State of Palestine

Coastal Municipalities Water Utility

Gaza Water Supply and Sewage Systems Improvement Program

Annual Progress Report 2014

January 2015

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This annual report has been prepared by the Coastal Municipalities Water Utility (CMWU) operational team. The report is mainly composed of all relevant activities progress schemes implemented from January to December 2014 .

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Great thanks should be mentioned here for the hidden soldiers PWA and CMWU staff in cooperation with all different municipalities water and wastewater teams who were working during the offensive war to secure access for water and to ensure the minimum services of wastewater.

INTRODUCTION

Throughout this year, all efforts and activities have been directed in parallel towards implementing the essential required water and wastewater projects and managing set of operational and maintenance tasks which are playing great role to improve the level of services for the people in Gaza strip. Hence to achieve the following;

a) Keep managing and monitoring the performance indicators since they are very important to keep the functionality of the utility.
b) Coordinate among CMWU different departments of head quarter and the Regional offices to improve the performance indicators; especially the collection system and treatment efficiencies.
c) Plan for projects in coherence with the strategic plan.

During the past project year ,and in particular the months of July and August 2014 ,the whole Gaza strip was under war conditions initiated as part of the Military operations by Israel where the whole living and life aspects were under direct threatening and firing with more than 400,000 people displaced away from their homes towards safer places . CMWU operation field teamwork's with assistance of several funding agencies and with full co-ordination set-up produced by ICRC have continued with full determination to provide for all possible fast track damages repairs and facilities operation to secure the minimum level of services towards heavily populated districts and more than 90 shelters , while the other damages repair are included in the coming projects mainly funded by WB-AF1, ICRC, KFW and UNICEF.

Also, the Gaza Strip has continued to be under restrictions across the borders' commercial gates except for minimum requirements of living and some selective materials for development projects. These restrictions and control over materials and equipments deliveries through the borders gates have continued to cause several development strategies and plans to be in a noticeable delay and have affected on PWA and CMWU efforts to keep the service running without any main or major breakdown. This has tighten the PWA and the CMWU from developing and implementing their plans by enhancing the services through delivering accepted water for drinking and other usage as well as construction of waste water treatment plants.

Meanwhile the difficulties are everywhere in the service area; so the challenges are the motivated forces to CMWU staff to run the services and even sometimes attract the donors to implement some of the developmental projects. Also, the Israeli siege on Gaza Strip is still hindering the PWA, CMWU and their partners in the donor's community of getting into Gaza Strip some of the needed equipments, materials and spare parts and movement of some staff in order to improve the services provided to the inhabitants of the Gaza Strip,

CMWU teamwork continues to manage and implement various repair, refurbishment and overhauling works related to more than 247 water wells, 26 water Storage tanks, 10 water desalination plants, 16 water booster stations, 42 wastewater pumping stations, 4 waste water treatment plants, water networks, storm water networks, sewage collection networks and basins with all associated equipments and systems upgrading and monitoring requirements. Purpose has been kept with high level of response towards several events of preventive and corrective repair and maintenance activities to minimize the risk of breakdown and operation time lost. Therefore, many services contracts launched during this period of the project, with local contractors for specialized upgrading, maintenance and repair needs e.g. generators, deep well water pumping sets...etc.

The poor reliability of electrical power supply grid with overall deficit of about 40% and sometime goes down to 60% connecting the water and wastewater facilities including water wells, pumping facilities and treatment works continues with its harsh negative impacts to create a lot of damages

and loss of services at various sites. In addition to the moderate production of Gaza power generation plant ranges from (50-75 MW), Gaza electricity Distribution Company (GEDCO) has continued to claim that the lack of regular fuel supplies and absence of construction and spare parts materials make it impossible in some how to do any upgrading or services improvement with this regard.

Several financing and humanitarian agencies e.g. World Bank, IDB, GCC, QRC, TIKA, ICRC, UNRWA, UNDP, UNICEF, GVC, OCHA (HRF),PAH,CARE, ACF, KFW,QC and others have continued to play their great roles to assist and facilitate the delivery of fuel and materials but with limited capabilities and interventions. Therefore, it has become relatively so difficult to fulfil and complete other planned projects implementation programs in the due time.

Moreover ,the war conditions occurred during July and August 2014 have harshly affected several operation and control aspects of both water and wastewater services with regard to life threatening conditions which make it impossible some times to monitor systems behaviours from operational point views towards dynamic changeable services demands .Also, most of materials stocks and consumables were rapidly exhausted and consumed to provide for system fast track repairs carried out during the Seize fire times and after the end of protective edge operations in September 2014 .

TECHNICAL PROGRESS ACTIVITIES

This report describes the progress achieved during the period from January to December 2014. The running activities are being classified into different categories such as water wells activities; water networks activities, Water Storage Tanks, wastewater networks and plants activities, mechanical and electrical activities. However the achievement and indicators calculation shall be applied for 10 months only and the war months of July and August 2014 shall be excluded .

1. IMPROVING QUALITY & QUANTITY OF WATER

*refer to Annex 1 for Performance Indicators Table

1.1 Overall Water Distribution System Efficiency

Throughout implementing the 2nd year of WSSSIP project, CMWU has continued monitoring program in order to improve the overall efficiency of the existing water distribution systems. Due to the prevailing conditions occurred during military operations ,**the 2nd year target of 65% has been changed to be 66% end of 2017 . The annual monitoring records cannot reflect the real situation as the system efficiency reached 62% with 38% UFW in the last quarter of year2014.** By the end of December 2014 the system efficiency has been improved beyond its records in the third quarter of the year (new base line of AF1) demonstrating an excellent performance and conclusion to this task within the targeted areas of southern and middle governorates.

Efforts to improve the overall system efficiency have continued to be made through the 2nd year of WSSSIP . PMU and CMWU believe that through the initiatives and procedures currently in place will allow the system efficiency to be monitored and improved with similar focus in the future.

The improved management of data introduced by CMWU continues to be a valuable tool to monitor and report the overall system efficiency each month. Meter readings continue to be collected by the Municipality and regional areas staff. Although new data collection and verification procedures were introduced, some difficulties were experienced in the municipal

reports; this required CMWU to perform additional verification crosschecking and refinement of the submitted figures.

The overall annual system efficiencies recorded to date are as follows:

Table 1. Overall Annual Water Networks System Efficiencies -Year 2014 /Middle and Southern Governorates

Month/2014	System Efficiency%
January	69.89%
February	67.95%
March	64.08%
April	63.01%
May	63.88%
June	60.58%
July	59.56%
August	59.70%
September	57.10%
October	61.99%
November	62.52%
December	63.30%
Average System Efficiency	**63%**

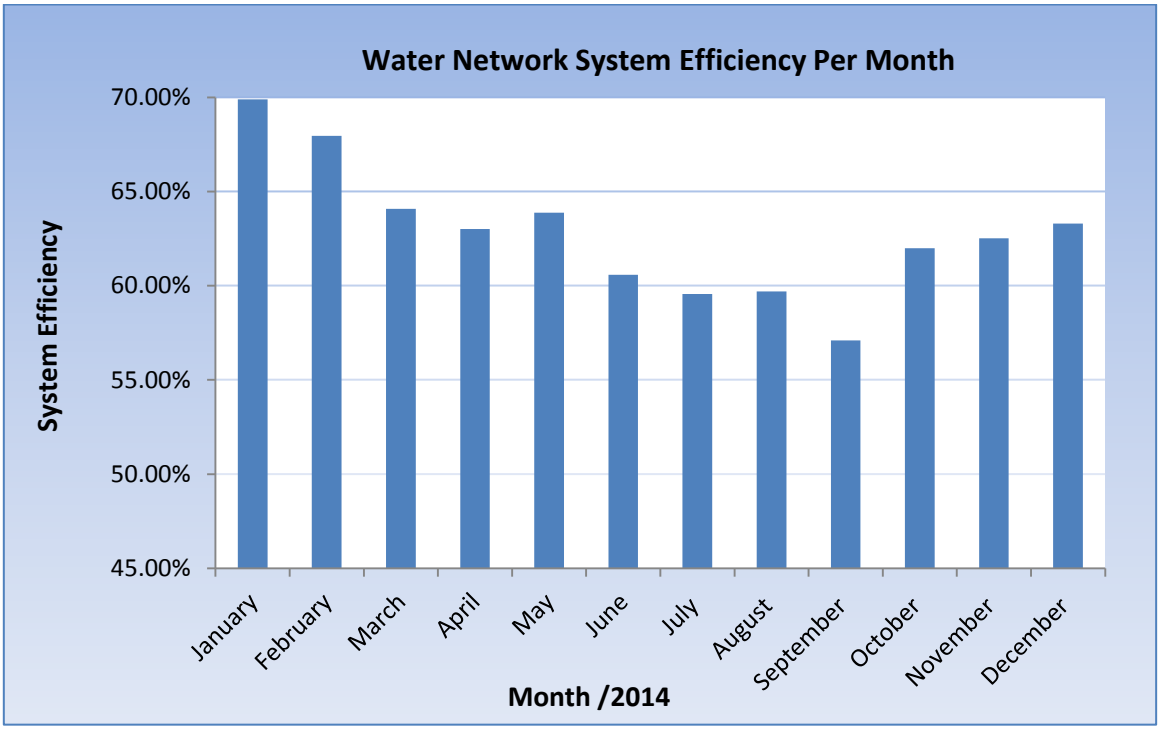


Figure 1: Overall Annual Water Networks System Efficiencies -Year 2014 /Middle and Southern Governorates

The low system efficiency occurred during months April and May 2014 can be attributed to the large number of illegal connections mainly in Khan Younis and Middle area municipalities. Also, the low system efficiency for the months June to October 2014 is due to war catastrophic results on Gaza.

The efforts and initiatives to improve the system efficiency have continued during the 2nd year of WSSSIP project, these are outlined below:

- Network Rehabilitation:

The water mains rehabilitation and repair program in the 20 targeted municipal areas have continued to be applied by CMWU repair and maintenance team, works including mobile workshop specialized for such purposes . All the sites have been successfully handed over and operated again. The work for the construction and rehabilitation program of water distribution networks was carried out based on criteria that was oriented towards reducing the unaccounted for water of both commercial and technical characteristics including disconnection of illegal connection .

Figure 2 : Water networks Repairs and installations

- Meter Installation:

The meter installation program has been initiated and continued during the period of this report from January to December 2014. It is anticipated that the effect of the installation of new accurate meters, particularly replacing blocked meters, will continue to improve the overall efficiency of the system. During the period of 12 months of project 2nd year, a total of 9100 meters were issued and installed throughout different areas to replace blocked meters and to provide for new connections as well.

The meter installation program has continued to cover non-metered buildings including Hospitals, Schools, Mosques, Universities, Parks, etc. which are consuming water that is

unaccounted for either financially in terms of revenues, or technically in terms of cubic meters of water consumed. The responsibility of the municipalities to take the readings of these buildings even if they are exempt from water fees has been discussed at municipal level.

- Water Networks Repair and Maintenance:

A comprehensive network repair and maintenance program was introduced to the targeted areas during the 2nd year of WSSSIP Project. Also, during this period of project and as a result of military operations occurred in Gaza strip during July and August months excessive emergency repairs job orders and fast track rehabilitation of damaged water networks have been applied by CMWU crews and its service contractors working in the field during seize fire periods and after the end of war . Several works of water networks repairs were directly initiated and applied to provide for all emergency damages repairs which will enable the reactivation of water supply system at various areas of Gaza strip municipalities.

This program has been implemented in co-operation with the municipalities and regional offices network repair staff. CMWU procures the repair materials and issues them to the teams in a well-controlled procedure. The Municipal crews carry out the repairs under the supervision and support of the CMWU's staff. Repair materials including repair clamps, MDPE fittings and joints and couplings continue to be issued to the municipalities from CMWU stores.

A summary of the 714 repair jobs performed during the period from January 2014 to end of December 2014 are listed in the following table

Table 2. Networks Repair Jobs January – December 2014:

Annual Water Networks Repair Monitoring Records - Number of repairs													
No.	**Municipality**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
1	Al Zahra	1		3		1	2	2	3	5	3	2	1
2	Wadi Gaza		2		3	1	1	4	6		3		1
3	Musader	2		2			2	1	1		2		
4	Wadi Al salqa		2	2			1	2	2	10		1	3
5	Moghrakah	1		2		3		3	1	4	2		1
6	Buraij	3		2		3	2	1	2	6	5	2	
7	Maghazi	3	6	16	3		2	2	3	9	1		2
8	Deir Balah	10	8	4	7	5	3	2	4	15	15	10	2
9	Zuwaida	2		3		2	4	4	2	3	1	2	
10	Nusirat	3	2	4	5	4	4		6		6		7
11	Khan Younis	5	3	6	9	3	2	5	6	18	7	17	7
12	Khoza'a	1	2	1		1	2	3	2	20	5	6	2
13	Qarrara	1	1		3	2		1	2	5	6	3	1
14	Abassan Kabira	1	1	2	2	1	1		1	5	2		2
15	Bani Suhaila	1	2	2	2	4	1	1	2	8	3	1	2
16	Abassan Jadidah	2	1	3		1	1	2	1	7	3	2	
17	Al Fukhari							2	1	5	4		1
18	Al Naser	2		1	2	2	1		2	6	2	1	
19	Al shokah		1	3	3	1		2	2	9	5	2	1
20	Rafah	8	7	11	9	10	10	4	5	16	5	4	4
Total		**46**	**38**	**67**	**48**	**44**	**39**	**41**	**54**	**151**	**80**	**53**	**53**
Total Networks Repairs		**714**											

This program of water distribution networks' repairs has contributed significantly to the reduction of the unaccounted for water. CMWU anticipates that through the efforts put into this task and the procedures developed; the network repair and maintenance program will continue with a similar focus in the future.

1.1.1 Wells Construction Progress:

Due to the destruction of several water wells during the last war in Gaza and having regards to the increasing demand for water in some areas (Deir El Balah, Khan Younis, Rafah and Gaza cities); several water wells are either in progress of construction to be ready for water production or have been put in operation. PMU and CMWU have succeeded to carry out and initiate the following activities listed here below:

1. Complete ,drilling, construction and equipping of new Wadi Salqa water well No. 2 at 50m^3/hr production capacity to serve 7000 inhabitants of Wadi Salqa people in the middle area Governorate funded by WSSSIP project . The water well was purposely drilled to relocate one of the existing wells close to Israel security fence. All works have been completed, tested and the well is now in operational mode. The construction was completed and the well has been brought into operational mode .

2. Complete ,drilling, construction and equipping of new Hiteen water well in Al Nussiarte at 50m^3/hr production capacity to serve 6000 inhabitants of Al Nussirate refugee camp No. 2 people in the middle area Governorate funded by WSSSIP project . The water well was purposely drilled to relocate one of the existing wells close to cemetery . All works have been completed, tested and the well is now in operational mode. The construction was completed and the well has been brought into operational mode .

3. Drilling ,construction and equipping new water wells borehole in Aya reservoir area of Khanyounis city .The works includes for drilling ,and installation of complete vertical turbine water pumping set of production capacity 80m^3/hr to serve 12000 inhabitants complete with all associated electromechanical installations. All works and installations were financed by ACF agency under emergency programs initiated after the end of war events in Gaza this year .

4. Drilling ,construction and equipping new water well of 80m^3/hr production capacity in Abu Naser area of eastern Deir Al Balah funded by ICRC to replace bombed and damaged existing well J146 during the last war .The works and installations have been completed and brought into operational mode .

5. Completion of re-construction of completely damaged and destroyed Abu Marwan well S69 located eastern of Deir Al Balah .The works and installations were funded by ICRC and it produces 80m^3/hr and serving more than 10000 inhabitants of Deir Al Balah residents .

After War

After Rehabilitation

Figure 3 : Abu Marwan S69 Damaged Water Well –Before & After Rehabilitation

6. Construction ,drilling and equipping two new water wells to serve Deir Al Balah area and to replace totally damaged water wells eastern of Deir Al Balah (Abu Hamam wells) .The project shall be financed by WSSSIP- AF1 and each well will produce 60m3/hr to serve in total; about 15000 inhabitants .The works and on site construction shall be started soon .

