Progress Report

1. Report Summary

(1) **Title of the Project** : Construction of Sewage Treatment Plant and Main Pressure Line in Khan Younis (PAL10-00047395)
(2) **Date of the approval** : Jan. 2006
(3) **Project budget** : US$14,830,000
(4) **Scheme of the Project** : Emergency Grant
(5) **Period covered by the report** : 1 July – 30 Sept. 2010 (Progress Report No. 14)
(6) **UNDP Officer in charge** : Husam Tubail, Programme Analyst, Environment and Natural Resources, UNDP/PAPP Tel: 02-2428040 (ext. 340), Mobile: 059-9606876;
Project Manager : Ashraf A. Shamala, UNDP/PAPP Gaza, Tel: 08-2863364 (ext. 141), Mobile: 059-9606792
(7) **Name of PA counterpart:** Yousef Haj Yousef, Director of Water and Waste Water Department, Municipality of Khan Younis, mobile: 0599-815541, email: hajyousef@hotmail.com
Monther Shublaq, General Director, Coastal Municipal Water Utility, mobile: 0599-267108, email: monthersh@cmwu.ps
Rebhi El-Sheikh, Deputy Chairman, Palestinian Water Authority, mobile: 0599-267103, email: ralsheikh@pwa-gpmu.org

2. Contents

(1) Summary of the project:

Background:
Khan Younis City is the second largest city in the Gaza Strip with a total administrative area of 59 km^2 and is currently inhabited with a population of around 195,000 persons. The City has a rapidly growing population with an annual growth rate of 3.5%. At present, nearly 40% of the population of Khan Younis City is served by public sewerage collection system. However, due to the absence of a wastewater treatment plant, the collected wastewater is pumped without treatment to the existing main storm water box culvert, which in turn flows by gravity to a storm water infiltration pond located in the north-western side of Khan Younis City. The wastewater generated from the un-served areas is still being evacuated by tanker trucks and is disposed without any treatment.

This situation is posing serious risks on the Khan Younis residents' public health as well as contaminating the ground water aquifer. Nitrate concentration levels in few of KhanYounis water wells reaches around (458 mg/l) that far exceeds WHO level (50 mg/l). Recent researches have concluded that such high level of Nitrate is one of the factors that cause the blue baby Syndrome. Therefore, this project comes as an emergency response that aims to improve the public health of Khan Younis residents and to safeguard the environment, in particular the limited water resources.

The primary beneficiaries of the project are the 195,000 residents of Khan Younis city. Other beneficiaries include:

- The Khan Younis Municipality, the Coastal Municipalities Water Utility and the Palestinian Authority as the project will contribute to enhancing the management of water and wastewater services.
- The families of the unemployed workers who will have the opportunity to work on the project.

Project Objective:
The project aims to protect the public health of KhanYounis residents and improve their environmental health conditions through construction of an extendable Waste Water Treatment Plant. The project as well will control the pollution of the coastal aquifer..

Project execution modality:
The project is directly executed by UNDP/PAPP in coordination with the project counterparts: the Water Authority as sector regulator; the Coastal Municipalities Water Utility as service provider and the Municipality of Khan Younis as the direct beneficiary.

(2) Project components:

Component	Budget US$	Project site
a. Construction of the main pressure line to collect and convey the wastewater from KhanYounis city (pump station 8) to the treatment plant	1,000,000	Khan Younis / Eastern Side
b. Conduct the detailed design for an extendable WWTP for Khan Younis Governorate	1,100,000	Khan Younis WWTP sites (east of Khan Younis)
c. Construction of KY WWTP, Phase 1	11,450,000	Khan Younis WWTP sites

(3) Project timeframe, schedule status, progress of activities, and tasks & measures

Indicated output	Activities	Timeframe								Schedule Status	Activities done in the reporting period	Remaining Work	Tasks & Measures
		2009				2010							
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Output 1: Main Pressure line supplied and installed.	1.1 Installation of 996.3 LM of steel pressure pipes of 24 inches diameter.									Completed as scheduled			
	1.2 Installation of 1070.4 LM of reinforced concrete pipes of 1000 mm diameter.									Completed as scheduled			
	1.3 Construction of 15 reinforced concrete Manholes of 1.5mX1.5 m and 2mX2m dimensions.									Completed as scheduled			
Output 2: Detailed Design for the construction of KY WWTP conducted.	2.1 Issuing an Expression of Interest.									Completed as scheduled			
	2.2 Drafting and posting Request For Proposal (RFP) to the pre qualified consultants.									Completed as Scheduled.			
	2.3 Bidders submitting their technical and financial proposals.									Completed as scheduled with one week extension.			
	2.4 Performing the technical and financial evaluation, CAP report with awarding									Completed with 3 weeks delay.	Technical clarification was sent to the first rank bidder		Consultants' response on technical clarifications has been delayed by 3 weeks due to annual

