REPUBLIC OF LEBANON
MINISTRY OF ENERGY AND WATER

NATIONAL WATER SECTOR STRATEGY UPDATE - 2020

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FOREWORD

The present volume is part of the ***National Water Sector Strategy Update – 2020***, which includes the following volumes :

VOLUME I : EXECUTIVE SUMMARY

VOLUME II : WATER SECTOR GOVERNANCE

- Section II A Strategy pillar – SDG 6
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- Section IV A Tapped water resources and wastewater facilities
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VOLUME V : PROPOSED PROJECTS (this volume)

- Section V A Criteria for projects and priorities selection
- Section V B Proposed Projects
- Section V C Appendices to Proposed Projects

VOLUME VI : DRAWINGS

PREAMBLE

The Ministry of Energy and Water prepared and adopted the Lebanese National Water Sector Strategy (NWWSS) in 2010 which, in turn, was endorsed by the Government of Lebanon in 2012 (Resolution No.2, Date 09/03/2012).

Since then, the Ministry has been implementing plans and projects identified in the strategy and, in parallel, the CDR and the Water Establishments have prepared regional water resources allocation plans, and national and regional groundwater resources studies for the catchment, treatment and distribution of water to all areas of Lebanon. In addition, regional plans for the collection and treatment of wastewater were prepared.

Seven years through, time has come to review what has been realized from the original roadmap and update the Water & Wastewater strategies of 2012 by revisiting the water allocation and supply plans, wastewater collection and treatment plans, water storage / dams master plans, and irrigation plans.

Seven years through, it has become time to review what has been realized from the original roadmap and update the Water & Wastewater strategies of 2012 by revisiting the water allocation and supply plans, wastewater collection and treatment plans, water storage / dams master plans, and irrigation plans.

OBJECTIVE OF THE CONSULTANCY

The national water sector strategy of 2012 has put an end to a phase and started a new phase for developing a wide and comprehensive vision and confirming the general principles of the national water policies on the short, medium and long terms.

The updated strategy maintains the main strategic principles of the water policies adopted by the Government of Lebanon in 2012, but reassesses the then set priorities in light of today's actual context. This update also merges the National Water and Wastewater strategies of 2012 into one consolidated strategy that we shall call "Updated National Water Sector Strategy 2020", taking into account studies and projects completed between 2012 and 2019 in both fields.

The objective of the Consultancy is to merge the National Water and Wastewater strategies of 2012 into one consolidated strategy, and will take into account studies and projects that were completed between 2012 and 2019 in both fields.

DATA COLLECTION

The first phase of the consultancy services is the Data Collection.

All available data and necessary information were collected from the relevant stakeholders such as MoEW, the four Water Establishments, the Litani River Authority, the CDR, relevant Ministries such as MoE and MoA, the Council of the South, Donors involved in the water sector, UN Agencies, local and international NGOs, and else.

This information covers all what is available to date about

- Water governance and tariffs of the four WEs.
- Available updated data about rainfall, population count and growth, water needs
- Available water resources and water balance by sector, for each WE
- Status of the production, treatment, conveying and distribution systems for drinking and irrigation water
- Status of the collection, conveying, and treatment of sewage
- Implemented and planned projects,
- Status of large scale projects in progress such as dams, hill lakes, treatment plants, big water conveyors, …
- Conducted hydrogeological and hydrological studies and other relevant studies,
- Available regional water, wastewater, and irrigation master plans,

It needs to be pointed out that at the present stage the collected data is not comprehensive and some information such as the construction dates and the conditions of the existing infrastructure (and else) is scarcely available. However it gives an overall picture of the present status of the subjects covered under this report.

STRUCTURE OF THE PRESENT VOLUME V

The present volume is divided in two sections:

1. Section A : Proposed projects.

   Gives a list, with cost estimates, of the proposed projects, studies, and investigations, including :

   - The criteria used for the selection of the projects and setting out of the priorities.
   - A list of the required projects for water, wastewater and irrigation, grouped by WE, and by priority.
   - The studies and works for implementing Artificial Aquifers Recharge
   - The required studies and works for improving and expanding the Meteorological and Hydrometric networks at the national scale
   - The implementation of a PMU
   - The implementation the emergency action plan for improving the water governance.
   - The required general geological and hydrogeological studies at national scale

2. Section B : Appendices to proposed projects.

   Provides additional details and justification for each of the proposed projects

LIST OF ACRONYMS

Bm^3	Billion cubic meter
BMLWE	Beirut and Mount Lebanon Water Establishment
BWE	Beakaa Water Establishment
CDR	Council for Development and Reconstruction
CM	Customer Management
EIB	European Investment Bank
EU	European Union
HR	Human resources
IFRS	International Financial Reporting Standards
IHIS	Integrated Hydrological Information System
IWMI	International Water Management Institute
l/c/d	Liters per capita per day
l/sec	Liters per second
LBP	Lebanese Pound
m^3/d	Cubic meter per day
m^3/h	Cubic meter per hour
masl	Meters above sea level
MCM	Million cubic meter
MENA	Middle East and North Africa region
Mm^3	Million cubic meter
MoA	Ministry of Agriculture
MoE	Ministry of Environment
MoEW	Ministry of Energy and Water
NGO	Non-Governmental Organization
NLWE	North Lebanon Water Establishment
NRW	Non Revenue Water (unaccounted for water)
NWSS	National Water Sector Strategy

ONL	Office National du Litani
PMU	Project Management Unit
SLWE	South Lebanon Water Establishment
UFW	Unaccounted for Water
UN	United Nations
WE	Water Establishment
WEs	Water Establishments
WES	Water Establishments

SECTION V A
PROPOSED PROJECTS

Table of contents

V A.1. CRITERIA FOR PROJECTS AND PRIORITIES SELECTION

V A.1.1 GENERAL

The NWSS aims to identify the projects that need to be implemented in order to cover the needs of the population in terms of drinking water, wastewater, and water for irrigation. Those needs for the strategy horizon (2035), covering the whole territory, are given in *Volume IV*.

In addition, the Consultants undertook a comprehensive assessment of the statuses and capacities of the existing infrastructures and operational systems, which allowed identifying the gaps that should be filled in order to cover the needs. These gaps were then translated into projects in all three sectors, and prioritized by order of urgency and impact:

- Priority 1 is for urgent projects to be implemented as soon as can be.
- Priority 2 is for projects that are required but could be delayed if no possibility to implement them now.
- Priority 3 is for projects that would be required in the future, based on the foreseen evolution of the present status of the water sector.

V A.1.2 CRITERIA FOR WATER PROJECTS SELECTION

IV B. 1.2.1 Priority 1 (2020 -2025)

Priority 1 is for projects addressing a negative water balance in a given water distribution scheme, and/or implementing missing components such as reservoirs, networks, and pumping stations in order to extend the coverage and the good performance of the distribution scheme. Namely:

- Development and expansion of water resources to cover potable water needs, i.e. in water systems having a negative water balance in 2020
- Provision of adequate water storage capacities, i.e. in water systems that currently have very small reservoirs compared to the required storage or in those that have very old reservoirs that need to be replaced.
- Provision of adequate main transmission lines by constructing new ones, increasing the capacity of existing ones, and replacing very old ones
- Construction of distribution networks, mainly in water systems that currently don't have a distribution network or where the network is very old and in bad condition.
- Monitoring main transmission and distribution lines through the installation of district water meters, in order to better control the distribution and address leakage issues.

IV B. 1.2.2 Priority 2 (2025 - 2030)

Priority 2 projects cover mainly :

- The extension of existing distribution networks and/or replacement of old ones
- The expansion of existing water storage capacities to the required standards

- The development of new (or improvement of existing) water resources to address future negative water balances, along with the construction of related works (i.e. transmission lines, pumping stations, reservoirs …)

IV B. 1.2.3 Priority 3 (2030 – 2035)

Priority 3 is for projects that should be implemented to address expected issues at the long term.

V A.1.3 CRITERIA FOR WASTEWATER PROJECTS SELECTION

The main objective of the proposed wastewater projects is to eradicate, or at least reduce, the nuisance to the environment and to groundwater by minimizing the discharge of untreated wastewater into the open or in waterbodies. For this purpose, priorities are set as follows :

IV B. 1.3.1 Priority 1

- Implement new WWTPs and sewers in densely populated areas with poor (or inexistent) sanitation infrastructure
- Expansion and upgrade of major existing WWTPs the treatment capacity of which isn't enough to treat the influent (in 2020) to acceptable standards.
- Implementation of new WWTPs and sewers in areas that are in the watershed of proposed and existing dams

IV B. 1.3.2 Priority 2

- Implementation of new WWTPs and sewer networks in less densely populated areas
- Expansion and upgrade of existing WWTPs if their treatment capacity isn't enough to treat the influent wastewater flows in the near future

IV B. 1.3.3 Priority 3

- Implementation of small wastewater treatment units in isolated villages/areas

V A.1.4 CRITERIA FOR IRRIGATION PROJECTS SELECTION

A negative water balance and/or the bad status and coverage of the irrigation networks. However, proper estimation of the water balance is quite impossible due to the lack of meteorological and hydrometric data, and insufficient studies on the subject. Therefore Priorities are set as follows :

IV B. 1.4.1 Priority 1

For agricultural areas requiring :

- Concreting of existing earth channels
- Rehabilitation of existing concrete channels
- Construction of new irrigation networks (channels or pipes)

IV B. 1.4.2 Priority 2

Increase the availability of water resources and construct all related works (i.e. irrigation transmission and distribution lines and small storage structures)

IV B. 1.4.3 Priority 3

Construction of new networks and development of new resources for potential future expansions

V A.1.5 CRITERIA FOR DAMS AND HILL LAKES SELECTION

The expected impact of climate change (see Volume III, Section III A.2.) is that the volumes of water stored in aquifers and in the form of snow will be reduced in favour of lost runoff to the sea (at least on the western slope of Mount Lebanon, but this is exactly where the majority of the population lives). This reduction in the volumes stored naturally must be compensated artificially through artificial aquifers recharge where possible and/or through the construction of retention dams.

It is a strategic option to keep groundwater resources as a strategic reserve for the future and use them only in areas where surface storage is not possible or insufficient to cover the growing needs.

Therefore surface storage must be a strategic priority. The NWSS 2020 considers the construction of surface storage facilities as the first resort to compensate for water supply needs, provided it is financially, technically and environmentally feasible.

It should be noted that some of the dams identified in the 2011 strategy are now dismissed due to the following:

- Different criteria used to calculate the water demands leading to acceptable water balances.
- Feasibility or Design studies conducted on some dams has shown that they are geotechnically not feasible
- The sites selected for dam construction are now constructed and not available anymore

The main objective of the proposed dams and Hill lakes is to secure new water resources to cover future potable water and/or irrigation needs in areas with high negative water balance where no other resources are available. Priorities are set depending on when the storage would be needed.

IV B. 1.5.1 Priority 1

For Dams that would be needed in the next ten years, the construction of which should therefore start as soon as possible.

For Hill Lakes in areas facing severe water shortages for irrigation purposes, or in areas that have witnessed a drastic and rapid increase in irrigated lands in the past few years

IV B. 1.5.2 Priority 2

For Dams that would be needed in more than 15 years, the construction of which should therefore start in less than 10 years.

For Hill Lakes in areas facing less severe water shortages for irrigation purposes, or in areas that witness a relatively stable or slight increase in irrigated area

IV B. 1.5.3 Priority 3

For Dams that would be needed in more than 20 years, the construction of which should therefore start in less than 15 years.

For Hill Lakes in areas that currently don't face water shortages, but that might require additional resources in the future

V A.2. PROPOSED PROJECTS COST ESTIMATES AND RATIOS PER CAPITA

Table V A 1 below gives a list of the proposed projects with the cost estimates and the ratio per capita for each project.

Table V A 2 and Table V A 3 below show the consolidated Cost Estimates of the proposed projects, sorted by water sector and by water Establishment.

Table V A 1 Projects Cost Estimates and ratios per capita

Project	Cost M USD	Population capita	Ratio USD / cap
NORTH LEBANON WATER ESTABLISHMENT			
Drinking water projects			
NL-W A. District of Batroun	23.15	93 578	247
NL-W B. District of Halba	72.48	377 776	192
NL-W C. District of Koura	29.84	171 508	174
NL-W D. District of Minieh	32.11	167 742	191
NL-W E. District of Ed Danniyeh	31.92	121 074	264
NL-W F. District of Zgharta	44.92	139 251	323
NL-W G. District of Tripoli	30.79	483 451	64
NL-W H. District of Qobayate	73.33	179 838	408
Wastewater projects			
NL-WW A. District of Akkar	358.82	635 838	564
NL-WW B. District of Koura	29.69	171 508	173
NL-WW C. District of Minieh	54.06	167 742	322
NL-WW D. District of Zgharta	41.48	139 251	298
NL-WW E. District of Batroun	8.36	93 578	89
SOUTH LEBANON WATER ESTABLISHMENT			
Drinking water projects			
SL-W A. District of Nabatiye	94.80	353 107	268
SL-W B. District of Jezzine	31.55	46 964	672
SL-W C. District of Sour	76.85	639 726	120
SL-W D. District of Zahrani	58.20	210 183	277
SL-W E. District of Saida	46.37	317 202	146
SL-W F. District of Bint Jbeil	60.93	301 366	202
SL-W G. District of Marjaayoun & Hasbaya	55.43	136 057	407
Wastewater projects			
SL-WW A. District of Nabatiye	78.70	353 107	223
SL-WW B. District of Sour	87.25	639 726	136
SL-WW C. District of Bint Jbeil	205.90	301 366	683
SL-WW D. District of Jezzine	15.94	46 964	339
SL-WW E. District of Saida	136.00	317 202	429

Table V A 1 Projects Cost Estimates and ratios per capita

Project	Cost M USD	Population capita	Ratio USD / cap
BEIRUT & MOUNT LEBANON WATER EST.			
Drinking water projects			
BML-W A. District of Beirut	133.63	643 059	208
BML-W B. District of Jbeil	63.99	218 128	293
BML-W C. District of Baabda Aley	100.25	1 198 485	84
BML-W D. District of Keserwan	48.86	464 480	105
BML-W E. District of Chouf	127.35	409 006	311
BML-W F. District of Meten	92.23	1 064 429	87
Wastewater projects			
BML-WW A. District of Beirut	50.00	643 059	78
BML-WW B. District of Jbeil	140.10	218 128	642
BML-WW C. District of Baabda Aley	290.00	1 198 485	242
BML-WW D. District of Keserwan	23.70	464 480	51
BML-WW E. District of Chouf	138.48	409 006	339
BML-WW F. District of Metn	238.00	1 064 429	224
BEQAA WATER ESTABLISHMENT			
Drinking water projects			
BQ-W A. District of Baalbeck	60.18	588 872	102
BQ-W B. District of Hermel	38.48	107 820	357
BQ-W C. District of West Beqaa, Zahleh & Rachaiya	49.19	742 940	66
Wastewater projects			
BQ-WW A. District of Baalbeck	295.22	588 872	501
BQ-WW B. District of Hermel	116.70	107 820	1 082
BQ-WW C. District of Zahleh - West Beqaa	44.01	665 560	66
BQ-WW D. District of Rachaya	73.96	77 380	956

Table V A 2 Consolidated Cost Estimates, by water sectors
In M USD, VAT and expropriations excluded

	Water	Wastewater	irrigation	Dams	Hill lakes	Total
Priority 1 projects						
NLWE	338.55	242.39	29.12	196.02	33.37	839.44
BWE	96.03	214.31	109.71	52.00	-	472.05
SLWE	411.52	367.05	86.55	-	-	865.12
BMLWE	420.77	569.58	1.02	65.00	-	1 056.37
Aquifer Artificial Recharge **(*)**						3.65
Meteorological and Hydrometric networks **(*)**						15.61
General Studies and Investigations **(**)**						35.78
Total	1 266.87	1 393.33	226.40	313.02	33.37	**3 288.03**
Priority 2 projects						
NLWE	-	250.03	11.20	50.00	110.72	421.95
BWE	50.28	268.08	83.00	150.00	55.20	606.55
SLWE	12.60	77.09	408.88	273.00	119.70	891.27
BMLWE	122.58	205.40	1.15	200.00	33.50	562.63
Aquifer Artificial Recharge **(*)**						11.60
Meteorological and Hydrometric networks **(*)**						-
General Studies and Investigations **(**)**						2.50
Total	185.46	800.59	504.23	673.00		**2 496.50**
Priority 3 projects						
NLWE	-	-	103.27	150.00	22.90	276.17
BWE	1.55	47.50	4.52	107.06	-	160.63
SLWE	-	79.65	299.70	480.00	-	859.35
BMLWE	22.95	105.30	5.22	53.00	-	186.47
Aquifer Artificial Recharge **(*)**						16.50
Meteorological and Hydrometric networks **(*)**						-
General Studies and Investigations **(**)**						11.15
Total	24.49	232.45	412.71	790.06		**1 510.26**
Total Projects	1 476.82	2 426.37	1 143.34	1 776.08		7 294.79
15% Contingencies	221.52	363.96	171.50	266.41		1 094.22
Projects Grand Total	**1 698.34**	**2 790.32**	**1 314.84**	**2 042.49**		**8 389.01**

*** Including studies and implementation**
**** Including General geological studies + PMU and Governance**

Table V A 3 Consolidated Cost Estimates, by Water Establishment
In M USD, VAT and expropriations excluded

	NLWE	BWE	SLWE	BMLWE	Total
Priority 1 projects					
Water	338.55	96.03	411.52	420.77	1 266.87
Wastewater	242.39	214.31	367.05	569.58	1 393.33
Irrigation	29.12	109.71	86.55	1.02	226.40
Dams	196.02	52.00	-	65.00	313.02
Hill Lakes	33.37	-	-	-	33.37
Aquifer Artificial Recharge **(*)**					3.65
Meteorological and Hydrometric networks **(*)**					15.61
General Studies and Investigations **(**)**					35.78
Total	839.44	472.05	865.12	1 056.37	**3 288.03**
Priority 2 projects					
Water	-	50.28	12.60	122.58	185.46
Wastewater	250.03	268.08	77.09	205.40	800.59
Irrigation	11.20	83.00	408.88	1.15	504.23
Dams	50.00	150.00	273.00	200.00	673.00
Hill Lakes	110.72	55.20	119.70	33.50	319.12
Aquifer Artificial Recharge **(*)**					11.60
Meteorological and Hydrometric networks **(*)**					-
General Studies and Investigations **(**)**					2.50
Total	421.95	606.55	891.27	562.63	**2 496.50**
Priority 3 projects					
Water	-	1.55	-	22.95	24.49
Wastewater	-	47.50	79.65	105.30	232.45
Irrigation	103.27	4.52	299.70	5.22	412.71
Dams	150.00	107.06	480.00	53.00	790.06
Hill Lakes	22.90	-	-	-	22.90
Aquifer Artificial Recharge **(*)**					16.50
Meteorological and Hydrometric networks **(*)**					-
General Studies and Investigations **(**)**					11.15
Total	276.17	160.63	859.35	186.47	**1 510.26**
Total Projects	1 537.56	1 239.23	2 615.74	1 805.47	7 294.79
15% Contingencies	230.63	185.88	392.36	270.82	1 094.22
Projects Grand Total	**1 768.19**	**1 425.12**	**3 008.10**	**2 076.29**	**8 389.01**

*** Including studies and implementation**
**** Including General geological studies + PMU and Governance**

V A.3. LIST OF PROPOSED PROJECTS

The tables hereinafter give a list of the proposed projects, starting with two Tables of Contents, sorted by Water Establishment and by water sector.

Each project is given a code number. The same code is given to the corresponding project's appendix in Section V B, where additional details and justifications about the project can be found.

LIST OF PROJECTS

Sorted by Water Establishment

LIST OF PROJECTS

Sorted by Water Sector

TOTAL COST OF WATER PROJECTS IN NORTH LEBANON

Priority 1	Priority 2	Priority 3	Total
338,546,090 $	-	-	**338,546,090 $**

Priority	Project code	Description	Estimated cost (USD)
NL-W A. District of Batroun (see drawing NL-W.A)			
1	NL-W. A.1	Distribution system 1 supplying Tannourine Faouqa; Chatine Required works : - 17 km Distribution networks - Construction of 1x200 m³ + 1x 500 m³ reservoirs	1,653,600
1	NL-W. A.2	Distribution System 2 supplying Daraya El-Batroun; Aabdelli; Douma; Bcheaali; Tannourine Et-Tahta; Deir Mar Youssef ; rabta; Toula El-Batroun; Aalali; Sghar; Jrabta El-Batroun; Racha; Ouata Houb; Douq; Mehmarch; Hadtoun; Dahr Abi Yaghi; Mar Mama; Masrah; Ram El-Batroun. Required works : - 6 km Transmission lines + 7 km Distribution networks	1,515,800
1	NL-W. A.3	Distribution System 3 supplying Hamat,Ouajh El-Hajjar, Koubba and Ras Nahhach Required works : - 2.5 km Transmission lines	238,500
1	NL-W. A.4	Distribution System 4 supplying Beit Kassab; Hardine; Niha El-Batroun; Kfour El-Aarbi. Required works : - 11.5 km Transmission lines	1,097,100
1	NL-W. A.5	Distribution System 5 supplying Selaata, Rachkida, Qatnaaoun, Aabrine, Batroun, Kfar Khollos, Kfar Hay, Boqsmaiya, Bijdarfil, Ijdabra, Jebla, Basbina, Kfifane, Deir Kfifane, Jrane El-Batroun, Smar Jbayl, Mrah Ez Ziyat, Rachana, Thoum, Ghouma, Kfar Aabida, Edde El-Batroun, Mrah Chdid, Helta, Sourat El-Batroun, Kfarb Shlaimane, Deir Billa, Kfar Hilda, Beit Chlala, Daael, Bechtoudar, Assia, Ftahat El-Batroun, Zané, Chibtine, Deir Mar Youhanna EL-Batroun, Nahlé El-Batroun, Mrah El-Hajj, Kour, Harbouna, Aartiz and Kfar Hatna Required works : - 30.5 km Transmission lines - Construction of 9x100 m³, 1x150 m³ and 1x200 m³ new reservoirs	3,641,100
1	NL-W. A.6	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Batroun district	**23,146,100**
		Out of which : Priority 1	23,146,100
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-W B. District of Halba (see drawing NL-W.B)			
1	NL-W. B.1	Distribution System 1 supplying Akkar el Atika. Required works : - 8 km Transmission lines + 2 km Distribution networks - Drilling and equipping 4 new wells	3,052,800
1	NL-W. B.2	Distribution System 2 supplying Shakdouf Aakkar and Daoura. Required works : - 2 km Transmission lines - Drilling and equipping 1 new well	720,800
1	NL-W. B.3	Distribution System 3 supplying Aïn-Yacoub; Bazbina; Beino; El-Borge; Mimnih; Tikrite; ElAyoune; Aaiyat; Chakdouf; Qboula; Tallet Chattaha and Tshea Required works : - 2 km Transmission lines + 14 km Distribution networks - Construction of 1x1000 m³ and 1x2000 m³ new reservoirs - Drilling and equipping 1 new well	2,363,800
1	NL-W. B.4	Distribution System 4 supplying Rahbe Required works : - 4 km Transmission lines + 2 km Distribution networks	551,200
1	NL-W. B.5	Distribution System 5 and 6A supplying Beit Mallat; Dahr-Leyciné; Edbel; Hayzouk; Ilate; Jebrâil; Machha Required works : - 12 km Transmission lines + 102 km Distribution networks - Drilling and equipping 6 new wells - Construction of 1x250 m³; 1x1500 m³; 1x500 m³; 1x3000 m³ new reservoirs	13,737,600
1	NL-W. B.6	Distribution System 7A supplying Al-Jédidé; Al-Zoureiribe; Cheikh Taba Montagne; Cheikh Taba Plaine; El-Kantara; Hekr el Dahiri; Karem-Asfour-El-Nahrieh; Minyara and Beit Ghattas Required works : - 6 km Transmission lines + 23 km Distribution networks - Construction of 1x400 m³ new reservoir - Drilling and equipping 2 new wells	3,694,100
1	NL-W. B.7	Distribution System 7B supplying Beit-Ghattas; Bkarzala; Majdla; Mar Touma; Mechaïlha Hakour; Zouk el Moukachérine; Zouk-El-Habalça; Zouk-El-Hosmieh; Dahr Ayasse Required works : - 11 km Transmission lines + 4 km Distribution networks - Drilling and equipping 4 new wells	3,508,600
1	NL-W. B.8	Distribution System 9 supplying Berkayel; Bzal; Safineh el Kayteh Required works : - 14.5 km Transmission lines + 11 km Distribution networks - Construction of 1x1500 m³ new reservoir - Drilling and equipping 5 new wells	5,194,000

Priority	Project code	Description	Estimated cost (USD)
1	NL-W. B.9	Distribution System 10 supplying Bebnine Required works : - 4.5 km Transmission lines + 5 km Distribution networks - Drilling and equipping 4 new wells	2,973,300
1	NL-W. B.10	Distribution System 11 supplying Ouadi El-Jamous Required works : - 2 km Transmission lines - Drilling and equipping 1 new well	720,800
1	NL-W. B.11	Distribution System 12 supplying El-Karkaf; Beit-El-Haouche; Jdeidet el Kayteh and Eyoune-El-Ghouzlane Required works : - 8 km Distribution networks and 5 km Distribution networks - Drilling and equipping 4 new wells - Construction of 1x4000 m³ new reservoir	3,731,200
1	NL-W. B.12	Distribution System 14A supplying Chane; El Houaiche; Khreibet Akkar Required works : - 5.5 km Transmission lines + 4 km Distribution networks - Drilling and equipping 1 new well	1,393,900
1	NL-W. B.13	Distribution System 14B supplying Beit Ayoub; Beit Younes; El Korne; El Krayat; Sadaqa and Michmiche Required works : - 15.5 km Transmission lines + 18 km Distribution networks - Construction of 1x2000 m³ new reservoir - Drilling and equipping 7 new wells	6,958,900
1	NL-W. B.14	Distribution System 14C supplying Danbou; Habchite; Harare and Qabaait Required works : - 11 km Transmission lines - Construction of 1x750 m³ new reservoir	2,798,400
1	NL-W. B.15	Distribution System 14D supplying Fneidek Required works : - 14 km Transmission lines and 6 km Distribution networks - Construction of 1x5000 m³ new reservoir - Drilling and equipping 7 new wells	6,084,400
1	NL-W. B.16	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Halba district	**72,483,800**
		Out of which : Priority 1	72,483,800
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-W C. District of Koura (see drawing NL-W.C)			
1	NL-W. C.1	Distribution System 2 supplying Al-Boukaia; Al-Hraïché; Badbhoun; Bargoune; Barsa; Afsdik; Beitroumine; Belmand; Bkeftine; Btouratige; Déddé; En-Nakhlé; Fih; Kelhate; Kfar Kahel and Zakroune Required works : - 6.5 km transmission lines + 7 km distribution networks - Construction of 2x100 m³; 2x200 m³; 1x300 m³; 1x350 m³; 2x500 m³; 1x600 m³; 1x1000 m³; 1x3500 m³ new reservoirs	2,676,500
1	NL-W. C.2	Distribution System 3 supplying Ras Maska Required works : - Drilling and equipping 2 new wells - 8 km transmission lines - Construction of 1x5000 m³ new reservoir	2,353,200
1	NL-W. C.3	Distribution System 4 supplying Aba; Amioune; Bdebba; Bechmezzine; Bsarma; Aïn Akrine; Dar Chmezzine; Kfar Akka; Kfar Hazir; Bterram; Kfar Saroun; Kousba and Rechdebbine Required works : - 3 km transmission lines + 57 km distribution networks - Construction of 3 pumping stations - Construction of 3x1500 m³; 2x1000 m³; 1x1200 m³; 2x500 m³; 1x200 m³; 1x300 m³; 1x100 m³ new reservoirs	8,220,300
1	NL-W. C.4	Distribution System 5 supplying Bhabbouche; Bziza; Dar Bechtar; Kaftoune and Majdel Required works : - 10 km Distribution networks - Construction of 1x300 m³ new reservoir	943,400
1	NL-W. C.5	Distribution System 6 supplying Bednayel; Btaaboura; Ejdabrine; Kefraya and Kfar Hatta Required works : - Construction of 2x100 m³ new reservoirs	127,200
1	NL-W. C.6	Distribution System 7 supplying Bnehrane Required works : - 5 km Distribution networks - Construction of 1x300 m³ new reservoir	519,400
1	NL-W. C.7	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Koura district	**29,840,000**
		Out of which : Priority 1	29,840,000
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-W D. District of Minieh (see drawing NL-W.D)			
1	NL-W. D.1	Distribution System 1a supplying Al Minieh Required works : - 23 km Transmission lines - 10 km Distribution networks - Construction of 2x3000 m³ + 1x4000 m³ new reservoirs - Drilling and equipping 10 new wells	9,932,200
1	NL-W. D.2	Distribution System 2a supplying Markabta Required works : - 3 km Transmission lines - 2 km Distribution networks - Drilling and equipping 1 new well	985,800
1	NL-W. D.3	Distribution System 3a supplying Borge el Yahoudiyeh; Deir Omar Required works : - 3 km Transmission lines - 17 km Distribution networks - Construction of 1x1000 m³ + 1x1500 m³ + 1x6000 m³ new reservoirs - Drilling and equipping 1 new well	3,333,700
1	NL-W. D.4	Distribution System 4a supplying Nabi Youchaa Required works : - 1 km Transmission lines - 3 km Distribution networks - Construction of 1x500 m³ new reservoir	477,000
1	NL-W. D.5	Distribution System 5a supplying Tourbol Required works : - 1 km Transmission lines - 2 km Distribution networks - Construction of 1x600 m³ new reservoir	402,800
1	NL-W. D.6	Distribution System 6a supplying Zouk Bhannine; Al Rihanieh; Aadoua Required works : - 5 km Transmission lines - 6 km Distribution networks - Construction of 2x400 m³ + 1x2000 m³ new reservoirs - Drilling and equipping 1 new well	1,982,200
1	NL-W. D.7	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Minieh district	**32,113,700**
		Out of which : Priority 1	32,113,700
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-W E. District of Ed Danniyeh (see drawing NL-W.E)			
1	NL-W. E.1	Distribution System 1 supplying Sir Required works : - Construction of 1 km Transmission line + 20 km Distribution networks - Construction of 1x600 m³ + 1x500 m³ + 1x200 m³ new reservoirs	2,141,200
1	NL-W. E.2	Distribution System 2 supplying Al-Sfiré, Assoun, Bkaa Safrine, Bkarsouna, Mrah-El-Sfiré Required works : - Construction of 13.5 km Transmission line + 5 km Distribution networks - Construction of 2x1000 m³ + 1x500 m³ new reservoirs	2,263,100
1	NL-W. E.3	Distribution System 3 supplying Azka, Btermaz, El-Watié et Harf Siad, Kfar Chlane, Kfar Habou, Mrah-el-Sreige, Tarane Required works : - Construction of 7 km Transmission line + 5 km Distribution networks - Construction of 3x1000 m³ + 1x500 m³ + 1x300 m³ + 1x100 m³ + 1x200 m³ new reservoirs	2,098,800
1	NL-W. E.4	Distribution System 4 & 5 supplying Bakhoune, Haql el Aazimé, Kattiné, Kharnoub Required works : - Construction of 1 km Transmission line + 5 km Distribution networks - Construction of 1x600 m³ + 1x1000 m³ new reservoirs	869,200
1	NL-W. E.5	Distribution System 6 supplying Bechhara, Izal, Jarjoura, Mazraat Ketrane Required works : - Construction of 2 km Transmission line + 8 km Distribution networks - Construction of 1x1000 m³ + 2x200 m³ new reservoirs	1,250,800
1	NL-W. E.6	Distribution System 8 supplying Aassaymout, Debaael, Jaroun, Qarhaiya Required works : - Construction of 7.5 km Transmission line	715,500
1	NL-W. E.7	Distribution System 9 supplying Aïn-El-Tiné, Beit-El-Faks, El-Hazmieh, Karseita, Nemrine et Bakoura Required works : - Construction of 9.5 km Transmission line + 8 km Distribution networks - Construction of 1x300 m³ + 1x200 m³ new reservoirs	1,764,900
1	NL-W. E.8	Distribution System 10 supplying Beit Haouik, Hawara, Kfar Bibnine Required works : - Construction of 6 km Transmission line + 3 km Distribution networks - Construction of 1x400 m³ new reservoir	938,100
1	NL-W. E.9	Distribution System 12 supplying Kahf-El-Malloul Required works : - Construction of 2 km Transmission line + 1 km Distribution networks - Drilling and equipping 1 new well	805,600
1	NL-W. E.10	Distribution System 13 supplying Zaghrteghrine Required works : - 2 km Distribution networks + 2 km Distribution networks - Drilling and equipping 1 new well	890,400
1	NL-W. E.11	Distribution System 14 supplying Behweité Required works : - 1 km Distribution networks	84,800
1	NL-W. E.12	Distribution System 15 supplying Bchnnata, Btehline, Omar Required works : - Construction of 15 km Transmission line + 5 km Distribution networks - Construction of 1x400 m³ new reservoir	678,400
1	NL-W. E.13	Distribution System 16 supplying Deir Nebouh Required works : - Construction of 5 km Transmission line + 4 km Distribution networks - Drilling and equipping 2 new wells - Construction of 2x500 m³ new reservoirs	2,130,600
1	NL-W. E.14	Distribution System 17 supplying Beit Zaoud Required works : - Construction of 3 km Transmission line	286,200
1	NL-W. E.15	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Danniyeh district	**31,917,600**
		Out of which : Priority 1	31,917,600
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-W F. District of Zgharta (see drawing NL-W.F)			
1	NL-W. F.1	Distribution System 1 supplying Hailan and Mzraat Kefraya Required works : - 2 km Transmission lines - Construction of 300 m³ new reservoir - Drilling and Equipping of 1 new well	816,200
1	NL-W. F.2	Distribution System 2 supplying Aalma Required works : - 2 km Transmission lines + 10 km Distribution network - Construction of 2000 m³ new reservoir - Drilling and Equipping of 1 new well	1,812,600
1	NL-W. F.3	Distribution System 3 supplying Kfarhoura Required works : - 2 km Transmission lines + 5 km Distribution network - Drilling and Equipping of 1 new well	1,144,800
1	NL-W. F.4	Distribution System 5 supplying Daraiya Zgharta Required works : - 2 km transmission lines - Construction of 250 m³ new reservoir - Drilling and Equipping of 1 new well	810,900
1	NL-W. F.5	Distribution System 6 supplying Aarjis and Bnechaai Required works : - 2 km Transmission lines - Construction of 250 m³ new reservoir - Drilling and Equipping of 1 new well	810,900
1	NL-W. F.6	Distribution System 7 supplying Seraal Required works : - 6 km Distribution network - Construction of 200 m³ new reservoir	593,600
1	NL-W. F.7	Distribution System 8 supplying Aintourine Required works : - 5 km Distribution network - Construction of 100 m³ new reservoir	487,600
1	NL-W. F.8	Distribution System 9 supplying Mazraat Et-Teffah Required works : - 6 km Transmission lines + 12 km Distribution network	1,590,000
1	NL-W. F.9	Distribution System 10 supplying Arde, Mejdlaiya Zgharta, Boussit and Hraiqis Required works : - 1.5 km Transmission lines - Construction of 1x1500 m³, 1x750 m³, 1x3000 m³ new reservoirs	850,000
1	NL-W. F.10	Distribution System 11 supplying Aachach, Miriata, Rachaaine, Sakhra and Danha. Required works : - 6.5 km transmission lines + 11 km Distribution network - Construction of 1x1500 m³, 1x750 m³, 1x100 m³ new reservoirs - Drilling and Equipping of 2 new wells	3,063,400
1	NL-W. F.11	Distribution System 12 supplying Deir Jdeide, Khaldiye, Asnoun, Iaal, Qarah Bach, Mazraat Ajbeaa, Mazraat Jnaid and Hariq Zgharta Required works : - 11.5 Transmission lines + 2 km Distribution network - Construction of 2x75 m³, 1x250 m³, 3x100 m³,1x50 m³ new reservoirs - Drilling and Equipping of 1 new well	2,268,400
1	NL-W. F.12	Distribution System 13 supplying Miziara Required works : - 7.5 Transmission lines - Construction of 2x1500 m³ new reservoirs - Drilling and Equipping of 1 new well	1,701,300

Priority	Project code	Description	Estimated cost (USD)
1	NL-W. F.13	Distribution System 14 supplying Aardat, Tallet Zgharta, Kfardlaqous, Kfarhata Zgharta and Zgharta Required works : - 16.3 Transmission lines + 9 km Distribution network - Construction of 1x50 m³, 1x250 m³, 1x3000 m³ new reservoirs	278,990
1	NL-W. F.14	Distribution System 15 supplying Ayto and Aarbet Qozhaiya - 7.5 km transmission lines + 23 km Distribution network - Construction of 2x300 m³ new reservoirs - Construction of 1 new pumping station	3,175,000
1	NL-W. F.15	Distribution System 16 supplying Karm Saddé, Kfarfou, Ras Kifa and Sebaal Zgharta Required works : - 13.5 km transmission lines + 40 km Distribution network - Construction of 1x200 m³, 1x250 m³, 1x500 m³ new reservoirs - Construction of 1 new pumping station	5,353,000
1	NL-W. F.16	Distribution System 17 supplying Ijbaa Required works : - 2 km Transmission lines + 8 km Distribution network - Construction of 1x350 m³ new reservoir	975,200
1	NL-W. F.17	Distribution System 18 supplying Beslouqit and Ehden Required works : - 13.5 km transmission lines - Construction of 1x275 m³, 1x2000 m³, 1x500 m³, 1x250 m³, 2x1000 m³ new reservoirs - Drilling and Equipping of 1 new well	2,793,100
1	NL-W. F.18	Distribution System 19 supplying Kafar Zeina Required works : - 1 km Transmission lines	95,400
1	NL-W. F.19	Distribution System 20 supplying Kfarsghab Required works : - 1 km Transmission lines - Construction of 1x1000 m³ new reservoirs	307,400
1	NL-W. F.20	Distribution System 21 supplying Bchannine, Bsebaal, Kfaryachit and Morh Kfarsghab. Required works : - 4.5 km Transmission lines - Construction of 2x250 m³, 1x200 m³ new reservoirs	694,300
1	NL-W. F.21	Distribution System 22 supplying Bhairet Toula and Toula Zgharta Required works : - 1.5 km Transmission lines - Construction of 1x100 m³, 1x250 m³ new reservoirs	296,800
1	NL-W. F.22	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Zgharta district	**44,918,890**
		Out of which : Priority 1	44,918,890
		Priority 2	-
		Priority 3	-
NL-W G. District of Tripoli (see drawing NL-W.G)			
1	NL-W. G.1	Required works : - 10 km Transmission lines + 150 km Distribution networks - Drilling and equipping 4 new wells	15,794,000
1	NL-W. G.2	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Tripoli district	**30,794,000**
		Out of which : Priority 1	30,794,000
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-W H. District of Qobayate (see drawing NL-W.B)			
1	NL-W. H.1	Distribution System 0 supplying Dayret Nahr El-Kabir; Ouadi Khaled; Qarha; Hnaïder; Al-Kneissé Required works : - 10 km Distribution networks - Construction of 1x250 m³ and 1x350 m³ new reservoirs - Construction of 1 new Pumping station	1,415,100
1	NL-W. H.2	Distribution System 1 supplying Mouanse Required works : - Construction of 1 new Pumping station	371,000
1	NL-W. H.3	Distribution System 2 supplying Sahle, Qenia, Mrah el Khokh, Wata el Sahle and Bsatine Required works : - 6 km Distribution networks - Construction of 1x1000 m³ new reservoir - Construction of 1 new Pumping station	1,092,000
1	NL-W. H.4	Distribution System 3 supplying Akroum Required works : - Construction of 1 new Pumping station	371,000
1	NL-W. H.5	Distribution System 4 supplying Andeket Required works : - Construction of 1 new Pumping station	371,000
1	NL-W. H.6	Distribution System 6 and 7 supplying Aaouainat; Khalsa; Khirbet Er Remmane; Mazraet-El-Nahrieh; El-Bardé; Al Moghrak and El Kobayet Required works : - 3.5 km Transmission lines + 55 km Distribution networks - Construction of 1x50 m³ + 1x1200 m³ + 1x5000 m³ new reservoirs	5,803,500
1	NL-W. H.7	Distribution System 8 supplying Aaidamoun Required works : - 2 km Transmission lines - Construction of 1x1000 m³ new reservoirs - Drilling and equipping of 1 new well - Construction of 1 new Pumping station	1,303,800
1	NL-W. H.8	Distribution System 9 supplying Chadra Required works : - 2 km Transmission lines + 20 km Distribution networks - Construction of 1x250 m³ + 1x350 m³ new reservoirs - Drilling and equipping of 1 new well - Construction of 1 new Pumping station	2,983,900
1	NL-W. H.9	Distribution System 10 supplying Machta Hammoud Required works : - 6 km Transmission lines + 35 km Distribution networks - Construction of 1x2500 m³ + 1x500 m³ new reservoirs - Drilling and equipping of 3 new wells - Construction of 2 new Pumping stations	6,291,100
1	NL-W. H.10	Distribution System 11 supplying Sindianet Zeidan Required works : - 4 km Transmission lines + 10 km Distribution networks - Drilling and equipping of 2 new wells	2,289,600
1	NL-W. H.11	Distribution System 13 supplying Freidice; Daoucet Baghdadi; El-Kousseir; Denket el Amriyeh Required works : - 2 km Transmission lines + 35 km Distribution networks - Drilling and equipping of 1 new well - Construction of 1x1000 m³ + 2x500 m³ new reservoirs	4,155,200