7. Comprehensive rehabilitation and refurbishment works of completely damaged water well No.1 (War events) eastern of Wadi Al Salqa, which is the only well serves the city of 7000 inhabitants . The water well was repaired and brought back into operational mode with pumping capacity of 60m3/hr .

After War

After Rehabilitation

Figure 4: Wadi Al Salqa well Before & After Rehabilitation

8. Drilling and construction of new water well borehole called here AL Salam well -eastern of Khanyounis of production capacity 50m^3/hr to replace Abu Rashwan water well (C) .The works and installations have been completed and tested ,whereas the project was funded under emergency financing program of ICRC .

9. Construction of Al Shifa water well in Jabalia with production rate 60m^3/hr, funded by Qatar Charity, the work is still in progress (80%)

10. Construction of new water well and Ro desalination plant at Wadi Gaza municipal area, funded by welfare association, the work is still in progress (30%)

11. Construction of Water well and brackish desalination plant 70 m^3/day at Wadi Gaza municipal area, the project funded by Welfare association. the work is still in progress

12. Construction of two water wells in Al Qarara area one is funded by Muslim hands where all works and installations have been successfully completed, tested and the water well is in operational mode. The second is under construction funded by IDB.

13. Construction of new Water well in Jabalia Nazla area with production rate 60 m^3/hr, funded by Muslim hands, the works still in progress (75%).

14. Construction of new water well in Besan area at Beit lahia, the project funded by QF, All works and installations have been successfully completed, tested and the water well is in operational mode.

15. Rehabilitation of two water wells in Jabalia and Beit Hanoun, those wells affected by the last war on July 2014, the work still in progress and project funded by (Save the children).

16. Construction of new water well in Wadi Al Salqa municipal area with production rate 60 m^3/hr, the project funded by Islamic Help, the work is still in progress (10%).

17. Repairing and maintenance most of affected water wells which have been attacked during the last war on Gaza July 2014, these works took place at(Dair El Balah, Rafah, Khuza, Bani Suhila , Beit Hanoun, Jabalia ..)

Figure 5 : Drilling and Equipping of a Water Well

1.1.2 Electromechanical Progress

CMWU has continued to carry out and manage all electromechanical works and installations required to improve the functionality of the water wells and other associated systems providing for optimum operating and maintenance conditions. This will secure and safeguard the water productivity level over different seasonal periods of demand and throughout regional areas.

PMU and CMWU has continued its strategy towards the electrification of all newly constructed water wells and other water facilities e.g reservoirs with booster stations, desalination plants and some of existing wells by connecting them to the public electricity gridlines, all in coordination with Gaza Electricity Distribution Co. (GEDCO).

During the period of this report the works include installation of both high and low tension electrical grid lines with all associated transformers for different water wells have been already initiated as it will be detailed here-below. There are still other facilities waiting the materials entry to Gaza Strip in order to complete connecting all the facilities with electricity.

Supply and installation of several standby power supply generating sets at various water wells and pumping sites to overcome the problems of electricity cut-offs which occur daily in Gaza.

Moreover, CMWU has succeeded to continue the implementation of the following works in water wells at different areas;

- In Awkaf well: Complete rehabilitation of the main panel including replacement of the soft starter RVSDN-105A and all control components with all required cables and wiring process
- In well W1 in Rafah : Replacement of the main cable and rehabilitation of the well including replacement of control components and Measuring instruments.
- In the ground main tank in Rafah Replacement of Two Electronic Cards for the Existing soft starters RVSDN RVSDN-310A
- In Zahra Well in Nussairat Upgrading the MCC Panel including installation of Surge protection and Power factor correction circuits.
- In Hassyna booster in Nussairat installation of Electrical water sensor and associated power supply with all required control relays and timers.
- In EV2 in Bani Suhila replacement of the main 4-pole manual changeover with all required wirings
- In UNRWA Booster in Rafah installation of Ultrasonic water level detector ULTRA-5 with all required control wiring modifications.
- In Al Mughraga Well Upgrading the MCC Panel including replacements of Soft starter RVSDN-145A, two current transformer and the power and control cables with all required connection
- In Kawther Well in Al Mughraga Upgrading the MCC Panel including installation of Manual Changeover 4X100A and replacements of power and control cables with all required accessories
- In Booster Bani Suhila: Replacement of contactors of 20 KW and over loads and replacement of cooling fans with all required modifications.
- In RO. Plant in Bani Suhila : Installation of electrical Water solenoid and replacement of PKZM breaker with all required wirings
- In Well P 148 in Rafah ; Repair of the main ATS of 4X250 A and replacement of the trip unit, two relays and one timer

- In Abu Zuhri Well in Rafah : Make an overhead control connection of 350 Meters for operating the well from P148 well
- In Sea Water RO Plant in Dair al Balah, Replacement of one of the wooden poles holding connection of the well cable, connection of the overhead cable, replacement of six 80 Ampere fuses, replacement of the capacitors in Power factor correction panel and replacement of three circuits breakers MCB 1X20 A and MCB 3X 40 A. The external lighting was also repaired
- In Al Nadda Well in Beit Hanoun : Connection of the main cable and temporary rehabilitation of the well including replacement of the Main breaker and control wires inside the well (the panel was damaged due the war)
- In Aida Well in Beit Hanoun : Connection of the main cable and temporary rehabilitation of the well including replacement of the Main breaker and control wires inside the well (the panel was damaged due the war)
- In S71 In Al Burij Installation of Overhead ABC cable with all required connections, and replacement of all power and control components (the panel was damaged due the war).
- In S72 in Al Burij Complete rehabilitation of the Well cable and the MCC(the panel was damaged due the war)
- In Shawwa Well in Beit Lahia Installation of a Manual transfer Switch 4X160A and Replacement of the soft starter RVSDN-145 with all required control components and circuits.
- In Sa'ada Booster in Khan Younis Repair of the main ATS
- In Zawida Well Installation of new PKZM-63A with over load for the new pump and installation of under volt protection relay.
- In Abassan Booster : installation of Electrical Water solenoid and power supply 24V with all required control circuit and components
- In Fukhari Well Installation of Soft Starter RVSDN-58A.
- In P15 in Rafah; Installation of New soft starter RVSDN-145A
- In P124 in Rafah Installation of Manual Transfer Switch 4X160 A with all required modifications in the MCC panel with all required wiring
- In Heteen well in Nussairat Reconnection of the Main cable by a water proof Shrinkable connection.
- In G56, G57, Ein Jalout and F208 in Nussairat : installation of new under volt protection relays in each well
- In West Zahra Well in Zahra; Rehabilitation of all control connection including replacement of the under volt protection relay.
- In S81, S82 in Maghazi Installation of Control transformer of 220/24V and replacement of the hour meters
- In Rahma Well in Khan Younis: Replacement of the control card for Soft Starter RVSDN-105A.
- In All water wells in Rafah: Rehabilitation of all Internal and External lightings including replacement of all damaged overhead projectors.
- In All water wells in Khan Younis: Rehabilitation of all Internal and External lightings including replacement of all damaged overhead projectors. In all station The panel ampere meters and Multimeters were also replaced by digital units as well.
- Manage and carry out usual inspection of electrical panels and generators at all water wells facilities.

- Carry out several upgrading and refurbishment of electrical installations of lighting system and chlorination pumps at different water wells and pumping facilities all over the Gaza Strip.
- Design; Follow up, supervision, revision and taking over of all new control panels installed at different water wells and booster stations all over the Gaza Strip.
- Supervise and implement the optimum selection of vertical turbine water pumps with high efficiency to achieve energy savings as per cubic meter of water produced.
- Manage the installation of dosing pumps and chlorination equipments at the wells' exits to safeguard the water supplied against any risk of contamination ensuring that the water supplied to the customers is well disinfected with positive residual chlorine levels detected.
- Manage and supervise implementation of specialized service contract.
- Manage and arrange for procurement of all essentially required spare parts and equipment for CMWU warehouse stock recovery program.

A) Standby power supply facilities:

More than **220** standby generators located throughout water and wastewater facilities of rated power ranges from 50KVA to 900KVA are continued to be well maintained, repaired and serviced by CMWU team works and specialized repair and service contracts arranged with local generators dealers.

During the period of this report and as a result of unreliable grid electricity power supply, the generators have continued to be heavily and severely affected by long daily hours of operations which create lots of repair and maintenance needs and parts. The repair records show that more than **278** predictive, preventive and corrective maintenance job orders were carried out and applied at various areas. Also, and as a result of damage assessment report issued by CMWU after the end of Gaza war in July and August 2014 ,more than 40 new electric power supply Diesel generating sets funded mainly by ICRC ,NRC have been newly supplied and installed by PMU/CMWU at various water and wastewater facilities to replace deteriorated sets and to provide other facilities having no standby electrical power supply generators.

Moreover ,five mobile generating sets, four wheel trailer mounted each of 110KVA capacity and five mobile Diesel fuel tanks each of 2000 liters capacity have been made available at five regional areas of Gaza strip governorates in order to enhance and support operation capacities during emergency and war conditions.

Figure 6: Mobile generators and fuel tanks supplied to regional areas

Figure 7: Generator and Fuel Tank Installation in Water Well Facility

B) Mobile mechanical maintenance and repair workshop

- The mobile mechanical service maintenance unit established by CMWU continues to repair many of the municipal water wells faults which used to be repaired in the past by private services.
- Mechanical repairs and refurbishment of 12 water pumping manifolds for both water and wastewater pumping stations.
- Repair and adjustment of 16 water meters for water wells exits
- Arrange for all metal works emergency installations required to connect Al Salam brackish water RO desalination plant in Rafah to Al Brazil water distribution zone.
- Mechanical repair of water distribution valves on the network throughout all operating areas of Gaza strip.
- Carry out several water and wastewater networks repairs, replacement and reconnection works at various CMWU areas along Gaza strip.
- The team was involved in different emergency repairs required at various water and wastewater sites in Gaza strip.

1.1.3 Water Wells Functionality Progress

The functionality of Water Wells Task aims to make sure that all breakdowns of water wells in Rafah Area, Khan younis Area and Middle Area will be rectified in a very short time to achieve the satisfaction of the water customers in those areas.

The functionality of the water production wells will be measured on monthly basis by measuring the efficiency of the water well functionality in each area:

$$\text{Water Well functionality Efficiency} = \frac{\sum Qw * Dw}{(\sum Qw) * Dm}$$

Where:

Qw: flow rate of each well.

Dw: No. of working days of each well in the month

Dm: No of days of the month

Water wells operating hours have been continued to be managed and recorded as per operational registry data-base representing the tool of measurement for the actual level of serviceability and functionality .The records of each water well pumping facility against breakdown and repair down time hours has been traced and calculated for the targeted period from which the annual target of functionality **efficiency for year 2014 has been reached with excellent achievement of 96.2%.**

Despite the continuation of several operational constraints and difficulties by having unreliable electricity power supply from grid lines and shortages of spare parts and fuel supplies, CMWU team work with high level of determination has relatively succeeded to manage on time repairs and maintenance requirements .This reduces the negative impact of faults and breakdown events and safeguard the level of functionality for water wells which represent the major source of water in Gaza strip. Also, it is worthy to mention that the collaborative efforts exerted by O&M team work to reach this level of cooperation with the abnormal situation are remarkable and unique.

The operational availability time for each well has kept secured and ready for operation as per the water demand at various regions. The repair records show that there are no more than two sites of water production wells at the same time out of service waiting for repair or refurbishment.

The monthly monitoring program of water wells functionality measured throughout the services targeted Southern and Middle areas for the 2nd year 2014 has been illustrated here below. Also, it is obviously shown that as a result of catastrophic electricity deficit occurred during the last four months of the year and its negative impact on the sequential occurrence of faults and number of repairs, the monthly functionality efficiency decreases compared with other months, but still the overall annual target of 90% was achieved.

Table 3. The monthly water wells functionality efficiency - Middle and South Governorates

Month	Regional Area	Total No of working hours of all Wells	Monthly Water Production	Sum of flow rates of all wells (QW)	total No. of working days of all wells (Dw)	weighted value	Wells Functionality Efficiency	**Monthly Functionality Efficiency**
		hour	m^3	m^3/hr		Qw* Dw	%	%
January	Khan Youins Area	10703	818744	2429	886	67454	92.58%	**94.12%**
	Middle Area	12016	754859	2314	1060	66179	95.32%	
	Rafah area	7613	613715	1403	548	39904	94.79%	
February	Khan Youins Area	11366	888411	2404	904	68080	94.40%	**93.98%**
	Middle Area	12900	841188	2352	1076	66585	94.35%	
	Rafah area	7657	617639	1394	531	38737	92.62%	
March	Khan Youins Area	12421	973830	2346	936	68581	97.46%	**95.56%**
	Middle Area	14627	922223	2333	1066	65614	93.75%	
	Rafah area	8746	686842	1430	552	40919	95.40%	
April	Khan Youins Area	12695	1008650	2451	949	70552	95.94%	**96.93%**
	Middle Area	14719	941103	2352	1120	69150	98.02%	
	Rafah area	8899	712592	1392	516	40455	96.85%	
May	Khan Youins Area	13856	1069860	2664	1046	77625	97.14%	**97.56%**
	Middle Area	15374	995774	2363	1076	69239	97.66%	
	Rafah area	9486	753278	1400	528	41245	98.17%	
June	Khan Youins Area	13280	1110695	2490	1065	73130	97.90%	**98.18%**
	Middle Area	15250	982764	2350	1100	69195	98.15%	
	Rafah area	9366	730106	1467	560	43447	98.70%	
July	Khan Youins Area	23840	1555965	4580	2060	128345	93.41%	**92.71%**
	Middle Area	25805	2509878	4236	2120	115433	90.83%	
	Rafah area	17453	1378138	2139	970	60897	94.90%	
August	Khan Youins Area	12741	984499	2653	1058	78111	98.13%	**97.40%**
	Middle Area	14567	908870	2348	980	68140	96.73%	
	Rafah area	9963	754568	1433	548	41765	97.14%	
September	Khan Youins Area	14512	1104289	2560	1000	75485	98.28%	**98.76%**
	Middle Area	14888	919317	2212	1070	65714	99.05%	
	Rafah area	10030	777295	1332	506	39643	99.20%	
October	Khan Youins Area	12184	902417	2358	972	69651	98.48%	**98.13%**
	Middle Area	14272	882719	2263	1101	66091	97.37%	
	Rafah area	8834	683576	1388	532	41137	98.77%	
November	Khan Youins Area	12015	884369	2350	1064	68750	97.52%	**97.50%**
	Middle Area	13877	865064	2214	1085	65091	98.00%	
	Rafah area	8520	669904	1350	540	39137	96.64%	
Average Annual water Wells Functionality Efficiency %								**96.2%**

