

**Document of
The World Bank**

Report No: ICR2347

**IMPLEMENTATION COMPLETION AND RESULTS REPORT
(P063398)**

ON A

CREDIT

IN THE AMOUNT OF SDR 15.40 MILLION

(US\$23 MILLION EQUIVALENT)

AND AN

ADDITIONAL FINANCING OF SDR 12.80 MILLION

(US\$20 MILLION EQUIVALENT)

TO THE

REPUBLIC OF ARMENIA

FOR THE

MUNICIPAL WATER AND WASTEWATER PROJECT

June 14, 2012

**Urban, Water Supply & Sanitation Sector Unit
South Caucasus Country Unit
Europe and Central Asia Region**

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 6, 2011)

Currency Unit = Armenian Drams (AMD)

AMD1 = US\$0.0026

US\$ 1.00 = AMD391

FISCAL YEAR

July 1-June 30

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AHC	Asset Holding Company
AMD	Armenian Dram
AWSC	Armenia Water and Sanitation Company
BP	Bank Policy
CAPEX	Capital Expenditure Program
CAS	Country Assistance Strategy
CMU	Contract Monitoring Unit
DCA	Development Credit Agreement
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EMC	Enhanced Management Contract
EMP	Environmental Management Plan
ERR	Economic Rate of Return
FA	Financing Agreement
FIRR	Financial Internal Rate of Return
FM	Financial Management
FY	Fiscal Year
GOA	Government of Armenia
ICB	International Competitive Bidding
IDA	International Development Association
IFRS	International Financial Reporting Standards
ISR	Implementation Supervision Report
KfW	Kreditanstalt für Wiederaufbau
kWh	Kilo Watt-Hour
LD	Legal Document
MDP	Municipal Development Project
MWWP	Municipal Water and Wastewater Project
MOFE	Ministry of Finance and Economy
mWh	Mega Watt-Hour
NPV	Net Present Value

NRW	Non-Revenue Water
O&M	Operation and Maintenance
OP	Operational Procedure
OPEX	Operating Expenditures
PA	Project Agreement
PAD	Project Appraisal Document
PDO	Project Development Objective
PICR	Project Implementation Completion and Results Report
PMU	Project Monitoring Unit
PP	Project Paper
PPF	Project Preparation Facility
PPP	Public-Private Partnership
PSRC	Public Services Regulatory Committee
QAE	Quality at Entry
QCBS	Quality Cost Based Selection
QSA	Quality of Supervision
SCWE	State Committee for Water Efficiency
SIF	Social Investment Fund
SLA	Sub-Loan Agreement
TA	Technical Assistance
TOR	Terms of Reference
UfW	Unaccounted-for Water
WW	Water and Wastewater
YWSC	Yerevan Water and Sanitation Company
YWWP	Yerevan Water and Wastewater Project

Vice President:	Philippe H. Le Houerou
Country Director:	Elene Imnadze (Acting)
Sector Manager:	Sumila Gulyani
Project Team Leader:	Zaruhi Tokhmakhian
ICR Team Leader:	Zaruhi Tokhmakhian
ICR Primary Author:	Alain R. Locussol

Republic of Armenia
Municipal Water and Wastewater Project

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A. Basic Information

Country:	Armenia	Project Name:	Municipal Water and Wastewater Project
Project ID:	P063398	L/C/TF Number(s):	IDA-38930,IDA-45140
ICR Date:	04/02/2012	ICR Type:	Core ICR
Lending Instrument:	SIM	Borrower:	MINISTRY OF FINANCE AND ECONOMY
Original Total Commitment:	XDR 15.40M	Disbursed Amount:	XDR 28.18M
Revised Amount:	XDR 28.20M		
Environmental Category: F			
Implementing Agencies:			
Water Sector Development and Institutional Improvements PIU			
Co-financiers and Other External Partners:			

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	06/15/2000	Effectiveness:	11/11/2004	11/11/2004
Appraisal:	03/08/2004	Restructuring(s):		01/27/2011 12/28/2011
Approval:	05/04/2004	Mid-term Review:	10/31/2006	05/02/2007
		Closing:	02/28/2009	02/28/2012

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes:	Moderately Satisfactory
Risk to Development Outcome:	Substantial
Bank Performance:	Moderately Satisfactory
Borrower Performance:	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Satisfactory	Government:	Not Applicable
Quality of Supervision:	Moderately Satisfactory	Implementing Agency/Agencies:	Not Applicable
Overall Bank Performance:	Moderately Satisfactory	Overall Borrower Performance:	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators

Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	Satisfactory
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes

	Original	Actual
Sector Code (as % of total Bank financing)		
Central government administration	4	4
General water, sanitation and flood protection sector	20	20
Sewerage	5	5
Water supply	71	71

Theme Code (as % of total Bank financing)		
Other urban development	40	40
Pollution management and environmental health	20	20
Urban services and housing for the poor	40	40

E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Philippe H. Le Houerou	Shigeo Katsu
Country Director:	Asad Alam	Hossein Razavi
Sector Manager:	Sumila Gulyani	Sumter Lee Travers
Project Team Leader:	Zaruhi Tokhmakhian	Brian Steven Smith
ICR Team Leader:	Zaruhi Tokhmakhian	
ICR Primary Author:	Alain R. Locussol	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

The project development objective is to improve (i) the quality of services provided to customers in AWSC's service area; and (ii) the sustainability of AWSC.

Revised Project Development Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Increased weighted average of the daily hours of drinking water service			
Value (quantitative or Qualitative)	6.04 h	15 h		15.02 h
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	End-of-project target met			
Indicator 2 :	Increased weighted average water bacteriological safety compliance			
Value (quantitative or Qualitative)	93.8 %	98.1 %		98.2 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments	Exceeded end-of-project target			

(incl. % achievement)				
Indicator 3 :	Increased percent of individual subscribers billed on the basis of metered consumption			
Value quantitative or Qualitative)	40.2 %	77.8 %		82.2 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 4 :	Decreased company working ratio			
Value quantitative or Qualitative)	194.9 %	118 %		117.8 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Increased percentage of cities with minimal daily hours of water supply service			
Value (quantitative)	68.1 %	90 %		94 %

or Qualitative)				
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 2 :	Increased percentage of block apartment buildings with individual or common block meters			
Value (quantitative or Qualitative)	38.6 %	75 %		82.1 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 3 :	Increased revenue collected from domestic subscribers per registered inhabitant (dram per month)			
Value (quantitative or Qualitative)	166	260		502
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 4 :	Increased collection ratio excluding budget organizations			
Value (quantitative or Qualitative)	47.9 %	80 %		100.8 %
Date achieved	11/30/2004	12/31/2011		02/28/2012

Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 5 :	Decreased percentage of subscribers with more than 4 months debt			
Value (quantitative or Qualitative)	79.5 %	78 %		26 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 6 :	Increased average domestic metered consumption per metered registered inhabitant (in liters per capita per day (l/c/d))			
Value (quantitative or Qualitative)	81 l/c/d	70 l/c/d		94 l/c/d
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 7 :	Increased average price of m3 metered and billed to domestic subscribers			
Value (quantitative or Qualitative)	100.41 AMD/m3	180 AMD/m3		179.8 AMD/m3
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	End-of-project target met			

Indicator 8 :	Growth of total collected revenue from base year excluding budget organizations (in 1000 AMD per month)			
Value (quantitative or Qualitative)	114.568	200 %		166.8 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Close to the end-of-project target			
Indicator 9 :	Increased ratio of water volume billed on the basis of metering to the total metered and normative billed volume			
Value (quantitative or Qualitative)	25 %	65 %		85.8 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 10 :	Increased average daily production per equivalent registered inhabitant (in l/c/d)			
Value (quantitative or Qualitative)	668 l/c/d	670 l/c/d		670 l/c/d
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	End-of-project target met			
Indicator 11 :	Increased ratio of metered final consumption (m3) to water production at water catchments levels			

Value (quantitative or Qualitative)	6.8 %	7.8 %		13.7 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 12 :	Decreased working ratio for branches with gravity systems			
Value (quantitative or Qualitative)	89.7 %	80 %		63.5 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 13 :	Decreased working ratio for branches with pumping stations or treatment plants			
Value (quantitative or Qualitative)	223.3 %	120 %		123.3 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Close to the end-of-project target			
Indicator 14 :	Decreased electricity costs as % of revenue collected in systems with pumping or treatment plants			
Value (quantitative or Qualitative)	72.6 %	40 %		23.2 %

Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 15 :	Decreased total staff per 1000 individual subscribers			
Value (quantitative or Qualitative)	9.45	6.80		6.0
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 16 :	Decreased total cost of regular and contracted staff as % of collected revenues			
Value (quantitative or Qualitative)	70.2 %	60 %		59.3 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 17 :	Decreased electricity consumption in KWH/m3 (efficiency)			
Value (quantitative or Qualitative)	0.43 KWh/m3	0.30 KWh/m3		0.26 KWh/m3
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			

achievement)				
Indicator 18 :	Percentage of water disinfected			
Value (quantitative or Qualitative)	60.9 %	95 %		97.3 %
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	Exceeded end-of-project target			
Indicator 19 :	New piped household water connections that are resulting from the project intervention			
Value (quantitative or Qualitative)	0	259,505		259,505
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	This is a IDA Core Indicator. End-of-project target met			
Indicator 20 :	Piped household water connections that are benefiting from rehabilitation works undertaken by the project			
Value (quantitative or Qualitative)	0	99,938		99,938
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	This is a IDA Core Indicator. End-of-project target met			
Indicator 21 :	Number of people in rural areas provided with access to improved water sources under the project			

Value (quantitative or Qualitative)	0	34,748		34,748
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	This is a IDA Core Indicator. End-of-project target met			
Indicator 22 :	Number of people in urban areas provided with access to improved water sources under the project			
Value (quantitative or Qualitative)	0	285,055		285,055
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	This is a IDA Core Indicator. End-of-project target met			
Indicator 23 :	Number of water utilities that the project is supporting			
Value (quantitative or Qualitative)	0	1		1
Date achieved	11/30/2004	12/31/2011		02/28/2012
Comments (incl. % achievement)	This is a IDA Core Indicator. End-of-project target met			

G. Ratings of Project Performance in ISRs

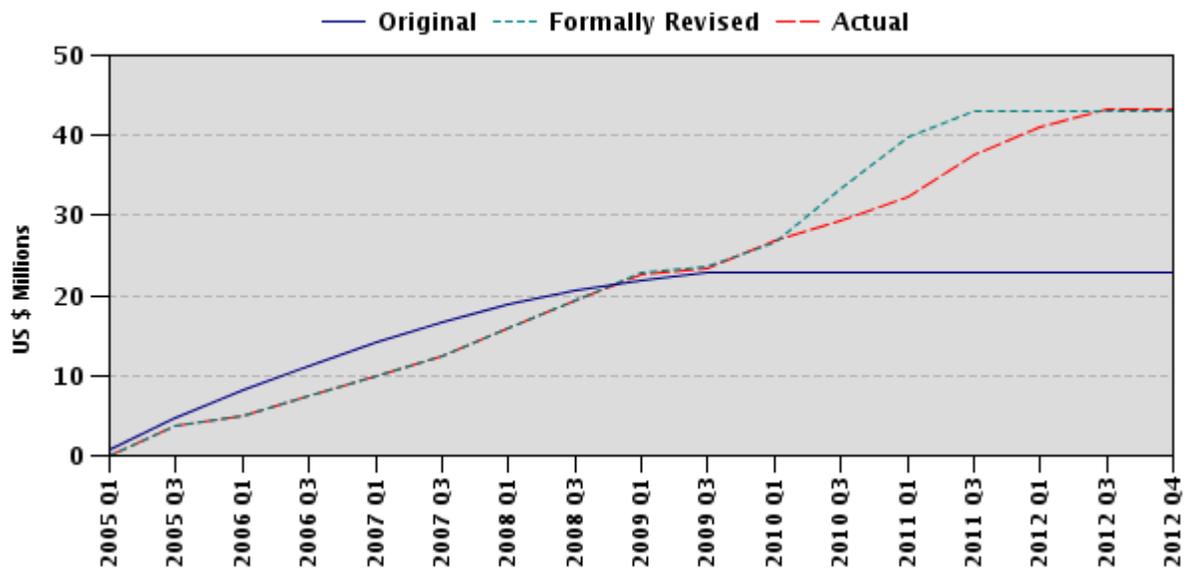
No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	05/28/2004	Satisfactory	Satisfactory	0.00
2	11/30/2004	Satisfactory	Satisfactory	0.00
3	05/20/2005	Satisfactory	Satisfactory	3.91
4	12/02/2005	Satisfactory		5.38
5	07/18/2006	Satisfactory	Satisfactory	9.47
6	03/28/2007	Satisfactory	Satisfactory	12.36
7	06/08/2007	Satisfactory	Satisfactory	14.34
8	05/30/2008	Satisfactory	Satisfactory	19.86
9	12/11/2008	Satisfactory	Satisfactory	23.19
10	05/09/2009	Satisfactory	Satisfactory	23.45
11	02/12/2010	Satisfactory	Moderately Satisfactory	28.39
12	04/14/2010	Moderately Satisfactory	Moderately Satisfactory	29.42
13	12/20/2010	Satisfactory	Satisfactory	34.80
14	06/29/2011	Satisfactory	Satisfactory	38.73
15	01/03/2012	Satisfactory	Satisfactory	42.34
16	02/22/2012	Satisfactory	Satisfactory	43.27

H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
01/27/2011		S	S	36.43	(1) Reallocate credit proceeds of the Additional Financing to

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
					provide more resources mainly to the works and consultant services category towards the end of the project.
12/28/2011		S	S	42.34	(1) Extend the closing date of Armenia Additional Financing for Municipal Water and Wastewater Project by two months, from December 31, 2011 to February 28, 2012, to use cost savings accumulated under the Project. (2) Reallocate remaining proceeds for the original Project (P063398) and the Additional Financing (P107614) to allow utilization of savings generated from SDR/USD currency exchange.

I. Disbursement Profile



Municipal Water and Wastewater Project

Project Implementation and Completion Report

1. Project Context, Development Objectives and Design

1.1.Context at Appraisal

1. **Country Background.** Armenia, a small landlocked country with few natural resources, achieved an impressive growth after the early 1990s period that followed independence from the Soviet Union, characterized by hyperinflation, economic contraction and fiscal crisis. Successful stabilization and structural reform programs resulted in annual growth rates of 5.5 percent during the 1994-2000 period, six percent in 2001 and 12 percent during 2001-2003 driven by an increased inflow of remittances and foreign investments.

2. **Sector Background.** The country is divided in 10 regions regrouping 930 urban and rural communities plus Yerevan, itself divided in 12 districts. In 2004, about 2.0 million people out of the country's total population of 3.2 million lived in urban centers, of which about 1.1 million in the capital city Yerevan. Local governments are legally responsible for the water and wastewater (WW) service in their territory, but in fact the WW service is currently provided by five utility companies. In the capital city Yerevan, the WW service under the responsibility of the Yerevan Water and Sewerage Company (YWSC) has since 2006 been provided by Yerevan Djur, a private operator under a ten-year "Lease" contract. The service area of the Armenia Water and Sanitation Company (AWSC) includes 37 urban centers and 283 rural communities regrouping a total of about 0.62 million people. AWSC is a public WW utility company whose shares, as that of the YWSC, are all owned by the State Committee for Water Economy (SCWE) of the Territorial Administration Ministry. SCWE oversees the WW and irrigation sectors since 2001. The three cities of Gyumri, Vanadzor and Armavir, have created their own WW utility companies with KfW assistance. About 560 rural communities operate themselves their WW service. The Water Code adopted in 2002 allows various models of Public-Private Partnerships (PPP), ranging from short-term Service and Management contracts to medium-term Lease contracts and long-term Concessions. In 2003, the Public Services Regulatory Committee (PSRC) was given the responsibility for resetting WW tariffs and WW service standards.

3. **The Municipal Development Project (MDP).** In 1998, the Bank granted a US\$30 million IDA Credit for a Municipal Development Project (MDP) that significantly improved the performance of the WW service provided by the YWSC hitherto characterized by high levels of operating and capital development inefficiencies. The outcome of the MDP closed in 2006 was rated "satisfactory", its sustainability "likely" and its institutional development impact "substantial" in its Project Implementation Completion and Results (PICR) report. According to the latter, between 2000 and 2006, the "Management" contract entered into by

the Government of Armenia (GOA) and the YWSC with the private professional operator ACEA of Italy, helped:

- Improve the permanence of the water service from an average 7 to 18 hours/day;
- Increase the number of customers with a permanent water supply from 28 percent to 50 percent;
- Reduce average water consumption from an assumed 250 liters per capita per day (lcd) to a metered 110 lcd;
- Decrease Unaccounted-for Water (UfW) from 870,000 m³/day to 723,000 m³/day, actually translating in an increase from 73 percent to 80 percent of water production;
- Limit energy consumption by 48 percent;
- Increase the individual metering ratio from almost zero to 80 percent; and
- Improve the bill collection ratio from 20 to 79 percent.

4. **Rationale for Bank Assistance.** Following the MDP positive experience, the GOA decided to: (i) to pursue a more advanced form of PPP in Yerevan with a Lease of the WW service that transferred most operational and commercial risks as well as significant responsibilities for identifying and implementing a comprehensive rehabilitation program of the WW infrastructure to its private partner; and (ii) replicate the Management contract model to the AWSC. Both the Municipal Water and Wastewater Project (MWWP) approved in 2004 and the Yerevan Water and Wastewater Project (YWWP) approved in 2005 were conceived as a natural continuation of the Bank support provided under the MDP for modernizing Armenia's WW sector. The YWWP closed at the end of 2011; its PICR report is being prepared in parallel with this PICR.

5. In the early 2000s, financing requirements for improving the WW service were estimated at about US\$700 million, of which US\$550 million for activities outside of Yerevan; these figures have since been updated to US\$1,700 million and US\$1,100 million respectively. No specific financing plan and cost recovery arrangement have so far been developed to test the feasibility of these investments. In the early 2000s, other financing agencies involved in the urban WW sector included USAID, which helped develop the sector legal framework and KfW, which still supports the improvement of the WW service in the three towns listed above, also through a PPP with the Operator MVV of Germany. Since the early 2000s, the WW sector has been able to attract financing from the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), and the French Government.

1.2.Original Project Development Objectives and Key Indicators

7. **Project Development Objectives.** The 2001 Country Assistance Strategy (CAS) highlighted the need for financially and technically rehabilitating Armenia's WW systems by improving utility financial discipline with better cash generation and expenditure management, improving WW services and rehabilitating sector infrastructure, and increasing efficiency of water distribution and use. The MWWP Project Development Objectives (PDOs), as stated in the 2004 Project Appraisal Document (PAD) were: *“to improve: (i) the quality of services provided to customers in AWSC's service area; and (ii) the sustainability of AWSC.* The Development Credit Agreement (DCA) used a slightly different wording by

mentioning PDOs as being “to improve the quality of WW services in the Armenia Water and Sanitation Company (AWSC) Service Area by providing efficient and sustainable WW services and strengthening the capacity and sustainability of AWSC”. The 2008 Project Paper (PP) that requested approval for additional financing for the MWWP mentioned that PDOs would remain unchanged; the 2008 Financing Agreement (FA) used the same wording as that of 2004 DCA but replaced “Armenia Water and Sanitation Company” by “Project Implementing Entity”.

8. **Key Performance Indicators.** The achievement of the PDOs was to be measured by a series of technical, commercial and investment outcome indicators: (i) technical: improved service reliability, improved water quality and greater operating efficiency; (ii) commercial: increased water company cash generation through reform of billing and collection operations, closer alignment of service tariffs with costs and better cash flows; and (iii) sector investments: all investments to be economically justified and to meet applicable safeguard policies. Specific results indicators were based on the criteria to be used for determining the incentive bonus of the Manager under the Management contract and included:

- The weighted average of daily hours of drinking water services;
- The percentage of individual subscribers billed on the basis of metered consumption;
- The weighted average water bacteriological safety compliance; and
- ASWC working ratio.

In response to the 2001 CAS, that identified the financial rehabilitation of WW utility companies as one of the objectives to be pursued, and to the 2004 CAS that later highlighted the poor financial condition of public WW utility companies as the major constraint for infrastructure development and service improvement, the PAD proposed to monitor AWSC working ratio, i.e., the ratio of operating expenditures to operating revenues. If the working ratio is a good measurement of progress made towards recovering costs, it is of course only one of several indicators to measure the financial sustainability of a WW service provider.

1.3. Main Beneficiaries

9. **Armenia Water and Sanitation Company (AWSC).** The main beneficiary of the MWWP was the AWSC, a public joint stock company owned by the SCWE. In 2004, AWSC employed about 2,370 staff, 2,250 of them based in more than 37 territorial Branches and the remainder in Yerevan where its headquarters were and are still based. This translated in a high staffing ratio of about 9.45 staff per thousand water connections. The PAD did not provide basic information on AWSC past technical operations such as water production, water sales, non-revenue water (NRW), number of connections and active accounts, wastewater collected and treated presumably because data available were considered unreliable.

10. **AWSC Fragile Financial Situation.** The PAD however assessed AWSC past financial performance on the basis of its audited (2001) and provisional (2002 and 2003) financial statements. While ASWC revenues decreased from AMD 2,210 million (US\$5.65 million) in 2001 to AMD1,890 million (US\$4.85 million) in 2003, its collection evolved from

AMD960 million (US\$2.45 million) to AMD1,110 million (US\$2.85 million) translating in poor but improving collection ratios of 43 percent and 53 percent. Between 2001 and 2003, collected revenues were insufficient to cover O&M costs that increased from AMD2,135 million (US\$5.45 million) to AMD2,775 million (US\$7.10 million). During that period if energy expenses declined from 42 to 30 percent, staff costs increased from 26 to 33 percent of O&M total expenditures. As a result of high energy and staff costs, maintenance was neglected and most facilities were steadily deteriorating. Cash deficits were met through a combination of GOA subsidies, direct payment by the GOA to the electric power company and to the YWSC for bulk water supplies. Cash deficits were also met through non-payment of the Value Added Tax (VAT). The PAD noted that as a combination of high VAT applying to WW services (20 percent, to be compared with an average five percent in OECD countries) and a very high ratio of operating expenses to collection and thus low VAT recovered from customers, and high environmental fees, the AWSC was devoting about 15 percent of its collected revenues to the payment of taxes. Following the adoption of Armenia's Law on Debt Forgiveness, 2003 AWSC balance sheet was to be restructured, its debt written off and deferred liabilities and other arrears significantly reduced.