Priority	Project code	Description	Estimated cost (USD)
1	NL-W. H.12	Distribution System 14 supplying Chikhlar; Rmah Required works : - 20 km Distribution networks - Construction of 1x350 m³ new reservoir	1,802,000
1	NL-W. H.13	Distribution System 16 supplying Kfarnoune Required works : - 10 km Distribution networks - Construction of 1x1000 m³ new reservoir	1,060,000
1	NL-W. H.14	Distribution System 17 supplying El Kouachra Required works : - 2 km Transmission lines - Construction of 1x5000 m³ new reservoir - Drilling and equipping 1 new well	1,250,800
1	NL-W. H.15	Distribution System 18 supplying Dabbabieh Charkiyeh; Noura el Faouka and el Tahta Required works : - 2 km Transmission lines + 25 km Distribution networks - Drilling and equipping 1 new well	2,840,800
1	NL-W. H.16	Distribution System 19 supplying Qachlaq; Aamaret El-Baykat; Wadi el Haour Required works : - 2 km Transmission lines - Drilling and equipping 1 new well	720,800
1	NL-W. H.17	Distribution System 20 supplying Al-Mouzeihmé; Haytla; El-Tleil; Saïdnaya Required works : - 2 km Transmission lines - Construction of 1x500 m³ new reservoir	848,000
1	NL-W. H.18	Distribution System 21 supplying Jannine, Aarme and Srar Required works : - 2 km Transmission lines - Construction of 1x100 m³ new reservoir - Drilling and equipping 1 new well	784,400
1	NL-W. H.19	Distribution System 22 supplying El-Msallé; Aïn El-Zeit; Kafr; Charbila; Aïn Tanta; Al-Rihanié; Douair Adouiyé; Hmais Required works : - 6 km Transmission lines + 42 km Distribution networks - Construction of 2x100 m³ + 2x250 m³ + 1x300 m³ + 2x500 m³ new reservoirs - Drilling and equipping 3 new wells	6,381,200
1	NL-W. H.20	Distribution System 23, 24 and 12 supplying Kherbet Daoud; Sfinet Ed-Draib; Fseikine et Aïn Achma; El-Daghlé; Kherbet Char; Majdel; Barbara; Deir-Janine; Knissé; Mazraat Baldé; El-Hed; Al-Souaissé, Kfar Harra and el Bire Required works : - 22 km Transmission lines + 100 km Distribution networks - Construction of 1x100 m³ + 1x150 m³ + 3x200 m³ + 1x300 m³ + 2x400 m³ + 1x1000 m³ + 1x5000 m³ new reservoirs - Drilling and equipping 8 new wells	16,196,800
1	NL-W. H.21	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Qobayate district	**73,332,000**
		Out of which : Priority 1	73,332,000
		Priority 2	-
		Priority 3	-

TOTAL COST OF WATER PROJECTS IN THE BEQAA

Priority 1	Priority 2	Priority 3	Total
96,031,378 $	**50,277,699 $**	**1,545,000 $**	**147,854,077 $**

Priority	Project code	Description	Estimated cost (USD)
BQ-W A. District of Baalbeck (see drawing BQ-W.A)			
1	BQ-W. A.1	Laboue distribution scheme, Including : - 34.5 km transmission lines + 115 km Distribution network - Construction of 1x200 m³ new reservoir	9,054,817
1	BQ-W. A.2	Ouyoun Orghosh distribution scheme Including : - 5.75 km transmission lines + 55 km Distribution network - Construction of 6 new reservoirs - Rehabilitation of 26 existing reservoirs - Drilling of 2 new wells	4,127,248
1	BQ-W. A.3	Younine, Maqne and Nahle distribution scheme, including : - 20.25 km transmission lines + 25 km Distribution network - Construction of 1x1000 m³ reservoir - Drilling of 1 new well	4,435,952
1	BQ-W. A.4	Yammouneh distribution scheme Including : - 7.25 km transmission lines + 65 km Distribution network - Construction of 1x500 m³ new reservoirs - Rehabilitation of 24 existing reservoirs - Drilling of 1 new well and equipping 3 existing wells	6,378,454
1	BQ-W. A.5	Yahfoufa - Ain Sikkeh distribution scheme Including : - 6.4 km transmission lines + 4 km Distribution network - Construction of 2x150 m³ new reservoirs - Rehabilitation of 27 existing reservoirs - Drilling of 1 new well	2,674,051
2	BQ-W. A.6	Aarsal distribution scheme Including : - 16 km transmission lines + 50 km Distribution network - Drilling of 15 new wells	10,714,109
2	BQ-W. A.7	Ouyoun Orghosh distribution scheme Including : - Rehabilitation of 1 existing reservoirs	47,700
2	BQ-W. A.8	Yammouneh village distribution scheme Including : - 0.5 km transmission lines + 1 km Distribution network - Drilling of 1 new well	401,210
2	BQ-W. A.9	Halbata - El Kharayeb distribution scheme Including : - 3 km transmission lines + 6.75 km Distribution network	535,035
2	BQ-W. A.10	Fekha & Jdeideh distribution scheme Including : - 4 km transmission lines + 8.5 km Distribution network - Drilling of 4 new wells	2,919,770
2	BQ-W. A.11	Baalbeck, Aamechki & Ain Bourday distribution scheme Including : - Drilling of 3 new wells	1,590,000
2	BQ-W. A.12	Local distribution scheme Including : - 3.25 km transmission lines + 20 km Distribution network - Rehabilitation of 13 existing reservoirs	2,299,299
1	BQ-W. A.13	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Baalbeck district	**60,177,645**
		Out of which : Priority 1	41,670,522
		Priority 2	18,507,123
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
BQ-W B. District of Hermel (see drawing BQ-W.B)			
1	BQ-W. B.1	Upper Hermel, Ras El Mai & Ain Zarqa distribution scheme Including : - 10 km transmission lines + 71 m Distribution network - Construction of 3 x 1500 m³ and 2 x 500 m³ new reservoirs - Rehabilitation of 3 existing reservoirs 3,000 m³ each - Rehabilitation of the catchment of Ras el Mai spring - Rehabilitation of the distribution network of Hermel city - Construction of a new pumping station (32 l/s @ 380 m) - Equiping 3 existing wells	9,829,640
1	BQ-W. B.2	Ain el Haour distribution scheme Including : - 22.5 km transmission lines + 40 m Distribution network - Construction of 2 x 100 m³ and 1 x 200 m³ and 1 x 500 m³ new reservoirs - Construction of a new pumping station (32 l/s @ 250 m)	4,405,248
2	BQ-W. B.3	Naanaah-El Kharbe and El Wardeh distribution scheme Including : - 14.5 km transmission lines + 13 m Distribution network - Construction of 4 x 100 m³ new reservoirs	1,728,855
2	BQ-W. B.4	Beit Et Tochem, El Charqe, Mazraat Chelman distribution scheme Including : - 1 km transmission lines + 9 m Distribution network - Construction of 1 x 150 m³ new reservoir - Drilling and equipping 1 new well	756,535
2	BQ-W. B.5	Ouadi En Naira, Ouadi Bnit-Zouetini, Wadi El karem, Kaeb Wadi El Karem distribution scheme Including : - 4.5 km transmission lines + 12 m Distribution network - Construction of 1 x 200 m³ and 1 x 300 m³ new reservoirs - Equipment of Wadi el Naira existing well + new control room - Rehabilitation of Zoueitini existing well and pumping station	1,556,632
2	BQ-W. B.6	Ouadi Faara, Mrah El Aaqbet distribution scheme Including : - 8 m Distribution network	344,947
2	BQ-W. B.7	Ain Maabour distribution scheme Including : - 21 km transmission lines + 5.2 m Distribution network - Construction of 1 x 200 m³ new reservoir	1,750,073
2	BQ-W. B.8	Ain el Lezabbe distribution scheme Including : - 15.5 km transmission lines - Construction of 1 x 300 m³ new reservoir -Construction of a new pumping station (17 l/s @ 170 m)	1,566,934
3	BQ-W. B.9	Kouakh distribution scheme Including : - Rehabilitation of well and pumping station	257,500
3	BQ-W. B.10	Kouakh and Fissane distribution scheme Including : - Construction of a new pumping station for existing well	515,000
3	BQ-W. B.11	El Qasr distribution scheme Including : - Drilling and equipping of a new well	257,500
3	BQ-W. B.12	Marjahin distribution scheme Including : - Rehabilitation of Marjhine pumping station	515,000
1	BQ-W. B.13	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Hermel district	**38,483,864**
		Out of which : Priority 1	29,234,888
		Priority 2	7,703,976
		Priority 3	1,545,000

Priority	Project code	Description	Estimated cost (USD)
BQ-W C. District of West Beqaa, Zahleh & Rachaiya (see drawings BQ-W.C and BQ-W.D)			
1	BQ-W. C.1	Chamsine Distribution System : Serving El Salamieh; Soultan Y T-Mansoura; Dalhamieh; Terbol. Required works : - 1.3 km Transmission lines + 17 km Distribution networks - Construction of 1x100 m³ + 1x300 m³ + + 1x1000 m³ new reservoirs	1,947,008
1	BQ-W. C.2	Ain Zarka - Jabal el Arabi system : Serving Jabal El Arabi-Mdoukha; Ain Arab; Bireh; Dahr El Ahmar; Er Rafid; Kfardenis; Kherbet Rouha; Mdoukha; Mhaydtheh; Beit Lahia Required works : - 2 km Transmission lines + - Construction of 1x500 m³ - Drilling 1 new well	826,800
1	BQ-W. C.3	Ain Zarka - Machghara system : Serving Machghara Required works : - 2 km Transmission lines - Drilling 1 new well	699,600
1	BQ-W. C.4	Ain Zarka - Baaloul system : Serving Sohmor Required works : - 2 km Transmission lines - Drilling 1 new well	699,600
1	BQ-W. C.5	Deir el Achayer system : Serving Deir el Achayer Required works : - 2 km Transmission lines - Drilling 1 new well	699,600
1	BQ-W. C.6	Rayak system : Serving Rayak, Hochemoche, Nasriyat Rizk and Haouche Hala Required works : - 6 km Transmission lines - Drilling 3 new wells	2,098,800
1	BQ-W. C.7	Ablah system : Serving Ablah Required works : - 6 km Transmission lines - Drilling 1 new well	699,600
1	BQ-W. C.8	Ain Ata system : Serving Ain Ata Required works : - 20.7 km Distribution networks	1,755,360
1	BQ-W. C.9	Fourzol system : Serving Fourzol Required works : - 2 km Transmission lines - Drilling 1 new well	699,600
2	BQ-W. C.10	Ain Zarka - Machghara system : Serving Ain el Tineh; Maidoun Required works : - 13.5 km Distribution lines	1,144,800
2	BQ-W. C.11	Ain Zarka - Baaloul system : Serving Lebbeya; Qaraoun; Qelia; Sohmor; Yohmor; Zelleya Required works : - 44.5 km Distribution lines - Construction of 1x500 m³ reservoir	3,900,800

Priority	Project code	Description	Estimated cost (USD)
2	BQ-W. C.12	Ain Zarka - Jabal el Arabi system : Serving; Bireh; Aazzi Dahr el Ahmar; Ed Rafid; Kfardenis; Kherbet Rouha; Mdoukha; Mhaydtheh; Ain Arab; Kfarmechki Required works : - 4 km Transmission lines - Construction of 1x500 m³ reservoir - 170.5 km Distribution lines - Drilling 2 new wells	16,000,000
2	BQ-W. C.13	Bab Mareh system : Serving Bab Mareh Required works : - 1 km Distribution lines - Construction of 1x100 m³ reservoir	148,400
2	BQ-W. C.14	Chamsine system : Serving Ain el Fokhar Required works : - 1 km Distribution lines	84,800
2	BQ-W. C.15	Niha system : Serving Niha Required works : - 11.5 km Distribution lines	975,200
2	BQ-W. C.16	Kfarqouq system : Serving Kfarqouq Required works : - 1 km Distribution lines	84,800
2	BQ-W. C.17	Yanta system : Serving Yanta Required works : - 0.5 km Distribution lines - Construction of 1x300 m³ reservoir	137,800
2	BQ-W. C.18	Bouareij system : Serving Bouareij Required works : - Construction of 1x500 m³ reservoir	127,200
2	BQ-W. C.19	Fourzol system : Serving Fourzol Required works : - Construction of 1x1000 m³ reservoir	212,000
2	BQ-W. C.20	Ablah system : Serving Ablah Required works : - 3 km Transmission lines - Construction of 1x500 m³ reservoir	381,600
2	BQ-W. C.21	Jdita System : Serving Saadnayel; Taalabaya; Taanayel Required works : - 4 km Transmission lines - Construction of 1x100 m³ water tower + 2x1000 m³ new reservoirs	869,200
1	BQ-W. C.22	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total West Beqaa; Zahleh; Rachaiya district	49,192,568
		Out of which : Priority 1	25,125,968
		Priority 2	24,066,600
		Priority 3	-

TOTAL COST OF WATER PROJECTS IN SOUTH LEBANON

Priority 1	Priority 2	Priority 3	Total
411,520,000 $	**12,600,000 $**	**-**	**424,120,000 $**

Priority	Project code	Description	Estimated cost (USD)
SL-W A. District of Nabatiye (see drawing SL-W.A)			
1	SL-W. A.1	Northern Distribution system supplying Aarab Salim, Deir El Zahrani, Habbouch, Jarjouaa, Kfar Roummane, Kfaroue Required works : - Rehabilitation and upgrading of Nabaa El Tasse pumping system - Rehabilitation and upgrading of Kfar Roummane pumping system - Gravity conveyor line to supply Zahrani and Nabatiyeh districts in wet season	12,800,000
1	SL-W. A.2	Nabatiyeh Distribution system supplying Kfar Tibnit, Nabatiyeh el Faouqa, Nabatiyeh el Tahta - Kfar Joz Required works : - Gravity line Yohmor regional reservoir and WTP to Nabatieh reservoirs and Aadchit regional reservoir - Construction of Galle water system -Construction of Kfar Tibnit Regional reservoir - Gravity line connecting regional reservoir of Nabatiye-Kfartibnit to regional reservoirs and local reservoirs of Choukine, Maifadoun and Qaaqaiet Ej Jisr - Gravity lines from Nabatiye Kfar Tibnit regional reservoir to the local reservoirs	18,000,000
1	SL-W. A.3	Western Distribution system supplying Toul, El Kfour, Ed Douair, Zebdine Required works : - Rehabilitation and upgrading of Fakhr El Din water system - Rehabilitation and upgrading of El Rejem water system	3,500,000
1	SL-W. A.4	Arnoun Yohmor Distribution system supplying Arnoun, Yohmor Required works : - Construction of the Arnoun Yohmor regional reservoir at Yohmor - Gravity line from Yohmor regional reservoir to local reservoirs in Yohmor and Arnoun	400,000
1	SL-W. A.5	Zaoutar system supplying Zaoutar el Charqiyeh, Zaoutar el Gharbiyeh Required works : - Construction of Aalman pumping system - Rehabilitation and upgrading of Aalman Zawtar Eh Charqiye pumping system	6,800,000
1	SL-W. A.6	At Nabatieh district level : Expansion and upgrade of water supply networks, including 20 reservoirs and 320 km pipelines	14,400,000
1	SL-W. A.7	At Nabatiyeh district level : Construction of a new WTP at Yohmor including the raw water transmission line from Taybeh catchment	16,000,000
2	SL-W. A.8	Northern Distribution system supplying Aarab Salim, Deir El Zahrani, Habbouch, Jarjouaa, Kfar Roummane, Kfaroue Required works : - Construction of the Northern regional reservoir at Jarjouaa - Construction of gravity lines to supply the localities reservoirs of the Northern sub-system (Aarab Salim, Deir El Zahrani, Habbouch, Jarjouaa, Kfar Roummane and Kfaroue) from the Northern reservoir	2,100,000

Priority	Project code	Description	Estimated cost (USD)
2	SL-W. A.9	Middle Distribution system supplying Aabba, Harouf, Jibchit, Choukine, Choukine-Ain Dahab, Maifadoun Required works : - Construction of the Middle regional reservoir at Zebdine (Jabal Al Ahmar) - Construction of gravity lines to supply local reservoirs from the Middle regional reservoir	2,300,000
2	SL-W. A.10	Southern Distribution system supplying Aadchit, Braiqaa, El Qsaibe, Kfar Sir, Qaaqaiet Ej Jisr, Sir El Gharbiyeh Required works : - Construction of the Southern regional reservoir at Aadchit Kfar Dajjal - Gravity lines to supply local reservoirs of the Southern regional reservoir	3,500,000
1	SL-W. A.11	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Nabatiye district	**94,800,000**
		Out of which : Priority 1	86,900,000
		Priority 2	7,900,000
		Priority 3	-
SL-W B. District of Jezzine (see drawing SL-W.B)			
1	SL-W. B.1	Ain Toghra system supplying Wadi Jezzine, Baba, Btedine El-Leqch, Taaid, Bisri, Harf Jezzine, Machmouche, Sabbah, El-Ghabbatieh, Midane Jezzine Homsiye, Roum, Aazour, Anane, Qtale Jezzine, Mazraat El-Mathane, Qabaa Jezzine, Qaytoule, Mrah Bou Chedid, Maknounet Jezzine, Haytoura, Zhilta, Sanaya, Bouslaya, Hidab, Saydoun, Rimat, Sfaray, Required works: - Expansion of Ain Toghra storage capacity by 3000 m³ to accommodate 1 Mm³ of treated water per year from Bisri dam - Construction of a new regional reservoir in the outskirts of Sfaray Supplied in wet season from local sources and in dry season from Bisri dam - Construction of Qtale water scheme including: - 12 000 m³ regional reservoir in Qtale - 350 mm pumping transmission line from Bisri dam - Water treatment plant	11,100,000
1	SL-W. B.2	Independent systems supplying Ouardiye, Mazraat El-Aarqoub, Mazraat Ouazaiye, Mazraat Khallet Khazen, Mazraat Zighrine Jezzine, Mazraat Tamra, El-Demachkiyeh, Mahmoudiye Jezzine, Mazraat Qrouh, Mazraat Er-Rouhbane, Mazraat Louzid (Louayziye), Required works: - Catchment and protection of major springs: Ain Qobays, Aazibe el Faouka, Ain Zarka	1,250,000
1	SL-W. B.3	At Jezzine district level : Expansion and upgrade of the water supply networks in the Caza of Jezzine, including the construction of 8 reservoirs	4,200,000
1	SL-W. B.4	For All Systems : - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Jezzine district	**31,550,000**
		Out of which : Priority 1	31,550,000
		Priority 2	-

Priority	Project code	Description	Estimated cost (USD)
		Priority 3	-
SL-W C. District of Sour (see drawing SL-W.C)			
1	SL-W. C.1	Kfardounine system supplying Kfar Dounine, Qalaouiye, Tair Falsay, Silaa, Deir Kifa, Froun, Srifa-Niha, Naffakhiye, Derdaghaiya, Arzoun, Chehour, Ghandouriye, Borj Qalaouiye, Bestiyat, Hmairi, Hallousiye, Bafliye, Barich, Debaal Required works : - Construction of Ech Chhabiye - Kfardounin lift line - Gravity lines from Kfardounin regional reservoir to local reservoirs	3,500,000
1	SL-W. C.2	Maaroub system supplying Maaroub, Jennata, Toura El Mantra, Deir Qanoun, Aabbassiye, Bedias, Borj Rahhal Required works : - Gravity lines from Maaroub regional reservoir to local reservoirs	2,500,000
1	SL-W. C.3	Borj ech Chemali system supplying Borj ech Chemali-Maachouk, Sour Required works : - Construction of Borj el Chmali pumping station and lift line to regional reservoir - Rehabilitation of Ras El Ain Treatment plant and pumping station - Rehabilitation of El Bass pumping station and treatment plant	12,700,000
1	SL-W. C.4	Saddiqine system supplying Qana El Jalil, Hanaouay, Deir Qanoun, Rmaidiye, Knaisse, Ech Chaaitiye-El Malkiye Required works : - Rehabilitation of Siddiquin Pumping station - Construction of Batoulay - Siddiquin Lift line	3,300,000
1	SL-W. C.5	Hanaouay system supplying Ain Baal-el Hoch, Batoulay Required works : - Rehabilitation of Batoulay Pumping station	3,500,000
1	SL-W. C.6	Kafra & Ramieh system supplying Kafra, Aalma, Aita Ech Chaab, Beit Lif, Boustane Al Kasayer, Chamaa Al Qalaa, Chihine, Debel, Ed Dhaira, Ej Jibbain, En Naqoura, Hanine, Jbal El Botm, Majdel Zoun, Marouahine, Mazraat Ez-Zalloutiyeh, Qaouzah, Ramiye, Rmaysh, Srobbine, Yarine, Yater, Zebqine, Tair , arfa Required works : - Rehabilitation of Kafra Pumping station - Construction of Ramya pumping station, including lift and gravity lines	3,400,000
1	SL-W. C.7	Chehabiyeh system supplying Chehabiyeh, El Majdel, Jouaiya, Mahrouna Required works : - Construction of Ouadi Jilou PS1 - Chhabiye Lift line - Rehabilitation of Ech Chhabiye Pumping station	2,550,000
1	SL-W. C.8	Haddethta system supplying Haddethta, Aita el Jabal, Rachaf, Haris Required works : - Construction of Haddetha Regional Reservoir 3000 m³	320,000
1	SL-W. C.9	El Soultaniyeh system supplying Es Soultaniye, Tibnine, Baraachit, Safad El Batikh, Majdel Selm, Jmaijme, Khirbet Selm, Deir Ntar Required works : - Rehabilitation of Ouadi Jilou PS1 pumping station	6,000,000
1	SL-W. C.10	Ouadi Jilo 2 supplying Maarake, Tayr Debbe, Required Works: - Rehabilitation of Ouadi Jilou PS2 pumping station	2,500,000

Priority	Project code	Description	Estimated cost (USD)
1	SL-W. C.11	Expansion and upgrade of water supply networks in the Caza of Sour, including construction of 30 reservoirs and 350 km of pipelines.	21,575,000
1	SL-W. C.12	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Sour district	**76,845,000**
		Out of which : Priority 1	76,845,000
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
SL-W D. District of Zahrani (see drawing SL-W.D)			
1	SL-W. D.1	Northern & Eastern Distribution system supplying Ech Charqiye, El Aaddoussiye. El Merouaniye, En Najjariye, En Nmairiye, Zefta. Insar, Kaoutariet Es Siyad, Khartoum, Mazraat Kaoutariyet er Rizz, Mazraat Sinai Required works : - 8 000 m gravity line to supply the regional reservoir of Ez Zrariyeh from Ech Charqiyeh - Gravity tie line between Zefta and El Merouaniye existing pipes - Gravity lines to supply local reservoirs in Kaoutariet Es Siyad and Khartoum from Ech Charqiye regional reservoir	2,900,000
1	SL-W. D.2	Middle Distribution system supplying Bissariyeh, Ghassniyeh, Qaaqaiet Es Sanaoubar Required works : - 8 000 m gravity line to supply the regional reservoir of Ez Zrariyeh from Ech Charqiyeh - Lift line from el Brak to Ghassaniye regional reservoir - Construction of Ghassaniyeh regional reservoir - Gravity line from Ghassaniyeh regional reservoir to existing pipeline - Rehabilitation and upgrade of Teffahta pumping scheme - Construction of Arzai pumping system (2 wells, and pump sets to Ez Zrariye) along with Adloun P.S. and the lift lines from Arzai to Adloun to El Ghassaniye	19,100,000
1	SL-W. D.3	Coastal Distribution system supplying Aadloun, El Babliye, Loubiye, Es Saksakiye, Insariye, Sarafand Required works : - El Brak wells and pumping system - Lift line from el Brak to Ghazieh regional reservoir	5,100,000
1	SL-W. D.4	Southern Distribution system supplying Arzai, El Kharayeb, Ez Zeariyeh Required works : - Gravity lines to supply local reservoirs from Ez Zrariyeh regional reservoir - Lift line from Arzai P.S. to Ez Zrariye regional reservoir	4,200,000
2	SL-W. D.5	Northern & Eastern Distribution system supplying Ech Charqiye, El Aaddoussiye. El Merouaniye, En Najjariye, En Nmairiye, Zefta. Insar, Kaoutariet Es Siyad, Khartoum, Mazraat Kaoutariyet er Rizz, Mazraat Sinai Required works : - Upgrade of the storage capacity of Ech Charqiyeh regional reservoir. - Replacement of the gravity line to supply the regional reservoir in Ez Zrariyeh from Ech Charqiyeh	2,300,000
2	SL-W. D.6	Middle Distribution system supplying Bissariyeh, Ghassniyeh, Qaaqaiet Es Sanaoubar Required works : - Upgrade of the storage capacity of Teffahta regional reservoir.	300,000
2	SL-W. D.7	Southern Distribution system supplying Arzai, El Kharayeb, Ez Zeariyeh Required works : - Upgrade of the regional reservoir at Ez Zrarie	2,100,000
1	SL-W. D.8	Expansion and upgrade of water supply networks in the Caza of Zahrani, including construction 15 reservoirs and 150 km pipelines.	7,200,000
1	SL-W. D.9	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Zahrani district	**58,200,000**

Priority	Project code	Description	Estimated cost (USD)
		Out of which : Priority 1	53,500,000
		Priority 2	4,700,000
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
SL-W E. District of Saida (see drawing SL-W.E)			
1	SL-W. E.1	Arkey system supplying Arkey, Required works: - Barti Reservoir and Pipeline: A 400 mm pipeline from the Kfar Melki bifurcation to Barti bifurcation. - Barti Reservoir and Pipeline: A 100 mm pipeline from Barti bifurcation until the proposed reservoir 450 m³. - DN 400 line from Barti bifurcation to Kfar Falous Sub Regional reservoir.	4,320,000
1	SL-W. E.2	Fouar-Serail system supplying Saida Ed-Dekermane, Saida El-Qadimeh, Saida El-Oustani, Haret Saida, Hlaliye Saida, Bramie, Miye ou Miye, Ghaziye, Bqosta, Required works: - Inspection and Rehabilitation of Serail 1 Well - Inspection and Rehabilitation of Faouar 5 and Faouar 6 Wells - Rehabilitation/upgrading of existing Faouar Water Treatment Plant - Investigation of Potential Seawater Intrusion – Serail Pumping Station and Faouar Pumping Stations	5,450,000
1	SL-W. E.3	Majdelyoun and Saydoun Wells supplying Haret Saida, Hlaliye Saida, Bramie Aabra Saida, Bqosta, Majdelyoun, Required works: - Inspection, Rehabilitation, and Testing of Saidoun 1 Well.	150,000
1	SL-W. E.4	Kfar Falous system supplying Kfar Falous, Ouaid El-Laymoun, Mharbiye, Required works: - DN 400 line from Barti bifurcation to Kfar Falous Sub Regional reservoir. - Small Retention Dam Ein Bou Younes – Kfar Melki - Construction of Kfar Falous sub-regional reservoir - Construction of Qtale water scheme including: - 12 000 m³ regional reservoir in Qtale - 350 mm pumping transmission line from Bisri dam - Water treatment plant - 400 mm gravity transmission line qtale-Kfar Falous	4,550,000
1	SL-W. E.5	Kfaroue system supplying Kfaroue, Required works: - Catchment and protection of major springs : Kfaroue and Oum Chemmas	300,000
1	SL-W. E.6	Nabeh el Tasse system supplying Hassaniye, Khzaiz, Lebaa, Mazraat Aarab Soukkar, Aarab Ej-Jall, Sarba, Mazraat El Khraibe, Houmine El-Faouqa, Hmaile, Mazraat Kaleit Mais, Required works: - Twin DN 450 transmission line from Nabaa El Tasse to Houmine El Fawka - Houmine El Fawka Reservoir and Pipeline Two compartments reservoir 1,000 m³ eah + DN 100 connection to the twin DN 450 line - Sarba Sub Regional Reservoir and Pipeline Two compartments reservoir 2,500 m³ each + DN 300 connection to the twin DN 450 line - Anane – Lebaa Rehabilitation/Upgrade of Existing Irrigation and Domestic System	6,880,000
1	SL-W. E.7	Expansion and upgrade of water supply networks in the Caza of Saida, including construction of 34 reservoirs and 145km of pipelines.	9,720,000

Priority	Project code	Description	Estimated cost (USD)
1	SL-W. E.8	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Saida district	**46,370,000**
		Out of which : Priority 1	46,370,000
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
SL-W F. District of Bint Jbeil (see drawings SL-W.F and SL-W.C)			
1	SL-W. F.1	Taybeh system supplying Aadaisseh, Aadchit Al Qser, Aalman, Aynata, Bani Hayyan, Baraachit, Chahabiah, Chaqra, Deir Seriane, Kounin, Majdel Selm, Qabrikha, Qantara, Saf el Hawa, Safad Al Battikh, Salaa, Souwana, Tamriyyeh, Taybeh, Touline Required works : - Rehabilitation of the Taybeh raw water catchment scheme including a new pumping station and a transmission line to the Taybeh WTP - Rehabilitation of Taybeh water treatment plant - Construction of a 3,000 m³ new regional reservoir at Baraachit, including transmission lines to local reservoirs - Rehabilitation of Chaqra pumping station	16,570,000
1	SL-W. F.2	Kafra PS system supplying Tibnine, Ayta El Jabal (Ayta Al Zot), Hadatha , Tiri, Bait Yahoon, Kounin, Ain Ebel, Saf el Hawa, Srebbine, Bait Lif, Qaouzah, Ayta Al Shaab, Rmaich Required works : - Rehabilitation of Saf El Hawa pumping station - Transmission pipeline from Kafra pumping station to Bint Jbeil Saf el Hawa	3,650,000
1	SL-W. F.3	Markaba PS system supplying Talloussa, Rob Tlateen, Markaba, Aadaisseh, Houla, Mais el Jabal , Mhaybib, Blida Required works : - Markaba 3,000 m³ regional reservoir - Rehabilitation of Markaba pumping station	1,670,000
1	SL-W. F.4	Saf el Hawa system supplying Yaroun, Bint Jbeil, Aynata, Aytaroun, Maroun El Ras Required works : - Rehabilitation of Slouki Pumping station	300,000
1	SL-W. F.5	Expansion and upgrade of water supply networks in the Caza of Bint Jbeil, including construction of 32 reservoirs and 400 km of distribution pipelines.	23,735,000
1	SL-W. F.6	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Bint Jbeil district	**60,925,000**
		Out of which : Priority 1	60,925,000
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
SL-W G. District of Marjaayoun & Hasbaya (see drawing SL-W.G and SL-W.F)			
1	SL-W. G.1	Halta system supplying Halta, Kfarchouba, Kfarhamam, Dahayrjet Required works : - New well with 3 km transmission lines	810,000
1	SL-W. G.2	Hebbariyeh system supplying Rachaya El Foukhar, Kfarhamam, Meri, Hebbariye, Fardis, Abou Qamha, Kawkaba, Ain , arfa, Chwayya, Ain Qenia Required works : - Rehabilitation of Hebbariye pumping station - Rehabilitation of Ain Jarfa pumping station	2,050,000
1	SL-W. G.3	Hasbani system supplying Hasbaya, Ain jarfa Required works : - Rehabilitation of Hasbani pumping station - Construction of a new regional reservoir 30,000 m³ and treatment facility at Mayssat including the rehabilitation of the existing pumping station - New Wells Field & pumping station	19,450,000
1	SL-W. G.4	Ebl el Saqi/Snoubar system supplying Ebel el Saqi, Blat,Debbine, Khiam Required works : - Rehabilitation of Ebl Saqui pumping station	500,000
1	SL-W. G.5	Marj el Khaoukh system supplying Deir Mimas, Kfarkila, Qlaiaa, Marjeyoun, Khiam, Borj Al Mlouk (Khirbe) Required works : - Rehabilitation of Marj el Khaoukh pumping station	500,000
1	SL-W. G.6	Wazzani/Hasbani system supplying Kfarkila, Khiam, Abbassieh, Ain Arab, Rihanet Berri Required works : - Construction of Wazzani new pumping station including catchment works and transmission line	2,500,000
1	SL-W. G.7	Local systems supplying El Majidiyé, Al Dellafé, Burghoz, Chebaa, El Kfeir, Mimas, El Amra, Mazraet el Sarada, Mazraet el Jrein Required works : - Construction of 3 new wells and pumping station in Chebaa	2,500,000
1	SL-W. G.8	Expansion and upgrade of water supply networks in the Caza of Marjaayoun & Hasbaya, including construction of 9 reservoirs and 285 km of pipelines.	12,120,000
1	SL-W. G.9	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Bint Marjaayoun & Hasbaya district	**55,430,000**
		Out of which : Priority 1	55,430,000
		Priority 2	-
		Priority 3	-

TOTAL COST OF WATER PROJECTS IN BEIRUT AND MOUNT LEBANON

Priority 1	Priority 2	Priority 3	Total
420,773,073 $	**122,581,083 $**	**22,946,456 $**	**566,300,612 $**

Priority	Project code	Description	Estimated cost (USD)
BML-W A. District of Beirut (see drawing BML-W.A and BML-W.G)			
1	BML-W. A.1	Construction of 21 km transmission Line between Janneh Dam and Dbayeh Water Treatment Plant	51,500,000
1	BML-W. A.2	Tallet El Khayat and Borj Abi Haidar Networks System including: - 3 km Transmission lines + 46 km Distribution networks - Rehabilitation of TEK and BAH Reservoirs - Rehabilitation of TEK and BAH pumping stations - Installation of 9000 Service connection + 120000 Water Meters	28,408,739
1	BML-W. A.3	Achrafieh Lower and Upper Networks System including: - 20 km Distribution networks - Rehabilitation of Achrafieh Inf. and Sup. Reservoirs - Rehabilitation of Achrafieh Inf. and Sup. Pumping Stations	4,016,794
2	BML-W. A.4	Supply of Tallet El Khayat and Borj Abi Haidar from Naameh reservoirs (Awali project) including: - 18 km Transmission lines + 85 km Distribution networks - Rehabilitation of Naameh Inferior and Superior Reservoirs - Rehabilitation of Naameh Inferior Pumping Station	25,065,256
2	BML-W. A.5	Achrafieh Lower and Upper Networks System; replacement of old pipes (before 1980) including 9 km Transmission lines + 20 km Distribution networks	9,636,165
1	BML-W. A.6	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Beirut district	**133,626,954**
		Out of which : Priority 1	98,925,533
		Priority 2	34,701,421
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
BML-W B. District of Jbeil (see drawing BML-W.B)			
1	BML-W. B.1	Afqa Spring Lower Region + Coastal Area System including: - 18.5 Transmission lines + 139.75 km Distribution networks - Construction of 23 reservoirs - Well Equipment of Fatre + PS + WTP 800 m³/d - Janneh Dam PS & WTP 6 000 m³/d	20,109,406
2	BML-W. B.2	El Aaqoura Region distribution system including: - 4.25 km Transmission lines + 15.75 km Distribution networks - Construction of 1*200 m³ + 1*500 m³ reservoirs - Construction of 1 pumping station 2.5 l/s @ 250 m	1,722,922
2	BML-W. B.3	El Mejdel Region distribution system including: - 12.50 km Transmission lines + 46.75 km Distribution lines - Construction of 1*100 m³ + 1*500 m³ reservoirs	3,229,081
2	BML-W. B.4	Afqa Region distribution system including: - 3.25 km Transmission lines + 9.75 km Distribution networks - Construction of 1*100 m³ reservoir - Construction of 1 pumping station 1.25 l/s @ 180 m	1,101,101
2	BML-W. B.5	El Ghabet and Lassa Region distribution system including: - 6.50 km Transmission lines + 40.75 km Distribution networks - Construction of 1*300 m³ + 1*500 m³ reservoirs - Construction of 2 pumping stations : 2.5 l/s @ 100 m & 0.9 l/s @ 60 m	3,163,202
2	BML-W. B.6	Qartaba-Aouaini Region distribution system including: - 23.75 km Transmission lines + 167.75 km Distribution networks - Construction of 9 reservoirs - Equipment of 3 wells - Construction of 5 pumping stations : 2.5 l/s @ 100 m & 0.9 l/s @ 60 m	15,488,100
2	BML-W. B.7	El Kharbe-Qatra and Afqa Spring distribution system including: - 5.50 km Transmission lines + 32.75 km Distribution networks - Construction of 7 reservoirs	2,840,483
2	BML-W. B.8	El Moukhada System distribution system including: - 8.25 km Transmission lines + 3 km Distribution networks - Construction of 2 reservoirs - Construction of 1 pumping station : 5.56 l/s @200m	1,336,425
1	BML-W. B.9	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Jbeil district	**63,990,720**
		Out of which : Priority 1	35,109,406
		Priority 2	28,881,314
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
BML-W C. District of Baabda Aley (see drawing BML-W.C)			
1	BML-W. C.1	Bmaryam Distribution system including: - 42.33 km Distrbution networks - Construction of 1 X 250 m³, 2 x 150 m³ reservoirs	3,828,084
1	BML-W. C.2	Daychouniyeh Distribution system including: - Rehabilitation of Daychouniyeh WTP - Treatment for Galery Semaan Well - Rehabilitation of Jamhour Pumping Station	5,830,000
1	BML-W. C.3	Local systems including: - 125 km Distribution networks - Construction of 1 x 1500 m³ reservoir - Drilling, equiping and casing of "Chbaniyeh 1" well	11,754,340
1	BML-W. C.4	Raayan Distribution systems including: - Rehabilitation of 30 km old transmission Asbestos Cement Lines - 343 km Distribution networks - Construction of 3 x 150 m³, 2 x 100 m³, 2 x 500 m³, 1 x 200 m³ reservoirs	32,522,920
2	BML-W. C.5	Bmaryam Distribution system including: - 7.9 km Distrbution networks - Construction of 1 X 100 m³ reservoir	733,520
2	BML-W. C.6	Ain El Delbeh Distribution system including: - 1.5 km Distribution networks	127,200
2	BML-W. C.7	Daychounieh Distribution system including: - 5.975 km Transmission lines - Drilling and equiping 9 wells	6,036,488
2	BML-W. C.8	Local systems including: - 4.8 km Distribution networks - Construction of 1 x 300 m³ reservoir truction of 20 km transmission lines Constructon of 3 pumping stations	2,685,000
2	BML-W. C.9	Raayan Distribution systems including: - 28.3 km Distribution networks - Construction of 1 x 400 m³ and 1 x 150 m³ reservoirs - Catchment Works Of Ain El Saouda And Ain El Jawzeh Spring	3,645,340
3	BML-W. C.10	Local systems including: - 116.65 km Distribution networks - Construction of 1 x 300 m³ and 1 x 100 m³ reservoirs	10,056,220
3	BML-W. C.11	Bmaryam Distribution system including: - 62.73 km Distribution networks	5,319,504
3	BML-W. C.12	Daychounieh Distribution system including: - 150 m Transmission lines - 10.5 km Distribution networks - Drilling and equiping 3 wells	2,711,692
1	BML-W. C.13	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Baabda Aley district	100,250,308
		Out of which : Priority 1	68,935,344
		Priority 2	13,227,548
		Priority 3	18,087,416

