposals for industrial discharge fees, identify further training needs of municipal accounting staff, launch adequate awareness campaigns for the population and prepare the taking over of encashment of the sewage fees by JWU.

The result has not yet been achieved completely, although important preconditions have been fulfilled. In this context, the project has elaborated the tariff study and a tariff by-law, currently awaiting approval by concerned ministryand the industrial wastewater cadastra. The Municipality is furthermore ready to introduce the new wastewater tariff scheme at the moment of putting into operation the new treatment plant and transfer the encashment of the fees to JWU.

Nevertheless, we have to state that other important activities have been postponed, like the introduction of a cost centrerelated accounting system (Commercial Oriented Accounting System) and awareness campaigns within the population. The new accounting system, financed through the World Bank in the framework of a municipal improvement project with the Local Government, will be introduced in the course of this year, and awareness campaigns will only be launched after starting with the operation of the treatment plant.

The current exisiting accounting system does not provide reporting tools to establish the break-even between expenditures and revenues, nor does it report collection ratio. Nevertheless we have to recognize, that the Municipality has increased in the past the sewerage maintenance fee twice to compensate the increasing operation costs and prepare the customers for the introduction of a consumption related tariff scheme.

300 %

Result 3:	Treated effluent and sludge are used by Palestinian farmers against payment.

The activities planned to achieve this result included the elaboration and approval of a conceptual study for the reuse of treated wastewater and sludge in the Deir Debwan area, the execution of information campaigns for Palestinian land-users and the implementation of the concept for the use of the treated wastewater and sludge.

It has to be stated, that, except for the concept study conducted in 02/1998, no further activities have so far been initiated. Complementary investigations commissioned by KfW showed "high risk" results, so that the decision to finance the necessary infrastructure has been postponed. In the meeting of May 12, 1999 in Germany it was decided that the responsible executing agency for the financing of all activities on behalf of a future reuse of the treated wastewater will be KfW. KfW has

Municipality was officially informed that

ast decided to send two experts during the month of March 2000 to Palestine to prepare a project concept for the agricultural reuse of the treated wastewater in the Deir Debwan area and to identify an appropiate project-executing agency for this agricultural pilot scheme.

The Technical Cooperation project is in the position to support any further activity through its acquired knowledge during the past project phase.

Result 4:	Quality of wastewater and soil is continuously supervised.

This results include activities which are oriented towards a permanent control of the characteristics of the treated wastewater and sludge with regard to their reuse for agricultural purpose. The analyses have to be made in the laboratory of the treatment plant, permitting the operational personnel to adjust the treatment process to the established requirements.

To achieve this result it had been planned to elaborate a control ordinance, to maintain permanently an operational logbook with all related data, to elaborate a cadastra for the use of sludge and actualize it permanently, and to train complementary personnel of the laboratory.

Except for a translation of a correspondent ordinance for the use of sludge, no activities have been done so far due to the delay mentioned above.

This result can only been achieved in the context of the implementation of the wastewater and sludge reuse concept.

Contributions and Impacts:

The sewerage project of the Municipality of Al Bireh has already had an impact on the development of the city and even beyond its boundaries. Summarizing the contributions and impacts due to the development of the different activities during the past eight years it can be confirmed the following:

1. The Municipality has established an independent Sewage Section and created satisfaction among the concerned personnel.
2. The professional and operational personnel of the Sewage Section has been trained and has achieved a much higher professional capability.
3. The illegal discharge of sludge and wastewater from individual cesspools by private entrepreneurs to public sewers has been stopped, creating therefore better environmental conditions.
4. The industrial polluters are aware of their responsibility and willing to cooperate with the Municipality in respect of finding solutions to reduce the pollution of their wastewater discharges.
5. The Municipality has achieved a broad experience in dealing with international donors being now capable to apply for further projects with international funding.
6. The project has created an awareness at other institutions towards application and implementation of similar projects.
7. The execution of the project has created new economical activities in the city due to the condition to employ local manpower.

3. The improved sanitary infrastructure is a good basis for a more active development of the town (building industry) and will attract more entrepreneurial activities in the near future.

As negative impacts it might be stated, that for the time being the Municipality continus depending on the external contribution to the project and has not yet achieved a cost recovery for the operational and depreciation costs for the actual sewerage system in operation.

4. RECOMMENDATIONS

4.1 Summary

On the basis of the results of the Project Progress Review, the mission recommends to continue with the Technical Cooperation project for a period of two years, considering a 6 months-prolongation of the actual phase till December 31, 2000 followed by a complementary phase 2 of 1,5 years from January 1st, 2001 to June 30th, 2002. This period of 2 years shall serve mainly to assist the Sewage Section in all operation matters of the wastewater treatment plant with the objective to train the operational staff permanently on the job to ensure a constant quality of the effluents and sludge characteristics, and to assist the Municipality in economical matters and public awareness campaigns.

4.2 Planning Workshop

From this point of view it was organized from February 12 to 14 a ZOPP 5-Workshop at the Municipality of Al Bireh for the planning of an additional project period, during which the project objective as well as the results to be achieved, the indicators, the assumptions and the corresponding activities were redefined. It was decided to maintain the overall goal without any modification as follows:

Overall Goal: **Securing an environmentally sound sanitation**

4.3 Project Objective and Results

Project Objective: **The sewerage system of Al Bireh is operated effectively according to the established standards and regulations.**

Result 1: The technical and administrative staff are operating and maintaining the sewerage system on a reliable basis.

Result 2: The economic viability is ensured.

Result 3: Awareness of the public and self-image are enhanced.

4.4 Important Indicators

The most important indicators were identified and agreed, which permits to the executing institutions having a tool to control the achievement of the project objective and the different results.

Indicators for Project Objective:

Project Objective:
1. The effluent quality meets the 20/30 regulation by the end of the 2nd year of operation of the WWTP.
2. 80% of connectees are billed by MAB within the 1st year.

Indicators for Results:

Result 1:
- Response time for repair of sewerage system is less than 12 hours.
- 40% of licensed trucks use septic facilities in WWTP for a fee within 1st year of operation of WWTP.
- Number of over-flowing manholes is reduced by 20% at the end of 2nd phase.

Result 2:
- Full operation and 50% of depreciation cost are recovered at the end of 2nd phase.

Result 3:
- No. of forced connections is reduced by 50%.
- Reducing of connection of roof draining to sewerage network by 30% of current cases by end of 2nd phase.
- 70% of bills are paid on time.
- JWU fee collection ratio is not negatively effected.

4.3 Recommendations regarding the Contribution of GTZ

With the purpose to achieve the results in the within the agreed timetable of 2 years, the mission recommends the following assignments of experts, which still have to be planned in detail and quantified:

Long term assignment:	Technical Advisor / Expert in operation of wastewater and sludge treatment plants as well as sewer networks.
Short term assignments:	External and local advisory services for support of commercial department and public awareness campaigns.

The outcome of the ZOPP 5-Workshop as well as the recommendations made by the PPR-Team are subject to an official approval by the German Ministry for Economical Cooperation and Development (BMZ).

The PPR-Team likes to express its profound gratitude to the Mayor of Al Bireh, Eng. Walid M. Hamad, and the Executives of the Municipality, as well as to the representatives of all contacted institutions, for their valuable help and permanent support to the mission during its stay in Palestine.

Al Bireh, February 15, 2000

Eng. Walid M. Hamad
Mayor of Al Bireh

Dr. Reinhard Schrage
Regional Project Officer GTZ

Eng. Munif R. Treish
City Engineer
Municipality of Al Bireh

Eng. Erwin Schmechel
Technical Advisor
Treatment of Wastewater Project Al Bireh

Eng. Uwe Putzar
Project Progress Review Team

Annex: Structure of the PPR Report

The following structural breakdown must be used for every PPR report:

Summary

Table of Contents

Abbreviations

1. **PROCEDURE**
   - Commission and schedule
   - Methodological approach
2. **PLANNING**
   - Quality of plan and planning process (account taken of TC principles and partner-country objectives)
   - Present status of planning
3. **IMPLEMENTATION STATUS**
   - Present status of contributions
   - Organization and steering of project implementation
   - Project integration into partner-country structures
   - Cooperation with other GTZ-assisted projects and projects of other development organizations
   - Changes to framework conditions/assumptions
4. **CONTRIBUTIONS AND IMPACTS**[5]
   - Use made of project contributions and direct benefits
   - Unintentional positive and negative impacts
   - Highly aggregated development impacts (with respect to poverty reduction, gender, conservation of natural resources, education)
   - Contribution to the development objectives of the partner country
5. **RECOMMENDATIONS** regarding...
   - implementation of the ongoing phase
   - design and updating of project plans
   - project organization
   - inputs
   - impact
6. **LESSONS LEARNED**

[5] You will find some general information and assistance on impact monitoring in the GTZ's INTRANET under the "Internal Evaluation Team" Unit 04. If you have any specific queries, please contact the departmental advisors of the quality advisory team, if necessary via Michael Göbel (Country Department 3), e-mail: michael.goebel@gtz.de

3.4.2 Services

Within the scope of the PPR the appraiser shall render the following services:

- participate in preparatory talks;
- study and examine the documentation provided;
- hold talks in the partner country with the GTZ office, the German embassy; the principal advisor, project executing agency and implementing organizations, target-group representatives and relevant organizations in the project environment;
- ensure ongoing coordination of activities with the officer responsible for the commission/principal advisor, with co-appraisers and the implementing organizations;
- implement the PPR in accordance with GTZ's operational rules for a PPR;
- discuss the results of the PPR mission with the political executing agency and the implementing institutions; sign a joint protocol;
- produce the PPR report by including the contributions of other involved appraisers and in accordance with the prescribed structure of the report (see annex);
- undertake final editing of overall PPR report;
- fill in the project impact assessment form (GTZ form 23-19-e) and forward it to section 0420 in GTZ head office;
- take part in evaluation talks.

3.4 Sample of TOR for Contracts for Appraisers/Consultants

The appraiser shall support the officer responsible for the commission in conducting a project progress review (PPR) for the project "*{_____project name_____}*".