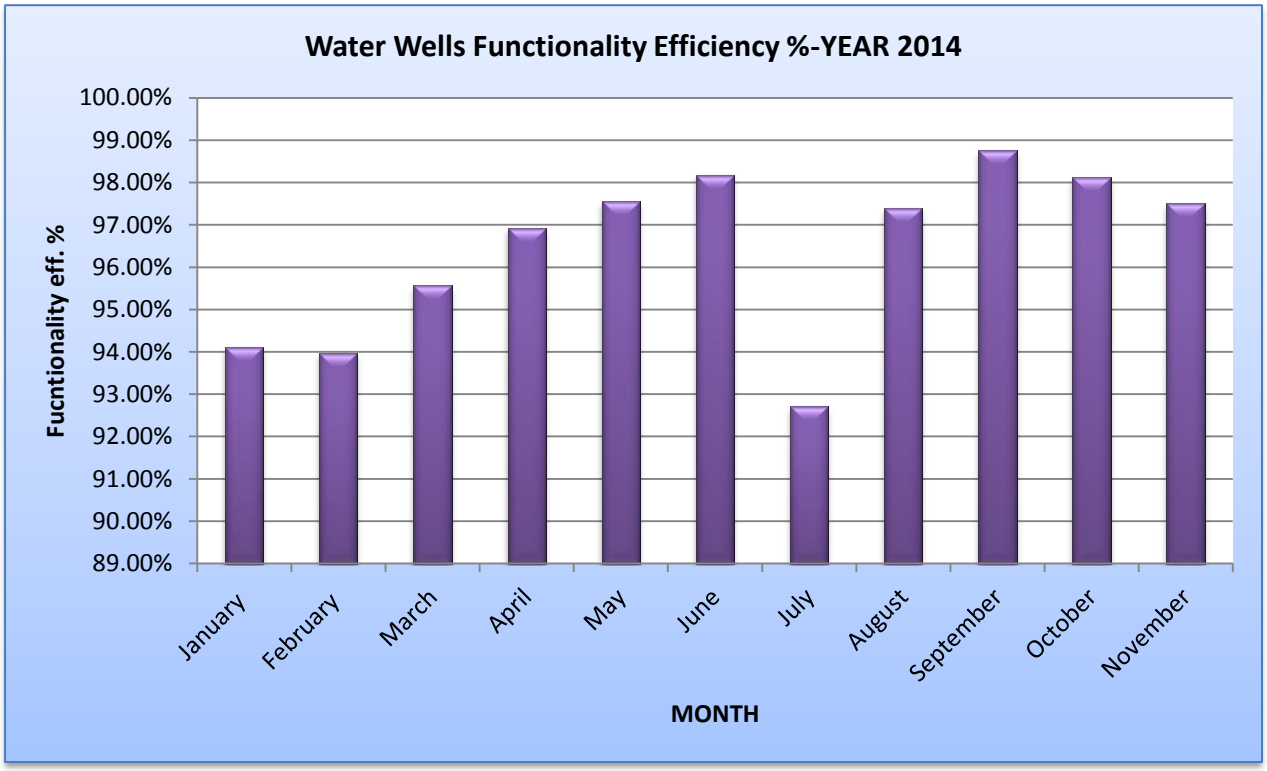


Figure 8: Monthly Functionality Percentage for served Areas-Year 2014

The registry of major mechanical and electrical repairs and maintenance job orders show that during this period 384 job orders of various mechanical and electrical repair upgrading were carried out and technically categorized as follows:

- Follow up the repair and maintenance of electrical faults related to pumps electrical drive motors and associated systems.
- Electrical upgrading and repair of control switchboards
- Power supply connections and cabling between the grid and the electrical control switch board.
- Repair and upgrading of PLC controllers
- Replacement of control instrumentation e.g. pressure switches...etc
- Continue to carry out and manage remote monitoring system for water wells, where additional 10 sites have been added to the existing system of four pilot water wells sites .The system was initially designed to register for faults notification and some data acquisition.
- Mechanical repair of deep well vertical turbine water pumping sets and submersible pumps of water wells, where 25 main jobs of vertical turbine pumps replacement were completed this year.
- Refurbishment and repair of water wells' exit pumping manifolds.
- Replacement of deteriorated sand removal hydro cyclones.

The following works represents part of the main categories listed here above:

- Carry out 72 jobs of repairs, replacement, new installations and M&E works for chlorine dosing systems which are essentially required for water disinfection systems throughout all water production facilities.
- Manage and carry out complete mechanical overhauling and refurbishment of pumping manifolds of water wells where 35 sites in Khanyounis and Rafah and the middle area have been covered during the period of this report.

1.1.4 Water Wells Energy Consumption

The objective of this task is to manage the energy consumption in the water wells, by continued measuring the Specific Energy Consumption for all water wells in the three targeted regional areas and calculated as follows:

$$\text{Specific Energy Consumption (KWh/m3)} = \frac{\text{Consumed Energy in KWH}}{\text{water produced in m3}}$$

During the 2nd year of WSSSIP project of 2014, the prevailing conditions of electricity cut off occurred and scheduled on daily basis has become part of the operating inputs and conditions for the systems in Gaza strip, and the annual targeted value of specific power consumption of water production wells within the targeted areas as defined lately by WSSSIP-AF1 project have been improved to reach **0.424 KWh/m^3** of water produced from wells where the base value after the war was **0.55 KWh/m^3**

CMWU has continued to manage the efficiency of the pumping equipment utilized in the water wells, where more than 18 water wells pumps turbines throughout several services areas have been replaced and changed by new more efficient turbines by IsDB parallel fund. This intervention improves the pumping efficiency and reduces the specific power consumption for each cubic meters of water produced under the same hydraulic conditions. The management program set for monitoring of energy consumed by water production wells shows that during the 2nd year 2014 of project period , the overall specific Energy consumption in the three targeted regional Areas is **0.424 KWh/m^3**,all as illustrated here below:

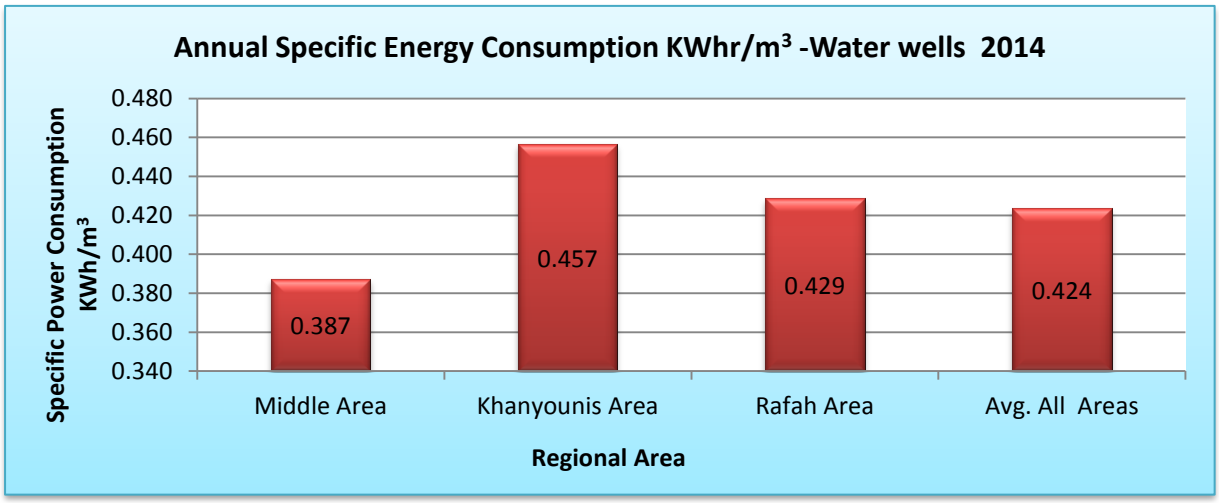


Figure 9: Annual Specific Energy Consumption 2014

1.1.5 Water Quality Monitoring Progress

Improve Water Disinfection

The project 2nd year target as well as 1st year target of 99.0 % coverage has been very challenging, the maximum recorded disinfection efficiency for the period from January to December 2014 approaches around **99.6%** by the end of December 2014**.** Over the period of the 2nd year ,the disinfection efficiency has progressively increased successfully maintaining a high level of Chlorination throughout the water distribution network in all Gaza strip governorates . As indicated through the chlorine monitoring program, CMWU is confident that 100% of the networks can be disinfected using the chlorination systems installed. Managing and sustaining this maximum efficiency through the effective maintenance and repair program has resulted in an excellent performance and conclusion to this task. However ,and as a result of life threatening conditions occurred during ware months July and August in Gaza ,it was so difficult for technicians and operators to carry our field testing and collecting relevant data ,but CMWU has succeeded to secure disinfection solutions (sodium hypochlorite 10% active chlorine down to the water wells and pumping facilities .
The disinfection efficiencies recorded as part of the Chlorine Monitoring Program are illustrated in the graph below:

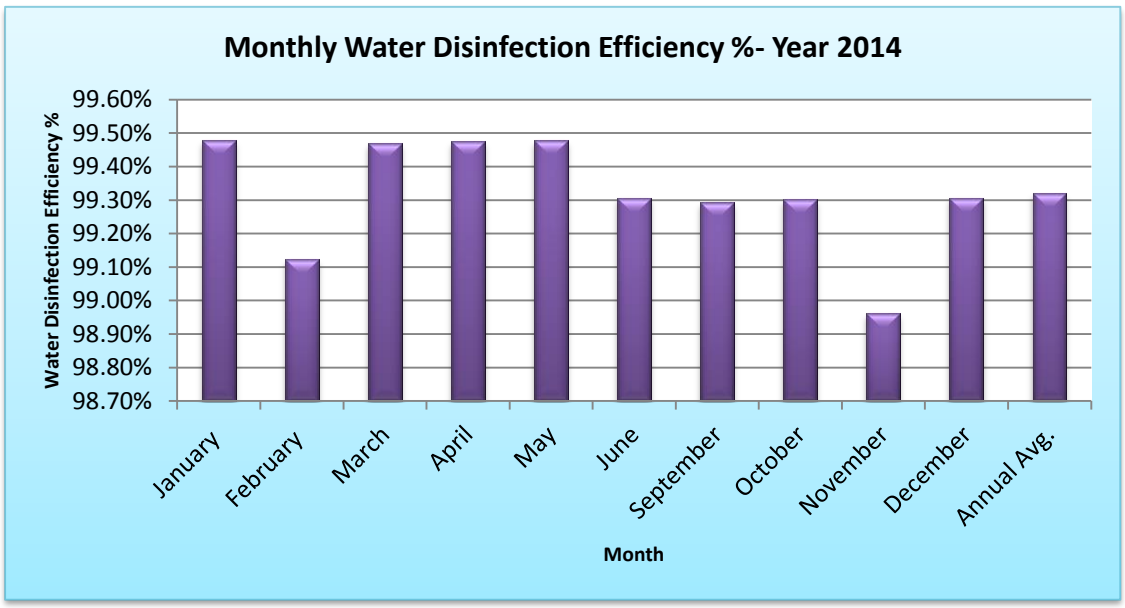


Figure 10: Monthly Water Disinfection Percentage 2014

a) Chlorine Supply and Delivery

Since the start of 2nd year 2014 of WSSSIP Project ,a total quantity of 970 m^3 of Sodium Hypochlorite NaOCl (10%-12% active chlorine) has been managed ,supplied and distributed to the water production and treatment installations throughout all Gaza Strip governorate . The scope of chlorine delivery and supply contract managed by PMU and CMWU has included in addition to Chlorine, other water treatment chemicals necessary for the operation of both 10 brackish and one sea water desalination plants in Gaza strip. This includes Hydrochloric Acid, citric acid, Sodium Metabisulfite, Caustic Soda and Anti-scalant and ferric chloride.

Figure 11: Chlorine Dosing Unit & Chlorine filling in water well

The provision of these chemicals is essential to the operation of the desalination plants, and contributes significantly to the improvement of water quality in the areas supplied.
The supply and delivery follow almost the same procedures introduced as per WB procurement guidelines for the supply and delivery of Chlorine. The table below shows the quantities of chemicals supplied to the desalination plants during 2014.

Table 4. Supplied Chemicals January-December 2014

Chemicals Supplied From 1st Jan 2014 to End December 2014 (Ton)		
Municipality	Chemical	Quantity (ton)
Khan Younis (Desalination Plants L43/L87)	Hydrochloric acid	17.5
	Caustic Soda	21
	Sodium Metabisulfite	1.3
	Antiscalant	8.5
Rafah (Desalination Plants Salam/Sheoot)	Hydrochloric acid	5.5
	Caustic Soda	7.5
	Sodium Metabisulfite	1
	Antiscalant	7.5
Bani Suhaila (Desalination)	Antiscalant	8.5
Deir Al Balah Brackish water J32	Hydrochloric acid	4.5
Deir Al Balah Sea Water Desalination Plant	Caustic Soda	4
	Sodium Metabisulfite	0.50
	Antiscalant	6.7
	Hydrochloric Acid	8.5
Al Nussirate Ro Desalination Plants –Taj Al Waqar &Al Forqan	Caustic Soda	6
	Sodium Metabisulfite	1.5
	Antiscalant	9.5

b) Residual Chlorine Monitoring Program

The monitoring program continues to be performed in all the municipalities and regional areas on a regular basis using the Photometer test kit, which was made available to the health department of each municipality. Consumables required to run the program were provided as planned in the standard disinfection procedure.
Tests are being carried out for free and total chlorine on a fixed number of sampling points of 570 locations (sampling points) carefully selected to give a true representation of the whole distribution network. The results of the program continue to be saved in the database designed to establish a historical reference, where detailed Monthly disinfection reports are monthly produced and issued.

It is clearly shown that by the end of December 2014 there is a significant achievement in which the disinfection efficiency targets of the network has been progressively approached and reached the task targeted values.

The test results show a maintained residual chlorine level that is consistent within each municipality. During the project 2nd year 2014 CMWU has continued to monitor the reports of high chlorine levels through the customer complaints whereas the strength of the chlorine solution has been reduced by dilution before it is injected into the network or in some cases dosing pumps have been replaced to match the dosing requirements.

The results of the monitoring program are summarized in the table provided here below:

Table 5. Monthly Water Disinfection Monitoring Program from Jan-June 2014

No.	Municipality	No. of Samples	1-Jan		1-Feb		1-Mar		1-Apr		1-May		1-Jun	
			Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative –No. Samples	Positive – No. Samples
1	Um Al Nasser	9	0	12	0	9	0	9	0	9	0	9	0	9
2	Beit Hanoun	19	0	19	0	19	0	19	0	19	0	18	1	19
3	Beit lahia	26	0	26	0	26	0	26	0	26	0	26	0	26
4	Jabalia	42	0	42	1	42	0	42	0	42	1	43	0	42
5	Gaza	86	0	85	1	85	0	84	0	84	0	85	1	84
6	Wady Gaza	12	0	12	0	12	0	9	0	12	0	12	0	12
7	Al Moghraka	12	0	12	0	12	0	12	0	12	0	12	0	12
8	Al Zahra	12	0	11	1	10	0	10	1	11	1	12	0	12
9	Al Nusseirate	24	0	24	0	24	2	24	0	24	0	24	0	24
10	Al Burij	20	1	19	0	20	0	20	0	19	1	20	0	20
11	Al Maghazy	24	0	24	0	24	0	24	0	24	0	24	0	24
12	Al Zawaida	24	1	22	0	23	0	22	0	24	0	24	0	24
13	Al Mussader	12	0	12	0	10	0	10	0	12	0	11	1	12
14	Deir Al Balah	30	1	30	1	28	0	30	0	30	0	30	0	30
15	Wady Al Salqa	12	0	12	0	12	0	12	0	12	0	12	0	12
16	Al Qrara	16	0	16	0	16	0	16	0	13	0	16	0	16
17	Khanyounis	44	0	43	0	44	1	44	0	44	0	44	0	44
18	Bani Suhila	20	0	20	0	20	0	20	0	20	0	20	0	20
19	Abssan Al Kabera	18	0	18	0	18	0	15	0	17	0	17	0	17
20	Abssan Al jadeda	16	0	16	0	16	0	16	1	16	0	16	0	16
21	Khezaa	16	0	16	0	14	0	16	0	16	0	16	0	16
22	Al Fokhary	12	0	12	0	12	0	12	0	12	0	12	0	12
23	Al Nasser	12	0	10	0	12	0	12	0	12	0	12	0	12
24	Al Shuka	12	0	12	0	12	0	12	0	12	0	11	0	12
25	Rafah	46	0	46	1	45	0	46	1	46	0	46	1	46
Total		576	3	571	5	565	3	562	3	568	3	572	4	573
Monthly Disinfection Efficiency			**99.48%**		**99.12%**		**99.47%**		**99.47%**		**99.48%**		**99.31%**	