Priority	Project code	Description	Estimated cost (USD)
BML-W D. District of Keserwan (see drawing BML-W.D)			
1	BML-W. D.1	Al Moudiq Distribution system including: - 1.5 km Transmission lines - 21 km Distribution networks - Construction of 1 x 500 m³ reservoir - Rehabilitation of Ouadi Hantouche Pumping Station	2,067,530
1	BML-W. D.2	Chabrouh-Assal Distribution system including: - 6 km Transmission lines - 32.1 km Distribution networks - Construction of 1 x 300 + 1 x 500 m³ reservoirs	3,370,800
1	BML-W. D.3	Chabrouh-Ain El Delbe-Afqa Distribution system including: - 79 km Transmission lines - Construction of 1 x 500 m³ reservoir	10,574,560
2	BML-W. D.4	Al Moudiq Distribution system including: - 33.7 km Distribution networks	2,857,760
2	BML-W. D.5	Chabrouh-Assal Distribution system including: - Construction of 1 x 1000 m³ reservoir	212,000
2	BML-W. D.6	Al Assal Distribution system including: - 60 km Distribution networks	5,088,000
2	BML-W. D.7	Chabrouh-Ain El Delbe-Afqa Distribution system including: - 106.8 km Distribution networks - Construction of 3 x 200 m³ reservoir, 1 x 500 m³ reservoir, 1 x 250 m³ reservoir + 1 elevated reservoir - DMA Modeling For All Distribution Networks	9,687,340
1	BML-W. D.8	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Keserwan district	**48,857,990**
		Out of which : Priority 1	31,012,890
		Priority 2	17,845,100
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
BML-W E. District of Chouf (see drawing BML-W.E)			
1	BML-W. E.1	Barouk Kafra system including: - 14 km Transmission lines - 360 km Distribution networks - Drilling and equiping 2 wells	32,893,920
1	BML-W. E.2	El Qaa system including: - 28 km Transmission lines - 517 km Distribution networks - Rehabilitation of El Qaa spring catchment	47,937,440
1	BML-W. E.3	Mristi system including: - 1 km Transmission lines - 23 km Distribution networks	2,043,680
1	BML-W. E.4	Raayan system including: - 13 km Transmission lines - 39 km Distribution networks	4,519,840
1	BML-W. E.5	Independent systems including: - 3 km Transmission lines - 167 km Distribution networks	14,441,440
2	BML-W. E.6	Barouk Kafra system including: - Construction of 1 x 400 m³ reservoir	111,300
2	BML-W. E.7	El Qaa system including: - Construction of 1 x 500 m³, 1 x 300 m³, 1 x 250 m³, 1 x 450 m³, 1 x 350 m³ and 1 x 150 m³ reservoirs	609,500
2	BML-W. E.8	Independent systems including: - 18 km Transmission lines - Construction of 1 x 150 m³ reservoir - Drilling and equiping 6 wells	4,933,240
3	BML-W. E.9	El Qaa system including: - 9 km Transmission lines - Drilling and equiping 3 wells	2,429,520
3	BML-W. E.10	Damour wells system including: - 9 km Transmission lines - Drilling and equiping 3 wells	2,429,520
1	BML-W. E.11	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Chouf district	**127,349,400**
		Out of which : Priority 1	116,836,320
		Priority 2	5,654,040
		Priority 3	4,859,040
BML-W F. District of Meten (see drawing BML-W.F)			
1	BML-W. F.1	Upper Metn system including: - 30 km new transmission lines - Rehabilitation of 20 km Transmission lines - 81.6 km Distribution networks - Construction of 1 x 5000 m³, 1 x 1500 m³ and 1 x 1000 m³ reservoirs - Drilling and equiping 10 wells - Water Treatment Plant, Transmission Lines And Reservoirs For	54,953,580
2	BML-W. F.2	Upper Metn system including: - 69.7 km Distribution networks - Construction of 5 x 200 m³, 2 x 300 m³, 2 x 500 m³ and 2 x 2000 m³ reservoirs	7,362,760
2	BML-W. F.3	Coastal Metn system including: - 146 km Distribution networks - Construction of 2 x 500 m³, 2 x 1000 m³, 1 x 1500 m³, 1 x 2000 m³, 1 x	14,908,900
1	BML-W. F.4	For All Systems: - Remote Control And Monitoring Of Water Systems (SCADA and DMA)	15,000,000
		Total Meten district	**92,225,240**
		Out of which : Priority 1	69,953,580
		Priority 2	22,271,660
		Priority 3	-

TOTAL COST OF WASTEWATER PROJECTS IN NORTH LEBANON

Priority 1	Priority 2	Priority 3	Total
242,388,258 $	**250,030,443 $**	**-**	**492,418,701 $**

Priority	Project code	Description	Estimated cost (USD)
NL-WW A. District of Akkar (see drawing NL-WW.A)			
1	NL-WW. A.1	Collection system Sahel 2 Required works : - 150 km Collection network	20,857,500
1	NL-WW. A.2	Collection system Sahel 3 Required works : - 380 km Collection network	52,839,000
1	NL-WW. A.3	Collection system Jebrayel Required works : - 135 km Collection network - 1 WWTP activated sludge	35,096,787
2	NL-WW. A.4	Other Collection systems covering 46 villages in Akkar District Required works : - 475 km Collection network - 1 WWTP Activated sludge - 30 WWTP Trickling filter - 14 WWTP Wetland	250,030,443
		Total Akkar district	**358,823,730**
		Out of which : Priority 1	108,793,287
		Priority 2	250,030,443
		Priority 3	-
NL-WW B. District of Koura (see drawing NL-WW.B)			
1	NL-WW. B.1	Ejdabrine Collection systems Required works : - 15 km Collection network - 1 WWTP Trickling filter	7,125,012
1	NL-WW. B.2	Btaaboura Collection systems Required works : - 1 km Collection network - 1 WWTP Wetland	725,343
1	NL-WW. B.3	Kaftoune Collection systems Required works : - 74 km Collection network - 1 WWTP Trickling filter	18,409,447
1	NL-WW. B.4	Connection to Chekka main collector Required works : - 24 km Collector	3,434,400
		Total Koura district	**29,694,202**
		Out of which : Priority 1	29,694,202
		Priority 2	-
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
NL-WW C. District of Minieh (see drawing NL-WW.C)			
1	NL-WW. C.1	Construction of 16 local collection and treatment schemes (excluding the cities conneced to Tripoli WWTP) Total required works : - 63 km Collection network - 5 WWTP Trickling filter	54,060,169
		Total Minieh district	54,060,169
		Out of which : Priority 1	54,060,169
		Priority 2	-
		Priority 3	-
NL-WW D. District of Zgharta (see drawing NL-WW.D)			
1	NL-WW. D.1	Tourza Collection systems Required works : - 13 km Collection network	1,860,300
1	NL-WW. D.2	Kfar Zghab Collection systems Required works : - 3.5 km Collection network - 1 WWTP Trickling filter	3,935,336
1	NL-WW. D.3	Arbet Qozhaiya Collection systems Required works : - 5.3 km Collection network - 1 WWTP Trickling filter	4,413,008
1	NL-WW. D.4	El Buhaira Collection systems Required works : - 1.5 km Collection network - 1 WWTP Wetland	1,006,611
1	NL-WW. D.5	Asloute Collection systems Required works : - 5.2 km Collection network - 1 WWTP Trickling filter	4,184,446
1	NL-WW. D.6	Collection system directed to Ehden WWTP Required works : - 25 km Collection network	3,577,500
1	NL-WW. D.7	Collection system directed to Tripoli WWTP Required works : - 166 km Collection network + collector	22,500,000
		Total Zgharta district	**41,477,200**
		Out of which : Priority 1	41,477,200
		Priority 2	-
		Priority 3	-
NL-WW E. District of Batroun (see drawing NL-WW.E)			
1	NL-WW. E.1	Dahr Abi Yaghi Collection system Required works : - 10 km Collection network - 1 WWTP	2,491,000
1	NL-WW. E.2	Jrabta Collection system Required works : - 21 km Collection network - 1 WWTP	4,595,100
1	NL-WW. E.3	Ram Collection system Required works : - 3 km Collection network - 1 WWTP	1,277,300
		Total Batroun district	**8,363,400**
		Out of which : Priority 1	8,363,400
		Priority 2	-
		Priority 3	-

TOTAL COST OF WASTEWATER PROJECTS IN THE BEQAA

Priority 1	Priority 2	Priority 3	Total
214,310,500 $	**268,075,000 $**	**47,500,000 $**	**529,885,500 $**

Priority	Project code	Description	Estimated cost (USD)
BQ-WW A. District of Baalbeck (see drawing BQ-WW.A)			
1	BQ-WW. A.1	Temnine collection system Required works : - 335 km Collection network - 1 WWTP activated sludge	84,225,000
1	BQ-WW. A.2	Iaat collection system Required works : - 60 km Collection network - 1 WWTP activated sludge	22,600,000
1	BQ-WW. A.10	Aarsal collection system Required works : - 61 km Collection network - 1 WWTP trickling filter	11,135,000
2	BQ-WW. A.3	Qaa collection system Required works : - 145 km Collection network - 1 WWTP activated sludge	23,475,000
2	BQ-WW. A.4	Ras Baalbeck collection system Required works : - 207 km Collection network - 1 WWTP activated sludge	56,945,000
2	BQ-WW. A.5	Chaat collection system Required works : - 135 km Collection network - 1 WWTP activated sludge	35,225,000
2	BQ-WW. A.7	Deir el Ahmar collection system Required works : - 82 km Collection network - 1 WWTP activated sludge	22,770,000
3	BQ-WW. A.6	Boudai collection system Required works : - 115 km Collection network - 1 WWTP activated sludge	22,525,000
3	BQ-WW. A.8	Chlifa collection system Required works : - 50 km Collection network - 1 WWTP activated sludge	8,250,000
3	BQ-WW. A.9	Ouypun Orghoch collection system Required works : - 6 km Collection network - 1 WWTP activated sludge	1,010,000
3	BQ-WW. A.11	Ainata collection system Required works : - 7 km Collection network - 1 WWTP activated sludge	1,645,000
3	BQ-WW. A.12	Maaraboun collection system Required works : - 12 km Collection network - 1 WWTP activated sludge	2,620,000
3	BQ-WW. A.13	Jenta collection system Required works : - 10 km Collection network - 1 WWTP activated sludge	1,815,000
3	BQ-WW. A.14	Tfeil collection system Required works : - 5 km Collection network - 1 WWTP activated sludge	975,000
		Total Baalbeck district	**295,215,000**
		Out of which : Priority 1	117,960,000
		Priority 2	138,415,000
		Priority 3	38,840,000

Priority	Project code	Description	Estimated cost (USD)
BQ-WW B. District of Hermel (see drawing BQ-WW.B)			
1	BQ-WW. B.1	Hermel Phase 1 Collection system Required works : - 354 km Collection network - 1 WWTP activated sludge	66,290,000
2	BQ-WW. B.2	Hermel Phase 2 Collection system Required works : - 111 km Collection network - 1 WWTP activated sludge	33,485,000
2	BQ-WW. B.3	Wadi Faara Collection system Required works : - 70 km Collection network - 1 WWTP (Mrah Yassine) MBBR	9,650,000
2	BQ-WW. B.4	Marjhine Collection system Required works : - 20 km Collection network - 1 WWTP (Mdaouiche) MBBR	3,300,000
2	BQ-WW. B.5	Jouar el Hachiche Collection system Required works : - 25 km Collector - 1 WWTP (El Boustane) MBBR	3,975,000
		Total Hermel district	**116,700,000**
		Out of which : Priority 1	66,290,000
		Priority 2	50,410,000
		Priority 3	-
BQ-WW C. District of Zahleh - West Beqaa (see drawings BQ-WW.C and BQ-WW.E)			
1	BQ-WW. C.1	Joub Jannine System, serving Ana Required works : - 8.1 km Collection network	1,160,500
1	BQ-WW. C.2	Majdel Anjar / Marj System; serving Jdita Required works : - 16 km Collection network	2,300,000
1	BQ-WW. C.3	Es Srairi WWTP collection system; serving Ain el Tineh, Maidoun, Zelleya, Yohmor, Loucia, Qelia and Lebbeya Required works : - 85 km Collection network - 1 pumping station - 1 WWTP Activated sludge 2000 m³/day	18,900,000
1	BQ-WW. C.4	Sohmor Collection system, serving Sohmor Required works : - 8.5 km Collection network - 1 WWTP Trickling filter 2 000 m³/day	7,700,000
2	BQ-WW. C.5	Majd el Anjar - Marj system, serving Marj Required works : - 44.5 km Collectin network	6,340,000
2	BQ-WW. C.6	Joub Jannine system, serving Haouch el Harime, Kefraya Required works : - 28 km Collection network - 1 WWTP Wetland 50 m³/day	4,050,000
2	BQ-WW. C.7	East Zahleh Collection system, serving Ali el Nahri, Delhamiyeh Required works : - 25 km Collection network	3,560,000
		Total Zahleh - West Beqaa districts	**44,010,500**
		Out of which : Priority 1	30,060,500
		Priority 2	13,950,000
		Priority 3	-

Priority	Project code	Description	Estimated cost (USD)
BQ-WW D. District of Rachaya (see drawing BQ-WW.D)			
2	BQ-WW. D.1	Hasbaiya WWTP System Required works : - 90 km Collection network - 1 WWTP	18,900,000
2	BQ-WW. D.2	Kfar Qouq System Required works : - 53 km Collection network - 1 WWTP	11,800,000
2	BQ-WW. D.3	Beit Lahia System Required works : - 77 km Collection network - 1 WWTP	18,600,000
2	BQ-WW. D.4	Haouche el Kennabe System Required works : - 140 km Collection network - 1 WWTP	16,000,000
3	BQ-WW. D.5	Deir el Achayer System Required works : - 6.25 km Collection network - 1 WWTP	2,060,000
3	BQ-WW. D.6	Helouet Rachaya System Required works : - 3.5 km Collection network - 1 WWTP	800,000
3	BQ-WW. D.7	Majdel Balhis System Required works : - 26 km Collection network - 1 WWTP	5,800,000
		Total Rachaya district	**73,960,000**
		Out of which : Priority 1	-
		Priority 2	65,300,000
		Priority 3	8,660,000

TOTAL COST OF WASTEWATER PROJECTS IN SOUTH LEBANON

Priority 1	Priority 2	Priority 3	Total
367,050,000 $	**77,088,000 $**	**79,647,000 $**	**523,785,000 $**

Priority	Project code	Description	Estimated cost (USD)
SL-WW A. District of Nabatiye (see drawing SL-WW.A)			
1	SL-WW. A.1	Braiqeaa Collection system Required works : - 100 km Collection network - 1 WWTP	34,200,000
1	SL-WW. A.2	Nabaa el Taseh Collection system Required works : - 80 km Collection network	11,550,000
1	SL-WW. A.3	Charquieh Collection system Required works : - 64 km Collection network - 1 WWTP Activated sludge	25,000,000
3	SL-WW. A.4	Yohmor En-Nabatiyeh system Required works : - 1 5 km Collection network	2,147,000
3	SL-WW. A.5	Sir el Gharbiyeh Collection system Required works : - 22 km Collection network - 1 WWTP	5,800,000
		Total Nabatiyeh district	**78,697,000**
		Out of which : Priority 1	70,750,000
		Priority 2	-
		Priority 3	7,947,000

Priority	Project code	Description	Estimated cost (USD)
SL-WW B. District of Sour (see drawing SL-WW.B)			
1	SL-WW. B.1	Chabriha system Required works : - 225 km Collection network - 1 WWTP	38,000,000
2	SL-WW. B.2	Hallousiyeh system Required works : - 202 km Collection network	4,200,000
2	SL-WW. B.3	Bafliyeh system Required works : - 32 km Collection network	4,500,000
3	SL-WW. B.4	Jabal el Botm system Required works : - 17 km Collection network - 1 WWTP	7,400,000
3	SL-WW. B.5	Burj el Nagoura system Required works : - 25 km Collection network	3,400,000
3	SL-WW. B.6	Jijim system Required works : - 26 km Collection network - 1 WWTP	14,250,000
3	SL-WW. B.7	Mansouri Sour system Required works : - 47 km Collection network - 1 WWTP	15,500,000
		Total Sour district	**87,250,000**
		Out of which : Priority 1	38,000,000
		Priority 2	8,700,000
		Priority 3	40,550,000
SL-WW C. District of Bint Jbeil (see drawing SL-WW.C)			
1	SL-WW. C.1	Wadi el Houjair system Required works : - 623 km Collection network - 1 WWTP	122,300,000
2	SL-WW. C.2	Tibnine system Required works : - 120 km Collection network - 1 WWTP Activated sludge	17,100,000
2	SL-WW. C.3	Salhani system Required works : - 218 km Collection network - 1 WWTP	51,200,000
3	SL-WW. C.4	Kafra Bint Jbeil system Required works : - 44 km Collection network - 1 WWTP	15,300,000
		Total Bint Jbeil district	**205,900,000**
		Out of which : Priority 1	122,300,000
		Priority 2	68,300,000
		Priority 3	15,300,000

Priority	Project code	Description	Estimated cost (USD)
SL-WW D. District of Jezzine (see drawing SL-WW.A)			
2	SL-WW. D.1	Construction of sewer networks serving : Qaytouleh Required works : - 1 km Collection network - 1 WWTP Activated sludge	88,000
3	SL-WW. D.2	Construction of sewer networks serving : El Rihane Required works : - 10 km Collection network - 1 WWTP Activated sludge	2,300,000
3	SL-WW. D.3	Construction of sewer networks serving : Azour Required works : - 3 km Collection network - 1 WWTP Reed bed	1,400,000
3	SL-WW. D.4	Construction of sewer networks serving : Bisri Required works : - 23 km Collection network - 1 WWTP Reed bed	5,200,000
3	SL-WW. D.5	Construction of sewer networks serving : Roum Required works : - 10 km Collection network - 1 WWTP Reed bed	1,500,000
3	SL-WW. D.6	Construction of sewer networks serving : Zhilta Required works : - 3 km Collection network - 1 WWTP Reed bed	950,000
3	SL-WW. D.7	Construction of sewer networks serving : Sfaray Required works : - 14 km Collection network - 1 WWTP Reed bed	4,500,000
		Total Jezzine district	**15,938,000**
		Out of which : Priority 1	-
		Priority 2	88,000
		Priority 3	15,850,000
SL-WW E. District of Saida (see drawing SL-WW.A)			
1	SL-WW. E.1	Sainik system Required works : - 230 km Collection network - 1 WWTP	75,000,000
1	SL-WW. E.2	Sarafand system Required works : - 610 km Collection network - 1 WWTP	61,000,000
		Total Saida district	**136,000,000**
		Out of which : Priority 1	136,000,000
		Priority 2	-
		Priority 3	-

TOTAL COST OF WASTEWATER PROJECTS IN SOUTH LEBANON

Priority 1	Priority 2	Priority 3	Total
569,580,000 $	**205,400,000 $**	**105,300,000 $**	**880,280,000 $**

Priority	Project code	Description	Estimated cost (USD)
BML-WW A. District of Beirut (see drawing BML-WW.A)			
1	BML-WW. A.1	Rehabilitation, Replacement and upgrade of sewer in various sectors of Beirut	50,000,000
		Total Beirut district	**50,000,000**
		Out of which : Priority 1	50,000,000
		Priority 2	-
		Priority 3	-
BML-WW B. District of Jbeil (see drawing BML-WW.B)			
1	BML-WW. B.1	Construction of sewer networks serving : Additional villages to be connected to Jbeil WWTP, Hdeine and Lassa Required works: - 170 Km collection networks - 3 WWTP	51,000,000
2	BML-WW. B.2	Construction of sewer networks serving : Additional villages to be connected to Ghalboun, Ferhet and Kfar Mashoun Required works: - 205 Km collection networks - 3 WWTP	46,600,000
3	BML-WW. B.3	Construction of sewer networks serving : Kherbet Jbail, Fatre, Zibdine, Tartij, Haqel, Qorqraiya. Required works: - 180 Km collection networks - 6 WWTP	42,500,000
		Total Jbeil district	**140,100,000**
		Out of which : Priority 1	51,000,000
		Priority 2	46,600,000
		Priority 3	42,500,000
BML-WW C. District of Baabda Aley (see drawing BML-WW.C)			
1	BML-WW. C.1	Construction of sewer networks serving : El Kneisseh, El Halaliyeh, El Ghadir and Chourit systems Required works: - 630 Km collection networks - 4 WWTP	174,000,000
2	BML-WW. C.2	Construction of sewer networks serving : Bchetfine, Bou Zride, El Abadiyeh and Kartada Required works: - 270 Km collection networks - 4 WWTP	97,000,000
3	BML-WW. C.3	Construction of sewer networks serving : Bhamdoun and Aghmid Required works: - 50 Km collection networks - 2 WWTP activated sludge	19,000,000
		Total Baabda Aley district	**290,000,000**
		Out of which : Priority 1	174,000,000
		Priority 2	97,000,000
		Priority 3	19,000,000

Priority	Project code	Description	Estimated cost (USD)
BML-WW D. District of Keserwan (see drawing BML-WW.D)			
1	BML-WW. D.1	Construction of sewer networks serving Hrajel Required works: - 64 Km collection networks - 1 WWTP	2,700,000
2	BML-WW. D.2	Construction of sewer networks serving Achqout Required works: - 71 Km collection networks - 1 WWTP	21,000,000
		Total Keserwan district	**23,700,000**
		Out of which : Priority 1	2,700,000
		Priority 2	21,000,000
		Priority 3	-
BML-WW E. District of Chouf (see drawing BML-WW.E)			
1	BML-WW. E.1	Construction of sewer networks serving : Deir Baba, Sirjbal and Ras nabi Younes (including Nahr el Hamam area) Required works: - 420 Km collection networks - 1 WWTP Activated sludge - 2 WWTP Biofilters	95,180,000
1	BML-WW. E.2	Remaining budget regarding protection of Bisri dam project Required works: - 185 Km collection networks - 10 WWTP in Chouf (El-Jdeidé, Mazraet El-Chouf, Maasser el-Chouf, El-Moukhtara, Ammatour, Baadarane, Mristé, El-Khreibé, Bater and Jebah)	12,300,000
2	BML-WW. E.3	Construction of sewer networks serving : Ainbal Required works: - 8 Km collection networks - 1 WWTP	6,500,000
3	BML-WW. E.4	Construction of sewer networks serving : El Fouara, Mazraat el Mahtaqra and Bkifa Required works: - 100 Km collection networks - 3 WWTP	24,500,000
		Total Chouf district	**138,480,000**
		Out of which : Priority 1	107,480,000
		Priority 2	6,500,000
		Priority 3	24,500,000
BML-WW F. District of Metn (see drawing BML-WW.F)			
1	BML-WW. F.1	Costruction of sewer networks serving : Borge Hammoud and Zabbougha Required works: - 105 Km collection networks - 2 WWTP	184,400,000
2	BML-WW. F.2	Construction of sewer networks serving El Souan and Mchikha Required works: - 120 Km collection networks - 2 WWTP	34,300,000
3	BML-WW. F.3	Costruction of sewer networks serving Abou Mizane and Hasbaya el Maten Required works: - 75 Km collection networks	19,300,000
		Total Metn district	**238,000,000**
		Out of which : Priority 1	184,400,000
		Priority 2	34,300,000
		Priority 3	19,300,000

TOTAL COST OF IRRIGATION PROJECTS IN NORTH LEBANON

Priority 1	Priority 2	Priority 3	Total
29,120,000 $	**11,200,000 $**	**103,265,000 $**	**143,585,000 $**

Priority	Project code	Description	Estimated cost (USD)
NL-IR A. District of Akkar (see drawings NL-IR.A)			
1	NL-IR. A.1	Akkar el Bared Scheme Required works : - 0.3 km Concrete channels to rehabilitate - 3.3 km Earth channels to concrete	600,000
1	NL-IR. A.2	Mounjez Scheme Required works : - 26 km Earth channels to concrete	4,000,000
1	NL-IR. A.3	Omar el Breikat Scheme Required works : - 18 km Earth channels to concrete	1,820,000
1	NL-IR. A.4	Rahbeh Scheme Required works : - 3 km Earth channels to concrete	450,000
1	NL-IR. A.5	El Koubayet Scheme Required works : - 1.5 km Concrete channels to rehabilitate - 15 km Earth channels to concrete	2,500,000
1	NL-IR. A.6	Bouqaiaa - Machta Hamoud - Machta Hassan Scheme Required works : - 42 km Earth channels to concrete	10,600,000
3	NL-IR. A.8	Akkar plain Scheme Required works : - 50 m Concrete channels to rehabilitate - 78 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	30,000,000
3	NL-IR. A.9	Akkar el Atika Scheme Required works : - 2 km Concrete channels to rehabilitate - 29 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	4,900,000
3	NL-IR. A.10	Fneidek and Michmich Scheme Required works : - 14 km Concrete channels to rehabilitate - 18 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	5,700,000
		Total Akkar district	**60,570,000**
		Out of which : Priority 1	19,970,000
		Priority 2	-
		Priority 3	40,600,000

Priority	Project code	Description	Estimated cost (USD)
NL-IR B. North districts (see drawings NL-IR.B)			
1	NL-IR. B.1	Bcharreh Scheme Required works : - 22 km Concrete channels to rehabilitate	1,050,000
1	NL-IR. B.2	Ehden Scheme Required works : - 21 km Concrete channels to rehabilitate	300,000
1	NL-IR. B.3	El Minieh scheme Required works : - 19 km Concrete channels to rehabilitate - 0.6 km Earth channels to concrete	1,100,000
1	NL-IR. B.4	Tannourine Scheme Required works : - 37 km Concrete channels to rehabilitate - 17 km Earth channels to concrete	4,600,000
1	NL-IR. B.5	Tripoli Scheme Required works : - 2.5 km Earth channels to concrete	400,000
1	NL-IR. B.6	Zghorta Scheme Required works : - 11.5 km Concrete channels to rehabilitate - 7 km Earth channels to concrete	1,700,000
2	NL-IR. B.8	Dar Baachtar Dam related network Required works : - Network to cover 700 ha of additional land to irrigate	11,200,000
3	NL-IR. B.7	Danniyeh Scheme Required works : - 29 km Earth channels to concrete - Extention Of Networks to Cover Present Dry Farm Area	5,215,000
3	NL-IR. B.9	Noura Tahta Dam related network Required works : - Network to cover 3 500 ha of additional land to irrigate	56,000,000
3	NL-IR. B.10	Kfar Helda Scheme Required works : - 14 km Concrete channels to rehabilitate - Extention Of Networks to Cover Present Dry Farm Area	1,450,000
		Total North district	**83,015,000**
		Out of which : Priority 1	9,150,000
		Priority 2	11,200,000
		Priority 3	62,665,000

TOTAL COST OF IRRIGATION PROJECTS IN THE BEQAA

Priority 1	Priority 2	Priority 3	Total
109,709,000 $	**83,000,000 $**	**4,524,000 $**	**197,233,000 $**

Priority	Project code	Description	Estimated cost (USD)
BQ-IR A. District of Baalbeck (see drawings BQ-IR.A, BQ-IR.B and BQ-IR.C)			
1	BQ-IR. A.1	Ayneta Baalbeck Scheme Required works : - 2 km Concrete channels to rehabilitate	28,000
1	BQ-IR. A.2	Baalbeck Plain Scheme Required works : - 8 km Concrete channels to rehabilitate - 4 km Earth channels to concrete	830,000
1	BQ-IR. A.3	Chmistar Scheme Required works : - 0.1 km Concrete channels to rehabilitate - 1.5 km Earth channels to concrete	1,900,000
1	BQ-IR. A.4	Ham Scheme Required works : - 0.8 km Concrete channels to rehabilitate - 0.2 km Earth channels to concrete	29,000
1	BQ-IR. A.5	Haouch Er-Rafqa Scheme Required works : - 2 km Concrete channels to rehabilitate - 2 km Earth channels to concrete	940,000
1	BQ-IR. A.6	Hizzine Scheme Required works : - 3.5 km Earth channels to concrete	500,000
1	BQ-IR. A.7	Kfar Dabach Scheme Required works : - 1 km Earth channels to concrete	135,000
1	BQ-IR. A.8	Labboue Scheme Required works : - 20 km Concrete channels to rehabilitate - 40 km Earth channels to concrete	3,900,000
1	BQ-IR. A.9	Maaraboun Scheme Required works : - 0.5 km Earth channels to concrete	43,000
1	BQ-IR. A.10	Marjhine and Jbab Scheme Required works : - 5 km Concrete channels to rehabilitate	78,000
1	BQ-IR. A.11	Ras Baalbeck Scheme Required works : - 2 km Concrete channels to rehabilitate - 0.5 km Earth channels to concrete	200,000
1	BQ-IR. A.12	Taibet Baalbeck Scheme Required works : - 1.2 km Earth channels to concrete	175,000
1	BQ-IR. A.13	Taraya Scheme Required works : - 7 km Earth channels to concrete	990,000
1	BQ-IR. A.14	Wadi Nahle and Maqne Scheme Required works : - 6 km Concrete channels to rehabilitate - 10 km Earth channels to concrete	2,600,000
1	BQ-IR. A.15	Yahfoufa, Jenta and Serraine Scheme Required works : - 15 km Concrete channels to rehabilitate - 10 km Earth channels to concrete	1,300,000
1	BQ-IR. A.16	Yammoune Scheme Required works : - 1.5 km Concrete channels to rehabilitate - 11 km Earth channels to concrete	3,500,000

Priority	Project code	Description	Estimated cost (USD)
1	BQ-IR. A.17	Younine Scheme Required works : - 2.5 km Concrete channels to rehabilitate - 1.2 km Earth channels to concrete	330,000
3	BQ-IR. A.18	Temnine and Bednayel Scheme Required works : - 0.2 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	3,600,000
1	BQ-IR. A.19	Assi Dam Phase I related irrigation network Required works : - Network to cover 3 254 ha of land to irrigate	84,272,000
2	BQ-IR. A.20	Assi Dam Phase II related irrigation network Required works : - Network to cover 3 870 ha of land to irrigate	83,000,000
		Total Baalbeck district	**188,350,000**
		Out of which : Priority 1	101,750,000
		Priority 2	83,000,000
		Priority 3	3,600,000

Priority	Project code	Description	Estimated cost (USD)
BQ-IR B. District of Zahle (see drawings BQ-IR.A, BQ-IR.B and BQ-IR.C)			
1	BQ-IR. B.1	Aanjar (Haouch Moussa) Scheme Required works : - 0.1 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	29,000
1	BQ-IR. B.2	Zahle Scheme Required works : - 3 km Earth channels to concrete	2,100,000
1	BQ-IR. B.3	Ablah and Niha Scheme Required works : - 4.5 km Earth channels to concrete	3,000,000
1	BQ-IR. B.4	Chtaura Scheme Required works : - 9 km Concrete channels to rehabilitate - 1 km Earth channels to concrete	630,000
1	BQ-IR. B.5	Kfarzabad Scheme Required works : - 4 km Earth channels to concrete	2,200,000
3	BQ-IR. B.6	Mrayjet Zahle Scheme Required works : - 2 km Concrete channels to rehabilitate	31,000
3	BQ-IR. B.7	Bouarej Scheme Required works : - 2.5 km Concrete channels to rehabilitate	53,000
3	BQ-IR. B.8	Touaite Zahle Scheme Required works : - 0.2 km Concrete channels to rehabilitate - 1 km Earth channels to concrete	840,000
		Total Zahle district	**8,883,000**
		Out of which : Priority 1	7,959,000
		Priority 2	-
		Priority 3	924,000

TOTAL COST OF IRRIGATION PROJECTS IN SOUTH LEBANON

Priority 1	Priority 2	Priority 3	Total
86,550,000 $	**408,880,000 $**	**299,700,000 $**	**795,130,000 $**

Priority	Project code	Description	Estimated cost (USD)
SL-IR A. Major irrigation schemes (see drawing SL-IR.A)			
1	SL-IR. A.1	Saida - Jezzine scheme Irrigated area : 430 ha Required works : - 45 km Distribution Networks	7,650,000
1	SL-IR. A.2	Conveyor 800 Distribution Networks Phase II - A Irrigated area : 3420 ha Required Works : - 465 km Distribution networks	78,900,000
2	SL-IR. A.3	Conveyor 800 Distribution Networks Phase II - B Irrigated area : 9830 ha Required Works : - 1 335 km Distribution networks	227,100,000
3	SL-IR. A.4	Khardaleh Dam scheme distribution networks Required Works : - 1 300 km Distribution networks	221,000,000
2	SL-IR. A.5	Choumariyeh Dam scheme distribution networks Required Works : - 660 km Distribution networks	112,200,000
		Total Major schemes	**646,850,000**
		Out of which : Priority 1	86,550,000
		Priority 2	339,300,000
		Priority 3	221,000,000
SL-IR B. Local irrigation schemes (see drawing SL-IR.A)			
2	SL-IR. B.1	**Bint Jbeil district** - Villages covered : Ayta El Jabal, Beit Lif, Debel, El Tairi, Es Salhani, Haddatha, Rouaisse, Srobbine, Yatar - Total Irrigated area : 1100 ha - Required works : 100 km distribution network	20,400,000
2	SL-IR. B.2	**Hasbaya district** - Villages covered : Mazraat Islamiyeh - Total Irrigated area : 94 ha - Required works : 8 km distribution network	1,650,000
2	SL-IR. B.3	**Jezzine district** - Villages covered : Haffet Bou Hajli, Mazraat Khallet Khazene, Fouzour, Qalaat Dabboura - Total Irrigated area : 142 ha - Required works : 13 km distribution network	2,650,000

Priority	Project code	Description	Estimated cost (USD)
2	SL-IR. B.4	**Nabatiyeh district** - Villages covered : Nabaa el Tasse, Tahounet el Badaouiyeh - Total Irrigated area : 75 ha - Required works : 6 km distribution network	1,225,000
2	SL-IR. B.5	**Saida district** - Bqosta scheme - Total Irrigated area : 19 ha - Required works : 1 km distribution network	205,000
2	SL-IR. B.6	**Sour district** - Villages covered : Aaitit, Ain Baal, Al Aabsiye, Bafliye, Chehour, El Bazouniye, El Izziye, El Khraybeh, El Malkiyeh, Jabal El Botm, Jennata, Jouaya, Knaisse, Maaroub, Recheknanay, Saddiqine, Tair Debba, Zebqine - Total Irrigated area : 2 240 ha - Required works :	43,450,000
		Total Local schemes	**69,580,000**
		Out of which : Priority 1	-
		Priority 2	69,580,000
		Priority 3	-
		SL-IR C. Construction/Rehab of concrete channels (see drawing SL-IR.A)	
3	SL-IR. C.1	Construction of new (or rehabilitation of existing) concrete channels within the following schemes : Ain el Kbiri, Ain el Rihane, Ain el Tineh, Ain Rkiz, Ain Toghra, Baklleh, Berket el Djej, Chamaliye, El Aaichiye, El Bayad, El Choab - Ain Saha, El Fawar , El Fawar, El Harf, El Jawz - Wadih, El Meshreh, El Mghara, El Rabiaa - Jawzeh -Qaitoule, El Tineh, El-Dayaa, Ghraybeh - Azzoubiyeh, Jezzine, Jlikha, Kobay - Cheikh, Machereh, Majdaleen, Nabaa Ain Jbaa, Nabaa el Ain, Nabaa Sader, Nahr el Zahrani, Qobeiss - Majdaline, Wadi Chebaa, Zaarour Required works : - 141 km concrete channels	14,100,000
3	SL-IR. C.2	Ibl es Saqi Dam scheme distribution networks Irrigated area : 3800 ha Required works : - 380 km Distribution network	64,600,000
		Total concrete channels	**78,700,000**
		Out of which : Priority 1	-
		Priority 2	-
		Priority 3	78,700,000

TOTAL COST OF IRRIGATION PROJECTS IN BEIRUT AND MOUNT LEBANON

Priority 1	Priority 2	Priority 3	Total
1,020,000 $	**1,150,000 $**	**5,220,000 $**	**7,390,000 $**

Priority	Project code	Description	Estimated cost (USD)
BML-IR A. District of Jbeil (see drawings BML-IR.A)			
3	BML-IR. A.1	Aaqoura and Laqloug Scheme Required works : - 6 km Concrete channels to rehabilitate - 2 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	390,000
3	BML-IR. A.2	Lassa, Ghabat, Mezarib,Mghairi, Afqa & Surrounding Scheme Required works : - 2 km Concrete channels to rehabilitate - 2.5 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	300,000
2	BML-IR. A.3	Qartaba and Surrounding Scheme Required works : - 8 km Concrete channels to rehabilitate - 10 km Earth channels to concrete	1,150,000
		Total Jbeil district	**1,840,000**
		Out of which : Priority 1	-
		Priority 2	1,150,000
		Priority 3	690,000

Priority	Project code	Description	Estimated cost (USD)
BML-IR B. District of Maten (see drawings BML-IR.A)			
3	BML-IR. B.1	Baskinta Scheme Required works : - 16 km Concrete channels to rehabilitate - 8 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	1,050,000
		Total Halba district	**1,050,000**
		Out of which : Priority 1	-
		Priority 2	-
		Priority 3	1,050,000
BML-IR C. District of Keserouane (see drawings BML-IR.A)			
1	BML-IR. C.1	Mayrouba and Hrajel Scheme Required works : - 9 km Concrete channels to rehabilitate - 3 km Earth channels to concrete	530,000
3	BML-IR. C.3	Adonis (Keserouane) Scheme Required works : - Extention of Networks to Cover Present Dry Farm Area	230,000
3	BML-IR. C.4	Kfar Dibiane and Faraya Scheme Required works : - 25 km Concrete channels to rehabilitate - 8 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	1,900,000
3	BML-IR. C.5	Nahr el Kalb Wata Scheme Required works : - 5 km Concrete channels to rehabilitate	145,000
		Total Keserouane district	**2,805,000**
		Out of which : Priority 1	530,000
		Priority 2	-
		Priority 3	2,275,000

Priority	Project code	Description	Estimated cost (USD)
BML-IR D. District of Baabda (see drawings BML-IR.B)			
3	BML-IR. D.1	Baabda Scheme Required works : - 4 km Concrete channels to rehabilitate - 1.5 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	280,000
3	BML-IR. D.2	Tarchich Scheme Required works : - 0.5 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	85,000
		Total Baabda district	**365,000**
		Out of which : Priority 1	-
		Priority 2	-
		Priority 3	365,000
BML-IR E. District of Chouf (see drawings BML-IR.B)			
1	BML-IR. E.1	Damour Scheme Required works : - 16 km Concrete channels to rehabilitate	490,000
3	BML-IR. E.2	Barouk Scheme Required works : - 17 km Concrete channels to rehabilitate - 0.8 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	610,000
3	BML-IR. E.3	Nbaa El Safa Scheme Required works : - Extention of Networks to Cover Present Dry Farm Area	230,000
		Total Chouf district	**1,330,000**
		Out of which : Priority 1	490,000
		Priority 2	-
		Priority 3	840,000

TOTAL COST OF DAMS PROJECTS IN LEBANON

Priority 1	Priority 2	Priority 3	Total
313,020,000 $	**673,000,000 $**	**790,060,000 $**	**1,776,080,000 $**

Priority	Project code	Description	Estimated cost (USD)
NL-D. Dams in North Lebanon			
1	NL-D. 1	El Bared dam: Construction of Water Supply dam (37-90 MCM) and associated water treatment plant and transmission network	196,020,000
3	NL-D. 4	Noura el Tahta Dam: Construction of dam (35-50MCM) for Nour el Tahta and surrounding villages for drinking water and irrigation	150,000,000
2	NL-D. 6	Dar Baachtar Dam: Construction of Water and Irrigation Dam (7 MCM) for Koura and Batroun	50,000,000
		Total dams in North Lebanon	**396,020,000**
		Out of which : Priority 1	196,020,000
		Priority 2	50,000,000
		Priority 3	150,000,000
BQ-D. Dams in the Beqaa			
1	BQ-D. 1	Assi Phase I Dam: Completion of execution works for Assi Phase 1 Water and Irrigation Dam, and supervision works.	52,000,000
2	BQ-D. 2	Assi Phase 2 Dam: Construction of Assi Phase 2 Water and Irrigation Dam (15 MCM).	150,000,000
3	BQ-D. 3	Younine Dam: Providing additional storage capacity of 5.8 MCM for the irrigation of 1200 ha	69,960,000
3	BQ-D. 4	Massa Dam: Providing additional storage capacity of 8 MCM for the irrigation of 1600	37,100,000
		Total dams in the Bekaa	**309,060,000**
		Out of which : Priority 1	52,000,000
		Priority 2	150,000,000
		Priority 3	107,060,000
SL-D. Dams in South Lebanon			
2	SL-D. 1	Ibl es Saqi Dam: Construction of Irrigation and Water supply dam (50 MCM) on the Hasbani river next to Ibl es Saqi, with related transmission lines and	145,000,000
2	SL-D. 2	Choumariye Dam: Construction of Water supply and Irrigation DAM (28 MCM) on Litani River with related transmission lines and reservoirs	128,000,000
3	SL-D. 3	Khardali Dam: Construction of Irrigation and Water supply dam (128 MCM) on Litani river (Khardali segment) including downstream works (transmission lines and reservoirs)	480,000,000
		Total dams in South Lebanon	**753,000,000**
		Out of which : Priority 1	-
		Priority 2	273,000,000
		Priority 3	480,000,000

Priority	Project code	Description	Estimated cost (USD)
BML-D. Dams in Beirut and Mount Lebanon			
1	BML-D. 1	Ain Dara - Azounieh Dam: Construction of Water Supply dam (4-5 MCM)	65,000,000
2	BML-D. 2	Damour Dam: Construction of Water and Irrigation DAM (42-106 MCM) for Beirut and Damour region.	200,000,000
3	BML-D. 3	Maaser Chouf Dam: Construction of Water Supply hill lake (2.2 MCM)	53,000,000
		Total dams in Beirut & Mount Lebanon	**318,000,000**
		Out of which : Priority 1	65,000,000
		Priority 2	200,000,000
		Priority 3	53,000,000

TOTAL COST OF HILL LAKES PROJECTS IN LEBANON

Priority 1	Priority 2	Priority 3	Total
33,370,000 $	**319,120,000 $**	**22,900,000 $**	**375,390,000 $**