The PPR shall be conducted in line with the GTZ Guide for Project Progress Reviews (Eschborn, January 1999). The appraiser's work encompasses the areas and services indicated below:

3.4.1 Areas

Within the scope of the PPR, the appraiser shall focus on the areas of evaluation as marked below:

- ☐ quality of plans and planning process, especially with respect to the question whether the principles of TC and development objectives of the partner-country have been adequately considered
- ☐ present status of planning
- ☐ present status of contributions
- ☐ organization and steering of project implementation
- ☐ project integration into partner-country structures
- ☐ cooperation with other GTZ-assisted projects and projects of other development organizations
- ☐ changes to framework conditions/assumptions
- ☐ use made of project contributions and their direct benefits
- ☐ unintentional positive and negative impacts
- ☐ highly aggregated development impacts (poverty reduction, gender, conservation of natural resources, education)
- ☐ possible effects of AIDS on project execution and project goal attainment[4]
- ☐ contribution to partner's development-policy objectives
- ☐ recommendations, in particular on
  - ☐ - implementation of the ongoing phase
  - ☐ - design and updating of project plans
  - ☐ - project organization
  - ☐ - inputs
  - ☐ - impact
- ☐ lessons learned
- ☐ *{state other areas}*_____

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[4] More and more projects are affected by AIDS. Directly through illness or death of staff and counterparts, but even more so indirectly because the far reaching social and economic consequences of AIDS threaten the project's goal. AIDS has developed from a mere health issue into a global development problem; see BMZ-aktuell, No. 094, September 1998

- The appraiser responsible for the overall report has no influence on the timely submission of individual contributions and may not be sufficiently supported by GTZ personnel in demanding submission of overdue contributions.

- The principal advisor and/or those responsible for the project on the partner side usually have no opportunity to take part in the evaluation talks at GTZ head office which generates ill feelings and may lead to conflicting statements from the project after submission of the final version of the PPR report.

- Without explanation the term "project progress review" may be associated with a top-down inspection process and put people on their guard.

3.3 Frequently observed weak points in PPR implementation

- Prior to implementation of the PPR the partner organizations are not adequately informed on the objectives and purpose of the PPR, nor on the manner in which the PPR is to be conducted and the services the partner side is expected to render.

- The project team has not made adequate preparations for the provision of written documents; as a result, considerable efforts have to be made during the mission to collect the information from project files.

- The appraisers work more like inspectors, rather than specialists offering in-process consultancy, with the result that their work inputs fail to promote the mutual learning process.

- The appraisers are not sufficiently prepared for their assignment and thus lack acquaintance with the project under review.

- The project-planning matrix and the plan of operations have not been updated; when the PPR mission starts they are still in the same preliminary form as drafted during the planning workshop for the present project phase, with an incomplete and not quantified list of indicators.

- Contracts fail to (adequately) define the inputs by local experts, particularly in respect of written submissions to the PPR report; as a result, their function is reduced to that of an escort on official visits.

- In cases where the PPR is linked to planning the next project phase, the project team and/or the partner side have not been given sufficient time to develop concrete ideas for its concept and contents.

- The planning workshop for a follow-on phase is ineffective for the following reasons:
  - too many participants;
  - heterogeneous group of participants;
  - the presence of higher-level officials prevents lower-ranking counterparts from voicing their opinion;
  - participants from institutions related with the project are often inadequately informed about the workshop and what is expected of them as participants;
  - a rigid application of the objectives-oriented project planning method (ZOPP) limits active participation;
  - too much time and effort is invested in formulating difficulties and establishing a hierarchy of problems, often resulting in a complicated and confusing structure rather than leading to new insights;
  - the partner side often takes offence when weak points in their own organizations are pointed out;
  - objectives, results and indicators are often worded in a too abstract manner and thus become incomprehensible – especially when translated into local language.

3.2 PPR Time Frame

The following empirically-based overview is designed to give you an idea of the time frame required for each stage of the PPR work process if conducted professionally. The times given are meant as a rough guide only; actual time requirements will vary depending on circumstances.

Stage of Work	Days
Study and evaluation of project documents	3
Assignment briefing	1
Introductory talks with: project manager/principal advisor GTZ office partner organization German embassy	 1 0.5 0.5 0.5
Hand-over/elucidation of project documentation	1
Presentation/discussion of implementation status (comparison of actual situation with targets)	2 - 3
Talks with relevant organizations in the partner country	2 - 3
Trips to project area and neighboring countries; talks with target groups	3 - 7
Environmental impact assessment	1
Internal review of project documents	2 - 3
Individual talks with project management and the GTZ team	1 - 3
Presentation and discussion of PPR results	1-2
Discussion of PPR results in project team	1-2
Documentation of results, duplication and distribution	1-3
Final talks with the project manager, the principal advisor and, if necessary, the director of the GTZ office and signing of a joint record	1
Final visit to the German embassy	0.5
Writing of various sections of PPR report (preliminary version)	5 (highly variable!)
Integration of the individual sections and overall editing of the PPR report	3 - 5
Evaluation talk	1
Completion of project impact assessment form (GTZ form 23-19-e)	0,5

- ❑ Internal discussions within the appraisal team during the execution of above steps in order to evaluate and coordinate them.

- ❑ Steps after completion of the PPR mission:
  - ☐ final editing, duplication and distribution of PPR report
  - ☐ debriefing at GTZ head office

3.1.2.1 Checklist for Internal Briefing/Coordination Talks with Appraisers

- ☐ Various parties have introduced themselves to each other
- ☐ PPR objectives and focus
- ☐ Team formation and team cooperation
- ☐ TOR discussed and assigned to the individual appraisers along with the structure of the PPR report
- ☐ Procurement of required information organized
- ☐ Contributions to documentation and reporting specified
- ☐ Ongoing internal discussions and coordination

3.1.2.2 Checklist for Initial Talks with the Project Manager and the Principal Advisor and/or with the Project Team

- ☐ Objectives and focus of the PPR, and TOR
- ☐ Agreement on PPR implementation schedule
- ☐ Office space for appraisers
- ☐ Use of project's EDP facilities by appraisers
- ☐ Communications (telephone, fax, e-mail)
- ☐ Photocopying facilities
- ☐ Translations/guides/interpreters
- ☐ Transport - official and private
- ☐ Currency exchange
- ☐ Safety/freedom of movement in the project area
- ☐ Emergency rescue data on appraisers (air-borne rescue services)
- ☐ Addresses/telephone numbers of local doctors and hospitals

- ☐ present cost-unit accounts
- ☐ partner's project budget
- ☐ organization charts of the implementing organizations and political executing agency
- ☐ list of counterparts involved in project
- ☐ list of GTZ staff
- ☐ list/short description of relevant institutions
- ☐ short description of other relevant projects, if necessary
- ☐ relevant parts of the minutes taken at the governmental negotiations
- ☐ where relevant, partner's application for implementation of a follow-on phase

❑ GTZ office/the German embassy/the political executing agency/the implementing organizations notified of the PPR team's arrival.

❑ Invitations sent to persons who are to take part in the workshop(s) planned for the PPR; details of the workshop agenda are provided and relevant documents distributed.

❑ If workshops are to be moderated externally, *moderator/s are being selected and* contracts concluded.

3.1.2 Checklist for the implementation of a PPR in the partner country

❑ Stages of PPR implementation on site

- ☐ internal briefing talks with appraisers (cf. checklist 3.1.2.1)
- ☐ preliminary talks with project management, the principal advisor and the project team (cf. checklist 3.1.2.2)
- ☐ visit to GTZ office
- ☐ introduction at German embassy
- ☐ introduction at political executing agency/implementing organizations
- ☐ hand-over and elucidation of project documents
- ☐ if necessary, a start-up workshop with project team and representatives of the implementing organizations to clarify implementation status (comparison of actual situation with set targets)
- ☐ talks with relevant organizations
- ☐ visit to project area
- ☐ talks with target groups
- ☐ trips to project locations in other countries (in case of a supra-regional project)
- ☐ internal review/interim appraisal within appraisal team following return from official journeys and after surveys
- ☐ requests for and provision of supplementary documents
- ☐ presentation and discussion of the appraisal team's findings/recommendations; where applicable in the form of a workshop
- ☐ compilation of documents needed for the environmental impact assessment (EIA) together with the principal advisor and the project manager
- ☐ documentation of key results
- ☐ signing of minutes drawn up in joint discussions between project manager, officer responsible for the commission, the head of the PPR mission, and, where applicable, the office director
- ☐ discussion with principal advisor and project manager of the project impact assessment form (GTZ form 23-19-e)
- ☐ wrap-up visits to the GTZ office and German embassy, if required

3. Best Practices

This chapter contains a series of checklists and overviews deriving from the experience gained with hundreds of PPRs in past years.

3.1 Checklists

The following checklists are not to be understood as a set of rules to be worked through item-by-item. Realizing that PPRs will be carried out under very different circumstances, they are meant to help both the officer responsible for the commission and the PPR team observe the standards expected of the PPR.

3.1.1 Checklist for the preparation of a PPR

- ❑ Implementing organizations, the political executing agency and the respective superior(s) agree on the objectives, focuses and time frame of the PPR, including deadlines.
- ❑ TOR drafted for the PPR in cooperation with project management and the GTZ office; if necessary also with the regional manager and the responsible P+D section.
- ❑ Identification of suitable German, international and local appraisers and elaboration of the respective TORs.
- ❑ PPR briefing session with appraisers; points to be discussed include:
  - ☐ objectives and main focus of activities
  - ☐ program and approach
  - ☐ briefing of appraisers at GTZ head office and, if necessary, at other organizations in Germany
  - ☐ visits to organizations in partner country
  - ☐ journeys to neighboring countries (in the case of regional projects)
  - ☐ provision of documents
  - ☐ planning of any workshops that might be required in the course of PPR (if necessary, including secretariat to document results)
  - ☐ documentation and reporting
  - ☐ deadlines
  - ☐ contractual issues, flight bookings, visa procurement, hotel reservations
- ❑ Contracts concluded with the appraisers (GTZ office is responsible for contracting appraisers from the partner country).
- ❑ Project team and GTZ head office compile relevant project documents and forward them to the appraisers in good time, including:
  - ☐ expert reports on project preparation/feasibility study
  - ☐ present commission and/or implementation offer and previous BMZ commissions
  - ☐ project data sheet
  - ☐ last project report
  - ☐ last PPR report
  - ☐ evaluation report (BMZ)
  - ☐ project planning matrix
  - ☐ present plan of operations
  - ☐ project arrangement (exchange of notes)

The technical requirements to be satisfied by external experts are stipulated in TORs by the officer responsible for the commission in cooperation with the partners. It is up to the officer to decide whether or not to involve P+D in PPR design or whether to assign P+D specialists together with staff from other projects as external appraisers.

The officer responsible for the commission gives the PPR team members all the logistical support they need and ensures that they can meet with the people they wish to consult. It is the officer's job to provide the team with all the requisite documents, in particular the results of project monitoring, internal control and auditing. The officer makes sure that relevant decision-makers in the partner country and involved organizations are informed of the impending PPR in good time.

A PPR does not have to be over and done with in a single mission. In fact, multi-stage implementation, each with its own focus, has proven to be a valuable and useful option.