11. *AWSC Customers.* In 2004, AWSC served about 0.62 million people through an estimated 185,000 active accounts out of a total 251,000; about 15 percent of the population received water from public standpipes. The PAD mentioned that AWSC low collection was the result of: (i) limited ability and willingness-to-pay of households living in small towns and villages, whose income was estimated to be about half that of those living in Yerevan; and (ii) non-enforcement of AWSC disconnection for non-payment policy because of the poor quality of service provided and unfair billing procedures based on normative consumption. The culture of non-payment was more deeply ingrained in villages than in towns. The PAD discussed affordability of the WW service by low income customers and mentioned that enforcing collection of the WW bill could result in poorer households having to spend up to five percent of their income for their WW budget.

1.4. Original Components

The MWWP originally included three main components: (i) AWSC management strengthening; (ii) AWSC investments; and (iii) investments in AWSC Branch systems.

12. *Component A: AWSC Management Strengthening.* Under this component, the MWWP was to finance:

- The fixed fee and the performance bonus of the first four years of a six-year Management contract to be entered into by AWSC with a professional WW operator for improving administration, operations and maintenance, and ensuring optimal use of MWWP investment funds;
- The overall project management and supervision by the Contract Monitoring Unit (CMU) of the SCWE; and
- The refinancing of activities carried out under the Project Preparation Facility (PPF).

13. **Component B: AWSC Investment.** Several sub-components were to be financed to help improve WW operations:

- Communication equipment, instruments, hardware, software, spare parts and annual audits;
- A redundancy program to help reduce the size of the staff by about 610 and improve AWSC staffing ratio from 9.45 to 6.0 staff per 1,000 subscribers;
- Training facilities and a training and re-qualification program to familiarize AWSC staff and its contractors with good practice in well-managed WW utility companies;
- A chemical and bacteriological laboratory for analyzing drinking water and wastewater effluent samples, collection and transportation equipment and the refurbishment of local laboratories;
- A water meter testing laboratory;
- A revolving fund for the credit sale and installation of water meters;
- An assistance to condominium where about 50 percent of the population lived through the installation of block meters and repair of internal networks and the development of an investment program to fully refurbish the latter; and
- Incremental AWSC operating expenses, such as spare parts and chemicals.

14. **Component C: Investments in Branch Systems.** This component was to finance the rehabilitation of water supply systems and sewerage networks as well as other Branch investments, such as offices or operating equipment. It was divided into two sub-components:

- An immediate investment program, identified prior to the mobilization of the Manager, so that the latter could start its implementation without delay, after amending it if necessary; and
- The design, implementation and supervision of rehabilitation and reconstruction of existing WW systems identified by the Manager.

1.5. Revised Components.

The initial Credit represented only a small fraction of the total investment needs of the AWSC, in particular for rehabilitating and extending Branch systems. The Additional Financing (AF) approved in 2008 mostly increased the financing made available for the same three components.

15. **Component A: AWSC Management Strengthening.** In addition to an additional two years of the Management contract and other sub-components listed above, the AF was to finance consulting services for preparing a strategy for implementing a “Lease” contract for AWSC service area, similar to that implemented in Yerevan.

16. **Component B: AWSC Investments.** The same sub-components as above were to be financed, including consulting services for carrying out AWSC fixed assets inventories and revaluation and reviewing its O&M costs.

17. **Component C: Investments in Branch Systems.** The Project Paper (PP) for the AF provided a more detailed description of activities to be financed, including:

- Supply and replacement of treatment and chlorination equipment;
- Supply and installation of pressure loggers, pipes and fittings, water meters and chambers and pumping stations;
- Repair and reconstruction of sector offices; and
- Design and construction for rehabilitating the water network in the city of Hrazdan.

18. **Project Restructuring.** The Restructuring Paper (RP) of 2011 simply requested an extension of the closing date of the AF by two months and a reallocation of the proceeds of the original Credit to use savings generated from the SDR/US\$ currency exchange variations to finance the Management contract until end 2011, and the AF to use savings to prepare feasibility studies and designs for WW systems in two towns.

2. Key Factors Affecting Implementation and Outcomes

2.1. Project Preparation, Design and Quality at Entry

19. **Soundness of the Background Analysis.** Project preparation activities financed by the US\$1.2 million PPF focused mostly on: (i) reviewing PPP options for improving AWSC performance and alternatives for implementing the MWWP; (ii) drafting the Management contract and organizing the selection of the Manager; and (iii) identifying the priority construction program to be implemented by the AWSC. Both the GOA and its consultants performed satisfactorily, as evidenced by the mobilization of an experienced Manager (SAUR of France) after a fair and transparent competition that attracted proposals from four reputable operators from France, Germany and Italy.

20. **Assessment of the Project Design.** The MWWP aimed at addressing the key institutional, technical and financial issues the AWSC was faced with.

- *Operational:* Since the outcome of the MWWP was highly predicated upon the successful implementation of the Management contract its signing was a condition of Credit effectiveness. The Manager was to be requested, in addition to reorganizing all the core AWSC technical, commercial, financial and human resources development functions, to identify, prepare, implement and supervise the capital expenditure program (CAPEX) described above.
- *Technical:* the MWWP objectives mostly focused on improving the permanence of the water supply service, improving the bacteriological quality of the water distributed, metering water consumed by customers and saving energy.
- *Financial:* the submission of a proposal for restructuring AWSC balance sheet in application of GOA Law on Debt Forgiveness to IDA and the Manager was also a condition for Credit effectiveness. Because of AWSC fragile financial situation, the PAD suggested that the Bank jointly reviewed with AWSC: (i) AWSC financial performance, including revenues and expenditures for the preceding and

following semesters, on a semi-annual basis; (ii) AWSC financial projected performance for the following two years on the basis of forecasts prepared by AWSC, on an annual basis; and (iii) steps to be taken, including but not limited to tariff increases and improved collections to ensure adequacy of revenues and planned subsidies to meet projected financial requirements. Neither the 2004 DCA nor the 2008 Project Agreement (PA) covenanted these regular reviews.

21. *Lessons from Earlier Operations in Armenia.* The PAD discussed the “strategic” choices that were made during preparation of the MWWP, namely: (i) the appointment of a private professional operator to manage AWSC operations; (ii) the support to AWSC as a WW utility company with a national coverage, rather than to a series of municipal WW utility companies carved out of AWSC service area, as was the case for the three companies of Gyumri, Vanadzor and Armavir; and (iii) an initial focus on water production and distribution and wastewater collection in medium and small towns while limiting activities to bulk supplies to villages. The PAD also listed several lessons learned from the successful implementation of the MDP and urban WW projects worldwide, such as:

- Building the ownership by the end-borrower (AWSC), Ministry of Finance and Economy (MOFE), CMU, participating municipalities, AWSC staff and the community at large;
- Ensuring readiness of construction components of the project to avoid implementation delays;
- Ensuring availability of counterpart funds of 10 percent of contract costs net of tax; and selecting the Manager after a competitive process for achieving transparency and optimum pricing.

22. *Lessons from Similar Operations in other Countries.* Bank financed urban WW projects usually aim at improving the financial performance of WW utility companies by including in the legal documents financial covenants adapted to the issues to be addressed and by closely following-up on their compliance during implementation. The legal documents for the MWWP did not include covenants to cause AWSC gradually: (i) generating sales revenues to first cover its operation and maintenance (O&M) costs and later its capital costs; (ii) reducing its heavy reliance on explicit and implicit subsidies; and (iii) limiting the accumulation of customer arrears.

23. *Adequacy of the Government’s Commitment.* The GOA strong commitment to reforming the WW sector was demonstrated under the MDP and the preparations of the MWWP and YWWP with: (i) the passing of the Water Code; (ii) the creation of the SCWE; (iii) the transfer of responsibility for resetting WW tariffs and monitoring performance of operators to a semi-autonomous regulatory body (PRSC); (iv) the successful implementation of the initial YWSC Management contract; (v) the willingness to replicate this PPP model to the AWSC and the three independent WW utilities supported by KfW; and (vi) the decision to finance the Lease contract in Yerevan from the tariff rather than from external sources, as is the case for the above mentioned Management contracts. Also the GOA capacity to efficiently implement WW projects was demonstrated under the MDP, whose outcome was rated “satisfactory”.

24. **Assessment of Risks and Mitigation Measures.** The 2004 PAD identified a wide range of risks to PDOs and component results. Overall the MWWP risk was rated “substantial”.

- *From outputs to objectives.* The risk of a lack of support in a consistent and coordinated manner of the WW sector, identified as the main risk to PDOs, was rated “negligible” because of SCWE leadership in the successful Yerevan Management contract under the MDP was expected to continue.
- *High risks from components to outputs.* The non-payment of WW bills by residential customers was considered a “high” risk to be mitigated through incentives included in the Management contract under the form of bonus linked to the collection performance.
- *Substantial risks from components to outputs.* Two risks were rated “substantial”: (i) insufficient allowances for WW expenses in social assistance programs, a risk to be mitigated through a Bank-financed Social Protection Administration project; and (ii) insufficient financial resources for addressing all pressing needs that could result in a major breakdown in the provision of safe water, a risk to be mitigated through a coordination between GOA sector professionals and AWSC Manager.
- *Modest risks from components to outputs.* Among the risks rated “modest”, the PAD listed: (i) a poor support to PPP in WW, a risk to be mitigated by the GOA strong commitment to reforming the sector; (ii) a limited success of the Armenia Social Investment Fund (SIF) in providing WW services in rural areas, a risk to be mitigated through an increase collaboration between SIF and AWSC; and (iii) AWSC incapacity to bear the foreign exchange under the Subsidiary Loan Agreement (SLA) for the IDA Credit, a risk to be mitigated by a transfer back to the MOFE in case foreign exchange variations were deemed unaffordable by AWSC.

25. **Revised Assessment of Risks and Mitigation Measures.** The 2008 PP for the AF identified a set of different risks that took into account the experience gained during the four years of implementation of the initial project:

- *Substantial risk.* The inadequate political support to tariff increases and to institutional and financial improvements of the AWSC was assessed a “substantial” risk to be mitigated by targeted programs aimed at protecting low income households against high water bills.
- *Modest risks.* Possible political influence in the management of the AWSC, the inadequacy of the preparation and approval procedures of annual investment programs, the poor targeting of the latter, the limited capacity of contractors to deliver quality constructions and the possibility of cost overruns were identified as “modest” risks in view of past track records.
- *Low risks.* The dismantling of AWSC, a condition for Credit suspension, and the incapacity of providing counterpart financial contributions were assessed as “low” risks.

26. **Other Potential Risks.** Because neither the 2004 PAD nor the 2008 PP included a financial forecast of AWSC operations, AWSC bankruptcy, as a result of accumulated losses and/or reduction of GOA subsidies was not identified as a risk. Also, despite the outcome of the MWWP being heavily predicated upon the successful implementation of

the Management contract, its early termination – because of poor performance of the Manager, reduced interest of the Manager in AWSC operations or the impossibility of mobilizing external funds to finance it – was not identified as a risk either.

27. *Quality at Entry.*

- *Project preparation.* Project preparation activities focused on the drafting of the Management contract, the selection of the Manager and the identification of the CAPEX to be implemented in the first year of the MWWP. These activities were successfully carried out, as evidenced by the timely mobilization of a reputable Manager after a flawless selection process. In addition to the Management contract, the project was to finance the acquisition of equipment for upgrading AWSC operations and the rehabilitation of existing water production distribution networks connections and meters. The CAPEX identified during preparation for the first year of implementation was indicative, and its exact definition was left to the Manager. The project was also to finance a potentially controversial program aimed at reducing AWSC work force by about 25 percent; consultations with affected parties were held prior to Credit effectiveness, but actual identification of staff to be terminated was left to the Manager.
- *Project justification.* The PAD justified the project by estimating its Net Present Value (NPV) at US\$12.5 million and its Financial Internal Rate of Return (FIRR) at 14 percent based on efficiency gains expected from the Management contract. It also estimated its Economic Rate of Return (ERR) at 11 percent on the basis of energy savings; the impacts of avoided “coping costs”, reduced wastewater overflows or limited water-borne diseases incidence could not be quantified.
- *Affordability.* The PAD mentioned that the MWWP scope and size were based on affordability considerations, and that the rate of increase and restructuring of the tariff over the project period had taken into account the impact of the water bill on household budgets, estimated to be in the one percent range. The PAD addressed the affordability issue mostly by proposing the subsidization of the installation of residential meters for poor households and the establishment of a two-block tariff for metered consumption and the elimination of fixed fee for poor households.
- *Financial Covenants.* The PAD highlighted AWSC weak financial situation by providing a summary of its income statements for FY2001 to 2003 and commenting on its revenues, O&M expenses and liabilities. But, it did not include a medium-term forecast of AWSC income and cash flow statements and balance sheet, as is standard practice for WW projects implemented by revenue earning utility companies (OMS 2.20). The PAD listed however a series of assumptions with the main objective of estimating the project NPV and FIRR.
 - The PAD proposed that “*any change in the level or structure of tariffs will be implemented in accordance with Armenian legislation, including with previous recommendations by the Management contractor – as recommended by the PPIAF study – financed regulator study*” that was however not translated in a covenant in the legal documents. In the absence of discussion of procedures to be followed by the Regulator for resetting tariffs, such a proposal was rather meaningless.

- Both the PAD and the legal documents mentioned an on-lending of the IDA Credit by MOFE to AWSC on its exact same terms including a transfer of the foreign exchange risk to AWSC. The rationale for lending to a WW utility company whose 2003 sales revenues and actual collection of water bills were respectively 68 and 40 percent of its operating expenses was not very clear as AWSC would be able to repay the loan to the GOA only if receiving subsidies from the GOA.
- The PAD proposed a covenant whereby “*MOFE will provide funds required by the AWSC for: (i) operating subsidies to cover all cash needs which cannot be covered by collected revenues, including but not limited to expenses for O&M, social security payments, VAT and other taxes, environmental charges and debt service; (ii) local counterpart financing of the MWWP costs; and (iii) any import duties, VAT and other taxes on MWWP investments (goods, works and services). The operating subsidies will be recommended by the Management contractor, approved by the Contract Management Board (CMB), adopted by the GOA and included in its annual budget*” that was not translated in the legal documents. If the PAD mentioned that the AWSC was expected to break even, i.e., to cover its cash operating expenses from its cash collected revenues in 2009, the legal documents did not include a covenant on the evolution of AWSC working ratio and accounts receivable.

2.2.Implementation

28. Implementation by Component. Table 1 below summarizes activities financed by the MWWP.

Table 1: Summary of Project Costs by Main Components

		Credit 3893-AM		Credit 4514-AM		Total	Percent
		Original US\$ million	Revised US\$ million	Original US\$ million	Revised US\$ million	Actual US\$ million	%
A	AWSC Management		10.61		9.68	20.29	39%
	PPF	1.20	1.33			1.33	
	Management contract	7.68	8.33	6.31	8.52	16.85	32%
	CMU	0.86	0.95	1.27	1.16	2.11	
	Preparation of a Lease Contract			0.65			
B	AWSC Investments		2.96		4.26	7.22	14%
	General Assistance	0.60	0.78	4.90	3.27	4.05	
	Redundancy Program	0.46	0.25			0.25	
	Training	0.18	0.12	0.57	0	0.12	
	Chem. and Bact. Lab.	0.22	0.27	0.50	0.53	0.80	
	Meter Testing Lab.	0.22	0.21			0.21	
	Meter Revolving Fund	0.55	0.35			0.35	
	Assistance to Condominiums	0.21	0.18	0.40	0.46	0.64	
	Incremental AWSC expenses	0.88	0.80			0.80	
C	Invest. in Branch Systems		12.49		11.96	24.45	47%
	Immediate Program	4.74	5.07			5.07	
	Investments	7.76	7.42	12.21	11.96	19.38	
	Total		26.05		25.90	51.95	100%

29. **Component A: AWSC Management Improvement.** More than US\$20.0 million or 39 percent of the total project cost were devoted to improving AWSC management.

- *Management contract.* Out of it, a total of almost US\$17.0 million was paid to the Manager between end 2004 and end 2011, of which US\$14.5 million, or 85 percent, in fixed fees and US\$2.5 million, or 15 percent, in performance bonus. The Manager initially provided a team of 10 expatriates; at the end the project the Manager's team included an expatriate General Director (also member of AWSC Board of Directors) who had been in place since the beginning of operation, and three Armenian senior staff. Throughout project implementation, the Manager has received back office support from its headquarters, but this was not formally monitored.
- *Support to the Contract Monitoring Unit (CMU).* This subcomponent financed the operating costs of the CMU, including staff salaries, project audits and the purchase of equipment (software, hardware).
- *Preparation of the Lease contract.* This component was eventually financed by an EBRD grant.

30. **Component B: AWSC Investments.** About US\$7.0 million or 14 percent of the total project cost were used to for AWSC investments.

- *General assistance and AWSC incremental expenses.* This subcomponent financed the purchase of equipment, machinery, vehicles and chlorine for AWSC operations.
- *Redundancy program and training program.* About 610 employees were terminated during the first two years of the project; statutory severance packages paid eventually were lower than what was budgeted. As a result, salaries of the

remaining staff could be increased to encourage performance. AWSC organized training courses at its own cost at the training center established with project funds in Echmiadzin on a wide range of technical and administrative matters. As a result, project funds earmarked for training could be reallocated to other components.

- *Laboratories.* Chemical, bacteriological and meter laboratories were equipped as initially scheduled.
- *Meter revolving fund.* About 60,000 meters were installed under the MWWP and the revolving funds helped finance the supply and installation of about 2,000 meters for low income households.
- *Assistance to condominiums.* While internal networks of residential and commercial buildings are not legally under AWSC responsibility, this sub-component was used to help reduce physical losses by replacing leaking pipes and valves in basements of apartment buildings .

31. **Component C: Investments in Branch Systems.** About US\$25.0 million or little less than 50 percent of the total project cost were used for investments in Branch systems.

- *Immediate investment program.* This sub-component focused on the full rehabilitation of two water treatment plants in Dilijan, the construction of two water reservoirs in Sevan and the replacement of leaky pipes in these two cities.
- *Main investment program.* This sub-component financed the rehabilitation of 10 pumping stations and 13 storage reservoirs and the installation of 221 km of water distribution pipes in the 14 urban areas of Tsakhkadzor, Charentavan, Ashtarak, Aparan, Gavar, Ararat, Yeghegnadzor, Masis, Vedi, Alaverdi, Tashir, Noyemberyan, Stepanavan and Hrazdan. It also financed the purchase of 59 energy efficient pumps and the replacement of 180 km of distribution pipes in other urban and rural areas. Finally this sub-component financed the supply and installation of chambers for residential water meters transferred from private to public land.

2.3. Monitoring and Evaluation: Design, Implementation and Utilization

32. **Design and Implementation.** The 2004 PAD proposed to monitor the improvement of the water supply service through four main performance indicators; the rather complex formula to be used basically consisted in dividing the indicator for the year minus the indicator for the base year by the target indicator minus the indicator for the year.¹ The PAD set improvement objectives, but mentioned that the definition of baseline data would be the responsibility of the Manager. Below is a summary of the objectives:

- *Weighted average of daily hours of drinking water service:* target 24 hours per day; gradual improvement by 30 percent by the fourth year of the Management contract;
- *Metering ratio of individual subscribers:* target 85 percent; gradual improvement by 80 percent by the fourth year of the Management contract;

¹ For example if the baseline data for the number of hours of service was 6, the target number of hours of service was 24 and the number of hours of service in a particular year for the year was 12, the improvement of the service constancy could be estimated at $(12 - 6) / (24 - 6) = 33$ percent.

- *Weighted average of water bacteriological safety compliance*: target 100 percent; gradual improvement by 70 percent by the fourth year of the Management contract; and
- *AWSC working ratio*: target 100 percent; gradual improvement by 68 percent by the fourth year of the Management contract.

33. Revised Indicators. The 2008 PP confirmed that similar service quality improvement indicators would be used to monitor progress under the AF but set clearer targets to be reached by the end of the Management contract such as: (i) a weighted average of 18 hours of water supply service in the AWSC service area; (ii) 98 percent compliance ratio with bacteriological quality standards; (iii) 100 percent metering of individual connections; and (iv) AWSC working ratio of 100 percent. If the bonus payment to the Manager was to be calculated on the basis of the four main performance indicators listed above, the CMU in fact monitored a total of 22 sub-indicators for documenting progress achieved on:

- *Permanence of the water service*: (i) percentage of cities with minimum water hours;
- *Water quality*: (i) percentage of water disinfected;
- *Metering*: (i) percentage of apartment buildings with individual or common block meters; (ii) ratio of bills established on the basis of metered consumption; (iii) ratio of metered consumption to water production;
- *Bill collection*: (i) revenue collected per capita; (ii) residential collection ratio; (iii) percentage of customers with more than four months of arrears;
- *Production and consumption*: (i) production per capita; (ii) metered consumption per capita;
- *Efficiency*: (i) electricity costs as percentage of revenue collected in branches with pumping stations; (ii) staffing ratio per 1,000 subscribers; (iii) staff costs as percentage of collected revenues; (iv) electricity consumption in kWh/year;
- *Operating costs recovery*: (i) average tariff per m³ for metered consumption; (ii) growth of revenue collected from residential customers; (iii) average working ratio for branches with gravity systems; and (iv) average working ratio for branches with pumping stations.

Non-revenue water (NRW), an indicator commonly used for measuring the efficiency of a WW utility company was not one of the performance indicators listed in the Management contract (see discussion on NRW below).