Priority	Project code	Description	Estimated cost (USD)
NL-HL.A. Hill Lakes in Akkar			
1	NL-HL.A. 1	Omar El Breiket Hill Lake: Construction of Hill Lake	1,170,000
2	NL-HL.A. 2	Bouqaiaa - Machta Hamoud - Machta Hassan Scheme Hill Lakes: Construction of Hill Lakes	1,170,000
		Total hill lakes in Akkar	**2,340,000**
		Out of which : Priority 1	1,170,000
		Priority 2	1,170,000
		Priority 3	-
NL-HL.B. Hill Lakes in North Lebanon (other than Akkar)			
1	NL-HL.B. 1	Blaita Hill Lake: Construction of Hill Lake (0.18 MCM)	5,000,000
1	NL-HL.B. 2	Tim Rbita Hill Lake: Construction of Hill Lake (0.1 MCM)	2,200,000
1	NL-HL.B. 3	Rahwe Hill Lake: Construction of 20 m high Hill Lake (2.2 MCM), providing an additional capacity for the irrigation of 200 ha	25,000,000
2	NL-HL.B. 4	Bcharre Scheme Hill Lakes: Construction of Hill Lakes	8,750,000
2	NL-HL.B. 5	Ehden Scheme Hill Lakes: Construction of Hill Lakes	3,500,000
2	NL-HL.B. 6	Rahban Hill Lake: Construction of Hill Lake (0.3 MCM)	7,000,000
2	NL-HL.B. 7	Laqlouq Hill Lake: Construction of Hill Lake (0.06 MCM)	400,000
2	NL-HL.B. 8	Arez Tannourine Hill Lake: Construction of Hill Lake (0.4 MCM)	14,000,000
2	NL-HL.B. 9	Hourayta Hill Lake: Construction of Hill Lake (0.21 MCM)	7,000,000
2	NL-HL.B. 10	Ain Rouana Hill Lake: Construction of Hill Lake (1.43 MCM)	30,000,000
2	NL-HL.B. 11	Ech Chir Hill Lake: Construction of Hill Lake (0.3 MCM)	4,500,000
2	NL-HL.B. 12	Ain Saouda Hill Lake: Construction of Hill Lake (0.06 MCM)	400,000

Priority	Project code	Description	Estimated cost (USD)
2	NL-HL.B. 13	Ain Lebne Hill Lake: Construction of Hill Lake (1.86 MCM)	34,000,000
3	NL-HL.B. 14	Ain Es Safsafe Hill Lake: Construction of Hill Lake (0.3 MCM)	400,000
3	NL-HL.B. 15	El Khaf Hill Lake: Construction of Hill Lake (0.07 MCM)	500,000
3	NL-HL.B. 16	Midane Hill Lake: Construction of Hill Lake (0.79 MCM)	22,000,000
		Total hill lakes in North Lebanon (other than Akkar)	**164,650,000**
		Out of which : Priority 1	32,200,000
		Priority 2	109,550,000
		Priority 3	22,900,000

See Volume III - Section III-C for details

TOTAL COST OF ARTIFICIAL AQUIFER RECHARGE

Priority 1	Priority 2	Priority 3	Total
3,650,000 $	**11,600,000 $**	**16,500,000 $**	**31,750,000 $**

Priority	Project code	Description	Estimated cost (USD)
AAR A. Artificial recharge at Berdaouni pilot site			
1	AAR A.1.	Detailed design of the AAR pilot project facility at Berdaouni site	150,000
1	AAR A.2.	Construction of Berdaouni AAR facility	3,500,000
		Total artificial recharge at Berdaouni pilot site	**3,650,000**
		Out of which : Priority 1	3,650,000
		Priority 2	-
		Priority 3	-
AAR B. Artificial recharge at Abou Ali site			
2	AAR B.1.	Detailed design of the AAR facility at Abou Ali site	500,000
2	AAR B.2.	Construction of Abou Ali AAR facility	5,000,000
		Total artificial recharge at Abou Ali site	**5,500,000**
		Out of which : Priority 1	-
		Priority 2	5,500,000
		Priority 3	-
AAR C. Artificial recharge at Damour site			
2	AAR C.1.	Detailed design of the AAR facility at Damour site	500,000
2	AAR C.2.	Construction of Damour AAR facility	5,000,000
		Total artificial recharge at Damour site	**5,500,000**
		Out of which : Priority 1	-
		Priority 2	5,500,000
		Priority 3	-
AAR D. Artificial recharge at Hadath-Hazmieh pilot site			
2	AAR D.1.	Feasibility study of the AAR pilot project at Hadath-Hazmieh	200,000
3	AAR D.2.	Detailed design of the AAR facility at Hadath-Hazmieh site	500,000
3	AAR D.3.	Construction of Hadath-Hazmieh AAR facility	5,000,000
		Total artificial recharge at Hazmieh-Hadath pilot site	**5,700,000**
		Out of which : Priority 1	-
		Priority 2	200,000
		Priority 3	5,500,000
AAR E. Artificial recharge at Daichounie site			
2	AAR E.1.	Feasibility study of the AAR pilot project at Daichouniye	200,000
3	AAR E.2.	Detailed design of the AAR facility at Daichouniye site	500,000
3	AAR E.3.	Construction of Daichouniye AAR facility	5,000,000
		Total artificial recharge at Daichouniye pilot site	**5,700,000**
		Out of which : Priority 1	-
		Priority 2	200,000
		Priority 3	5,500,000
AAR F. Artificial recharge in Akkar plain			
2	AAR F.1.	Feasibility study of the AAR pilot project in Akkar plain	200,000
3	AAR F.2.	Detailed design of the AAR facility in Akkar plain	500,000
3	AAR F.3.	Construction of Akkar plain AAR facility	5,000,000
		Total artificial recharge at Daichouniye pilot site	**5,700,000**
		Out of which : Priority 1	-
		Priority 2	200,000
		Priority 3	5,500,000

See Volume III - Section III-A.6 for details

TOTAL COST FOR METEOROLOGICAL AND HYDROMETRIC NETWORKS

Priority 1	Priority 2	Priority 3	Total
15,614,000 $	-	-	**15,614,000 $**

Priority	Project code	Description	Estimated cost (USD)
MH A. Meteorological and Hydrometric network expansions and improvements			
1	MH-A.1	LMS + LRA Meteorological Network Expansion Coastal Catchments: 9 Uncovered Catchments (+5 stations) 6 Semi-covered Catchments (+3 stations) Snow monitoring stations (+1 station per catchment above 2000m)	790,000
1	MH-A.2	LMS + LRA Meteorological Network Expansion Interior Catchments: 1 Uncovered Catchments (+5 stations) 3 Semi-covered Catchments (+3 stations) Snow monitoring stations (+1 station per catchment above 2000m)	200,000
1	MH-A.3	LARI Meteorological Network Expansion Maintenance instruments for 10 stations	100,000
1	MH-A.4	MoEW Meteorological Network Expansion Natural reserves and Forests	250,000
1	MH-A.5	LRA Hydrometric Network Expansion: Improvement of hydrometric stations as per LWP assessment report Hydrometric monitoring stations for stream connections coverage Hydrometric monitoring stations for hydrogeology coverage Main springs ADCP Installation Groundwater wells monitoring	4,726,000
		Total	**6,066,000**
		Out of which : Priority 1	6,066,000
		Priority 2	-
		Priority 3	-
MH-B. Integrated Hydrological Information System			
1	MH-B.1	Required studies for IHIS implementation: Assessment studies Update and Analysis of the NLUMP and annexed geodatabase Lebanese Data Rescue Project Design studies for the IHIS implementation Integrated water resources management studies Flood Risk Management plan Drought Mitigation plan Rainwater Harvesting plan	7,180,000
1	MH-B.2	IHIS implementation	2,000,000
1	MH-B.3	IHIS Operation for 24 months	288,000
1	MH-B.4	WEAP Operation and Implementation	80,000
		Total	**9,548,000**
		Out of which : Priority 1	9,548,000
		Priority 2	-
		Priority 3	-

See Volume III - Section III-C for details

TOTAL COST OF GENERAL STUDIES AND INVESTIGATIONS

Priority 1	Priority 2	Priority 3	Total
35,777,500 $	**2,500,000 $**	**11,150,000 $**	**49,427,500 $**

Priority	Project code	Description	Estimated cost (USD)
RS-A Implementation of a Project Management Unit for a 5 years period			
1	RS-A.1	Mobilisation of experts	6,700,000
1	RS-A.2	Purchase of cars, IT equipment, flow monitoring equipment, flow meters, manual dipmeters, misc working tools and required software	325,000
1	RS-A.3	Travel and transportation expenses	1,060,000
1	RS-A.4	Office expenses	420,000
		Total Implementation of PMU	**8,505,000**
		Out of which : Priority 1	8,505,000
		Priority 2	-
		Priority 3	-
RS-B Water Governance priority action plan			
1	RS-B.1	Sector Governance	1,355,000
1	RS-B.2	Financial and Commercial	6,750,000
1	RS-B.3	Reporting and Monitoring	1,257,500
1	RS-B.4	Capacity building	2,950,000
1	RS-B.5	O&M of facilities and services	660,000
		Total Water Governance priority action plan	**12,972,500**
		Out of which : Priority 1	12,972,500
		Priority 2	-
		Priority 3	-
RS-C General Geological and Hydrogeological Studies			
1	RS-C.1	Geology ang hydrogeology mapping and studies	12,200,000
3	RS-C.2	Refreshment of water budget studies of major hydrogeological basins	2,000,000
3	RS-C.3	Groundwater vulnerability mapping for springs Q > 10 l/s	1,600,000
3	RS-C.4	Modeling of major karst aquifers hydrogeological basins	3,000,000
3	RS-C.5	Modeling of major porous, saline aquifer systems	3,000,000
		Total Geology and hydrogeology mapping and studies	**21,800,000**
		Out of which : Priority 1	12,200,000
		Priority 2	-
		Priority 3	9,600,000
RS-D Drilling and testing exploratory wells			
1	RS-D.1	In Hadath-Hazmieh - 3 wells	1,500,000
1	RS-D.2	In Daichouniye - 2 wells	600,000
2	RS-D.3	In Akkar plain - 5 wells	2,500,000
3	RS-D.4	In Brak (Zahrani) - 1 well	500,000
3	RS-D.5	In Damour - 3 wells	1,050,000
		Total Drilling and testing exploratory wells	**6,150,000**
		Out of which : Priority 1	2,100,000
		Priority 2	2,500,000
		Priority 3	1,550,000

SECTION V B
APPENDICES TO PROPOSED PROJECTS

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Appendix NL-W.A : Water North Lebanon - Batroun

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
System 1	Tannourine El-Faouqa			12.00	960 000	500	120 000							1 080 000	1 144 800	**Served population in System 1 (in 2035) : 5613** -New water distribtuion networks are proposed for tannourine el Faouqa and Chatine -Since the total capacities of the existing reservoirs in the villages are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Chatine			5.00	400 000	200	80 000							480 000	508 800	
System 2	Daraya El-Batroun													-	-	**Served population in System 2 (in 2035) : 15497** - Based on the water balance in summer for System 2, a deficit occurs since 2020. 2 wells with each with a flow of 10 l/s are proposed to cover the deficit with 4 km proposed lift lines for the proposed well - Proposed distribution network for Tannourine et Tahta - Additional requiered storage was proposed to meet the 2035 water needs requierements - New transmission lines are needed in: Aabdelli, Aalali, Douq
	AAbdelli	1.00	90 000			300	90 000							180 000	190 800	
	Douma					300	90 000							90 000	95 400	
	Bcheaali													-	-	
	Tannourine Et-Tahta			7.00	560 000	300	90 000							650 000	689 000	
	Deir Mar Youssef Jrabta													-	-	
	Toula El-Batroun													-	-	
	Aalali	2.50	225 000											225 000	238 500	
	Sghar													-	-	
	Jrabta El-Batroun													-	-	
	Racha													-	-	
	Ouata Houb					100	60 000							60 000	63 600	
	Douq	2.50	225 000											225 000	238 500	
	Mehmarch													-	-	
	Hadtoun													-	-	
	Dahr Abi Yaghi													-	-	
	Mar Mama													-	-	
	Masrah													-	-	
	Ram El-Batroun													-	-	
System 3	Hamat													-	-	**Served population in System 3 (in 2035) : 7484** -New transmission lines are needed in: Ras Nahhach
	Ras Nahhach	1.00	90 000											90 000	95 400	
	Ouajh El-Hajjar	1.50	135 000											135 000	143 100	
	Koubba													-	-	
System 4	Beit Kassab	4.00	360 000											360 000	381 600	**Served population in System 4 (in 2035) : 2964** - New transmission lines are needed in: Beit Kassab, Hardine, Niha El Batroun, Kfour El Aarbi
	Hardine	2.00	180 000											180 000	190 800	
	Niha El-Batroun	3.50	315 000											315 000	333 900	
	Kfour El-Aarbi	2.00	180 000											180 000	190 800	

Appendix NL-W.A : Water North Lebanon - Batroun

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 5	Selaata													-	-	**Served population in System 5 (in 2035): 68941** - Additional requiered storage was proposed to meet the 2035 water needs requierements -New transmission lines are needed in: Ouajh El Hajjar, Qatnaaoun, Aabrine, Kfar Khollos, Kfar Hay, Boqsmaiya, Bijdarfil, Ijdabra, Jebla, Deir kfifane - Additional requiered storage was proposed to meet the 2035 water needs requierements - New transmission lines are needed in: Deir Billa - Based on the water balance in summer, a deficit occurs since 2020. 2 wells with each with a flow of 10 l/s are proposed to cover the deficit with 4 km proposed lift lines for the proposed well - Additional requiered storage was proposed to meet the 2035 water needs requierements - New transmission lines are needed in: Zane, Assia - Additional requiered storage was proposed to meet the 2035 water needs requierements - New transmission lines are needed in: Kour
	Rachkida					100	60 000							60 000	63 600	
	Qatnaaoun	2.00	180 000			100	60 000							240 000	254 400	
	Aabrine	2.00	180 000											180 000	190 800	
	Batroun													-	-	
	Kfar Khollos	4.00	360 000			100	60 000							420 000	445 200	
	Kfar Hay	2.00	180 000											180 000	190 800	
	Boqsmaiya	0.50	45 000											45 000	47 700	
	Bijdarfil	0.50	45 000											45 000	47 700	
	Ijdabra	0.50	45 000											45 000	47 700	
	Jebla	8.00	720 000											720 000	763 200	
	Basbina													-	-	
	Kfifane													-	-	
	Deir Kfifane	1.50	135 000			100	60 000							195 000	206 700	
	Jrane El-Batroun													-	-	
	Smar Jbayl					100	60 000							60 000	63 600	
	Mrah Ez Ziyat													-	-	
	Rachana													-	-	
	Thoum													-	-	
	Ghouma													-	-	
	Kfar Aabida													-	-	
	Edde El-Batroun													-	-	
	Mrah Chdid													-	-	
	Helta													-	-	
	Sourat El-Batroun					100	60 000							60 000	63 600	
	Kfarb Shlaimane					100	60 000							60 000	63 600	
	Deir Billa	1.50	135 000											135 000	143 100	
	Kfar Hilda													-	-	
	Beit Chlala													-	-	
	Daael					100	60 000							60 000	63 600	
	Bechtoudar													-	-	
	Assia	2.00	180 000											180 000	190 800	
	Ftahat El-Batroun													-	-	
	Zané	3.50	315 000											315 000	333 900	
	Chibtine													-	-	
	Deir Mar Youhanna EL-Batroun													-	-	
	Nahlé El-Batroun													-	-	
	Mrah El-Hajj													-	-	
	Kour	2.50	225 000			200	80 000							305 000	323 300	
	Harbouna													-	-	
	Aartiz					150	70 000							70 000	74 200	
	Kfar Hatna					100	60 000							60 000	63 600	
System 6	Chikka													-	-	
	Heri													-	-	
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**50.50**	**$ 4 545 000**	**24.00**	**$ 1 920 000**	**17.00**	**$ 1 220 000**	**-**	**$ -**	**-**	**$ -**	**-**	**$ -**	**$ 7 685 000**	**$ 23 146 100**	

Appendix NL-W.B : Water North Lebanon - Halba

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
System 1	Akkar El-Atika	8.00	720 000	2.00	160 000			4.00	2 000 000					2 880 000	3 052 800	**Served population in System 1 (in 2035): 34011** '-Based on the water balance summer for Akkar El Atika system, a deficit occurs since 2020. 4 wells with a flow of 10 l/s are proposed to cover the deficit with 8 km proposed lift lines for the proposed wells -Proposed distribution network for Akkar El Atika
System 2	Chakdouf													-	720 800	**Served population in System 2 (in 2035): 17683** 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
	Daoura	2.00	180 000					1.00	500 000					680 000		
System 3	Aïn-Yacoub					1 000	200 000							200 000	2 363 800	**Served population in System 3 (in 2035): 46463** '-Based on the water balance summer for System 3, a deficit occurs since 2020. 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line -Proposed distribution networks for Bazbina and Tikrite -Additional required storage was proposed to meet the 2035 water needs requirements '-Proposed distribution networks for Bazbina and Tikrite
	Bazbina			12.00	960 000									960 000		
	Beino					2 000	230 000							230 000		
	El-Borge													-		
	Mimnih													-		
	Tikrite			2.00	160 000									160 000		
	ElAyoune	2.00	180 000					1.00	500 000					680 000		
	Aaiyat													-		
	Chakdouf													-		
	Qboula													-		
	Tallet Chattaha													-		
	Tshea													-		
System 4	Rahbé	4.00	360 000	2.00	160 000									520 000	551 200	**Served population in System 4 (in 2035): 10799** -2 km of proposed distribution networks for Bazbina and Tikrite -4 km of transmission lines
System 5 & 6A	Beit Mallat	2.00	180 000	2.00	160 000			1.00	500 000					840 000	13 737 600	**Served population in System 5 & 6A (in 2035): 28570** - Based on the water balance summer for System 5, a deficit occurs since 2020. 6 wells each with a flow of 15 l/s are proposed to cover the deficit with 12 km proposed lift lines for the proposed wells - Proposed distribution network for Beit Mallat - Proposed distribution networks for: Edbel, Hayzouk, liate, Jebrail, Machha - Additional required storage was proposed to meet the 2035 water needs requirements
	Dahr-Leyciné					250	85 000		-					85 000		
	Edbel	2.00	180 000	20.00	1 600 000	1 500	215 000	1.00	500 000					2 495 000		
	Hayzouk	2.00	180 000	20.00	1 600 000			1.00	500 000					2 280 000		
	Ilate	2.00	180 000	20.00	1 600 000			1.00	500 000					2 280 000		
	Jebrâil	2.00	180 000	20.00	1 600 000	500	120 000	1.00	500 000					2 400 000		
	Machha	2.00	180 000	20.00	1 600 000	3 000	300 000	1.00	500 000					2 580 000		
System 7A	Al-Jédidé			10.00	800 000									800 000	3 694 100	**Served population in System 7A (in 2035): 31406** - Based on the water balance summer for System 7A, a deficit occurs since 2020. 2 wells with a flow of 20 l/s are proposed to cover the deficit with 4 km proposed lift lines for the proposed wells - Proposed distribution networks for Al-Jdeide, Karem Asfour El Nahrieh, Minyara - Additional required storage was proposed to meet the 2035 water needs requirements - 2 km of transmission lines
	Al-Zoureiribe	1.00	90 000			400	105 000							195 000		
	Cheikh Taba Montagne	1.00	90 000											90 000		
	Cheikh Taba Plaine	2.00	180 000					1.00	500 000					680 000		
	El-Kantara													-		
	Hekr el Dahiri													-		
	Karem-Asfour-El-Nahrieh			10.00	800 000									800 000		
	Beit-Ghattas													-		
	Minyara	2.00	180 000	3.00	240 000			1.00	500 000					920 000		
System 7B	Zouk el Haddara		-											-	3508600	**Served population in System 7B (in 2035): 25971** - Proposed distribution networks for: Bkarzala, Zouk el Moukacherine - Based on the water balance in summer for System 7B, a deficit occurs since 2020. 4 wells with a flow of 35 l/s are proposed to cover the deficit - 11 km of transmission lines
	Bkarzala	5.00	450 000	2.00	160 000			1.00	500 000					1 110 000		
	Majdla	2.00	180 000					1.00	500 000					680 000		
	Mar Touma	2.00	180 000					1.00	500 000					680 000		
	Mechaïlha Hakour		-		-									-		
	Zouk el Moukachérine		-	2.00	160 000									160 000		
	Zouk-El-Habalça		-											-		
	Zouk-El-Hosmieh et Dahr Ayasse	2.00	180 000					1.00	500 000					680 000		
System 8	Homeira													-	-	
	Kloud El-Bakia													-	-	
	Saïssouk													-	-	

Appendix NL-W.B : Water North Lebanon - Halba

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 9	Berkayel	5.50	495 000	4.00	320 000			2.00	1 000 000					1 815 000	5 194 000	**Served population in System 9 (in 2035): 43459** - Proposed distribution networks for: Berkayel, Bzal, Safine El Kayteh - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for System 9, a deficit occurs since 2020. 5 wells each with a flow of 20 l/s are proposed to cover the deficit - 14.5 km of transmission lines
	Bzal	7.00	630 000	4.00	320 000			2.00	1 000 000					1 950 000		
	Safiné-El-Kayteh	2.00	180 000	3.00	240 000	1 500	215 000	1.00	500 000					1 135 000		
System 10	Bebnine	4.50	405 000	5.00	400 000			4.00	2 000 000					2 805 000	2 973 300	**Served population in System 10 (in 2035): 55344** - Based on the water balance summer for System 10, a deficit occurs since 2020. 4 wells each with a flow of 10 l/s are proposed to cover the deficit - Proposed distribution networks for: Bebnine - 4.5 km of transmission lines
System 11	Ouadi El-Jamous	2.00	180 000					1.00	500 000					680 000	720 800	**Served population in System 11 (in 2035): 10799** Proposed distribution networks for Ouadi El jamous and 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
System 12 and 13	El-Karkaf	2.00	180 000	2.00	160 000			1.00	500 000					840 000	3 731 200	**Served population in System 12 (in 2035): 18868** - Based on the water balance summer, a deficit occurs since 2020. 2 wells with a flow of 15 l/s are proposed to cover the deficit - 4 km of transmission lines - Proposed distribution networks for: Jdeidet El Kayteh - Based on the water balance summer for System 12, a deficit occurs since 2020. 1 well with a flow of 45 l/s is proposed to cover the deficit - Based on the water balance summer for System 13, a deficit occurs since 2020. 1 well with a flow of 15 l/s is proposed to cover the deficit - 4 km of transmission lines
	Beit-El-Haouche	2.00	180 000					1.00	500 000					680 000		
	Jedeidet-El-Kayteh	2.00	180 000	3.00	240 000	4 000	400 000	1.00	500 000					1 320 000		
	Eyoune-El-Ghouzlane	2.00	180 000					1.00	500 000					680 000		
System 14A	Chane													-	1 393 900	**Served population in System 14A (in 2035): 9726** - Proposed distribution networks for: Khreibet Aakkar - Based on the water balance in summer for System 14A, a deficit occurs since 2020. 1 well with a flow of 25 l/s is proposed to cover the deficit - 5.5 km of transmission lines are proposed
	El-Houaïche	3.50	315 000					1.00	500 000					815 000		
	Khreibet Aakkar	2.00	180 000	4.00	320 000									500 000		
System 14B	Beit Ayoub	2.00	180 000	5.00	400 000			1.00	500 000					1 080 000	6 958 900	**Served population in System 14B (in 2035): 43649** '- Proposed distribution networks for: Beit Ayoub, Beit Younes, El Korne, El Krayat - Additional required storage was proposed to meet the 2035 water needs requirements - 15.5 km of transmission lines are proposed
	Beit Younes	4.50	405 000	5.00	400 000			1.00	500 000					1 305 000		
	Sadaqa								-					-		
	Michmiche	2.50	225 000					2.00	1 000 000					1 225 000		
	El-Korné	4.00	360 000	3.00	240 000	2 000	230 000	2.00	1 000 000					1 830 000		
	El-Krayat	2.50	225 000	5.00	400 000			1.00	500 000					1 125 000		
System 14C	Danbou	7.00	630 000					1.00	500 000					1 130 000	2 798 400	**Served population in System 14C (in 2035): 46241** - Additional required storage was proposed to meet the 2035 water needs requirements 3 wells each with a flow of 10 l/s are proposed to cover the deficit - 11 km of transmission lines are proposed
	Habchite		-			750	150 000							150 000		
	Qabaait	2.00	180 000					1.00	500 000					680 000		
	Harare	2.00	180 000					1.00	500 000					680 000		
System 14D	Fneidek	14.00	1 260 000	6.00	480 000	5 000	500 000	7.00	3 500 000					5 740 000	6 084 400	**Served population in System 14D (in 2035): 47245** - Proposed distribution networks for: Fneidek -Based on the water balance in summer for Fneidek system, a deficit occurs since 2020. 7 wells each with a flow of 10 l/s are proposed to cover the deficit - 14 km of transmission lines
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**120.00**	**$ 10 800 000**	**196.00**	**$ 15 680 000**	**12**	**$ 2 750 000**	**50.00**	**$ 25 000 000**	**-**	**$ -**	**-**	**$ -**	**$ 54 230 000**	**$ 72 483 800**	

Appendix NL-W.C : Water North Lebanon - Koura

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
System 1	Enfeh															
System 2	Al-Boukaia													-	2 676 500	**Served population in System 2 (in 2035): 67193** - Additional required storage was proposed to meet the 2035 water needs requirements - Proposed distribution network for Afsdik - 6.5 km of transmission lines
	Al-Hraïché													-		
	Badbhoun	1.50	135 000			100	60 000							195 000		
	Bargoune	1.00	90 000			200	80 000							170 000		
	Barsa		-											-		
	Afsdik		-	7.00	560 000	600	120 000							680 000		
	Beitroumine		-			1 000	200 000							200 000		
	Belmand		-			200	80 000							80 000		
	Bkeftine		-			500	120 000							120 000		
	Btouratige		-			500	120 000							120 000		
	Déddé		-											-		
	En-Nakhlé		-			3 500	350 000							350 000		
	Fih		-			300	90 000							90 000		
	Kelhate	1.00	90 000											90 000		
	Kfar Kahel	1.50	135 000			350	100 000							235 000		
	Zakroune	1.50	135 000			100	60 000							195 000		
System 3	Ras Maska	8.00	720 000			5 000	500 000	2.00	1 000 000					2 220 000	2 353 200	**Served population in System 3 (in 2035): 29054** - Based on the water balance in summer for Ras Maska system, a deficit occurs since 2020. 2 wells each with a flow of 15 l/s are proposed to cover the deficit - 8 km of transmission lines
System 4	Aba			5.00	400 000									400 000	8 220 300	**Served population in System 4 (in 2035): 87258** - Proposed distribution network for Aba, Amioune, Bdebba, Bsarma, Dar Bechtar, Kfar Hazir, Kousba and Rechdebbine - Additional required storage was proposed to meet the 2035 water needs requirements - Proposed pumping stations in Kfar Hazir, Kousba and Rechdebbine - 3 km of transmission line
	Amioune			15.00	1 200 000	1 500	215 000							1 415 000		
	Bdebba			5.00	400 000									400 000		
	Bechmezzine													-		
	Bsarma			6.00	480 000	1000 + 500	320 000							800 000		
	Aïn Akrine					300	90 000							90 000		
	Dar Chmezzine					100	60 000							60 000		
	Kfar Akka					1 500	215 000							215 000		
	Kfar Hazir			6.00	480 000					1.00	400 000			880 000		
	Bterram					1 200	210 000							210 000		
	Kfar Saroun					1 000	200 000							200 000		
	Kousba	3.00	270 000	10.00	800 000	1 500	215 000			1.00	400 000			1 685 000		
	Rechdebbine			10.00	800 000	200 + 500	200 000			1.00	400 000			1 400 000		
System 5	Bhabbouche													-	943 400	**Served population in System 5 (in 2035): 13694** - Additional required storage was proposed to meet the 2035 water needs requirements - Proposed distribution network for Dar Bechtar
	Bziza													-		
	Dar Bechtar			10.00	800 000	300	90 000							890 000		
	Kaftoune													-		
	Majdel													-		
System 6	Bednayel													-	127 200	**Served population in System 6 (in 2035): 8492** - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for System 11, a deficit occurs since 2020.2 wells each with a flow of 10 l/s are proposed to cover the deficit
	Btaaboura					100	60 000							60 000		
	Ejdabrine					100	60 000							60 000		
	Kefraya													-		
	Kfar Hatta													-		
System 7	Bnehrane			5.00	400 000	300	90 000							490 000	519 400	**Served population in System 7 (in 2035): 1315** - Proposed distribution network for Bnehrane - Additional required storage was proposed to meet the 2035 water needs requirements
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**17.50**	**$ 1 575 000**	**79.00**	**$ 6 320 000**	**27**	**$ 3 905 000**	**2.00**	**$ 1 000 000**	**3.00**	**$ 1 200 000**	**-**	**$ -**	**$ 14 000 000**	**$ 29 840 000**	

Appendix NL-W.D : Water North Lebanon - Minieh

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
System 1a	Al-Minieh	23.00	2 070 000	10.00	800 000	3000 + 3000 + 4000	1 000 000	10.00	5 500 000					9 370 000	9 932 200	**Served population in System 1a (in 2035): 135648** - Proposed distribution networks for al-Minieh - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for Al-Minieh system, a deficit occurs since 2020. 10 wells each with a flow of 25 l/s are proposed to cover the deficit - 23 km of transmission lines
System 2a	Markabta	3.00	270 000	2.00	160 000			1.00	500 000					930 000	985 800	**Served population in System 2a (in 2035): 8139** - Based on the water balance in summer for Markabta system, a deficit occurs since 2025. 1 well with a flow of 25 l/s is proposed to cover the deficit - 3 km of transmission lines
System 3a	Borge-El-Yahoudié	1.00	90 000	2.00	160 000	1 000	200 000							450 000	3 333 700	**Served population in System 3a (in 2035): 29842** - Proposed distribution network for Deir Omar - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for System 3a, a deficit occurs since 2025. 1 well with a flow of 25 l/s is proposed to cover the deficit - 3 km of transmission lines
	Deir Omar	2.00	180 000	15.00	1 200 000	6000 + 1500	815 000	1.00	500 000					2 695 000		
System 4a	Nabi Youcheaa	1.00	90 000	3.00	240 000	500	120 000							450 000	477 000	**Served population in System 4a (in 2035): 16278** - Proposed distribution network for Nabi Youcheaa - Additional required storage was proposed to meet the 2035 water needs requirements - 1 km of transmission line
System 5a	Tourbol	1.00	90 000	2.00	160 000	600	130 000							380 000	402 800	**Served population in System 5a (in 2035): 169** - Proposed distribution network for Tourbol - Additional required storage was proposed to meet the 2035 water needs requirements - 1 km of transmission lines
System 6a	Zouk Bhanine	2.00	180 000	2.00	160 000	2 000	230 000	1.00	500 000					1 070 000	1 982 200	**Served population in System 6a (in 2035): 19991** - Proposed distribution network for Zouk Bhanine, Al Rihanié and Aadoua - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for System 6a, a deficit occurs since 2030. 1 well with a flow of 25 l/s is proposed to cover the deficit - 5 km of transmission lines
	Al-Rihanié	2.00	180 000	3.00	240 000	400	105 000							525 000		
	Aadoua	1.00	90 000	1.00	80 000	400	105 000							275 000		
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**36.00**	**$ 3 240 000**	**40.00**	**$ 3 200 000**	**11**	**$ 2 705 000**	**13.00**	**$ 7 000 000**	**-**	**$ -**	**-**	**$ -**	**$ 16 145 000**	**$ 32 113 700**	

Appendix NL-W.E : Water North Lebanon - Ed Danniyeh

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
System 1	Sir	1.00	90 000	20.00	1 600 000	600 + 500 + 200	330 000							2 020 000	2 141 200	**Served population in System 1 (in 2035): 16022** - Proposed distribution network for Sir - Additional required storage was proposed to meet the 2035 water needs requirements - 1 km of transmission lines
System 2	Al-Sfiré	5.00	450 000											450 000	2 263 100	**Served population in System 2 (in 2035): 37408** - Proposed distribution networks for Assoun and Bkaa Safrine - Additional required storage was proposed to meet the 2035 water needs requirements - 13.5 km of transmission lines
	Assoun	2.50	225 000	3.00	240 000	1 000	200 000							665 000		
	Bkaa Safrine	2.50	225 000	2.00	160 000	1000 + 500	320 000							705 000		
	Bkarsouna	3.50	315 000											315 000		
	Mrah-El-Sfiré		-											-		
System 3	Azka	4.00	360 000	2.00	160 000	1 000	200 000							720 000	2 098 800	**Served population in System 3 (in 2035) : 28768** - Proposed distribution networks for Azka, Kfar Chlane and El Watie et Harf Siad - Since the total capacities of the existing reservoirs in the villages are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages. - 7 km of transmission lines
	Btermaz		-			500 + 300	210 000							210 000		
	El-Watié et Harf Siad		-	1.00	80 000	100	60 000							140 000		
	Kfar Chlane	2.00	180 000	2.00	160 000	200	80 000							420 000		
	Kfar Habou		-			1 000	200 000							200 000		
	Mrah-el-Sreige		-			1 000	200 000							200 000		
	Tarane	1.00	90 000											90 000		
System 4 & 5	Bakhoune	1.00	90 000	1.00	80 000									170 000	869 200	**Served population in System 4&5 (in 2035): 17081** - New water distribution networks are proposed for Bakhoune, Haql el Azime and Kattine - Since the total capacities of the existing reservoirs in the villages are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages. - 1 km proposed transmission lines
	Haql el Aazimé		-	2.00	160 000	600	130 000							290 000		
	Kattiné		-	2.00	160 000	1 000	200 000							360 000		
	Kharnoub		-											-		
System 6	Bechhara		-											-	1 250 800	**Served population in System 6 (in 2035): 10717** - New water distribution networks are proposed for Izal and Mazraat Ketrane - Since the total capacities of the existing reservoirs in the villages are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages. - 2 km proposed transmission lines
	Izal	2.00	180 000	6.00	480 000	200 + 200 + 1000	360 000							1 020 000		
	Jarjoura		-											-		
	Mazraat Ketrane		-	2.00	160 000									160 000		
System 7	Mazraet El-Krême		-											-	-	
	Mrabine		-											-		
	Qemmamine		-											-		
	Qraine		-											-		
System 8	Aassaymout		-											-	715 500	**Served population in System 8 (in 2035): 5449** - 7.5 km proposed transmission lines
	Debaael	7.50	675 000											675 000		
	Jaroun		-											-		
	Qarhaiya		-											-		

Appendix NL-W.E : Water North Lebanon - Ed Danniyeh

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 9	Aïn-El-Tiné		-											-	1 764 900	**Served population in System 9 (in 2035): 14288** - Distribution networks - Additional required storage was proposed to meet the 2035 water needs requirements - 9.5 km of transmission lines
	Beit-El-Faks	1.00	90 000	2.00	160 000									250 000		
	El-Hazmieh	2.00	180 000	2.00	160 000	300	90 000							430 000		
	Karseita	2.00	180 000											180 000		
	Nemrine et Bakoura	4.50	405 000	4.00	320 000	200	80 000							805 000		
System 10	Beit Haouik		-											-	938 100	**Served population in System 10 (in 2035): 3182** - New water distribution networks are proposed for Hawara - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs capacities in the village. - 6 km proposed transmission lines
	Hawara	3.00	270 000	3.00	240 000	400	105 000							615 000		
	Kfar Bibnine	3.00	270 000											270 000		
System 11	Karm el Mahr													-	-	
System 12	Kahf-El-Malloul	2.00	180 000	1.00	80 000			1.00	500 000					760 000	805 600	**Served population in System 12 (in 2035): 814** - Distribution network for Kahf el Malloul - Based on the water balance in summer for Kahf-El-Malloul system, a deficit occurs since 2020. 1 well with a flow of 10 l/s is proposed to cover the deficit - 2 km of transmission lines
System 13	Zaghrteghrine	2.00	180 000	2.00	160 000			1.00	500 000					840 000	890 400	**Served population in System 13 (in 2035): 949** - Distribution network for Zgharteghrine - Based on the water balance in summer for Zgharteghrine system, a deficit occurs since 2020. 1 well with a flow of 10 l/s is proposed to cover the deficit - 2 km of transmission lines
System 14	Behweité		-	1.00	80 000									80 000	84 800	**Served population in System 14 (in 2035): 649** -New water distribution networks are proposed for Behweité.
System 15	Bchnnata		-											-	678 400	**Served population in System 15 (in 2035): 2385** -New water distribution networks are proposed for Omar -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs capacities in the village. -Replacement of 1.5 km of transmission lines
	Btehline		-											-		
	Omar	1.50	135 000	5.00	400 000	400	105 000							640 000		
System 16	Deir Nebouh	5.00	450 000	4.00	320 000	500 + 500	240 000	2.00	1 000 000					2 010 000	2 130 600	**Served population in System 16 (in 2035) : 10174** - Distribution network for Deir Nebouh - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for Deir Nebouh system, a deficit occurs since 2020. 2 wells each with a flow of 10 l/s are proposed to cover the deficit - 5 km of transmission lines
System 17	Beit Zaoud	3.00	270 000											270 000	286 200	**Served population in System 17 (in 2035) : 814** -3 km proposed transmission lines
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**61.00**	**$ 5 490 000**	**67.00**	**$ 5 360 000**	**24**	**$ 3 110 000**	**4.00**	**$ 2 000 000**	**-**	**$ -**	**-**	**$ -**	**$ 15 960 000**	**$ 31 917 600**	

Appendix NL-W.F : Water North Lebanon - Zgharta

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
System 1	Hailan	2.00	180 000			300	90 000	1.00	500 000					770 000	816 200	**Served population in System 1 (in 2035) : 2078** -Based on the water balance, a deficit occurs since 2020 (-116 m³/d deficit in 2020). One well with a flow of 10 l/s is proposed to cover the deficit with 2 km of proposed transmission lines for the proposed well. -Additional required storage was proposed to meet the 2035 water needs requirements
	Mzraat Kefraya													-	-	
System 2	Aalma	2.00	180 000	10.00	800 000	2 000	230 000	1.00	500 000					1 710 000	1 812 600	**Served population in System 2 (in 2035) : 6495** -New water distribution network are proposed for Aalma. -Based on the water balance, a deficit occurs since 2025 (-14 m³/d deficit in 2020). One well with a flow of 10 l/s is proposed to cover the deficit with 2 km of proposed transmission lines for the proposed well. -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage.
System 3	Kfarhoura	2.00	180 000	5.00	400 000			1.00	500 000					1 080 000	1 144 800	**Served population in System 3 (in 2035): 2496** -Proposed distribution network for Kfarhoura -Based on the water balance, a deficit occurs since 2020 (-111 m³/d deficit in 2020). One well with a flow of 10 l/s is proposed to cover the deficit with 2 km of proposed transmission lines for the proposed well.
System 4	Kfarchakhna													-	-	
System 5	Daraiya Zgharta	2.00	180 000			250	85 000	1.00	500 000					765 000	810 900	**Served population in System 5 (in 2035): 2830** -Based on the water balance, a deficit occurs since 2020 (-222 m³/d deficit in 2020). One well with a flow of 10 l/s is proposed to cover the deficit with 2 km of proposed transmission lines for the proposed well. -Additional required storage was proposed to meet the 2035 water needs requirements.The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs capacities in the village.
System 6	Aarjis	2.00	180 000					1.00	500 000					680 000	720 800	**Served population in System 6 (in 2035): 2706** -1 well with a flow of 10 l/s is proposed to cover the deficit of the water balance that occurs in 2020 with 2 km of proposed transmission lines
	Bnechaai					250	85 000							85 000	90 100	-Additional required storage was proposed to meet the 2035 water needs requirements. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs capacities in the village.