2.6 Documentation and Utilization

Each and every PPR is being documented. The requirements for documentation are laid down in GTZ's operational rules.

The results of a PPR would be poorly used if they were only formulated verbally and thus available only on site for a short period of time. To preserve them and enable people to learn from them, both on site and throughout the entire company, every PPR has to be documented in an appropriate manner. This is the prime objective of the PPR report whose set structure is to be adhered to in all cases (see the Annex).

The PPR results are discussed both with the project partner and between the officer responsible for the commission and his or her superior. When updating project planning, the officer responsible for the commission takes account of the results and recommendations emerging from the PPR. The officer's superior is responsible to review how PPR recommendations have been considered and acted upon in the further course of activities.

Combined and screened, the evaluation results of hundreds of individual projects constitute one of the most important sources for institutional learning throughout the entire company. Therefore, GTZ's operational rules include the obligation by the officer responsible for the commission to ensure that the PPR report is forwarded to the following addresses within the company (preferably using e-mail):

- to the GTZ office in the partner country,
- to the regional division (or, in the case of sector operations, to the respective technical division),[3] and
- in the event of particularly interesting lessons learned, to the organizational unit Information and Documentation, 0230.

Also, the officer responsible for the commission will ensure that the PPR questionnaire is filled in and returned to GTZ's Internal Evaluation (0420). This questionnaire serves as the basis of the annual cross-section analyses of the GTZ portfolio.

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[3] On request, the Regional Manager makes the PPR report available to the BMZ Division responsible for the project, stating that it is an internal GTZ document

2.3 Occasion

A PPR is conducted whenever the officer responsible for the commission considers it expedient to do so.

Until now, the PPR has taken place at the end of the ongoing project phase, always leading to a planning workshop that results in a modification offer for the given project. From now on, the PPR instrument can be used whenever the officer responsible for the commission wishes to clarify the project's status and benefits. If, for example, doubts are raised as to the relevance, effectiveness or sustainability of a project, or whenever altered framework conditions call the project's purpose into question, project management can use a PPR to look into these issues and, if necessary, work out new objectives and targets. The new PPR need not necessarily happen at the end of a project phase.

In exceptional cases and with a good reason, the superior of the officer responsible for the commission may arrange for a PPR, perhaps at the advice of the partner, BMZ or P+D. In such cases, the PPR is a managerial steering instrument whose predominant feature is that of external control.

2.4 Responsibility

As a rule, the officer responsible for the commission is responsible for planning and conducting the PPR.

The officer responsible for the commission is responsible for defining the contents and technical focus of the PPR; he or she also decides when and how the PPR will be carried out. In keeping with the professional standards called for, the officer selects the external experts to take part in the PPR and formulates the special requirements they must fulfill. Acceptance of the PPR report is part of these responsibilities. In consultancy projects, responsibility for the PPR also rests with the officer.

Support from the officer's superior in the fulfillment of these various responsibilities takes the form of advisory inputs and is a matter of standard managerial dialogue.

In the case of an externally initiated PPR, the officer's superior is responsible for planning and steering. Execution of the PPR is preceded by intensive managerial dialogue, identifying those steps that can be conducted by the officer responsible for the commission (or by the project).

2.5 Planning and Implementation

The officer responsible for the commission steers the PPR in terms of its sector-specific, technical contents and administrative aspects, in close cooperation with the project partners.

To enhance the learning effect amongst all those concerned, PPRs are conducted with the support of external experts. This will make it easier to question any established routines and certitudes and thus introduce new perspectives. Independent third parties are intended to enhance the project's process of reflection, often they will also find it easier to deal with possible conflicts.

ity criterion is no longer absolute, but relative, no longer prescribed by us, but requested by our clients. Naturally, we influence our clients' wishes through an intensive advisory process, and we can always refuse to accommodate a request, if it is incompatible with the professional ethics of our development mandate. Ultimately, however, the quality and sustainability of our work depends on the degree of client satisfaction.

This is why impact evaluation is so important. Client satisfaction is not simply a matter of good intentions and impressive plans, but is determined, first and foremost, by the usefulness of the project results and the development impact they have. Quality assurance thus means ensuring that the results and effects of our work are able to generate the benefits that our clients expect. This is what the new PPR is here to do.

2.2 Function

A PPR reviews and assesses project status from the point of view of its impacts; it makes recommendations and documents important lessons learned.

The PPR is a critical appraisal of a project's status and its impact, conducted with external support. It is primarily learning oriented and designed to initiate change amongst all those involved in the project.

The PPR not only takes a close look at the German contribution, but also at the changes occurring in partner organizations and target groups. Since the entire project and its impacts have to be examined, PPR planning, implementation and evaluation must be closely coordinated with our partners and adequate participation by project management must be ensured.

PPRs provide an insight into the planning process, they evaluate actual achievements against and planned targets and comment on the verifiable development impact of the project. Furthermore, a PPR usually culminates in a list of recommendations for the areas investigated. A PPR is not designed to substitute for technical studies required by the project.

Box 2: Evaluation Areas of a PPR

PLANNING
- Quality of planning and the planning process
- Current planning status

IMPLEMENTATION STATUS
- Status of contributions
- Organization and steering of project implementation
- Project integration into partner-country structures
- Cooperation with other GTZ-assisted projects and projects of other organizations
- Changes to framework conditions and assumptions

CONTRIBUTIONS AND IMPACTS
- Use made of project contributions and direct benefits
- Unintentional positive and negative impacts
- Highly aggregated development impacts

RECOMMENDATIONS

LESSONS LEARNED

1. Purpose and Contents of this Guide

This guide is intended to facilitate the application of GTZ's operational rule regarding PPR.

In future, project progress will mainly be reviewed by the projects themselves and in response to specific events. Although no longer a regulatory instrument, PPR nevertheless retains certain standards and a few rules that must be adhered to.

This guide summarizes those points that ought to be taken into account, together with those that must be observed when preparing and implementing a PPR. PPRs implemented in the manner described in this guide comply with the professional standards GTZ demands and expects of this instrument.

Chapter 2 defines the PPR instrument and its place in GTZ's quality management. Chapter 3 contains tried-and-tested aids from hands-on implementation: checklists for the preparation and implementation of a PPR, an estimation of the time requirements, a list of frequently observed weak points and a sample of terms of reference for a contract for appraisers/consultants. The structure of the PPR report, which constitutes one of the set rules for GTZ operations, is given in the Annex.

2. The definition of a PPR and its place in quality management

2.1 Purpose

The main focus of a PPR will be on identifying a project's contributions and its development impact; a comparison of the actual situation with the targets is of secondary importance.

Within our overall corporate concept on quality management, PPR is a key element of quality assurance during project implementation. On the surface, this is no different to former times when head office and the commissioning party were mainly interested in finding out whether a project had done what it was commissioned to do during planning.

However, development cooperation takes place under conditions in which the meticulous observance of a plan is no guarantee for success. Today, the willingness to learn and a flexible response to changing circumstances are absolutely indispensable. Quality assurance can no longer rely solely on a comparison of the present situation with planned targets. Even though it is still important to compare a project's current status with planning, the focus needs to shift to project results and impact.

Greater emphasis on evaluating project impact derives from a change in our understanding of quality. In the past, when asked to define quality, our company came up with a whole range of different answers, most of which had an absolute, normative character: quality should be measured against the extent to which poverty has been reduced, the environment has been protected, women have been promoted etc.

In the meantime, such normative-type thinking has given way to the realization that, in the context of development cooperation, we can only achieve what our "clients" consider important themselves. Therefore, by quality we now mean the compliance of our services with what our clients (commissioning parties, partners and target groups) want. Our qual-

Summary

Until now, PPR has been a routine, managerial-level instrument used for planning and control, with the prime aim of reviewing project status and clarifying further assistance requirements.

In future, however, this kind of PPR will be the exception. In keeping with the spirit and needs of a decentralized GTZ, it will mainly help support the process of self-evaluation of projects and programs, in response to a specific event and under the responsibility of the officer responsible for the commission. Although the actual situation will still be compared with targets", the focus of a PPR shifts to the contributions of the project and to its development impact.

The new PPR will no longer be applied as a "regulatory instrument", although it will still have to adhere to a few rules. Anyone conducting a PPR will have to observe a number of formal specifications which are there to ensure that a uniform, high standard of quality is achieved in the self-evaluation process of our company. In short: if we call it a PPR, we should make sure that it actually is a PPR.

This guide outlines the purpose and contents of the new PPR and contains a series of tried-and-tested aids to facilitate PPR planning and design. The structural breakdown for the PPR report, which is part of GTZ's operational rules, is given in the Annex.

Box 1: Differences Between Old and New PPR

Feature	Old PPR	New PPR
Character	Regulatory instrument	In response to a specific event
Responsibility	Officer responsible for commission at GTZ head office	Usually: officer responsible for commission on site In justified cases: instigated by person with management responsibility, also on advice of P+D, BMZ etc.
Orientation	Comparison of actual situation with targets in line with PPM	Contributions and impacts
Function	To review project status and clarify further assistance requirements	Self-evaluation, reflection, learning (in justified cases, also external control)
Occasion	On completion of project phase	No fixed point in time, as required
Implementation	By independent third parties (P+D, external experts)	Officer responsible for commission with the help of independent third parties (P+D, external experts)
Documentation	PPR report	Form of report and mode of distribution stipulated in GTZ's operational rules

Preface

To keep pace with new conditions and tasks in development cooperation, GTZ has repeatedly had to align its organizational structures and procedures with new developments and circumstances. Such is the case again. Today GTZ is shedding its rather bureaucratic way of working and is starting to operate more like a modern-day service company. This change affects virtually all areas of activity, especially the way our company promotes and ensures the quality of its work.

It makes a big difference whether quality assurance relies on control or brings self-responsibility into play. Experience has taught us that, as a rule, self-evaluation is more critical and less expensive than external control – and that it makes a far greater contribution to internal learning, both in the projects and in the organization as a whole.

The key concepts of our new quality management were agreed on at the end of 1997[1] and have since become firmly established in our corporate principles[2]. Now is the time to go a step further and actually implement them. Although it has been widely known for quite some time that the PPR instrument needed overhauling, the process of finding a new, confidence-inspiring approach still proved to be a challenging one, characterized by very intensive talks and consultations, particularly with our main commissioning body, the German Federal Ministry for Economic Cooperation and Development (BMZ). However, we ultimately succeeded in finding a solution and are now able to present the new approach in this guide.

PPR will remain a key instrument of quality assurance in our company. Professional standards and sound experience gained in the past ("best practices") will not be forgotten. At the same time, however, PPR will take on an essentially different character, becoming primarily an instrument of self-evaluation and impact monitoring.