34. Financial Indicators. The above indicators have helped document the excellent progress achieved for improving the reliability and the efficiency of the water supply service.² But reconciling them with data available in AWSC audited financial statements would have provided a more balanced picture of the overall progress achieved for improving AWSC sustainability. In particular, performance indicators monitored could not help raise “red flags”: despite significant service quality improvements, AWSC was not making real progress towards recovering its cash operating costs from its cash collection and was still highly dependent upon the availability of GOA subsidies to survive. Annex 3 gives a rapid

² No indicators were designed for monitoring progress achieved for sanitation and wastewater collection and treatment.

review of AWSC audited financial statements between 2004 and 2010. Audited financial statements for 2011 were not available at the time this PICR was being prepared.

Table 2: Reconciling Indicators from Technical and Financial Audits

		2004	2005	2006	2007	2008	2009	2010
Average Tariff	AMD/m3	100	127	140	140	140	160	180
Billings	AMD mio	3,342	3,863	2,924	2,705	2,863	3,362	3,487
Subsidies and grants	AMD mio	1,064	1,436	1,449	1,667	1,358	1,340	2,174
Other operating revenues	AMD mio	9,137	128	630	157	106	633	649
Total operating revenues	AMD mio	13,543	5,427	5,003	4,529	4,327	5,335	6,310
Subsidies/Total operating revenues	AMD mio	8%	26%	29%	37%	31%	25%	34%
Total operating costs	AMD mio	3,102	4,100	3,920	3,676	4,186	4,799	5,287
Of which Management Contract	AMD mio	0	1,224	818	578	581	780	950
Working ratio (with subsidies)	%	23%	76%	78%	81%	97%	90%	84%
Working ratio (without subsidies)		25%	103%	110%	128%	141%	120%	128%
Collection ratio	%	48%	40%	69%	75%	78%	84%	90%
Collection from customers	AMD mio	1,604	1,545	2,018	2,029	2,233	2,824	3,138
Operating costs/(Collection + Subsidies)	%	116%	138%	113%	99%	117%	115%	100%
Accounts receivable	AMD mio						6,848	7,176
Provision for impairment	AMD mio						4,703	4,939
Net accounts receivable	AMD mio	3,473	3,473	4,611	5,445	2,136	2,145	2,237
Net accounts receivable/billings	days	379	328	576	735	272	233	234
Accounts payable	AMD mio	1,739	1,739	973	1,151	1,426	1,852	2,197
Accounts payable/operating costs	days	205	155	91	114	124	141	152

Legend

Red Flags

Data from Technical Audits

Data from Financial Audits

2.4.Safeguards and Fiduciary Compliance

35. *Environmental Safeguards.* MWWP triggered two safeguard policies: OP/BP 4.01 Environmental Assessment, and OP/BP 4.11 Physical Cultural resources. The project closed with satisfactory performance on the Bank's safeguard policies.

- The 2004 PAD classified the project as environmental Category FI, which was obviously not adequate taking into account the type of activities supported; the 2008 PP rightly corrected this classification to Category B. Individual investments underwent environmental screening and only activities classified as Category B or C were supported under the project. The Environmental Management Plan (EMP) framework developed during project preparation outlined main principles applicable, listed expected environmental issues and their

mitigation measures common to individual investments, and provided guidance on screening, categorization, review, and scoping of the specific environmental work required for handling individual activities.

- The EMP framework was not accurately followed during earlier stages of project implementation: individual investment activities were not screened and classified and site-specific EMPs were not developed. But after this shortfall was flagged by Bank supervision teams, the quality of environmental monitoring of works and related record-keeping improved markedly. Following newly introduced national requirements, an entity licensed for carrying out technical supervision of civil works was commissioned and tracking environmental compliance was an integral part of its terms of reference (TOR). Overall, no major environmental issues were encountered, because of the small scale of works and good construction practice under the MWWP. Issues such as: (i) the maintenance of sanitary zones around head-works and hydraulic structures; and (ii) the handling of existing of asbestos cement roofing materials were addressed satisfactorily.
- OP/BP 4.11 was triggered to safeguard any chance finds may have been encountered during the earth works. No such cases were recorded.

36. Procurement

- *Management contract.* The award of the Management contract was a condition for Credit effectiveness. The Manager was selected after an open bidding process among four prequalified operating companies from France, Germany and Italy. The original Management contract was signed for four years with the possibility of a two-year extension. In fact the MWWP financed the Manager for seven years between end 2004 and end 2011 by reallocating savings on other components. In 2008 the mandate of the Manager was extended to include supervision of projects financed by other financing agencies. A two-year extension of the Management contract until end 2013 to be financed under the MWP has been recently granted after direct negotiations, that benefitted from Bank financed technical assistance, with the incumbent Manager.
- *Construction, goods and consultant services.* The MWWP financed a total of 26 construction contracts (US\$11.9 million), 80 contracts for the supply of goods (US\$17.2 million), and 26 consultant contracts (US\$20.7 million, of which close to US\$17.0 million for the Management contract). A total of 77 contracts were subject to post review and 27 were actually reviewed. All construction contracts value at more than US\$0.6 million and goods contracts valued at more than US\$0.1 million were awarded after International Competitive Bidding (ICB) and subject to prior review. All consultant contracts valued at more than US\$0.1 million were awarded following the Quality and Cost Based Selection (QCBS) procedure.
- *Bank Procurement Supervision.* The Bank carried regular procurement supervisions and rated the “compliance” and “performance” risks as “moderate”. Supervision reports never identified governance issues that could have adversely affected the procurement process.

37. Financial Management. The Bank closely supervised the FM performance of both the MWWP CMU and the AWSC. FM supervision missions have been carried out annually since 2005. Throughout project implementation, FM and counterpart funding, two key Implementation Supervision Report (ISR) indicators have consistently been rated satisfactory (marginally satisfactory for the August 2005, however).

- *MWWP CMU.* Financial management arrangements – including planning and budgeting, accounting, internal controls, funds flow, financial reporting and external audits – have consistently been rated satisfactory. The level and timeliness of GOA co-financing have also been satisfactory. The financial management reports (FMRs) were received on time and mostly acceptable to the Bank. The auditors expressed unmodified (clean) opinions of the project’s financial statements (also received on-time) and raised no major issues in their management letters. The CMU internal controls were adequate. The controls over operating expenditures were also regularly reviewed and found to be adequate.
- *AWSC.* The restructuring of AWSC balance sheet aimed at shielding the company from debt accumulated prior to the Management contract was finally resolved in May 2008. Auditors have issued the following opinions on the AWSC financial statements: (i) unmodified (clean) opinions for 2009 and 2010; (ii) qualified exceptions for 2007 and 2008; (iii) qualified disclaimers on 2005 and 2006. Audit reports have usually been received by due dates. In their latest report available (May 2011) auditors expressed “*doubt about the ability of AWSC that had accumulated large financial losses in recent years, to continue as a going concern*”. In June 2011 the Bank, that systematically emphasized weaknesses identified in audit reports while acknowledging their receipts, specifically requested the preparation of a time bound action plan for implementing the recommendations of the auditor’s management letter of May 2011. This action plan was not available for review at the closing of the MWWP. Also, the PAD for the follow-up MWP does not include a summary of AWSC past audited financial statements and a forecast of its likely future financial situation.³
- *Financial Covenants.* AWSC has been in compliance with the financial covenant of not incurring any debt, unless its net revenues are at least 1.5 times its estimated maximum debt service requirement for any succeeding fiscal year. But, as already mentioned, this was possible only because operating subsidies regularly extended by the GOA.

³ In a Sector Development Policy Letter of 2011, the GOA commits to increasing tariffs by 2014.

2.5. Post-completion Operation/Next Phase

38. *The Future of the Management Contract.* The Management contract that started in October 2004 and ended late in 2011 has significantly improved the quality of the WW service and succeeded in changing AWSC corporate culture. It has recently been extended until end 2013 and is now referred to as an “Enhanced Management Contract – EMC” that mandates the Manager to prepare a “Total Management Plan – TMP” for AWSC in addition to managing the company. The Municipal Water Project (MWP) approved in February 2012 will finance this extension. Altogether the Management contract would have been supported by external financing for a period of nine years.

39. *The Lease Contract Option.* The GOA, eager to pursue its successful PPP experience, envisaged evolving the Management contract into a “Lease” contract similar to what has been successfully implemented in Yerevan since 2006. But AWSC poor financial situation and limited future cash generation capacity have caused this move to be postponed. In a Lease, collections would have to be sufficient to cover the Operator’s costs, including that of its foreign professional partner, and to generate cash surpluses to service the debt and contribute to the CAPEX. Also, because the Operator would take the operational and commercial risks, its shareholders would have to finance the working capital. The feasibility of a Lease contract for AWSC operations would greatly depend upon future GOA tariff, subsidy and financing strategies, as discussed below.⁴ If the GOA decides to move towards a Lease contract, it would be highly beneficial to transform the AWSC into an Asset Holding Company (AHC), owner or concessionaire of the WW fixed assets and responsible for the financing of their development. The AHC would be the signatory party to the Lease and the end beneficiary of funds made available to the GOA by its international partners and would issue consolidated financial statements of the WW operations.

40. *Tariff Strategy.* Before deciding on the PPP to be implemented after 2013, the GOA should first clarify if the WW tariff to be charged to AWSC customers would eventually be set to generate revenue sufficient to: (i) simply cover O&M costs; (ii) cover O&M costs, contribute cash to the CAPEX and cover loan principals and interests; or (iii) cover O&M costs, depreciate fixed assets and yield a return on assets to cover interest on debt and return on equity invested.⁵

41. *Subsidy Strategy.* The customer “willingness-to-pay” and the GOA “willingness-to-charge” are likely to set the upper limits to future tariff increases. The GOA may be unwilling to charge customers living in small towns and villages a much higher tariff than that applying in Yerevan, where households are reported to have much higher incomes. Addressing the “equity” objective of WW pricing raises the issue of uniformity of the WW tariff throughout the country and thus that of the rationale for having several utility

⁴ There are examples of Leases successfully implemented in cases where tariffs were originally insufficient to cover O&M costs: the best documented one is that of the Guinea (Conakry) Lease that started in 1989 (with SAUR and Veolia as foreign partners of the locally incorporated Lease Operator). The Guinean Government agreed to gradually increase the Customer tariff from a level sufficient to cover only about two thirds of O&M costs to a level sufficient to cover O&M, depreciation and financing costs over a ten-year period.

⁵ These three options are usually translated in financial covenants of Bank Loans or IDA Credits.

companies providing the WW service. It also raises the issue of subsidies, ideally to be transparent, targeted and time limited, three criteria that are not met by operating subsidies currently extended to AWSC. When it comes to the design of subsidies and cross-subsidies, there are several successful, or less successful, examples the GOA could look at before deciding which arrangements would best serve its objectives.

42. *Financing Strategy.* Current estimates for the future CAPEX outside of Yerevan are in the range of US\$1,000 million for the coming 20 years, of which about US\$75 to US\$100 million for the coming five years. So far, AWSC has been able to secure financing for a total of about US\$140 million from various financing agencies, of which a total of US\$58 million from the Bank, including the recently approved MWP. In the absence of significant GOA budget contributions and commercial debt financing in local currency on terms adapted to the WW sector, which depreciates its assets over long periods, the rehabilitation and renewal of AWSC infrastructure is likely to remain highly dependent upon the availability of external financing in the near future.

- *AWSC borrowing.* AWSC, which does not yet recover its operating costs from collected user charges and is, according to the latest available audit report, at risk of bankruptcy should not be allowed to borrow until it generates cash surpluses from sales revenues and it has been recapitalized to make up for its large accumulated losses. Until this has happened, GOA financing to AWSC should preferably be extended on grant terms.
- *Foreign exchange risk.* AWSC that generates revenues in AMD cannot bear the foreign exchange risk: heavily regulated WW sectors have faced major financial crisis when having to cope with rapid or brutal foreign exchange variations, as was the case in Argentina in the early 2000s. When the GOA raises funds in foreign currencies, it should preferably on-lend them to AWSC in local currency, and add a premium on the interest rate (when AWSC is allowed to borrow) for mitigating the foreign exchange risk.
- *Affordable CAPEX and financing plan.* AWSC challenge is to identify a medium-term CAPEX that would be affordable taking into account constraints set by: (i) politically acceptable tariff increases; (ii) realistic future efficiency gains; (iii) limited debt servicing capacity; and (iv) GOA limited resources for grant financing. This can only be done by regularly updating a detailed financial forecast of AWSC operations.

43. *Non-Revenue-Water Reduction Strategy.* The PAD mentioned the abnormally high level of unaccounted-for water (UfW), a notion now replaced by that of non-revenue water (NRW), a legacy of wasteful past practices. Neither the PAD nor the Management contract specifies NRW reduction targets either. The CMU Implementation Completion Report (Annex 6) mentions that water losses (NRW) evolved from about 74 percent in 2004 to 83 percent at end 2011. The NRW increase under MWWP does not translate a deterioration of the performance: (i) physical losses increase proportionally to the duration of the service; and (ii) expressing NRW as a percentage of the production is often misleading when consumption decreases as a result of successful demand management programs based on

metering and pricing.⁶ AWSC estimates that half of NRW is due to physical leaks, and half to commercial losses. i.e., faulty individual meters and water theft through illegal connections.

- Limiting physical losses on the public distribution network would require the gradual replacement of aging and poor quality distribution pipes, a very large investment that may not be economically justified, now that energy consumption has been significantly reduced by substituting gravity water sources to pumped ones.
- Limiting physical losses located on internal distribution networks of apartment buildings would require a revision of the condominium legislation, an action that is probably beyond what public and private parties involved in the WW sector could achieve.
- In the absence of an updated condominium legislation, limiting commercial losses would require replacing all existing poor quality meters located in each unit of apartment buildings and currently belonging to customers by accurate anti-magnetic class C meters preferably with remote reading equipment that would then be the property of the WW utility company; this is probably a project that could be carried out by AWSC.

Reducing NRW to internationally accepted levels of 20 percent and below may not be a realistic objective in the medium-term for AWSC, and before deciding on the next PPP model, it would be beneficial to develop a NRW reduction strategy justified by further energy savings and potential environmental gains for “managing expectations” of all parties.

3. Assessment of Outcomes

3.1.Relevance of Objectives, Design and Implementation. Rating: Moderately Satisfactory

44. **Objectives.** The original PDOs of improving the quality of the water supply service provided to customers and AWSC sustainability remain relevant in 2012. Increasing hours of water service, improving drinking water quality, achieving greater operating efficiency, improving customer relations, are still very high on the GOA agenda. The PDO for the MWP approved in 2012 is still “*to support improvement of the quality and availability of water supply in selected service areas of the AWSC*”. Other objectives pursued by the original MWWP of “*increasing cash generation through reform of billing and collection and closer alignment of service tariffs*” are also relevant, but they are not listed in the PDOs of the MWP.

45. **Design.** The original project design remains relevant for future support to AWSC activities. Injecting know-how by a professional Operator placed in line positions for changing the culture of a WW utility company and linking part of its remuneration to the performance of the company obviously has to be continued, either under a Management or under a Lease contract. Also, engaging an independent technical auditor for monitoring the

⁶ It is preferable to express NRW in liters per day per connection or liters per day per km of distribution pipe.

performance of the Manager or Operator provides guarantees that data available are reasonably accurate.

However, financing a Management contract from an external source creates an unhealthy “dependency” situation: the MWP has recently been approved primarily for avoiding a gap in the financing of the Management contract. The MWWP should have set a clear deadline for ensuring the coverage of the Manager’s costs from sales revenues. Also, by focusing exclusively on technical indicators and by not reconciling the latter with data available from audited financial statements (Table 2), the monitoring of the progress achieved by AWSC could not be comprehensive and red flags could not be raised timely.

46. *Implementation.* The MWWP implementation arrangement remains relevant to future projects with AWSC. AWSC should remain fully responsible for identifying, justifying, preparing and implementing rehabilitation projects; it could also become responsible for paying contractors. If the GOA decides to evolve the PPP into a Lease contract and evolve the role of AWSC into that of an AHC, it would then be necessary to clarify the breakdown of responsibilities between the AHC and the Lessee when it comes to implementing the CAPEX.

3.2. Achievement of Project Development Objectives. Rating: Moderately Satisfactory

47. *Quality of Service Improvement Objective.* The project objective of improving the quality of water supply service has been achieved, and sometimes exceeded:

- *Constancy of water service.* The weighted average of daily hours of drinking water services increased from 6.0 hours at end 2004 to 15.0 hours at end 2011, a figure to be compared with a target of 15.0 hours set in the Management contract for the latter date. 94 percent of cities and towns in AWSC service areas now receive minimum hours of service (end 2011 target was 90 percent).
- *Bacteriological water quality.* The percentage of water samples in compliance with bacteriological safety requirements increased from 93.8 percent in 2004 to 98.2 percent in 2011 (end 2011 target was 98.1 percent).
- *Metering ratio.* The percentage of individual subscribers billed on the basis of metered consumption increased from 40.2 percent in 2004 to 82.2 percent in 2011 (end 2011 target was 77.8 percent).

The achievement of this PDO can thus be rated highly satisfactory.

48. *Sustainability Objective.* Even if AWSC debt service coverage ratio covenant has been complied with, no significant progress has been made on achieving the objective of improving its sustainability. Estimates of the NVP and FIRR of future AWSC cash flows, using the total project cost as outflow and the total of collections and operating subsidies as inflows are of minus US\$3.6 million for a discount rate of 12 percent and minus six percent respectively. Appraisal estimates were plus US\$12.5 million and plus 14 percent respectively. As the NPV and FIRR of the project are good indicators of the sustainability of AWSC operations, the achievement of this PDO is rated unsatisfactory.

49. As highlighted in Annex 3, AWSC still relies heavily of GOA subsidies to cover its operating and management costs.

- Throughout the project period AWSC has received subsidies that represented about 30 percent of its total revenues. In 2010, for meeting its cash operating expenses from its collection, AWSC would have needed billings – and thus an average tariff – about 50 percent higher than what it achieved.
- AWSC accounts receivable equivalent to about 205 days of billing as of end 2010 resulted from a combination of improved collection performance from 48 to 90 percent between 2005 and 2010 and a provision for impairment of receivable.
- Because of increasing accumulated losses AWSC equity has been eroded from the equivalent of US\$56.3 to 2.6 million between 2004 and 2010. AWSC that has been able to mobilize about is a highly leveraged company with a ratio of total liabilities to shareholder equity that increased from 1.0 in 2005 to 11.1 in 2010.
- In their 2010 report, the Auditors mentioned that “*it is possible that the Company’s total liabilities will exceed total assets at year end of 2011*” a matter the “*may cast significant doubt about the Company’s ability to continue as a going concern*”. The time bound action plan requested by the Bank was not available at the time of closing of the MWWP. Obviously AWSC is at risk of defaulting on its loan payments in the near future.

50. Overall the efficacy of the project is rated moderately satisfactory on the ground that both PDOs, i.e., service quality improvement and AWSC financial sustainability were given an equal weight in the PAD and PP.⁷

3.3.Efficiency. Rating: Satisfactory

51. **Economic Benefits.** The PAD anticipated reduced energy consumption, time saved fetching water, avoided coping costs and reduced incidence of water borne diseases as the main economic benefits of the project. A comprehensive estimate of the project ERR could not be carried out because of the lack of quantitative data on the situation, costs and monetized benefits at the beginning and completion of the project.

- *Energy savings.* Overall electricity consumption was reduced by 40 percent between 2004 and 2010; assuming that investment in Branch systems (a total of US\$24.45 million) were mostly designed to save energy, the NPV of this project component can be estimated at US\$0.8 million for a discount rate of 12 percent and the ERR at 14 percent. These figures are likely to be on the low side, as not all investments in Branch systems were directly targeted at saving energy.
- *Improved commercial operations.* The main quantifiable economic benefit of the Management contract, for which US\$16.85 million have been invested, has been the improvement of the commercial operations evidenced by increased collections from customers and thus a reduced need for operating subsidies. Assuming that the collection ratio would have remained at its original 42 percent without the

⁷ If the “quality of service” objective is rated “highly satisfactory” and given a 6, and the “sustainability” objective is rated “unsatisfactory” and given a 2, the average efficacy rating can be estimated to be $0.5 \times 6 + 0.5 \times 2 = 4$ equivalent to a “moderately satisfactory” rating.

Management contract, the NPV of this component for a 12 percent discount rate is estimated to be just about zero and the ERR 12 percent

- *Time saving.* The PAD estimated that the equivalent of one person-hour per day per household was spent fetching water at the beginning of the project. While improved quality of the water service is likely to affect all customers, those who were relying on standpipes and were connected under the project are likely to have benefitted most. However, this benefit is likely to be pretty low in monetary terms.
- *Coping Costs.* The PAD suggested that improved quality of service and water quality would reduce household coping costs, related to booster pumps, individual storage tanks, household disinfection equipment, water boiling or purchase of bottled water. While these objectives have largely been achieved, available data do not allow concluding on the value if coping costs avoided.
- *Reduction in Incidence of Water Borne Diseases.* The end-line sociological report (Annex 5) mentions that water borne diseases affected 1.5 percent of households in 2011, a figure to be compared to two percent before 2006. This economic benefit could however not be valued.

3.4. Justification of the Overall Outcome Rating

- Overall rating: Moderately Satisfactory
- Relevance: Moderately Satisfactory
- Achievement of the PDOs: Moderately Satisfactory
- Efficiency: Satisfactory

52. Overall, the project outcome is rated moderately satisfactory, based on the mix of ratings for relevance, efficacy and efficiency justified above.

3.5. Overarching Themes, Other Outcomes and Impacts.

53. The subsidization of installation cost of residential meters was the MWWP only component specifically targeted at improving the WW service to low income households and reducing the burden of water expense on their budgets. It was successfully implemented and about 2,000 households did benefit from this financing scheme.

54. The project did include any activity aimed or at addressing specific gender issues. It may be noted however that women, who traditionally are the main users of water for carrying out domestic tasks and responsible for coping with a poor water service are likely to be the main beneficiaries of a project that essentially focused on improving the reliability of the water service

3.6. Summary of Findings of Beneficiary Survey

55. The beneficiary survey of December 2011 (Annex 5) collected data from a representative sample of 400 households in 14 primary sampling units representing regional cities covered

by the project. Overall, 74 percent of the respondents thought that the management of the WW service improved between 2004 and 2011, 21 percent said that it remained the same and five percent believed that it worsened.