Appendix NL-W.F : Water North Lebanon - Zgharta

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 7	Seraal			6.00	480 000	200	80 000							560 000	593 600	**Served population in System 7 (in 2035): 669** -Proposed distribution network for Seraal -Additional required storage was proposed to meet the 2035 water needs requirements.The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs capacities in the village.
System 8	Aintourine			5.00	400 000	100	60 000							460 000	487 600	**Served population in System 8 (in 2035): 552** -Proposed distribution network for Aintourine -Additional required storage was proposed to meet the 2035 water needs requirements.The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs capacities in the village.
System 9	Mazraat Et-Teffah	6.00	540 000	12.00	960 000									1 500 000	1 590 000	**Served population in System 9 (in 2035): 844** -Proposed distribution network for Mazraat Et-Teffah -Replacement of 6km of transmission lines that are old.
System 10	Arde					1 500	215 000							215 000	227 900	**Served population in System 10 (in 2035) : 9003** -2 wells with a flow of 12 l/s each are proposed to cover the deficit of the water balance that occurs in 2020, with new or renovated transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Mejdlaiya Zgharta	1.50	135 000			3000 + 750	450 000							585 000	620 100	
	Boussit													-	-	
	Hraiqis													-	-	
System 11	Aachach	1.00	90 000											90 000	95 400	**Served population in System 11 (in 2035): 18789** -Proposed distribution networks for Miriata and Rachaaine -2 wells with a flow of 12 l/s each are proposed to cover the deficit of the water balance that occurs in 2020 with 6.5 km of proposed transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Miriata	3.00	270 000	6.00	480 000	750	150 000	1.00	500 000					1 400 000	1 484 000	
	Rachaaine	2.50	225 000	5.00	400 000	1 500	215 000	1.00	500 000					1 340 000	1 420 400	
	Sakhra					100	60 000							60 000	63 600	
	Danha													-	-	

Appendix NL-W.F : Water North Lebanon - Zgharta

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 12	Deir Jdeide	0.50	45 000	2.00	160 000	100	60 000							265 000	280 900	**Served population in System 12 (in 2035) : 8053** -Proposed distribution network for Deir Jdeide -1 well with a flow of 10 l/s is proposed to cover the deficit of the water balance that occurs in 2020 with 7.5 km of new transmission lines and 4 km of renovated transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Khaldiyé	1.50	135 000			250	85 000							220 000	233 200	
	Asnoun	1.00	90 000			75	60 000							150 000	159 000	
	Iaal	4.50	405 000			100	60 000	1.00	500 000					965 000	1 022 900	
	Qarah Bach	1.00	90 000			100	60 000							150 000	159 000	
	Mazraat Ajbeaa	2.50	225 000			50	60 000							285 000	302 100	
	Mazraat Jnaid		-											-	-	
	Hariq Zgharta	0.50	45 000			75	60 000							105 000	111 300	
System 13	Miziara	7.50	675 000			1500 + 1500	430 000	1.00	500 000					1 605 000	1 701 300	**Served population in System 13 (in 2035) : 12989** -1 well with a flow of 10 l/s is proposed to cover the deficit of the water balance that occurs in 2025 with 7.5 km of proposed transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
System 14	Aardat	5.50	495 000			50	60 000							555 000	588 300	**Served population in System 14 (in 2035): 75470** -Proposed distribution network for Kfardlaqous and Kfarhata Zgharta -New transmission lines of 7.8 km and replacement of 8.5 km of old transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Tallet Zgharta	1.00	90 000			250	85 000							175 000	185 500	
	Kfardlaqous	2.00	180 000	5.00	400 000									580 000	614 800	
	Kfarhata Zgharta	6.30	567 000	4.00	320 000									887 000	940 220	
	Zgharta	1.50	135 000			3 000	300 000							435 000	461 100	
System 15	Ayto	4.00	360 000	8.00	640 000	300	90 000			1.00	300 000			1 390 000	1 473 400	**Served population in System 15 (in 2035) : 1722** -Proposed distribution networks for Ayto and Aarbet qozhaiya -2 wells with a flow of 10 l/s each are proposed to cover the deficit of the water balance that occurs in 2020 with 6.5 km of renovated transmission lines and 5 km of new transmission lines -Additional required storage was proposed to meet the 2035 water needs requirements -Proposed pumping station in Ayto
	Aarbet Qozhaiya	3.50	315 000	15.00	1 200 000	300	90 000							1 605 000	1 701 300	

Appendix NL-W.F : Water North Lebanon - Zgharta

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 16	Karm Saddé	1.50	135 000	15.00	1 200 000									1 335 000	1 415 100	**Served population in System 16 (in 2035) : 5649** -Proposed distribution network for Karm Saddé, Ras Kifa, Sebaal Zgharta -New transmission lines of 5 km and replacement of 8.5 km of old transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages. -Proposed pumping station in Sebaal Zgharta
	Kfarfou					200	80 000							80 000	84 800	
	Ras Kifa	4.00	360 000	15.00	1 200 000	500	120 000							1 680 000	1 780 800	
	Sebaal Zgharta	8.00	720 000	10.00	800 000	250	85 000			1.00	350 000			1 955 000	2 072 300	
System 17	Ijbaa	2.00	180 000	8.00	640 000	350	100 000							920 000	975 200	**Served population in System 17 (in 2035) : 1299** -Proposed distribution network for Ijbaa -Replacement of 2 km of old transmission lines -Additional required storage was proposed to meet the 2035 water needs requirements
System 18	Beslouqit	6.00	540 000			275	85 000	1.00	500 000					1 125 000	1 192 500	**Served population in System 18 (in 2035) : 8573** -1 well with a flow of 10 l/s is proposed to cover the deficit of the water balance that occurs in 2030, with 7 km of new transmission lines and 6.5 km of renovated transmission lines -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Ehden	7.50	675 000			2000 + 500 + 250 + 1000 + 1000	835 000							1 510 000	1 600 600	
System 19	Kafar Zeina	1.00	90 000											90 000	95 400	**Served population in System 19 (in 2035): 3602** -Proposed transmission lines of 1 km
System 20	Kfarsghab	1.00	90 000			1 000	200 000							290 000	307 400	**Served population in System 20 (in 2035): 3150** -Proposed transmission lines of 1 km -Additional required storage was proposed to meet the 2035 water needs requirements
System 21	Bchannine	2.00	180 000			250	85 000							265 000	280 900	**Served population in System 21 (in 2035) : 5736** -Proposed transmission lines of 4.5 km -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Bsebaal													-	-	
	Kfaryachit	1.00	90 000			200	80 000							170 000	180 200	
	Morh Kfarsghab	1.50	135 000			250	85 000							220 000	233 200	
System 22	Bhairet Toula	1.00	90 000			100	60 000							150 000	159 000	**Served population in System 22 (in 2035): 1039** -Proposed transmission lines of 1.5 km -Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs capacities in the villages.
	Toula Zgharta	0.50	45 000			250	85 000							130 000	137 800	
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**103.80**	**$ 9 342 000**	**131.00**	**$ 10 480 000**	**42**	**$ 5 120 000**	**10.00**	**$ 5 000 000**	**2.00**	**$ 650 000**	**-**	**$ -**	**$ 30 592 000**	**$ 47 427 520**	

Appendix NL-W.G : Water North Lebanon - Tripoli

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
Tripoli	Tripoli	10.00	900 000	150.00	12 000 000			4.00	2 000 000					14 900 000	15 794 000	**Served population in Tripoli (in 2035): 674187** Due to the salt water intrusion inside some existing wells, 4 wells are proposed to cover the water balance in the year 2035 with 10 km proposed lift lines for the proposed wells. Proposed 150 km of distribution networks to replace the old existing ones of more than 60 years old, in order to reduce losses.
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**10.00**	**$ 900 000**	**150.00**	**$ 12 000 000**	**-**	**$ -**	**4.00**	**$ 2 000 000**	**-**	**$ -**	**-**	**$ -**	**$ 14 900 000**	**$ 30 794 000**	

Appendix NL-W.H : Water North Lebanon - Qobayate

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
	Dayret Nahr El-Kabir					250 + 350	185 000			1.00	350 000			535 000		**Served population in System 0 (in 2035): 51454**
	Ouadi Khaled		-		-									-		- Proposed distribution networks for Al-Kneisse
System 0	Qarha		-		-									-	1 415 100	- Additional required storage was proposed to meet the 2035 water needs requirements
	Hnaïder		-		-									-		
	Al-Kneissé		-	10.00	800 000									800 000		- Proposed pumping station
System 1	Mouanse		-		-					1.00	350 000			350 000	371 000	**Served population in System 1 (in 2035): 1577** -Proposed pumping station
	Bsatine		-											-		**Served population in System 2 (in 2035): 11990**
	Wata el Sahle		-			1 000	200 000							200 000		- Proposed distribution network for Sahle
System 2	Mrah el Khokh		-											-	1 091 800	- Additional required storage was proposed to meet the 2035 water needs requirements
	Qenia		-											-		
	Sahle		-	6.00	480 000					1.00	350 000			830 000		- Proposed pumping station
System 3	Akroum		-							1.00	350 000			350 000	371 000	**Served population in System 3 (in 2035): 10258** - Proposed pumping station
System 4	Andeket		-		-					1.00	350 000			350 000	371 000	**Served population in System 4 (in 2035): 4725** - Proposed pumping station
System 5	Qatlabeh		-		-									-	-	
	Aaouainat		-	10.00	800 000	50	50 000							850 000		**Served population in System 6 and 7 (in 2035):17408**
	Khalsa		-		-									-		'- Proposed distribution networks for: Aouainat, Khirbet Er Remmane, El Barde, Al Moghrak
	Khirbet Er Remmane		-	10.00	800 000									800 000		- Additional required storage was proposed to meet the 2035 water needs requirements
System 6	Mazraet-El-Nahrieh	3.50	315 000		-	1 200	210 000							525 000	5 803 500	- Renovation OF the transmission lines in Mazraet El Nahrieh
	El-Bardé		-	10.00	800 000									800 000		- Proposed distribution networks for: El Koubayet
	Al Moghrak		-	10.00	800 000									800 000		
	El-Koubayet		-	15.00	1 200 000	5 000	500 000							1 700 000		
System 8	Aaidamoun	2.00	180 000		-	1 000	200 000	1.00	500 000	1.00	350 000			1 230 000	1 303 800	**Served population in System 8 (in 2035): 5139** - Proposed pumping station 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
System 9	Chadra	2.00	180 000	20.00	1 600 000	250 + 350	185 000	1.00	500 000	1.00	350 000			2 815 000	2 983 900	**Served population in System 9 (in 2035): 8099** - Proposed distribution networks for: Chadra - Proposed pumping station 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
System 10	Machta Hammoud	6.00	540 000	35.00	2 800 000	2500 + 500	395 000	3.00	1 500 000	2.00	700 000			5 935 000	6 291 100	**Served population in System 10 (in 2035): 15928** - Proposed distribution networks for: Machta Hammoud - Additional required storage was proposed to meet the 2035 water needs requirements - Proposed pumping stations 3 wells with a flow of 10 l/s are proposed to cover the deficit with 6 km proposed lift lines
System 11	Sindianet Zeidan	4.00	360 000	10.00	800 000			2.00	1 000 000					2 160 000	2 289 600	**Served population in System 11 (in 2035): 7154** - Proposed distribution networks for: Sindianet Zeidan - Additional required storage was proposed to meet the 2035 water needs requirements 2 wells with a flow of 10 l/s are proposed to cover the deficit with 4 km proposed lift lines

Appendix NL-W.H : Water North Lebanon - Qobayate

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 13	Freidice		-	10.00	800 000									800 000	4 155 200	**Served population in System 13 (in 2035): 5548** - Proposed distribution networks for: Freidice, Daouce et Baghdadi, Denke et El-Amriyeh - Additional required storage was proposed to meet the 2035 water needs requirements 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
	Daoucé et Baghdadi	2.00	180 000	10.00	800 000	1 000	200 000	1.00	500 000					1 680 000		
	El-Kousseir		-		-	500	120 000							120 000		
	Denké et El-Amriyeh		-	15.00	1 200 000	500	120 000							1 320 000		
System 14	Chikhlar		-	10.00	800 000	350	100 000							900 000	1 802 000	**Served population in System 14 (in 2035): 2252** - Based on the water balance in summer for system 14, a deficit occurs since 2020. 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km of proposed lift lines - Proposed distribution networks for: chikhlar, rmah - Additional required storage was proposed to meet the 2035 water needs requirements
	Rmah		-	10.00	800 000									800 000		
System 15	Mounjez		-		-									-	-	
System 16	Kfarnoune		-	10.00	800 000	1 000	200 000							1 000 000	1 060 000	**Served population in System 16 (in 2035): 607** - Proposed distribution network for Kfarnoune - Additional required storage was proposed to meet the 2035 water needs requirements - Based on the water balance in summer for Kfarnoune, a deficit occurs since 2020.
System 17	El-Kouachra	2.00	180 000		-	5 000	500 000	1.00	500 000					1 180 000	1 250 800	**Served population in System 17 (in 2035): 6074** - Based on the water balance in summer for El kouachra system, a deficit occurs since 2020. 1 well with a flow of 15 l/s is proposed to cover the deficit with 2 km proposed lift lines for the proposed well - Additional required storage was proposed to meet the 2035 water needs requirements
System 18	Dabbabiyé Charkié	2.00	180 000	10.00	800 000			1.00	500 000					1 480 000	2 840 800	**Served population in System 18 (in 2035): 4476** -Proposed distribution networks for: Dabbabiye Charkie and Noura El Faouka et Tahta 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
	Noura El-Faouka et Tahta		-	15.00	1 200 000									1 200 000		
System 19	Kachlak		-		-									-	720 800	**Served population in System 19 (in 2035): 4882** - Based on the water balance in summer for system 19, a deficit occurs since 2020. 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed of lift lines.
	Omar el-Beikate	2.00	180 000		-			1.00	500 000					680 000		
	Wadi el-Haour		-		-									-		
System 20	Al-Mouzeihmé		-		-									-	848 000	**Served population in System 20 (in 2035): 5053** - Additional required storage was proposed to meet the 2035 water needs requirements 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
	Haytla		-		-									-		
	El-Tleil	2.00	180 000		-	500	120 000	1.00	500 000					800 000		
	Saïdnaya		-		-									-		
System 21	Janine		-		-									-	784 400	**Served population in System 21 (in 2035): 1309** 1 well with a flow of 10 l/s is proposed to cover the deficit with 2 km proposed lift line
	Aarme		-		-									-		
	Srar	2.00	180 000		-	100	60 000	1.00	500 000					740 000		
System 22	El-Msallé		-		-	100	60 000							60 000	6 381 200	**Served population in System 22 (in 2035): 11173** - Based on the water balance in summer for System 22, a deficit occurs since 2020. 3 wells each with a flow of 10 l/s are proposed to cover the deficit with 6 km proposed lift lines for the proposed wells - Proposed distribution networks for: Ain El Zeit, Ain Tanta, Charbila, Douair Adouiye - Additional required storage was proposed to meet the 2035 water needs requirements
	Aïn El-Zeit	2.00	180 000	11.00	880 000	500	120 000	1.00	500 000					1 680 000		
	Kafr		-											-		
	Charbila		-	10.00	800 000	250	85 000							885 000		
	Aïn Tanta	2.00	180 000	11.00	880 000	300	90 000	1.00	500 000					1 650 000		
	Al-Rihanié	2.00	180 000		-	250	85 000	1.00	500 000					765 000		
	Douair Adouiyé		-	10.00	800 000	500	120 000							920 000		
	Hmais		-		-	100	60 000							60 000		

Appendix NL-W.H : Water North Lebanon - Qobayate

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
System 23, 24 and 12	Kherbet Daoud	5.00	450 000	10.00	800 000	1 000	200 000	1.00	500 000					1 950 000	16 196 800	**Served population in System 23 (in 2035): 47275** - Based on the water balance in summer for System 23, a deficit occurs since 2020. 6 wells each with a flow of 30 l/s are proposed to cover the deficit with 15 km proposed lift lines for the proposed wells -Proposed distribution networks for: Kherbet Daoud, Fseikine et Ain Achma, El Daghle, Kherbet Char, Majdel, Barbara, Deir Janine, El Hed - Additional required storage was proposed to meet the 2035 water needs requirements - Renovation in the transmission lines in Kherbet Daoud - Proposed distribution networks for: El Bire - Based on the water balance in summer for El Bire system, a deficit occurs since 2020. 2 wells with a flow of 25 l/s each are proposed to cover the deficit - Proposed distribution networks for: Kfar Harra - Additional required storage was proposed to meet the 2035 water needs requirements - Renovation of the transmission lines in Kfar Harra
	Sfinet Ed-Draib													-		
	Fseikine et Aïn Achma		-	10.00	800 000	200	80 000							880 000		
	El-Daghlé		-	10.00	800 000	200	80 000							880 000		
	Kherbet Char		-	10.00	800 000	400	105 000							905 000		
	Majdel	4.00	360 000	10.00	800 000	5000 + 300	590 000	2.00	1 000 000					2 750 000		
	Barbara		-	10.00	800 000	400	105 000							905 000		
	Deir-Janine		-	10.00	800 000									800 000		
	Knissé		-		-									-		
	Mazraat Baldé	2.00	180 000		-			1.00	500 000					680 000		
	El-Hed		-	10.00	800 000									800 000		
	Al-Souaissé	4.00	360 000		-	100	60 000	2.00	1 000 000					1 420 000		
	El-Biré	4.00	360 000	10.00	800 000			2.00	1 000 000					2 160 000		
	Kfar Harra	3.00	270 000	10.00	800 000	200	80 000							1 150 000		
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**57.50**	**$ 5 175 000**	**368.00**	**$ 29 440 000**	**35**	**$ 5 265 000**	**24.00**	**$ 12 000 000**	**9.00**	**$ 3 150 000**	**-**	**$ -**	**$ 55 030 000**	**$ 73 331 800**	

Appendix BQ-W.A : Water Beqaa Lebanon - Baalbeck

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
Laboue	Laboue	34.50	3 287 280	115.00	5 175 000	1	80 000							8 542 280	9 054 817	**- Served population for Labboue system (in 2020): 69472**
Ouyoun Orgosh	Ouyoun Orgosh	5.75	460 000	55.00	1 768 630	6	380 000	2.00	200 000			Rehabilitation of 26 Existing Reservoirs	1 085 000	3 893 630	4 127 248	**- Served population for Ouyoun Orgosh system (in 2020): 42195** - Qarha Well Need Rehabilitation and to be putted in service - Kneisseh Well to be equipped.
Younine, Maqne & Nahle	Younine, Maqne & Nahle	20.25	2 459 860	25.00	1 125 000	1	200 000	1.00	400 000					4 184 860	4 435 952	**- Served population for Younine, Maqne and Nahle system (in 2020): 32211**
Yammouneh	Yammouneh	7.25	568 490	65.00	2 411 455	1	120 000	4.00	950 000			Rehabilitation of 24 Existing Reservoirs+ Rehabilition of Networks	1 967 464	6 017 409	6 378 454	**- Served population for Yammouneh system (in 2020): 64244** - 3 wells to be equipped and one new well to be executed.
Yahfoufa-Ain Sikkeh	Yahfoufa-Ain Sikkeh	6.40	1 702 690	4.00	180 000	2	140 000			1.00	500 000			2 522 690	2 674 051	**- Served population for Yahfoufa-Ain Sikkeh system (in 2020): 2485 persons** - No existing network
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**74.15**	**$ 8 478 320**	**264.00**	**$ 10 660 085**	**11**	**$ 920 000**	**7.00**	**$ 1 550 000**	**1.00**	**$ 500 000**	**-**	**$ 3 052 464**	**$ 25 160 869**	**$ 41 670 521**	
Priority 2																
Aarsal	Aarsal	16.00	1 607 650	50.00	2 250 000			15.00	6 250 000					10 107 650	10 714 109	**- Served population for Aarsal system (in 2020): 49420**
Ouyoun Orgosh Village	Ouyoun Orgosh Village											Rehabilitation of 1 Existing Reservoir	45 000	45 000	47 700	**- Served population for Ouyoun Orgosh village system (in 2020): 500**
Yammouneh Village	Yammouneh Village	0.50	33 500	1.00	45 000			1.00	300 000					378 500	401 210	**- Served population for Yammouneh village system (in 2020): 4450**
Halbata - El Kharayeb	Halbata - El Kharayeb	3.00	201 000	6.75	303 750									504 750	535 035	**- Served population for Halbata - El Kharayeb system (in 2020): 2675**
Fekha & Jdaide	Fekha & Jdaide	4.00	572 000	8.50	382 500			4.00	1 800 000					2 754 500	2 919 770	**- Served population for Fekha & Jdaide system (in 2020): 17452**
Baalbeck, Aamechki & Ain Bourday	Baalbeck, Aamechki & Ain Bourday							3.00	1 500 000					1 500 000	1 590 000	**- Served population for Baalbeck, Aamechki & Ain Bourday system (in 2020): 96810**
Separate Systems	Separate Systems	3.25	129 150	20.00	900 000							Rehabilitation of 13 Existing Reservoirs	1 140 000	2 169 150	2 299 299	**- Served population for Miscellaneous Separate System (in 2020): 146888**
Total Priority 2		**26.75**	**$ 2 543 300**	**86.25**	**$ 3 881 250**	**-**	**$ -**	**23.00**	**$ 9 850 000**	**-**	**$ -**	**-**	**$ 1 185 000**	**$ 17 459 550**	**$ 18 507 123**	

Appendix BQ-W.B : Water Beqaa Lebanon - Hermel

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
Hermel Upper, Ras El Mal & Ain Zarqa Spring	Hermel Upper, Ras El Mal & Ain Zarqa Spring	10.00	1 828 300	71.00	4 385 440	5	885 000	3.00	159 600	1.00	1 000 000	-Ras El Mal Spring rehabilitation -Rehabilitaion of existing networks inside hermel -Rehabilitation of existing reservoirs (3*2000m3)	1 285 000	9 543 340	9 829 640	**- Served population for Hermel Upper, Ras El Mal & Ain Zarqa Spring system (in 2020): 56625** - PS (Q=32l/s; TDH=380m) - 5 Reservoirs (3*1500+2*500)
Ain El Haour Spring	Ain El Haour Spring	22.50	1 670 400	40.00	1 586 540	4	320 000			1.00	700 000			4 276 940	4 405 248	**- Served population for Ain el Haour spring system (in 2020): 8245** - PS (Q=33l/s; TDH=250m) - 4 reservoirs (2*100+1*200+1*500)
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**32.50**	**$ 3 498 700**	**111.00**	**$ 5 971 980**	**9**	**$ 1 205 000**	**3.00**	**$ 159 600**	**2.00**	**$ 1 700 000**	**-**	**$ 1 285 000**	**$ 13 820 280**	**$ 29 234 888**	
Priority 2																
Naanaah-El Kharbe & El Wardeh Springs	Naanaah-El Kharbe & El Wardeh Springs	14.50	931 000	13.00	507 500	4	240 000							1 678 500	1 728 855	**- Served population for Naanaah-El Kharbe & El Wardeh Springs system (in 2020): 3055** - 4 Reservoirs (4*100)
Beit Et Tochem + El Charqe+Mazraat Chelman	Beit Et Tochem + El Charqe+Mazraat Chelman	1.00	67 000	9.00	397 500	1	70 000	1.00	200 000					734 500	756 535	**- Served population for Beit Et Tochem + El Charqe+Mazraat Chelman system (in 2020): 1137** - 1 Reservoir (1*150) - No existing network
Ouadi En Naira - Ouadi Bnit-Zouetini, Wadi El karem & Kaeb Wadi El Karem	Ouadi En Naira - Ouadi Bnit-Zouetini, Wadi El karem & Kaeb Wadi El Karem	4.50	301 500	12.00	539 793	2	170 000					-Ouadi En Naira Existing Well: equipment and construction of control room in Ouadi En Naira. -Zoueitini Existing Well Pumping Station: rehabilitation and development	500 000	1 511 293	1 556 632	**- Served population for Ouadi En Naira - Ouadi Bnit-Zouetini, Wadi El karem & Kaeb Wadi El Karem system (in 2020): 1949** - 2 Reservoirs (1*200+1*300)
Ouadi Faara - Mrah El Aaqbet	Ouadi Faara - Mrah El Aaqbet			8.00	334 900									334 900	344 947	**- Served population for Ouadi Faara - Mrah El Aaqbet system (in 2020): 102** - No existing network
Maabour Spring	Maabour Spring	21.00	1 434 225	5.20	204 875	1	60 000							1 699 100	1 750 073	**- Served population for Maabour Spring system (in 2020): 2882** - 1 Reservoir (1*100)
Lezabbe Spring	Lezabbe Spring	15.50	1 066 295			1	90 000			1.00	365 000			1 521 295	1 566 934	**- Served population for Lezabbe Spring system (in 2020): 4158** - PS (Q=17l/s; TDH=170m) - 1 Reservoir (1*300)
Total Priority 2		**56.50**	**$ 3 800 020**	**47.20**	**$ 1 984 568**	**9**	**$ 630 000**	**1.00**	**$ 200 000**	**1.00**	**$ 365 000**	**-**	**$ 500 000**	**$ 7 479 588**	**$ 7 703 976**	
Priority 3																
Kouakh	Kouakh											-Rehabilitation of Existing Well Pumping Station	250 000	250 000	257 500	**- Served population for Kouakh system (in 2020): 1550**
Kouakh & Fissane	Kouakh & Fissane											-Construction of Pumping Station for Existing Well	500 000	500 000	515 000	**- Served population for Kouakh & Fissane system (in 2020): 2357**
El Qasr	El Qasr							1.00	250 000					250 000	257 500	**- Served population for El Qasr system (in 2020): 9849** - Additional well is needed, there is an existing operational system
Marjahin	Marjahin											-Rehabilitation of Marjahine Pumping Station	500 000	500 000	515 000	- Agricultural area (PS intended to be used for irrigation) - It can be used to irrigate Charbine region
Total Priority 3		**-**	**$ -**	**-**	**$ -**	**-**	**$ -**	**1.00**	**$ 250 000**	**-**	**$ -**	**-**	**$ 1 250 000**	**$ 1 500 000**	**$ 1 545 000**	

Appendix BQ-W.C : Water Beqaa Lebanon - West Beqaa, Zahleh and Rachaiya

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
Chamsine system	Es Salamieh					100m3	60 000							60 000	63 600	**Served population in Chamsine system (in 2035): 212888** - Since the total capacities of the existing reservoirs in the villages (Dalhamiye and Terbol) are not sufficient to cover the future demands, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on the future water needs taking into consideration the existing reservoirs' capacities. - Already designed reservoirs in Es Salamieh and Dalhamiyeh are proposed as well as a new reservoir for Terbol. - A new distribution network is proposed with 1.3 km new transmission lines for Dalhamiye
	Dalhamiye	1 300.00	104 000	17 285.00	1 382 800	300m³	90 000							1 576 800	1 671 408	
	Terbol					1000 m³	200 000							200 000	212 000	
Ain Zarka - Jabal el Arabi system	Tannoura					500 m³	120 000							120 000	127 200	**Served population in Ain Zarka system (in 2035): 178305** - Since the total capacities of the existing reservoirs in the village (Tannoura) are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. - Ain Zarka distribution networks are already designed. - Ain Zarka pumping station was designed to feed all the region. However, the operation of this pumping station remains a big issue for the concerned authorities. Therefore, additional wells are proposed as another alternative to cover Ain Zarka system needs. - Scenario 1 : Supplying water from Ain Zarka spring - Scenario 2 : Machghara well , Dahr El Ahmar well, Rafid well, Beit Lahia well and Sohmor well are proposed to cover the deficit that occurs in this system (along with 2 km proposed transmission lines).
	Beit Lahia	2 000.00	160 000					1.00	500 000					660 000	699 600	
Ain Zarka - Machghara system	Machghara	2 000.00	160 000					1.00	500 000					660 000	699 600	
Ain Zarka - Baaloul system	Sohmor	2 000.00	160 000					1.00	500 000					660 000	699 600	
Deir El Achayer system	Deir El Achayer	2 000.00	160 000					1.00	500 000					660 000	699 600	**Served population in Deir El Achayer system (in 2035): 2055** - Based on the water balance, a deficit occurs since 2020 (-112 m³/d deficit in 2020). One well is proposed to cover the deficit with 2 km proposed transmission lines for the proposed well.
Ryak system	Ryak	6 000.00	480 000					3.00	1 500 000					1 980 000	2 098 800	**Served population in Ryak system (in 2035): 32282** - Based on the water balance, a deficit occurs since 2020 (-1999m³/d deficit in 2020). Three wells with are proposed to cover the deficit with 6 km proposed transmission lines for the proposed wells.
Ablah system	Ablah	2 000.00	160 000					1.00	500 000					660 000	699 600	**Served population in Ablah system (in 2035): 14670** - Based on the water balance, a deficit occurs since 2020 (-1101 m³/d deficit in 2020). One well is proposed to cover the deficit with 2 km proposed transmission lines for the proposed well.
Ain Ata system	Ain Ata			20 700.00	1 656 000									1 656 000	1 755 360	**Served population in Ain Ata system (in 2035): 4695** New water distribution pipelines are proposed for Ain Ata village
Fourzol system	Fourzol	2 000.00	160 000					1.00	500 000					660 000	699 600	**Served population in Fourzol system (in 2035): 15858** - Based on the water balance, a deficit occurs since 2020 (-1279 m³/d deficit in 2020). One well is proposed to cover the deficit with 2 km proposed transmission lines for the proposed well.
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**19 300.00**	**$ 1 544 000**	**37 985.00**	**$ 3 038 800**	**-**	**$ 470 000**	**9.00**	**$ 4 500 000**	**-**	**$ -**	**-**	**$ -**	**$ 9 552 800**	**$ 25 125 968**	

Appendix BQ-W.C : Water Beqaa Lebanon - West Beqaa, Zahleh and Rachaiya

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 2																
Ain Zarka - Machghara system	Ain El Tineh			4 500.00	360 000									360 000	381 600	
	Maidoun			9 000.00	720 000									720 000	763 200	- Since the total capacities of the existing reservoirs in the village (Qaraaoun) are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. - Extensions of the distribution network are proposed in order to cover all regions (in Ain El Tine, Maisoun, Lebbeya, Qaraoun, Qelia, Sohmor, Yohmor, Zelleya)
Ain Zarka - Baaloul system	Lebbeya			4 500.00	360 000									360 000	381 600	
	Qaraoun			3 000.00	240 000	500 m³	120 000							360 000	381 600	
	Qelia			6 500.00	520 000									520 000	551 200	
	Sohmor			20 000.00	1 600 000									1 600 000	1 696 000	
	Yohmor			7 500.00	600 000									600 000	636 000	
	Zelleya			3 000.00	240 000									240 000	254 400	
Ain Zarka - Jabal el Arabi system	Bireh			5 000.00	400 000									400 000	424 000	
	Aazzi			16 000.00	1 280 000	500m³	120 000							1 400 000	1 484 000	- Proposed new reservoir in Azzi Ain Zarka distribution networks are already designed.
	Dahr El Ahmar	2 000.00	160 000	16 000.00	1 280 000			1.00	500 000					1 940 000	2 056 400	
	Er Rafid	2 000.00	160 000	19 000.00	1 520 000			1.00	500 000					2 180 000	2 310 800	- Ain Zarka pumping station was designed to feed all the region. However, the operation of this pumping station remains a big issue for the concerned authorities. Therefore, additional wells are proposed as another alternative to cover Ain Zarka system needs. - Scenario 1 : Supplying water from Ain Zarka spring - Scenario 2 : Machghara well , Dahr El Ahmar well, Rafid well, Beit Lahia well and Sohmor well are proposed to cover the deficit that occurs in this system (along with 2 km proposed transmission lines).
	Kfardenis			25 000.00	2 000 000									2 000 000	2 120 000	
	Kherbet Rouha			35 000.00	2 800 000									2 800 000	2 968 000	
	Mdoukha			20 000.00	1 600 000									1 600 000	1 696 000	
	Mhaydtheh			29 000.00	2 320 000									2 320 000	2 459 200	
	Ain Arab			4 000.00	320 000									320 000	339 200	
	Kfarmechki			1 500.00	120 000									120 000	127 200	Extension of the existing water network is needed to cover Kfarmechki village
Bab Mareh System	Bab Mareh			1 000.00	80 000	100m³	60 000							140 000	148 400	**Served population in Bab Mareh system (in 2035): 785** - Extension of the existing water network in Bab Mareh is needed. - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities.
Chamsine system	Aita El Fokhar			1 000.00	80 000									80 000	84 800	Extension of the existing water network is needed to cover Aita El Fokhar village
Niha system	Niha			11 500.00	920 000									920 000	975 200	**Served population in Niha system (in 2035): 3572** Replacement of the water distribution network in Niha village is proposed.
Kfarqouq system	Kfarqouq			1 000.00	80 000									80 000	84 800	**Served population in Kfarqouq system (in 2035): 4695** Extension of the existing water network is needed to cover Kfarqouq village
Yanta system	Yanta			500.00	40 000	300 m³	90 000							130 000	137 800	**Served population in Yanta system (in 2035): 4695** - Extension of the existing water network is needed to cover Yanta village - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. (One proposed reservoir for Yanta)
Bouareij system	Bouareij					500 m³	120 000							120 000	127 200	**Served population in Bouareij system (in 2035): 10504** - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. (One proposed reservoir for Bouareij)

Appendix BQ-W.C : Water Beqaa Lebanon - West Beqaa, Zahleh and Rachaiya

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Fourzol system	Fourzol					1000 m³	200 000							200 000	212 000	**Served population in Fourzol system (in 2035): 15858** - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. (One proposed reservoir for Fourzol)
Ablah system	Ablah	3 000.00	240 000			500m³	120 000							360 000	381 600	**Served population in Ablah system (in 2035): 14670** - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. (One proposed reservoir for Ablah with 3 km of transmission lines)
Jdita system	Saadnayel	2 000.00	160 000			1000 m³	200 000							360 000	381 600	**Served population in Jdita system (in 2035): 92841** - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the future demands, new reservoir is proposed for more water storage. The proposed reservoir capacity was calculated based on the future water needs taking into consideration the existing reservoirs' capacities. (One proposed reservoir for Saadnayel and Taalabaya with 4 km of transmission lines and one proposed reservoir for Taanayel)
	Taalabaya	2 000.00	160 000			1000 m³	200 000							360 000	381 600	
	Taanayel					100m³	100 000							100 000	106 000	
Total Priority 2		**11 000.00**	**$ 880 000**	**243 500.00**	**$ 19 480 000**	**-**	**$ 1 330 000**	**2.00**	**$ 1 000 000**	**-**	**$ -**	**-**	**$ -**	**$ 22 690 000**	**$ 24 051 400**	

Appendix SL-W.A : Water South Lebanon - Nabatiye

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Nabatiye Main Water Sources, Regional Reservoirs and Transmission Lines	Construction of Aalman pumping system	6 300 000	**Nabatiye System** - The served population of Nabatiye system entirely in 2020 is 353107 . - The water needs of Nabatiye system entirely in 2020 are: 71709 m3/d. - The served population of Nabatiye system entirely in 2035 is 476645. - The water needs of Nabatiye system entirely are: 75949 m3/d while the major resources available (excluding public localities wells) are 53088 m3/d resulting in a deficit of 22861 m3/d. That explains the need for the following works : - New pumping station in Aalman to cover the projected deficit in water demand. - New pumping station in Ghalle to cover the projected deficit in water demand. - 5 new regional reservoirs (Arnoun Yohmor regional reservoir, Kfar Tibnit regional reservoir, Northern regional reservoir Middle regional reservoir and Southern regional reservoir) in addition to other local reservoirs in designated localities. - Construction of all gravity and pumping lines from proposed regional reservoirs to existing and/or proposed reservoirs. - Rehabilitiation and upgrade of 5 pumping stations which are: Aalman-Zawtar El Charqiye P.S., Fakhr El Din P.S., Nabaa el Tasse P.S., Kfar Roummane P.S. and El Rejem P.S.) in order to cover the increasing demand.
	Rehabilitation and upgrading of Aalman Zawtar Eh Charqiye pumping system	500 000	
	Rehabilitation and upgrading of Nabaa El Tasse pumping system	900 000	
	Rehabilitation and upgrading of Fakhr El Din water system	2 400 000	
	Rehabilitation and upgrading of El Rejem water system	1 100 000	
	Rehabilitation and upgrading of Kfar Roummane pumping system	800 000	
	Construction of a new WTP at Yohmor	13 000 000	
	New transmission line from Taybe intake to Yohmor new WTP	3 000 000	
	Construction of the Arnoun Yohmor regional reservoir at Yohmor.	200 000	
	Construction of the gravity line connecting yohmor Reg. Res. and WTP with localities reservoirs of Yohmor and Arnoun	200 000	
	Construction of the gravity line connecting yohmor Reg. Res. and WTP with nabatieh reservoirs and Aadchit reg. Res.	1 600 000	
	Construction of Galle water system	8 900 000	
	Construction of the regional reservoir at Kfar Tibnit Regional reservoir	1 000 000	
	Construction of the gravity line connecting the regional reservoir of Nabatiye-Kfartibnit to the regional reservoirs, the locality reservoir of and to the localities reservoirs of Choukine, Maifadoun and Qaaqaiet Ej Jisr	5 700 000	
	Construction of gravity lines to supply the localities reservoirs of the Nabatiye Kfar Tibnit sub-system (Kfar Tibnit, Nabatiye El Faouqa and Nabatiye El Tahta) from Nabatiye Kfar Tibnit regional reservoir	800 000	
	Construction of the winter gravity conveyor line to supply Zahrani and Nabatiye areas during the winter period	11 100 000	
Nabatiye Water Supply system	Expansion and upgrade of water supply networks in the Caza of Nabatiye including 20 reservoirs and 320km of pipelines	14 400 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 86 900 000**	
Priority 2			
Nabatiye Main Water Sources, Regional Reservoirs and Transmission Lines	Construction of the Northern regional reservoir at Jarjouaa	500 000	
	Construction of gravity lines to supply the localities reservoirs of the Northern sub-system (Aarab Salim, Deir El Zahrani, Habbouch, Jarjouaa, Kfar Roummane and Kfaroue) from the Northern reservoir	1 600 000	
	Construction of the Middle regional reservoir at Zebdine (Jabal Al Ahmar)	300 000	
	Construction of gravity lines to supply the localities reservoirs of the Middle sub-system (Aabba, Harouf, Jibchit, Choukine, and Maifadoun) from the Middle regional reservoir	2 000 000	
	Construction of the Southern regional reservoir at Aadchit Kfar Dajjal	400 000	
	Construction of gravity lines to supply the localities reservoirs of the Southern sub-system (Aadchit, Braiqaa, El Qsaibe, Kfar Sir, Qaaqaiet Ej Jisr and Sir El Gharbiye) from the Southern regional reservoir	3 100 000	
Total Priority 2		**$ 7 900 000**	

Appendix SL-W.B : Water South Lebanon - Jezzine

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Jezzine Main Water Sources, Regional Reservoirs and Transmission Lines	Ain Toghra proposed reservoir (adjacent to the existing): The proposed scheme consists of pumping 1 MCM of the Bisri Dam water (after being treated at Bisri) up to Ain Toghra proposed reservoir (adjacent to the existing) 3000 m3	300 000	**Ain Toghra system:** - The served population of Ain Toghra system in 2020 is 18013 . - The water needs of Ain Toghra system in 2020 are: 3242 m3/d. - The served population of Ain Toghra system in 2035 is 24315. - The water needs of Ain Toghra system in 2035 are: 5106 m3/d. - The sources available in Ain Toghra system are not enough to cover the demand projected for 2035. That explains the need to pump a specific volume from the Bisri Dam water (post-treatment) to the following localities: Ain Toghra, Sfaray, Qtale. Followingly, to accomodate this future water supply, the existing storage capacity must be upgraded through the construction of Ain Toghra proposed reservoir (3000m3), Sfaray regional reservoir (3500m3) and Qtale regional reservoir (12,000m3) & treatment plant (with all necessary transmission lines).
	Sfaray regional reservoir : to be located in the outskirts of Sfaray , will be supplied from the Bisri Dam during summer; in winter from any available resources from Jezzine Division 3500 m3	350 000	
	Bisri – Qtale pumping transmission line with Qtale Regional reservoir and treatment plant: 350 mm transmission pumping line from bisri dam to Qtale village, a raw water treatment plant. And the construction of a 12,000m3 regional reservoir to treat and store the water from the dam.	7 450 000	
	Qtale – Kfar Falous Gravity Transmission Line (Lot 2): 400mm gravity transmission pipeline from Qtale regional reservoir to Kfar Falous sub regional reservoir	3 000 000	
	Utilization, Capture, Protection and Regulation of Major Springs: Ain Qobays, Aazibe Faouqa and Ain Zarka	1 250 000	
Jezzine Water Supply system	Expansion and upgrade of water supply networks in the Caza of Jezzine, including construction of 8 reservoirs and 75km of pipelines.	4 200 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 31 550 000**	

Appendix SL-W.C : Water South Lebanon - Sour

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Sour Main Water Sources, Regional Reservoirs and Transmission Lines	Rehabilitation of Ras El Ain Treatment plant and pumping station	7 500 000	**Sour System:** - The served population of Sour system entirely in 2020 is 639703 . - The water needs of Sour system entirely in 2020 are: 129909 m3/d while the major resources available (including public localities wells) are 121186 m3/d resulting in a deficit of 8723 m3/d. - The served population of Sour system entirely in 2035 is 863511. - The water needs of Sour system entirely in 2035 are: 166168 m3/d while the major resources available (including public localities wells) are 121186 m3/d resulting in a deficit of 44982 m3/d. That explains the need for the following works: - Rehabilitation of 8 pumping stations which are: Ras El Ain P.S. (and treatment plant), Ouadi Jilo P.S. 1, Ech Chehabiye P.S., Kafra P.S., Saddiqine P.S., Batoulay P.S., Ouadi Jilo P.S. 2 and El Bass P.S. (and treatment plant) in order to cover the increasing demand. - Construction of 4 lift lines which are: Ouadi Jilo PS1 - Chehabiye lift line, Batoulay - Saddiqine lift line, Borj Ech Chemali lift line to the regional reservoir and Ech Chehabiye - Kfar Dounine lift line in order to meet the projected needs. - Construction of gravity lines from from Kfar Dounine regional reservoir to locality reservoirs in order to meet the projected needs. - Construction of gravity lines from from Maaroub regional reservoir to locality reservoirs in order to meet the projected needs. - Construction of 2 new pump stations which are: Borj Ech Chemali P.S. and Ramya P.S. (with all necessary lift and gravity lines). - Construction of Haddatha regional reservoir of 3000 m3 capacity to cover the increasing storage demand.
	Rehabilitation of Ouadi Jilou PS1 pumping station	6 000 000	
	Construction of Ouadi Jilou PS1 - Chhabiye Lift line	1 200 000	
	Rehabilitation of Ech Chhabiye Pumping station	1 350 000	
	Rehabilitation of Kafra Pumping station	900 000	
	Rehabilitation of Siddiquin Pumping station	1 500 000	
	Rehabilitation of Batoulay Pumping station	3 500 000	
	Rehabilitation of Ouadi Jilou PS2 Pumping station	2 500 000	
	Construction of Batoulay - Siddiquin Lift line	1 800 000	
	Construction of Borj El chmali Pumping station and Lift Line to Regional Reservoir	1 200 000	
	Construction of Ech Chhabiye - Kfardounin Lift Line	500 000	
	Construction of gravity Lines from Kfardounin regional to the localities reservoirs	3 000 000	
	Construction of gravity lines from Maaroub regional reservoir to the localities reservoirs	2 500 000	
	Rehabilitation of El Bass pumping station and treatment plant	4 000 000	
	Construction of Haddetha Regional Reservoir 3000 m3	320 000	
	Construction of Ramya Pumping station, lift lines and gravity lines	2 500 000	
Sour Water Supply system	Expansion and upgrade of water supply networks in the Caza of Sour, including construction of 30 reservoirs and 350km of pipelines.	21 575 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 76 845 000**	