Table 5. Monthly Water Disinfection Monitoring Program from July -December 2014

No.	Municipality	No. of Samples	1-Jul		1-Aug		1-Sep		1-Oct		1-Nov		1-Dec	
			Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative – No. Samples	Positive – No. Samples	Negative –No. Samples	Positive – No. Samples
1	Um Al Nasser	9	0	12	0	9	0	9	0	9	1	9	0	9
2	Beit Hanoun	19	0	19	0	19	0	19	1	19	0	18	0	19
3	Beit lahia	26	0	26	0	26	1	26	0	26	0	26	1	26
4	Jabalia	42	0	42	0	42	0	42	0	42	1	43	0	42
5	Gaza	86	0	85	0	85	0	84	1	84	0	85	1	84
6	Wady Gaza	12	0	12	0	12	0	9	0	12	0	12	1	12
7	Al Moghraka	12	0	12	0	12	1	12	0	12	0	12	0	12
8	Al Zahra	12	0	11	0	10	0	10	0	11	0	12	0	12
9	Al Nusseirate	24	0	24	0	24	0	24	0	24	2	24	0	24
10	Al Burij	20	0	19	0	20	0	20	0	19	0	20	0	20
11	Al Maghazy	24	0	24	0	24	0	24	1	24	0	24	0	24
12	Al Zawaida	24	0	22	0	23	0	22	0	24	0	24	0	24
13	Al Mussader	12	0	12	0	10	0	10	0	12	1	11	0	12
14	Deir Al Balah	30	0	30	0	28	0	30	0	30	0	30	0	30
15	Wady Al Salqa	12	0	12	0	12	0	12	0	12	0	12	0	12
16	Al Qrara	16	0	16	0	16	0	16	0	13	0	16	0	16
17	Khanyounis	44	0	43	0	44	0	44	1	44	0	44	0	44
18	Bani Suhila	20	0	20	0	20	1	20	0	20	1	20	0	20
19	Abssan Al Kabera	18	0	18	0	18	0	15	0	17	0	17	1	17
20	Abssan Al jadeda	16	0	16	0	16	0	16	0	16	0	16	0	16
21	Khezaa	16	0	16	0	14	0	16	0	16	0	16	0	16
22	Al Fokhary	12	0	12	0	12	0	12	0	12	0	12	0	12
23	Al Nasser	12	0	10	0	12	0	12	0	12	0	12	0	12
24	Al Shuka	12	0	12	0	12	0	12	0	12	0	11	0	12
25	Rafah	46	0	46	0	45	1	46	0	46	0	46	0	46
Total		576	0	571	0	565	4	562	4	568	6	572	4	573
Monthly Disinfection Efficiency			War Month		War Month		99.29%		99.30%		98.96%		99.31%	

Table 6. Total annual Production (m^3) January-December 2014

No.	Municipality	Monthly Water Wells Production (m^3) - Year 2014												Total Annual Production
		January	February	March	April	May	June	July	August	September	October	November	December	
		m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3
1	Um Al Nasser	15850	16610	16628	16628	18580	20570	23170	0	27600	16960	15160	16000	203756
2	Beit Hanoun	289600	271750	323220	338630	367730	373660	274980	47920	377420	374570	351734	263650	3654864
3	Beit lahia	527606	415857	425406	506685	1126514	362869	398326	362420	436887	388785	487108	393488	5831951
4	Jabalia	944574	865089	997042	1053322	1150888	1065880	952477	952477	874575	936584	876242	911027	11580176
5	Gaza	2594757	2335772	2198130	2413618	2286825	2284969	2668135	2668135	2395041	2522735	2305526	2286762	28960404
6	Wady Gaza	7600	7630	9140	9930	10750	11510	2800	5240	4400	5340	6410	7750	88500
7	Al Moghraka	41710	47800	44940	62560	71700	70600	53870	53870	52420	45690	48910	51890	645960
8	Al Zahra	28703	34242	34242	33842	36924	36499	32906	33904	37548	35619	37199	35535	417163
9	Al Nusseirate	220350	213840	259410	265210	280420	278110	264880	264880	266727	233783	231840	204220	2983670
10	Al Burij	74570	89940	90790	93625	117170	135320	120502	139624	131318	135371	105380	130652	1364262
11	Al Maghazy	78117	64210	81311	88700	79467	90484	103856	103856	98632	100710	73927	72182	1035452
12	Al Zawaida	73396	68741	96335	86360	95493	98173	88954	79762	90358	82947	72157	76075	1008751
13	Al Mussader	8100	9520	9870	12780	16760	17664	13169	13169	13169	13320	9090	10230	146840
14	Deir Al Balah	311076	373724	387997	411888	402234	392716	330669	330669	389232	359200	389188	368208	4446800
15	Wady Al Salqa	7290	15540	9130	14510	20260	21300	0	0	5000	8310	8480	8525	118345
16	Al Qrara	86510	104730	104010	124350	114240	114150	118797	118797	118797	105500	98680	115260	1323820
17	Khanyounis	656788	669560	769133	766587	801182	837345	736260	736260	721771	742054	701073	609215	8747227
18	Bani Suhila	41450	69540	61860	76412	82178	71677	71677	71677	96310	133070	70730	56270	902850
19	Abssan Al Kabera	56210	56120	88940	69130	100260	99817	99817	99817	131090	154560	84250	101120	1141130
20	Abssan Al jadeda**													
21	Khezaa**													
22	Al Fokhary	19890	24225	28205	24005	23240	21800	21500	21600	19658	24625	21265	22130	272143
23	Al Nasser	30060	31580	34330	46520	48510	40120	60020	18083	46810	13400	34480	23320	427233
24	Al Shuka	40760	42650	42650	35850	46060	44560	27743	26821	63340	56606	46701	44518	518259
25	Rafah	626555	626829	704102	734912	774608	756066	725801	690177	780968	802015	702326	665428	8589787
Total Monthly Production m3-Water Wells		**6781522**	**6455499**	**6816821**	**7286054**	**8071993**	**7245858**	**7190306**	**6839155**	**7179070**	**7291754**	**6777856**	**6473455**	**84409343**

** : Served by the same wells shown on front of Bani Suhaila and Abassan Al Kabira from regional bvlending water tank -Khanyounis eastern cities

Table 7. Total annual MEKOROT Water supply (Israel Line) , (m^3): January-December 2014

No.	Municipality	Monthly Mekorot Water Supply (m^3) - Year 2014												Total Annual Mekorot Supply
		January	February	March	April	May	June	July	August	September	October	November	December	
		m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3
Al Nussierat	بلوك H مكروت	29210	29210	30090	30870	30990	33040	15805	15805	29460	30650	36280	36280	347690
	بلوك G مكروت	810	1100	3250	1840	2840	2620	350	350	3900	6560	10650	10650	44920
	بلوك F مكروت	16120	14670	17520	17250	16180	18020	6560	6560	14250	15820	16730	16730	176410
	بلوك D مكروت	15380	10960	13180	9510	7570	12220	3620	3620	5670	9870	19840	19840	131280
AL Burij	خط ميكوروت	36340	31160	33630	33823	29600	41000	15400	4200	21400	20510	5900	8350	281313
Al Maghazy	المدرسة الاعدادية - ميكروت	631	298	1400	425	131	750	0	0	3027	6742	17525	20705	51634
	عيادة الوكالة - ميكروت	13405	8415	8571	3377	10087	8847	0	0	8543	0	0	0	61245
	منطقة السعايدة - ميكروت	2947	3158	3478	3852	3421	4252	1690.5	1690.5	3570	4054	2901	2928	37942
	الصحة العامة - ميكروت	26161	21542	24097	21166	23179	28487	8721.5	8721.5	15163	20125	23155	21565	242083
Bani Suhaila	مكروت	50135	48991	35865	44918	33166	32710	47409	47409	12819	14639	28663	30840	427564
Abssan Al Kabera	مكروت	41555	91177	70475	82456	79082	78150	77033	77033	47413	71283	42641	54450	812748
Abssan Al Jadeda	مكروت	25035	24747	24215	28706	24932	14470	20548	20548	18923	23733	19441	21960	267258
Khezaa	مكروت	27345	27395	26935	32890	31820	38980	20330	20330	53305	27705	18235	26600	351870
Total Mekorot Water m^3		**285074**	**312823**	**292706**	**311083**	**292998**	**313546**	**217467**	**206267**	**237443**	**251691**	**241961**	**270898**	**3233957**

Table 8. Annual Water Supply Monitoring Program - From January to December 2014

Water Supply Categories	Monthly Water Supply (m^3) - Year 2014												Total Annual Water Supply
	January	February	March	April	May	June	July	August	September	October	November	December	
	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3
Total Monthly Production m^3-Water Wells	6781522	6455499	6816821	7286054	8071993	7245858	7190306	6839155	7179070	7291754	6777856	6473455	84409343
Total Mekorot Water m^3	285074	312823	292706	311083	292998	313546	217467	206267	237443	251691	241961	270898	3233957
Total Monthly water supply (m^3) -Year 2014	**7066596**	**6768322**	**7109527**	**7597137**	**8364991**	**7559404**	**7407773**	**7045422**	**7416513**	**7543445**	**7019817**	**6744353**	**87643300**

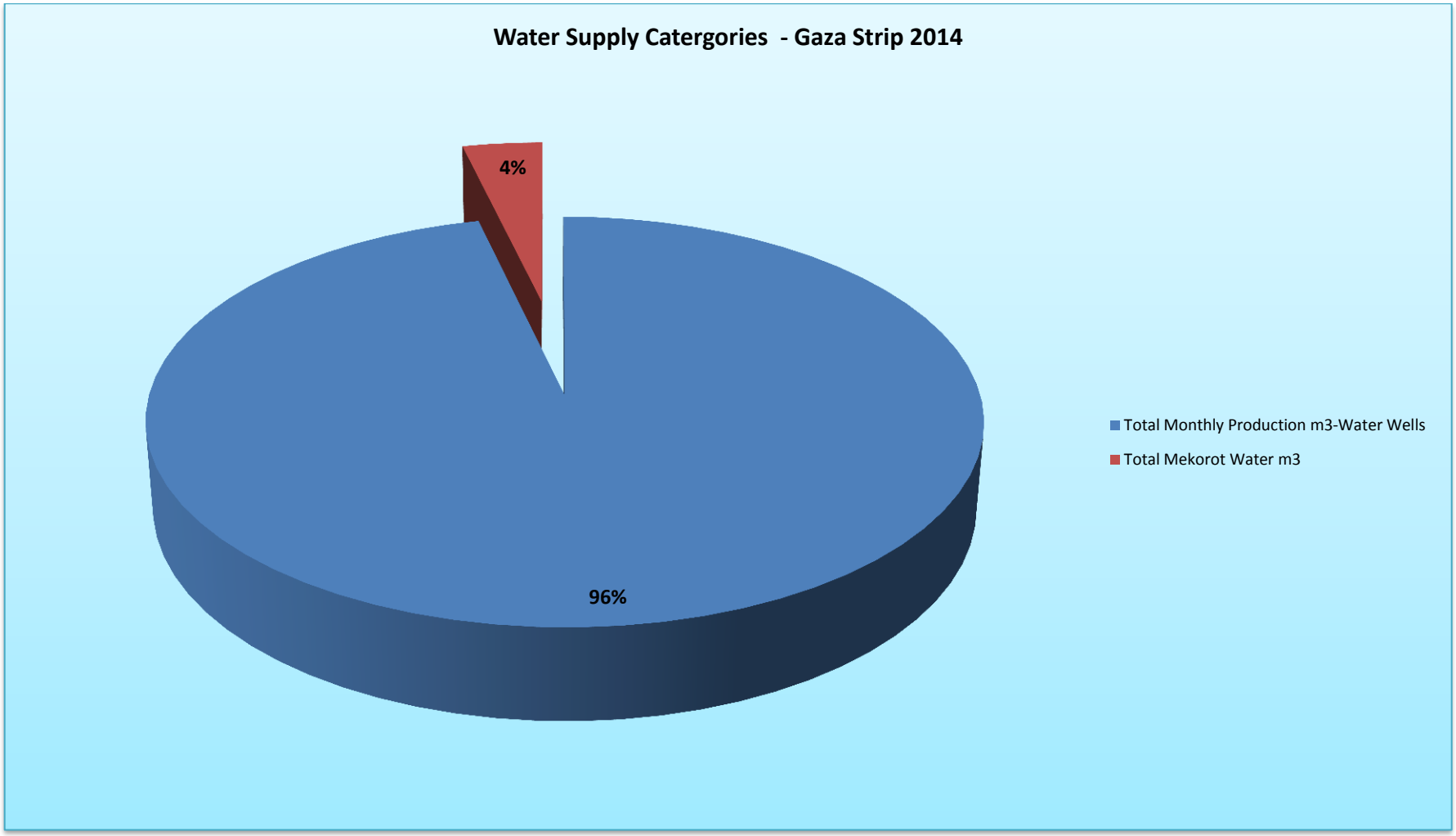


Figure 12: Total annual water supply (m^3) January-December 2014

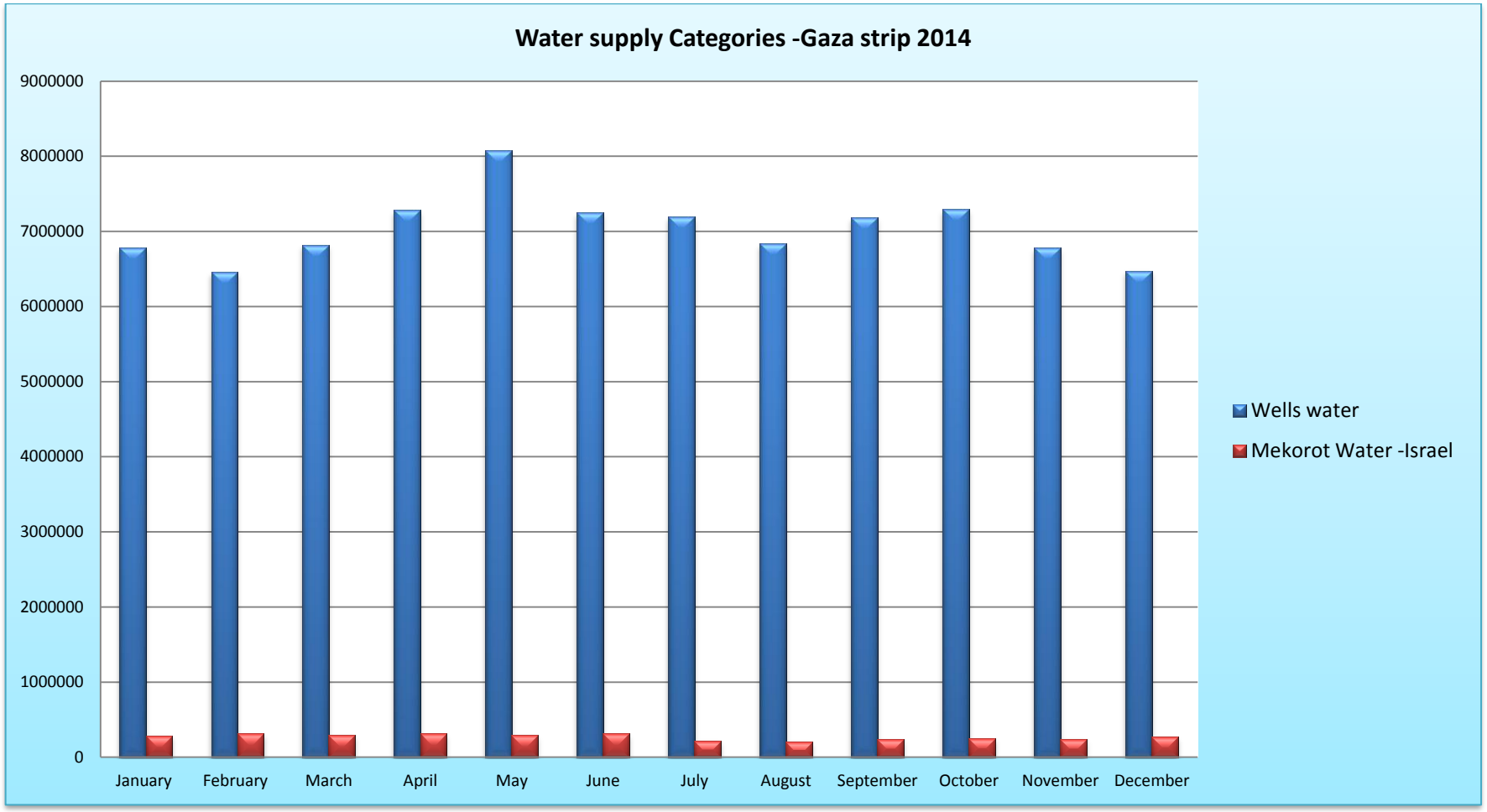


Figure 13: Total annual Production (m^3) January-December 2014

c) Chlorine Dosing Units

PMU and CMWU have continued to manage the repair and replacement of faulty dosing units. A number of new chlorine dosing units were installed to replace defective units. Technical specifications for installation were issued to the Municipalities and regional offices.