- *Constancy of the water supply service.* 76 percent of households reported an improvement in the constancy of the service since 2004, against 18 percent that said that it remained about the same. 42 percent of customers reported a service of 21 to 24 hours per day and still 46 percent a service of less than 12 hours per day. There was a difference between household expenditure quartiles: average of 13.4 hours for the lower quartile vs. 15.9 hours for the higher quartile.
- *Water quality.* All categories of customers mentioned a perceived improvement of the water quality. The survey highlighted a modest increase of consumption of bottled water between 2004 and 2011, mostly in case of perceived bad quality of piped water. However, 80 percent of respondents mention that they never purchase bottled water.
- *Customer service.* 43 percent of customers expressed their satisfaction with the response time to problems signaled to AWSC, a noticeable improvement over the 2004-2011 period
- *Tariff.* While 43 percent of households considered that the current level of the water bill was adequate, 40 percent considered it to be “rather high” and 17 percent “very high”, even if it represents only a small fraction of household budgets: (i) lower quartile: average monthly bill AMD1,537 for a household of 4.3 people (US\$3.9/month/household), or about 1.9 percent of the total monthly household spending; (ii) higher quartile: average monthly bill AMD1,775 for a household of 2.7 people (US\$4.5/month/household), i.e., only about 0.6 percent of the total monthly spending.

4. Assessment of Risk to Development Outcome

- Rating: Substantial

56. **Technical.** This risk is rated moderate. The MWWP mostly supported the rehabilitation of existing WW facilities, the establishment of good operating practice and the improvement of commercial operations and customer services with the main objectives of reducing production and distribution costs and increasing sales revenues. The risk that future construction activities be not focused on a similar agenda is low because the MWWP succeeded in changing the culture of the company. However future progress is linked to GOA capacity to pursue a PPP option: the risk of having to terminate the Management contract because of shortage of external funds is substantial until AWSC operating revenues are sufficient to finance it and the Manager is comfortable with associated risks, such as the foreign exchange risk.

57. **Financial.** This risk is rated substantial. AWSC still is highly dependent on GOA operating subsidies to survive and external funds to finance its Manager. A major tariff increase should be considered just to cover operating costs from collection. Future major

tariff increases would have to be considered once an agreement has been reached on the future pricing and financing strategies of the WW sector. At the completion of the MWWP, it is not clear how the GOA would address these issues. Further efficiency gains for increasing billing, collection and reducing operating costs would not be sufficient to improve AWSC financial situation.

58. **Economic.** This risk is rated substantial. The economy of the WW sector may need to be reassessed now that the culture of its key actors has changed and that significant operational progress has been achieved by the various PPPs. The key issue to be addressed should obviously be: how to finance future WW programs? Key parameters to be taken into account should be: (i) principles for resetting tariff levels and structures; (ii) the uniformity or disparity of WW tariffs between Yerevan, secondary cities and villages; (iii) the rationale for geographical cross-subsidies and as a consequence for operating several WW utility companies; and (iv) the “affordable” mix of cash generation, long-term debt and development grants for financing the “affordable” CAPEX.

59. **Social.** This risk is rated substantial. Even if there are some examples within AWSC service area of tariff adjustments that have recently been possible after the quality of service improved, and even if Annex 5 shows that household WW expenses are currently below the usually accepted threshold of four percent of the total household spending, major tariff increases are likely to face significant resistance: almost 60 percent of respondents to beneficiary surveys mentioned that the tariff was already “rather high” or “very high”. An issue to be addressed rapidly is the design of targeted subsidies for protecting low income households against high WW bills.

60. **Political.** This risk is rated moderate. Even if reaching a consensus on pricing, subsidies and financing strategies among the many stakeholders involved in the WW sector is likely to be a complex exercise, the already mentioned cultural change introduced by the MWWP is unlikely to be overturned, even in case of major political changes.

61. **Environmental.** This risk is rated moderate. Activities aimed at limiting energy and water consumptions can only have a beneficial impact on the environment. However the unusually high water consumption and NRW levels in most cities affect the proper operation of wastewater treatment plants because they translate into low concentration of the effluents discharged.

62. **Government Ownership.** This risk is rated moderate. Even if the GOA has hitherto taken major steps for modernizing its WW sector, there is always a risk that a government ideologically opposed to PPP in the provision of an essential public service decides not to extend the Management contract or not to evolve it into a Lease contract with an “expensive foreign operator”. Successful PPPs implemented in similar situations have usually been based on a gradual transfer of managerial responsibilities to local staff and of partial ownership of the operating company to local private interests. It is felt that even if the GOA opts for not extending the PPP experience, the cultural change introduced by the latter is likely to have a long lasting effect, even if financial incentives may no longer be the main engine for improving performance.

63. **Other Stakeholder Ownership.** This risk is rated moderate. The service quality improvements achieved by the MWWP have been heavily predicated upon the good performance of the PPP and in particular that of AWSC Manager. As long the Management contract can be financed, the Manager is likely to remain in business. But as already mentioned the dependency upon external funds to finance operating costs has become addictive and thus unhealthy.

64. **Governance.** The risk is rated moderate. The decision to extend the Management contract or to evolve it into a Lease contract would have to be taken soon after consultation with all stakeholders, including potential private partners. The procedure to be followed for selecting the future private partner would also have to be agreed upon at that stage. If an open bidding process is likely to be acceptable to most parties, it always carries the risk of having to select an operator with limited experience or interest in the operation, simply because it submitted the lowest bid. Direct negotiation with a preferred partner is an option that should not be discarded; it would however require a mechanism for ensuring transparency and fairness of the process. Reducing petty fraud by customers (manipulation of meters) and petty corruption by service provider agents (manipulation of meter readings) could be achieved by the combination of improved technology (anti-magnetic class C meters equipped with remote reading equipment) and contractual implicit or explicit incentives to increase billing and collection.

65. **Natural Disaster Exposure.** The risk is rated moderate, even if the country is located in a highly seismic area.

5. Assessment of Bank and Borrower Performance

5.1. Bank Performance

- Rating: Moderately Satisfactory

66. **Bank Performance: Quality at Entry.** There was no Quality at Entry (QAE) Panel for this project held after appraisal. At completion the QAE can be rated moderately satisfactory. If the Bank opted for supporting a simple and well-focused project and a PPP model that was well adapted to issues to be addressed, it twice missed the chance of putting the AWSC on the path of financial sustainability by not preparing financial forecasts of its operations and by selecting inadequate financial covenants. The project closes with an AWSC that is highly dependent on operating subsidies and has no clear action plan for moving towards financial sustainability.

67. **Bank Performance: Quality of Supervision.** A Quality of Supervision Assessment (QSA) Panel carried out in 2006 rated the overall Bank supervision effort as “satisfactory” and the adequacy of supervision inputs and processes as “highly satisfactory”. This Panel

also rated the QAE “satisfactory”. At completion, the QSA can be rated moderately satisfactory. Indeed, the Bank: (i) ensured that AWSC delivered quality construction on time and within budget and complied with fiduciary and safeguards requirements; (ii) issued well documented aide memoires with detailed annexes on procurement, financial management and environmental protection issues; and (iii) provided a highly valued assistance to the implementing agency. But the Bank supervision effort should have been strengthened by the regular updating of medium-term forecasts of AWSC financial statements to help identify potential up-coming problems and help support requests for tariff adjustments or equity injection in the Company.

5.2.Borrower Performance

- Rating: Moderately Satisfactory

68. The Borrower performance is rated moderately satisfactory. Even if the GOA was able to implement a reform of WW operations outside of Yerevan and deliver a quality project on time and within budget and to comply with fiduciary and safeguards requirements, it is partially responsible for not taking actions for putting AWSC on the path of financial sustainability.

6. Lessons Learned

6.1. Positive Lessons

There are several positive lessons that can be drawn from the design and implementation of the MWWP.

69. *Government Commitment.* As earlier mentioned in the PICR of the MDP, the GOA commitment to reforming the WW sector proved to be the key factor for the successful aspects of the project. The last Bank supervision aide-memoire (December 2011) highlighted that political support has been present at all times during project implementation. The SCWE, the key stakeholder in the WW sector, considers that Armenia, a country where most WW services now are operated under three different PPPs, is becoming a model for the region.

70. *Quality of the Manager.* When the outcome of a WW project depends highly upon the performance of the Manager of the utility company that implements it, it is essential to: (i) mobilize a reputable international operator; (ii) ensure that the conditions of the Management contract are acceptable to all stakeholders; and (iii) establish a true “partnership” between public and private parties. The MWWP has achieved these three conditions. The Bank last supervision aide-memoire noted that:

- The MWWP objective of establishing a partnership between the GOA and a private operator for improving service quality and transferring knowledge has been successfully met: institutional capacity has been built for enabling local staff to operate AWSC in the future, as well as other Armenian WW utility companies;
- The most important achievement of the MWWP has been to provide WW services to a population that had lacked them for more than twenty years, a result that could have not been achieved without the partnership with the Manager; and
- The MWWP has succeeded in developing the capacity of the PMU to monitor performance of WW utilities and to become a GOA unit able to identify and prepare future PPPs and interact with private partners in other sectors.

71. *Autonomy of the Manager.* The last supervision aide-memoire also noted that a key element of the successful PPP has been the autonomy and independence granted by the GOA to the Manager, even if monitoring and control functions still have to be strengthened to cause the latter meet its contract obligations. This Manager was able: (i) implement an independently designed investment plan; (ii) take some commercial risk; and (iii) properly manage financial resources available and even to contribute some working capital.

72. *Partnership with the Bank.* The quality of the partnership between the public and private partners and the financing institution(s) that support it is essential for ensuring achievement of the PDOs. The decentralization of Bank supervision responsibilities, in particular that related to procurement, financial management and environmental protection has proven to be highly beneficial. The locally based Bank team has played a key role in ensuring that Bank guidelines are properly understood, and complied with.

6.2. Other Lessons

There are several other lessons that can be drawn from the MWWP experience.

73. *The Bank should act as a Bank.* PADs for WW projects implemented by revenue-earning utility companies should answer two key questions in the following order: (i) who are we lending to? and (ii) what are we lending for? The 2004 PAD and 2008 PP provided a sufficiently clear answer to the second question by justifying the project with estimates of its NPV and ERR. In order to fully answer the first question, it would have been necessary to prepare a realistic medium-term financial forecast of AWSC operations, agree on an action plan for gradually moving towards recovery of O&M costs (and later capital costs) phasing out operating subsidies, maintaining accounts receivable to a reasonable level and ensuring sufficient funding of the Company and to covenant it in a PA. A PAD should also clearly identify issues, propose solutions to address them and ensure full consistency between its content and that of the legal documents; as highlighted above, there were several inconsistencies between the MWWP PAD and its legal documents.

74. *Tailoring Financial Covenants to Issues to be addressed.* The Bank last supervision aide-memoire (December 2011) rightly noted that GOA still had to make significant progress to allow tariff adjustments and AWSC recover its O&M costs from sales revenues, reduce its dependence on operating subsidies and become a sustainable utility company. Obviously, requesting AWSC, a public company that should have not been allowed to borrow in the first place, to comply with a debt service coverage covenant was unlikely to help achieve these objectives. Adapted covenants should have been included in the legal documents to cause GOA and AWSC: (i) generate sales revenues sufficient to gradually recover operating costs by increasing tariffs; and (ii) limit accounts receivable by further improving collection performance and allowing provisions for unrecoverable arrears.

75. *PDOs should be more Strategic.* The performance of a WW service eventually has to be assessed against reliability, efficiency, financial and environmental sustainability and affordability criteria.

- *Reliability:* the MWWP made good progress at improving the reliability of the WW service and there is no doubt that it is its major achievement;
- *Efficiency:* the MWWP made progress at reducing energy consumption and the staffing ratio and improving the metering and collection ratios, but with NRW above 80 percent, it cannot be claimed that AWSC is yet an efficient water operation;
- *Financial sustainability:* the MWWP obviously failed on this criteria – even in its most restrictive definition of recovering O&M costs from sales revenues – primarily as a result of inadequate design and selection of financial covenants;
- *Environmental sustainability:* the MWWP did not really address this issue beyond managing water demand through metering and reducing energy consumption; in particular, the MWWP did not attempt to address wastewater collection and safe disposal issues; and

- *Affordability*: the MWWP addressed this issue by putting in place a revolving fund for residential meters and by maintaining WW tariffs at below cost recovery level.

The MWWP illustrates well the inadequacy of the “common sense” approach that consists in first improving the quality of service and asking customers to pay cost recovery tariffs only when the service has improved. The quality of service has indeed improved in AWSC service area, but it is unlikely that GOA could raise the WW tariff by 50 percent or more to allow AWSC just recovering its cash operating costs from its collected user charges.

76. *The Need for Good Baseline Information.* Economic justification of projects that mostly focus on rehabilitation of existing facilities and operations is always difficult without reliable data before and at the completion of the project. If energy savings are usually easy to identify, time savings, reduction of coping costs, health improvements and environmental improvements are much more difficult to document. Future projects should consider establishing good baseline information for better supporting estimates of economic benefits in an environment where the competition for financing is likely to remain strong.

7. Comments on Issues raised by Borrower, Implementing Agencies and Partners.

7.1. Implementation of the CAPEX

Annex 6 provides the draft Implementation Completion Report prepared by the CMU. In its section on lessons learned, it makes a few suggestions for improving the design of future projects. Bank comments are between brackets in the text below.

77. *Water Loss Management.* The CMU proposal to focus more on water losses is fully justified taking into account the unusually high AWSC NRW performance.

- *Commercial Losses.* (The proposal of reducing commercial losses by replacing all poor quality individual meters owned by customers by class C meters owned by the AWSC placed in the public space is fully justified. As already mentioned, a revision of the condominium legislation, an issue that is probably beyond what the WW sector can address alone, would probably be a more practical solution: in most countries, the WW utility company meters the water consumed by the building, bills the condominium and leaves the building manager responsible for collecting payments from each apartment).
- *Physical Losses.* (Reducing physical losses for further reducing pumping costs and improving the operation of wastewater treatments is not mentioned by the CMU. The performance achieved by projects implemented in the three cities of Gyumri, Vanadzor and Armavir where aging distribution networks are replaced should be monitored and the ERR of such projects should be independently estimated to assess their replicability on a larger scale).

78. **Performance Indicators.** The CMU suggests setting annual targets for a much larger set of performance indicators than the four initially selected for calculating the bonus to be paid to the Manager.

- *Management contract.* (There are a few examples of Management contracts that monitor a large numbers of indicators, but it has not been demonstrated that their performance is better than those that focus on a few key indicators. If the GOA opts for continuing the Management contract arrangement, the main indicator to monitor should probably be the working ratio and accounts receivable, and thus indirectly tariff adjustments and enforcement of disconnection procedures for non-payment).
- *Lease contract.* (If, as would be desirable, the GOA evolves the Management contract into a Lease contract, incentives to perform would be built in the contract itself: the Lease Operator would aim at maximizing its profit by reducing its operating costs by fixing physical leaks and increasing its billing and collection by improving its commercial procedures).

Annex 1: Project Cost and Financing

1. Project Cost by Component (US\$ million equivalent)

		Credit 3893-AM		Credit 4514-AM		Total	Percent
		Original US\$ million	Revised US\$ million	Original US\$ million	Revised US\$ million	Actual US\$ mln	%
A	AWSC Management		10.61		9.68	20.29	39%
	PPF	1.20	1.33			1.33	
	Management contract	7.68	8.33	6.31	8.52	16.85	32%
	CMU	0.86	0.95	1.27	1.16	2.11	
	Preparation of a Lease Contract			0.65			
B	AWSC Investments		2.96		4.26	7.22	14%
	General Assistance	0.60	0.78	4.90	3.27	4.05	
	Redundancy Program	0.46	0.25			0.25	
	Training	0.18	0.12	0.57	0	0.12	
	Chem. and Bact. Lab.	0.22	0.27	0.50	0.53	0.80	
	Meter Testing Lab.	0.22	0.21			0.21	
	Meter Revolving Fund	0.55	0.35			0.35	
	Assistance to Condominiums	0.21	0.18	0.40	0.46	0.64	
	Incremental AWSC expenses	0.88	0.80			0.80	
C	Invest. in Branch Systems		12.49		11.96	24.45	47%
	Immediate Program	4.74	5.07			5.07	
	Investments	7.76	7.42	12.21	11.96	19.38	
	Total		26.05		25.90	51.95	100%

2. Financing by Disbursement Category (US\$ million equivalent)

	Credit 3893-AM			Credit 4515-AM			Actual Total			Percent of Appraisal
	Total	IDA	GOA	Total	IDA	GOA	Total	IDA	GOA	
Works	5.37	3.22	2.15	6.15	4.92	1.23	11.74	8.50	3.24	102%
Goods	7.60	7.39	0.21	11.06	7.19	3.87	17.16	13.98	3.18	92%
Consultant's services	10.46	10.28	0.18	9.18	7.58	1.60	21.62	19.88	1.74	110%
<i>Management contract</i>	7.68	7.68	0.0	0.0	0.0	0.0	17.14	15.99	1.15	
<i>Other</i>	2.78	2.60	0.18	0.0	0.0	0.0	4.48	3.89	0.59	
Redundancy payments	0.40	0.40	0.0	0.0	0.0	0.0	0.25	0.25	0.0	63%
Refunding of PPF	1.20	1.20	0.0	0.0	0.0	0.0	1.05	1.05	0.0	88%
Operating costs	0.20	0.18	0.02	0.41	0.31	0.10	0.79	0.63	0.16	129%
Unallocated	0.33	0.33	0.0	0.0			0.0	0.0	0.0	
Total	25.56	23.00	2.56	26.80	20.00	6.80	52.61	44.29	8.32	100%

Annex 2: Outputs per Components

Indicator	Unit	Baseline	End 2011	Target
PDOs				
Permanence of water service (weighted average)	Hours/day	6.04	15.02	15.0
Compliance with water bacteriological standards	%	93.8	98.2	98.1
Metering ratio of residential customers	%	40.2	82.2	77.8
AWSC working ratio	%	194.9	117.8	118.0
Additional Indicators				
Permanence of Water Service				
Cities with minimum number of hours of service	%	68.1	94.0	90.0
Water Quality Compliance				
Percentage of water disinfected	%	60.9	97.3	95.0
Metering				
Apartment buildings with block meter	%	38.6	82.0	75.0
Billing established on metered consumption	%	25.0	85.8	65.0
Bill Collection				
Revenue collected per capita	AMD/month	166	502	260
Collection ratio from residential customers	%	47.9	100.8	80.0
Residential customers in arrear more than 4 months	%	79.5	26.0	78.0
Production and Consumption				
Production per capita	lcd	668	670	670
Metered consumption per capita	lcd	81	94	70
Efficiency				
Metered consumption/water production	%	6.8	13.7	7.8
Electricity cost/revenue collected ⁸	%	72.6	23.2	40.0
Staffing ratio per 1,000 subscribers	U/1,000	9.45	6.0	6.80
Staff cost/collected revenue	%	70.2	59.3	60.0
Electricity consumption/water production	kWh/m3	0.43	0.26	0.30
Operating Costs Recovery				
Tariff/m3 consumed	AMD/m3	100.4	179.8	180.0
Growth of collection from residential customers ⁹	%	114.6	166.8	200.0
Working ratio for branches with gravity systems	%	89.7	63.5	80.0
Working ratio for branches with pumping systems	%	223.3	123.3	120.0
Bank Core Indicators				
Community water points rehabilitated	connections	NA	259,505	259,505
Household connections benefiting from rehabilitation	connections	NA	99,938	99,938
Water utilities benefiting from the project	U	1	1	1
Rural population with improved access to water	People	NA	34,748	34,748
Urban population with improved access to water	People	NA	285,055	285,055

⁸ For branches with pumping and/or treatment plants

⁹ Percentage of increase from base year

A. AWSC Financial Performance

1. This section of Annex 3 reviews the financial performance of the AWSC on the basis of its audited financial statements between 2004 and 2010; audited financial statements for 2011 were not yet available at the time the PICR was prepared.

Income Statements

2. **Reconstructed Income Statements.** The presentation of the Statement of Comprehensive Income provided in the audit reports, by splitting expenses between cost of sales, distribution costs and management costs and combining cash and non-cash (depreciation) expenses that follow IFRS does not allow an easy monitoring of key components of the income statement of a WW utility. In the summary financial statements (Table 2 of this Annex), the income statements have been reconstructed as follows (using data for FY2010)

Table 1: AWSC 2010 Income Statement

Statement of Comprehensive Income (Audit Report)	AMD mio	Reconstructed Income Statement (Financial Statements)	AMD mio
Revenue	3,487	Billings	3,487
Cost of sales	(3,771)	Subsidies	812
Gross loss	(284)	Grants related to assets	969
Other income	2,823	Grants related to income	393
Distribution costs	(541)	Other operating revenues	649
Administrative expenses	(2,498)	Total operating revenues	6,310
Other expenses	(438)	Management contract	(950)
Finance costs	(292)	Staff costs	(2,026)
Other gains (losses), net	706	Electricity	(858)
Loss before income tax	(525)	Other operating expenses	(1,453)
Income tax	0	Total operating expenses	(5,287)
Net loss	(525)	EBIDTA	1,023
Other comprehensive income	(401)	Non-operating revenues and expenses (net)	(133)
Total comprehensive result	(926)	Depreciation	(1,524)
		Interest on LT debt	(293)
		Net income (loss)	(926)

3. **AWSC Operating Revenues.** AWSC billings have remained constant between 2004 (AMD3,342 million) and 2010 (AMD3,487 million) equivalent to about US\$9.0 million. Operating subsidies and other grants have represented a significant share of AWSC total operating revenues: between 2004 and 2010 they have totaled AMD10,490 million (US\$26.8 million) to be compared with total billing of AMD22,550 (US\$57.7 million). Because no tariff adjustment is planned, AWSC forecasts the need for additional subsidies for the coming years, even more so that it will have to start repaying its long-term debt as of 2013.