Appendix SL-W.D : Water South Lebanon - Zahrani

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Zahrani Main Water Sources, Regional Reservoirs and Transmission Lines	Construction of El Brak pumping system (Wells, E&M, Civil works)	3 100 000	**Coastal Sub-system:** - The served population of the Coastal Sub-system in 2020 is 72684. - The water needs of the Coastal Sub-system in 2020 are: 14762 m3/d - The served population of the Coastal Sub-system in 2035 is 98113. - The water needs of the Coastal Sub-system in 2035 are: 18880 m3/d - The existing storage in the Coastal Sub-system is only restricted to local reservoirs in each designated locality. - The capacity of the existing reservoirs is not enough to cover the future demand of the village. - The sources available in the Coastal Sub-system (Teffahta wells & other public wells) are not enough to cover the demand projected for 2035. - No regional reservoir exists in the sub-system, therefore it is proposed to construct a regional reservoir in Ghassaniye of capacity 7500m3 by the year 2050. - El Brak locality suffers from a large deficit in water supply, therefore 3 wells will be drilled alongside a pump station (Brak P.S.). - Ghazie locality suffers from a large deficit in water supply, and although its cadastral limit falls within Saida Caza, a lift line from El Brak P.S. will be constructed to supply Ghazie regional reservoir at a rate of 100 l/s.
	Construction of the lift line from El Brak to Ghassaniye regional reservoir (Civil, and accessories).	4 500 000	
	Construction of the regional reservoir at Ghassaniyeh	700 000	
	Construction of the gravity line connecting the regional reservoir of Ghassaniyeh with the existing pipe	700 000	
	Construction of the lift line from El Brak to Ghazie regional reservoir.	2 000 000	
	Rehabilitation and upgrade of Teffahta pumping system (Wells, E&M, Civil works).	900 000	**Middle Sub-system:** - The served population of the Middle Sub-system in 2020 is 34498. - The water needs of the Middle Sub-system in 2020 are: 7006 m3/d - The served population of the Middle Sub-system in 2035 is 46567. - The water needs of the Middle Sub-system in 2035 are: 8961 m3/d - The sources available in the Middle Sub-system (Teffahta wells & other public wells) are not enough to cover the demand projected for 2035, therefore Teffahta P.S. must be rehabilitated in order to cover the projected needs/deficit. - The capacity of the existing reservoirs is not enough to cover the future demand of the village, therefore the storage capacity of Teffahta regional reservoir must be upgraded.
	Construction of gravity lines to supply the localities reservoirs of the middle sub-system (Kaoutariet Es Siyad, Khartoum) from Ech Charqiye regional reservoir	400 000	
	Construction of gravity lines to connect the existing pipes between Zefta and El Merouaniye.	200 000	**Northern and Eastern Sub-system:** - The served population of the Northern and Eastern Sub-systems in 2020 is 75757. - The water needs of the Northern and Eastern Sub-systems in 2020 are: 15386 m3/d - The served population of the Northern and Eastern Sub-systems in 2035 is 102261. - The water needs of the Northern and Eastern Sub-systems in 2035 are:19678 m3/d - The sources available in the Northern and Eastern Sub-systems (Teffahta wells & other public wells) are not enough to cover the demand projected for 2035, therefore Teffahta P.S. must be rehabilitated in order to cover the projected needs/deficit. - The capacity of the existing reservoirs is not enough to cover the future demand of the village, therefore the storage capacity of Ech Charqiyeh regional reservoir must be upgraded.
	Construction of the gravity line to supply the regional reservoir of Ez Zrariyeh from Ech Charqiyeh (constructing of about 8000m to connect the regional reservoir of Ez Zrariye with the existing line at Insar)	2 300 000	**Southern Sub-system:** - The served population of the Southern Sub-system in 2020 is 33445. - The water needs of the Southern Sub-system in 2020 are: 6792 m3/d - The served population of the Southern Sub-system in 2035 is 45146. - The water needs of the Southern Sub-system in 2035 are: 8688m3/d - The capacity of the existing reservoirs is not enough to cover the future demand of the village, therefore the storage capacity of Ez Zrariye regional reservoir must be upgraded. - In order to cover the projected water demand/deficit, Arzai P.S. will be constructed alongside 2 wells.
	Construction of gravity lines to supply the localities reservoirs of the southern sub-system from Ez Zrariyeh regional reservoir	2 100 000	
	Construction of Arzai pumping system (2 wells, and pump sets to Ez Zrariye) along with adloun P.S. and the lift lines from Arzai to Adloun to El Ghassaniye	12 300 000	
	Construction of the lift line from Arzai P.S. to Ez Zrariye regional reservoir.	2 100 000	
Zahrani Water Supply system	Expansion and upgrade of water supply networks in the Caza of Zahrani, including construction 15 reservoirs and 150 km of pipelines.	7 200 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 53 500 000**	
Priority 2			
Zahrani Main Water Sources, Regional Reservoirs and Transmission Lines	Upgrade the storage capacity of Ech Charqiyeh regional reservoir.	400 000	
	Upgrade the storage capacity of Teffahta regional reservoir.	300 000	
	Upgrade of the regional reservoir at Ez Zrarie	2 100 000	
	Replacement of the gravity line to supply the regional reservoir in Ez Zrariyeh from Ech Charqiyeh	1 900 000	
Total Priority 2		**$ 4 700 000**	

Appendix SL-W.E : Water South Lebanon - Saida

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Saida Main Water Sources, Regional Reservoirs and Transmission Lines	Transmission Twin Pipeline From Nabaa El Tasse to Houmine El Fawka: Twin 450mm pipelines conveying water from Nabaa El Tasse to Houmine El Fawka bifurcation.	4 000 000	**Nabaa El Tasse Sub-system:** - The served population of Houmine El Faouqa locality in 2020 is 4256. - The water needs of Houmine El Faouqa in 2020 are: 766 m3/d - The served population of Houmine El Faouqa in 2035 is 5745. - The water needs of Houmine El Faouqa in 2035 are 1207m3/d while the sources available are 149 m3/d resulting in a deficit of 1057m3/d. That explains the need to install a 100mm branch from the twin 450mm connection of Nabaa el Tasse and therefore expand the existing storage capacity of Houmine El Faouqa by 2000m3 (two reservoirs of 1000m3 each).
	Houmine El Fawka Reservoir and Pipeline: A 100 mm branch from the twin 450mm connection	90 000	
	Houmine El Fawka Reservoir and Pipeline: A reservoir composed of two compartments to be implemented. The capacity of each compartment is 1,000 m3.	600 000	
	Sarba Sub Regional Reservoir and Pipeline: A 300 mm pipeline from the twin 450mm connection, until the proposed reservoir.	575 000	- The served population of **Sarba locality** in 2020 is 2301. - The water needs of Sarba in 2020 are: 414 m3/d - The served population of Sarba in 2035 is 3106. - The water needs of Sarba in 2035 are 652m3/d while the sources available are 149 m3/d resulting in a deficit of 503m3/d. That explains the need to install a 300 mm pipeline from the twin 450mm connection of Nabaa El Tasse and therefore expand the existing storage capacity of Sarba by 5000m3 (two reservoirs of 2500m3 each).
	Sarba Sub Regional Reservoir and Pipeline: A reservoir composed of two compartments to be implemented. The capacity of each compartment is 2,500 m3.	1 200 000	
	Kfar Melki Sub Regional Reservoir and Pipeline: A 400 mm pipeline from the twin 450mm connection (Houmine El Fawka bifurcation), until the bifurcation to Kfar Melki.	2 200 000	**Kfar Melki system:** - The served population of Kfar Melki locality in 2020 is 4774. - The water needs of Kfar Melki in 2020 are: 859 m3/d - The served population of Kfar Melki in 2035 is 6444. - The water needs of Kfar Melki in 2035 are 1353m3/d while the sources available are 2421m3/d resulting in a surplus of 1068m3/d. That explains the need to expand the existing storage capacity by constructing a sub-regional reservoir of 2000m3 capacity (two compartments of 1000m3 each) as well as all necessary transmission lines from this P.S.
	Kfar Melki Sub Regional Reservoir and Pipeline: A 250 mm pipeline from the bifurcation till the proposed sub regional reservoir.	135 000	
	Kfar Melki Sub Regional Reservoir and Pipeline: A reservoir composed of two compartments to be implemented. The capacity of each compartment is 1,000 m3.	600 000	
	Small Retention Dam Ein Bou Younes – Kfar Melki	2 500 000	
	Barti Reservoir and Pipeline: A 400 mm pipeline from the Kfar Melki bifurcation to Barti bifurcation.	1 250 000	**Barti system:** - The served population of Barti locality in 2020 is 1415. - The water needs of Barti and Sfenta localities in 2020 are: 260 m3/d - The served population of Barti locality in 2035 is 1910. - The water needs of Barti and Sfenta localities in 2035 are 409m3/d while the sources available are 890m3/d resulting in a surplus of 481m3/d. That explains the need to expand the existing storage capacity by constructing reservoir of 450m3 capacity (with all necessary transmission lines from this P.S.).
	Barti Reservoir and Pipeline: A 100 mm pipeline from Barti bifurcation until the proposed reservoir 450 m3.	135 000	
	Pipeline to Kfar Falous Sub Regional Reservoir from Barti Bifurcation: A 400 mm pipeline from Barti bifurcation to Kfar Falous Sub Regional reservoir.	1 550 000	**Kfar Falous system:** - The served population of Kfar Falous locality in 2020 is 224. - The water needs of Kfar Falous, Ouadi El-Laymoun and Mharbiye localities in 2020 are: 210 m3/d - The served population of Kfar Falous locality in 2035 is 303. - The water needs of Kfar Falous, Ouadi El-Laymoun and Mharbiye localities in 2035 are 331m3/d while the sources available are 1281m3/d resulting in a surplus of 950m3/d. That explains the need to expand the existing storage capacity by constructing Kfar falous sub-regional reservoir (with all necessary transmission lines).
	Construction of Kfar Falous sub-regional reservoir	500 000	
	Inspection and Rehabilitation of Serail 1 Well	150 000	**Fouar-Serail system:** - Existing Serail 1 well in poor condition. - Existing Faouar 5 and Faouar 6 wells in poor condition. - Existing Faouar Water Treatment plant in poor condition.
	Inspection and Rehabilitation of Faouar 5 and Faouar 6 Wells	300 000	
	Rehabilitation/upgrading of existing Faouar Water Treatment Plant	1 500 000	
	Investigation of Potential Seawater Intrusion – Serail Pumping Station and Faouar Pumping Stations	3 500 000	
	Inspection, Rehabilitation, and Testing of Saidoun 1 Well.	150 000	**Majdelyoun and Saidoun wells:** - Existing Saidoun 1 well in poor condition.
	Anane – Lebaa Rehabilitation/Upgrade of Existing Irrigation and Domestic System	415 000	- Existing **Anane–Lebaa** Irrigation and Domestic System in poor condition. The system must be upgraded to meet the projected/increasing needs.
	Utilization, Capture, Protection and Regulation of Major Springs: Kfaroue	150 000	
	Utilization Capture Protection and Regulation of Oum Chemmas Spring	150 000	
Saida Water Supply system	Expansion and upgrade of water supply networks in the Caza of Saida, including construction of 34 reservoirs and 145km of pipelines.	9 720 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 46 370 000**	

Appendix SL-W.F : Water South Lebanon - Bint Jbeil

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Bint Jbeil Main Water Sources, Regional Reservoirs and Transmission Lines	Rehabilitation of Taybeh water treatment plant and pumping station & Reservoir	5 400 000	- The served population of the Taybeh system in 2020 is 77810 . - The water needs of the Taybeh system in 2020 are: 15801 m3/d - The served population of the Taybeh system in 2035 is 105032. - The water needs of the Taybeh system in 2035 are: 20212 m3/d while the sources available are 10368 m3/d resulting in a deficit of 9844 m3/d. That explains the need to install a new Taybeh pumping station next to the intake location (with all necessary transmission lines) and therefore expand the existing storage capacity of Taybe system by 300 m3 (one regional reservoir in Baraachit with all necessary lines). - Existing Taybeh water treatment plant and pumping station & reservoir in poor condition.
	Taybeh intake rehabilitation wokrs	1 250 000	
	Taybe new pumping station next at the intake location	5 800 000	
	New transmission line from Taybe intake to the Taybe existing water treatment plants	2 000 000	
	Regional Reservoir at Baraachit village (3000 m3)	320 000	
	transmission lines from Baraachit regional reservoir to locality's reservoirs	1 600 000	
	Regional Reservoir at Markaba village (3000 m3)	320 000	**Markaba PS system:** - The capacity of the existing reservoirs is not enough to cover the future demand of the village, therefore the need to construct a new regional reservoir in Markaba village of 3000m3 capacity. - Existing Markaba pumping station in poor condition.
	Rehabilitation of Markaba pumping station	1 350 000	
	Rehabilitation of Slouki Pumping station	300 000	- Existing **Slouki** pumping station in poor condition.
	Rehabilitation of Chaqra pumping station	200 000	- Existing **Chaqra** pumping station in poor condition.
	Rehabilitation of Saf El Hawa pumping station	1 400 000	- Existing **Saf el Hawa** pumping station in poor condition.
	Transmission pipeline from Kafra pumping station to Bnt Jbeil Saf el hawa	2 250 000	
Bint Jbeil Water Supply system	Expansion and upgrade of water supply networks in the Caza of Bnt Jbeil, including construction of 32 reservoirs and 400 km of pipelines.	23 735 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 60 925 000**	

Appendix SL-W.G : Water South Lebanon - Marjaayoun and Hasbaya

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Marjaayoun and Hasbaya Main Water Sources, Regional Reservoirs and Transmission Lines	Rehabilitation of Hebbariye pumping station	1 600 000	- Existing Hebbariye pumping station in poor condition.
	Rehabilitation of Ain Jarfa pumping station	450 000	- Existing Ain Jarfa pumping station in poor condition.
	Rehabilitation of Hasbani pumping station	850 000	- Existing Hasbani pumping station in poor condition.
	Rehabilitation of Ebl Saqui pumping station	500 000	- Existing Ebl Saqui pumping station in poor condition.
	Rehabilitation of Marj El Khoukh pumping station	500 000	- Existing Marj El Khoukh pumping station in poor condition.
	Rehabilitation of Mayssat pumping station	1 350 000	- Existing Mayssat pumping station in poor condition.
	Wazzani new pumping station, Masonry intake wall and TL	2 500 000	- In order to cover the projected water demand, a new pumping station must be built in Wazzani.
	Regional Reservoir at Mayssat/or Adaisseh (30,000 m3)	3 250 000	- The capacity of the existing reservoirs is not enough to cover the future demand of the village, therefore the need to construct a new regional reservoir of 30,000 m3 capacity.
	Treatment Facilities at Mayssat	12 000 000	
	New well for Halta system with 3 km transmission lines	809 840	In order to cover the projected water demand, a new well with its transmission lines is proposed
	New Well's Field & PS	2 000 000	
	Chebaa Wells And pumping station (3 Wells)	2 500 000	- In order to cover the projected water demand, a new pumping station must be built in Chebaa alongside 3 wells.
Marjaayoun and Hasbaya Water Supply system	Expansion and upgrade of water supply networks in the Caza of Marjaayoun & Hasbaya, including construction of 9 reservoirs and 285 km of pipelines.	12 120 000	
For all villages in the System	Remote Control And Monitoring Of Water Systems (SCADA And DMA)	15 000 000	
Total Priority 1		**$ 55 429 840**	

Appendix BML-W.A : Water Beirut Mount Lebanon - Beirut

System	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1															
All Beirut City Water Systems	21.00	50 000 000											50 000 000	51 500 000	- All Beirut City Water Systems is only a transmission system for the 2 regional reservoirs “Borj Abi Haidar and Tallet El Khayat” & “ Achrafiyeh Lower and Upper”. - Construction of a Transmission Line between Janneh Dam and Dbayeh Water Treatment Plant to provide additional water supply from Janneh dam to Beirut area. -Design already achieved.
Tallet El Khayat and Borj Abi Haidar Networks System	3.00	2 215 500	46.00	5 485 800	2 rehabilitation	1 100 000			2 rehabilitation	1 200 000	-9000 Service Connections -120000 Water meters	17 580 000	27 581 300	28 408 739	**- Served population for Tallet El Khayat and Borj Abi Haidar Networks System (in 2020): 414223** - Remove all connections on transmission lines and replace old distribution lines (before year 1960) - Revise distribution networks subdivisions. Design review is needed. - Install HC and related Water meters - Rehabilitation of Reservoirs and Pumping stations is currently under study
Achrafieh Lower and Upper Networks System			20.00	2 549 800	2 rehabilitation	750 000			2 rehabilitation	600 000			3 899 800	4 016 794	**- Served population for Achrafiyeh Lower and Upper Networks System (in 2020): 219003** - Replace old distribution lines (before year 1960) - Revise distribution networks subdivisions Design review is needed. - Reservoirs and Pumping stations need rehabilitation
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)													15 000 000	
Total Priority 1	**24.00**	**$ 52 215 500**	**66.00**	**$ 8 035 600**	**4**	**$ 1 850 000**	**-**	**$ -**	**4**	**$ 1 800 000**	**-**	**$ 17 580 000**	**$ 81 481 100**	**$ 98 925 533**	
Priority 2															
Tallet El Khayat and Borj Abi Haidar Networks System	18.00	15 751 000	85.00	7 884 200	2 rehabilitation	350 000			1 rehabilitation	350 000			24 335 200	25 065 256	- Replacement of old transmission and distribution piplines (before 1980). - Ensure supplying Tallet El Khayyat Reservoirs by Gravity from Naameh Sup reservoir, rather than by pumping directly from Damour and Naameh Boreholes.
Achrafieh Lower and Upper Networks System	9.00	7 794 000	20.00	1 561 500									9 355 500	9 636 165	- Replacement of old transmission and distribution piplines (before 1980)
Total Priority 2	**27.00**	**$ 23 545 000**	**105.00**	**$ 9 445 700**	**2**	**$ 350 000**	**-**	**$ -**	**1**	**$ 350 000**	**-**	**$ -**	**$ 33 690 700**	**$ 34 701 421**	

Appendix BML-W.B : Water Beirut Mount Lebanon - Jbeil

System	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1															
Afqa Spring Lower Region + Coastal Area System	18.50	1 855 010	139.75	7 598 685	23	3 270 000			1.00	1 800 000	1.00	5 000 000	19 523 695	20 109 406	**- Served population for Afqa Spring Lower Region + Coastal Area System (in 2020): 142730** - Jbeil City Reservoir (1*3000), Dhour Adonis (1*5000) to be excuted in a later stage. - Dhour Adonis Regional Reservoir (1*6000) is considered under tendering by EBML (1000m3); it remains 5000m3 (to be tendered and executed). - Well Equipment of Fatre +PS + WTP (800m3/d) - Janneh Dam PS & WTP (6000m3/d)
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)													15 000 000	
Total Priority 1	**18.50**	**$ 1 855 010**	**139.75**	**$ 7 598 685**	**23**	**$ 3 270 000**	**-**	**$ -**	**1**	**$ 1 800 000**	**1.00**	**$ 5 000 000**	**$ 19 523 695**	**$ 35 109 406**	
Priority 2															
El Aaqoura Region	4.25	390 800	15.75	681 940	2	200 000			1	400 000			1 672 740	1 722 922	**- Served population for El Aaqoura System (in 2020): 4497** - 1 PS (Q=2.50l/s; TDH=250m) - 2 Reservoirs (1*200+1*500)
El Mejdel Region	12.50	957 320	46.75	1 997 710	2	180 000							3 135 030	3 229 081	**- Served population for El Mejdel System (in 2020): 2905** - 1 Reservoir (1*100) to be excuted in a later stage for yanouh. - El Mejdel Reservoir (1*500) is considered under tendering by EBML.
Afqa Region	3.25	217 750	9.75	411 280	1	60 000			1	380 000			1 069 030	1 101 101	**- Served population for Afqa System (in 2020): 747** - 1 PS (Q=1.25l/s; TDH=180m) - 1 Reservoir (1*100)
El Ghabet and Lassa Region	6.50	565 700	40.75	1 845 370	2	210 000			2	450 000			3 071 070	3 163 202	**- Served population for El Ghabet and Lassa System (in 2020): 5268** - 1 PS (Q=2.50l/s; TDH=100m) - 1 BS (Q=0.9l/s; TDH=60m) - 2 Reservoirs (1*300+1*500)
Qartaba-Aouaini Region	23.75	2 338 050	167.75	8 157 440	9	720 000	3	700 000	5	3 121 500			15 036 990	15 488 100	**- Served population for Qartaba-Aouaini System (in 2020): 39460** - Lehfed Well (11l/s; d= 505m); price include PS Civil works, reservoir, lift lines, and EM works - Mechmech Well (15l/s; d= 500m); price include PS Civil works, reservoir, lift lines, and EM works - Ehmej Well (5l/s; d=550m) - Jaj PS (1.39l/s; H= 119m)
El Kharbe-Qatra-and Afqa Spring	5.50	493 550	32.75	1 454 200	7	810 000							2 757 750	2 840 483	**- Served population for El Kharbe-Qatra and Afqa System (in 2020): 19071**
El Moukhada System	8.25	652 500	3.00	105 000	2	240 000			1	300 000			1 297 500	1 336 425	- Moukhada PS (5.56l/s; H= 200m)
Total Priority 2	**64.00**	**$ 5 615 670**	**316.50**	**$ 14 652 940**	**25**	**$ 2 420 000**	**3**	**$ 700 000**	**10**	**$ 4 651 500**	**-**	**$ -**	**$ 28 040 110**	**$ 28 881 313**	

Appendix BML-W.C : Water Beirut Mount Lebanon - Baabda and Aley

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
Bmaryam	Btekhnay					250 m3	85 000							85 000	90 100	**- Served population in Bmaryam system (in 2020): 48,473** - The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Deir El Harf			6.00	480 000									480 000	508 800	- Existing network in poor condition
	El-Dleibe			2.50	200 000									200 000	212 000	- Existing network in poor condition
	El-Erbaniyeh			3.50	280 000	150 m3	70 000							350 000	371 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities -Existing network in poor condition
	El-Kalaa			12.85	1 028 000									1 028 000	1 089 680	- Existing network in poor condition
	El-Kraye			4.10	328 000									328 000	347 680	- Existing network in poor condition
	Haret Hamze			5.90	472 000	150 m3	70 000							542 000	574 520	-The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities -Existing network in poor condition
	Jouret Arsoune			1.63	130 400									130 400	138 224	- Existing network in poor condition
	Ktale			5.85	468 000									468 000	496 080	- Existing network in poor condition
Daychounieh	Daychounieh											Rehabilitation of Daychouniyeh WTP,Treatment for Galery Semaan Well,Rehabilitation Of Jamhour Pumping Station	2 500 000	2 500 000	2 650 000	**- Served population in Daychounieh system (in 2020): 393,461** - These projects are necessary to ensure the supply of clean water
	Hadath(Lower)											Artificial Recharge of Hadath-Hazmieh Underground Water Basin	3 000 000	3 000 000	3 180 000	
Local Systems	Bedghane			14.00	1 120 000									1 120 000	1 187 200	**- Served population in local systems (in 2020): 76,961** - Existing network in poor condition
	Bsaba			21.50	1 720 000									1 720 000	1 823 200	- Existing network in poor condition
	Chbaniyeh							1.00	882 000					882 000	934 920	- The village suffers from a water deficit in 2020. The deficit will reach around 960 m3/d in 2035. Therefore, 1 well is needed to cover this deficit
	Deir Khouna			0.40	32 000									32 000	33 920	- Existing network in poor condition
	Deir-Koubel			13.30	1 064 000									1 064 000	1 127 840	- Existing network in poor condition
	El Chmeice			1.10	88 000									88 000	93 280	- Existing network in poor condition
	El-Khalouat			1.50	120 000									120 000	127 200	- Existing network in poor condition
	Hammana					1500 m3	215 000							215 000	227 900	-The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Mazraet-el-Mzeiraa			2.40	192 000									192 000	203 520	- Existing network in poor condition
	Mecherfeh			12.80	1 024 000									1 024 000	1 085 440	- Existing network in poor condition
	Sawfar			24.90	1 992 000									1 992 000	2 111 520	- Existing network in poor condition
	Tarchiche			33.00	2 640 000									2 640 000	2 798 400	- Existing network in poor condition

Appendix BML-W.C : Water Beirut Mount Lebanon - Baabda and Aley

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Raayan	Abey			23.10	1 848 000									1 848 000	1 958 880	**- Served population in Raayan system (in 2020): 229,968** - Existing network in poor condition
	Aghmide			17.20	1 376 000									1 376 000	1 458 560	- Existing network in poor condition
	Ain Drafile			1.50	120 000	150 m3	70 000							190 000	201 400	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Existing network in poor condition
	Ain es Saideh					100 m3	60 000							60 000	63 600	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Ain Ksour			11.40	912 000	150 m3	70 000							982 000	1 040 920	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Existing network in poor condition
	Ainab			24.80	1 984 000									1 984 000	2 103 040	- Existing network in poor condition
	Aramoun			48.80	3 904 000									3 904 000	4 138 240	- Existing network in poor condition
	Baissour			47.60	3 808 000									3 808 000	4 036 480	- Existing network in poor condition
	Baouarta			21.40	1 712 000	200 m3	80 000							1 792 000	1 899 520	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Existing network in poor condition
	Bisrine			3.00	240 000									240 000	254 400	- Existing network in poor condition
	Bmakkine					150 m3	70 000							70 000	74 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Bsatine			10.00	800 000									800 000	848 000	- Existing network in poor condition
	Chanay			10.00	800 000	500 m3	120 000							920 000	975 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Existing network in poor condition
	El Halaliyeh			4.80	384 000									384 000	407 040	- Existing network in poor condition
	El-Azouniyeh			8.10	648 000									648 000	686 880	- Existing network in poor condition
	El-Bennaye			14.50	1 160 000									1 160 000	1 229 600	- Existing network in poor condition
	El-Ghaboun			6.50	520 000									520 000	551 200	- Existing network in poor condition
	El-Kamatiyeh					500 m3	120 000							120 000	127 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	El-Ramliyeh			19.90	1 592 000									1 592 000	1 687 520	- Existing network in poor condition
	Habramoun			1.70	136 000									136 000	144 160	- Existing network in poor condition
	Jisr El Qadi					100 m3	60 000							60 000	63 600	-The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Maasraiti			3.60	288 000									288 000	305 280	- Existing network in poor condition
	Majdel Baana			45.00	3 600 000									3 600 000	3 816 000	- Existing network in poor condition
	Mazraet el-Nahr			2.60	208 000									208 000	220 480	- Existing network in poor condition
	Roueissat el-Ballout			6.60	528 000									528 000	559 680	- Existing network in poor condition
	For Entire System	30	2 640 000											2 640 000	2 798 400	-Transmission lines are old and in poor condition
	Roueissat el-Naaman			10.30	824 000									824 000	873 440	- Existing network in poor condition
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**30.00**	**$ 2 640 000**	**509.63**	**$ 40 770 400**	**12**	**$ 1 090 000**	**1**	**$ 882 000**		**$ -**	**-**	**$ 5 500 000**	**$ 50 882 400**	**$ 68 935 344**	

Appendix BML-W.C : Water Beirut Mount Lebanon - Baabda and Aley

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 2																
	Bmariam			1.50	120 000									120 000	127 200	- Network extensions
	Falougha			1.50	120 000									120 000	127 200	- Network extensions
Bmaryam	Hasbaya El Meten					100 m3	60 000							60 000	63 600	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Jouar el Haouz			2.20	176 000									176 000	186 560	- Network extensions
	Kobbaï			2.70	216 000									216 000	228 960	- Network extensions
Ain El Delbe	Wadi Chahrour			1.50	120 000									120 000	127 200	- Network extensions
Daychounieh	Daychounieh	0.05	4 400					1.00	573 000					577 400	612 044	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Daychounieh	0.05	4 400					1.00	602 000					606 400	642 784	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Daychounieh	0.05	4 400					1.00	589 000					593 400	629 004	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Daychounieh	0.05	4 400					1.00	559 000					563 400	597 204	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Hadace	1.47	129 360					1.00	641 000					770 360	816 582	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Hadace	1.62	142 560					1.00	745 000					887 560	940 814	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Hadace	1.69	148 280					1.00	735 000					883 280	936 277	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Hadace	1.00	88 000					2.00	725 000					813 000	861 780	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
Local Systems	Ain Mouaffak			1.50	120 000									120 000	127 200	- Network extensions
	Charoun	6.00	468 000	1.80	120 000					1	260 000			848 000	898 880	- Network extensions - Lift line and pumping station for supply from Raayan system
	Kfarchima			1.50	120 000									120 000	127 200	- Network extensions
	Kfar Selwan	7.00	546 000							1	190 000			736 000	780 160	- Lift line and pumping station for supply from Bmariam system
	Qornayel					300 m3	90 000							90 000	95 400	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Tarchiche	7.00	469 000							1	150 000			619 000	656 140	- Lift line and pumping station for supply from Bmariam system
Raayan	Ain El-Halzoune			2.00	160 000									160 000	169 600	- Network extensions
	Ain-Dara			3.00	240 000							Catchment Works Of Ain El Saouda And Ain El Jawzeh Spring	1 000 000	1 240 000	1 314 400	- Network extensions - The catchment works of Ain El Souada and Ain El Jawzeh are necessary for additional water supply to Raayan system
	Aïn-El-Jdeidé			4.40	352 000									352 000	373 120	- Network extensions
	Aïn-Rommané			7.10	568 000									568 000	602 080	- Network extensions
	Aitate			8.80	704 000									704 000	746 240	- Network extensions
	Bkhichtay					400 m3	105 000							105 000	111 300	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Chartoun			1.50	120 000									120 000	127 200	- Network extensions
	El-Rejmeh			1.50	120 000									120 000	127 200	- Network extensions
	Mejdlaya					150 m3	70 000							70 000	74 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
Total Priority 2		**25.98**	**$ 2 008 800**	**42.50**	**$ 3 376 000**	**4**	**$ 325 000**	**9**	**$ 5 169 000**		**$ 600 000**	**-**	**$ 1 000 000**	**$ 12 478 800**	**$ 13 227 528**	

Appendix BML-W.C : Water Beirut Mount Lebanon - Baabda and Aley

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 3																
Local Systems	Arsoune			3.50	280 000									280 000	296 800	- Network extensions
	Bchamoune			46.00	3 680 000									3 680 000	3 900 800	- Network extensions
	Bleibel			6.85	548 000									548 000	580 880	- Network extensions
	Bsous			5.20	416 000									416 000	440 960	- Network extensions
	Charoun					300 m3	95 000							95 000	100 700	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Chbaniyeh			24.20	1 936 000									1 936 000	2 052 160	- Network extensions
	Kernayel			30.90	2 472 000									2 472 000	2 620 320	- Network extensions
	Mecherfeh					100 m3	60 000							60 000	63 600	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
Bmaryam	Btebiat			1.54	123 200									123 200	130 592	- Network extensions
	Btekhnay			10.10	808 000									808 000	856 480	- Network extensions
	El-Khreibe			4.50	360 000									360 000	381 600	- Network extensions
	El-Kneisse			1.59	127 200									127 200	134 832	- Network extensions
	El-Ksaibeh			2.40	192 000									192 000	203 520	- Network extensions
	Kartada			2.70	216 000									216 000	228 960	- Network extensions
	Ras el Meten			19.00	1 520 000									1 520 000	1 611 200	- Network extensions
	Ras-el-Harf			3.90	312 000									312 000	330 720	- Network extensions
	Salima			15.00	1 200 000									1 200 000	1 272 000	- Network extensions
	Zandouka			2.00	160 000									160 000	169 600	- Network extensions
	Bzebdine			10.50	840 000									840 000	890 400	- Network extensions
Daychounieh	Daychounieh	0.05	4 400					1.00	573 000					577 400	612 044	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Daychounieh	0.05	4 400					1.00	573 000					577 400	612 044	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
	Daychounieh	0.05	4 400					1.00	559 000					563 400	597 204	- Wells to account for the very large deficit in the system (around 50,000m3). These will be used in dry years and in case Al Awali project is postponed - Transmission line for well
Total Priority 3		**0.15**	**$ 13 200**	**189.88**	**$ 15 190 400**	**2**	**$ 155 000**	**3.00**	**$ 1 705 000**		**$ -**	**-**	**$ -**	**$ 17 063 600**	**$ 18 087 416**	

Appendix BML-W.D : Water Beirut Mount Lebanon - Keserwan

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
Al Moudiq	Djounie Ghadir			3.00	240 000									240 000	254 400	**- Served population in Al Moudiq system (in 2020): 237,123** -Extension of distribution network
	Haret Sakher			3.00	240 000							Rehabilitation of Ouadi Hantouche Pumping Station	50 000	290 000	307 400	- Extension of distribution network - Wadi Hantouche Pumping station in poor condition
	Kferyacine			3.00	240 000									240 000	254 400	- Extension of distribution network
	Safra	1.50	100 500			500 m3	120 000							220 500	233 730	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Transmission line from pumping station to new reservoir
	Djounie Sahel Alma			3.00	240 000									240 000	254 400	- Extension of distribution network
	Tabarja			3.00	240 000									240 000	254 400	- Extension of distribution network
	Wata Salam			3.00	240 000									240 000	254 400	- Extension of distribution network
	Zouk Mkael			3.00	240 000									240 000	254 400	- Extension of distribution network
Chabrouh-Assal	Ain El Delbe	3.00	201 000	6.10	488 000									689 000	730 340	- Served population in Chabrouh-Assal system (in 2020): 146,517 -Transmission lines from regional reservoirs to proposed reservoirs in Wata El Jaouz and Ain El Delbeh - Construction of a new distribution network because the existing network is in poor condition. Currently Wata El Jaouz and Ein El Delbeh are supplied with water by pumping directly into the network
	Boqaatet Achkout					300 m3	90 000							90 000	95 400	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Watta El Jaouz	3.00	201 000	26.00	2 080 000	500 m3	120 000							2 401 000	2 545 060	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Transmission lines from regional reservoirs to proposed reservoirs in Wata El Jaouz and Ain El Delbeh - Construction of a new distribution network because the existing network is in poor condition
Chabrouh-Ain El Delbe-Afqa	For Entire System	18.00	4 158 000											4 158 000	4 407 480	**- Served population in Chabrouh'- Ain El Delbeh'- Afqa system (in 2020): 39,929** - Replacement of Afqa spring transmission line because it is in a very poor condition. This source currently supplies the system with 8,000m3/d during winter. With this project, the flow will be increased to 10,000 m3/d
	For Entire System	55.00	4 840 000											4 840 000	5 130 400	- Replacement of transmission lines in the entire system because they are in very poor condition
	For Entire System	6.00	858 000											858 000	909 480	- Transmission line to convey an additional 4,000m3 of water to the system from Chabrouh dam to cover the water deficit. Currently only 6,000 m3/d are conveyed to this system from Chabrouh.
	Harhraya-El Qattine					500 m3	120 000							120 000	127 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**86.50**	**$ 10 358 500**	**53.10**	**$ 4 248 000**	**4**	**$ 450 000**	**-**	**$ -**		**$ -**	**-**	**$ 50 000**	**$ 15 106 500**	**$ 31 012 890**	

Appendix BML-W.D : Water Beirut Mount Lebanon - Keserwan

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 2																
Al Moudiq	Aaqaybe and Bqaq El Dine			21.20	1 696 000									1 696 000	1 797 760	- Construction of a new distribution network because the existing network is in poo condition
	Bouar			12.50	1 000 000									1 000 000	1 060 000	- Construction of a new distribution network because the existing network is in poo condition
Chabrouh-Assal	El-Kleiyate					1000 m3	200 000							200 000	212 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
Al Assal	Kfardebian			60.00	4 800 000									4 800 000	5 088 000	- Served population in Assal system (in 2020): 26,282 -Construction of a new distribution network because the existing network is in poor condition
	Bezhel			7.80	624 000	250 m3	85 000							709 000	751 540	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of a new distribution network because the existing network is in poor condition
	Eghbeh			8.00	640 000									640 000	678 400	- Construction of a new distribution network because The Existing network is in poo condition
	El Abri et Chouan			8.00	640 000									640 000	678 400	- Construction of a new distribution network because the existing network is in poo condition
	El Mouaisra			30.00	2 400 000	200 m3	80 000							2 480 000	2 628 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of a new distribution network because the existing network is in poor condition
Chabrouh-Ain El delbe-Afqa	Fatka			30.00	2 400 000	500 m3	120 000							2 520 000	2 671 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of a new distribution network because the existing network is in poor condition
	Ghodrace					200 m3	80 000							80 000	84 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Jouret Bedrane			10.00	800 000	Elevated reservoir	150 000							950 000	1 007 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of a new distribution network because the existing network is in poor condition
	Nahr Ed Dahab			13.00	1 040 000									1 040 000	1 102 400	- Construction of a new distribution network because the existing network is in poo condition
	Nammoura Et Kfar Jerif					200 m3	80 000							80 000	84 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
Total Priority 2		**-**	**$ -**	**200.50**	**$ 16 040 000**	**7**	**$ 795 000**	**-**	**$ -**		**$ -**	**-**	**$ -**	**$ 16 835 000**	**$ 17 845 100**	

Appendix BML-W.E : Water Beirut Mount Lebanon - Chouf

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
	For all the system villages	6.00	528 000					2	1 000 000					1 528 000	1 619 680	**- Served Population in Barouk-Kafra system (in 2020): 90554** - Based on the water balance in summer for Barouk-Kafra system, a deficit occurs since 2020 (-3000 m3/d deficit in 2020). Two wells each with a flow of 50 l/s are proposed downstream Barouk spring to cover the deficit with 6 km proposed lift lines for the proposed wells.
		8.00	704 000											704 000	746 240	- Replacement of 8 km of transmission lines that are in Asbestos Cement and more than 40 years old.
Barouk Kafra				360.00	28 800 000									28 800 000	30 528 000	- Most of the villages in Barouk-Kafra system have very old water distribution networks; or else no water distribution networks exist at all. Therefore, new water distribution networks are proposed for the following villages: Aïn Ouzaïn, Ammik, Baïkoun, Batloune, Bchatfine, Botmé, Brih et Mteilé, Deir Baba, Deir Couché, Douair Bsennaï, El-Barouk, El-Biré, El-Fouara, El-Freidice, El-Jdeidé, El-Kahlouniyeh, El-Kneissé, El-Moukhtara, El-Samkanieh, El-Werhaniyeh, Ghabet Jaafar, Kfar Fakoud, Kfar Haml, Kfar Katra, Kfar Nabrakh, Kfarhime, Maasser Beit Eddine, Sirjbal and Wadi Bnahley.
	For all the system villages	28.00	2 464 000											2 464 000	2 611 840	**- Served Population in el Qaa system (in 2020): 197319** - Replacement of 28 km of transmission lines that are in Asbestos Cement and more than 40 years old.
El Qaa				517.00	42 260 000									42 260 000	44 795 600	- Most of the villages in El Qaa system have very old water distribution networks; or else no water distribution networks exist at all. Therefore, new water distribution networks are proposed for: Almane, Anbal, Anoute, Atrine, Baakline, Baassir, Barja (rehabilitation of the existing network only), Beit Eddine, Benouaïti, Bkhchtaine, Bkifa, Bsaba, Chehime, Dalhoune, Daraya, Debbiyeh, Debbiyeh (Ain el Haour), Deir Mkhallesse, El-Berjaine, El-Bkaya, El-Jleiliyeh, El-Maaniyeh, El-Wardaniyeh, Gharifé, Hasroute, Jadra, Katermaya, Kherbet Bisri, Kraya, Mazboud, Mazraet El-Dahr, Mtoullé Bzina, Sebline, Wadi Abou Youssef and Zaarouriyeh.
												Rehabilitation of El Qaa spring Catchment	500 000	500 000	530 000	- The rehabilitation of el Qaa spring catchment is a must to reduce The leaks to The maximum.
Mristi	For all the system villages	1.00	88 000											88 000	93 280	**- Served Population in Mristi system (in 2020): 5300** - Replacement of 1 km of transmission lines that are in Asbestos Cement and more than 40 years old.
				23.00	1 840 000									1 840 000	1 950 400	- New water distribution networks are proposed for Baadrane and El Khreibe villages to replace the very old existing networks.
Raayan	For all the system villages within Chouf caza	13.00	1 144 000											1 144 000	1 212 640	- Raayan system includes different villages in Baabda, Aley and Chouf cazas: **The served population within Chouf caza only is around 9000 in 2020.** - Replacement of 13 km of transmission lines that are in Asbestos Cement and more than 40 years old.
				39.00	3 120 000									3 120 000	3 307 200	- New water distribution networks are proposed for Aïn Zhalta, Jdael Kfarhay and Kfar Matta (Klaliyé) villages to replace the very old existing networks.
Independent	For all the system villages	3.00	264 000											264 000	279 840	- Chouf caza contains a total of 15 local systems that are mainly supplied with water from local wells or springs: **The total population of these local systems is around 52000 in 2020**. - Replacement of 3 km of transmission lines that are in Asbestos Cement and more than 40 years old.
				167.00	13 360 000									13 360 000	14 161 600	- All these local independent villages have very old water distribution networks; or else no water distribution networks exist at all. Therefore, new water distribution networks are proposed for: Bater, Chemaarine, Dardourite, Dmite, El-Jahliyeh, Jebah, Maasser el-Chouf, Niha (extensions on the existing network), Mristé, Deir El-Kamar and Wadi El-Deir.
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**59.00**	**$ 5 192 000**	**1 106.00**	**$ 89 380 000**		**$ -**	**2**	**$ 1 000 000**		**$ -**	**-**	**$ 500 000**	**$ 96 072 000**	**$ 116 836 320**	