	recommendations.												holidays in the consultant's home office in France
	2.5 conducting Pre contract negotiations with the first rank bidder and signing contract									Completed with 2 months delay	Contract was signed by UNDP on the 8 of Oct. 2008 and by the consultant on the 17 of October 2008. Commencing letter was issued by the 23 of October 2008		An online pre contract negotiation was conducted to overcome the difficulties of the physical attendance of the international consultant due to Gaza current security circumstances.
	2.6 Preparing the detailed design Inception Report	X								Completed with 1.5 months delay due to the last Israeli military operation in Gaza.	The Draft Inception Report was delivered by the consultant on the 17 of Dec. 2008. Comments were performed on 31 Jan. 2009. The final copy was approved on 25 Feb. 2009. Payment no.1 was disbursed on 30 March 2009.		A video conference meeting was conducted on 23 Jan. 2009 to evaluate the project situation after the last military operation in Gaza. The consultant contract was extended by 1.5 months. The consultant contract amendment was signed on 16 March 2009.
	2.7 Preparing the Initial Design Report	X	X	X						Completed, with 1.5 months delay due to last military operation in Gaza.	Issuing the Draft Initial Design Report. Reviewing the Draft Initial Design Report mutually with the counterparts. Approving the		Security coordination actions were mobilized with Israeli concerned authorities to grant permits to accomplish the required survey and geotechnical investigation works in

											Initial Design Report on 6 Sept. 2009. Payment No.2 was disbursed on 28 Sept. 2009.		KY WWTP eastern site. Different meetings were conducted between UNDP, counterparts and the JV consultant to mutually discuss, review and approve the Initial Design Report.
	2.8 Preparing the Environmental Impact Assessment Study Report	X	X	X	X	X	X	X		Completed, Rescheduled by 1.5 Months lag due to the last military operation in Gaza.	The draft report of the EIA study performed. EIA main public hearing workshop conducted on 30 Dec. 2009. EIA draft report sent to EQA for approval on 26 Jan 2010. Comments received on 30 May 2010 and rectified. Rectified final report re-sent to EQA for final approval on 2 June 2010. EIA Final Report approved by EQA on 6 July 2010. 13 copies of final approved report sent to EQA to		Preparation and coordination actions were mobilized with all concerned authorities, officials, NGOs, civil society organizations, community and localities leaders and residents to conduct the EIA main public hearing workshop, which was performed successfully. Coordination carried out with PWA and EQA to finalize the EQA's approval of EAI report.

										present it to the national environmental assessment committee.		
	2.9 Preparing the Geotechnical Investigation Reports	X	X	X	X	X				Completed, Rescheduled by 4 Months lag due to the last military operation in Gaza and the relevant delay resulted from the residents objections of Muraj and Al Fukhari infiltration areas to carry out the on-site geotechnical investigations.	Detailed geotechnical investigations in Al Fukhari infiltration site completed. Analysis of results and relevant hydraulic modeling completed. Geotechnical investigation of the effluent and emergency pressure line completed. Final stage and surface geotechnical investigations of Al Fukhari infiltration basins completed.		Security coordination actions had been mobilized with Israeli concerned authorities to grant access for the project's eastern site. Different community participation and public hearing meetings and workshops had been conducted with all concerned parties, Al Fukhari's municipal council and residents to explain the project and to discuss residents' objection concerning the infiltration basins.
	2.10 Preparing the Detailed Design Report		X	X	X	X	X	X		On going, Rescheduled by 8.5 months lag due to the last military operation in Gaza, the relevant delay resulted from	The draft detailed design report performed. Comments have been sent to the JV consultant on 18 April 2010 and have been rectified.	Issuing the final tender documents of four agreed upon packages based on the final detailed design report.	Different meetings had been conducted with all concerned parties to discuss residents' objection relevant to Al Fukhari infiltration basins to avoid extra delay of on-site work.

										the residents' objections of Muraj and Al Fukhari infiltration areas and the client, the counterparts and the consultant requirements to revise and rectify the detailed design report and the related tender documents.	Rectified report re-checked and remaining non done comments re-sent again to the JV consultant on 14 June 2010. The detailed design report rectified and final draft sent on 7 July 2010.		Different meetings and discussions had been conducted with the JV consultant to evaluate the delay of on-site geotechnical investigations resulted from residents' objections, to discuss the draft detailed design report and relevant technical comments deem to be rectified and the project work plan. Contract was extended by extra 3.5 months. A contract amendment No.3 was issued on March 2010, discussed and signed by consultant on 19 May 2010.

	2.11 Preparing the Tender and Contract Documents, per packages		X	X	X	X	X	X	X	On going, Rescheduled by 11 months lag due to the last military operation in Gaza, the relevant delay resulted from the residents' objections of Muraj and Al Fukhari infiltration areas and the client and the consultant requirements to revise and rectify the detailed design report and the related tender documents.	The draft tender documents were performed and submitted on 21 March 2010. The draft tender documents sent to PSO/LSO in NY for revision. Comments received from NY and sent o the JV consultant on 9 June 2010. The rectified tender documents re-submitted by JV consultant on 23 June 2010. The rectified tender documents revised by client and answers on comments sent to consultant on 1 Sept. 2010.	Final revision of the Tender documents, rectifying the client's comments by the consultant and issuing the final tender documents of the four agreed upon packages.	The consultant contract was extended by extra 3.5 months. A contract amendment No.3 was issued on March 2010 and sent to the consultant for acceptance and signature. It has been discussed and signed by consultant on 19 May 2010. A VC meeting conducted with JV consultant on 10 August 2010 to discuss comments to finalize the tender documents. A mission to Gaza is planned for the international consultant to have a meeting on 7 Oct. 2010 to finalize the tender documents for approval.
	2.12 Preparing the Assignments Final Report					X	X	X	X	Started.	Draft Report is under preparation by consultant.	Issuing the Assignment final report.	
Output 3: KY WWTP, Phase 1 constructed.	3.1 Carrying out the construction supervision for KY WWTP.									planned			
Project Completion Date: June 2013 (23 months to finalize the detailed design (output 2, Nov 2008 – Oct. 2010) , and 24 months for the construction phase (output 3, 2011 – 2013)													