Internal Evaluation Team

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1 Cf. Decision by Committee of Executives, November 19, 1997

2 Cf. "We are the GTZ", "The core process of the GTZ", July 1998

Contents

Deutsche Gesellschaft für Technische Zusammenarbeit

GTZ
Strategic Corporate Development (Unit 04)
Internal Evaluation Team

Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

A Guide to Project Progress Reviews (PPR)

Eschborn, January 1999

AIDE-MEMOIRE

Mission of Project Progress Review

TREATMENT OF WASTEWATER AL BIREH

1. PREFACE

The purpose of the Project Progress Review (PPR) was to analyse the actual progress of the project on the basis of the original planning and to determine the contributions achieved and the development impacts, originated by the project and other factors. The mission took place at Al Bireh, Palestine, from February 2 to February 16, 2000. During the days February 12 to 14 a planning workshop, ZOPP 5, was conducted with all involved actors, defining the contents of a 6 months prolongation of the actual phase till December 31, 2000. Planning for a complementary phase 2 of Technical Cooperation for a duration of 1,5 years (01.01.01 to 30.06.02) was also described. The objective was to conclude the Technical Cooperation component of the project in the utmost successfull way.

The participants of the PPR were the following professionals:

Uwe Putzar	Technical evaluator and Team Leader
Andreas Kanzler	Technical Department GTZ HQ (as from 09.02. to 16.02.00)

Mr. Adnan Ghosheh, GTZ-Advisor for the Projects of Al Bireh and Salfeet, acted as resource person and mission assistant. The ZOPP 5-Workshop was moderated by Mr. Nadim Mulhem.

2. PROJECT HISTORY AND CONCEPT

The Technical Cooperation between the Municipality of Al Bireh and GTZ was initiated in 1992. The implementation agreement was signed in June 1993. The purpose of this project is to enable the Municipality of Al Bireh to operate the sewerage system including the wastewater treatment plant according to the technical and economical requirements, and to elaborate and indroduce an agreed concept for the reuse of the treated wastewater and sludge in the agriculture. Due to the condition to avoid any contamination to the natural recipient Wadi Qilt, of which the catchment area is intensively used for drinking water purposes, it had to be planned to transfer the effluents of the wastewater treatment plant to the adjacent Dier Dibwan area, where it could be used for irrigation and fertilizing purposes in the agricultural activities of Palestinian landowners and farmers.

The concept of the project included the extension and completion of the sewerage system of Al Bireh and the construction of a modern biological wastewater treatment plant including effluent pipes and storage tank for the reuse of the treated wastewater. As a main target of the Technical Cooperation it included also to build up a qualified institutional structure within the Municipality of Al Bireh for an adequate operation and maintenance of the sewer network and wastewater treatment plant through training of the required operational personnel.

The period of the project, from 12/1992 as well as the following period from 07/1993 to 06/1996 included a series of activities which can be summerized as follows:

1. Erection and operation of a pilot treatment plant in 1992;
2. Preliminary final design of the activated sludge treatment plant till 12/1994;
3. Contracting of a Joint Venture German/local consultant in 06/1995 for final design and supervision;
4. Final design for the treatment plant in 11/1995;
5. Completion of the international tender documents till 11/1995;
6. Prequalification for contractors till 10/1995;
7. Long term advisory services by a German sewage expert (Technical Advisor) as from 12/1993 to the Municipality including selection and training of future operation personnel.

With the establishment of the Palestinian National Authority, and within the scope of the bi-lateral (Palestinian/German) negotiations, it was decided in 1996 to finance the investment costs for the extension of the sewer network and the wastewater treatment plant in Al Bireh in the framework of the Financial Cooperation through KfW, the German Bank for Reconstruction and Development. The corresponding agreements were signed in 12/1996 and 08/1997 and included the construction and connection of a sewer network with pumping station in the Lower South suburb of Al Bireh. The two German institutions (GTZ and KfW) concluded a cooperation agreement in view of concentrating their efforts to achieve the project purpose within the accorded time schedule.

The on-going second period of the project, from 07/1996 to 06/2000 includes within the framework of the Technical Cooperation the major part of the training activities in 3 blocks according to an agreed training programme for the designated personnel of the Sewage Section and for the operation of the sewerage system. Furthermore, it contains the elaboration and – partially – implementation of special studies such as the organizational and manpower study, tariff study and preparation of a by-law, wastewater and sludge reuse study and the preparation of an industrial wastewater cadastra. These activities are coordinated and accompanied by the Technical Advisor who simultaneously is in charge of three other technical cooperation projects in the area.

The Financail Cooperation component of the project included the construction of the sewer network and pumping station at Lower South catchment area which was concluded in 1999, and the wastewater treatment plant that is still under construction. Furthermore it is planned to extend the sewer network to Upper North, which will be implemented shortly.

It should be mentioned that due to various reasons the finalization of construction of the wastewater treatment plant was in delay for 18 to 21 months. The main reasons were identified as follows:

- External influences due to the political situation;
- Tendering procedure included invitation to offer alternative treatment processes, requiring a longer submission period;
- Evaluation of offers took more time because of the presentation of alternative treatment processes;
- Managerial problems of the leading contractor and coordination problems with the subcontractor lead to delays;

- Lack of experience by leading constructor in executing projects of this magnitude;
- The contract period of 18 months for the construction of the treatment plant was unrealistically short and should have been of 24 months.

It is intended that the wastewater treatment plant will go into operation in the second quarter of 2000, just before the conclusion of the actual phase of Technical Cooperation. That means that the programmed assistance during two years of operation of the plant through the Technical Advisor could not take place within the actual phase.

3. RESULTS OF THE PPR

The planning of the Technical Cooperation component had been established in accordance with the Project Planning Matrix of 1993 and 1996. The Operation Plan for the execution of the different activities was lastly actualized in 01/1999 and covered the period till 12/1999. These documents have served during the PPR-mission as reference for the evaluation, taking well into account the accumulated delay of the overall project of 18 to 21 months.

Project Purpose:	The City of Al Bireh is enabled to operate its sewerage system properly and cost effectively; a tuned concept for controlled agricultural utilization of wastewater and sewage sludge has been developed and introduced.

The project purpose has only been achieved partially, mainly due to the delayed finalization of construction of the wastewater treatment plant and the non-implementation of the reuse concept as proposed in the corresponding concept study of 1998. Nevertheless it can be confirmed that important preconditions within the Municipality, especially regarding the technical operation of the already used sewer network and pumping stations, have been fulfilled. Additionally it should be highly recognized that, regardless of the delay of nearly 2 years, the Municipality of Al Bireh is continuing to contribute to the success of the project maintaining available the complete personnel for the operation of the treatment plant.

Therefore it can be stated that the project purpose will, probably, be achieved once construction activities are finalized, the entire sewerage system is operated and the concept for the reuse of the treated wastewater and sludge is introduced.

Result 1:	The sewerage system including the wastewater treatment plant of Al Bireh City is operated properly.

To achieve this result, it was planned to prepare the corresponding technical standards and guidelines, identify and compile the industrial and commercial polluters including the establishment of a wastewater cadastra, introduce an effective operation and control system and improve the working and administrative routine within the Sewage Section of the Municipality. Furthermore it was agreed to qualify the technical operation personnel through theoretical and practical training, to contract additional personnel according to the requirements for an adequate operation, to train future operational and administrative personnel, and to accompany the operation of the treatment plant during an initial period of two years.

This result, regarding the part of the sewerage system already in operation, has been achieved. All preconditions for a successful operation through the Sewage Section have been fulfilled, waiting at the moment for the completion of construction of the treatment plant. An important positive aspect is furthermore, that the key operational staff has been involved in design and construction matters of the complete sewerage scheme, having obtained extended knowledge about constructional particularities of the different installations.

Result 2:	Tariff and fee collection system have been introduced to cover operation and depreciation costs.

It was planned to adjust and introduce the wastewater fee ordinance, to improve the accounting and auditing system within the Municipality, elaborate on proposals for industrial discharge fees, identify further training needs of municipal accounting staff, launch adequate awareness campaigns for the population and prepare the taking over of collection of the sewage fees by JWU.

The result has been achieved partially, since important steps have been fulfilled. In this context, the project has elaborated the tariff study and a tariff by-law, currently awaiting approval by concerned Ministry. The industrial wastewater cadastra has been completed. The Municipality is furthermore ready to introduce the new wastewater tariff scheme at the moment of putting into operation the new treatment plant and transfer the collection of fees to JWU. Moreover, the Municipality is currently active in the Transition Team, which is preparing the ground for full integration of water and wastewater services under one umbrella organization.

Nevertheless, we have to state that other important activities have been postponed, like the introduction of a cost centre related accounting system (Commercial Oriented Accounting System) and awareness campaigns within the population. The new accounting system, which will be financed by the World Bank in the framework of a municipal improvement project with the Ministry of Local Government, will be introduced in the course of this year, and awareness campaigns will only be launched after starting with the operation of the treatment plant.

The current existing accounting system does not provide enough reporting tools to establish the break-even between expenditures and revenues, nor does it report exact collection ratios. Nevertheless we have to recognize, that the Municipality has increased within the project period the sewerage maintenance fee by 200% in order to optimize the increasing operation costs and to prepare the customers gradually for the introduction of a consumption related tariff as it is proposed in the new by-law, which is in approval procedure by the Ministry of Local Government.

Result 3:	Treated effluent and sludge are used by Palestinian farmers against payment.

The activities planned to achieve this result included the elaboration and approval of a conceptual study for the reuse of treated wastewater and sludge in the Deir Debwan area, the execution of information campaigns for Palestinian land-users and the implementation of the concept for the use of the treated wastewater and sludge.

In the initial phase of the project during 1992/93, an experimental treatment plant was erected and operated by the project. Together with that an experimental agricultural farm was prepared and cultivated with different crops, irrigated by the effluent from

the pilot treatment plant, in order to increase the awareness of the Palestinian farmers on the concept of reuse of treated sewage. This experimental farm was financed by ANERA and MAB and was operated by the extension service from the Agricultural Department of the West Bank.

It has to be stated, that, except for the concept study conducted in 02/1998, no further activities have so far been initiated. Complementary investigations commissioned by KfW showed "high risk" results, so that the decision to finance the necessary infrastructure has been postponed. In the meeting of May 12, 1999 in Germany it was decided that the responsible executing agency for the financing of all activities on behalf of a future reuse of the treated wastewater will be KfW. KfW has just decided to send two experts during the month of March 2000 to Palestine to prepare a project concept for the agricultural reuse of the treated wastewater in the Deir Debwan area and to identify an appropiate project-executing agency for this agricultural pilot scheme.