Appendix BML-W.E : Water Beirut Mount Lebanon - Chouf

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 2																
Barouk Kafra	Kfar Nabrakh					400 m3	105 000							105 000	111 300	- Since the total capacities of the existing reservoirs in the village are not sufficient to cover the peak of the future demands, new reservoirs are proposed for more water storage. The proposed reservoir capacity was calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacities.
El Qaa	Baakline					500 m3	120 000							120 000	127 200	- Since the total capacity of the existing reservoirs in these villages is not sufficient to cover the peak of the future demands of each village, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacitiess.
	Chehime					300 m3	90 000							90 000	95 400	- Since the total capacity of the existing reservoirs in these villages is not sufficient to cover the peak of the future demands of each village, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacitiess.
	Gharife					250 m3	85 000							85 000	90 100	- Since the total capacity of the existing reservoirs in these villages is not sufficient to cover the peak of the future demands of each village, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacitiess.
	Joun					450 m3	110 000							110 000	116 600	- Since the total capacity of the existing reservoirs in these villages is not sufficient to cover the peak of the future demands of each village, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacitiess.
	Katermaya					350 m3	100 000							100 000	106 000	- Since the total capacity of the existing reservoirs in these villages is not sufficient to cover the peak of the future demands of each village, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacitiess.
	Aanout					150 m3	70 000							70 000	74 200	- Since the total capacity of the existing reservoirs in these villages is not sufficient to cover the peak of the future demands of each village, new reservoirs are proposed for more water storage. The proposed reservoirs capacities were calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacitiess.
Independent	Mazraet El Chouf	6.00	528 000			150 m3	70 000	2	1 000 000					1 598 000	1 693 880	- Two wells are proposed to cover the deficit of the water balance that occurs in 2020 (around 1400 m3/d) , with 6 km proposed lift lines. - Since the total capacities of the existing reservoirs in the village are not sufficient to cover the peak of the future demands, new reservoirs are proposed for more water storage. The proposed reservoir capacity was calculated based on 30% of the future water needs taking into consideration the existing reservoirs' capacities.
	Dmit	3.00	264 000					1	500 000					764 000	809 840	- One well is proposed to cover the deficit of the water balance that occurs in 2020 (around 220 m3/d), with 3 km proposed lift lines.
	El Jahliyeh	3.00	264 000					1	500 000					764 000	809 840	- One well is proposed to cover the deficit of the water balance that occurs in 2020 (around 500 m3/d), with 3 km proposed lift lines.
	El Mouchhref	3.00	264 000					1	500 000					764 000	809 840	- One well is proposed to cover the deficit of the water balance that occurs in 2020 (around 250 m3/d), with 3 km proposed lift lines.
	Aammatour	3.00	264 000					1	500 000					764 000	809 840	- One well is proposed to cover the deficit of the water balance that occurs in 2020 (around 100 m3/d), with 3 km proposed lift lines.
Total Priority 2		**18.00**	**$ 1 584 000**	**-**	**$ -**	**8**	**$ 750 000**	**6**	**$ 3 000 000**		**$ -**	**-**	**$ -**	**$ 5 334 000**	**$ 5 654 040**	

Appendix BML-W.E : Water Beirut Mount Lebanon - Chouf

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 3																
El Qaa	For all the system villages	9.00	792 000					3.00	1 500 000					2 292 000	2 429 520	- Based on the water balance in summer for El Qaa system, a deficit will occur in 2035 (around 3500 m3/d deficit in 2035). Three wells are proposed to cover this future deficit along with 9 km of proposed lift lines for the new wells.
Damour Wells	For all the system villages	9.00	792 000					3.00	1 500 000					2 292 000	2 429 520	**- Served Population in Damour wells system (in 2020): 65944** - Based on the water balance in summer for Damour wells system, a deficit will occur in 2035 (around 1000 m3/d deficit in 2035). Three wells (each 350m depth) are proposed to cover this future deficit along with 9 km of proposed lift lines for the new wells.
Total Priority 3		**18.00**	**$ 1 584 000**	**-**	**$ -**		**$ -**	**6.00**	**$ 3 000 000**		**$ -**	**-**	**$ -**	**$ 4 584 000**	**$ 4 859 040**	

Appendix BML-W.F : Water Beirut Mount Lebanon - Meten

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 1																
	Ain Aalak			7.70	616 000									616 000	652 960	**- Served population in Upper Metn system (in 2020): 430,198**
	Ain Saadeh			29.10	2 328 000									2 328 000	2 467 680	- Construction of new distribution network because the existing network is in poor conditior
	Beit Merry			44.80	3 584 000									3 584 000	3 799 040	- Construction of new distribution network because the existing network is in poor conditior
	Boqaata											Water Treatment Plant, Transmission Lines And Reservoirs For Boqaata Dam	35 000 000	35 000 000	37 100 000	- Boqaata Dam still requires the construction of a WTP, transmission lines and reservoirs. Boqaata is expected to supply Upper Metn with around 38,000 m3/d.
	Dhour El Choueir					5000 m3	500 000							500 000	530 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
Upper Metn	For All Villages	30.00	2 640 000					10.00	5 000 000					7 640 000	8 098 400	- Drilling of 10 new wells to account for the water deficit in Upper Metn which currently reaches around 28,000 m3/d in the summer season - Transmission lines for proposed wells (average of 3km per well)
	For All Villages	20.00 (rehabilitation)	1 760 000											1 760 000	1 865 600	- Replacement of old transmission lines since they are in poor condition
	Mrouj					1500 m3	215 000							215 000	227 900	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Zekrit					1000 m3	200 000							200 000	212 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
For all Systems	Remote Control And Monitoring Of Water Systems (SCADA And DMA)														15 000 000	
Total Priority 1		**50.00**	**$ 4 400 000**	**81.60**	**$ 6 528 000**	**3**	**$ 915 000**	**10**	**$ 5 000 000**		**$ -**	**-**	**$ 35 000 000**	**$ 51 843 000**	**$ 69 953 580**	

Appendix BML-W.F : Water Beirut Mount Lebanon - Meten

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Priority 2																
Upper Metn	Abou Mizane			3.00	240 000									240 000	254 400	- Construction of new distribution network because the existing network is in poor condition
	Ain El Zeitoune			0.70	56 000									56 000	59 360	- Construction of new distribution network because the existing network is in poor condition
	Baabdat Et Sfaile					300 m3	90 000							90 000	95 400	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Beit Chebab					200 m3	80 000							80 000	84 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Beit Merry					2000 m3	230 000							230 000	243 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Bsalim			8.00	640 000	200 m3	80 000							720 000	763 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of new distribution network because the existing network is in poor condition
	Chaouié, Knaitré et Mar gergesse Bhurdok			3.20	256 000									256 000	271 360	- Construction of new distribution network because the existing network is in poor condition
	Chrine					200 m3	80 000							80 000	84 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Deir Chamra			9.80	784 000	200 m3	80 000							864 000	915 840	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of new distribution network because the existing network is in poor condition
	El Dechouniyeh			9.70	776 000									776 000	822 560	- Construction of new distribution network because the existing network is in poor condition
	El Freike					300 m3	90 000							90 000	95 400	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	El Khelle			0.90	72 000									72 000	76 320	- Construction of new distribution network because the existing network is in poor condition
	El Mtein			28.20	2 256 000									2 256 000	2 391 360	- Construction of new distribution network because the existing network is in poor condition
	Hemlaya					2000 m3	230 000							230 000	243 800	- Proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Kannabet Salima					300 m3	90 000							90 000	95 400	- Proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Mar Boutous Karm El Tine					500 m3	120 000							120 000	127 200	- Proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Mar Mikhael Bnabil			2.80	224 000									224 000	237 440	- Construction of new distribution network because the existing network is in poor condition
	Mchikha			3.40	272 000									272 000	288 320	- Construction of new distribution network because the existing network is in poor condition
	Sakiet El Misk Et Bhorsaf					500 m3	120 000							120 000	127 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Zabbougha					200 m3	80 000							80 000	84 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities

Appendix BML-W.F : Water Beirut Mount Lebanon - Meten

System	Village	Transmission Lines		Disrtibution networks		Reservoirs		Wells (Drilling, Casing, Testing and Equipping)		Pumping Stations		Others		Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Length (km)	Cost Estimate (USD)	Nb/capacity of reservoirs	Cost Estimate (USD)	Nb of wells	Cost Estimate (USD)	Nb of PS	Cost Estimate (USD)	Description	Cost Estimate (USD)	(USD)	(USD)	
Coastal Metn	Baouchariat					5000 m3	500 000							500 000	530 000	- Served population in Coastal Metn system (in 2020): 632,948 - The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Borge Hammoud			56.90	4 552 000	5000 m3	500 000							5 052 000	5 355 120	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of new distribution network because the existing network is in poor condition
	Dekouanet					3000 m3	300 000							300 000	318 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Deir Tamiche			5.00	400 000									400 000	424 000	- Construction of new distribution network because the existing network is in poor condition
	Jal El Dib			10.00	800 000	500 m3	120 000							920 000	975 200	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities '- Construction of new distribution network because the existing network is in poor condition
	Naccache					1000 m3	200 000							200 000	212 000	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Sin El Fil					2000 m3	230 000							230 000	243 800	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Wata Amaret Chalhoub			6.20	496 000	500 m3	120 000							616 000	652 960	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities
	Dbaye			21.70	1 736 000									1 736 000	1 840 160	- Construction of new distribution network because the existing network is in poor condition
	Haret El Belleni			6.00	480 000									480 000	508 800	- Construction of new distribution network because the existing network is in poor condition
	Mazraet Deir Aoukar			7.10	568 000									568 000	602 080	- Construction of new distribution network because the existing network is in poor condition
	Zouk-Khrab			22.00	1 760 000	1000 m3	200 000							1 960 000	2 077 600	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of new distribution network because the existing network is in poor condition
	Zalka			11.10	888 000	1500 m3	215 000							1 103 000	1 169 180	- The capacity of the existing reservoir is not enough to cover the peak of the future demand of the village. The proposed reservoir capacity was calculated based on 30% of the water needs and taking into consideration the existing reservoirs' capacities - Construction of new distribution network because the existing network is in poor condition
Total Priority 2		**-**	**$ -**	**215.70**	**$ 17 256 000**	**21**	**$ 3 755 000**		**$ -**		**$ -**	**-**	**$ -**	**$ 21 011 000**	**$ 22 271 660**	

Appendix NL-WW.A : Wastewater North Lebanon - Akkar

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Sahel 2	150.00	20 250 000				20 250 000	20 857 500	Proposed networks only
Sahel 3	380.00	51 300 000				51 300 000	52 839 000	Proposed networks only
Jebrayel	135.00	18 225 000	Activated Sludge	17 275	15 918 670	34 143 670	35 167 980	Proposed wastewater treatment plant and network
Total Priority 1	**665.00**	**$ 89 775 000**			**$ 15 918 670**	**$ 105 693 670**	**$ 108 864 480**	
Priority 2								
To Machta Hammoud WWTP	20.00	2 700 000				2 700 000	2 862 000	Proposed networks only
Aaouadi	40.17	5 422 950	Activated Sludge	8 880	12 643 787	18 066 737	19 150 741	Proposed wastewater treatment plant and network
Aaouinat	7.04	950 400	Wetland	410	859 794	1 810 194	1 918 806	Proposed wastewater treatment plant and network
Aarida	3.62	488 700	Trickling Filter	510	3 022 435	3 511 135	3 721 803	Proposed wastewater treatment plant and network
Ain Tanta	23.38	3 156 300	Trickling Filter	2 860	6 983 044	10 139 344	10 747 705	Proposed wastewater treatment plant and network
Akkar el atika 1	26.19	3 535 650	Trickling Filter	3 410	7 611 248	11 146 898	11 815 712	Proposed wastewater treatment plant and network
Akkar el atika 2	31.23	4 216 050	Trickling Filter	4 260	8 485 227	12 701 277	13 463 353	Proposed wastewater treatment plant and network
Akroum	4.19	565 650	Trickling Filter	1 020	4 217 853	4 783 503	5 070 513	Proposed wastewater treatment plant and network
Chane	0.84	113 400	Trickling Filter	1 080	4 353 179	4 466 579	4 734 574	Proposed wastewater treatment plant and network
Cheikh Zennad	2.31	311 850	Trickling Filter	1 360	4 865 544	5 177 394	5 488 037	Proposed wastewater treatment plant and network
Chiklar	3.20	432 000	Wetland	200	565 290	997 290	1 057 127	Proposed wastewater treatment plant and network
Chir Hmairine	29.22	3 944 700	Trickling Filter	5 850	9 897 999	13 842 699	14 673 261	Proposed wastewater treatment plant and network
Dabbabiye 1	1.14	153 900	Wetland	220	593 474	747 374	792 217	Proposed wastewater treatment plant and network
Dabbabiye 2	2.45	330 750	Wetland	220	593 474	924 224	979 678	Proposed wastewater treatment plant and network
Danbo	35.00	4 725 000	Trickling Filter	6 770	10 626 933	15 351 933	16 273 048	Proposed wastewater treatment plant and network
Darine	1.08	145 800	Wetland	440	896 442	1 042 242	1 104 777	Proposed wastewater treatment plant and network
El Barde	1.90	256 500	Wetland	100	372 769	629 269	667 025	Proposed wastewater treatment plant and network
El Majdal	4.28	577 800	Trickling Filter	1 150	4 484 212	5 062 012	5 365 733	Proposed wastewater treatment plant and network
Fraidis	4.12	556 200	Wetland	310	724 599	1 280 799	1 357 647	Proposed wastewater treatment plant and network
Habchit	10.72	1 447 200	Trickling Filter	580	3 222 445	4 669 645	4 949 824	Proposed wastewater treatment plant and network
Hekr ed Dahri	2.10	283 500	Trickling Filter	980	4 148 445	4 431 945	4 697 861	Proposed wastewater treatment plant and network
Hnaider	14.10	1 903 500	Trickling Filter	1 320	4 786 522	6 690 022	7 091 424	Proposed wastewater treatment plant and network
Houaich 1	7.34	990 900	Trickling Filter	660	3 420 270	4 411 170	4 675 840	Proposed wastewater treatment plant and network
Houaich 2	1.76	237 600	Wetland	400	846 919	1 084 519	1 149 590	Proposed wastewater treatment plant and network
Hrar	23.18	3 129 300	Trickling Filter	1 430	4 987 544	8 116 844	8 603 855	Proposed wastewater treatment plant and network
Karha	3.60	486 000	Trickling Filter	680	3 462 894	3 948 894	4 185 827	Proposed wastewater treatment plant and network
Kfar Noun	4.22	569 700	Wetland	410	859 794	1 429 494	1 515 264	Proposed wastewater treatment plant and network
Kfartoun 1	12.14	1 638 900	Trickling Filter	970	4 115 355	5 754 255	6 099 510	Proposed wastewater treatment plant and network
Kfartoun 2	10.33	1 394 550	Trickling Filter	970	4 115 355	5 509 905	5 840 499	Proposed wastewater treatment plant and network
Knaisseh Massoudiye	6.86	926 100	Trickling Filter	1 390	4 922 644	5 848 744	6 199 669	Proposed wastewater treatment plant and network

Appendix NL-WW.A : Wastewater North Lebanon - Akkar

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Mazraet El Nahriye 1	12.20	1 647 000	Trickling Filter	630	3 333 298	4 980 298	5 279 116	Proposed wastewater treatment plant and network
Mazraet El Nahriye 2	8.05	1 086 750	Wetland	370	815 483	1 902 233	2 016 367	Proposed wastewater treatment plant and network
Memneaa	13.19	1 780 650	Trickling Filter	580	3 198 164	4 978 814	5 277 543	Proposed wastewater treatment plant and network
Menjez	4.96	669 600	Wetland	510	984 654	1 654 254	1 753 510	Proposed wastewater treatment plant and network
Mouanse	4.22	569 700	Wetland	410	859 794	1 429 494	1 515 264	Proposed wastewater treatment plant and network
Mrah El Khaoukh	9.10	1 228 500	Trickling Filter	1 160	4 495 581	5 724 081	6 067 526	Proposed wastewater treatment plant and network
Noura el Tahta	5.00	675 000	Trickling Filter	580	3 208 980	3 883 980	4 117 018	Proposed wastewater treatment plant and network
Qatlabe	5.71	770 850	Wetland	340	769 539	1 540 389	1 632 813	Proposed wastewater treatment plant and network
Qochloq	1.85	249 750	Trickling Filter	580	3 198 164	3 447 914	3 654 789	Proposed wastewater treatment plant and network
Qraiyat	3.22	434 700	Trickling Filter	510	3 010 912	3 445 612	3 652 349	Proposed wastewater treatment plant and network
Rahbe	18.31	2 471 850	Trickling Filter	1 650	5 348 615	7 820 465	8 289 693	Proposed wastewater treatment plant and network
Sahle	11.14	1 503 900	Trickling Filter	530	3 084 999	4 588 899	4 864 233	Proposed wastewater treatment plant and network
Semmaqiye	3.66	494 100	Trickling Filter	970	4 125 725	4 619 825	4 897 015	Proposed wastewater treatment plant and network
Sindianet Zeidan	35.38	4 776 300	Trickling Filter	5 850	9 895 526	14 671 826	15 552 136	Proposed wastewater treatment plant and network
Srar	0.91	122 850	Wetland	30	191 770	314 620	333 497	Proposed wastewater treatment plant and network
Tall Bire	0.37	49 950	Trickling Filter	1 190	4 548 239	4 598 189	4 874 081	Proposed wastewater treatment plant and network
Total Priority 2	**474.98**	**$ 64 122 300**			**$ 171 754 936**	**$ 235 877 236**	**$ 250 029 871**	

Appendix NL-WW.B : Wastewater North Lebanon - Koura

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Ejdabrine	14.24	1 922 805	Trickling Filter	1 323	4798904.737	6 721 710	7 125 012	Proposed wastewater treatment plants and networks in Ejdabrine, Btaaboura and Kaftoune
Btaaboura	1.03	139 455	Wetland	191	544830.5411	684 286	725 343	
Kaftoune	73.45	9 915 480	Trickling Filter	3 266	7451923.101	17 367 403	18 409 447	
To Chekka WWTP	24.00	3 240 000				3 240 000	3 434 400	Proposed network only
Total Priority 1	**112.72**	**$ 15 217 740**			**$ 12 795 658**	**$ 28 013 398**	**$ 29 694 202**	

Appendix NL-WW.C : Wastewater North Lebanon - Minieh

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Behouaita	1.00	135 000	Wetland	116	402 933	537 933	570 209	
Bchernata	2.29	308 880	Wetland	132	435 696	744 576	789 250	
Karm El Moher	5.26	709 560	Wetland	360	799 465	1 509 025	1 599 566	
Izal	6.28	848 070	Trickling Filter	1 258	4 682 599	5 530 669	5 862 509	
Qattine	23.84	3 218 400	Activated Sludge	8 988	12 697 773	15 916 173	16 871 143	
Tarane	0.55	74 250	Trickling Filter	993	4 173 081	4 247 331	4 502 170	
Beit Zoud	0.60	81 000	Wetland	199	558 525	639 525	677 896	
Bakhaoun	50.30	6 790 770	Activated Sludge	24 492	17 962 324	24 753 094	26 238 280	
Haoura 2	0.69	92 610	Wetland	414	870 004	962 614	1 020 371	17 Wastewater treatment plants and networks are proposed
Qemmamine	2.02	272 970	Wetland	215	585 277	858 247	909 742	
Btoumaz 1	13.09	1 767 150	Trickling Filter	3 413	7 613 421	9 380 571	9 943 405	
Haoura 1	4.16	562 140	Trickling Filter	1 474	5 058 255	5 620 395	5 957 619	
Btoumaz 2	0.14	19 170	Trickling Filter	545	3 115 786	3 134 956	3 323 053	
Jairoun	1.01	136 080	Wetland	248	638 086	774 166	820 616	
Qarn	0.37	50 220	Wetland	80	321 815	372 035	394 357	
Azqey	0.42	56 700	Wetland	83	329 063	385 763	408 908	
Terbol	0.62	84 240	Wetland	72	301 941	386 181	409 352	
Total Priority 1	**112.65**	**$ 15 207 210**			**$ 60 546 044**	**$ 75 753 254**	**$ 80 298 449**	

Appendix NL-WW.D : Wastewater North Lebanon - Zgharta

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Kfar Sghabe	3.57	482 085	Trickling Filter	587	3230496.24	3 712 581	3 935 336	
Arbet Qozhaiya	5.28	712 800	Trickling Filter	672	3450414.9	4 163 215	4 413 008	Wastewater treatment plants and networks in Kfar Sghabe, Arbet Qozhaiya, El Buhaira and Asloute are proposed
El Buhaira	1.55	209 385	Wetland	317	740247.78	949 633	1 006 611	
Asloute	5.19	701 055	Trickling Filter	593	3246535.23	3 947 590	4 184 446	
To Tourza WWTP	13.00	1 755 000				1 755 000	1 860 300	Proposed networks
To Ehden WWTP	25.00	3 375 000				3 375 000	3 577 500	
To Tripoli WWTP	166.00	22 500 000				22 500 000	22 500 000	Proposed 166 km in Zgharta caza to cover the whole Tripoli WWTP drainage basin. It will serve about 140,000 inhabitants and the expected flow is 20,000 m^3/d in the year 2035.
Total Priority 1	**219.60**	**$ 29 735 325**			**$ 10 667 694**	**$ 40 403 019**	**$ 41 477 200**	

Appendix NL-WW.E : Wastewater North Lebanon - Batroun

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Dahr Abi Yaghi	10.00	1 350 000	Activated sludge with nutrient removal	150	1000000	2 350 000	2 491 000	Local wastewater treatment plants and networks in Dahr Abi Yaghi, Jrabta and Ram
Jrabta	21.00	2 835 000	Activated sludge with nutrient removal	300	1500000	4 335 000	4 595 100	
Ram	3.00	405 000	Activated sludge with nutrient removal	100	800000	1 205 000	1 277 300	
Total Priority 1	**34.00**	**$ 4 590 000**			**$ 3 300 000**	**$ 7 890 000**	**$ 8 363 400**	

Appendix BQ-WW.A : Wastewater Beqaa - Baalbeck

System	Sewer line		WWTP			Total	Total with design and	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Temnine	335.00	45 225 000	Conventional activated sludge	36 074	39000000	84 225 000	84 225 000	Phase I of WWTP and Networks is under execution Networks to be accomplished
Iaat	60.00	8 100 000	Conventional activated sludge	20 308	14500000	22 600 000	22 600 000	WWTP to be rehabilated and upgraded (under design)
Aarsal	61.00	8 235 000	Trickling filters	9 121	2 900 000	11 135 000	11 135 000	Networks and WWTP design (study for 2027)
Total Priority 1	**456.00**	**$ 61 560 000**			**$ 56 400 000**	**$ 117 960 000**	**$ 117 960 000**	
Priority 2								
Qaa	145.00	19 575 000	Conventional activated sludge	2 318	3 900 000	23 475 000	23 475 000	Install complete system
Ras Baalbek	207.00	27 945 000	Conventional activated sludge	19 895	29 000 000	56 945 000	56 945 000	Install complete system
Chaat	135.00	18 225 000	Conventional activated sludge	11 893	17 000 000	35 225 000	35 225 000	Install complete system
Deir El Ahmar	82.00	11 070 000	Conventional activated sludge	6 870	11 700 000	22 770 000	22 770 000	WWTP to be replaced
Total Priority 2	**569.00**	**$ 76 815 000**			**$ 61 600 000**	**$ 138 415 000**	**$ 138 415 000**	
Priority 3								
Boudai	115.00	15 525 000	Conventional activated sludge	4 220	7 000 000	22 525 000	22 525 000	Install complete system
Chlifa	50.00	6 750 000	MBBR	1 281	1 500 000	8 250 000	8 250 000	Install complete system
Ouyoun Orghoch	6.00	810 000	MBBR	103	200 000	1 010 000	1 010 000	Install complete system
Ainata	7.00	945 000	MBBR	618	700 000	1 645 000	1 645 000	Install complete system
Maaraboun	12.00	1 620 000	MBBR	822	1 000 000	2 620 000	2 620 000	Install complete system
Jenta	9.00	1 215 000	MBBR	512	600 000	1 815 000	1 815 000	Install complete system
Tfeil	5.00	675 000	MBBR	268	300 000	975 000	975 000	Install complete system
Total Priority 3	**204.00**	**$ 27 540 000**			**$ 11 300 000**	**$ 38 840 000**	**$ 38 840 000**	

Appendix BQ-WW.B : Wastewater Beqaa - Hermel

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Hermel Phase 1	354.00	47 790 000	Conventional activated sludge	19 144	18500000	66 290 000	66 290 000	Parts of the funds may be insured by Italian Protocol
Total Priority 1	**354.00**	**$ 47 790 000**			**$ 18 500 000**	**$ 66 290 000**	**$ 66 290 000**	
Priority 2								
Wadi Faara	70.00	9 450 000	MBBR	275	200 000	9 650 000	9 650 000	Dismantled parts of existing WWTP (MBBR) from Hermel Site after completion of CAS WWTP to be used
Marjahine	20.00	2 700 000	MBBR	858	600 000	3 300 000	3 300 000	Dismantled parts of existing WWTP (MBBR) from Hermel Site after completion of CAS WWTP to be used
Jwar El Hachich	25.00	3 375 000	MBBR	849	600 000	3 975 000	3 975 000	Dismantled parts of existing WWTP (MBBR) from Hermel Site after completion of CAS WWTP to be used
Hermel Phase 2	111.00	14 985 000	Conventional activated sludge	19 144	18 500 000	33 485 000	33 485 000	Extension of WWTP and Networks outside dense populated area
Total Priority 2	**226.00**	**$ 30 510 000**			**$ 19 900 000**	**$ 50 410 000**	**$ 50 410 000**	

Appendix BQ-WW.C : Wastewater Beqaa - Zahle and West Beqaa

System	Villages	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
		Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1									
Joub Jannine System	Ana	8.1	1 094 850				1 094 850	1 160 541	Proposed wastewater networks in Ana
Majdel Anjar -Marj System	Jdita	16.0	2 153 925				2 153 925	2 283 161	Proposed wastewater networks in Jdita
Es Srairi WWTP (Qelia, Yohmor, Zelleya, Dellafi, Saryra, Ain El Tine, Maidoun and Lebbeya (15%))	Maidoun	16 + PS	2 292 150	Activated Sludge (secondary treatment)	2 000	6 330 805	18 337 285	18 887 404	Proposed wastewater networks in Maidoun, Ain El Tine, Zelleya, Loucia, Yohmor, Qelia, Lebbeya Proposed pumping station in Maidoun Proposed wastewater treatment plant in Srayri Project under design
	Ain El Tine	5.9	796 500						
	Zelleya	7.1	961 200						
	Loucia	11.4	1 540 350						
	Yohmor	26.7	3 600 450						
	Qelia	18.2	2 457 000						
	Lebbeya	2.7	358 830						
Sohmor System	Sohmor	4.6	614 250	Activated Sludge	2 000	6 856 413	7 470 663	7 694 783	Proposed wastewater treatment plant and network in Sohmor Project under design
Total Priority 1		**116.7**	**$ 15 869 505**			**$ 42 243 941**	**$ 29 056 723**	**$ 30 025 888**	
Priority 2									
Majdel Anjar -Marj System	Marj	44.3	5 980 500				5 980 500	6 339 330	Proposed wastewater networks in Marj
Joub Jannine System	Haouch El Harime	14.8	1 998 000				1 998 000	2 117 880	Proposed wastewater networks in Haouch El Harime and Kefraya
	Kefraya	13.5	1 822 500				1 822 500	1 931 850	
East Zahle system	Ali El Nahri	17.1	2 310 525				2 310 525	2 449 157	Proposed wastewater networks in Ali El Nahri and Delhamiyeh
	Delhamiyeh	7.8	1 046 925				1 046 925	1 109 741	
Total Priority 2		**97.5**	**$ 13 158 450**			**$ -**	**$ 13 158 450**	**$ 13 947 957**	

Appendix BQ-WW.D : Wastewater Beqaa - Rachaya

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 2								
Kfar Qouq system	52.80	7 127 628		1 243	3 995 903	11 123 531	11 790 943	Feasibility study ongoing for CDR by Nazih Taleb
Beit Lahia system	77.02	10 397 620		2 843	7 187 872	17 585 492	18 640 621	Feasibility study ongoing for CDR by Nazih Taleb
Haouch El Qinnabé system	138.72	18 727 188		4 824	10 462 161	29 189 348	15 940 709	Feasibility study ongoing for CDR by Nazih Taleb Available budget of 15,000,000 is accounted for this project
Total Priority 2	**268.54**	**$ 36 252 435**			**$ 21 645 936**	**$ 57 898 371**	**$ 46 372 274**	
Priority 3								
Deir El-Aachayer system	6.25	844 303		203	1 103 005	1 947 307	2 064 146	Feasibility study ongoing for CDR by Nazih Taleb
Helouet Rachaiya system	3.51	473 194		27	266 602	739 796	784 184	Feasibility study ongoing for CDR by Nazih Taleb
Majdel Balhiss system	25.54	3 447 633		482	2 040 276	5 487 908	5 817 183	Feasibility study ongoing for CDR by Nazih Taleb
Total Priority 3	**35.30**	**$ 4 765 129**			**$ 3 409 883**	**$ 8 175 012**	**$ 8 665 513**	

Appendix SL-WW.A : Wastewater South Lebanon - Nabatiye

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Braiqeaa System	99.84	13 478 796		962	18785387.68	32 264 184	34 200 035	Based on the study by WET, the network is considered proposed and not yet executed Needs detailed design
Nabaa al Tase System	80.70	10 894 895				10 894 895	11 548 589	Nabaa El Tassé System - Needs detailed design
Charquieh System	64.01	8 641 630	Activated Sludge	1 800	14978157.72	23 619 788	25 036 975	Needs detailed design
Total Priority 1	**244.56**	**$ 33 015 321**			**$ 33 763 545**	**$ 66 778 866**	**$ 70 785 598**	
Priority 3								
Yohmor En-Nabatiyeh WWTP	15.00	2 025 000				2 025 000	2 146 500	The Sewer Network is considered existing except in Arnoune The WWTP is existing according to MoEW
Sir El-Gharbiyé WWTP	22.15	2 990 750			2 449 033	5 439 782	5 766 169	Based on the study by WET, the network is considered proposed and not yet executed The WWTP cost estimation is based on the 2035 projection of the received population
Total Priority 3	**37.15**	**$ 5 015 750**			**$ 2 449 033**	**$ 7 464 782**	**$ 7 912 669**	

Appendix SL-WW.B : Wastewater South Lebanon - Sour

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m³/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Chabriha System (Sour WWTP)	224	30 235 406	Activated sludge	55 000	21 421 852	51 657 258	38 090 026	A pipeline along Litani River starting from Chehour to the coast is already under construction for a budget of 25,000,000,000 L.P. Available fund of 16666667 has been accounted for this project
Total Priority 1	**223.97**	**$ 30 235 406**			**$ 21 421 852**	**$ 51 657 258**	**$ 38 090 026**	
Priority 2								
Hallousiyé System	29	3 964 368		1 816		3 964 368	4 202 230	Needs detailed design
Bafliyé System	31	4 251 697		2 300		4 251 697	4 506 798	Needs detailed design
Total Priority 2	**61**	**$ 8 216 065**			**$ -**	**$ 8 216 065**	**$ 8 709 029**	
Priority 3								
Jijim System	25.82	3 485 850		4 500	9 958 920	13 444 770	14 251 456	No works have been done for this area
Borj En-Naqoura System	23.68	3 197 185				3 197 185	3 389 016	The WWTP has been constructed by UNRWA
Jabal El-Botm System	18	2 367 183		1 500	4 565 162	6 932 345	7 348 285	No works have been done for this area
Mansouri Sour System	46.88	6 328 470		3 500	8 331 432	14 659 902	15 539 496	No works have been done for this area
Total Priority 3	**113.92**	**$ 15 378 688**			**$ 22 855 514**	**$ 38 234 202**	**$ 40 528 254**	

Appendix SL-WW.C : Wastewater South Lebanon - Bint Jbeil

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Wadi el Houjair system	623	84 111 858		26 093	34 634 610	118 746 468	122 308 862	Detailed design ongoing by Dar Al Handasah Shair
Total Priority 1	**623.05**	**$ 84 111 858**			**$ 34 634 610**	**$ 118 746 468**	**$ 122 308 862**	
Priority 2								
Salhani system	218.14	29 448 302		11 000	18 785 388	48 233 689	51 127 711	No works have been done for this area
Tibnine system	119.18	16 088 826	Activated Sludge	4 312	-	16 088 826	17 054 155	Need detailed design
Total Priority 2	**337**	**$ 45 537 127**			**$ 18 785 388**	**$ 64 322 515**	**$ 68 181 866**	
Priority 3								
Kafra Bint Jbeil system	43.82	5 915 251		3 621	8 535 626	14 450 877	15 317 930	No works have been done for this area
Total Priority 3	**43.82**	**$ 5 915 251**			**$ 8 535 626**	**$ 14 450 877**	**$ 15 317 930**	

Appendix SL-WW.D : Wastewater South Lebanon - Jezzine

System	Sewer line		WWTP			Total	Total with design and supervision (USD)	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)		
Priority 2								
Qaytouleh system	0.63	85 050	Activated Sludge	985		85 050	87 602	Detailed design completed
Total Priority 2	**1**	**$ 85 050**			**$ 85 051**	**$ 85 050**	**$ 87 602**	
Priority 3								
El Rihane system	9.66	1 304 624	Activated Sludge	1 550	791 776	2 096 400	2 222 184	Needs detailed design
Azour system	3	412 971	Reed Bed	2 185	909 296	1 322 267	1 401 603	Needs detailed design
Roum system	10.20	1 376 438	Reed Bed	635		1 376 438	1 459 025	Needs detailed design
Bisri system	23	3 168 058	Reed Bed	1 480	1 653 762	4 821 819	5 111 129	Needs detailed design
Zhilta system	3	337 500	Reed Bed or small scale activated sludge	74	540 000	877 500	930 150	Needs detailed design
Sfaray system	14.07	1 900 019	Reed Bed	402	2 292 786	4 192 805	4 444 373	Needs detailed design
Total Priority 3	**62.96**	**$ 8 499 611**			**$ 4 486 547**	**$ 14 687 230**	**$ 15 568 464**	

Appendix SL-WW.E : Wastewater South Lebanon - Saida

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Sainik system	229.96	31 044 600	Preliminary Treatment	1 443	39 659 540	70 704 140	74 946 388	Needs detailed design The WWTP must be urgently upgraded since it is only for preliminary treatment Possibility of funding the WWTP by EIB
Sarafand system	609.56	82 290 180			47 179 233	129 469 413	60 737 578	Needs detailed design 76,500,000 USD Available budget according to CEDRE Report Houmine El Tahta WWTP is cancelled. The cost of collecting Houmine and upstream area was added to Sarafand System cost
Total Priority 1	**839.52**	**$ 113 334 780**			**$ 86 838 773**	**$ 200 173 553**	**$ 135 683 966**	

Appendix BML-WW.A : Wastewater Beirut and Mount Lebanon - Beirut

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Rehabilitation, Replacement and upgrade of sewers in Beirut		50 000 000				50 000 000	50 000 000	Assessment and Review of the Master Plan Rehabilitation, Replacement and Upgrade
Total Priority 1	**-**	**$ 50 000 000**			**$ -**	**$ 50 000 000**	**$ 50 000 000**	

Appendix BML-WW.B : Wastewater Beirut Mount Lebanon - Jbeil

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Jbayl System	78	10 496 566	Biofilters	17 132	17 953 997	28 450 563	30 157 597	Project Under Construction, some villages need to be included to the network; the network cost mentioned is the network cost related to these villages that are still not included in this project (the under construction network budget is considered already provided and is not included in the cost estimation mentioned here) - Jbeil WWTP is already constructed but needs capacity upgrade. The estimated cost is based on the cost of a new WWTP with the needed additional capacity (the upgrade of the WWTP found impossible --> we need to construct a new one adjacent to the existing)
Lassa System	41.28	5 572 321		962	3 330 681	8 903 002	9 437 182	Requires Feasibility study
Hdeine System	48	6 426 824		1 443	4 440 779	10 867 603	11 519 659	Requires Feasibility study
Total Priority 1	**167**	**$ 22 495 710**			**$ 25 725 458**	**$ 48 221 168**	**$ 51 114 438**	
Priority 2								
Ghalboun System	80	13 493 876	Activated Sludge	1 875	4 833 000	18 326 876	19 426 489	Requires detailed design (Cost estimation based on LC Feasibility Study)
Kfar Mashoun System	36.12	5 415 943	Activated Sludge	985	3 330 872	8 746 815	9 271 624	Requires detailed design (Cost estimation based on LC Feasibility Study)
Ferhet System	88	11 903 843	Activated Sludge	2 185	5 016 000	16 919 843	17 935 034	Requires detailed design (Cost estimation based on LC Feasibility Study)
Total Priority 2	**204**	**$ 30 813 662**			**$ 13 179 872**	**$ 43 993 534**	**$ 46 633 146**	
Priority 3								
Kharbet Jbayl System	61.17	9 681 010	Activated Sludge	1 480	4 290 000	13 971 010	14 809 271	Requires detailed design (Cost estimation based on LC Feasibility Study)
Fatre System	56	7 814 714	MBBR	1 550	4 125 000	11 939 714	12 656 097	Requires detailed design (Cost estimation based on LC Feasibility Study)
Haqel System	8	1 124 733		111	717 038	1 841 771	1 952 277	Requires Feasibility study
Zibdine System	29.41	3 854 781	Activated Sludge	635	2 681 250	6 536 031	6 928 193	Requires detailed design (Cost estimation based on LC Feasibility Study)
Tartij System	13.67	1 844 964		402	1 791 779	3 636 743	3 854 948	Requires Feasibility study
Qorqraiya System	12.93	1 745 685		49	402 832	2 148 517	2 277 428	Requires Feasibility study
Total Priority 3	**181.14**	**$ 26 065 887**			**$ 14 007 899**	**$ 40 073 786**	**$ 42 478 213**	

Appendix BML-WW.C : Wastewater Beirut Mount Lebanon - Baabda and Aley

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m³/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
El-Kneissé System	80	10 743 946	Activated Sludge	9 500	16 928 369	27 672 315	29 332 654	Detailed design ongoing by ACE
El Halaliyeh System	57	7 754 649	Activated Sludge	17 400	19 982 510	27 737 159	29 401 389	Detailed design ongoing by ACE
Ghadir System	328	44 340 588	Pretreatment	306 430	139 640 151	183 980 739	68 900 161	Needs WWTP Upgrade 170,600,000 USD is an available budget according to CEDRE Report Beirut Part is included in the needed budget (50 MUSD)
Chourit System	164	22 140 798		13 000	21 151 000	43 291 798	45 889 306	Included in Zone 8 & 9 - Pre-feasibility stage
Total Priority 1	**629**	**$ 84 979 981**			**$ 197 702 030**	**$ 282 682 011**	**$ 173 523 509**	
Priority 2								
Bchetfine system	49.84	6 728 541		10 200	17 809 200	24 537 741	26 010 005	Pre-feasibility stage
Bou Zridé System	141	19 014 899		9 152	16 485 713	35 500 611	37 630 648	Included in Zone 7 - Pre-feasibility stage
El-Abadiyeh System	55	7 439 467		5 090	10 869 285	18 308 752	19 407 277	Detailed design ongoing by ACE
Kartada System	23.93	3 230 587	Activated Sludge	4 700	10 271 192	13 501 779	13 906 832	Detailed design ongoing by ACE
Total Priority 2	**269.73**	**$ 36 413 493**			**$ 55 435 389**	**$ 91 848 883**	**$ 96 954 762**	
Priority 3								
Bhamdoun System	23.10	3 118 500		1 648	4 881 376	7 999 876	8 479 869	No studies have been done for this area, possibility to be joined with Bouzride system but needs further investigations and site visits
Aghmid System	26.41	3 564 993		2 253	6 094 365	9 659 358	10 238 920	Included in Zone 8 & 9 - Pre-feasibility stage
Total Priority 3	**49.51**	**$ 6 683 493**			**$ 10 975 741**	**$ 17 659 234**	**$ 18 718 788**	