4. **AWSC Operating Expenses.**

- a. *Electricity expenses* (16 percent of total operating costs in 2010), have declined by about 15 percent between 2004 and 2010, while the energy consumption decline by about 40 percent from 63.4 MWh in 2004 to 38.6 MWh, as result of the project;
- b. *Staff costs* (38 percent of total operating costs in 2010), have increased by 58 percent (about eight percent per year) between 2004 and 2010 despite a staff retrenchment program aimed at improving the staffing ratio from 9.45 to 6.0/1,000 connections. This increase, above an inflation rate of six percent per year, reflects change in the profile of staff employed by AWSC;
- c. *The Management Contract* (18 percent of total operating costs in 2010) whose costs have represented about 19 percent of the total operating expenses between the start of its operations (2005) and 2010;
- d. *Other operating costs* (27 percent of total operating costs in 2010) that regroup mostly maintenance and administrative expenses.

5. **AWSC Net Income.** Thanks to subsidies and grants received, AWSC has been able to maintain positive earnings before interests, taxes, depreciation and amortization (EBITDA). However after deducting non-operating expenses (such as redundancy expenses or provision for impairment of trade receivables) and adding non-operating revenues (such as foreign exchange fluctuation) and after deducting depreciation and financing costs, AWSC has generated a net loss in each of the years under review (Table 2 of this Annex).

6. **AWSC Working Ratio.** AWSC has been able to maintain a working ratio (operating expenses divided by operating revenues) below 100 percent, meaning that the Company was, in theory, able to recover its cash operating costs from its operating revenues. However this ratio is a meaningful indicator only when bill collection is high. If AWSC bill collection ratio has regularly improved, it was still 75 percent in 2007 and 90 percent in 2010. The working ratio calculated excluding subsidies and grants has always been above 100 percent: it was 128 percent in 2010. Assuming that: (i) other operating revenues, the collection ratio and operating expenses remain at their current levels; and (ii) subsidies and grants are phased out, AWSC billings should have been about 50 percent higher than their current level to allow AWSC meeting its cash operating costs (excluding depreciation and financing costs) from its cash collection. Of course, any future tariff adjustment would have be estimated on the basis on the medium-term financial forecast of AWSC operations to reflect potential efficiency gains in operating expenses, and affordable CAPEX and financing conditions.

Balance Sheets

7. **AWSC Assets.** AWSC assets were valued at AMD34,050 million (US\$87.0 million) as of end 2010, out of which fixed assets in operation represented AMD29,585 million (US\$75.7 million). AWSC poor collection performance in the earlier years of the period under review has resulted in regularly growing accounts receivable that reached AMD7,180 million (US\$18.3 million) in 2010, equivalent to 705 days of billing; this ratio has regularly increased, from 205 days of billing equivalent in 2004. Since 2008, AWSC has provisioned

large amounts for impairment of accounts receivable, and net accounts receivable represented only 235 days (7.75 months) of billing in 2010.

8. **AWSC Equity.** As of 2010 AWSC share capital was AMD2,985 million (US\$7.6 million). Because of regularly increasing accumulated losses valued at AMD17,385 (US\$44.5 million) in 2010, i.e., an increase of about AMD10,000 million (US\$25.6 million) between 2004 and 2010, AWSC equity has steadily been eroded from AMD22,000 million to AMD1,000 million (US\$56.2 to US\$2.6 million).

9. **AWSC Liabilities.** In addition to the two Credits granted by IDA for the MWWP (total of US\$43.0 million) and the recently approved Loan for the Municipal Water Project (US\$15 million), AWSC has obtained financing from ADB (US\$76 million) and EBRD (US\$19 million). The weighted cost of borrowing is in the two percent range. As of end 2010 AWSC had used AMD24,475 million (US\$62.6 million) of these loans; in addition AWSC has received development grants from the GOA of AMD6,260 million (US\$16.0 million). Accounts payable, that reached about AMD2,200 million (US\$5.6 million) in 2010, have regularly increased from the equivalent of 90 days to 150 days of cash operating expenses between 2006 and 2010.

10. **AWSC Debt/Equity Ratio.** AWSC is a highly leveraged company. The ratio of its total liabilities to its shareholder equity has increased from 1.0 in 2005 to 11.1 in 2010, a value that is way above what is usually accepted for water utility companies.

Cash Flow Statements

11. **From Operating Activities.** After adjustments, in particular for variations of working capital, AWSC has always been able to generate a positive cash flow from operating activities.

12. **From Investing Activities.** No comments.

13. **From Financing Activities.** AWSC had to contract short term loans from local banks in 2006 and 2008, but since their maturities were below 12 months, the debt service coverage covenant of the IDA Credits did not apply. AWSC has paid interests on its long-term borrowing since 2009, but repayment of AWSC long-term debt will not start in 2012. The debt service coverage ratio (total of principal and interest payments divided by the EBIDTA of the previous year) could thus only be calculated as of 2009. It has been slightly below the agreed target of 1.4 in 2009 and above in 2010.

AWSC Financial Future

14. In their 2010 report, the Auditors mentioned that as result of large accumulated losses, “*it is possible that the Company’s total liabilities will exceed total assets at year end of 2011*” a matter the “*may cast significant doubt about the Company’s ability to continue as a going concern*”. Obviously AWSC is at risk of defaulting on its loan payments. The Company can

only service its debt to the GOA if it receives operating subsidies from the GOA and bear the foreign exchange risk if it receives compensations from the GOA. AWSC estimates that it will need an additional AMD1,875 million (US\$4.8 million) to service its debt between 2012 and 2014. Freezing AWSC debt service obligations until the Company is able to generate cash surpluses to service it and contribute to its CAPEX is an option to consider. However, only a detailed medium-term financial forecast of AWSC operations could help identify the combination of additional equity required and the affordable financing conditions for AWSC CAPEX taking into account constraints imposed by politically acceptable increases of the WW tariff and reductions (and hopefully phasing out) of operating subsidies and other grants. Preliminary (non-audited) AWSC financial statements for 2011 show a shareholder equity of AMD6,020 million (US\$15.4 million) suggesting an equity contribution by SCWE.

B. Financial and Economic Analysis

Financial Analysis

15. An estimate of the project NVP and FIRR was carried out based on a 10-year projection of future AWSC cash flows, using the total project cost as outflow and the total of collections and operating subsidies as inflows. The NPV has been estimated at minus US\$3.6 million for a discount rate of 12 percent and the FIRR at minus six percent. These figures would be lower if only collections from customers were used for estimating inflows. Appraisal estimates were plus US\$12.5 million and plus 14 percent respectively.

Economic Analysis

16. The PAD anticipated reduced energy consumption, time saved fetching water, avoided coping costs and reduced incidence of water borne diseases as the main economic benefits of the project. A comprehensive estimate of the project ERR could not be carried out because of the lack of quantitative data on the situation, costs and monetized benefits at the beginning and completion of the project.

- a. *Energy savings.* Overall electricity consumption was reduced by 40 percent between 2004 and 2010; assuming that investment in Branch systems (a total of US\$24.45 million) were mostly designed to save energy, the NPV of this project component can be estimated at US\$0.8 million for a discount rate of 12 percent and the ERR at 14 percent. These figures are likely to be on the low side, as not all investments in Branch systems were directly targeted at saving energy.
- b. *Improved commercial operations.* The main quantifiable economic benefit of the Management contract, for which US\$16.85 million have been invested, has been the improvement of the commercial operations evidenced by increased collections from customers and thus a reduced need for operating subsidies. Assuming that the collection ratio would have remained at its original 42 percent with the Management contract, the NPV of this component for a 12 percent discount rate is estimated to be about zero and the ERR 12 percent
- c. *Time saving.* The PAD estimated that the equivalent of one person-hour per day per household was spent fetching water at the beginning of the project. While

improved quality of the water service is likely to affect all customers, those who were relying on standpipes and were connected under the project are likely to have benefitted most. However, this benefit is likely to be pretty low in monetary terms.

- *Coping Costs.* The PAD suggested that improved quality of service and water quality would reduce household coping costs, related to booster pumps, individual storage tanks, household disinfection equipment, water boiling or purchase of bottled water. While these objectives have largely been achieved, available data do not allow concluding on the value if coping costs avoided.
- *Reduction in Incidence of Water Borne Diseases.* The end-line sociological report (Annex 5) mentions that water borne diseases affected 1.5 percent of households in 2011, a figure to be compared to two percent before 2006. This economic benefit could however not be valued.

Table 2: AWSC Summary Financial Statements (Audited)

AWSC	2004	2005	2006	2007	2008	2009	2010
	AMD million						
Income Statements							
Operating Revenues							
Billings	3,342	3,863	2,924	2,705	2,863	3,362	3,487
Subsidies and grants	1,064	1,436	1,449	1,667	1,358	1,340	2,174
Other operating revenues	9,137	128	630	157	106	633	649
Total Operating Revenues	13,543	5,427	5,003	4,529	4,327	5,335	6,310
Operating Expenses							
Management contract	0	1,224	818	578	581	780	950
Staff costs	1,284	1,283	1,435	1,501	1,711	1,809	2,026
Electricity	1,004	939	804	823	860	803	858
Other operating expenses	814	654	863	774	1,034	1,407	1,453
Total Operating Expenses	3,102	4,100	3,920	3,676	4,186	4,799	5,287
EBIDTA	10,441	1,327	1,083	853	141	536	1,023
Non-Operating Revenues (Expenses)	(24,779)	(87)	(3,769)	189	(3,643)	(3,621)	(133)
Depreciation	1,448	1,580	1,584	1,394	1,472	1,306	1,524
Financing costs		11	7	2	11	130	293
Net income (loss)	(15,786)	(352)	(4,278)	(351)	(4,985)	(4,521)	(925)
Balance Sheets							
Assets							
Fixed Assets	23,972	23,183	18,602	15,277	14,296	18,885	29,583
Inventories	74	100	532	1,191	1,129	983	1,547
Trade receivable	1,065	4,048	5,043	5,859	2,432	2,860	2,440
Cash and cash equivalent	34	40	38	96	404	514	477
Total Assets	25,145	27,371	24,215	22,423	18,261	23,242	34,047
Equity and Liabilities							
Share Capital	7,848	5,781	5,781	2,904	2,904	3,037	2,985
Reserves	44	44	44	44	44	44	44
Revaluation surplus on PPE	21,483	21,483	18,574	18,574	16,050	15,829	15,361
Accumulated losses	(7,365)	(5,633)	(7,002)	(6,978)	(11,962)	(16,980)	(17,386)
Equity	22,010	21,675	17,397	14,544	7,036	1,930	1,004
Borrowing		1,723	3,325	4,294	6,926	15,616	24,476
Grants related to assets		2,149	2,499	2,307	2,623	3,722	6,258
Non-current liabilities	2,110	3,872	5,844	6,648	9,628	19,338	30,734
Accounts payable	760	1,739	973	1,151	1,426	1,852	2,198
Current liabilities	1,026	1,824	974	1,231	1,597	1,974	2,309
Total Equity and Liabilities	25,146	27,371	24,215	22,423	18,261	23,242	34,047

Annex 4: Bank Lending and Implementation Support/Supervision Processes

(a) Task Team Members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Brian Steven Smith	Sr. Financial Specialist TL Since: 01/01/2000	ECSIE	Task team lead
Jan Drozd	Sr. Water and Sanitation Specialist	AFTUW	Technical inputs
Paul Kriss	Lead Urban Specialist	ECSSD	Operational support
Zaruhi Tokhmakhian	Operations Officer	ECCAR	Operational support
Solvita Klapare	Environmental Economist	ECSIE	Economic/financial analysis
Alexander Astvatsatryan	Sr. Procurement Specialist	ECSSO2	Procurement
Plamen Stoyanov Kirov	Sr. Procurement Specialist	ECSPS	Procurement
Salim Benouniche	Sr. Procurement Specialist	MNAPR	Procurement
Arman Vatyan	Sr. Financial Management Specialist	ECSPS	Financial management
Andrina A. Ambrose-Gardiner	Sr. Finance Officer	LOAG1	FM/disbursement
Ekaterina Arsenyeva	Financial Management Specialist	LOAG1	Financial management
Rita E. Cestti	Sr. Water Resources Econ	ECSSD	Operational support
Julian A. Lampietti	Sr. Social Development Economist	ECSSD	Social
Nightingale Rukuba-Ngaiza	Sr. Counsel	LEGAF	Legal
Lars A. V. Rasmusson	Consultant	ECSSD	Water engineer
Alfiya Mirzagalyamova	Consultant	ECSIE	Operational support
Milane de Jesus Reyes	Program Assistant	ECSIE	Team support
Peter Nicholas	QER Panel Chair		Peer review
Maria Ines Fraile-Ordonez	QER Panel Member		Peer review
Jan G. Janssens	QER Panel Member		Peer review
Lee Travers	QER Panel Member		Peer review
Supervision/ICR			
Jonathan S. Kamkwalala	Sector Manager, Water	AFTWR	Task management

	TL Since:06/09/2006		
Ahmed A.R. Eiweida	CSC TL Since: 2010	ECSSD	Task management
Zaruhi Tokhmakhian	Operations Officer TL Since: May 2011	ECSS6	Task management and operations
Paul Kriss	Lead Urban Specialist	EASCS	Operational support
Manuel G. Marino	Lead Water and Sanitation Specialist	ECSS6	Technical inputs
Lars A. V. Rasmusson	Consultant	ECSS6	Engineer
Alexander Astvatsatryan	Sr. Procurement Specialist	ECSO2	Procurement
Arman Vatyan	Sr. Financial Management Specialist	ECSPS	Financial management
Salim Benouniche	Lead Procurement Specialist	MNAPR	Procurement
Darejan Kapanadze	Sr. Environmental Specialist	ECSS3	Environmental safeguards
Ahmet Gokce	Consultant	ECSO2	Procurement
Garik Sergeyev	Consultant	ECSO3	Financial management
Armine Aydinyan	Consultant	ECSO2	Procurement
Milane de Jesus Reyes	Program Assistant	ECSSD	Team support
Gayane Davtyan	Program Assistant	ECSSD	Team support

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY03	14.12	57.20
FY04	24.01	138.97
FY05	9.58	3.27
Total:	47.71	199.44
Supervision/ICR		
FY05	19.1	82.90
FY06	26.84	87.64
FY07	22.42	78.71
FY08	19.86	79.56
FY09	26.31	105.00
FY10	34.46	116.30
FY11	15.11	44.74
FY12	12.74	50.86
Total:	176.84	645.71

Annex 5: Beneficiary Survey Results

Municipal Water and Wastewater Project: End-line Assessment

Final report, January 24, 2012

Prepared by Advanced Social Technologies NGO for The World Bank Armenia Office

Introduction

Background

For many years most of the water supply and sanitation systems in Armenia was in serious state of disrepair; despite an abundance of water in the country, for almost all Armenians, water was available for only a few hours a day. Over the past decade, the government of Armenia has strived to improve access, reliability and quality of the drinking water and its infrastructure. Although the water resource balance in many parts of the country has improved since the 1980s, and despite the progress in improving water supply in areas supported by private sector participation, the institutional framework for sustainable water supply delivery in most parts of Armenia remained poor.

The project introduced a successful public/private partnership for the management of water and wastewater services in AWSC service area, covering about 33 percent of the population. It has delivered substantial results. Private sector participation is increasingly seen by the Armenian government as a key component of sector reform strategies. Municipal Water and Wastewater Project (MWWP) replicated the successful PPP model tested in Yerevan water sector. The reform continues under Additional Financing, scaling up the rehabilitation and investments under the MWWP.

In 2004, IDA provided US\$23 million under Municipal Water and Wastewater Project, for the areas outside Yerevan for improvement of water supply in terms of coverage, quality and cost. To scale up the ongoing program of water system rehabilitation and improvements under the MWWP project, in 2008 IDA provided Additional Financing of US\$20 million. The closing date was December 2011.

The current study aimed at assessing the level of achievement of the following KPIs set forth at inception of the second phase of the project: (i) access to water and wastewater services; (ii) duration of water supply; (iii) water quality; (iv) service quality by the utility, (v) water metering and (vi) revenue collection. Additionally, the assignment aimed at describing the incidence of benefits (access to water and wastewater services) among poor and non-poor households.

Methodology

The main data collection method was a representative sample survey of 400 households implemented in the period of 10-20 December, 2011. The sample size allowed ensuring a margin of error of 5% at 95% confidence level.

The sample was distributed proportionally among 14 Primary Sampling Units (PSUs) representing regional cities covered by the project¹⁰, and the households in each city were

¹⁰ The cities were selected from the list of all project sites with probability proportional to size and covered all marzes of Armenia.

selected through a random route technique.¹¹ In each household, the interview was conducted with the most informed person.

The survey instrument was a structured questionnaire designed in collaboration with The World Bank task team and pretested in one PSU (Abovyan city). Besides measuring the current satisfaction with water and wastewater services, the questionnaire tried to capture the respondents' perceptions of their possible improvement or worsening over the past five years.

To measure benefit incidences among poor and non-poor households, the questionnaire included a detailed section on household expenditures. The total monthly per capita expenditures were then used to break down the achieved sample into quartiles, 1 representing the poorest households. Table 1 below summarizes the data on monthly per capita spending of each of the quartiles. Although the breakdown is based on reported expenditures, it is still believed that estimates of expenditures are much less biased than estimates of incomes, and hence are better proxies of household welfare.

Table 1. Expenditure quartiles based on monthly per capita spending, AMD

Quartile	Average spending	Minimum spending	Maximum spending
Quartile 1	18,836	2,500	25,470
Quartile 2	32,270	25,567	38,958
Quartile 3	46,753	39,417	58,722
Quartile 4	95,866	59,000	337,917

When interpreting the findings it is necessary to consider, however, that while the survey was quite representative in terms of allowing valid extrapolations to the general population, the margin of error on quartile-level extrapolations was 10%.

Findings

Access to water and wastewater services

The survey reported that all 400 interviewed households had access to water and wastewater services, thus suggesting that in December 2011 [close to] 100% of the households in project sites were covered by the water service company (Saur).

While 14% of the respondents reported that they were not residing in their current place of residence 5 years ago, the remaining 86% reported that they were using centralized water services back in 2006 as well.

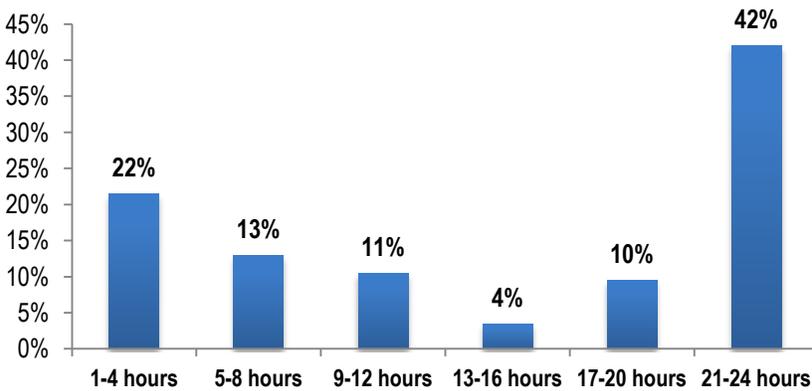
¹¹ With no access to the actual list of households (to which, in Armenia, only the National Statistical Service has access), geographically stratified random route sampling is the only valid substitute.

Duration of water supply

The survey suggested that in the three months preceding the survey, 39% of the water users had 24-hour water supply (see Chart 1).

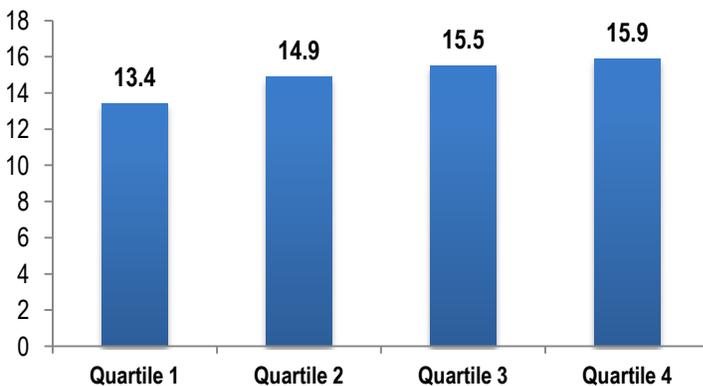
The average duration of water supply was estimated at 15 hours suggesting a 150% increase as compared to the base value of 6 hours in 2004.

Chart 1. Average duration of water supply, October-December 2011



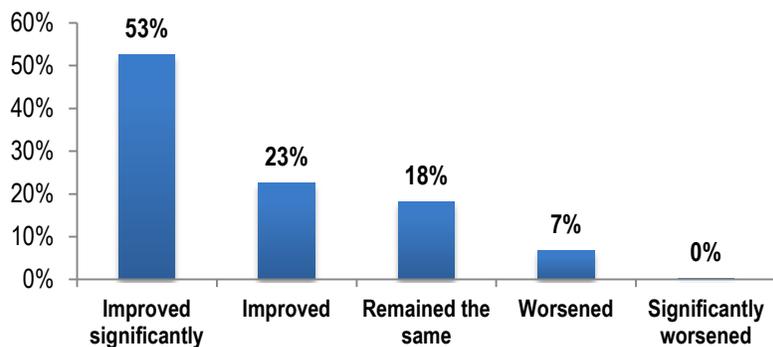
The survey suggested that the overall increase in the duration of water supply may have benefited the poorest households the least, but considering the high margin of error the finding is very tentative.