The following table summarizes the number and location where new dosing units are installed and where repairs have taken place during the period from 1st January to the end of December 2014.

Table 9. Repair Works for dosing pumps

Municipality	Number of repairs for dosing pumps	Number of new dosing units installed as per each municipality
Khanyounis	32	2
Jabalia	18	3
Nusairat	10	2
Al Bureij	6	3
Deir El Balah	21	1
Beit Lahia	6	2
Beit Hanoon	9	3
Qararah	5	1
Bani-Suhaila	3	1
Abasan Kabirah	3	1
Rafah	18	2
Total	**131**	**21**

Since the chlorine dosing pumps are the critical units in each dosing system, PMU /CMWU and its crew in charge have continued to take great care to maintain the essential stock of spares and consumables in stores. The delivery and repair procedures have continued to be carried out through the regional offices and the Municipal chlorination technicians.

During the project 2nd year 2014 CMWU has provided additional support through a new On-Call Service Procedure allowing Municipal chlorination technicians to contact CMWU at any time to log faulty systems, CMWU then ensures the repair is carried out within 48 hours. This procedure has improved the availability of operational dosing pumps, ensuring all water entering the distribution network is securely well disinfected.

Figure 14: Residual Chlorine Testing Equipment

1.2 New Water Resource

Based on various relevant studies, the groundwater deterioration has continued in both quality and quantity in the Gaza Strip due to over abstraction of the aquifer compared to the recharge quantities which led to seawater intrusion and lowering the groundwater table. Desalination of seawater and/or brackish water is one of the proposed solutions to relief the stress on the groundwater but due to large investment requirements to develop such plant which is not available at this time since it needs a stable political and economical situation; Henceforth, CMWU in cooperation with PWA throughout the recent study has attracted funds to construct three moderate desalination plants with the total production capacity of 13 MCM as short term low volume desalination (STLV) program . Also, as emergency interventions PMU/CMWU constructed small scale emergency brackish desalination plants to deliver acceptable drinking water quality in areas that already suffer from water shortage and deteriorated water quality with high salinity.

PMU/CMWU have continued to manage, upgrade, rehabilitate and monitor desalination plants from different donation which were constructed in several areas where the groundwater quality is not acceptable for distribution aiming at providing adequate water service for areas that are used to be deprived of water supply system.

Completion of Well head 600m^3/Day RO Desalination Plant –Bani Suhaila

As part of agreement signed between CMWU and INTERPAL funding organization to construct and equip brackish water desalination plant at Bani Suhaila area (Reservoir & water well) funded by INTERPAL. The plant of daily total capacity of 600m^3/day were completely constructed ,tested and brought into operational mode to serve more than 8000 inhabitants of Bani Suhaila people with drinking water services. The water shall be supplied from existing brackish water well and supplied throuhg the designated desalination facility with recovery rate of 80% ,where the brine shall be pumped back to the sea .

Completion of Extension of Existing Deir al Balah Sea Water Desalination Plant –Middle area

Completion of construction for 2000m^3/Day sea water RO desalination modules funded by IsDB and the plant is now in the process of operation treating sea water and turning it into drinkable water . Also, it will be linked and connected to the existing 600m^3/Day module ,producing in total 2600m^3/day to serve 30,000 inhabitants of the Middle area residence (Deir Al Balah &Al Zawaida cities) through 3000m^3 capacity water blending reservoir which is under construction now . The designated water blending reservoir shall receive water from both sea water desalination plant and the appropriate water wells in order to mix it and producing water supplied to the people in accordance with WHO standards for drinking water quality parameters.

Figure 15: Water Desalination Works

In progress implementing Project : Design and construction of 6000m^3/Day Sea Water Ro Desalination Plant :

As part of implementing STLV sea water desalination plant , new 6000m^3/Day sea water RO desalination plant shall be constructed and operated to serve 75,000 inhabitants of both Khanyounis and Rafah western parts . The project is funded by EU and implemented by UNICEF in co-operation with PWA & CMWU and both ESIA and design documents are completed and tendering for construction of the plant was initiated and carried out last October 2013. Also, the construction contracts have been launched for all contractors to carry out the works for all plant components and packages. The plant shall mainly comprise of the following items:

- Four sea water beach wells each of 200m^3/hour capacity
- Three sea water RO desalination trains each of 2000m^3/Day production capacity.
- Electrical sub-station and three standby generators (3x0.66MW) with all associated electrical works and installations.
- Chemicals storage and dosing systems
- Permeate water storage tank and booster station
- Plant truss building and site landscaping
- Administration building and ancillary facilities
- Rehabilitation and upgrading of existing water carrier line connecting between the plant and the two existing water blending reservoirs located in both Rafah and Khanyounis governorates.

Figure 16: Sea Water Desalination Plant – Southern Governorates

In progress implementing Project : Design and construction of 10000 m^3/Day Sea Water Ro Desalination Plant in Gaza City :

CMWU and IsDB have signed an agreement to implement sea water desalination plant in Gaza city with a total amount 15M$. This plant is an important component of the STLV program that will improve the potable water supply system with a production capacity 10,000 m3/day of desalinated water to blend it with selected municipal water wells with acceptable chloride concentration levels; in order to serve the western part of Gaza city. The targeted areas include the refugee Beach Camp, Western Nasr and Sheikh Radwan areas besides Western part of Tal Alhawa.

The CMWU in cooperation with PWA has launched consultancy services to carry out detail design and bidding documents of all downstream facilities of the plant. These facilities include: carrier and main water pipes, water networks re-routing installations and wells connections, water reservoir for blending and pumping stations including all associated works and installations.

The consultant also requested to prepare a tender document for design-build sea water desalination plant. The consultant has submitted the inception design report and the design for the blending tank which will be constructed early 2015.

In Progress implementing Wadi Gaza Brackish Ro Desalination plant

During 2014 CMWU and through the welfare association started the construction of Wadi Gaza brackish desalination plant of total capacity 70 m^3/day, this plant will serve 3000 inhabitants with drinkable water.

1.2.1 Mechanical Repairs Progress

During the period of this report from January to December 2014, several mechanical refurbishment repairs, upgrading works and repair installations have been continued to be managed and carried out at various operating water sites .Purpose has been applied to keep the existing and the new water installations functioning well to cover service demands and improve the level of reactivity towards some operational constraints such as unreliable power supply and shortages of spare parts and fuel supplies. Besides Carrying out and on time reactions with all programmed inspections and preventive maintenance requirements for all water sites with all associated minor repairs and adjustment works; the regular continuous repairs and maintenance works besides major upgrading works have been provided and completed for several water wells ,reservoirs and pumping water sites listed here below :

A- Dismantle vertical or submersible pumping unit and transfer it to workshop for inspections.
B- Repair or replace all materials and parts depend on its case and as the contract items.
C- Reassemble pumping unit after stage of repair then running the system.

1- Rafah Area

- W1 water well.
- Al Eskan water well.
- Al Rahma RO Plant.
- TRC1 water well.
- TRC3 water well.
- UNDP reservoir.
- TRC 2 water well.
- P15 water well.

- P124 water well.
- P148 water well.
- Al Saffa water well.
- Booster station – Al Shoka municipality.
- Al Nasser No.1 – Al Nasser municipality.
- Al Nasser No.3 – Al Nasser municipality.

2- Middle Area

- K21 water well - Deir El Balah.
- Al Aqsa RO plant.
- Seawater Desalination Plant – Deir El Balah.
- J4 water well - Deir El Balah.
- Al Moatared water well - Deir El Balah
- Abu Medain water well – Al Buraij
- Al Mousaddar water well – Al Musaddar.
- Water well No.4 – Al Zawaida.
- G57 water well – Al Nusirate.
- Reservoir water well – Wadi Al Salqa.
- F208 water well – Al Nusirate.
- F203 water well – Al Moghraqa.
- Al Kauthar water well - Al Moghraqa.
- Al Doha water well – Al Maghazi.
- S71 water well - Al Maghazi.
- Maqbula water well – Al Burij.
- Al Hasaina booster station – Al Nusirate.
- Heteen water well – Al Nusirate
- F205 water well – Wadi Gaza.
- Taj El Waqqar water well and RO plant.
- Al Mofty water well – Al Nusirate.

3- Khan younis Area

- Al Ahrash water well.
- Al Maouasi water well.
- Ma'an water well.
- Al Madinal Al Reiadia water well.
- Breaka water well.
- L189 Al Tahadi water well.
- Al Amal RO plant.
- Al Sattar North water well.
- Aiia water well.
- Kuaity water well.
- EV4 water well – Bani Suhaila.
- Ground reservoir RO plant – Bani Suhaila.
- EV2 water well – Bani Suhaila.
- L178 water well – Al Qarara water well.
- Khuza'a water well – Khuza'a.

- B154 water well – Bani Suhaila.
- M11 water well – Bani Suhaila.
- N22 water well – Abasan Al Kabira.

4- Bait Lahia

- El Mashroa'a water well.
- Al Shawwa water well.
- Al Sheakh Zaied water well.

5- Bait Hanoon

- Al Salah water well.
- Al Awqaf water well.

6- Jabalia

- El Bahtimy water well.

Figure 17 : Construction of and rehabilitation of Bani Suhaila Main Water Booster Station

Moreover and during the period of aggressive Gaza war occurred on July 2014 and continued on August 2014 ,CMWU technical directorate was acting on the ground with all possible means and wherever it is accessible to mitigate against the systems damages and collapsing events for both water and wastewater facilities and systems ,where several activities have been carried out in order to relief the harsh destructive impacts. Also, and during the periods of cease fire ,team-works have immediately started to provide for all possible repairs and refurbishment of repairable facilities such as water and wastewater networks ,water wells and desalination units .

As a result of harsh destruction of both Gaza electricity generation plant and many electricity feeders from Israel, Diesel fuel supply was one of the main required pillars and tasks in order to keep the minimum survival level of water and wastewater services throughout Gaza governorates .Therefore and during the war days ,CMWU has taken the lead in coordination with all relevant financiers and funding agencies to distribute Diesel fuel supplies for all water and wastewater facilities to operate standby Diesel generators which became heavily used and overloaded by long hours of operations.

List of Activities and Emergency Works :

- Carry out emergency repairs and reconnection of damaged underground networks for water distribution networks and wastewater collection networks with all associated pipes and fittings and accessories, where more than 120 repairs were completed .The works have been continued throughout all Gaza municipalities and about 70% of the main damages were completed by today.

- Mechanical repair , refurbishment and operation of Aya water well in Khanyounis producing 70m^3/hour and serving 10,000 inhabitants .

- Hiring 250KVA generator for Maan water well and booster station in Khanyounis serving 15,000 inhabitants.

- Electrical repair ,refurbishment and operation of damaged water well S71 in Al Maghazi municipality producing 60m^3/hour and serving 8,000 inhabitants .

- Supply and install 110 KVA generator for private well in Al Maghazi ,producing 50m^3/hour and serving 7,000 inhabitants.

- Supply and install submersible water pumping unit for water well S64 in the middle of Al Maghazi to produce 60m^3/hour and serving 8,000 inhabitants in the central part of Refugee camp .

- Hiring 110 KVA standby generator for Al Kawther well to serve Al Moghrakah municipality producing 50m^3/hour and serving 7,000 inhabitants.

- Supply and install 22KVA mobile Diesel generator for private well in Wadi Al Salqa municipality to overcome water shortages resulted from complete destruction of the only water well in wadi Al Salqa by Israeli forces .This will serve 4,000 inhabitants in Wadi Al Salqa .

- Supply and install 50KVA generator for TARAZI well in Dier Al Balah municipality producing 50m^3/hour and serving 7,000 inhabitants .

- Mechanical and electrical repairs of sea water desalination plant in Deir Al Balah producing now 1,200m^3/Day and serving most of Middle area governorate with drinking water distributed by tankers .

- Supply and install 88KVA Diesel generator to operate private well in Khoza'a municipality in order to serve the people (6,000 inhabitants) within destructed districts there.

- Supply and distribution of 30,000 liters of Sodium Hypochlorite solution for water disinfection of water wells throughout all Gaza strip governorates and municipalities and the process shall continue to safeguard proper water disinfection and secure the public health.

- Ongoing supply and distribution of Diesel fuel for water and wastewater facilities ,where more than 350,000 liters were distributed .

- Ongoing Emergency Repairs and reconnection of damaged underground networks for water distribution networks and wastewater collection networks with all associated pipes and fittings and accessories .

- Hiring generator from Abu Jehad Yassin 30KVA for Abasan Al Kabira to operate private well of 20m^3/hour and serving 3,000 inhabitants.

- Hiring 110 KVA generator for Abasan Al Kabira water well N22 producing 50m^3/hour and serving 6,000 inhabitants.

- Reconnect and repair of damaged and bombed electrical cable connecting sea water beach wells to supply raw water to the sea water desalination plant in Deir Al Balah and the beach wells have been re-operated again and brought into service mode.

- Emergency repair of Hawaber generator for wastewater pumping station in Jabalia .

- Relocate 500KVA generator from storm water pumping station down to Al Saudi water booster and reservoir site in Rafah in order to secure electricity generation system at the site serving more than 80,000 inhabitants in Rafah eastern district with water pumped from western resources up to the Eastern ground reservoirs .

- Supply and install two feed pumps funded by ICRC to increase the production capacity of Al SADAA desalination plant in Khanyounis.

- Supply 30,000 liters of Diesel fuel funded by ICRC to increase the production capacities of brackish and sea water desalination plants from 4,000m^3/Day up to 8,000m^3/Day -Middle ,Khanyounis and Rafah Governorates

- Hiring 250 KVA generator for Al Najjar water well in Bani Suhaila .The generator hired for Maan reservoir shall be transferred down to Al Najaar area -12th August 2014.

- Hiring 110KVA generator for private water well via Maan to serve people in Khanyounis -12th August 2014.

- Procurement and supply high pressure pump 3m^3/hr at 16 bar pressure to serve Aya brackish water desalination plant in Khanyounis ICRC/SAK

- Supply and install saline water submersible pumping unit to serve Deir Al Balah sea water desalination plant -ICRC /SAK.

- Hiring generator of 77KVA to operate private well at Abassan Al Jadidah municipality .

- Procurement and supply submersible water pumping set for one of Deir Al Balah private water wells (10hp,60MCH@40 meter head).

- Procurement of high pressure pump turbine for sea water desalination plant in Deir Al Balah ICRC direct procurement .

- Electrical, mechanical repairs and operating again of Al Nada water well (C137) in Beit Hanoon producing 100m^3/Hour and serving 8000 inhabitants.

- Electrical, mechanical repairs and operating again of Ayda water well (C20) in Beit Hanoon including hiring generator to produce 80m^3/Hour and serving 7,000 inhabitants.

- Hiring 110 KVA standby electrical power supply Diesel generating set for Al Shawa well in Beit Hanoon producing 50m^3/hr to cover the demand of 7,000 inhabitants .

- Supply and install water booster pumping set (80m^3/hr at 50m head) for Jabalia water well E156 (Abu Talal) to pump the water for 20,000 inhabitants and two UNRWA school shelters.

- Procurement of high pressure sea water pumping set for Deir Al Balah RO desalination plant affected by air strikes in the plant surroundings.

Figure 18: Rehabilitation of Water Well

1.2.2 Electrical Works Progress

During the period of this report several electrical repairs and upgrading activities were applied and carried out as follows:

1. Manage, supervise and carry out all procurement required for specialized electrical service contracts including the procurement of essentially required stock of spare parts, equipments and relevant specialized service contracts.