3. Financial report

Budget items (according to the proposal)	A. Original budget (according to the proposal) US$	B. Revised budget (if the original budget is revised) US$ *	C. Disbursement US$	D. Balance (B-C) US$	E. Rate of disbursement (%) (C/B*100)
Construction of KY WWTP	12,550,000	11,450,000	0	11,450,000	0%
Supplying and installation of 24 inch main pressure line	1,000,000	1,000,000	527,303.15	472,696.85	53%
Carrying out the Detailed Design of KY WWTP.	0	1,100,000	665,129.81	434,870.19	60.5%
Project Engineer for 24 months	60,000	60,000	83,777.86	-23,777.86	139%
Civil Site Engineers for 20 months	60,000	60,000	0	60,000	0%
Electro mechanical 1 for 20 Months	30,000	30,000	0	30,000	0%
Contingencies and Miscellaneous	31,481	31,481	11,831.57	19,649.43	37.6%
Sub-total	13,731,481	13,731,481	1,288,042.39	12,443,438.61	9.4%
GMS (8%)	1,098,519	1,098,519	103,043.39	995,475.61	9.4%
Total	14,830,000	14,830,000	1,391,085.78	13,438,914.22	9.4%

* Project Budget was revised based on letter of clearance from the Government of Japan dated 24 July 2007

*It is important to highlight that the financial figures in this report are temporary figures, and may be corrected at a later stage due to exchange rate fluctuations, realized gain/loss or any other possible corrections. UNDP/PAPP's financial system operates in such a manner that the financial system closes in early December of each year and that final expenditure reports reflecting the disbursements and GMS of the previous year are only published in March of the following year.

4. Any special notes or remarks:

4.1 The cost estimate for the construction of waste water treatment plant "WWTP", phase1, has dramatically increased due to the following reasons:

- The design capacity of WWTP, phase I increased by 10,000 cubic meter per day cm/d, based on the preliminary design carried out by Palestinian Water Authority "PWA". The scope of work was identified to design an extendable waste water treatment plant to be implemented in two phases; with inflow capacity of 16,100 cm/d and load estimates for the year 2018. In parallel, temporary treatment lagoons plant was proposed to be constructed at early stage; before the construction of the permanent waste water treatment plant, to handle 10,000 cm/d of the collected waste water during the emergency situation. However, this temporary treatment plant has not been constructed and accordingly the project target has been modified to design and construct an extendable WWTP to treat and dispose of the generated load of 26,100 cubic meter per day.
- The scope of work of the project was modified to ensure environmentally sound disposal of wastewater: The TOR of the detailed design assignment was developed and approved by the projects counterparts. The infiltration scheme (that includes the infiltration basins and emergency outflow) was added to the project components to ensure the optimum utilization of the treated wastewater as alternative water resources to recharge the aquifer and contribute to restore its capacity and to use the treated waste water for irrigation purposes to release the pressure on the fresh water.. Thus the detailed design's assignment included performing the design of the related components of ultimate disposal facilities (the infiltration basins and the effluent and emergency pressure pipelines); where no budget lines were allocated in the Project Document for the construction costs of these additional components.
- The cost for the construction management by international consulting company as well as the cost for the first year operation and maintenance during the commissioning period (one year) of the treatment plant was also not included in the original project document.

4.2 Revised cost estimate for the construction of WWTP, phase I, and budget shortfall

According to the detailed design cost estimate , it is clear that the available fund of USD 11.45 millions is neither sufficient to construct phase I of KY WWTP itself; nor to construct the additional necessary and vital components of the project (infiltration basins and effluent and emergency pressure pipelines). Based on the above, and to ensure successful implementation of the project, the following activities and their additional corresponding budget lines; are urgently needed over the forthcoming three years:

- Constructing KY WWTP, Phase I,
- Constructing infiltration basins to recharge the treated water effluent into the ground water aquifer, and effluent and emergency main pressure pipeline
- Carrying out the required pre-contract services and construction supervision for the construction of KY WWTP, Phase I;
- Carry out the required one year operation after commissioning of KY WWTP, Phase I, to build the capacity of the CMWU and to transfer knowledge and codes of proper practice.

According to the detailed design figures; around USD 57,238,233 Millions* are needed to construct and effectively manage and operate KY WWTP, Phase I. Therefore,, additional USD 42,408,233 Millions matching fund are needed to construct the treatment ploant.

* The cost estimates will be adjusted according to the final Detailed Design Report.

4.3 Update on mobilizing US$ 42 million budget shortfall

UNDP/PAPP contacted USAID, EU, IDB and ARAB countries in the Gulf in order to mobilize the additional resources (US$ 42,408,233 million) that are needed to bridge the gap in the construction of KHWWTP. The EU and the Kuwait fund expressed their interest in the project. However, up-to date there is no feed back or any commitment from any donors.