Chart 2. Average duration of water supply by quartiles (October-December 2011)



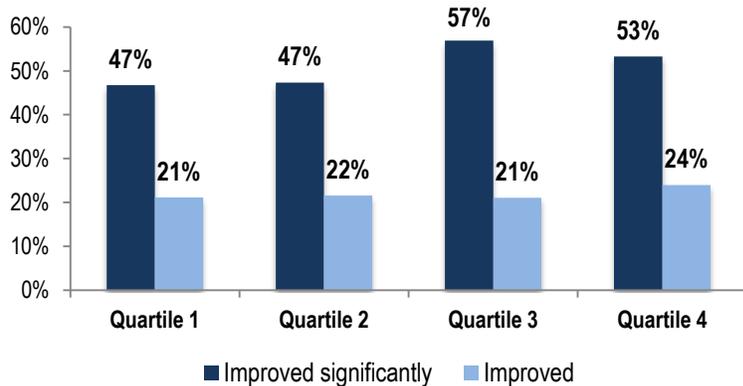
The overwhelming majority of the respondents (76%) thought that the duration of water supply has improved as compared to 5 years ago, every fifth respondent thought it remained the same, while 7% noticed a somewhat negative trend.

Chart 3. Perceived change in the duration of water supply since 2006



While quantifying the actual improvement was impossible due to possible recollection bias, the survey suggested that poorer households may have witnessed somewhat less significant improvement than better-off households.

Chart 4. Perceived improvement in the duration of water supply since 2006 by quartiles



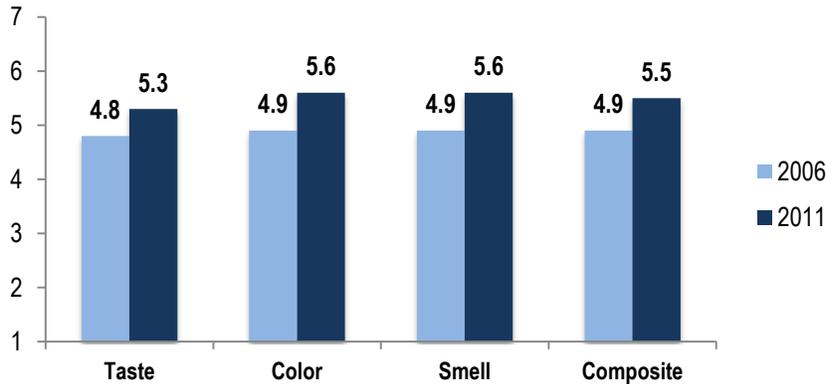
Water quality

In the context of the survey, water quality was assessed through three indicators of taste, color and smell. Considering that all categories, but especially taste, is very subjective, the respondents were specifically asked to rate the provided water in relation to absence of unpleasant or strange taste, rather than based on how much they like the taste.

To measure the improvement of the quality of water over since project inception, the respondents were asked to rate the indicators now and [as best they can recall] five years ago. While the indicators were rated separately using a 1-to-7 point rating scale (7=very good), the overall quality was then assessed through averaging the three estimates.

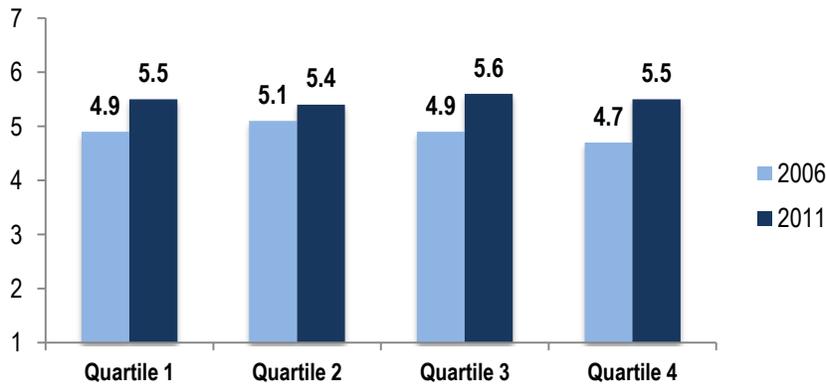
As shown in Chart 5 below, the results suggested that the quality of water has somewhat improved in all aspects.

Chart 5. Perceived improvement in the quality of water since 2006



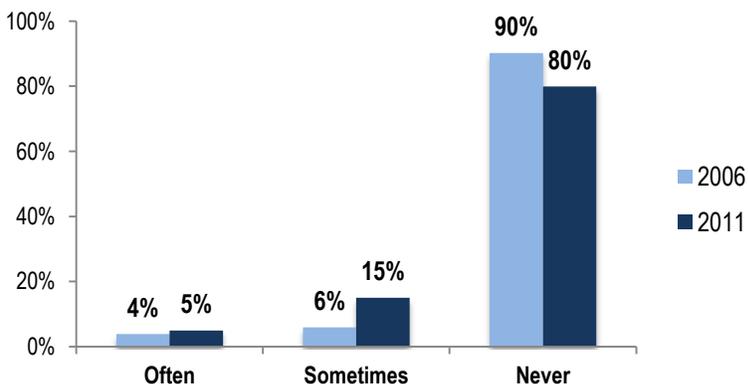
While the results implied that improvement of the duration of water supply may have better benefited the richer households, the findings regarding water quality suggested that the improvement equally benefited poor and rich households.

Chart 6. Perceived improvement in the quality of water since 2006 by quartiles



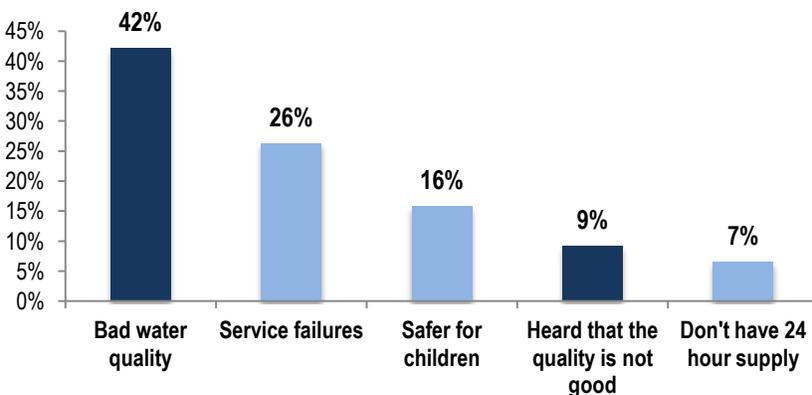
The questionnaire included as well an indirect question regarding quality of water - inquiring about consumption of bottled water in the household and the reasons for doing so. The fact of consumption as such was not considered to be an indicator of bad water quality, but it may be useful to know that over the past five years the proportion of households that often or sometimes purchased bottled water for household consumption increased from 10% to 20%.

Chart 7. Consumption of bottled water in 2006 and in 2011



The survey established that quality related issues determined the decision to buy bottled water in only 51% of cases (some attesting to respondents’ actual experience, while some relating to perceptions), while the rest had to do with service failures or maintenance activities, special needs and duration of water supply (see Chart 8).

Chart 8. Reasons for buying bottled water in 2011



Water safety

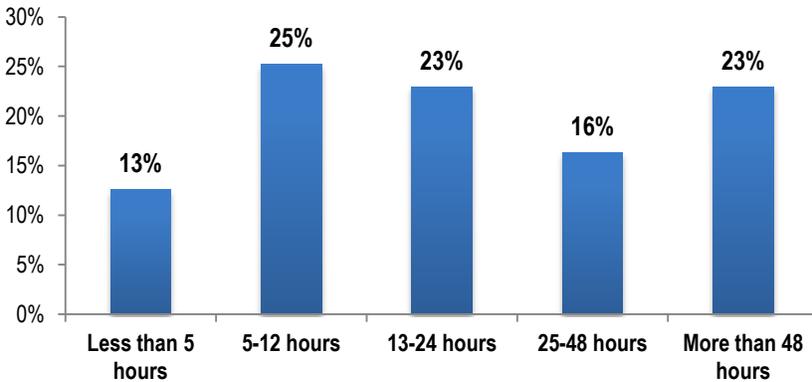
In the course of 2011, as evidenced by the respondents, water borne diseases affected 1.5% of the households in AWSC service area. Prior to 2006, 2% of the respondents reported similar incidences, suggesting improved bacteriological safety.

Both in 2011 and prior to project inception all respondents reported that medical treatment of the diseases incurred additional costs [of 5,000 – 80,000 AMD in 2011].

Service quality by the utility

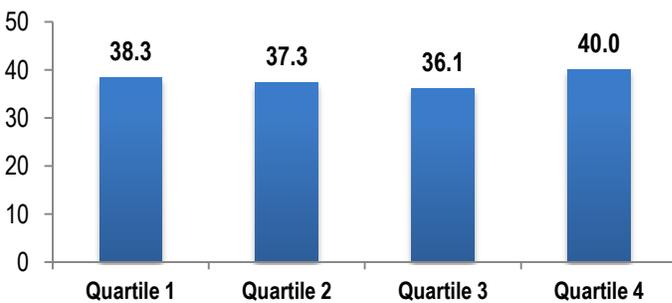
The data suggested that 35% of the households experienced water service failures in 2011 (the percentage excludes internal system failures for which the utility is not responsible), each of the households reporting an average of 2 such incidents. According to the respondents' accounts, the utility took care of the problem in an average of 37.8 hours.

Chart 9. Average time spent by the utility on solving the issues



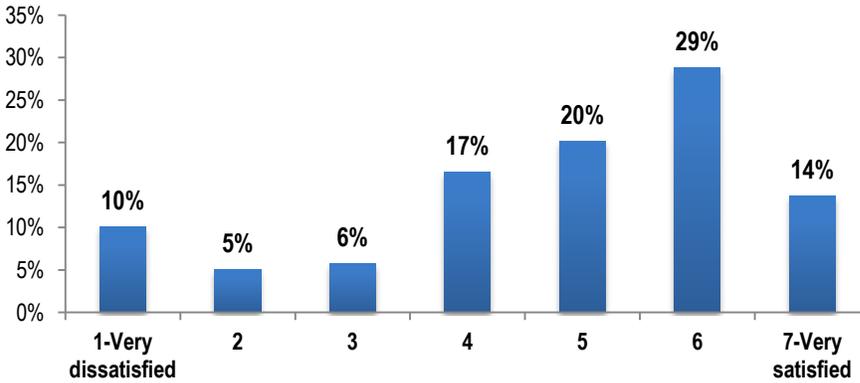
While the survey suggested that the poor may have benefited somewhat less than the rich when it came to continuity of water supply, the findings allowed assuming that the response time to service failures was rather income indifferent.

Chart 10. Average time spent by the utility on solving the issues by quartiles (hours)



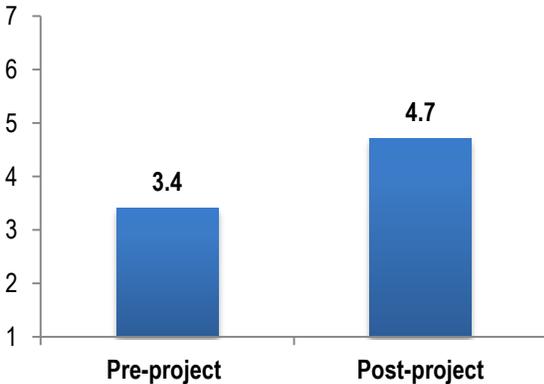
The respondents have rated their satisfaction with rapid response to the failures by the utility at an average of 4.7 on a 1-to-7 rating scale (7=very satisfied).

Chart 11. Satisfaction with rapid response by the utility



Comparing these results with the respondents’ recollections regarding pre-project situation, the survey suggested that a) the incidences of failures have significantly decreased (from 65% in 2006 to 35% in 2011; and b) the responsiveness of the utility has notably increased (see Chart 12).

Chart 12. Satisfaction with rapid response by the utility in 2011 and in 2006 (mean estimates)



As per the survey, 18% of water users in AWSC service area were aware that the utility had a hotline, but only 4% of them (3 respondents) have contacted the hotline during 2011.

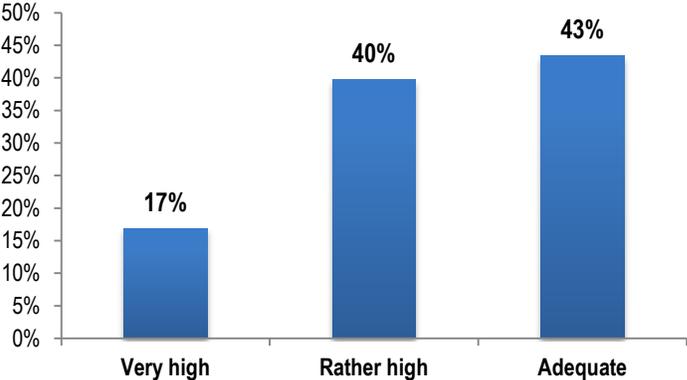
Water metering, tariffs and revenue collection

All 400 respondents reported to have a water meter installed in their households. The average monthly household bill on water services was estimated at 1,663 AMD suggesting consumption of approximately 10 m³ of water per month.

Remarkably, 93% of the respondents reported to have regularly paid their monthly bills without any delays throughout the past year, suggesting that the end of project target of 95% may be considered to be achieved. The remaining 7% reported to have paid with delays, and only 1 respondent said they never paid for the services.

As far as the perceptions regarding the current tariff are concerned, 43% of the respondents thought it was adequate, and only 17% thought it was very high.

Chart 13. Perceptions regarding the current tariff



To better understand the motives behind criticism, we asked all respondents who thought the tariff was very high or rather high to explain their position. Thus, the majority of these respondents (66%) reasoned their criticism by general comments pertaining to low incomes, 19% thought that water is “Armenia’s own natural resource” and hence should not cost that much, while 8% considered price-quality ratio and believed the tariff to be inadequate to the level of service.

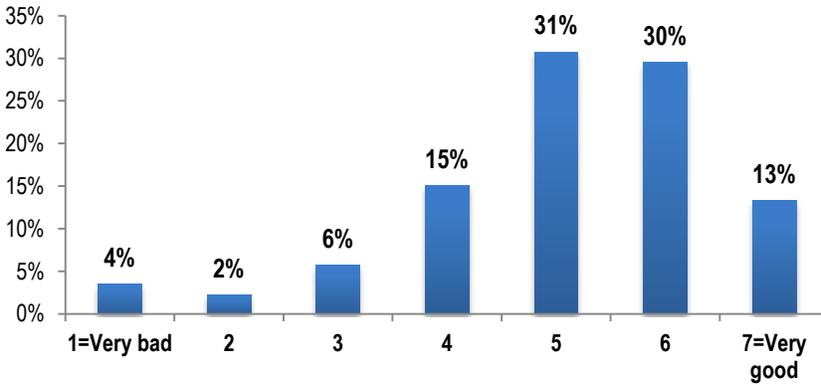
The survey suggested that 25% of the households would be ready to pay a higher price to get better service quality (longer duration, better quality, less failures). When asked whether they would have been ready to do so five years ago, 32% of the respondents said yes.

Although the absolute number of respondents who expressed willingness to pay more than they currently do was quite small (only 96 respondents) and hence the estimate cannot be considered reliable, it may be useful to know that they were ready increase their monthly spending by as much as 46% to buy better service (from an average of 1,770 AMD to an average of 2,575 AMD).

Water system management

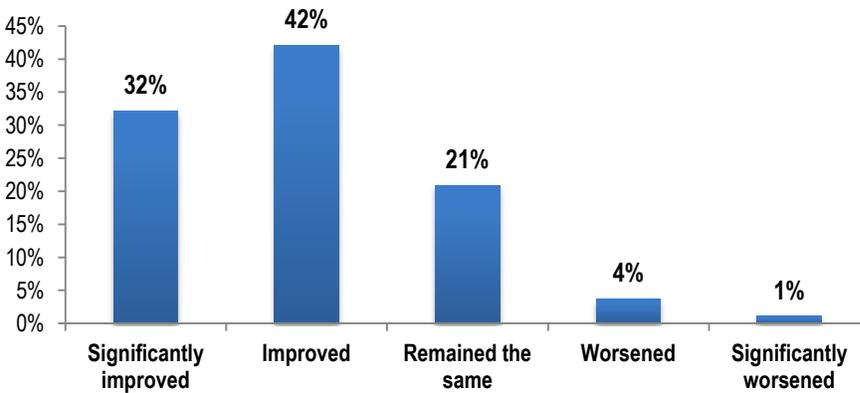
The overall satisfaction with water system management in AWSC service area was rated at 5.1 on a 1-to-7 point rating scale.

Chart 14. Overall satisfaction with water system management



The overwhelming majority of respondents (74%) thought that water system management has improved over the past 5 years, and only 5% thought the trend was negative (see Chart 15).

Chart 15. Perceived changes in water system management over the past 5 years



Considering the overall improvement in the duration of water supply, water quality and service efficiency it wasn't surprising to find that only 33% of the respondents wanted to revert from the current public-private partnership scheme back to state-managed services.

Annex 6: Summary of Borrower's ICR

Additional Financing for Municipal Water and Wastewater Project

Implementation Completion Report

1. Introduction

The service area of Armenian Water and Sewerage Company (AWSC) includes 37 cities and 268 rural settlements.

The water supply to over 300 settlements is implemented through about 100 systems, 545 intake structures, 2,500 km long water mains, 3,600 communal distribution networks, 45 pump stations, 380 daily regulation reservoirs (DRR), 109 chlorinating stations and 11 water treatment plants. The wastewater disposal is implemented through about 1,900 km long sewerage collectors. There are 13 sewerage treatment plants none of which is operational, and most of them cannot be rehabilitated anymore.

Due to lack of funds in 1994-2000, the issues of water supply and wastewater disposal, system's sectorization, expansion and development of community networks, efficient distribution and accounting of drinking water remained unsolved. The structures and pipelines of Water and Wastewater (WW) system were highly deteriorated due to insufficient major rehabilitation and maintenance activities, which was evidenced by high water losses and frequent failures of the system. Prevention of the diseases caused by water contamination was a top priority issue.

Due to extremely low level of technical equipment and lack of control, measurement and regulation devices and instruments and absence of special heavy equipment (only 10-15% of the required items were available) maintenance activities were very inefficient and technological processes were implemented at a very low level.

According to expert assessments, about 1,000 million USD of investments are required for rehabilitation of AWSC system.

To address those issues, the Government of Armenia (GOA) has applied for a credit to International Development Association.

2. Project Context, Development Objectives and Design

a) Project Development Objectives

The major objective of Municipal Water and Water Project (MWWP, or Project) was to improve the level of WW services within the service area of AWSC and increase Company's operational and managerial efficiency. Namely, to prevent future deterioration of the system, improve the existing state, achieve the most efficient management through institutional reforms of water supply and wastewater entities, satisfy increasing potable water demand of the population,

organize water consumption accounting, improve financial state of the system and establish favorable conditions for private investors. As a result, the following outcomes will be achieved:

- Technical - improved reliability and increased hours of service, improved water quality, greater operating efficiency and
- Commercial - improved relationships with customers; capable management and qualified staff; increased water company cash generation through reform of billing and collection, and closer alignment of service tariffs with costs, with a working ratio of 68 percent targeted for year four of the project.
- Investments – to have economically justified investments.

The aim of the Additional Financing (AF) for Municipal Water and Wastewater Project was to enable AWSC to expand the on-going rehabilitation activities and investments. The project development objective was the same as in original Project: to improve the quality of services provided to customers in AWSC's service area and the sustainability of AWSC.

b) Project Preparation

A 1.195 million USD Project Preparation Facility (PPF) was provided to the GOA under Agreement Q287-0 AM signed on September 18, 2001 between IDA and the Republic of Armenia for preparation of the Project. The main objective of activities implemented by consultants in 2002-2004 under PPF advance funding were the following:

- investigate economic, financial, legal, social and environmental aspects of the sector and the existing state of AWSC;
- Prepare Draft Management Contract and Bidding Documents for involvement of Private Sector Participation (PSP) through a tender.

A 15.4 million SDR (23.0 USD equivalent) credit was provided to Armenia for four years (2004-2008) under Municipal Water and Wastewater Project Credit Agreement 3893AM signed between GOA and IDA on June 14, 2004. The contribution of the GOA was 2.56 million USD.

The process for the involvement of a private manager in the management of operation and maintenance of WW systems of AWSC started with a Management Contract tender implemented in 2003-2004. 10 firms expressed interest to participate in the tender, and proposals were received from four firms having extensive experience in European WW sector: “GELSENWASSER AG” (Germany); the Consortium of “MVV Energy AG – AnfraMan DmbH” (Germany, Austria); “RENCO spa” (Italy); and “SAUR S.A.” (France). An Intergovernmental Committee was established under GOA Resolution No. 1172 dated November 28, 2001 to ensure the preparation phase of the Project. By its Resolution No. 1444-N dated October 30, 2003, the GOA assigned the Intergovernmental Committee to establish an Evaluation Commission with the involvement of representatives from various ministries for evaluation of results of the tender for transferring the powers of the Executive Body of AWSC to a private manager. The Evaluation Commission evaluated technical and financial proposals of the tender in January-April of 2004. SAUR S.A. was recognized the winning bidder. After

signing the Credit Agreement, the Management Contract was signed with SAUR S.A. on August 19, 2004 under which the powers of the Executive Body of AWSC were transferred to Management Contractor. The price of the proposal was 7.85 million Euro, 5.6 million Euro of which for the period of 2004-2008, and 2.39 million Euro – for the period of 2009-2010 (including 0.14 million Euro for additional compensation – Contract Amendment, July 2009).

The activities provided under credit Project of 2004-2008 were completed by February 2009.

According to AF for MWWP and MWWP, the responsible entity for Project implementation is the AWSC.

The highest level (strategic) governance and oversight of the Company will be carried out by Company Management Board (CMB) chaired by the Chairman of State Committee for Water Systems (SCWS). The SCWS is the owner of all stocks of the Company, and CMB Chairman has signed the Management Contract on behalf of the GOA. All the stakeholding ministries are presented in the CMB.

The monitoring and supervision of Project activities was assigned to the Contract Monitoring Unit (CMU) of the State Institution of Water Sector Development and Institutional Improvements Project Implementation Unit.

c) Outcome Indicators

As it is stated in the Project Appraisal Document (PAD), the Project sets the following Outcome Indicators:

- Technical - improved service reliability; improved water quality; greater operating efficiency
- Commercial – improved relationships with customers; capable management and qualified staff, increased water company cash generation through reform of billing and collection, and closer alignment of service tariffs with costs, better cash flow and achievement of 68% working ration in Project year 4.
- Sector investments - all investments are economically justified and meet applicable safeguard policies.