2. Continue to manage and follow up remote monitoring program initiated for specific water wells in Rafah and Khanyounis. The system will enhance and improve the operation and maintenance activities for different water and wastewater facilities and eliminate the human intervention. Also, all operational data and faults records shall be remotely provided by the system down to the designated control room at CMWU regional and HQ offices.

3. Continue to carry out technical review and provide electrical design for new projects whether it is implemented now or proposed to be carried out in the future e.g. booster stations, reservoirs, wells lifting stations.

4. Continue to review electrical shop drawings and review as built drawings for electrical installations of all new projects managed and carried out by CMWU along with all Gaza strip governorates.

5. Supervise and manage the electrical repairs and refurbishment of 67 various job orders for different water treatment ,wells and pumping sites including replacement and repair of soft starters ,panel boards ,breakers ,contactors ,cables ..etc

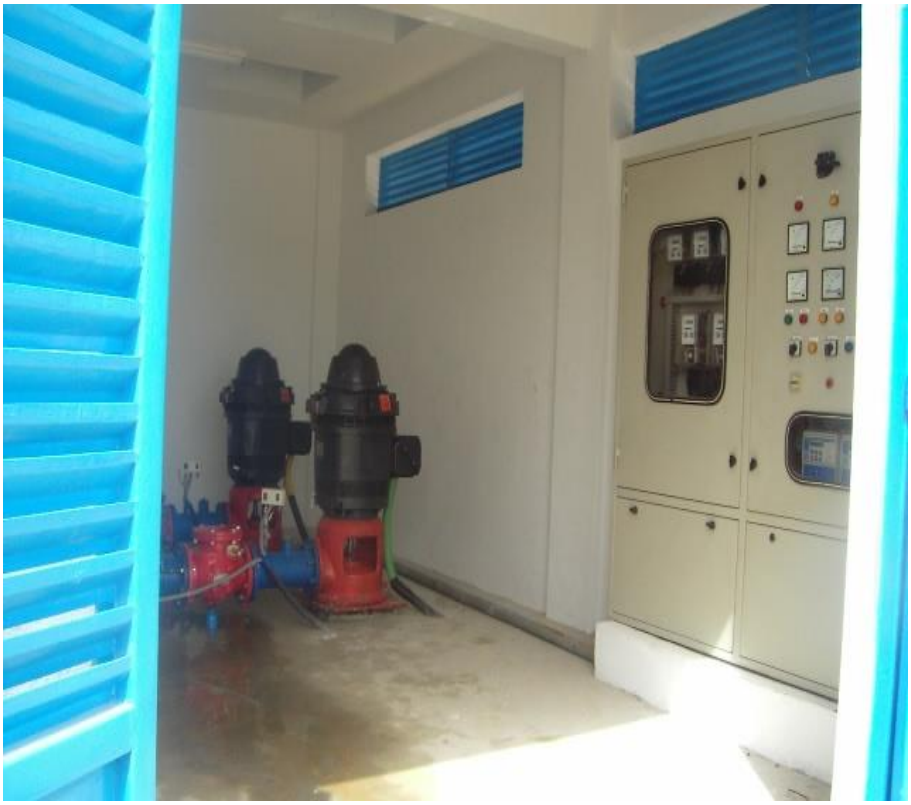


Figure 19: Electrical Control Switch board& Pumps -Water Booster Station ,Shokah City

Figure20: Repair and rehabilitation of elevated tank in Khanyounis -Sadda Desalination site

1.2.3 Fuel Distribution

CMWU Continues to manage and monitor the supply and distribution of programmed Diesel fuel supplies to various standby power supply generators located at water wells, desalination and pumping facilities funded by WB, GCC/IDB, UNRWA, TIKA, UNICEF, OCHA (HRF) ,ICRC . This task

has become one of the life supporting systems in Gaza strip which is essentially required to support water sector during harsh conditions of unreliable electricity supplies in Gaza strip from grid lines. Therefore, it has crucially becomes needed to operate standby generators and to safe guard satisfactory water supplies to the people in Gaza strip. The chart shows that the distribution and supply of more than 2,274,894 liters of Diesel fuel were managed by PMU/CMWU towards various water and wastewater facilities all over Gaza strip governorates. This illustrates the crucial situation of unreliable grid electric supply in Gaza which suffer from daily cutoffs periods of more than 12 hours .

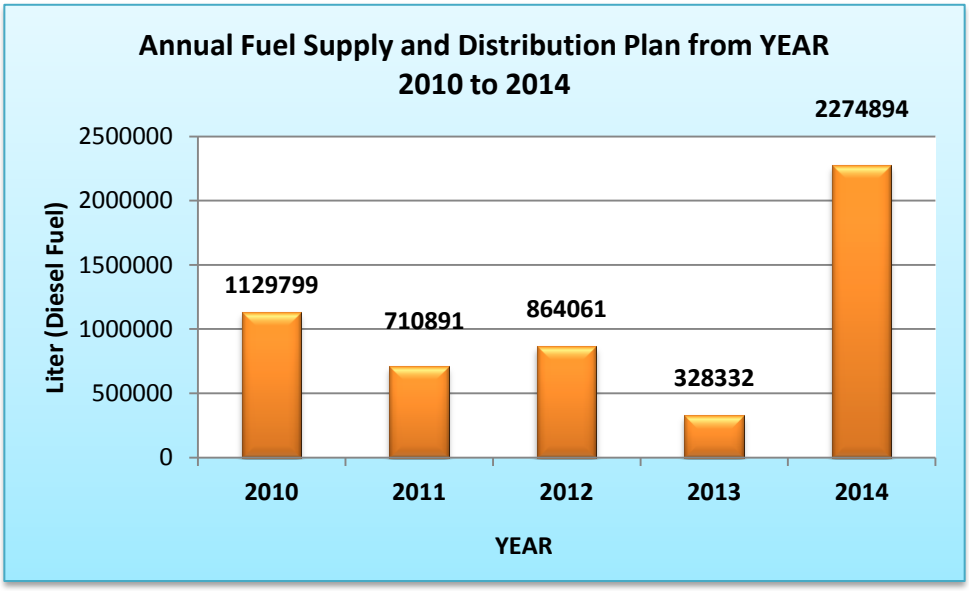


Figure 21: Annual Fuel Supply and Distributed Quantities

1.2.4 Computerized Maintenance Management System CMMS

CMWU by its own resources has took the initiative to produce its modified version of CMMS software required to manage and drive all maintenance programs with different activities for water , wastewater and vehicles facilities.

The soft ware modules have been completed and installed for demonstration at Rafah regional area which will improve maintainability and serviceability levels for different equipments and systems .The new soft ware will efficiently deal with scheduled and unscheduled job orders for maintenance and enhance the implementation of preventive maintenance needs as per manufacturer's recommendations.

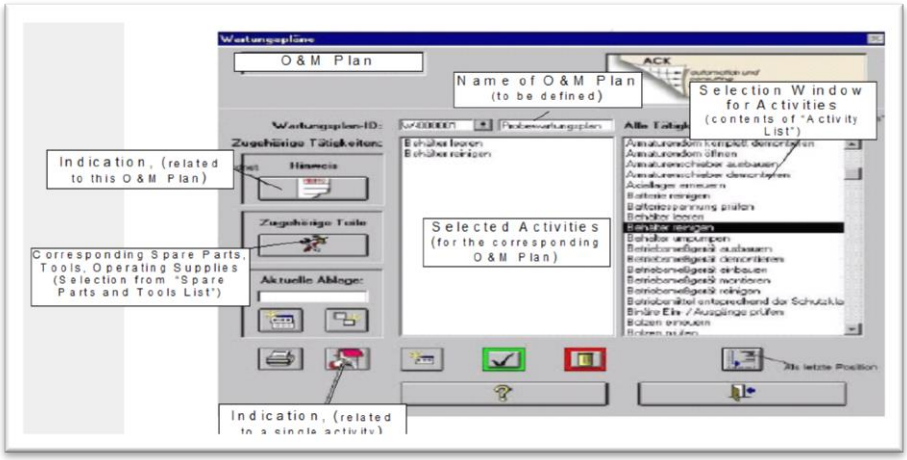


Figure 22: CMMS Screen Shot

1.3 Water Networks and Reservoirs

This section handles water network plans, upgrading, rehabilitation activities, water tanks activities and water booster pump stations activities as CMWU succeed during the period of this report to implement a lot of water networks project varies between rehabilitation , upgrading , and construction new carrier lines and distribution systems in different areas of the Gaza Strip as follows:

1. Water Network Calibration – funded by WB:
   In this project, an actual network of Rafah and Deir El-Balah have been calibrated in order to evaluate the efficiency of hydraulic model.
   Project Objectives:
   The main goal of this Project is building of Hydraulic model to evaluate hydraulic performance of water distribution networks of Rafah and Deir El-Balah, taking into account the effects of local operating conditions.
   The detailed objectives of the Project are the following:
   - ✓ Mapping and inventory of pipes and fittings in water distribution network of Rafah and Deir El-Balah.
   - ✓ Model the existing water supply system
   - ✓ Calibration of hydraulic system
   - ✓ Study the hydraulic parameters in the water distribution system
   - ✓ (Pressure, velocity), the relations between them and other factors such as the time.
   - ✓ Investigate the effects of local operating conditions (pumping, pressure zoning, and management) on the hydraulic performance of the water supply networks.
   - ✓ Investigate the efficiencies of the existing water supply networks and identify the existing water supply problems.
   - ✓ Improving Water distribution management by decision makers
2. Completed, construction of water network at Besan area-Beit lahia, this project is financed by QATAR STATE.
3. Completed, construction of water network at Al Boraq area-Khan Younis, this project is financed by QATAR STATE
4. Completed, Construction of Water Network at Al Esraa area-Khan Younis (Funded by QATAR STATE)
5. Completed, construction of water network at Al Qastal-Dair El Balah (funded by QATAR STATE)
6. In progress, Construction service Building and Installation of electromechanical Equipment at Bani Suhila Reservoir. (Funded by WB).
7. In progress, Construction of Carrier lines and Connections for Al Moghraqa and Deir El Balah Reservoirs (Funded by WB).
8. In progress, Construction of Bani Suhaila Water Reservoir Piping & Mechanical Works (funded by ICRC).
9. As a result of Israeli offensive many kilometers of water networks through Gaza Strip have been damaged (partially or completely) at (Bani Suhila, Rafah, Dair Al Balah, Al Mosader

,Wadi Al Salqa, Al Zanna, Khuzaa,) urgent works have been performed during the cease fires while the others were included in rehabilitation projects after the war.

Figure 23: Rehabilitation works After War

10. In addition five reservoirs have been constructed during 2014:
    - "Construction of Water Tank 3000 m^3 and Pumping station in Al Moghraka "this project is financed by IsDB.
    - "Construction of Water Tank 4000 m^3 at Bani Suhaila the project is financed by IsDB.
    - "Construction of Water Tank 4000 m^3 at Dair El Balah the project is financed by IsDB.
    - "Construction of Beit Hanoun water tank 3000 m^3 capacity." Financed by UNDP.
    - "Construction of Om Al Nasser water tank 4000 m^3 capacity" Financed by UNDP.

Figure 24: Al Moghraka Water tank

Figure 25: Al Aqsa Water Tank - Dair El Balah

11. As a result of Israeli offensive many of water tanks through Gaza Strip have been damaged (partially/completely) at Al Bani Suhila, AL Moghraka, Dair el Balah, Al Mosader and Wadi Al Salqa, those tanks are included in rehabilitation and maintenance project funded by WB- AF1, the tender was launched on Dec.2014 and the works at sites will start by the end of January 2015.
12. Launching the tender for construction of Khuza'a water tank 1800m^3 capacity, the project funded by WB-AF1
13. Preparing the design documents for Al Boraq water tank 5000m^3 which will be financed by EU.
14. Prepare the tender for Absan water tank which will be financed through WB-AF1.
15. Mobilization for the design of four water tanks funded by USAID at Beit lahia, Nusirat, Dair El Balah and Khan Younis.

Figure 26: Damaged Water tanks

1.4 Waste Water Treatment Plants

There are three main waste water treatment plants located in Beit Lahia, Gaza and Rafah areas as well as two intermediate treatment plants in Khan Younis (Mawasi area) and under construction Wadi Gaza WWTP. This section will describe the main activities implemented in all the treatment plants to improve their treatment efficiency.

PMU /CMWU has continued its operational and management rules to manage and carry out comprehensive monitoring program related to the wastewater treatment plants located throughout Gaza strip Governorates and provide for all mitigation measures and improvement programs despite that all the plants were targeted during the last war event, but PMU/CMWU are now in the process to provide for all emergency and fast track mitigation measures . Although all relevant events occurred during the last year ,the average achieved 77% efficiency of treatment process and BOD removal have been tabulated and shown here below as per all four treatment plants .

Table 10. Annual wastewater quality monitoring program

Wastewater Treatment Plants Monitoring Program -2014										BOD Removal efficiency	BOD Removal
Plant	Treatment Process Type	Average Weekly Flow m^3/Week	Average Annual Flow m^3/Year	Avg. Annual Influent			Avg. Annual Effluent				
				BOD(mg/l)	COD(mg/l)	TSS(mg/l)	BOD(mg/l)	COD(mg/l)	TSS (mg/l)	%	ton/Y
BLWWTP	Aerated Lagoons	165,230	8,615,564	459	1039	514	114	275	136	**75.11%**	**2.97**
GWWTP	Bio Towers /Lagoons	375,230	19,565,564	476	808	466	108	339	167	**77.31%**	**7.20**
KhWWTP	Aerated Lagoons	91,050	4,747,607	522	1193	550	129	303	152	**75.38%**	**1.87**
RWWTP	Bio Tower s	87,062	4,539,661	606	1316	636	116	278	138	**80.88%**	**2.23**
Total m^3/year		**718572**	**37,468,397**								
Average				**516**	**1089**	**541**	**117**	**299**	**148**		
BOD Removal Efficiency % - Weighted Value										**76.99%**	
BOD removal in Ton / Year										**14.26**	

This section will describe the main activities implemented during the last year 2014 in all the treatment plants to improve their treatment efficiency as follows:

1.4.1 Beit Lahia WWTP:

- Enlarge cross piping between different lagoons in order to cope with annual flows increase and avoid overflow between lagoon No.2 and Lagoon No.7 in Beit Lahia waste water treatment Plant BLWWTP.
- Raise up the ground level between different lagoons to increase in somehow the capacity of lagoons and prevent overflows from one to another at BLWWTP.
- Carry out comprehensive sludge cleaning program for five lagoons 1,2,3,4 and 6 in order to improve the process and lagoons capacities by improving retention time which will lead to effluent quality improvement-BLWWTP.

- Supply and install new 6 mechanical floating aerators of 25hp each with all associated electrical and mechanical installations .
- Enhance the embankments and provide for additional supports to prevent any risk of wastewater seepage in particular for western side of the plant .
- Improve safety measures in the site by providing fencing around different lagoons.
- Carry out all electrical and mechanical rehabilitation and repair works and installations for aerators,generators,pumps ..etc ,where more than 28 major electrical and mechanical repair job order have been completed during the last year of 2014 .
- Procurement of automatic digital wastewater samplers .