The Technical Cooperation project is in the position to support any further activity through its acquired knowledge during the past project phase.

Result 4:	Quality of wastewater and soil is continuously supervised.

This results include activities which are oriented towards a permanent control of the characteristics of the treated wastewater and sludge with regard to their reuse for agricultural purpose. The analyses have to be made in the laboratory of the treatment plant, permitting the operational personnel to adjust the treatment process to the established requirements.

To achieve this result it had been planned to elaborate a control ordinance, to maintain permanently an operational logbook with all related data, to elaborate a cadastra for the use of sludge and actualize it permanently, and to train complementary personnel of the laboratory.

Except for a translation of a correspondent ordinance for the use of sludge, no activities have been done so far due to the delay mentioned above.

This result can only been achieved in the context of the implementation of the wastewater and sludge reuse concept.

Contributions and Impacts:

The sewerage project of the Municipality of Al Bireh has already had an impact on the development of the city and even beyond its boundaries. Summarizing the contributions and impacts due to the development of the different activities during the past eight years it can be confirmed the following:

1. The Municipality has established an independent Sewage Section and created satisfaction among the concerned personnel.
2. The professional and operational personnel of the Sewage Section has been trained and has achieved a much higher professional capability.
3. The illegal discharge of sludge and wastewater from individual cesspools by private entrepreneurs to public sewers has been stopped, creating therefore better environmental conditions.

4. The industrial polluters are aware of their responsibility and willing to cooperate with the Municipality in respect of finding solutions to reduce the pollution of their wastewater discharges.
5. The Municipality has achieved a broad experience in dealing with international donors being now capable to apply for further projects with international funding.
6. The project has created an awareness at other institutions towards application and implementation of similar projects.
7. The execution of the project has created new economical activities in the city due to the condition to employ local manpower.
8. The improved sanitary infrastructure has contributed to the attraction of more active development and investment in the city (by the private sector) and will attract more entrepreneurial activities in the near future.

As negative impacts it might be stated, that for the time being the Municipality continus depending on the external contribution to the project and has not yet achieved a full cost recovery for the operational and depreciation costs for the actual sewerage system in operation.

4. RECOMMENDATIONS

4.1 Summary

On the basis of the results of the Project Progress Review, the mission recommends to continue with the Technical Cooperation project for a period of two years, considering a 6 months-prolongation of the actual phase till December 31, 2000 followed by a complementary phase 2 of 1,5 years from January 1st, 2001 to June 30th, 2002. This period of 2 years shall serve mainly to assist the Sewage Section in all operation matters of the wastewater treatment plant with the objective to train the operational staff permanently on the job to ensure a constant quality of the effluents and sludge characteristics, and to assist the Municipality in economical matters and public awareness campaigns.

4.2 Planning Workshop

From this point of view it was organized from February 12 to 14 a ZOPP 5-Workshop at the Municipality of Al Bireh for the planning of an additional project period, during which the project objective as well as the results to be achieved, the indicators, the assumptions and the corresponding activities were redefined. It was decided to maintain the overall goal without any modification as follows:

Overall Goal: **Securing an environmentally sound sanitation**

4.3 Project Objective and Results

Project Objective: **The sewerage system of Al Bireh is operated effectively according to the established standards and regulations**

Result 1: The technical and administrative staff are operating and maintaining the sewerage system on a reliable basis.

Result 2: The economic viability is ensured.

Result 3: Awareness of the public and self-image are enhanced.

4.4 Important Indicators

The most important indicators were identified and agreed, which permits to the executing institutions having a tool to control the achievement of the project objective and the different results.

Indicators for Project Objective:

Project Objective:
1. The effluent quality meets the 20/30 regulation by the end of the 2nd year of operation of the WWTP.
2. 80% of connectees are billed by MAB within the 1st year.

Indicators for Results:

Result 1:
- Response time for repair of sewerage system is less than 12 hours.
- 40% of licensed trucks use septic facilities in WWTP for a fee within 1st year of operation of WWTP.
- Number of over-flowing manholes is reduced by 20% at the end of 2nd phase.

Result 2:
- Full operation and 50% of depreciation cost are recovered at the end of 2nd phase.

Result 3:
- No. of forced connections is reduced by 50%.
- Reducing of connection of roof draining to sewerage network by 30% of current cases by end of 2nd phase.
- 70% of bills are paid on time.
- JWU fee collection ratio is not negatively effected.

4.3 Recommendations regarding the Contribution of GTZ

With the purpose to achieve the results in the within the agreed timetable of 2 years, the mission recommends the following assignments of experts, which still have to be planned in detail and quantified:

Long term assignment: Technical Advisor / Expert in operation of wastewater and sludge treatment plants as well as sewer networks.

Short term assignments: External and local advisory services for support of commercial department and public awareness campaigns.

The outcome of the ZOPP 5-Workshop as well as the recommendations made by the PPR-Team are subject to the official approval by the German Ministry for Economic Cooperation and Development (BMZ).

The PPR-Team likes to express its profound gratitude to the Mayor of Al Bireh, Eng. Walid M. Hamad, and the Executives of the Municipality, as well as to the representatives of all contacted institutions, for their valuable help and permanent support to the mission during its stay in Palestine.

Al Bireh, February 15, 2000

W. M. Hamad

Eng. Walid M. Hamad
Mayor of Al Bireh

R. Schrage

Dr. Reinhard Schrage
Regional Project Officer GTZ

Eng. Munif R. Treish
City Engineer
Municipality of Al Bireh

E. Schmechel

Eng. Erwin Schmechel
Technical Advisor
Treatment of Wastewater Project Al Bireh

U. Putzar

Eng. Uwe Putzar
Project Progress Review Team

comunications to the M...

Draftagreement GTZ/MAP

Communitation To GTZ

Training

Payments

بسم الله الرحمن الرحيم

23 January, 1999

Deutsche Gesellschaft fur Technische
Zusammenarbeit (GTZ) GMBH .

Subject : Financing Agreement dated Oct. 17/23 , 1994 for DM 4,500,000 .00
Amendment to the agreement, dated Febr. 11th 1997.

Name of Project : Sewage Treatment Plant Al-Bireh

Agreement No. 4 - 2001 - 60129895
Call No. :

Dear Sirs ,

According to our contract with Al Quds for Engineering & Surveying , dated 15/12/ 1998.

Cost Category No.	Contract dated	Invoice No. dated	Amount in D.M.
3	15/12/ 1998.	20/12/1998	1500

In accordance with item 3.4 of our special agreement dated Oct. 17 / 23 , 1994 the following amounts from the payments due are to be financed from the financial contribution ; you are requested to disburse said amounts as follows :

Amount	To be paid to	Name of Bank and Account No.
DM.1500	Al Quds for Engineering & Surveying	Hapoalim Bank, French Hill, Branch no. 784 Jerusalem. Account no. 236135. Mr. Bassam Abu Leil.

We herewith confirm that the supplies and services have not already been finance from other grants or long term loans.

We are enclosing duplicates / photocopies of the above-mentioned invoices .

We look forward to receiving confirmation that payment has been effected by you .

Best Regards ,

W.M. Hamad

بلدية البيرة

Waleed M. Hamad
Mayor of Al-Bireh Municipality

بلدية البيرة هاتف ٩٩٥٤٧٣٧/٨/٩ و ٠٢-٩٩٥٦٤٤٥ فاكس ٩٩٥٤٤٣١ ص.ب ٣٥٠٦ البيرة
Al-Bireh Municipality Tel. 02-9956445 & 9954737 / 8 / 9 Fax 02-9954431 P.O.Box 3506 Al-Bireh email. albireh@planet. edu

بسم الله الرحمن الرحيم

23 January, 1999

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بســـــــم الله الرحمن الرحيـــــــم

23 January, 1999

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Al-Bireh Municipality Tel. 02-9956445 & 9954737 / 8 / 9 Fax 02-9954431 P.O.Box 3506 Al-Bireh email. albireh@planet. edu

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بلدية البيرة هاتف ٩٩٥٤٧٣٧/٨/٩ و ٠٢-٩٩٥٦٤٤٥ فاكس ٩٩٥٤٤٣١ ص.ب ٣٥٠٦ البيرة
Al-Bireh Municipality Tel. 02-9956445 & 9954737 / 8 / 9 Fax 02-9954431 P.O.Box 3506 Al-Bireh email. albireh@planet. edu

مكتب القدس للهندسة والمساحة

القدس - الرام مقابل همشبير

تلفاكس: ٢٣٤٢٨١٣ بلفون: ٠٥٢-٦٧٦١١٥

משרד ירושלים להנדסה ומדידות

ירושלים - אלראם מול המשביר

טל.פקס : 2342813 פלא-פון : 052-676115

עוסק מורשה 028189439

מקור

חשבונית מס מס'
فاتورة ضريبة رقم № 0018

תאריך
التاريخ 20/12/98

לכבוד
السيد بلدية البيرة

כמות الكمية	פרטים البيان	الكمية	מחיר יח' سعر الوحدة	סה"כ الاجمالي
	Camera Inspection			1755
	one days			

סה"כ	1500
מע"מ %	255
סה"כ לתשלום	1755

Month.

مكتب القدس للهندسة والمساحة
القدس - الرام مقابل همشبير
تلفاكس: ٢٣٤٢٨١٣ بلفون: ٠٥٢-٦٧٦١١٥

משרד ירושלים להנדסה ומדידות
ירושלים - אלראם מול המשביר
טל.פקס: 2342813 פלא-פון: 052-676115

עוסק מורשה 028189439

מקור

חשבונית מס מס' **№ 0018**
فاتورة ضريبة رقم

20/12/98
תאריך
التاريخ

לכבוד بلدية البيرة
السيد

כמות الكمية	פרטים البيان	الكمية	מחיר יח' سعر الوحدة	סה"כ الاجمالي
	Camera Inspection			1755
	one day			

1500	סה"כ
255	מע"מ % .....
1755	סה"כ לתשלום

Month.

משרד ירושלים להנדסה ומדידות

ירושלים - אלראס מול המשביר

טל.פקס: 2342813 פלא-מן: 052-676115

مكتب القدس للهندسة والمساحة

القدس - الرأس مقابل همشبير

تلفاكس: ٢٣٤٢٨١٣ بلقون: ٠٥٢-٦٧٦١١٥

עוסק מורשה 028189439

מקור

חשבונית מס מס'
فاتورة ضريبة رقم 0018 :No

20/12/98 תאריך
التاريخ

לכבוד بلدية البيرة
السيد

כמות الكمية	פרטים البيان	כמות Quantity	מחיר יח' سعر الوحدة	סה"כ الاجمالي
	Camera inspection			1755
	one day			

סה"כ	1500
מע"מ 17%	255
סה"כ לתשלום	1755

Month.

