No.25 Nor Yedesia

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.25 Community Nor Yedesia
District Ashtarak
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Water main	40	16	51.9	44	10	52.6	-	-	-	800m 3 in 3 days
2											
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Not acceptable
Notes	800m3 water is permitted for supplying to Nor Yedeisa from the water main once in three days. The internal network is also deteriorated. Community feels poor water quality due to pipe-inside being corroded.
Alternative sources if any	No alternative water sources are available

No.25 Community Nor Yedesia
District Ashtarak
Marz Aragatsotn
Sampling date 20/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		6.8				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	15					
c	TDS	Mg/L	99				1000	1000
1	Al:Aluminum	Mg/L	n.d				0.10	0.50
2	B:Boron	Mg/L	0.20				0.70	0.50
3	Cl:Chloride	Mg/L	19				250	350
4	Cr:Chrome	Mg/L	<0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.33				1.50	
7	Hardness	Mg/L	200				500	700
8	Fe:Iron	Mg/L	0.04				0.30	0.30
9	Mn:Manganese	Mg/L	0.10				0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.8				50.0	45.0
13	SO4:Sulfate	Mg/L	5.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	0.00005				NA	0.00020
18	Cd:Cadmium	Mg/L	<0.0001				0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001				0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	n.d				0.010	0.010
22	Sr:Strontium	Mg/L	<0.7				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.25 Community Nor Yedesia
District Ashtarak
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	2		57-71	4.4	Not Identified
2	2		26-100	4.4-7.5	Not Identified
3	3		35-40	4.3	Not Identified
4	4		1	Not Identified	Not Identified
5	6		4-6	Not Identified	Not Identified
6	7		0-1	Not Identified	Not Identified

No. 25 **Marz** Aragatsotn **Community** Nor Yedesia

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Fair	Possible	
2	Transmission pipeline	Possible	Possible	Pipeline is generally along or close to the road
3	Reservoir	Fair	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume *1 (l/s)	Rehabilitation Necessity (Y/N)
1	Water main	40°16'51.9″	44°10'52.6″	1,196	1978	Steel	3.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	11,000	150	Steel	3.0	2004	No	No

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°13'51.8″	40°07'43.1″	1,097	reinforced concrete	Rectangular	12x18x4.5	800	No

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Reservoir	Powder	Once a month

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	3,900	100	Steel	1970	Medium	Yes
2	1,200	150	Steel	1970	Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
Yes (1nos)	Commercial	Centrifugal	-	-	-	-	No

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
No					

9. DRAINAGE SYSTEM

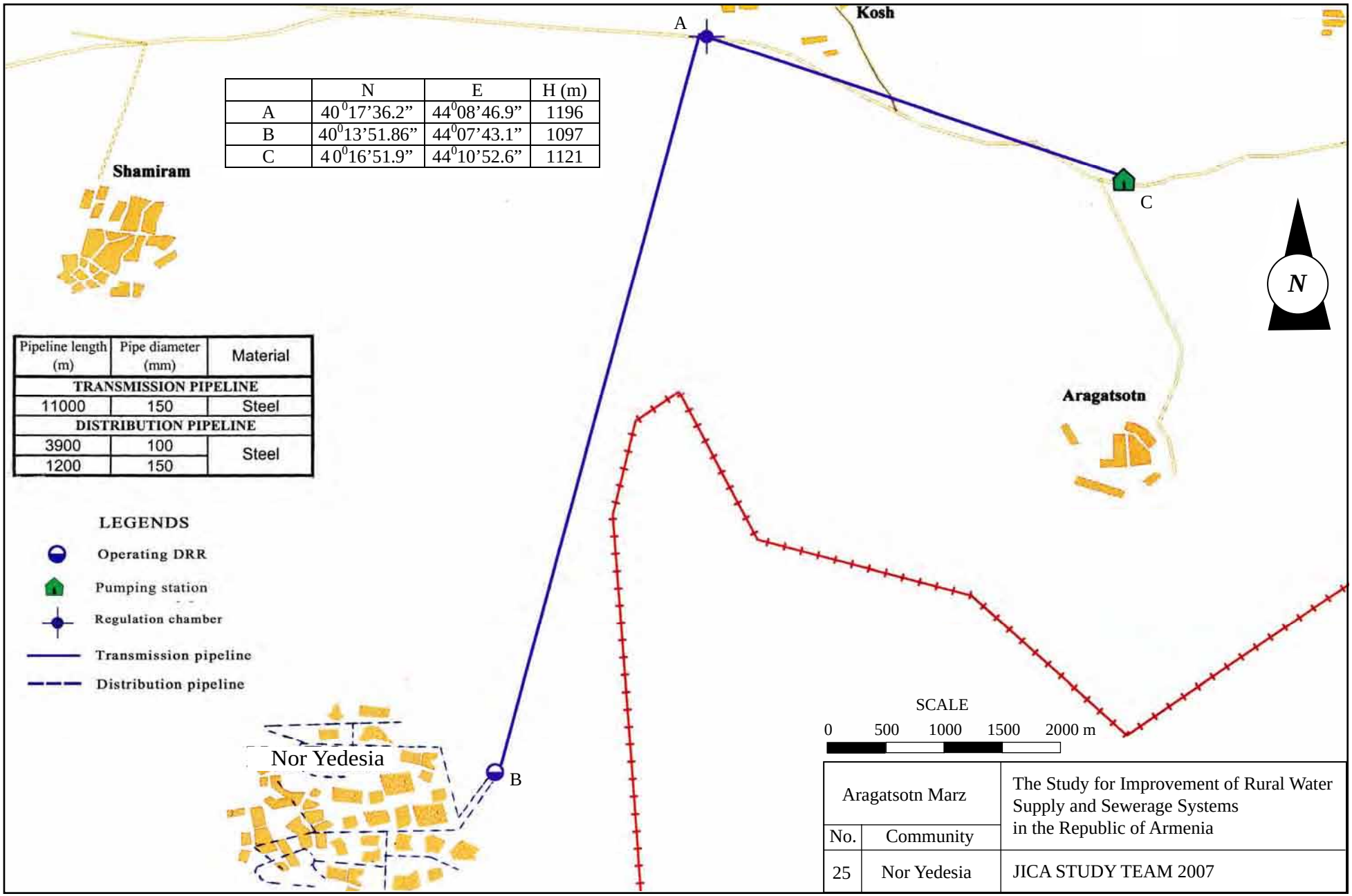
Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
Yes	Yes	