UNDP also approached the Palestinian Water Authority to support in the resource mobilization for this strategic project. Securing the additional resources for this project is being given a priority at UNDP HQ in New York as well. .

4.4 Completion of the detailed design

In accordance with the project work-plan the detailed design shall be completed by the end of September 2009. The final draft report has been submitted and reviewed by the project counterparts; however, we are waiting for the UNDP HQ approval on the submitted tender document. Due to the complexity and the size of the construction activities, the UNDP general conditions of contract has been modified which needs a clearance from the UNDP legal office in NY. A mission for the consultant has been scheduled to take place in October 2010 to finalize the tender document in coordination with UNDP HQ.

4.5 COGAT "Israeli Authorities" approval to facilitate entry of construction materials into Gaza

The list and quantities of needed construction materials has been prepared and submitted to the Israeli authorities. An Israeli Approval regarding facilitating entry of materials for this project was granted on July 11, 2010 (attached).

4.6 Impacts of absence of KYWWTP

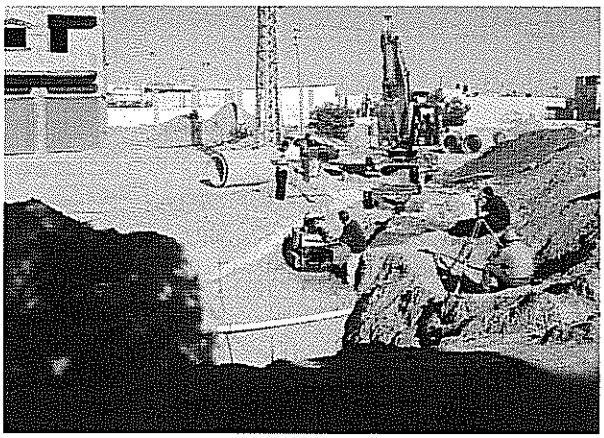
The absence of a functional WWTP in Khan Younis Governorate for long years has adversely affected the public health of the residents of khan Younis and lead to the deterioration of the environmental health conditions. It has also polluted the coastal aquifer which is the only source of water for the Gaza Strip. The following statistics illustrate and summarise the existing conditions that will exacerbate further if the pollution caused by the wastewater is not controlled or managed.

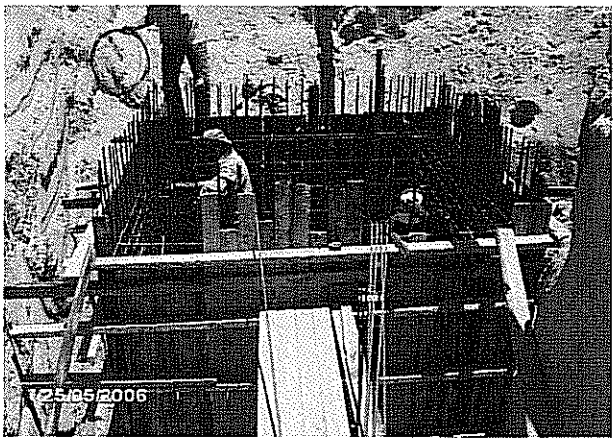
- The existing cesspits (30,000) are considered a serious source of pollution that poses a health risk to residents of the city. The cesspits frequent flooding in the streets pollutes the populated residential areas and is a source of nuisance and bad smell. They also accelerate the breeding of flies and mosquitoes and rodents.
- According to the attached water analysis that was conducted in July 2009, it was found that nitrate concentration in all the 24th municipal water wells in Khan Younis are generally very high. It recorded as high as 458 Mg/l in one of the wells and 200 mg/liter in average. It is worth to note that the recommended WHO standard is 50 mg/l. The high concentration of nitrate in drinking water is one of the leading causes for methemoglobinaemia (blue baby phenomena) among babies. The UNEP report of 2009 mentioned that some cases of methemoglobinaemia were documented in the Gaza Strip.
- The existing western waste water lagoons become a serious source of pollution for the western shallow coastal aquifer. The attached lab results of water analysis of agricultural water wells located close to the waste water lagoons in Al Mawasi area in western side of Khan Younis; which are used for drinking purposes by local residents, showed high and serious biological contamination. Some samples showed that the Fecal coli-form and Total coli-form (indicators of biological contamination) are too numerous to count, while it should be 0.00 No/100 ml as per the WHO guidelines. The Ammonia concentration was very high as well at a value of 3.4 mg/l.
- The prevalence of water born diseases such as, diarrheas, dysenteries, salmoellosis, hepatitis A, typhoid, guardian and amoeba histolytic in KhanYounis city is considered to be one of the highest among the Gaza Strip.
- In 2009, 4800 person; the majority of them are children, were admitted to UNRWA clinics in Khan Younis due to infection caused by water born diseases such as watery diarrhea, acute bloody diarrhea, viral hepatitis and typhoid fevers.

- Discharge of partially treated waste water to the sea is causing its pollution and rendering it harmful to marine life. Moreover, it is posing public health risks to the residents of KhanYounis especially during summer vacation when the sea is the only recreational spot in the area.