****
* TRANSMIT MESSAGE CONFIRMATION REPORT *
****

NAME:Erwin Schmechel, GTZ
TEL :0097229952870
DATE:01/25 14:41

TRANSMIT: 6286321			DURATION	PAGE	SESS	RESULT
TYPE : MEMORY TX	MODE	E - 14	00'32	01	711	OK

Deutsche Gesellschaft für technische Zusammenarbeit (GTZ) GmbH

WASTE WATER TREATMENT PLANT PROJECT
AL BIREH

Mercantile Discount Bank
Salah Eddin Branch
Jerusalem

Fax: 6286321

PAYMENT ORDER

Please transfer

From account no. 313459 (GTZ Account)

the amount of 1.500,- DM (Deutsche Mark)

to account no. 236135

at (bank/branch) Hapoalim Bank, French Hill Branch n° 784, Jerusalem

to the order of Al Quds for Engineering and Surveying

for (purpose) Kanalfernschuntersuchungen

Al Bireh, 25.07.1999

E. Schmechel

Erwin Schmechel, GTZ

Monthly final Invoice paid from implementation aggreement!

ADDRESS :
DIPL. - ING. ERWIN SCHMECHEL
MUNICIPALITY AL BIREH
P. O. BOX 309
TEL. 02-950
FAX. 02-954

Curriculum Vitae

Name:	Hans-Joachim Rabe
Tel. in Ramallah:	02 - 995 2031
Fax in Ramallah:	02 - 995 3407 (manual)
E-mail:	106746.1074@compuserve.com
Date of Birth:	6 December 1965
Nationality:	German

Academic Degrees

July 1992	School of Oriental and African Studies, University of London: Bachelor of Arts (B.A. with honours) in Arabic and Politics, degree included a one-year course at the University of Alexandria, Egypt
Nov. 1993	School of Oriental and African Studies, University of London: Master of Science (MSc) in the Politics of Africa and Asia

Work Experience

1991 - 1992	Stillitron Language Institute, London Position: Language Tutor Tasks: Teaching German and English to business executives
1992 - 1993	Control Risks Information Service, London Position: Analyst Supporter Tasks: Monitoring the Arabic, English, German and French press
1993 - 1996	School of Oriental and African Studies, London Position: Student Research Fellow Tasks: Organising and teaching seminars in Middle East politics and comparative politics; scholarship for research on Palestinian elites after the Oslo Agreements
1996 -1997	Field work in the Palestinian Territories
	Publications in the following magazines: The Jerusalem Times, Palestine Business Report, Middle East International, British Journal for Middle Eastern Studies

Skills

Fluent in English and German, advanced knowledge of Modern Standard Arabic and different dialects, working knowledge of French.

Proposal for an English Language Intensive Course

I. Duration, aims and structure of the course:

The course will be run over a period of eight weeks with four daily contact hours between the teacher and the students, on five days a week. Students will be required to allocate at least two extra hours per day for revision and preparation.

The course has the following aims:

1. to ensure that students have a good understanding of spoken English,
2. to develop their reading, writing, and conversational skills,
3. to provide them with in depth knowledge on English grammar,
4. to improve their pronunciation,
5. to equip them with vocabulary on environmental issues and waste water treatment.

Classes will be held exclusively in English, except for cases where Arabic explanations save time and are necessary to ensure the students' understanding. There will be a clear time table of the course and attendance by students will be compulsory and monitored. At the end of each week, students will be asked to take part in a written test to assess progress and identify areas where weaknesses prevail. Sponsors of the course will be briefed regularly on course developments and be provided with a report on each student at the end of the course.

Contact hours between the teacher and the student will be divided into the following categories:

1. Conversation classes in which current affairs and topics related to the future work of students will be discussed,
2. reading classes in which articles relevant to the students' work will be read,
3. writing classes in which letters, reports and proposals will be written by students,
4. grammar classes in which grammatical rules will be taught.

The following material will be used for teaching:

1. English newspaper articles on current affairs to stimulate discussions,
2. specialised articles on environmental issues and waste water treatment to upgrade vocabulary,
3. the teaching books "English - Take One" and "English - Take Two" to back up comprehension and expression,
4. educational video films to improve understanding.

Written material and video films will be discussed in class and students will be asked to write summaries on their contents. In addition, students will be required to prepare at home presentations on assigned topics to be presented in class.

II. Requirements of the course:

To ensure effectiveness and efficiency of teaching, the following requirements need to be met:

1. We will need an appropriate room with a blackboard and tables for the students and the teacher, preferably arranged in a circle to enhance group dynamics. Booking arrangements should be made in advance and be adhered to in order to avoid confusion and loss of teaching time.

2. Books to be constantly available in class. These include:

   Hans Wehr Arabic-English Dictionary,
   Al-Mawrid English-Arabic Dictionary,
   Oxford English Dictionary,
   Roget's Thesaurus,
   a pronunciation dictionary.

3. Access to the British Council library in East Jerusalem. Membership fees are NIS 100 per month with availability of books and videos.

4. A TV set and a video recorder.

III. Compensation for teachers:

Assuming a basis of $10 per hour, the design, running, administration, and completion of the course can be specified as follows (each point refers to an eight week period, except 1. Each point is an estimate, except 2.):

1. Preparations before the start of the course:	32 hours
2. Teaching:	160 hours
3. Attendance during breaks:	30 hours
4. Daily preparations:	40 hours
5. Marking:	20 hours
6. Briefing sponsors and writing reports:	12 hours
7. Obtaining and preparing material from Jerusalem:	20 hours
Total:	316 hours

This specification adds up to 39.5 hours per week, amounting to a total of $3160 for the whole course. This proposal is negotiable, but it should be noted that reducing the hours would also reduce the quality of the course.

IV. Choosing Teachers:

According to my understanding, there is at least one other potential teacher who has submitted a proposal. Sponsors are kindly requested to contemplate whether the course would benefit from splitting the work between two teachers. Provided that the teachers co-ordinate closely, such an arrangement would offer the following advantages:

1. Students would be confronted with different personalities and teaching styles, enhancing the dynamics of the course while reducing negative aspects of repetition and routine.

2. Students would be familiarised with different English accents, which would be beneficial for their future postings.

3. More than one teacher would provide a back-up for cases of illness or other unpredictable developments.

Ramallah, 7 June 1997

RESUME

PERSONAL DETAILS

Name	Kevin Daromar	Date of Birth	7/10/1965
Address	c/o Ayoub Obeida	Nationality	British (Palestinian)
	Ramallah Post Office	Sex	Male
	Ramallah	Status	Single
Telephone	02- 574 8976		
Fax	02-574 9931		

EDUCATION

1975-1987	High School Diploma
1992-1995	King's College, London, BA (Hons) English Language and Literature.

WORK EXPERIENCE

1987-1988	Reporter for ABC NEWS in the West Bank
1988-1989	Researcher for Law in Service of Man Association in Ramallah, West Bank
1989-1992	Guest Relations Officer for FORTE Plc. London, England
-1996	Teacher of English at Oxford Institute, Bologna, Italy and Centro Linguistico, Imola, Italy
-1997	Administrative Assistant at Unity Trading Co. in El Ram, West Bank Translator/ Interpreter for GTZ in Al Bireh Municipality, West Bank

SKILLS I am familiar with a variety of word processing packages.
I speak English, Arabic, Italian and Hebrew

INTERESTS AND ACTIVITIES

Writing	I write poetry and short stories
Sports	I play basketball and tennis

REFEREES

Professor Richard Proudfoot Department of English King's College, London Strand, London, WC2 4DD	Mrs. Christine Reese Department of English King's College, London Strand, London, WC2 4DD

A proposed outline for an intensive English language course

Week 1 :
1- Introduction, nouns, singular, plural,
2- Nouns, adjectives, verbs, adverbs]
3- Possessive noun forms
4- Pronunciation
5- Test

Week 2 :
1- The articles ; forms and pronunciation
2- Demonstratives i.e. This, These, Those, That
3- test

Week 3 :
1- Quantifiers, (some, any, etc.) Distributive, (each, any, every, etc.)
2- Positive and negative ways of looking at things (few, a few, some, much)
3- Test

Week 4 :
1- A wider analysis of the above (adjectives)
2- Pronouns
3- Possessive pronouns
4- Possessive adjectives
5- Test

Week 5 :
1- Prepositions
2- Phrasal verbs
3- Test

Week 6 :
1- Verb forms (present, past, future, negative, positive, ed, regular verbs, irregular verbs
2- Pronunciation
3- Spelling
4- Test

Week 7 :
1- Verb tense continues,
2- Introducing scientific English terms
3- Writing and spelling
4- Oral presentations on certain subjects related to course objectives
5- Oral and written tests

Week 8 :
1- Preparation: preparing students for Germany, introducing information about the country
Testing students' linguistic knowledge up to this point
2- Testing students' scientific English
3- Conversational English
4- Final test

TEXT BOOK

1- Allsop, Jake, *CASSELL'S STUDENTS' ENGLISH GRAMMAR*, Cassell, London, 1983.