23 Performance Indicators were set under Management Contract to evaluate the performance of Management Contract. Right after commencement of the Contract, the Parties agreed to amend them and the following indicators were removed:

- a) percent of block apartment buildings under contractual agreement with the company;
- b) average daily supply to distribution reservoir per equivalent registered inhabitant;
- c) amount of chlorine effectively used per equivalent inhabitant per year.

The following indicators were added:

- a) electricity specific consumption;
- b) percent of water disinfected.

The performance of Management Contractor was evaluated based on 21 performance indicators. Meantime the Incentive Compensation payable to Management Contractor was calculated on the basis of the following four indicators:

Table 1

	Indicator and calculation method	Base year	Target Value			
			PY1	PY2	PY3	PY4
1	Continuity of Water Supply Service Indicator for the year minus indicator in base year) <hr/> 24 minus indicator in base year)	6.04 hours		10%	20%	30%
2	Effectiveness of meters installation program Indicator for the year minus indicator in base year) <hr/> 85 minus indicator in base year)	40.2%		20%	40%	80%
3	Water safety compliance Indicator for the year minus indicator in base year <hr/> 100 minus indicator in base year	93.8%		20%	40%	70%
4	Company operating efficiency Indicator for the year minus indicator in base year <hr/> Indicator in base year minus 100	194.9 %		14%	50%	68%

95,000 Euro Fixed Management Fee (VAT and profit tax excluded) was set for Project Year 7 under Management Contract (October 2010 – October 2011). 150,000 Euro out of that amount is retained and released at the end of the period based on the four Project Indicators calculated according to a method similar to Incentive Compensation calculation in previous years.

Three Performance Indicators out of four remained the same: Continuity of Water Supply Service (PI 1); Effectiveness of meters installation program (PI 2); Water Safety Compliance (PI 3), and the fourth Performance Indicator was the Collection Ratio (PI 9) instead of Company's Operation Efficiency (PI 4, working ratio) used in previous years.

The improvement of those indicators should show the same trend as in the first six years of Management Contract. Considering that the improvement of these indicators should be reviewed for the period from October 11, 2010 to October 18, 2011, the following improvement requirements were set:

- continuity of water supply service – 1 hour;
- effectiveness of meters installation program – 0.5%;
- water safety compliance 5%;
- collection ratio – 4%.

c) Revision of Project Development Objectives

It should be stated that the first phase of the Project has been implemented rather successfully. Considerable improvements were achieved in the service area of AWSC under the 4-year Management Contract signed with internationally experienced Management Contractor. Daily supply hours were increased and water quality was improved, the number of metered subscribers, revenue collection rate, working ration were increased. Water supply and wastewater disposal systems were constructed and rehabilitated. The Company became more manageable. However the GOA continues its efforts to find out possible forms of cooperation through the involvement of private sector in short-term and long-term future.

The MWWP was prepared for 6 years. The tender for Management Contract also was carried out for 6 years (in phases: 4 years plus 2 years). Due to lack of funds the IDA provided only 23.0 million USD under Phase 1, and a 4-year contract was signed with Management Contractor. In case of successful implementation of Phase 1, the Contract should have been extended by two years according to Article 2.2 of General Conditions of Management Contract (with further extension for another year).

In 2009 the GOA received Additional Financing from IDA in the amount of 12.8 million SDR (20 million USD equivalent, Credit 4514AM) to scale up the ongoing program of water system rehabilitation and improvements. The contribution of the GOA was 6.8 million USD. The proposed additional financing was aimed at enhancing the sustainability, impact and development effectiveness of the ongoing project, maximizing its development outcomes and continuation of the institutional and financial capacity building of AWSC.

The Closing date is December 31, 2011.

d) Project Components

Municipal Water and Wastewater Project 3893AM. The Project has the following components:

Table 2 (in million USD)

	Component	Purpose	Original	Revised	Grounds for revision
A	AWSC management strengthening		9.737	10.607	
A.1	PPF	Funds were disbursed in 2002-2004 for Project preparation	1.195	1.325	Cost adjustment
A.2	Management contract, incentive calculation, cost adjustments	To improve AWSC management, operation and maintenance activities and ensure efficient use of MWWP funds	7.68	8.331	Adjustment for Fixed Management Fee and Euro/USD exchange rate fluctuations
A.3	Project Management and Supervision by the CMU	Financing of CMU to ensure efficient Project management, supervision and coordination	0.86	0.951	
B	AWSC investments		3.324	2.953	
B.1	General assistance	Procurement of office and communication equipment, spare parts	0.605	0.779	
B.2	Redundancy program	Payments for staff reduction	0.46	0.246	Implemented based on actual calculations
B.3	Training and re-qualification	Establishment of Training Center and development of training programs	0.176	0.117	
B.4	Chemical and bacteriological laboratories	Re-furnishing and upgrading of branch laboratories	0.22	0.271	
B.5	Water meters testing laboratory	Establishment of water meters testing laboratory	0.22	0.210	
B.6	Water meter revolving fund and installation	Establishing a revolving fund for the credit sale of water meters.	0.55	0.351	
B.7	Assistance to condominiums	Assistance to the condominiums of apartment blocks within AWSC service area	0.213	0.180	

	Component	Purpose	Original	Revised	Grounds for revision
B.8	Incremental AWSC operating expenses	Financing of materials, spare parts, machinery, equipment and other O&M expenses	0.88	0.797	
C	Investments in branch system		12.499	12.492	
C.1	Immediate investment program	Preparation of designs approved by PMB prior to Management Contract commencement	4.735	5.070	
C.2	Investments in AWSC branches	Financing the design, implementation and supervision of the rehabilitation and reconstruction of WW systems in AWSC branches.	7.764	7.423	
	Total		25.559	26.052	

Additional Financing for Municipal Water and Wastewater Project 4514 AM. The Project has the following components:

Table 2 (in million USD)

	Component	Purpose	Original	Revised	Grounds for revision
A	AWSC management strengthening		8.225	9.683	
A.1	PPF	Was implemented under 3893AM Credit Project	0	0	
A.2	Management contract, incentive calculation, cost adjustments	To improve AWSC management, operation and maintenance activities and ensure efficient use of MWWP funds	6.31	8.523	Additional amount for PY7
A.3	Project Management and Supervision by the CMU	Financing of CMU to ensure efficient Project management, supervision and coordination	1.265	1.160	Training costs are removed from procurement
A.4	Preparation of a lease contract	After completion of Management Contract in 2012 the Company has to move to a	0.65	0	These services are paid from EBRD credit proceeds

	Component	Purpose	Original	Revised	Grounds for revision
		lease contract			
B	AWSC investments		6.365	4.254	
B.1	General assistance	Procurement of office and communication equipment, spare parts	4.895	3.269	Some equipment was procured under ADB funding
B.2	Redundancy program	Was implemented under 3893AM Credit Project	0	0	
B.3	Training and re-qualification	Establishment of Training Center and development of training programs	0.57	0	Training costs were removed. The task was implemented through AWSC funding
B.4	Chemical and bacteriological laboratories	Re-furnishing and upgrading of branch laboratories	0.5	0.526	
B.5	Water meters testing laboratory	Was implemented under 3893AM Credit Project	0	0	
B.6	Water meter revolving fund and installation	Was implemented under 3893AM Credit Project	0	0	
B.7	Assistance to condominiums	Assistance to the condominiums of apartment blocks within AWSC service area	0.4	0.459	
B.8	Incremental AWSC operating expenses	Was implemented under 3893AM Credit Project	0	0	
C	Investments in branch system		12.210	11.962	
C.1	Immediate investment program	Was implemented under 3893AM Credit Project	0	0	
C.2	Investments in AWSC branches	Financing the design, implementation and supervision of rehabilitation and reconstruction of WW systems in AWSC branches.	12.210	11.962	

	Component	Purpose	Original	Revised	Grounds for revision
	Total		26.800	25.9	

Notes:

1. The column “Grounds for revision” states only major changes (over 10%).
2. The difference between total amounts in case of both credits is due to fluctuation of SDR/USD exchange rates.

3. Key Factors Affecting Implementation and Outcomes

a) Key factors affecting achievements and major drawbacks

The Management Contractor has made considerable efforts within 2004-2011 which resulted in improvement of the system and better performance indicators. Meantime we think that these indicators could have been even better if more practical approach was applied to some key issues:

- i) The duration of water supply services in the service areas of AWSC were 14.96 hours in September, 2011.

It should be stated that Appendix 9 of Management Contract has set a 24-hours target for this indicator. Although the hours did increase, the target was achieved only by 60%.

- ii) The rate of metered subscribers was 81.2% (40% in 2004).

Nevertheless, the Company is still behind the schedule of individual customers’ Meter Installation Program. The delay of this process negatively impacts Company’s revenues and collection rate.

The process of accounting of produced water is not completed yet. As a result, the produced water and losses are not adequately accounted. Rehabilitation of meters installed at all intakes and distribution points and their proper operation and maintenance will clarify the volume of water taken from the source, transferred to the distribution network and delivered to customers. That will also clarify the losses and leaking points.

- iii) Electricity consumption was 64.3 million KW-hours in 2004. That consumption made up 38.6 million KW*hours in the last Project year (October 2010 – October 2010) through conversion of some pumping systems to gravity, installation of more

efficient pumps in pump stations and implementation of rehabilitation activities in distribution networks (a reduction of 25.7 million KW*hours).

- iv) Water losses have increased from 73.8% in 2004 (water consumption at that time was calculated mainly by per capita norms) to 82.7% in 2011 in spite of investments through WB, ADB, EBRD and USAID funding. In order to reduce losses, it is necessary to establish water accounting system and to continue the detection and elimination of illegal connections. That would enable more targeted use of investments and increase collection rate.
- v) During 6 years of Management Contract it was consistently stated that the Company serves 170,000 subscribers (or about 60%) out of total number of 270,000.

The customers database has to be adapted. In our opinion it would be important to implement that process as it will specify the number of total and served customers, generated revenues, which in its turn will improve collection.

- vi) During first 4 years of the Project 15 civil works contract were implemented for a total amount of 4.0 million USD. Following the Management Contractor's suggestion, the technical and quality supervision of those works was carried out by the Company's in house capacities.

However the technical supervision was carried out by the Company with some shortcomings, and considerable additional efforts were required to eliminate the deficiencies which resulted in the delays of all contracts. Therefore the quality and technical supervision of the civil works implemented in Project years 5-7 were assigned to consultant firms selected through tender.

b) Key factors affecting Project preparation phase

A consultant firm (ICEA, France) with relevant international experience was selected in 2002 for project preparation. The consultant had to investigate the financial, technical, economic, organizational and legal status of the Company and recommend steps required for transferring the system to a private management. The consultant had also to prepare bidding documents (including draft Management Contract) and provide advise to the GOA on arranging the tender and on the measures required for handing over the system to a private management.

The consultant prepared a report consisting of three parts based on the investigation results:

- i) Financial. This part presented the project scope, settlements covered by the project, economic and commercial state and problems.
- ii) Technical. This part described water systems, problems at the intake structures and distribution networks. This part also included preliminary proposals on the priority investment projects.
- iii) Legal-Organizational. This part presented the legal and organizational framework and its major problems. This part also discussed several alternative options for implementation

of MWWP and provided recommendations on Project management and institutional structure.

A draft Management Contract was also prepared, which was tendered internationally after approval by the GOA. An Intergovernmental Commission was established with participation of interested ministries for evaluation of tender results. The French SAUR S.A. firm was recognized winning bidder.

c) Project Risks

The Project has set various risk ratings: High, Significant, Moderate and Low. The following table presents high and significant risks of the Project.

Table 4

Rating	Risk	Proposed Mitigation Measure
High	Domestic (including condominiums) water and wastewater customers do not pay for services provided.	Employment of an international operator under contract incentive to increase collections is the best means of risk minimization. Support to condominiums also is provided.
Significant	Social assistance to the poor does not include sufficient allowance for water and wastewater expenses.	Bank's water sector staff will advocate for increased focus on improving social assistance to the poor.
Significant	Insufficient resources to address all pressing sector needs risks that a major breakdown in provision of safe water may occur.	AWSC specialists will prioritize efforts and investments to minimize the possibility of future breakdowns.

The World Bank and the GOA implemented various actions during entire Project implementation to mitigate the risks.

d) Impact of Project Restructuring or of Other Significant Changes

There were several factors which enabled successful Project implementation, in particular:

- i) Financial assistance to water and wastewater sector by other donors. In addition to 43 million USD credit funds provided by IDA, about 36 million USD was provided by ADB, 12 million USD - by EBRD and about 3 million USD – by USAID.
- ii) Under resolution No. 1458-A of the GOA dated 07.10.2004, the Armenian Water and Sewerage Company was reorganized into two companies: Armenian Water and Sanitation Company, and Water and Sanitation Company. The receivables (except for

834.9 million AMD) and the payables (except for 834.9 million AMD) and about 3.3 billion AMD of assets of the Armenian Water and Sewerage Company were transferred to Water and Sanitation Company.

- iii) The financial accounting system of the Company was improved under the “Armenia Water Metering, Billing and Collection Assistance Program” financed by USAID:
- iv) The Accounting Unit is governed by and operates according to the new Accounting Policy and Accounting Guideline.
- v) Staff Redundancy Program was implemented in the first two Project years. As a result, the Company’s staff number was reduced by 610 employees and the salary of others was increased, which assisted in improving the living standard of employees and enhancing work efficiency.

e) Mid-term Review and Fiduciary Issues

1. The mid-term review of MWWP (3893AM) was conducted by the Bank Mission during its visit to Yerevan in May 2-12, 2007. According to Aide Memoir issued based on the mission results:

- i) The water quality has already improved in some parts of AWSC service area, and the availability of clean and safe water supply has increased in the overall service area. Despite initial delays, the investment program under components 2 (AWSC investments) and 3 (investment in branch systems) is now on track and is expected to be completed on time in February 2009. The investments carried out so far include a chlorination program, which has resulted in an increase in the percentage of water disinfected and the average bacteriological safety compliance, thus meeting the objective of improved water safety and quality. The rehabilitation activities include water treatment rehabilitation and systems repair.
- ii) Through organizational restructuring and efficiency improvements, including staff reduction, AWSC and its branches have been able to improve financial sustainability. Among other improvements, revenue collection increased significantly (from 47.9% to 62.6% in the two years since the start of implementation) and the ratio of water volume billed on the basis of metering also increased from 25% to 47% during the same period. Despite these improvements in the revenue and collection performance, further significant improvement could have been achieved if the meter installation program had started early in the project. The meter installation program experienced delay.
- iii) In comparing the monitoring indicators for 2006 with the baseline data, significant progress has been made. This progress is mainly attributed to improvements in operational procedures, staff qualifications and in office facilities and equipment, and procurement of tools and equipment, water meters and laboratory and testing facilities. In addition, minor investments have been made, mainly through internal resources, in works rehabilitation, replacement of pumps and equipment, and improved/extended chlorination facilities.
- iv) In summary, the achievement of the project’s objectives is based on improvement of service and water quality, as well as satisfactory financial performance of AWSC and its

service branches. Because of this satisfactory performance in project implementation, the mission is satisfied that the project objectives are still valid and remain relevant. Therefore, the mission does not recommend any changes to project objectives or project activities.

2. The mid-term review of the AF MWWP (4514 AM) was conducted by the Bank Mission during its visit to Yerevan in March 22-26, 2010. Aide Memoir was issued based on the Mission results, and the Fiduciary Aspects section states the following:

- In spite of delays in preparation of bidding documents for 20 tenders, the procurement performance was assessed satisfactory.
- The financial management arrangements at the CMU including accounting, financial reporting, budgeting and planning, funds flow, internal controls and external audit and staffing are satisfactory and continue to be acceptable to Bank.
- Based on the discussions with CMU as well as field trips to the implementation sites, no major environmental issues have been encountered during implementation of civil works.

The major performance indicators (intermediate results) as provided in the Quarter Report for October-December 2009 evidence continued progress towards meeting project objectives. The main indicators are as follows:

- i) Average duration of water supply has increased from 6 hr in baseline year to current 13 hr.
- ii) The bacterial safety compliance has increased from 93% in baseline year to current 98%.
- iii) Percentage of individual subscribers billed on the basis of water meters has increased from 40% in baseline year to current 68%.
- iv) Company's working ratio has decreased from 195% at the baseline year to current 104%.
- v) The percentage of cities with minimal daily hours of water supply services has increased from 68% in baseline year to current 85%.

f) Performance (Operation and Maintenance) of Structures Financed from the Projects

- i) Technical, financial, commercial and structural provisions.

Technical: Armenia has sufficient water resources. About 96% potable water is obtained through tubewells, wells or springs. About 4% of potable water is produced from surface water after required treatment. The main indicators for service quality measurement are the water supply duration and the water quality. The water service target for AWSC for 2011 was set at 16 hours (it made 14.94 hr in September 2011). The water quality target is achieved: it was 98.1% as of September 2011.

The wastewater in almost all urban centers of Armenia is removed through wastewater disposal networks. However the existing treatment plants do not operate. They are deteriorated and cannot be rehabilitated anymore. The rural settlements usually do not

have wastewater collection system. It may be stated that actually nothing was proposed for rehabilitation, reconstruction or new construction of wastewater disposal systems under IDA credit projects.

The losses within the system are very high. They made up 82.7% as of September, 2011. About 50% of that loss is estimated to be through the commercial losses and about 50% - through technical losses. It is assumed that 50-65% of losses occur due to the poor state of the internal distribution network of block apartment buildings and private houses which are beyond AWSC control boundaries.

Water accounting has reached high levels. The number of subscribers billed on the basis of water meters made up 81.2% of total subscribers number. However there is a problem with the replacement of low quality water meters.

Financial-commercial. According to Financial Statements and Independent Audit Opinion for the year ended 31.12.2010, the auditor has issued unmodified opinion for the financial statements of AWSC, which points out significant improvement in the quality of financial reports.

Most of the audit recommendations of the previous years have been addressed or are in progress. In the meantime the auditor expressed a repetitive emphasis of matter on the entity's ability to continue as a going concern, as the entity has incurred considerable financial losses in previous years, the aggregated amount of which makes up 17, 385, 512 thousands AMD, and it is expected that the entity's total liabilities will exceed its assets by the end of 2011.

Revenue collection rate is high. It was 93.6% as of September 2011 (budget entities excluded). However as the fees are billed on the basis of volumes which currently cannot be measured accurately due to poor state water meters, it cannot be verified whether the subscribers pay for actually consumed quantities.

Structural: It may be stated that the involvement of a private operator in water and wastewater system of Armenia was a success. The Management Contract of AWSC was signed in 2004. It has been successfully implementing for 7 years. Currently the contract is being amended according to 2+1 scheme (enhanced contract). It is envisaged to have a lease contract after completion of Management Contract. The asset ownership both in case of management contract and lease contract remains with the state.

- ii) Timely provision of investments and respective budget allocations.

The investments by the World Bank and GOA were provided in a timely manner and there were no problems with late or delayed payment. The following table presents allocations from credit proceeds and GOA co-financing by years.

Table 5

Year	WB financing (USD)	Contribution of the GOA (USD)
Water and Wastewater Project 3893AM		
2004	2037674.8	279667.07
2005	3339571.27	156292.44
2006	5759568.7	471594.08
2007	6541115.54	675261.84
2008	5513962.45	932810.5
2009	277441.97	0
Total	23469334.73	2515625.93
	25984960.66	
Additional Financing for Water and Wastewater Project 4514 AM		
2009	3666273.21	1495896.57
2010	8068619.79	2213873.17
2011*	6403728.46	2084965.06
Total	18138621.46	5794734.8
	23933356.26	

* Note: the data for 2011 are submitted as of 30.11.2011.

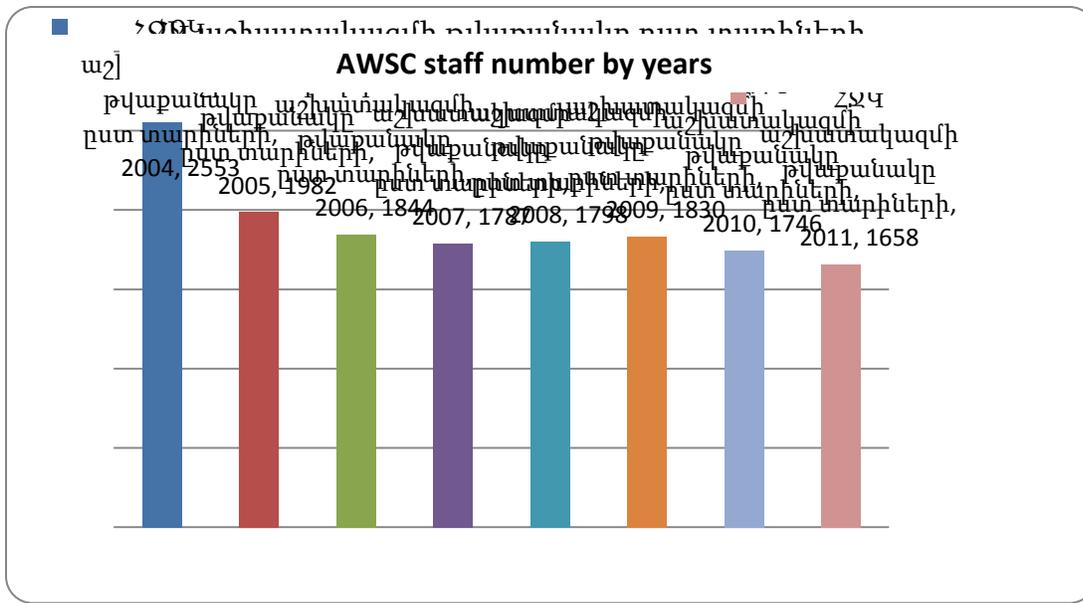
g) Due Completion of Staff

According to Management Contract, the Management Contactor provides services (general management, accounting, human resources, commercial, financial-economic, technical, etc.) through his Management Staff and Operations staff.