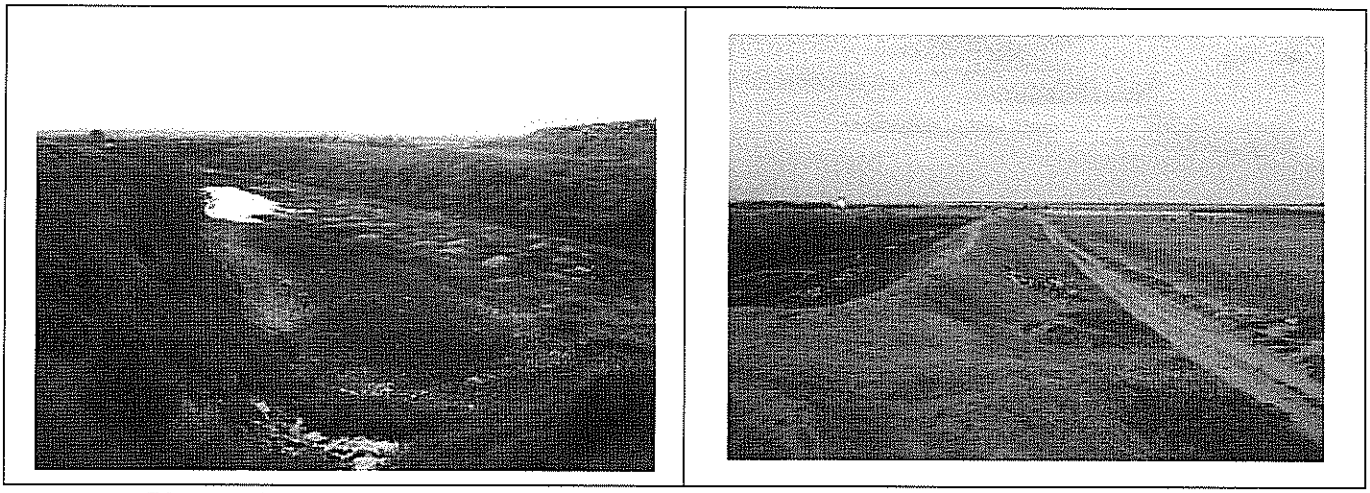
5. **Pictures of project indicating before the project and progress of the project:**