Ps. Xeroxes would be available in case enough copies of text book are not found

2- Extracts from newspapers and magazines

As for expenses; I will be charging you NIS 40 per hour

Look forward to doing business with you

Kevin Daromar

Kevin Daromar

A proposal: an outline for an intensive English language course

Week 1	Introduction, nouns, singular, plural nouns, adjectives, verbs, adverbs, possessive noun forms pronunciation **Test**
Week 2	the articles: forms & pronunciation demonstratives, (this, these, those, that) **Test**
Week 3	Quantifiers, (some, any, etc.) distributives, (each, every, all, etc.) positive and negative ways of looking at things: (few, a few, some, much) **Test**
Week 4	A wider analysis of the above (adjectives) Pronouns Possessive pronouns possessive adjectives **Test**
Week 5	Prepositions phrasal verbs **Test**
Week 6	Verb forms (verb to be) Past, present, future negative, positive, have, had, .ing, .ed, regular verbs, irregular verbs **Test**
Week 7	verb tenses ....continue introducing scientific English terms writing and listening presentations on certain subjects related to course objectives **Oral and written tests**
Week 8	preparation: preparing students for Germany, introducing information about the country **Testing linguistic knowledge up to this point** **Testing students' scientific English** **Conversational English** **Final Test**

Text Books

1- Allsop, Jake, ***Cassell's Students' English Grammar,*** Cassell, London, 1983

Ps. Xeroxes should be available in case enough copies of text book are not found

2- Extracts from newspapers and magazines

Class Schedule

Saturday	08:30	10:00	Class	
	10:00	10:30	Break	
	10:30	12:00	Class	
	12:00	12:30	Break	
	12:30	13:30	Class	
Sunday	08:30	10:00	Class	
	10:00	10:30	Break	
	10:30	12:00	Class	
Monday	08:30	10:00	Class	
	10:00	10:30	Break	
	10:30	12:00	Class	
Tuesday	08:30	10:00	Class	
	10:00	10:30	Break	
	10:30	12:00	Class	
	12:00	12:30	Break	
	12:30	13:30	Class	
Wednesday	08:30	10:00	Class	
	10:00	10:30	Break	
	10:30	12:00	Class	
Thursday	08:30	10:00	Class	
	10:00	10:30	Break	
	10:30	12:00	Class	

Ihab Shaheen

During this second week of teaching I have noticed that Ihab has improved a lot. He is still the attentive and a hard working student. He does all his homework and hands them on time. His second test result is 95%

Ayman Qura'n

Ayman is still improving slowly, he is attentive and he hands his homework on time but he needs to work harder at home. His result for the second test is 90%

Mahmoud Abed

Mahmoud is an excellent student, his pronunciation is very good, he is learning very fast, he has a wide knowledge of vocabulary. His second test result is 100%

Date: June, 21, 1997

First Report on Al-Berih Municipality Students
(The English Course)

Ihab Shaheen
Ihab is an attentive student, very much willing to learn, works hard in class and does all his homework.
He is a fast learner, I am expecting good results from him, his pronunciation is good, his reading and writing are good too.
Result of his first test is 63%

Ayman Qura'n
Ayman is improving slowly, he is willing to learn, he does not try hard enough but I am sure he will, he needs a lot of attention, his results at this point are fair. Ayman's pronunciation needs to be improved. His reading and writing need improvement too.
His first test result is 67.5%

Mahmoud Abed

Mahmoud is attentive, hard working and he is a fast learner, his pronunciation is very good, his homework comes on time, he participates in class and he works hard at home
His results will be excellent..
His first test result is 90%

********** -JOURNAL- ********** DATE 21-JUN-1997 ***** TIME 11:44 **********

NO.	COM	PAGES	DURATION	X/R		IDENTIFICATION	DATE	TIME	DIAGNOSTIC
24	OK	01	00:00'41	XMT	T	00496196796200	21-JUN	11:43	840450AC7820

-AL-BIREH MUNICIPAL COUNCL-

********** - 972 2 9954431- **********

Our Ref. .....313.97/3..... أشارتنا

6/21/97

Date ..... التاريخ

Mrs. Hallanzi
Mr. Erwin Schmechel
GTZ representative
Al-Bireh
Fax # : 0049 619 679 6200

Please hold this fax for Mr. Erwin Schmechel

Dear Mr. Schmechel,

I am pleased to inform you that the Municipal Council of Al-Bireh has decided on its weekly meeting No. 23/97 dated 18.6.97 to change the employment contract of the personal who are going to work at W.W.T.P to a permanent employment . This decision will effect the following :

1) Mr. Monther Hind - Head of Sewage section .
2) Mr. Nayef Tomaleh - chief operator.
3) Mr. Mahmoud Sleiman Abed.
4) Mr. Ihab Shuqri Shaheen.
5) Mr. Ayman Abedel Rahman Qur'an

This decision is conditional that all above employees will sign an affidavit coupled with financial guarantee that they will not resign from their position in the first 5 years of the plant operation.

I hope this decision is in line with GTZ condition in order to proceed with the training programs for W.W.T.P financed by GTZ.

Sincerely yours,

Eng. Walid M. Hamad
Mayor of Al-Bireh

Al-Bireh Municipal Council

P.O.Box 3506, Al- BIREH
Tel: (02)954738/7/9, 956445
Fax. (02)954431

ص.ب ٣٥٠٦، البيره
تلفون: ٩٥٤٧٣٨/٧/٩، ٩٥٦٤٤٥(٠٢) ٠٢
فاكس: ٩٥٤٤٣١(٠٢)

TRANSACTION REPORT

FOR:

RECEIVE

DATE & TIME	SENDER	RX TIME	PAGES	NOTE
04-04-94 09:43	+49 30 4307230	02'21"	3	OK

GERMAN FOUNDATION FOR INTERNATIONAL DEVELOPMENT (DSE)
Economic and Social Development Centre (ZWS)
Development Management Section
Reiherwerder
13505 Berlin
Federal Republic of Germany

Tel. No. 030/4307-337 Telefax No. 030/4307-230

F A X T R A N S M I S S I O N

To: GTZ-Abwasserprojekt Al Birch
Attn.: Erwin Schmechel

Palästina

Telefax: 00972 2 995 28 70

Date: 02.04.1996
bö/do

Number of pages: 3

Re.: TK 330-340-96 "Methods and Techniques of Project Management"
from 13.05.-28.06.96 in Berlin Germany

Sehr geehrter Herr Schmechel,

für Herrn Hind

wir freuen uns, Ihnen mitteilen zu können, daß Ihre Bewerbung zu o.g. Veranstaltung berücksichtigt werden kannn.
Bitte übermitteln Sie uns die Bewerbungsunterlagen, einschl. des Auftragsformulars GTZ-Form 41-36-4.
In der Anlage finden Sie eine Kursbroschüre mit den wichtigsten Informationen zum Kurs.
Die Kursgebühr ist vom Projekt zu tragen und beläuft sich auf DM 13.475,- (275,-DM x 49 Tage).

Für weitere Informationen stehen wir Ihnen gern zur Verfügung.

Mit freundlichen Grüßen
im Auftrag

M. Donda
Marianne Donda
(Programmassistentin)

Applications from GTZ-supported programmes and projects should directly be sent to the DSE. Source of finance for these participants will be the counterpart training fund of their respective project. The project is normally expected to make all necessary arrangements, provide their counterparts with return tickets to Berlin, as well as with a MCO for 10 kg excess luggage (in US-Dollar) for the return flight.

For participating GTZ-counterparts a fixed course fee is set by the BMZ. Participants holding a DSE invitation are expected to pay for domestic travel costs in their country of origin only.

Applicants from externally supported projects can be accepted, should seek funding, however, through their donor agency which will be responsible for all necessary travel arrangements. For details please contact DSE Berlin (address above).

Venue and Dates

The course will be conducted at the Economic and Social Development Centre of DSE, Villa Borsig, Berlin.
Participants are expected to arrive in Berlin on the weekend 11/12 May 1996 and to leave on the weekend 29/30 June. They are kindly requested to inform the DSE about their arrival time either via their project or via the German embassy in their home country. They will be met at Berlin-Tegel Airport.
During their stay in Berlin, participants will be accommodated in single rooms at the Villa Borsig. We regret that accommodation is not available for family members.
A one-week study tour will take the participants to Frankfurt/Main and other towns in the Federal Republic of Germany, with the opportunity to visit, and exchange experiences at, the headquarters of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). The study tour will also introduce into various aspects of German life and culture.

Remarks

The DSE provides a pocket allowance (24,- DM per day) to cover small daily expenses. Expenditure exceeding the pocket allowance is to be covered by the participants. Participants from countries with restrictions on currency convertibility are requested to obtain the necessary clearances.

We regret not being in a position to cover any other cost including cost which may arise for the participant if she/he combines course travel with private or official travel prior to or after the course. The participants are requested to obtain in due time visa which they may require for entry into Germany or any other country which they may wish to visit before or after the course. In most cases, there is no possibility to obtain visa for other countries in Berlin.

The DSE will be pleased to provide any further information which may be required. The DSE Programme Officer is Mr. Hans-Jürgen Bösel (Phone:++49-30-4307-337), the Programme Assistant is Mrs. Marianne Donda (Phone: ++49-30-4307-346) (address as above).

DSE in Brief

The German Foundation for International Development (DSE) was created by the Federal and the *Land* governments in 1959 on the initiative of all the political parties represented in the Federal Parliament. It was assigned the task of fostering the relations between the Federal Republic of Germany and developing countries on the basis of a mutual exchange of experience.
The DSE fulfills this mandate by organizing training programmes, seminars and conferences to support projects in countries of Africa, Asia and Latin America which serve economic and social development.

German Foundation for International Development
(DSE)

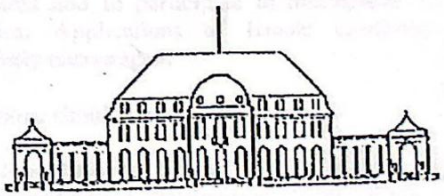
Course

Methods and Techniques of Project Management

13 May - 28 June 1996
in Berlin/Germany

Course Announcement

TK 330-340-96



Economic and Social Development Centre
Villa Borsig
Reiherwerder, D-13505 Berlin
Telephone: ++49-30-4307-1; Fax: ++49-30-4307-230
Telex: 17308891 dsezhw d

Course Announcement

The German Foundation for International Development announces a seven-week post-experience course on Methods and Techniques of Project Management" to be held in Berlin from 13 May to 28 June, 1996.

The course is especially designed for
- managers and supervisors of development programmes and projects, and
- project-external personnel engaged in the training of project staff and/or the moderation of workshops

wishing to enhance their knowledge of, and competence in
- the design of strategies for projects aiming at the alleviation of poverty and at the achievement of sustainable results
- methods and techniques employed during thei planning, implementation and evaluation of projects
- communication and moderation skills required to guide project teams and to co-operate with target groups.

The training course is based on the approach, methods and instruments developed for, and used in, projects supported within the framework of German Technical Cooperation by the German Agency for Technical Cooperation (GTZ).

Course Objectives and Outline

The course follows the concept of an overall integrated Project Cycle Management approach (PCM).

After completion of the course, participants will
- appreciate project management as the management of a process in cyclic stages,
- be motivated to use a management approach characterized by problem-consciousness and decision-orientation
- have applied the management techniques in practical examples and simulations,
- be able to select and apply such tools for management functions according to actual project requirements,
- have adopted a positive attitude towards team-work and participatory procedures, and
- have improved their skills with regard to facilitating and moderating workshops and trainings.

Furthermore, the role of programmes and projects within the overall development efforts of developing countries and their implications for effective project management and essential management functions will be discussed.

Project Conceptualization, Planning- and Implemention Techniques
A tool kit of interrelated methods and techniques for the effective performance of the main project management functions will be introduced. The course participants will apply these tools in
- the conceptualization of project strategies (economic viability, capacity building, self-help promotion, ecological sustainability, target group and gender orientation, participatory approaches),
- objectives oriented participatory project planning (participants' analysis, analysis of problems, objectives and alternative options, strategy delineation, project design by project planning matrix)
- steering project implementation (operational planning, project-internal organizing, monitoring, evaluation & adjustment, leadership and personnel management)
- project evaluation (techniques of comparing planned with actual achievements, analysis of causes for deviations, assessment of performance, delineation of recommendations).