The Management staff is the internationally experienced staff included in the Management Contractor's Bid. The number of Managerial Staff has been reduced.

The Operations Staff is the AWSC staff. Staff Redundancy Program was implemented in the first two Project years. As a result, the Company's staff number was reduced by 610 employees and salary of others was increased, which assisted in improving the living standard of employees and enhancing work efficiency

The following diagram shows average staff number of the Company by years.



Skilled employees-specialists have to be involved in order to improve Company management. Currently they are not always available. Additional funds have to be allocated to settle this issue.

4. Assessment of Outcomes

Outcome of operations

The Management Contractor of AWSC has made considerable efforts resulting in improvement of the system and higher performance indicators.

- a) The quality and the efficiency of water and wastewater disposal services provided by the Company have been improved. Special attention was paid to the improvement of daily hours of water supply, higher reliability and greater water safety.
- b) The consumers' willingness to pay for water and wastewater services was promoted through higher quality and better arrangements of consumers service.
- c) The financial state of the Company was improved and its future sustainability was ensured.
- d) Staff training and re-qualification courses were organized to improve management, operation and maintenance and financial sectors thus ensuring stable operations of these sectors after contract completion.
- e) Equipment required for operation and maintenance of the system was procured. The technical assets and infrastructures operated by the company were rehabilitated, renewed or upgraded under Company's MWWP fund.
- f) Investment programs were prepared and implemented within the contract period through the available funds and the long-term investment needs were assessed.

Implementation of the Additional Financing for MWWP (4514 AM) was reviewed by the Bank Mission during its visit to Yerevan in September 11-12 and September 19-23, 2011. Aide

Memoir was issued based on the Mission results, and the Fiduciary Aspects section states the following:

Procurement: The mission reviewed the progress of procurement under the Project. Overall, the procurement progress has been satisfactory.

Financial management: The auditor has issued unmodified opinion for the financial statements of AWSC for the year ended 31.12.2010, which pointed out significant improvement in the quality of financial reports. Most of the audit recommendations of the previous years have been addressed or are in progress. In the meantime the auditor expressed a repetitive emphasis of matter on the entity's ability to continue as a going concern, as the entity has incurred considerable financial losses in previous years, the aggregated amount of which makes up 17, 385, 512 thousands AMD, and it is expected that the entity's total liabilities will exceed its assets by the end of 2011.

Environmental Safeguards. Environmental performance under MWWP continues to be satisfactory. Ongoing works for the rehabilitation of water supply system of Hrazdan in general comply with site-specific Environment Management Plan for this Category B operation.

The performance was also assessed by the Technical Auditor (Danish Rambol firm). According to Year 2010 Audit Report of the Independent Technical Audit of Management Contract (Rambol, Denmark). the Management Contractor in general has improved most performance indicators in 2010 (the Auditor Report for year 2011 will be submitted in the beginning of 2012). The Auditor has briefly presented Management Contractor's achievements in 2010 for some indicators.

Weighted average number of daily hours of drinking water service: The Management Contractor has assessed this indicator slightly less than 14 hours by the end of 2010 which is about 1 hour longer than in December 2009.

Weighted average water bacteriological safety compliance: This indicator was 98.2% in 2010. The problem with this indicator is the low sample number – only 62% of the required samples were taken and tested. It was agreed that in Project year 7 the incomplete samples will be considered as non-complying samples.

Efficiency of water meters installation program: the percentage of domestic subscribers with water meters points out the success of water meters installation program.

Financial operational stability of the Company: this indicator was quite below 1, therefore the target is achieved.

No targets were specified for other performance indicators. However upon comparing the results with 2009, the Auditor points out that most of indicators have been improved. However the Auditor finds reasonable to provide some general comments for the improved indicators.

Percentage of cities with minimal daily hours of services: Good results were achieved for these indicators. However the Management Contractor has to direct his improvement efforts in such a manner to make the improvement beneficial to all the served subscribers. It is much important to increase water supply services by 2 hours to those subscribers who now get water for 3 hours or less per day than to extend water supply by the same 2 hours to those subscribers who get water for 17 hours per day.

Collection ratio: collection rate has increased from 47.9% to 93.6%. However there are things that have to be done in this direction, in particular adjustment of customer's data base and more accurate assessment of revenues.

Electricity specific consumption: The average electricity consumption in 2010 made up 0.23 KW*hours/cub.m. The baseline figure was assumed 0.43 KW*hours/cub.m. The overall electricity consumption was reduced from 60,048,000 KW*hours in base year to 34,511,000 KW*hours in 2010 representing a 43% reduction.

Percentage of water disinfected: About 78.8% of the total produced water was disinfected in 2010. The corresponding baseline figure was 60.9%. According to standards, the required concentration of residual chlorine in the distribution network is 0.3-0.5 mg/l. Based on the hypochlorite quantity consumed in 2010, the Auditor calculated the average chlorine content and arrived at 0.59 mg/l, which is less than required by standards: 0.7-1.0 mg/l for groundwater and 2.0-3.0 mg/l for surface water.

The 21 PIs were mainly improved. The following table presents PI data by years and the target values for 31.12.2011, defined by the Aide Memoir of the World Bank's mission in September-October 2010.

Performance indicators

Table 6

N	Indicator	Mes. unit	Base year	2005 Av.	2006 Av.	2007 Av.	2008 Av.	2008 Av.	2010 Av.	2011 QIII	31.12 2011 Target
1	2	3	4	5	6	7	8	9	10	11	
1	Weighted average number of daily hours of drinking water service	hour/day	6,04	7,39	9,62	10,98	12,10	13,0	14,0	14,96	16.0
2	% of individual subscribers billed on the basis of metered consumption	%	40,2	53,6	57,3	62,5	64,6	73,9	77,2	81,2	77.7
3	Weighted average water bacteriological safety compliance	%	93,8	93,8	93,9	96,2	96,6	98,6	98,2	98,1	98.1
4	Company working ratio	%	194,9	176,4	138,8	133,8	133,7	106,6	102,4	96,9	118

N	Indicator	Mes. unit	Base year	2005 Av.	2006 Av.	2007 Av.	2008 Av.	2008 Av.	2010 Av.	2011 QIII	31.12 2011 Target
1	2	3	4	5	6	7	8	9	10	11	
5	% of cities with minimal daily hours of services	%	68,1	74,1	80,1	83,9	85,6	80,7	90,1	94,0	90
6	% of block apartment buildings with individual or common block meter	%	38,6	56,3	61,6	67,5	70,6	76,8	79,9	82,0	75
7	% of block apartment buildings under contractual agreement with the company	%									
8	Revenue collected on domestic subscribers per registered inhabitant	AMD/month	166	181	242	250	286	396	446	524	260
9	Collection ratio (excluding budget organizations)	%	47,9	36,2	62,6	72,3	75,9	83,5	89,7	93,6	80
10	% of subscriber with more than 4 month debt	%	79,5	75,1	76,7	77,8	79,5	78,1	48,9	27,7	78
11	Average domestic metered consumption per metered registered inhabitant	l/subsc/day	81	71	75	78	87	87	91	120	70
12	Average price of m3 metered and billed to domestic subscribers	AMD/m ³	100,41	126,80	140,00	140,00	140,00	159,50	179,98	179,78	180
13	Growth of the total collected revenue (excluding budget organization) from base year	%	114 568	16,2	46,9	54,8	72,6	119,5	146,2	183,8	
14	Ratio of water volume billed on the basis of metering to the total metered and normative billed volume	%	25,0	26,0	47,3	56,2	59,1	64,5	77,8	87,9	65
15	Average daily production per equivalent registered inhabitant at water catchments levels	l/subsc/day	668	759	754	790	827	792	742	752	670
16	Average daily supply to distribution reservoir per equivalent registered inhabitant	l/subsc/day									
17	Ratio of metered final consumption (m3) to water production at water catchments levels	%	6,8	6,4	7,8	8,1	8,5	9,4	11,6	15,2	7.8

N	Indicator	Mes. unit	Base year	2005 Av.	2006 Av.	2007 Av.	2008 Av.	2008 Av.	2010 Av.	2011 QIII	31.12 2011 Target
1	2	3	4	5	6	7	8	9	10	11	
18	Working ratio for branches with gravity systems	%	89,7	121,0	97,5	94,5	85,2	65,9	58,0	56,8	80
19	Working ratio for branches with pumping stations or treatment plants	%	223,3	196,8	155,2	148,9	147,2	115,5	105,0	99,9	120
20	Electricity cost as % of revenue collected in systems with pumping or treatment plants	%	72,6	63,1	42,6	39,7	39,2	30,8	25,7	22,7	40
21	Amount of chlorine effectively used per equivalent inhabitant per year	%									
22	Total staff per 1000 individual subscribers	staff	9,45	8,34	7,15	6,87	6,85	6,9	6,3	6,0	6.8
23	Staff and assignment contractors total costs as % of collected revenue	%	70,2	68,9	61,9	61,4	62,2	51,1	49,4	45,2	60
24	Electricity consumption specific	KW*h r/m ³	0,43	0,38	0,31	0,30	0,29	0,25	0,23	0,23	0.30
25	% of water disinfected	%	60,9	67,8	80,0	90,3	91,2	82,6	78,8	92,9	95

It may be seen from the table, that as of September 2011 most of the performance indicators (18 out of 21) have already achieved or exceeded the target values projected for the end of December 2011. Three indicators did not reach target values.

Risks to Development Outcome

Under the Management Contract the operator takes the Management and Operations risk. He is paid a fee which is fixed against contractual requirements.

Before an operator takes the risks associated with the lease contract, the AWSC has to be in a good and established situation including adequate information available on the utility. Additionally there has to be a clear indication of the potential for the planned system improvements and the application of the associated tariff, the resulting demand levels and potential revenue collections. The existence of an already successful Management Contract, that has generated the required information and experience, is an important basis for an operator to be prepared to take the additional risks involved under a lease contract.

Through increasing the effective working life of pumps and pipes, the risks of major bursts and network failure will be significantly reduced.

The non-revenue water is very high by any standard, resulting in increasing operating costs, lost revenues, risks associated with water quality, water supply interruptions, and ultimately in the risk of serious network failure. It is advised to carry out priority inventory of water assets to have better understanding of sources of each component of non-revenue water.

Bank's and Borrower's Performance

In order to ensure the efficient commencement of the Project and the dedicated use of funds, IDA allocated 1.195 million USD PPF at the preparation stage under which some preparative activities were conducted. The Bank has been providing continuous support and assistance at the project implementation stage (2004-2011). Each World Bank mission has assessed Project progress achievements and drawbacks and provided recommendation for filling the gaps and eliminating the delays.

5. Lessons Learned

The Management Contract for AWSC was signed in 2004 following the success of Yerevan Management Contract and lessons learned from it. However, in order to make the performance more efficient, the following measures are required.

- a) The performance indicators should include other criteria like water losses, establishment of a system for accounting water losses from the source to consumer.
- b) Targets were set only for 4 indicators out of 22 performance indicators specified by the Management Contract, and that was done merely for calculation of incentive compensation. In our opinion annual targets should be specified for other performance indicators as well.
- c) The base year and annual indicators should be calculated on the basis of maximal reliable data. For example, the accuracy of revenue and collection rate depends upon the accuracy of customers' data base which has to be adjusted. Water losses should be calculated only after full water accounting, which currently is not in place.
- d) The activities on improving the AWSC system through sectorization and installation of water meters implemented under credit project have considerably improved operational and financial indicators. However, the lessons learned showed that the water meters data are incomplete. The studied meters have registered only 20% of produced water in average. The rest is documented as loss. In order to reduce essentially the losses and increase the volume of accounted water (and hence the generated revenue) it would be necessary to: (i) replace the broken water meters; (ii) remove the water meters of private houses outside private ownership areas and transfer their management to AWSC; (iii) install meters at apartment block buildings, etc.

6. Project Costs by Components

The following table presents Project costs by components, allocated funds and disbursements as of 31.10.2011.

Municipal Water and Wastewater Project 3893AM. Project costs by years (2004-2009) are presented in the following components:

Table 7 (in million USD)

	Component	Original	Revised	Note
A	AWSC management strengthening	9.737	10.607	Disbursed
A.1	PPF	1.195	1.325	Disbursed
A.2	Management contract, incentive calculation, cost adjustments	7.68	8.331	Disbursed
A.3	Project Management and Supervision by the CMU	0.86	0.951	Disbursed
B	AWSC investments	3.324	2.953	Disbursed
B.1	General assistance	0.605	0.779	Disbursed
B.2	Redundancy program	0.46	0.246	Disbursed
B.3	Training and re-qualification	0.176	0.117	Disbursed
B.4	Chemical and bacteriological laboratories	0.22	0.271	Disbursed
B.5	Water meters testing laboratory	0.22	0.210	Disbursed
B.6	Water meter revolving fund and installation	0.55	0.351	Disbursed
B.7	Assistance to condominiums	0.213	0.180	Disbursed
B.8	Incremental AWSC operating expenses	0.88	0.797	Disbursed
C	Investments in branch system	12.499	12.492	Disbursed
C.1	Immediate investment program	4.735	5.070	Disbursed
C.2	Investments in AWSC branches	7.764	7.423	Disbursed
	Total	25.559	26.052	

The following table presents costs of the Additional Financing for Municipal Water and Wastewater Project 4514 AM (2009-2011).

Table 8 (in million USD)

	Component	According to project	Contract price	Actual price	Actual completion/ note
A	AWSC management strengthening	9.683	9.06	8.118	Ongoing
A.1	PPF	0	0	0	
A.2	Management contract, incentive calculation, cost adjustments	8.523	7.944	7.242	Ongoing
A.3	Project Management and Supervision by the CMU	1.160	1.116	0.875	Ongoing
A.4	Preparation of a lease contract	0	0	0	
B	AWSC investments	4.254	4.114	4.172	
B.1	General assistance	3.269	3.145	3.187	Completed
B.2	Redundancy program	0	0	0	
B.3	Training and re-qualification	0	0	0	
B.4	Chemical and bacteriological laboratories	0.526	0.510	0.526	01.10.10
B.5	Water meters testing laboratory	0	0	0	
B.6	Water meter revolving fund and installation	0	0	0	
B.7	Assistance to condominiums	0.459	0.459	0.459	22.01.11
B.8	Incremental AWSC operating expenses	0	0	0	
C	Investments in branch system	11.962	11.687	10.233	
C.1	Immediate investment program	0	0	0	
C.2	Investments in AWSC branches	11.962	11.687	10.233	
	Total	25.9	24.861	22.523	

Notes: The difference between total amounts in case of both credits is due to fluctuation of SDR/USD exchange rates.

7. Outcomes by Components

Project components implementation progress

Project component A. The undisbursed amounts under this component are provided for technical and financial audit of this year, project management costs and payments to Management Contractor for the last year. It is also envisaged to implement training and experience exchange for enhancing knowledge on concession and lease contracts.

Project component B. The procurements of goods under this component are completed (AWSC investments).

Project component B. The largest activity under this component (investments in AWSC branches) is the contract on rehabilitation of water supply and wastewater disposal systems of Hrazdan. Civil works in Hrazdan are ongoing under two lots, and they will be completed by December 20.

8. Financial and Economic Analysis

This section provides some financial data. What regards to NPV, ERR and IRR, they will be submitted later after making respective calculations.

Table 9. (000' AMD)

	2005	2006	2007	2008	2009	2010	
Revenue	4,636.3	3,358.6	3,243.9	3,435.7	4,034.2	4,184.8	
Collection	1,833.9	2,308.1	2,442.8	2,683.2	3,387.7	3,797.4	
Collection rate (%)	39.6	68.7	75.3	78.1	83.9	90.1	
Subsidy	1,366.5	1,381.3	1,381.3	1,213.5	863.4	811.6	
Cost of sales	(3,691.4)	(3,607.6)	(3,547.1)	(3,471.4)	(3,429.4)	(3,771.4)	
Administrative costs	1,615.3	1,449.2	1,359.0	1,733.8	2,134.5	2,498.5	
Resource and environment payment	71.9	60.1	48.2	51.7	53.6	53.2	
Chlorine, bleaching chlorine and reagents	34.6	52.1	50.7	57.7	62.0	65.5	
Current rehabilitation works	220.5	171.9	150.4	168.5	144.2	159.4	
Fuel	173.3	184.5	140.3	205.8	188.4	239.1	
VAT, taxes and mandatory payments	162.9	171.2	200.2	239.0	512.0	531.3	
Labor costs (including mandatory payment)	1,297.5	1,436.4	1,505.1	1,711.2	1,806.6	1,941.1	
Average staff number	2,129	1,861	1,789	1,840	1,870	1,776	
Electricity	Mln AMD	1,151	996.1	1,023.9	1,062.8	1,058.8	996.1
	Mln KW-hr	61.53	53.12	54.21	55.16	45.78	40.46
Losses	Current year	352.2	994.2	351.0	5,177.5	4,349.1	525.2
	Incremental	5,780.9	6,627.1	6,980.5	12,915.5	16,980.3	17,385.5

The table shows that AWSC has improved collection indicator, accrual and recording systems and has fully abandoned the practice of fee collection in cash by Company employees. The installation of water meters and increasing of water supply service hours in many places have increased consumers' willingness to pay for services.

Simultaneously, electricity was saved. The average staff number was reduced, meantime the labor costs have increased, so it may be concluded that the salary rates have increased.

There were significant changes in the following items of administration costs:

(000' AMD)

	2006	2007	2008	2009	2010
Management costs (by external Contract Manager - SAUR)	817,981	578,217	580,697	779,649	949,927
Salary and social payments	300,569	456,849	508,385	506,378	634,095
Audit and consultant costs	109,335	54,096	189,785	158,223	141,153

The doubtful debt made up **4,131,432** thousands AMD in 2008, and the review of financial statements of the previous years shows that no allowance was made for it in 2004-2008. It was opened incrementally in 2008, therefore the losses also were increased.

However, if operational loss in 2008 made up **5,177,453** thousands AMD, out of which **4,131,432** thousands AMD (or 79.8%) was the doubtful loss, the operational loss of the company in 2009 made up **4,349,088** thousands AMD, out of which only **666,109** thousands (or 15.3%) was the doubtful debt. The lines of “Administrative costs” and “Other benefits/losses” have increased in the share of accumulated loss in 2009 compared to 2008. The administrative costs made up **1,832,988 thousands AMD** in 2008 and **2,134,457** thousands AMD in 2009. “Other benefits/losses” made up **20,369** thousands AMD in 2008 and **1,795,278** thousands AMD in 2009.

The Company loss was **525,170 thousand AMD** in 2010, out of which **233,421** thousands AMD or **44.5%** was the doubtful debt.

As a result, the accumulated loss as of 31.12.2009 was **16,980,298** thousand AMD or a **31.5%** increase compared to 01.01.2009. The accumulated loss as of 31.12.2010 was **17,385,512** thousand AMD or a **2.4%** increase compared to 01.01.2009

According to Financial Statements and Independent Audit Opinion for the year ended 31.12.2010, the auditor has issued unmodified opinion for the financial statements of AWSC, which points out significant improvement in the quality of financial reports.

Most of the audit recommendations of the previous years have been addressed or are in progress. In the meantime the auditor expressed a repetitive emphasis of matter on the entity’s ability to continue as a going concern (for the first time it was expressed in the Financial Statements and Independent Audit Opinion for the year ended 31.12.2009), as the entity has incurred considerable financial losses in previous years, the aggregated amount of which makes up 17,385,512 thousands AMD, and it is expected that the entity’s total liabilities will exceed its assets by the end of 2011.

“Water Sector Development Project Implementation Unit” SI

05.12.2011

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STATE COMMITTEE
OF WATER SYSTEM OF THE
RA MINISTRY OF TERRITORIAL
ADMINISTRATION
CHAIRMAN

ՀՀ, Երևան 375010, Վարդանանց 13ա
Հեռ.՝ (374 10) 540 909, ֆաքս՝ (374 10) 540 603
Էլ. փոստ՝ scws@netsys.am

13a, Vardanants st., Yerevan 375010, Armenia
Tel.: (374 10) 540 909, fax: (374 10) 540 603
E-mail: scws@netsys.am

«12» հունվարի, 2012թ. N 01/03/1239-12

Ձեր _____ 2012թ. N _____

Համաշխարհային բանկի
Եվրոպայի և Կենտրոնական Ասիայի տարածաշրջանի
Երևանյան գրասենյակի տնօրեն
Պրն ԺԱՆ ՄԻՇԵԼ ՀԱՊԻՆՆ

**Խնդրո առարկան. Համայնքային ջրամատակարարման և ջրահեռացման
ծրագրի իրականացման ավարտման հաշվետվություն**

Հարգելի պարոն Հապի,

Մենք ուսումնասիրեցինք վերը նշված ծրագրի իրականացման ավարտման
հաշվետվության ներկայացված նախագիծը և որևէ դիտողություն կամ
առաջարկություն դրա վերաբերյալ չունենք:

ՀՀ Տարածքային կառավարման նախարարության Զրային տնտեսության
պետական կոմիտեն բարձր է գնահատում Համաշխարհային բանկի աջակցությունը
Հայաստանի համայնքային ջրամատակարարման ոլորտում և հույս ունի, որ այդ
համագործակցությունը հաջողված կլինի նաև ընթացիկ Համայնքային
ջրամատակարարման ծրագրի շրջանակներում:

Հարգանքով՝

Ա. ԱՆԴՐԵԱՅԱՆ

Blank of the Committee

Mr. Jean-Michel Happi
Country Manager for Armenia
Europe and Central Asia Region

June 12, 2012

Re: Implementation Completion Report for Municipal Water and Waste Water Project

Dear Mr. Jean-Michel Happi,

We have reviewed and have no comments regarding the submitted draft
Implementation Completion Report for the above referred project.

The State Committee for Water Economy of the RA Ministry of Territorial
Administration appreciates the World Bank' assistance in the municipal water supply sector
of Armenia and hopes that this cooperation will be successful also within the framework of
the ongoing Municipal Water Project.

Sincerely,

Andranik Andreasyan

Chairman

State Committee of Water Economy