- **Photos of Installing the Main Pressure Line. (Completed)**

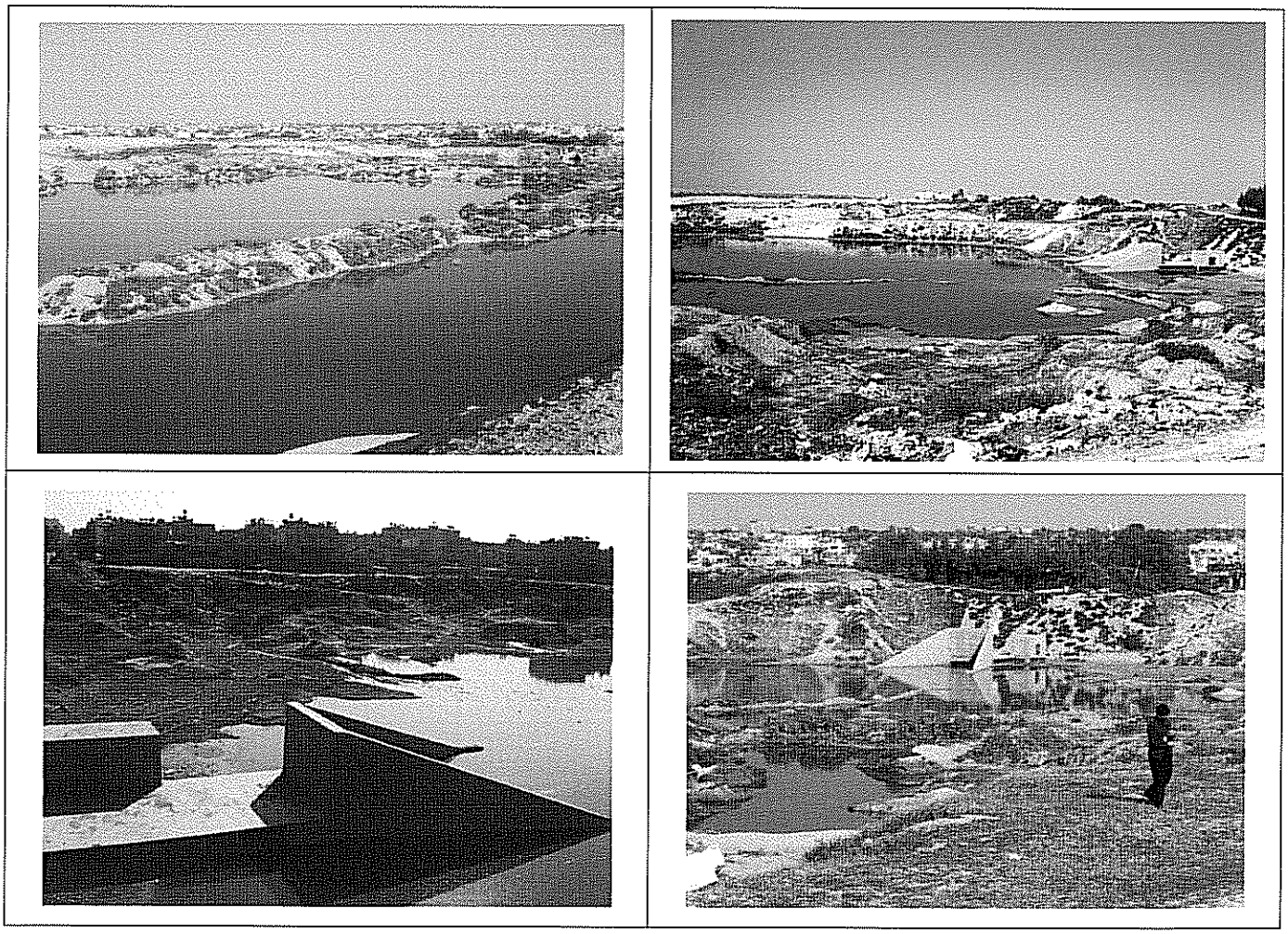


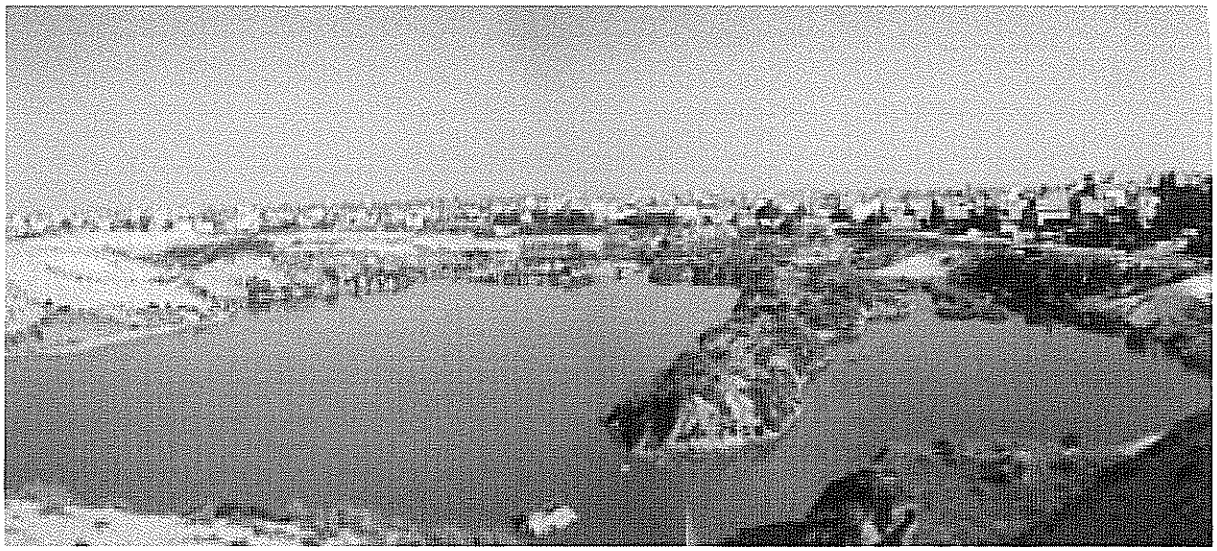


- **Photos of KY WWTP Eastern Site**

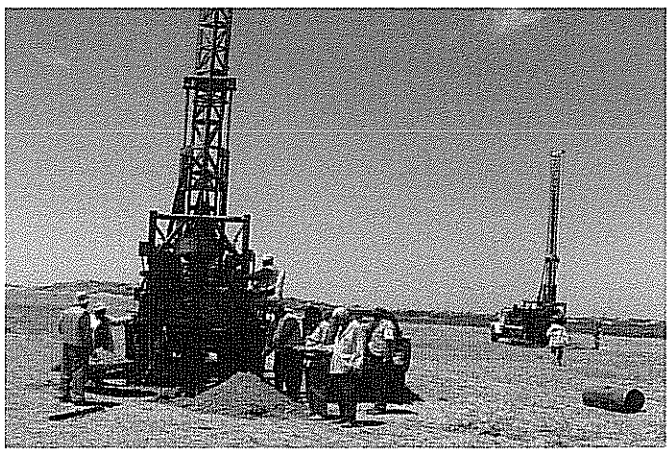


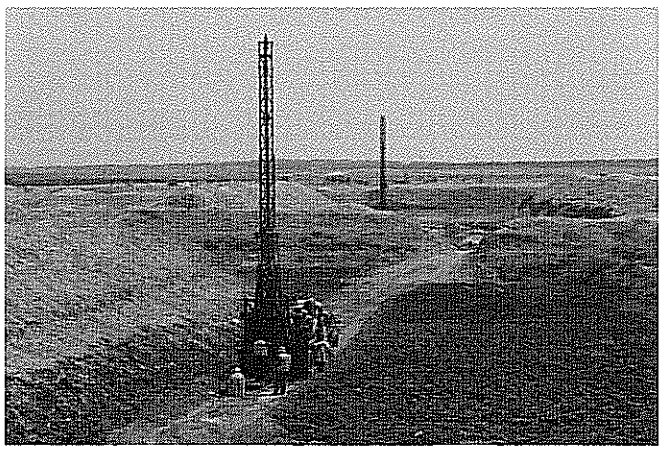
- **Photos of Temporary Waste Water Disposal Lagoon (Storm Water Lagoon) West of Khan Younis**