Communication and Team Work Techniques
The efficiency of project management depends to a high degree on its ability to mobilize those who should benefit from the project and to motivate those who assist in implementation. Therefore, successful training in project management needs to incorporate communication and team work techniques. The course participants will learn and practise various methods and ways
- to improve interpersonal communication and inter-cultural co-operation
- to work effectively in and with teams
- to handle group dynamics, to intervene in group processes and to manage conflicts and
- to act as moderators and facilitators.

Training Approach and Faculty

In managing development projects the above topics are closely interrelated. Managers organize processes which require the systematic use of analytical tools and effective interaction between all parties involved. The course reflects these requirements by presenting the management techniques in a systems perspective and by facilitating their application in working groups throughout the course using case material. The curriculum includes exercises, simulations, games and experiments in order to stimulate the application of management know-how, to encourage the exchange of knowledge among the participants and to allow them to draw their own conclusions from what they have experienced and learnt. The composition of the working groups will be frequently changed in order to encourage the greatest possible intercultural exchange.

The course will be conducted by trainers who have acquired a vast practical experience through many years of work with development projects supported in the frame of German Technical Cooperation. The course has been designed on the basis of material provided by the GTZ, as well as other development organizations.

Admission Requirements and Administrative Procedures

The course is open to all persons concerned with the planning and implementation of development projects. Applicants will normally be expected to have a university degree or equivalent and they should also have several years of experience in planning or implementing projects. The course will be held in English; applicants should have a sufficient knowledge of the course language to follow the lectures and to participate in discussions without difficulties. Applications of female candidates are expressively encouraged.

Applications should be submitted to the

German Foundation for International Development (DSE)
Economic and Social Development Centre (ZWS)
Development Management Section (FB 33)
Villa Borsig, Reiherwerder
D-13505 Berlin, Germany
Phone: ++49-30-4307-1
Telex: : 17308891 dsehw ttx d
Telefax: ++49-30-4307-230

DRAFT

JOB ANNOUNCEMENT

The Municipality of Al Bireh currently operates two pumping stations and a sewage network of approx. 50 km length. The expansion of the canalisation is speedily under way and the construction of drainage systems in the development areas "Lower South" and "Upper North" will commence soon.

The beginning of construction works for the waste water treatment plant is set for mid-1997; prospectively, it will be completed and ready for operation by early 1999.

To handle the tasks ahead, the Municipality's Engineering Department is in the process of establishing an independent Waste Water Department responsible for the operation of the waste water plants. Within this department, the following position are vacant:

- Deputy Chief Operator
- Electricity Technician
- Mechanical Electrician

For all three positions, including that of the Deputy Chief Operator, a vocational training in a crafts profession with at least two years of practice and experience is required. Besides this specific professional background, applicants must be ready to assume any work that may occur in a waste water plant, if delegated so by the Chief Operator.

In preparation for the future tasks, special training will be required to impart the necessary theoretical and practical knowledge. These advanced training and upgrading measures are intended to take place in Germany, Tunisia and other Arab countries, respectively. The training period will last from 1st July 1997 through 30th June 1998. During this time, three series of training courses will be completed, each of which will last for approx. 2 months.

Requirements:

- A good knowledge of the English language is essential (the training courses in Germany will be conducted in English)
- The readiness to participate and devote full attention to the training courses.
- A statement of commitment for at least 5 years (all travel, accommodation and boarding expenses, as well as the course fees will be borne by the employer in accordance with an agreement signed between the Municipality Al Bireh and the GTZ. In the event of premature termination of the employment contract, the employer reserves the right to claim refunds).
- Motivation to promote the protection of the environment
- Willingness to work overtime (e.g. from Saturday until Thursday from 7.00 a.m. to 4.00 p.m., and on Fridays and holidays from 7.00-11.00 a.m.)
- Acceptance to work on Fridays and holidays, if required.
- Readiness to stand-by service, i.e. availability beyond regular working time (day and night)
- Capability to work within a team

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- Capability to work within a team

245-96/2 07/23/96

Mr. Erwin Schmechel
G.T.Z. representative

Subject : Training of the project Manager

Dear Mr. Schmechel,

Regarding the training course of methods and techniques for project management which I attended from 13 May to 28 June in Berlin . The course was successfully organized by the Deutsche Stiftung Fur International Entwicklung (DSE) .

The course was designed for Managers, supervisors and coordinators of organizations and authorities who are concerned with identifying, planning, implementing and supervising development programs and projects.

The training improved my knowledge, skills and awareness in communication, project design, planning and implementing the cycles of our project.

* By providing me the opportunity to exchange experiences with the others participants.
* By introducing me to the current development approaches and options plus a tool-kit of respective methods and techniques to improve my practice.
* By practicing, experimenting and gaining new experiences in supervised situations.
* And by supplementing me with handbooks covering different management functions.

The management functions were covered in the course under four modules:

1- **Project Design .**
2- **Project planning (Log Frame).**
3- **Processional communication and facilitation.**
4- **Steering implementation.**

The hospitality in Villa Borsig was excellent and the staff was very organized and active.

I have the possibility to make one week tour in Germany organized by DSE and it was useful to have a general idea about Germany and German's life.

I would like to express my grateful to GTZ for offering me such an opportunity to improve my knowledge in management which is important also for my own future.

Sincerely yours,

Monther Hind
Project Manager

monther

السلطة الوطنية الفلسطينية
بلدية البيرة
AL-BIREH MUNICIPAL COUNCIL

أشارتنا ..... 317-97/5 ..... Our Ref.

التاريخ ..... ١٩٩٧/٦/٢٣ ..... Date

بسم الله الرحمن الرحيم

السيد ايهاب شكري أمين شاهين المحترم

الموضوع : التعيين

تحية طيبة وبعد ،

يسرني اعلامكم بقرار المجلس البلدي بجلسته الاسبوعية رقم ٩٧/١٥ بتاريخ ٩٧/٤/٢٣ والمتضمن تعيينكم كهربائي للعمل بمحطة التنقية اعتبارا من ٩٧/٦/١٥ حيث قرر المجلس البلدي في جلسته الاسبوعية رقم ٩٧/٢٣ بتاريخ ٩٧/٦/١٨ صرف راتب شهري مقطوع لكم وقدره ألف ومايتا شيكل طيلة فترة التدريب وسيتم تعديل مرتبكم ليصبح بمبلغ ألف وخمسماية شيكل بعد الانتهاء من فترة التدريب شريطة توقيع عقد عمل مع البلدية تلتزم به بالعمل لمدة خمس سنوات وتقديم كفالة مالية لصالح البلدية بمقدار خمسة الاف دينار اردني .

آملا أن تكون عند حسن ظننا بكم ،،

واقبلوا فائق الاحترام ،،

المهندس وليد مصطفى حمد
رئيس بلدية البيرة

P. O. Box 3506, AL-BIREH
Tel.: (02) 9954738/7/9 - 9956445
Fax : (02) 9954431

ص . ب ٣٥٠٦ ، البيرة
تلفون : ٩٩٥٤٧٣٨/٧/٩ - ٩٩٥٦٤٤٥ (٠٢)
فاكس : ٩٩٥٤٤٣١ (٠٢)

السلطة الوطنية الفلسطينية
البيرة
AL-BIREH MUNICIPAL COUNCIL

أشارتنا ..... 317-97/7 ..... Our Ref.

التاريخ ..... ١٩٩٧/٦/٢٤ ..... Date

بسم الله الرحمن الرحيم

السيد أيمن عبد الرحمن قرعان المحترم

الموضوع : العمل

تحية طيبة وبعد ،

لقد قرر المجلس البلدي في جلسته الاسبوعية رقم ٩٧/٢٣ بتاريخ ٩٧/٦/١٨ نقلكم للعمل بوظيفة مواسرجي بمحطة التنقية اعتبارات من ٩٧/٦/١٥ وتعديل مرتبكم الشهري ليصبح ألف ومايتا شيكل طيلة فترة التدريب المقررة من قبل المؤسسة الالمانية وبعد ذلك سيتم تعديل مرتبكم الشهري ليصبح ألف وخمسماية شيكل لذا عليكم تقديم كفالة مالية لصالح البلدية بمقدار خمسة الاف دينار اردني وتوقيع عقد تلتزمون به بالعمل لمدة خمس سنوات .

آملا أن تكون عند حسن ظننا بكم ،،

واقبلوا فائق الاحترام ،،

المهندس وليد مصطفى حمد
رئيس بلدية البيرة

P. O. Box 3506, AL-BIREH
Tel.: (02) 9954738/7/9 - 9956445
Fax : (02) 9954431

ص . ب ٣٥٠٦ ، البيرة
تلفون : ٩٩٥٤٧٣٨/٧/٩ - ٩٩٥٦٤٤٥ (٠٢)
فاكس : ٩٩٥٤٤٣١ (٠٢)

السلطة الوطنية الفلسطينية
بلدية البيرة
AL-BIREH MUNICIPAL COUNCIL

أشارتنا ..... 317-97/6 ..... Our Ref.

التاريخ ..... ١٩٩٧/٦/٢٤ ..... Date

بسم الله الرحمن الرحيم

السيد محمود سليمان عابد المحترم

الموضوع : العمل

تحية طيبة وبعد ،

لقد قرر المجلس البلدي في جلسته الاسبوعية رقم ٩٧/٢٣ بتاريخ ٩٧/٦/١٨ نقلكم للعمل بوظيفة مواسرجي بمحطة التنقية اعتبارات من ٩٧/٦/١٥ وتعديل مرتبكم الشهري ليصبح ألف ومايتا شيكل طيلة فترة التدريب المقررة من قبل المؤسسة الالمانية وبعد ذلك سيتم تعديل مرتبكم الشهري ليصبح ألف وخمسماية شيكل لذا عليكم تقديم كفالة مالية لصالح البلدية بمقدار خمسة الاف دينار اردني وتوقيع عقد تلتزمون به بالعمل لمدة خمس سنوات .

آملا أن تكون عند حسن ظننا بكم ،،

واقبلوا فائق الاحترام ،،

المهندس وليد مصطفى حمد
رئيس بلدية البيرة

P. O. Box 3506, AL-BIREH
Tel.: (02) 9954738/7/9 - 9956445
Fax : (02) 9954431

ص . ب ٣٥٠٦ ، البيرة
تلفون : ٩٩٥٤٧٣٨/٧/٩ - ٩٩٥٦٤٤٥ (٠٢)
فاكس : ٩٩٥٤٤٣١ (٠٢)