Figure 27: Beit Lahia Wastewater Treatment Plant

1.4.2 Gaza Central WWTP

KFW has allocated 70 million Euros for the construction of Gaza Central Wastewater treatment plant. But due to the political situation in the Gaza Strip, the project was frozen. Alternatively, and as an emergency requirement, it has been agreed with the KFW that the CMWU will prepare a proposal to upgrade GWWTP to serve Gaza city for the next five years. This proposal has been accepted by the KFW and part of the Central WWTP fund was allocated to finance the Emergency Sewage Works in Gaza City. Two contracts were signed with Masoud & Ali Contracting Company (MACC) in order to start upgrading GWWTP

- The contract No. 1 was for supplying materials and all the materials and equipment were submitted to CMWU/MOG.(finished)

- The contract No. 2 was for construction works at the pump station (Pump station No. 1); the pump station is operational now, construction sludge drying beds at East Bureij and GWWTP site beside two sludge holding ponds at GWWTP. In addition to install 500 mm ductile Iron pipe from pump station 2 to pump station 1 and 600 mm DI pipe line from pump station 1 to the treatment plant, that all with works at the treatment plant (inlet structure, bar screen, grit removal, bio tower feed PS, 4 new bio towers , and some internal piping and connections). (on-going)

A new addendum 4 has been agreed to re-plan and update the central WWTP project to take into account changes that have occurred since the original project documents were prepared, the project will include the following:

- Buriej Central Wastewater Treatment Plant
- Wadi Gaza Central PS
- Pressure Pipelines from Wadi Gaza PS to Buriej WWTP
- Gravity Collector from Shiekh Ajleen WWTP (Gaza City) to Wadi Gaza PS, including connections to the Central Communities wastewater system.

The Final revision of re-planning report submitted on June 2014, and starting of detail design supposed to be completed by end of August 2014. But All the works in the re-planning stopped because of the war occurred and the remaining budget (2.0 M Euro) from the Emergency project allocated for reconstruction of damaged infrastructure facilities within Gaza City. Following are the immediate measures and the status of each activity:

1- Supply and store materials at CMWU store (pipes, fittings, mechanical spare parts, valves, electrical parts, filters) - On Going
2- Supply replacement equipment & spares (pumps, lifting cranes, fuel tanks, Electrical panels, vehicles, etc) – On Going
3- Service contract(s) for repair of networks. – Tenders Preparations
4- Immediate repair PS 1 and Sheikh Ajleen WWTP – Lately Awarded
5- Supply fuel as operations support of PS1, PS 2, PS 3 & Sheikh Ajleen WWTP – On Going

Parallel to this addendum 4, KFW has signed agreement on the 6th of November 2014 with amount of 9 M Euros for reconstruction assistance for water and wastewater in Gaza City. The following are the agreed activities and the status of these activities to the end of Dec, 2014:

- Intermediate operational support for the Gaza Strip (Chlorine and other consumables) - Tender Preparation
- Supply and store materials at CMWU warehouse (pipes, Mechanical spare parts, valves, electrical parts, filters, etc)- Tender Preparation
- Supply administration equipment to support utility management – Tender Preparation
- Intermediate operations support of PS1, PS2, PS3, and GWWTP – Tender Preparation
- Service contract for repair of networks – Tender Preparation
- Reconstruction of Al Muntar Reservoir – On Awarding.
- Reconstruction of Civil Defence Reservoir- Tender Preparation
- Reconstruction and Rehabilitation of water wells in Gaza City & Central Communities (Muntar well and Saraya Well are Awarded)
- Rehabilitation of Sheikh Ajleen WWTP- Tendering
- Rehabilitation of PS3- Tendering

1.4.3 Rafah Wastewater Treatment Plant (RWWTP)

- Supply and install standby generating set for Rafah WWTP comprising of two generators 400 KVA and 110 KVA respectively . This will enable more appropriate power supply management during electricity cut off hours .
- Improve security fencing in RWWTP against vandalism and miss crossing in the area.

1.4.4 Khanyounis Wastewater treatment plant (KhTWWTP)

Last year the CMWU has upgraded the temporary KHWWTP by increasing its capacity to 12000 m^3/day and improving the efficiency to reach 80%, while the work is on-going in preparing the tenders and designs for Khan Younis Central WWTP which will be constructed by UNDP and CMWU in cooperation with PWA as follows:

1- Construction of wastewater treatment plant itself with a capacity 26,600 cubic meters per day (phase I), while the design figures of Phase II are based on flow of 44,900 cubic meters per day to serve 376,000 residents and load estimates for the year 2025.

2- infiltration basins:

The infiltration basins will be established in agricultural land of around 97 dunums; located in Al Fukhari area in the south eastern part of Khan Younis Governorate in order to infiltrate the treated wastewater to aquifer and use it for different purposes.

3- Effluent and emergency pressure pipeline

In order to ensure proper and environmentally sound disposal of treated wastewater, an effluent and emergency steel pressure pipeline will be constructed with dual use to pump the treated effluent from the effluent pump station at KYWWTP site to Al Fukhari infiltration basins or to the sea in emergency cases; with a total length of around 18.6 km.

The first 5.6 km of this effluent pipeline will be used to convey the treated wastewater to Al Fukhari infiltration basins.

An emergency pressure pipeline of 13 Km length will be constructed to complement the effluent pipeline to discharge partially treated or treated effluent into the sea

However and during this period of this report CMWU have completed the upgrading activities at Khan Younis temporary WWTP and implemented the following:

- ✓ Improve security fencing in KHWWTP against vandalism and miss crossing in the area.
- ✓ Procurement of automatic digital wastewater samplers .

Figure 28: Khanyounis Temporary Wastewater Treatment Plant

1.4.5 Wastewater Activities in Middle Area Governorate (WGWWTP)

The following activities took place in the Middle area:

1. Implementation phase of Wadi Gaza Intermediate Wastewater treatment plant is completed, this project includes three components (Wadi Gaza IWWTP, the pressure line from UNRWA pumping station to the plant with 2700 meter length) and rehabilitation of UNRWA Pumping station ; the project is financed by ICRC.

The main objectives of construction of waste water treatment plant (IWWTP) in Wadi Gaza are:

A. Drying Wadi Gaza from the raw wastewater streams running over 5 km along the Wadi course and causing serious environmental pollution and public health hazards. Drying the Wadi will be achieved by directing all the raw wastewater streams to the intermediate WWTP.

B. Treating the collected wastewater to a quality suitable for safe disposal to the sea. This will protect the marine environment and keep it suitable for fishing and recreational purposes. Treating the wastewater for irrigation reuse was excluded since it requires higher treatment technologies and higher investment costs that are not justified for an intermediate situation.

Wadi Gaza WWTP , rehabilitation of UNRWA Pumping station and construction of the third component of Wadi Gaza project" Sewage Pressure line from UNRWA Sewage pumping station to Wadi Gaza WWTP" all of these works have been completed by Dec.2014 while the only activity which is still on-going is the cover of the anaerobic pond , this cover aims to eliminate the odours/gases resulted from wastewater treatment, it's expected to accomplish the cover and start the operation of the plant by March 2015.

Figure 29: Wadi Gaza Wastewater Treatment Plant

Figure 30: Al Nussirat Sewage Pumping Station

1.5 Storm Water Activities

1. The CMWU has lunched consultancy service for" The Detail Design of Retention and Infiltration Basin in Al Amal Area at Khanyounis Governorate". Is completed, and the tender of implementation phase has been launched on July 2014 which will be financed by PALTEL Group Foundation, the CMWU still waiting the awarding no objection from PALTEL .Also the CMWU through IDB fund has finished the design of the carrier line from Al Amal Pond to infiltration pond near KHWWTP of total length 1.6 K.m in addition to the pumping station of total capacity 2700 m3/hr to be used in emergency cases.
2. In progress, Construction of Storm Water Network, Storm Water Pond at Rafah Municipal Area (Phase II) , This project is financed by PALTEL Group Foundation and the main activities of this project are:-
   - Implementation of storm water pipelines of diameter 40 cm up to 100 cm with all associated manholes, gullies.
   - Implementation of storm water pond, infiltration boreholes.
   - Pressure pipeline from Al Junina pumping station to the nearest existing sewerage network.

Figure 31: Storm water pond and networks at Rafah

3. During the storms occurred in winter 2014, the CMWU and concerned partners have acted properly during this storm in order to protect the people from floods by providing the municipalities with mobile pumps, spare parts to maintain the pumps, supplying diesel to operate the standby generators during the electricity cut offs.
4. As a result of previous storm in Nov.2013, which have caused floods at Al Manara area in Gaza city, the CMWU through ICRC fund has constructed overflow emergency HDPE carrier line from Al Sheikh Radawan storm water pond to the

sea with a total length 1700 m, this pipeline will transfer the collected water from the pond to the sea in order to prevent the flood , the work was completed in Dec.2014 and it is operational now.

Figure 32: Emergency HDPE Carrier Line – Gaza City

5. Launching the tender for " construction of Carrier line from Abeda storm water pond at Rafah", this project will eliminate the floods in the Abeda area by discharging the collected water from the pond to infiltration basin near the Egyptian border, the work will start in Jan.2015
6. The CMWU has launched a consultancy services for Al Qarara storm water project, the consultant is preparing the detailed design and tender documents.
7. A proposal has been raised to MoLG to solve the storm water problems at Jomazit Al Sabeel area of total budget 1.8 M $
8. As a result of this storm, many meetings were conducted with the municipalities and concerned partners to assess the needs for each municipality, in order to mitigate such flood events.

1.6 Waste Water Pump stations and networks

This section handles expand, repair and maintenance of all waste water networks activities as follows;

1. Completed the repair and maintenance of water and wastewater networks through Gaza strip" funded by UNICEF.
2. Design for Al Berka wastewater networks has been prepared. this project will be financed by KFW of a total amount 1.1 M Euros.
3. Prepare consultancy service for "review, design check, re-design if needed & implementation supervision for waste water networks in Dair Al Balah and Jabalia", this consultancy funded by KfW.
4. Completed the Re-construction of Al Nussirat Sewage Pumping Station which will collect the sewage from the whole middle area, then it will be pumped to Wadi Gaza WWTP which is currently under construction; the project is financed by ICRC.

Figure 33: Al Nussirat Sewage Pumping Station

5. Completed the construction of WW networks at Rafah, this project, funded by PHG
6. In progress, Supply of electromechanical equipment and spare parts for Pump Station 7B and 5 at Gaza city, this project is funded by ICRC
7. Completed " Rehabilitation of wastewater networks at El Salam neighbourhood in Rafah, this project is funded by PHG.
8. launching the tender of " Rehabilitation of wastewater networks at the southern Governorate package (1), this project is financed by UNICEF
9. launching the tender of " Rehabilitation of wastewater networks at the Middle Governorate package (2), this project is financed by UNICEF
10. In progress, Construction of Wastewater Networks at Wadi Gaza Municipal area, this project aims to provide wastewater system for the people instead of septic tanks that cause aquifer pollution. The project is financed by Welfare Association.
11. Preparing the design and tender documents for Wadi Gaza Sewage Pumping Station, the tender will be launched by end of Jan.2015, The project is financed by Welfare Association
12. Completed, Construction of wastewater networks at Boba'a area-Dair El Balah, the project funded by GVC

Figure 34: Wastewater Networks at Deir Al Balah

13. Completed, “Repair damages of infrastructures at Beit Hanoun resulted from the Israeli offensive on Gaza”, this project is financed by ICRC

Figure 35: Repair damages of infrastructures at Beit Hanoun

14. In progress, Rehabilitation of sewage Pumping stations at Beit Hanoun which have been attacked during the offensive, the project is financed by ICRC.

Figure 36: Beit Hanoun sewage pump station partially damaged

1.7 Electromechanical Services - Waste Water Pumping and treatment Facilities.

During the period of this report from January to December 2014 ,several electromechanical maintenance and repair services and activities summarized here below have been carried out to safe guard the systems and reduce the possibilities of breakdown events.

Meanwhile, most of wastewater and storm-water services and pumping facilities were continued to be severely overused and overloaded during the last storm hit Gaza strip from 10th to 14th December 2014 and create several emergency needs for repairs during flooding times. Therefore CMWU has taken all possible initiatives to reduce the negative impacts of storm. Also, the last war events in Gaza strip have affecting several wastewater facilities including damaged wastewater gravitation and force main pipelines which were air striked through out Gaza strip governorates and creating environmental and public health negative impacts .

1. Manage the maintenance and distribution of 13 mobile self priming storm water trash pumping sets driven by Diesel engines throughout various stations spread all over Gaza strip governorates with all associated pressure and intake hoses requirements and fuel needs.

2. Manage transportation, distribution and operation of additional 4 mobile self priming trash pumping sets supplied from Israel side during the storm period to assist clearing water floods from different areas in Gaza strip.
3. Supply all required safety and protective tools, clothes and equipments for technicians and labours working under the storm and flooding conditions.
4. Mechanical repair and refurbishment of 5 mobile pumps in Khanyounis ,Al Arishiya storm water collection lagoon.
5. Carry out on site and on time repair and maintenance campaigns through services contractors for several pumps, generators and electrical damages occurred as a result of war events operational faults at various pumping stations and facilities, where more than 87 mechanical job orders have been completed.
6. Carry out detailed mechanical and electrical rehabilitation and repair works of four mechanical bar screens in sewage pumping stations .
7. Manage and supervise the mechanical and electrical rehabilitation works of Al Hassayna sewage pumping station in Al Nussirate and provide additional sewage pump to upgrade its pumping capacity to match with master plan.
8. Manage and carry out complete mechanical overhauling and repair of KSB submersible sewage pumping set at Jemazit Al Sabeel pumping station in Rafah including the replacement of impeller ,mechanical seal and set of bearings .Also, valves systems and no return check valves have been also repaired and maintained .
9. In Wafia P.S in Khan younisUpgrading the MCC Panel by Installing a new soft starter RVSDN390A, Circuit breaker 3X400 A and A bypass contactor and installation of all power and control cables for the new third 210KW. The bar screen was also repaired by replacement of the proximity switches
10. In Manshia PS in BeitLahia Replacement of Two Electronic Cards for the Existing softstartersRVSDN -145A and installation of control circuit for automatic operation of the generator according to the water level.
11. In Block 7 PS in Burij Replacement of the two 10 KW contactors with all associated control circuits and measuring instruments
12. In Block 12 PS in Burij Replacement of MCC panel completely including all power and control circuits and wiring requirements
13. In Manshia PS in BeitLahiayounis Upgrading the MCC Panel by Installing of 220/24V control transformer , replacement of relays and timers to new 24 V components
14. In Jemezet al Sabeel in RafahUpgrading the MCC Panel by Installing an new MCCB 630 A at the main Feeder and repair of the main Automatic Transfer switch
15. In Main North P.S. connection of the main High tension cable with Special cable connections. (The cable was damaged during the war)
16. In Tal Sultan PS in Rafah repair of the main ATS by replacing the motor control unit of the main circuit breaker
17. In Hassayna P.S in Nussairat: upgrading the MCC panel including installation of MCCB, new RVSDN soft starter with a bypass contactor and reprogramming of the PLC to connect the new pump automatically with the existing two pumps the work included also installation of the pump protection unit and the control

components and installation of additional two float switches with all required power and control cables.

18. In Mughraga P.S. installation of Soft Starter RVSDN-58A. float switches and repair the damaged control components
19. In Om al NaseerP.S complete Rehabilitation of the MCC including installation of Two Soft Starter RVSDN-58A, Pump protection units, control transformer 220/24 V, surge protection 4X40KA and all required control relays and timers.
20. In Bassa P.S. in D. Balah replacement of the Electronic card for the RVSDN-145 Soft starter, replacement of two pump protection unit MiniCas and installation of grounding system for the Generator.
21. In B. Suhila P.S replacement f the manual changeover, two float switches and the step relay and one electronic card for the soft starter
22. In WWTP in Rafah: installation of a new change over for the effluent pump station
23. In All Rafah Pump stations :Rehabilitation of all Internal and External lightings including replacement of all damaged overhead projectors. In all stations the panel ampere meters and Multi-meters were also replaced by digital units as well.
24. In all khan youins Pumping stations : rehabilitation of all Internal and External lightings including replacement of all damaged overhead projectors. In all station the panel ampere meters and Multimeters were also replaced by digital units as well.

2.0 PROGRAM ACTIVITIES PROGRESS

2.1 Geographic Information System (GIS)

Through UNICEF-EU and (ICRC)donation, the GIS department has establish a comprehensive data base survey for all different water and waste water facilities in the southern part of the Gaza Strip (Middle, Khan Younis and Rafah governorates). All the collected data has been unified into one geo-database. Currently the GIS department is carrying a survey for customer locations to be linked later with the other collected data for better services and to detect the leakage and illegal connections by advance GIS modules once linked to the customer service collection software. By next year 2015 the GIS department will launch its online GIS through web application.