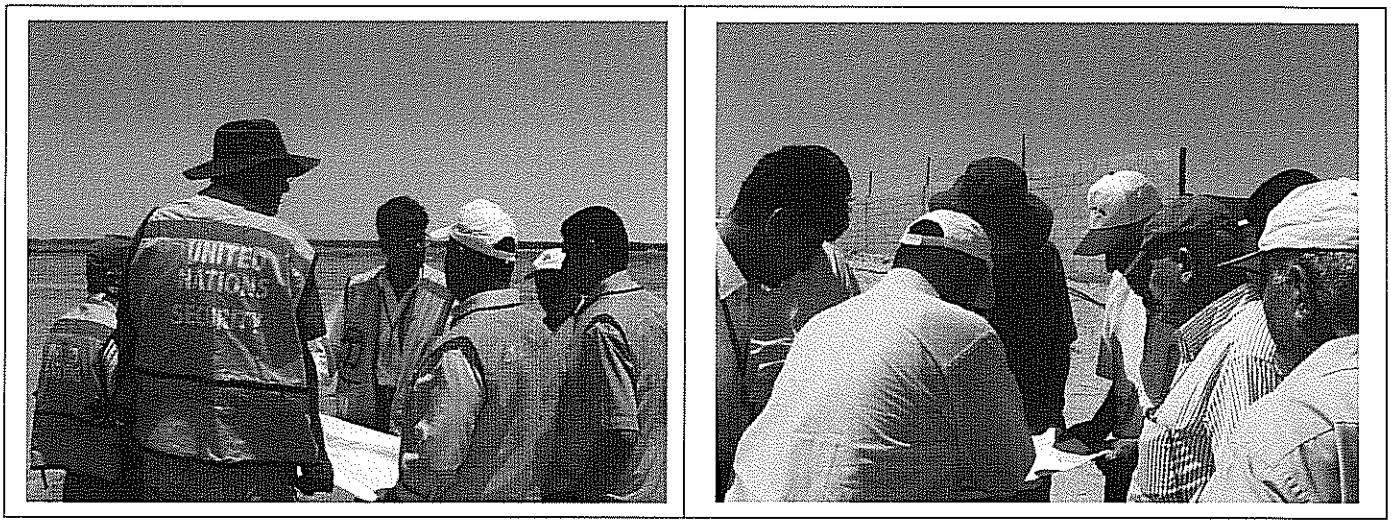




- **Photos of Geotechnical Investigations & International Consultant Mission (KY WWTP Eastern Site & Infiltration Areas)**

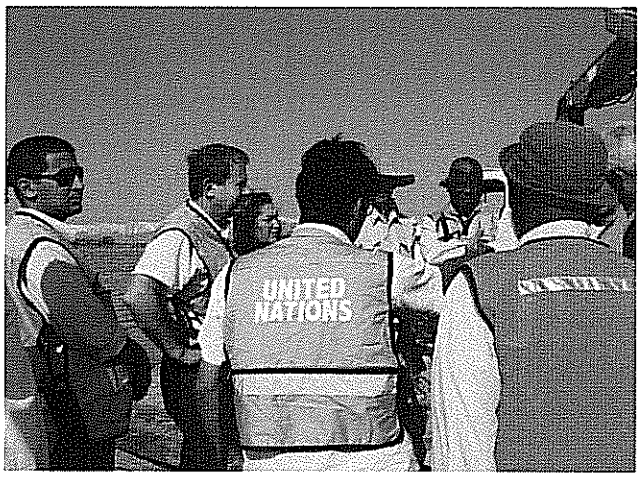






- **Photos of Geotechnical Investigations in Al Fukhari Infiltration Areas, EIA On-Site Baseline Data Collection.**

- **Photos of Project's Site Visit of the UNDP SR & Head of UNDP/PAPP Gaza Office,**



- **Photos of Public Hearing Meetings & EIA Public Hearing Workshop**

6. **Report authorization by UNDP/PAPP**

Reporting person, his/her title and belongings : Ashraf Abu Shamala , Project Manager
Reviewed and cleared by: Husam Tubail, Programme Analyst, environment and natural resources unit_UNDP/PAPP
Date of submission: 8 October 2010
Supervisor's name and his/her signature: Rima Abu Middain , Natural Capital Team Leader

السلطة الوطنية الفلسطينية
وزارة الصحـــــــة
الإدارة العامة للرعاية الأولية

Palestinian National Authority
Ministry Of Health
General Administration of P.H.C

التاريخ :-2008/11/02

السيد/ مدير عام مصلحة مياه بلديات الساحل المحترم
السيد/ مدير عام وزارة الزراعة المحترم

السلام عليكم ورحمة الله وبركاته،،،،

الموضوع/ برك تجميع المياه العادمة في منطقة المواصي بخانيونس

يرجى التكرم بالعلم بأن نتائج التفتيش الصحي الميداني وفحوصات المياه المخبرية للعديد من الآبـار الزراعيـة القريبـة مـن الأحواض تشير إلى وجود تلوث واضح وكبير في معظم الآبار المحيطة بالبرك. وخاصة من الجهة الغربية حيث يوجد العديد من السكان والأسر التي تعيش في تلك المنطقة والتي تعتمد بالدرجة الأولى على مياه الآبار الزراعية الخاصة لأغراض الشرب بسبب عدم وجود شبكات مياه شرب في تلك المناطق مما يعرض صحة الاهالى للخطر الشديد.