Appendix BML-WW.D : Wastewater Beirut Mount Lebanon - Keserwane

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Hrajel system	63.60	8 586 627	Activated sludge	5 148	10 957 773	19 544 400	2 717 064	The PE is under estimated because it does not include Kfar Tay El-Matn and Mchaa Kfar Dibiane. When added, the cost estimate for WWTP shall be increased Detailed design phase Upper area is under pre-feasibility phase 18,000,000 USD available budget for this project according to CEDRE Report
Total Priority 1	**63.60**	**$ 8 586 627**			**$ 10 957 773**	**$ 19 544 400**	**$ 2 717 064**	
Priority 2								
Achqout system	71.24	9 617 637		4 477	9 922 753	19 540 390	20 712 813	Master Plan completed
Total Priority 2	**71.24**	**$ 9 617 637**			**$ 9 922 753**	**$ 19 540 390**	**$ 20 712 813**	

Appendix BML-WW.E : Wastewater Beirut Mount Lebanon - Chouf

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Deir Baba System	67.80	9 152 359	Activated Sludge	2 464	6 492 640	15 644 999	16 114 349	Detailed design completed
Sirjbal System	192.90	36 877 000	Biofilters	10 780	18 517 855	55 394 855	7 056 701	Sewer pipes Cost estimation using the 135$ per m gave us a lower price(26 MUSD) compared to the price proposed in the study by LC(36 MUSD) due to the high prices given to the Collectors . The budget includes collection of Nahr Al Hamam Area Cost (7,500,000 USD) Detailed design completed 50,000,000 USD available budget according to CEDRE Report
Ras Nabi Younes System (including Nahr el Hamam area)	158.23	21 361 625	Biofilters	38 000	41 263 715	62 625 340	72 004 100	Networks designed
El-Jdeidé System - under protection of Bisri dam project	35.29	4 763 974	Activated Sludge	4 928	8 615 000	13 378 974	13 780 343	
Mazraet El-Chouf System - under protection of Bisri dam project	26.62	3 593 767	Activated Sludge	2 182	4 340 000	7 933 767	8 171 780	
Maasser el-Chouf System - under protection of Bisri dam project	1.12	151 628	mixture of trickling filter and activated sludge	450	-	151 628	156 176	
El-Moukhtara System - under protection of Bisri dam project	6.19	835 509	mixture of trickling filter and activated sludge	450	-	835 509	860 574	
Ammatour System - under protection of Bisri dam project	14.15	1 910 525	mixture of trickling filter and activated sludge	900	-	1 910 525	1 967 840	
Baadarane System - under protection of Bisri dam project	2.96	399 653	Activated Sludge	250	-	399 653	411 643	
Mristé System - under protection of Bisri dam project	2.28	307 395	mixture of trickling filter and activated sludge	225	-	307 395	316 617	Under detailed design - Included within Bisri Dam Protection Project Budget available from the ISDB --> 40,000,000 USD
El-Khreibé System - under protection of Bisri dam project	1.84	247 730	mixture of trickling filter and activated sludge	450	-	247 730	255 161	
Bater System - under protection of Bisri dam project	16.19	2 186 011	mixture of trickling filter and activated sludge	1 800	3 800 000	5 986 011	6 165 592	
Jebah System - under protection of Bisri dam project	7.55	1 019 218	mixture of trickling filter and activated sludge	300	-	1 019 218	1 049 794	
Jezzine Bhannine System - under protection of Bisri dam project	68.94	9 306 806	Activated Sludge	3 920	9 029 516	18 336 322	18 886 412	
Bteddine El-Lekche System - under protection of Bisri dam project	2.02	272 715	Small scale activated sludge	158	-	272 715	280 896	
Available budget for protection of Bisri dam project						-	40 000 000	
Total Priority 1	**-**	**$ -**			**$ -**	**$ -**	**$ 107 477 978**	
Priority 2								
Ainbal WWTP	8.30	1 120 129	Activated Sludge to be upgraded using MBBR	4 200	5 250 000	6 370 129	6 561 233	Needs detailed design
Total Priority 2	**8.30**	**$ 1 120 129**			**$ 5 250 000**	**$ 6 370 129**	**$ 6 561 233**	
Priority 3								
El-fouara WWTP	35.58	4 803 475		2 353	6 284 676	11 088 151	11 420 796	Included in Zone 8 & 9 - Pre-feasibility stage
Mazraat el Mahtaqra WWTP	9.00	1 215 000		118	750 702	1 965 702	2 083 644	Pre-feasibility stage
Bkifa WWTP	56.90	7 681 149		700	2 657 363	10 338 513	10 958 823	Pre-feasibility stage
Total Priority 3	**101.48**	**$ 13 699 624**			**$ 9 692 742**	**$ 23 392 366**	**$ 24 463 263**	

Appendix BML-WW.F : Wastewater Beirut Mount Lebanon - Metn

System	Sewer line		WWTP			Total	Total with design and supervision	Project Justification
	Length (km)	Cost Estimate (USD)	Type	Flow (m^3/day)	Cost estimate (USD)	(USD)	(USD)	
Priority 1								
Zabbougha System	45.37	6 125 242	MBR	2 000	5 599 673	11 724 915	12 428 410	Networks designed. WWTP not designed
Borge Hammoud System	206.59	27 889 318		325 000	208 000 000	235 889 318	171 965 997	WWTP under design Networks designed 71,000,000 availlable budget according to CEDRE Report
Total Priority 1	**206.59**	**$ 27 889 318**			**$ 208 000 000**	**$ 235 889 318**	**$ 184 394 407**	
Priority 2								
Es Souan System	57.44	7 755 051		5 681	11 750 949	19 506 000	20 676 360	Master Plan completed
Mchikha System	59.44	8 024 400	Activated Sludge	1 812	5 220 565	13 244 965	13 642 314	The cost Estimate as per Dar Shair is 14,245,200 USD not including the expropriation and using a 200 l/cap/day as design criteria and for 2050 horizon Detailed design done by Dar Al Handasah Shair
Total Priority 2	**59.44**	**$ 8 024 400**			**$ 5 220 565**	**$ 13 244 965**	**$ 34 318 674**	
Priority 3								
Abou-Mizane System	23.22	3 134 937		1 018	3 467 308	6 602 245	6 998 380	Master Plan completed
Hasbaya El Maten System	51.13	6 903 050		1 567	4 709 724	11 612 774	12 309 540	All numbers are based on estimations because no studies were done in this area except Ace master Plan which changed with Shair Study concerning Mchikha WWTP
Total Priority 3	**74.36**	**$ 10 037 987**			**$ 8 177 032**	**$ 18 215 019**	**$ 19 307 920**	

Appendix NL-IR.A : Irrigation North Lebanon - Akkar

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Akkar el Bared Scheme	- 0.3 km Concrete channels to rehabilitate - 3.3 km Earth channels to concrete	560 836	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Mounjez Scheme	- 26 km Earth channels to concrete - Dry Farm Expension	3 997 132	
Omar el Breikat Scheme	- 18 km Earth channels to concrete	1 821 080	
Rahbeh Scheme	- 3 km Earth channels to concrete	434 537	
El Koubayet Scheme	- 1.5 km Concrete channels to rehabilitate - 15 km Earth channels to concrete	2 506 993	
Bouqaiaa - Machta Hamoud - Machta Hassan Scheme	- 42 km Earth channels to concrete	10 617 185	
Total Priority 1		**$ 19 937 763**	
Priority 3			
Akkar plain Scheme	- 50 m Concrete channels to rehabilitate - 78 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	29 994 518	Justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Akkar el Atika Scheme	- 2 km Concrete channels to rehabilitate - 29 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	4 875 578	
Fneidek and Michmich Scheme	- 14 km Concrete channels to rehabilitate - 18 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	5 688 774	
Total Priority 3		**$ 40 558 871**	

Appendix NL-IR.B : Irrigation North Lebanon - North (excluding Akkar)

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Bcharreh Scheme	- 22 km Concrete channels to rehabilitate	1 048 847	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Ehden Scheme	- 21 km Concrete channels to rehabilitate	281 956	
El Minieh scheme	- 19 km Concrete channels to rehabilitate - 0.6 km Earth channels to concrete	1 108 745	
Tannourine Scheme	- 37 km Concrete channels to rehabilitate - 17 km Earth channels to concrete	4 585 412	
Tripoli Scheme	- 2.5 km Earth channels to concrete	388 401	
Zghorta Scheme	- 11.5 km Concrete channels to rehabilitate - 7 km Earth channels to concrete	1 722 907	
Total Priority 1		**$ 9 136 269**	
Priority 3			
Danniyeh Scheme	- 29 km Earth channels to concrete - Extention Of Networks to Cover Present Dry Farm Area	5 214 644	Justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Kfar Helda Scheme	- 14 km Concrete channels to rehabilitate - Extention Of Networks to Cover Present Dry Farm Area	1 435 216	
Total Priority 3		**$ 6 649 860**	

Appendix BQ-IR.A : Irrigation Beqaa - Baalbeck

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Ayneta Baalbeck Scheme	- 2 km Concrete channels to rehabilitate	28 242	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Baalbeck Plain Scheme	- 8 km Concrete channels to rehabilitate - 4 km Earth channels to concrete	829 377	
Chmistar Scheme	- 0.1 km Concrete channels to rehabilitate - 1.5 km Earth channels to concrete	1 903 196	
Ham Scheme	- 0.8 km Concrete channels to rehabilitate - 0.2 km Earth channels to concrete	28 811	
Haouch Er-Rafqa Scheme	- 2 km Concrete channels to rehabilitate - 2 km Earth channels to concrete	939 739	
Hizzine Scheme	- 3.5 km Earth channels to concrete	494 169	
Kfar Dabach Scheme	- 1 km Earth channels to concrete	131 051	
Labboue Scheme	- 20 km Concrete channels to rehabilitate - 40 km Earth channels to concrete	3 889 628	
Maaraboun Scheme	- 0.5 km Earth channels to concrete	43 148	
Marjhine and Jbab Scheme	- 5 km Concrete channels to rehabilitate	78 162	
Ras Baalbeck Scheme	- 2 km Concrete channels to rehabilitate - 0.5 km Earth channels to concrete	200 973	
Taibet Baalbeck Scheme	- 1.2 km Earth channels to concrete	173 355	
Taraya Scheme	- 7 km Earth channels to concrete	983 622	
Wadi Nahle and Maqne Scheme	- 6 km Concrete channels to rehabilitate - 10 km Earth channels to concrete	2 553 911	
Yahfoufa, Jenta and Serraine Scheme	- 15 km Concrete channels to rehabilitate - 10 km Earth channels to concrete	1 315 258	
Yammoune Scheme	- 1.5 km Concrete channels to rehabilitate - 11 km Earth channels to concrete	3 451 531	
Younine Scheme	- 2.5 km Concrete channels to rehabilitate - 1.2 km Earth channels to concrete	328 327	
Total Priority 1		**$ 17 372 501**	
Priority 3			
Temnine and Bednayel Scheme	- 0.2 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	3 588 918	Justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Total Priority 3		**$ 3 588 918**	

Appendix BQ-IR.B : Irrigation Beqaa - Zahle

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Aanjar (Haouch Moussa) Scheme	- 0.1 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	28 415	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Zahle Scheme	- 3 km Earth channels to concrete	2 103 178	
Ablah and Niha Scheme	- 4.5 km Earth channels to concrete	2 982 279	
Chtaura Scheme	- 9 km Concrete channels to rehabilitate - 1 km Earth channels to concrete	626 431	
Kfarzabad Scheme	- 4 km Earth channels to concrete	2 205 944	
Total Priority 1		**$ 7 946 247**	
Priority 3			
Mrayjet Zahle Scheme	- 2 km Concrete channels to rehabilitate	31 086	Justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Bouarej Scheme	- 2.5 km Concrete channels to rehabilitate	52 253	
Touaite Zahle Scheme	- 0.2 km Concrete channels to rehabilitate - 1 km Earth channels to concrete	832 694	
Total Priority 3		**$ 916 033**	

Appendix SL-IR.A : Irrigation South Lebanon - Major Irrigation Schemes

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Saida - Jezzine scheme	Saida - Jezzine Project: Irrigated area : 430 ha Required works : - Replacement of all the irrigation networks according to LRA requirements - 45 km Distribution Networks	7 650 000	Justified because it is an existing project presently under the management of the litani river authority and needs extensive rehabilitation
Conveyor 800 Distribution Networks	Conveyor 800 - Phase II A - Distribution Networks: Irrigated area : 3420 ha Required Works : - 465 km Distribution networks	78 900 000	Justified because it completes the goal of the first,under construction, phase composed of transmission system and reservoirs/dams
Total Priority 1		**$ 86 550 000**	
Priority 2			
Khardaleh Dam scheme	Khardaleh Dam scheme distribution networks (Phase 2 of the dam project) Required Works : - 1 300 km Distribution networks	221 000 000	Justified because it completes the goal of the first phase composed of transmission system and reservoirs/dams
Conveyor 800 Distribution Networks	Conveyor 800 - Phase II - B Distribution Networks: Irrigated area : 9830 ha Required Works : - 1 335 km Distribution networks	227 100 000	Justified because it completes the goal of the first,under construction, phase composed of transmission system and reservoirs/dams
Choumariyeh Dam scheme	Choumariyeh Dam scheme distribution networks (Phase 2 of the dam project) Required Works : - 660 km Distribution networks	112 200 000	Justified because it completes the goal of the first phase composed of transmission system and reservoirs/dams
Total Priority 2		**$ 560 300 000**	

Appendix SL-IR.B : Irrigation South Lebanon - Local Irrigation Schemes

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 2			
Bint Jbeil district	- Villages covered : Ayta El Jabal, Beit Lif, Debel, El Tairi, Es Salhani, Haddatha, Rouaisse, Srobbine, Yatar, Es Soultaniye - Total Irrigated area : 1092 ha - Required works : 100 km distribution network	20 400 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Hasbaya district	- Villages covered : Mazraat Islamiyeh, El Saqi - Total Irrigated area : 94 ha - Required works : 8 km distribution network	1 632 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Jezzine ditrict	- Villages covered : Haffet Bou Hajli, Mazraat Khallet Khazene, Fouzour, Qalaat Dabboura - Total Irrigated area : 142 ha - Required works : 13 km distribution network	2 652 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Nabatiyeh district	- Villages covered : Nabaa el Tasse, Tahounet el Badaouiyeh - Total Irrigated area : 75 ha - Required works : 6 km distribution network	1 224 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Saida district	- Villages covered : Bqosta - Total Irrigated area : 19 ha - Required works : 1 km distribution network	204 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Sour district	- Villages covered : Aaitit, Ain Baal, Al Aabsiye, Bafliye, Chehour, El Bazouniye, El Izziye, El Khraybeh, El Malkiyeh, Jabal El Botm, Jennata, Jouaya, Knaisse, Maaroub, Recheknanay, Saddiqine, Tair Debba, Zebqine - Total Irrigated area : 2 237 ha - Required works : 213 km distribution network	43 452 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures by; selecting this (these) project(s) negative water balance at farm level will be mitigated
Total Priority 2		**$ 69 564 000**	

Appendix SL-IR.C : Construction-Rehabilitation of concrete channels

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 3			
Ibl es Saqi Dam scheme	Ibl es Saqi Dam scheme distribution networks (Phase 2 of the dam project): Irrigated area : 3800 ha Required works : - 380 km Distribution Networks	64 600 000	Justified because it completes the goal of the first phase composed of transmission system and reservoirs/dams
Concerned schemes : Ain el Kbiri, Ain el Rihane, Ain el Tineh, Ain Rkiz, Ain Toghra, Baklleh, Berket el Djej, Chamaliye, El Aaichiye, El Bayad, El Choab - Ain Saha, El Fawar , El Fawar, El Harf, El Jawz - Wadih, El Meshreh, El Mghara, Rabiaa - Jawzeh -Qaitoule, El Tineh, El-Dayaa, Ghraybeh - Azzoubiyeh, Jezzine, Jlikha, Kobay - Cheikh, Machereh, Majdaleen, Nabaa Ain Jbaa, Nabaa el Ain, Nabaa Sader, Nahr el Zahrani, Qobeiss - Majdaline, Wadi Chebaa, Zaarour	Construction of new (or rehabilitation of existing) concrete channels: Total Irrigated area : 836 ha Required works : - 141 km concrete channels	14 100 000	Justified to modernize small schemes outside the LRA systems
Total Priority 3		**78 700 000 $**	

Appendix BML-IR.A : Irrigation Beirut Mount Lebanon - Jbeil

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 2			
Qartaba and Surrounding Scheme	- 8 km Concrete channels to rehabilitate - 10 km Earth channels to concrete	1 145 975	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Total Priority 2		**$ 1 145 975**	
Priority 3			
Lassa, Ghabat, Mezarib,Mghairi, Afqa & Surrounding Scheme	- 2 km Concrete channels to rehabilitate - 2.5 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	298 381	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Aaqoura and Laqlouq Scheme	- 6 km Concrete channels to rehabilitate - 2 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	387 856	justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Total Priority 3		**$ 686 237**	

Appendix BML-IR.B : Irrigation Beirut Mount Lebanon - Meten

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 3			
Baskinta Scheme	- 16 km Concrete channels to rehabilitate - 8 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	1 043 540	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Total Priority 3		**$ 1 043 540**	

Appendix BML-IR.C : Irrigation Beirut Mount Lebanon - Keserouane

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Mayrouba and Hrajel Scheme	- 9 km Concrete channels to rehabilitate - 3 km Earth channels to concrete	524 536	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Total Priority 1		**$ 524 536**	
Priority 3			
Adonis (Keserouane) Scheme	- Extention of Networks to Cover Present Dry Farm Area	230 000	justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Kfar Dibiane and Faraya Scheme	- 25 km Concrete channels to rehabilitate - 8 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	1 839 298	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Nahr el Kalb Wata Scheme	- 5 km Concrete channels to rehabilitate	144 690	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Total Priority 3		**$ 2 213 988**	

Appendix BML-IR.D : Irrigation Beirut Mount Lebanon - Baabda

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 3			
Tarchich Scheme	- 0.5 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	83 066	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Baabda Scheme	- 4 km Concrete channels to rehabilitate - 1.5 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	276 993	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Total Priority 3		**$ 360 058**	

Appendix BML-IR.E : Irrigation Beirut Mount Lebanon - Chouf

System	Project Description	Total with design and supervision (USD)	Project Justification
Priority 1			
Damour Scheme	- 16 km Concrete channels to rehabilitate	486 467	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated
Total Priority 1		**$ 486 467**	
Priority 3			
Barouk Scheme	- 17 km Concrete channels to rehabilitate - 0.8 km Earth channels to concrete - Extention of Networks to Cover Present Dry Farm Area	608 334	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Nbaa El Safa Scheme	- Extention of Networks to Cover Present Dry Farm Area	230 000	Justified in order to increase canal conveyance efficiency by rehabilitation of existing poorly maintained concrete channels and converting earth canals to concrete structures; by selecting this (these) project(s) negative water balance at farm level will be mitigated justified in order to increase scheme total area, and direct increase of beneficiaries number. The project(s) will lead to a horizontal expantion since arable land presence is not a limiting factor
Total Priority 3		**$ 838 334**	

Appendix NL-D.A : Dams North Lebanon - Akkar

System	Project Description	Total with design and supervision (USD)
Priority 1		
Akkar Caza	El Bared dam: Construction of Water Supply dam (37-90 MCM) and associated water treatment plant and transmission network	196 020 000
Total Priority 1		**$ 196 020 000**
Priority 3		
Akkar Caza	Atolbe Dam: Construction of Water Supply hill lake (0.70 MCM) to supply Qbayat	12 000 000
	Qarqaf Dam: Construction of Irrigation DAM (20-25 MCM) for Akkar coastal region	81 000 000
	Noura el Tahta Dam: Construction of dam (35-50MCM) for Nour el Tahta and surrounding villages	150 000 000
Total Priority 3		**$ 243 000 000**

Appendix NL-D.B : Dams North Lebanon - All North

System	Project Description	Total with design and supervision (USD)
Priority 3		
North Lebanon (excluding Akkar)	Dar Baachtar Dam: Construction of Water and Irrigation Dam (7 MCM) for Koura and Batroun	50 000 000
Total Priority 3		**$ 50 000 000**

Appendix BQ-D.C : Dams Beqaa - Baalbek Hermel

System	Project Description	Total with design and supervision (USD)
Priority 1 Baalbeck and Hermel cazas	Assi Phase I Dam: Completion of execution works for Assi Phase 1 Water and Irrigation Dam (63 MCM), and supervision works.	52 000 000
Total Priority 1		**$ 52 000 000**
Priority 2 Baalbeck and Hermel cazas	Assi Phase 2 Dam: Construction of Assi Phase 2 Water and Irrigation Dam (15 MCM).	150 000 000
Total Priority 2		**$ 150 000 000**
Priority 3 Baalbeck and Hermel cazas	Younine Dam: Providing additional storage capacity of 5.8 MCM for the irrigation of 1200 ha	69 960 000
Total Priority 3		**$ 69 960 000**

Appendix BQ-D.D : Dams Beqaa - Beqaa

System	Project Description	Total with design and supervision (USD)
Priority 3		
Beqaa	Massa Dam: Providing additional storage capacity of 8 MCM for the irrigation of 1600 ha	37 100 000
Total Priority 3		**$ 37 100 000**

Appendix SL-D.E : Dams South Lebanon - All South

System	Project Description	Total with design and supervision (USD)
Priority 2		
South Lebanon	Ibl es Saqi Dam: Construction of Irrigation and Water supply dam (50 MCM) on the Hasbani river next to Ibl es Saqi, with related transmission lines and reservoirs	145 000 000
Total Priority 2		**$ 145 000 000**
Priority 3		
South Lebanon	Choumariye Dam: Construction of Water supply and Irrigation DAM (28 MCM) on Litani River with related transmission lines and reservoirs (25 km transmission lines and 1 reservoir)	128 000 000
	Khardali Dam: Construction of Irrigation and Water supply dam (128 MCM) on Litani river (Khardali segment) including downstream works (145 km transmission lines, 2 pumping stations, 4 reservoirs and 3m diameter tunnel)	480 000 000
Total Priority 3		**$ 608 000 000**

Appendix BML-D.F : Dams Beirut Mount Lebanon - All Beirut and Mount Lebanon

System	Project Description	Total with design and supervision (USD)
Priority 1		
Beirut Mount Lebanon	Azounieh Dam: Construction of Water Supply dam (4-5 MCM)	65 000 000
Total Priority 2		**$ 65 000 000**
Priority 2		
Beirut Mount Lebanon	Damour Dam: Construction of Water and Irrigation DAM (42-106 MCM) for Beirut and Damour region.	200 000 000
Total Priority 2		**$ 200 000 000**
Priority 3		
Beirut Mount Lebanon	Maaser Chouf Dam: Construction of Water Supply hill lake (2.2 MCM)	53 000 000
Total Priority 3		**$ 53 000 000**

Appendix NL-HL.A : Hill Lakes Akkar

System	Project Description	Total with design and supervision (USD)
Priority 1		
Akkar	Omar El Breiket Hill Lake: Construction of Hill Lake	1 170 000
Total Priority 1		**$ 1 170 000**
Priority 2		
Akkar	Bouqaiaa - Machta Hamoud - Machta Hassan Scheme Hill Lakes: Construction of Hill Lakes	1 166 000
Total Priority 2		**$ 1 166 000**

Appendix NL-HL.B : Hill Lakes North Lebanon

System	Project Description	Total with design and supervision (USD)
Priority 1		
North Lebanon	Blaita Hill Lake: Construction of Hill Lake (0.18 MCM)	5 000 000
	Tim Rbita Hill Lake: Construction of Hill Lake (0.1 MCM)	2 200 000
	Rahwe Hill Lake: Construction of 20 m high Hill Lake (2.2 MCM), providing an additional capacity for the irrigation of 200 ha	25 000 000
Total Priority 1		**$ 32 200 000**
Priority 2		
North Lebanon	Bcharre Scheme Hill Lakes: Construction of Hill Lakes	8 745 000
	Ehden Scheme Hill Lakes: Construction of Hill Lakes	3 498 000
	Rahban Hill Lake: Construction of Hill Lake (0.3 MCM)	7 000 000
	Laqlouq Hill Lake: Construction of Hill Lake (0.06 MCM)	400 000
	Arez Tannourine Hill Lake: Construction of Hill Lake (0.4 MCM)	14 000 000
	Hourayta Hill Lake: Construction of Hill Lake (0.21 MCM)	7 000 000
	Ain Rouana Hill Lake: Construction of Hill Lake (1.43 MCM)	30 000 000
	Ech Chir Hill Lake: Construction of Hill Lake (0.3 MCM)	4 500 000
	Ain Saouda Hill Lake: Construction of Hill Lake (0.06 MCM)	400 000

Appendix NL-HL.B : Hill Lakes North Lebanon

System	Project Description	Total with design and supervision (USD)
	Ain Lebne Hill Lake: Construction of Hill Lake (1.86 MCM)	34 000 000
Total Priority 2		**$ 109 543 000**
Priority 3		
North Lebanon	Ain Es Safsafe Hill Lake: Construction of Hill Lake (0.3 MCM)	400 000
	El Khaf Hill Lake: Construction of Hill Lake (0.07 MCM)	500 000
	Midane Hill Lake: Construction of Hill Lake (0.79 MCM)	22 000 000
Total Priority 3		**$ 22 900 000**

Appendix BQ-HL. : Hill Lakes Beqaa

System	Project Description	Total with design and supervision (USD)
Priority 2		
Beqaa	Ablah and Niha Scheme Hill Lakes: Construction of Hill Lakes	5 900 000
	Baalbeck Plain Scheme Hill Lakes: Construction of Hill Lakes	10 000 000
	Chmistar Scheme Hill Lakes: Construction of Hill Lakes	9 000 000
	Taibet Baalbeck Scheme Hill Lakes: Construction of Hill Lakes	2 300 000
	Taraya Scheme Hill Lakes: Construction of Hill Lakes	9 300 000
	Yahfoufa, Janta, Serraine Scheme Hill Lakes: Construction of Hill Lakes	5 900 000
	Younine Scheme Hill Lakes: Construction of Hill Lakes	12 800 000
Total Priority 2		**$ 55 200 000**

Appendix SL-HL. : Hill Lakes South Lebanon

System	Project Description	Total with design and supervision (USD)
Priority 2		
South Lebanon	Kounine Hill Lakes: Construction of Hill Lakes	13 300 000
	El Houranieh Hill Lakes: Construction of Hill Lakes	13 300 000
	Chhour Hill Lakes: Construction of Hill Lakes	13 300 000
	Barich Hill Lakes: Construction of Hill Lakes	13 300 000
	Ansar Hill Lakes: Construction of Hill Lakes	13 300 000
	Jermoq Hill Lakes: Construction of Hill Lakes	13 300 000
	Alsalaa-Mimas Hill Lakes: Construction of Hill Lakes	13 300 000
	El Khiyam Hill Lakes: Construction of Hill Lakes	13 300 000
	Banaafoul Hill Lakes: Construction of Hill Lakes	13 300 000
Total Priority 2		**$ 119 700 000**

Appendix BML-HL. : Hill Lakes Beirut and Mount Lebanon

System	Project Description	Total with design and supervision (USD)
Priority 2		
Beirut and Mount Lebanon	Birket El Safa, El Mtein Hill Lake: Construction of Hill Lake (0.5 MCM)	5 200 000
	El Mtein 7 Hill Lake: Construction of Hill Lake (0.3 MCM)	2 800 000
	El Sannine 1 Hill Lake: Construction of Hill Lake (0.2 MCM)	2 600 000
	Kfardebiane, Wadi El Boud Hill Lake: Construction of Hill Lake (0.7 MCM)	6 600 000
	Kfardebiane, Wadi Nabaa Es Saquieh Hill Lake: Construction of Hill Lake (0.4 MCM)	6 200 000
	Kfardebiane 6 Hill Lake: Construction of Hill Lake (0.17 MCM)	1 900 000
	Damour Hill Lakes: Construction of Hill Lakes	4 664 000
	Mayrouba and Hrajel Hill Lakes: Construction of Hill Lakes	3 500 000
Total Priority 2		**$ 33 464 000**

Appendice RS-B : Water Governance priority action plan

Activity	Priority	Stakeholder		Means to mobilize	Deadline	Indicators	Funding	Cost (USD)
		Lead	Involved					
RS-B.1. Sector Governance								
RS-B.1.1 Implement the legal and regulatory framework reform (Water Code)								
RS-B.1.1.1 Prepare, adopt and implement the Water Code bylaws as already listed	High	MoEW	WE, LRA, MoE, MoA	Recruitment of legal consultant	Phase 1 : Q1 2021 Revision : end 2025	Adopted Decrees	INT	40 000
RS-B.1.1.2 Draft revised WE organisation bylaws, support the approval process and follow up on their enactment	High	MoEW	WE	Recruitment of legal consultant	Phase 1 : end 2020 Revision : end 2025	Adopted Decrees	INT	35 000
							Total A.1	**75 000**
RS-B.1.2 Rationalise the tutelage framework with a view for clear dispatching between operational and regulatory activities								
RS-B.1.2.1 Restructure the Ministry's supervisory functions and introduce a substitute function in the event of WE failure (incl. direct procurement of external audit if not conducted by WEs and cost deduction from their budget)		MoEW		Recruitment of legal consultant	End of 2020	Revised Decree	INT	5 000
RS-B.1.2.2 Review the organisational decrees by focusing them on defining guidelines for WEs organisation and streamline specific procedures	High	MoEW		Recruitment of legal consultant	Phase 1 : end 2020 Revision : end 2025	Adopted Decrees	INT	
a. Define guidelines for the WEs' HR recruitment and organisation structures / simplify the organisation chart validation procedure			WE					
b. Streamline the HR recruitment process and make it possible to enhance recruitment outside the public service procedures			WE					*Covered under item A.1.2*
c. Raise the expenditure and procurement validation thresholds			WE, MoF					
d. Define guidelines for WE performance monitoring			WE					
e. Define guidelines for pricing services and simplify the validation procedure			WE					
f. Define guidelines for procurement management and the management of performance-based contracts			WE					
RS-B.1.2.3 Conduct an assessment of the administrative supervision department roles and capacities and develop a specific staff capacity-building plan	High	MoEW		Recruitment of consultants / experts (water services management, HR, capacity-building)	Assessment : End of 2020	Assessment and CB plan validated by MoEW and activity reports of the supporting activities	INT	75 000
					Implementing the capacity-building plan : End 2025			300 000
							Total A.2	**380 000**
RS-B.1.3 Develop proper mechanisms for performance monitoring								
RS-B.1.3.1 Set up a unit in charge of performance monitoring within the MoEW administrative supervision department	Short Term	MoEW		Recruitment of technical assitants (to 2 Experts in water services management and performance monitoring)	Recruitment : End 2020 TA until end 2025	*Standardized reports prepared by WEs *Conduction of external annual audits starting in 2021 *Production of KPI *Performance contracts between MoEW and WEs	INT	900 000
RS-B.1.3.2 Standardise the structure of annual reports incl. financial and business reports	Mid Term	MoEW	WE					
RS-B.1.3.3 Define the monthly activity report submission and validation structure and procedure	High	MoEW	WE					
RS-B.1.3.4 Develop the framework for the annual external audit and evaluation of WE	High	MoEW	WE					
RS-B.1.3.5 Define key performance indicators to be monitored in the short, medium and long term (in alignment with the WE monitoring capacities)	High	MoEW	WE					
RS-B.1.3.6 Establish performance contracts between the MoEW and WE	High	MoEW	WE					
RS-B.1.3.7 Set up the performance monitoring committee as required by law 221	High	MoEW	WE, MoF					
							Total A.3	**900 000**

Total RS-B.1. Sector Governance : 1 355 000 USD

Appendice RS-B : Water Governance priority action plan

Activity	Priority	Stakeholder		Means to mobilize	Deadline	Indicators	Funding	Cost (USD)
		Lead	Involved					
RS-B.2. Financial and commercial								
RS-B.2.1 Conduct a customer and user census								
RS-B.2.1.1 Identify customers connected to piped water and convert unknown customers tapping into the network into legal users	High	WE	MoEW	Recruitment of consultants (technical experts and census experts) - Census to be conducted for all customers / estimated to 1 500 000 of households (price: $3 for 1 household)	Phase 1 : End 2020 Complete census : Beginning 2021	Census reports and updated WEs' consumers database	INT	4 500 000
RS-B.2.1.2 Identify users of collective wastewater services (network or network+WWTP) / identify those who are / are not WE customers (cross-reference with the water supply customer census) in order to define specific approaches for tariff-setting	High	WE	MoEW	Recruitment of consultants (technical experts and census experts)	Complete census for zone 1 by mid 2021	Census reports and updated WEs' wastewater services users database	INT	2 000 000
RS-B.2.1.3 Ensure the take over of new customers/users by WEs and their inclusion in the customer/users database for the billing/collection cycle		WE	MoEW	if needed support from specific TA	Beginning 2022	Increasing subscribers base	INT	*No Cost*
							Total B.1	**6 500 000**
RS-B.2.2 Implement consumption-based tariffs for water service								
RS-B.2.2.1 Streamline the water meter billing procedure		MoEW		Recruitment of financial and water tariff expert(s)	Mid 2022	Harmonized guidelines and procedures for water meter billing	INT	50 000
							Total B.2	**50 000**
RS-B.2.3 Revise the tariff structure for sanitation services								
RS-B.2.3.1 Conduct a proper cost analysis of facilities O&M		MoEW		Recruitment of technical and financial experts on wastewater management	End 2020	Adoption and implementation of new tariff policy for wastewater management	INT	200 000
RS-B.2.3.2 Base the tariff on the cost analysis and, as a minimum, cover O&M costs		WEs			Mid 2021			
							Total B.3	**200 000**

Total RS-B.2. Financial and commercial : 6 750 000 USD

Appendice RS-B : Water Governance priority action plan

Activity	Priority	Stakeholder		Means to mobilize	Deadline	Indicators	Funding	Cost (USD)
		Lead	Involved					
RS-B.3. Reporting and monitoring								
RS-B.3.1 Enhance sector monitoring								
RS-B.3.1.1 Create a Monitoring Department within the Ministry		MoEW		Recruitment of legal consultant	End of 2020	Revised Decree or Amendment to the Law 247	INT	7 500
RS-B.3.1.2 Establish a unified database to include all sector monitoring data and ensure it is regularly updated (incl. the WE KPI)		MoEW		Recruitment of water sector monitoring (part-time assistance) and 1 IT expert (full-time assistance)	Mid 2021 Mid 2022	*TA recruitment *TA activity reports *Establishment and regular update of the sector database Database	INT	750 000
RS-B.3.1.3 Set up an annual sector review involving the main stakeholders and partners		MoEW		Organisation of annual sector workshop	Mid 2020	Workshop / annual review and annual sector review report	National	*No Cost*
RS-B.3.1.4 Set up the process for monitoring the Strategy implementation status		MoEW		Analysis of sector data	Mid 2025	Strategy implementation status report	National	*No Cost*
							Total C.1	**757 500**
RS-B.3.2 Enhance sector transparency								
RS-B.3.2.1 Ensure a transparent flow of information between WEs and MoEW through regular reporting (annual report, financial report, business report)		MoEW		Reports production and publication / TA support	Continuious activity	Meeting minutes, reports	National	*No Cost*
RS-B.3.2.2 Publish annual WE reports (incl. results of audits performed by independent auditors)		WEs		Recruitment of external auditors	starting from mid 2021	Annual WEs' reports publication	National	*No Cost*
RS-B.3.2.3 Prepare financial reports based on IFRS book-keeping standards		WEs		Reports preparation with TA support if needed	starting from mid 2021	Financial report	National and INT TA	*No Cost*
RS-B.3.2.4 Publish the main sector indicators, ensuring these are updated on a regular basis		MoEW		Update of sector indicators (with TA - see C.1.1)	starting from mid 2021	Publication of main sector indicators	National and INT	*No Cost*
RS-B.3.2.5 Publish the breakdown of the water bill		WEs		Publication and communication support	starting from mid 2021	Publication by each WE of the water bill breakdown	National	*No Cost*
							Total C.2	**-**
RS-B.3.3 Enhance sector coordination								
RS-B.3.3.1 Improve coordination between CDR and WEs on infrastructure project planning and management		MoEW		Regular meetings, MoEW follow-up on coordination, support from donors and sector partners	Continuious activity	Participation of WEs in the projects design and implementation	National	*No Cost*
RS-B.3.3.2 Organise an annual sector review involving all stakeholders and partners		MoEW		Organisation of annual sector workshop	Mid 2020	Workshop / annual review and annual sector review report	National	*No Cost*
							Total C.3	**-**
RS-B.3.4 Enhance communication with user								
RS-B.3.4.1 Develop a communication strategy for MoEW and WE		MoEW		Recruitment of communication experts	End 2020	Communication strategy, tools and supports	Internatio nal	500 000
RS-B.3.4.2 Design and launch a national communication campaign on the water sector		MoEW			Beginning 2021			
							Total C.4	**500 000**

Total RS-B.3. Reporting and monitoring : 1 257 500 USD

Appendice RS-B : Water Governance priority action plan

Activity	Priority	Stakeholder		Means to mobilize	Deadline	Indicators	Funding	Cost (USD)
		Lead	Involved					
RS-B.4. Capacity-building								
RS-B.4.1 Strengthen the MoEW monitoring capacities								
RS-B.4.1.1 Appoint specific technical assistance to the MoEW to help develop monitoring		MoEW		***Covered under item C.1.1***				
RS-B.4.1.2 Support the MoEW in defining sector key performance indicators		MoEW						
RS-B.4.1.3 Support the MoEW and the WEs in developing a performance monitoring		MoEW		***Covered under item A3***				
RS-B.4.1.4 Identify the MoEW staff to be trained and supported in monitoring activities		MoEW						
							Total D.1	**-**
RS-B.4.2 Streamline and structure WE internal organisation and management								
RS-B.4.2.1 Conduct an overall internal audit in each WE (organisational, HR management, financial - assets, commercial, technical), propose measures and guidelines for streamlining internal WE organisation		WEs		Recruitment of the following experts: institutional, O&M of water utilities, capacity-building and HR management, water and wastewater	Beginning 2021	Audit report validated by MoEW and the four WEs	INT	450 000
RS-B.4.2.2 Prepare a handbook of jobs in the WEs with minimum skills required per position and standard training / capacity-building plan to be implemented		WEs			*Beginning of 2022 for the hanbook validation *End of 2025 for implementing the capacity-building plan and TA support	*Handbook *Capacity-building plan *TA activity reports and specific studies	INT	2 500 000
							Total D.2	**2 950 000**

Total RS-B.4. Capacity-building : 2 950 000 USD

RS-B.5. O&M of facilities and services								
RS-B.5.1 Improve operating cost control								
RS-B.5.1.1 Develop a specific strategy to control the energy costs of the facilities (based on ongoing studies)		MoEW		Recruitment of technical and financial experts	End of 2021	Validated reports and strategic guidelines	INT	150 000
RS-B.5.1.2 Define guidelines to ensure that facilities design is adapted to the capacity to cover their operating costs		MoEW		Recriutment of technical and financial experts (coordinate with other financial and technical studies)	End of 2021	Publication of guidelines	INT	100 000
							Total E.1	**250 000**
RS-B.5.2 Enhance private sector involvement								
RS-B.5.2.1 Review existing contracts with private operators and develop a new contracting framework and performance-based contracts		WEs		Recruitment of institutional, legal and technical experts in overseeing water facilities O&M contracts	Mid 2021 for pilot contract for wastewater facilities management End of 2025 to assess the contracts and revise the framework (if needed)	Implementation of performance-based contracts Assessment report of the efficiency and ownership by WEs of this framework and propose improvements	INT	160 000
RS-B.5.2.2 Identify the tasks or activities to be outsourced and the outsourcing arrangements to be adopted		WEs		Recruitment of the following experts: institutional, O&M of water utilities, capacity-building and HR management, water and wastewater	Mid 2021	Reports and validation of the proposed framework by WEs and MoEW	INT	*No Cost*

Appendice RS-B : Water Governance priority action plan

Activity	Priority	Stakeholder		Means to mobilize	Deadline	Indicators	Funding	Cost (USD)
		Lead	Involved					
RS-B.5.3 Adopt a shared wastewater management framework							**Total E.2**	**160 000**
RS-B.5.3.1 Address the issue of the organization(s) responsible for managing the WW network and treatment plants (WEs, municipalities, private operators.) and determine the financing method		MoEW		Recruitment of institutional, financial and technical experts in wastewater facilities operation and management	Mid 2021	Publication of the wastewater management framework	INT	250 000
							Total E.3	**250 000**
							Total : 660 000 USD	