2.2 Environmental Management Plan (EMP)

The PMU follows the different project activities, coordinates, monitors and measures the performance indicators during the report period. The Environmental Management Plan (EMP) has been designated to ensure effective implementation of the project in an acceptable environmental level.

CMWU have established a field survey to monitor the current activities of different projects in the field. Those forms are being filled by supervision teams as shown in **Annex no. 2**

Also the PMU analyzed the water quality in all domestic wells in the governorates based on EMP procedures(refer to **Annex 3** for details), added to that wastewater collection and sampling were carried out on almost a weekly basis based on EMP procedures.

Due to the last war on the Gaza Strip, the EMP has been modified to carry out chemical, heavy metals and isotopes parameters in the targeted areas to make sure that none of those areas are exposed to dangerous pollutants. This activity will be carried out through a consultancy services with an international certified lab.

From the ongoing monitoring of the different projects' activities running in the field, the environmental aspects are being observed and achieved.

2.3 Customer Services

In this period, lots of activities were running to enhance the customer services program as follows;

1. Follow up the operation and maintenance of comprehensive customer information and Service system CCISS at 14 different municipalities in Gaza Strip in total coordination with CMWU IT section.
2. CMWU continue issuing the water bill in a monthly basis for 14 municipalities in Gaza Strip region. The number of customers served by the 3 regional offices (Rafah, Khanyuins and Der El Balah) is 47,403 customers.
3. The following steps are being followed in order to enhance the collection efficiency in Rafah City :
    a. Coordination and cooperation with legal institute to follow up the uncommitted customers.
    b. Activation of illegal connection campaign through CMWU inspection unit, in order to raise the collection and enhance system efficiency.
    c. Rewards Campaign for the committed customers.
    d. Signing agreements with local banks for automatic payment for CMWU bills.
    e. Follow up the new housing projects in Rafah (Suadi project 1&2 , & UNDP project), with CMWU partners in order to legalize the water subscription for the beneficiaries.
    f. Follow up the governmental employees in Rafah with the ministry of finance in Ramallah in order to come up with a process for water bill payment.
4. Prepare a plan for year 2015 in order to raise the collection efficiency , the plan includes the following main tasks;
    a. Study the possibility of introducing a pre-paid water meter to be used as a trial in Rafah , then the other areas based on the outcome results.
    b. Negotiate with the unity government the possibility of issuing new laws to encourage the customers to pay their due amounts to the water utility.
    c. Enhance the operations of water inspection units.
    d. Re-launch the campaign to cut the service to the subscribers who are not committed of paying the monthly water bill .
5. Update customer data base (Unit served by the subscription, HH status, employment status for the customer, contact information …..etc.), through activations of water meter readers unit.
6. Update the customer services department hardware's (PCs , printers , scanners…. Etc) in Rafah, Khanyunis , and Dar El Balah.

7. Prepare a tariff study for tariff change in Rafah Area in cooperation with MOLG, in order to overcome the financial problem raised from using the old tariff.
8. Survey the customers opinions of the city of Rafah on the quality of service provided by the Water utility and prepare the report on the result found and set a plan for the next phase to overcome the negatives that have emerged through this survey.
9. Prepare several fund raising proposal for different donors to support customers services activities. (ACF, QRC, ICRC, UNICEF)
10. Cooperate with GIS & MIS department for customer data to be uploaded in CMWU GIS system.
11. Move the customer services office in the middle area to a new location to serve larger number of customers and to ease the communication with them.
12. Follow up the progress of the bill improvement collection campaigns firstly issued in April 2009 in Rafah area. The collection figures were encouraging and meet the campaign expectation. The collection ratio has risen from 25% in 2008, to 44% in 2009, 48% in 2010, 58.50% in 2011, 46.0% in 2012 , 52.0% in 2013 & 40% in 2014 , the decrease in 2014 due, to the extremely deteriorated economic situation (close the borders from Israeli & Egyptian Side) and the 51 days war on Gaza (July & August / 2014).
13. The collection ratios in 2014 summarized in the following table:

Area	Collection Ratio	No. of Customers
Khan Younis	41%	16,272.00
Rafah	39.5%	18,553.00
Deir El Balah	28%	7,147.00
Total		**41,972.00**

3.0 OTHER ACTIVITIES

Other activities have been running to enhance the performance of CMWU as well as strengthen the relationship between CMWU and PWA through enhancing the management relationship between each other, as well as other activities between the CMWU and funding agencies through close follow up and transparent financial procedures. (more details are found in Annex 4 “Financial Report”).

The following activities illustrate the CMWU other activities;

3.1 Enhance the identity of the CMWU as fully functional service provider:

1. CMWU Board of Directors has agreed on a decision that all municipalities who receive O&M services from the CMWU should pay 10% of the O&M cost to the CMWU account. This step will strength the CMWU future sustainability.
2. Restructuring CMWU head quarter and regional offices for better performance.
3. Expand the CMWU work activities to include all Gaza Strip municipalities.
4. Enhance the interface management between CMWU and PWA by regular meeting and close coordination.

5. Forming a coordination committee with Municipality of Gaza in order to implement the Gaza sewerage Emergency Project financed by KFW and other re-construction projects after the war.
6. Finishing the CMWU strategic plan (5 years plan), and present it to all CMWU partners, stockholders, etc.
7. Ongoing negotiations between PWA, CMWU, Northern Municipalities and MOLG to hand over the NGEST operation to CMWU.
8. The implementation of STLV (phase 1) funded by EU is in progress and there is on-going negotiations between PWA, CMWU and ISDB to complete the second phase of the STLV sea water desalination plant to reach 20,000m^3/day.
9. The tender for supervision consultant for the implementation of the central treatment plant in Khan Younis is under evaluation and the work should start early 2015.
10. Ongoing negotiations with Gaza and Jabalia municipalities to join the CMWU framework for better services delivered to the customers.
11. PWA and CMWU are working jointly with the WB and IDB in order to fulfil the new project's targets and continue monitoring and seek to improve the overall efficiency of the existing water and wastewater services through the WSSSIP and its additional fund AF1.
12. The design documents for the AF1 projects are under preparation.

3.2 Donor's visits to the CMWU sites:

During the period of this report, many donors' agencies have visited CMWU and field visits were made to some of the ongoing projects, part of those visits are as follow:

1. On 19.03.2014 ICRC director in the Middle East accompanied with representatives of donor institutions who support the Red Cross projects in the Gaza Strip, at Rafah Wastewater Treatment Plant.

2. On 12.04.2014ISDB representatives visited Al Moghraka Water tank, Central Water and Wastewater lab at Al Zahra city, and Dair El Balah Desalination plant which are financed by ISDB.

3. On 16.04.2014 ICRC and Ministry of local Governorate technical teams visited different projects implemented by the CMWU including Wadi Gaza WWTP, Al Moghraka water tank, Water and Wastewater lab in addition to other sites.

4. On 17.06.2014 KFW, PWA and concerned municipalities visited the sites of the proposed wastewater networks' projects at Jabalia and Dair El Balah, which will be financed by KFW.


Figure 37: Site Visits

3.3 Coordinate with other entities:

As known since the establishment of CMWU, all the projects for either development or for emergency are funded from different donors until CMWU could stand alone for its facilities operation and maintenance as well as developmental projects. This is expected to take more than 5 years at least. The following are the ongoing activities in cooperation with other donors' agencies as;

ISDB: CMWU and ISDB have signed an agreement to implement 10000 m^3/day sea water desalination plant in Gaza city .This plant is an important component of the STLV program that will improve the water supply quality for around 250,000 inhabitant in Gaza City.

UNICEF: new agreement signed between UNICEF and CMWU to rehabilitate water & wastewater networks at different locations in the southern and Middle areas.

ICRC: During 2014 ICRC has financed different projects which aim to improve especially the wastewater sector at different areas of Gaza strip . In addition to that ICRC has financed many emergency projects during and after the last offensive war on Gaza.

UNRWA: Coordinate with UNRWA in order to complete the projects: Sewage Pressure carrier line in Khanyounis , the contractor succeeded in cooperation with PWA/CMWU to gain the donation number and has started procuring and coordinating for the GRP pipes.

QRC: has financed different projects implemented during the past year including electromechanical upgrading and maintenance for water wells and WW pump stations.

QC: has financed different projects totals of 960,000 USD for rehabilitation of wastewater pumping stations.

KFW: is committed to finance two wastewater projects of total amount 3.3 M Euro in cooperation with PWA and CMWU which for construction wastewater networks in Anan area- Jabalia and Al Berka area- Deir Al Balah.
In addition to allocation of 9 M Euro for re-construction activities through Gaza strip.

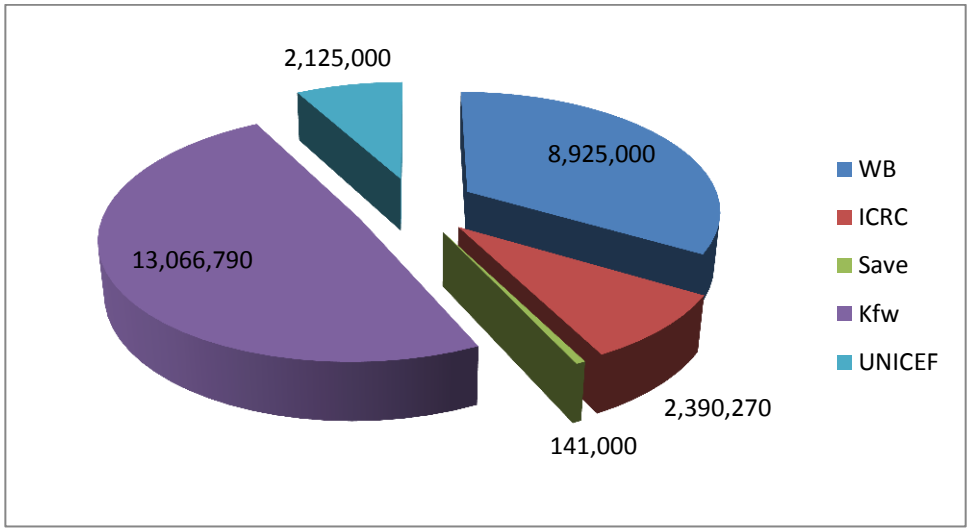
EU: an agreement has been signed with PWA, CMWU and EU; it includes different water projects which aim to rehabilitate and improve the water sector at the southern governorates, and the total budget is 4.7 Million Euro, the projects includes construction water tanks at Khanyounis city (Al Amal, and Al Satar) besides partial re-configuration for water distribution systems to accommodate with the desalinated quantity.

Other Ngo's: CMWU has been keeping the communication with all NGO's that are working in the water sector in order to work within master plans and its defined projects and targets.

CMWU played an important role in the signature of a long term "water Operations partnership Agreement" between Duetch water Utilities (Vitens and Water Net) and Palestinian Water Utilities (CMWU, JWU and Bethlehem Joint Water Services) sponsored

by PWA. This agreement is expected to strengthen the institutional framework, improve the water and wastewater operational capacity and performance and improve the assets management for both parties; especially the Palestinian institutions.

The figure below shows the last commitments after the War till the end of year 2014



3.4 Public awareness campaigns:

Public Awareness campaigns were implemented during the last year relied on the methodology of raising the public awareness of water and sanitation, storm water in the Gaza Strip and concentrated on the following issues:

- Saving water
- Warning the people from the risks of getting close from the storm water lagoons
- Cleaning the water tanks
- Water situation
- Health impact

However, Building the capacity of the activists in the field of water and sanitation, that targeting different groups; youth (males, females), women, farmers and children.

Parts of the implemented activities are mentioned here below:

1. Training courses: Media & awareness unit implemented 1training course, which targeted 5 trainees from Rafah city to implement awareness activities.
2. Workshops: Media &awareness unit implemented 30 workshops in all the 5 Gaza governorates.
3. Home visits: Media &awareness unit implemented 300 home visits in Rafah city.
4. Media Materials including; Stickers, billboards, printing messages on the back of the water bill and radio ads.

5. Performing 20 TV interviews on Water problems and issues on different satellite channels.
6. Performing 2 press conferences on water issues
7. Performing 5 academic workshops in different areas on water issues.
8. Ceremonies: World water Day ceremony.
9. Organizing Filed trips for students.






Figure 38: CMWU Public Awareness Activities

4.0 Main Obstacles

One of the main and major obstacles towards accomplishing ongoing contracts is the Israeli siege forced on the Gaza commercial borders towards importing the necessary goods to finish the works. Added to that; the cost of materials which become higher than its regular price due to difficulties in obtaining those materials to implement the projects. Some of the contractors have succeeded to import their materials with higher prices in which affect the engineering estimation for the projects supply materials.

Due to Gaza Strip situation, some of the developmental projects are not financed and some of the water and waste water projects become humanitarian projects.

During the period of this report, Gaza strip was suffering from catastrophic shortages and unreliability of electricity power supply which has severely and adversely affected the whole pumping and treatment systems of water and wastewater services. Also, standby electricity Diesel generators located at various sites were heavily and in somehow harmfully affected with long term operating schemes to keep and protect the services provided to the people of Gaza.

In addition for all these obstacles the last offensive on Gaza occurred on July – August 2014 added new challenges, especially during this period the Gaza Strip was suffering from lack of fuel, mechanical materials and shortage of electricity power supply, that caused catastrophic situations as the offensive left several types of damages; those damages have been assessed and classified for various elements of water and wastewater facilities and infrastructure.

The CMWU during the last offensive carried out some emergency response for essential damages occurred in water and wastewater networks and facilities. These damages had badly affected the water and wastewater services and caused many changes in the performance indicators.

5.0 Success Story (bringing life back to Wadi Al Salqa area)

During the 2014 war on Gaza Strip, Wadi Al Salqa area was exposed to bombing and military invasion by the Israeli forces; they destroyed the only and main water reservoir and their only water well supply. Wadi Al Salqa has more than 10,000 residents living there, they started to suffers from the water supply shortage due to the damages occurred.

CMWU immediately intervened to return water back to the people, with fund from the World Bank, and started to rehabilitate the water well and the reservoir after the cease-fire directly. Full maintenance to the damaged water well and rehabilitation of the water reservoir. The maintenance and the rehabilitation support cost was 25,000 USD from the WSSSIP.

The works included installing a water pump, installing the main networks that connect the reservoir with the houses networks, maintaining the control panel, maintaining the power network, installing a container room for the water pump instead of the destroyed concrete rooms and rehabilitating the reservoir.

Fatma Abu Swaween, 67 years old , from Wadi Al Salqa area, Said,"the situation was so difficult during the war, we couldn't find any drop of water due to the damaged water well and networks even we were risking our lives to buy from far areas." Fatima continued "the water cut lasted for about two months and with the efforts of good people water returned back to our house"

Ms. Fatma Abu Swaween

Before War

During the War

After Fast Recovery

6.0 Conclusion

Due to the last offensive war on the Gaza Strip (July – August 2014) CMWU in cooperation with PWA have contacted different donors' agencies (during and after the war) to provide the necessary financial support to carry out the emergency damages. While after the war, CMWU with close coordination with PWA has issue the damage assessment report which shows all the repairs needed to restore the water and waste water system with an estimation budget around 34M$-USD.

In order to provide a new fresh water resources to the system, PWA in cooperation with CMWU has been looking for financing large projects especially large scale seawater desalination plants and waste water treatment plants even the current political situation is not stable in order to:

1. Bridge the gap between the water supply demand and the available quantities.
2. Improve the quality of the supplied water which will lead to mitigate the health hazards, especially for the poor people.
3. Relief the stress on the coastal aquifer of Gaza Strip and upgrade its reserve of water for the next generations.

CMWU shall keep looking for self dependency especially in chemical, biological lab creation and vehicles workshop.

CMWU shall expand and improve water bill issuance and collection efficiency in order to be able to recover most of its operational expenses.

PWA and CMWU are working jointly with the WB and Multi donors in order to fulfil the new project's targets and continue monitoring and seek to improve the overall efficiency of the existing water and wastewater services through the WSSSIP & AF1.

END