لذلك وحفاظا على صحة وسلامة المواطنين يرجى التكرم بالعمل على اتخاذ الإجراءات التالية:-

1. توفير مياه شرب آمنة لسكان المناطق المتضررة بالسرعة القصوى .
2. مناشدة سكان المنطقة بعدم شرب المياد من آبارهم الزراعية لعدم صلاحيتها للشرب .
3. إيجاد حل عاجل لهذه المشكلة الخطيرة قبل وصول التلوث إلى معظم منطقة المواصى وذلك من خلال العمـل علـى ضخ المياه العادمة إلى منطقة صوفا على الحدود الشرقية حيث المكان الطبيعي المخصص لذلك حسب الخطة المعـدة سابقا .
4. عمل مناشدة لكافة المؤسسات المانحة للإسراع في تمويل وانجاز المرحلة النهائية لمشروع مجارى خـانيونس الـذي يضمن معالجة سليمة وآمنة لهذه المجاري.

برجاء اعتبار هذا المشروع في غاية الأهمية والسرعة الممكنة

شاكرين لسيادتكم حسن تعاونكم

وتفضلوا بقبول فائق الاحترام والتقدير

وزارة الصحة
الإدارة العامة للرعاية الأولية
الرقم: ٢٢٠٨
التاريخ: ٢٠٠٨/١١/٥

مدير عام الرعاية الأولية
بوزارة الصحة
الدكتور / فؤاد عبد الحليم العيسوي

صورة/ للسيد معالي وزير الصحة
صورة/ نائب رئيس سلطة المياه
صورة/ للسيد رئيس جمعية المواصى الخيرية
صورة/ للسيد مدير صحة محافظة خانيونس
صورة/ للسيد مدير دائرة صحة البيئة
صورة/ للسيد رئيس قسم مراقبة المياه

Municipality of Khan Younis
Department Wastewater and Water

بلـــديـــة خـــان يونـــس
دائـــرة المـياه و الصرف الصحى

التاريخ: ١٦/٧/٢٠٠٩م

KhanYounis Municipal Water Wells

Results of Chemical Analysis

No.	Well Name	PH	E.C mho/cm	T.D.S mg/L	Nitrate mg/L	Chloride mg/L	Sodium mg/L	Calcium mg/L	Magnisium mg/L	Potassium mg/L	Hardness mg/L
1	Old Amel Well L (159)	7.31	3100	1922	458	609.5	380	155.5	101	10	804
2	New Amel Well L (159 A)	7.3	2200	1364	369.2	394.4	260	121.8	78	5.5	626
3	AL Sada Well	7.4	3900	2418	360.1	867.7	630	128.7	100	6.5	734
4	Al Ahrash Well	7.37	3150	1953	365.7	731.4	430	146.9	102	4.5	788
5	Eastern Well L (41)	7.49	4500	2790	218.4	1004	910	73.4	46	5.6	372
6	Aia Well L (43)	7.41	4050	2511	420.4	867.7	600	188.4	109	7.2	918
7	South Well AL Shair (L 176)	7.74	2360	1463	147.7	544.9	360	87.3	59	4.6	462
8	New South Well L (182)	7.6	3870	2399	106	1045	650	94.2	61	5.5	488
9	Abo Rashwan A L (184)	7.64	2600	1612	104.5	593.1	370	96.8	49	3.4	445
10	Abo Rashwan B	7.6	4100	2542	128.5	972.5	630	151.2	81	5.5	713
11	AL Satar Abu Gafer L (87)	7.34	5210	3230	88	1221	1060	79.5	54	10	421
12	North AL Sater Well L (190)	7.49	5566	3447	159.8	1336	1130	90.7	55	6.3	554
13	Sport City Well	7.44	3850	2387	60.6	874.9	800	59.6	37	4.2	302
14	Al Tahady Well L (189 A)	6.44	2590	1606	257.7	544.9	340	131.3	63	4.4	590
15	Maan Well	7.52	4800	2976	104.5	1162	1020	76	49	5.6	393
16	Al Nagar Well	7.61	5900	3658	132.7	1593	1020	157.2	91	7.6	767
17	Culture Center Well L (198)	7.32	3100	1922	119.4	623.9	630	51	35	3.3	270
18	AL Mawasy Well	7.78	481	298.2	57.5	68.97	45	36.6	17	2.1	158
19	AL Aqsa Well Sea	7.1	621	385	77.3	85	46.5	37	35	2.2	238
20	North UNRWA Well	7.82	1020	632.4	157.6	158.6	105	61.3	35	2.6	296
21	South UNRWA Well	7.8	932	577.8	167.5	151.7	70	71.7	40	2.3	346
22	AL Istaad Club Well	7.54	4910	3044	143.8	1276	930	112.3	62	13.5	536
23	New Satar No (1) Well	7.91	1201	744.6	339.9	107.6	60	105	52	2.7	475
24	New Satar No. (2) Well		913	548	228	106					

م. يوسف الحاج يوسف
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