Note 1: 3lit/sec is calculated from intake yield 800m3/3days.

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.25 Nor Yedesia**
District	**Ashtarak**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	1,183
A2	Actual population in 2007	1,200
A3	Number of households	230
A4.1	Elderly people	34
A4.2	Population in labor force (age from 16 to 62)	780
A4.3	Children	325
A5.1	Pensioners	45
A5.2	Unemployed	12
A5.3	Receiving benefits	21
A6	Average monthly income of household (AMD)	25,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	270
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	2,300
	Annual Budget of the community 2005, in thousand AMD	7,500
	Annual Budget of the community 2006, in thousand AMD	15,000
	Annual Budget of the community 2007, in thousand AMD	1,000
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	0
	Amount spent in drinking water sector 2005, in thousand AMD	150
	Amount spent in drinking water sector 2006, in thousand AMD	600
	Amount spent in drinking water sector 2007, in thousand AMD	300
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	cereals
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	is not planned
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	almost sufficient
D7	Number of house connection to drinking water system	230
D8	How many house connection household set the water meter	10%
D9	Number of public taps	1
D10.1	How is the regime of water supply in your community in the dry season?	irregularly, 1-3 hrs in 3days
D10.2	How is the regime of water supply in your community in the wet season?	irregularly, 1-3 hrs in 3days
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	mainly displeased
D13	Are hours of water supply convenient?	not convenient at all
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	1,000
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	difficult to answer
D16	Drinking water monthly water fee per household	600drams
D17	How often do you usually pay water fees?	each month
D18	Water fee structure 1Flate rate, 2 Having water tariff	flat rate
D19	Where do you acquire the irrigation water?	Arzni - Shamiram reservoir
D20	Are you satisfied with irrigation water supply volume?	almost sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Sirakhanyan Aramayis
E2	Position	water distributor
E3	Telephone	with the help of administration head
E4	Quantity and present condition of the water supply facilities: spring/ intake	1 deteriorated
E5	Quantity and present condition of the water supply facilities:	absent
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1- deteriorated
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	1 deteriorated
E10	Who is the owner of the water supply facilities?	the water main and pump belong to Arm water sewerage
E11	Who is engaged in the water supply facilities repairing works?	community and residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	absent
E14	How you prepare O&M costs?	collect water fee from residents
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	600,000
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	600,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	difficult to answer
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent



	N	E	H (m)
A	40°17'36.2"	44°08'46.9"	1196
B	40°13'51.86"	44°07'43.1"	1097
C	40°16'51.9"	44°10'52.6"	1121

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
11000	150	Steel
DISTRIBUTION PIPELINE		
3900	100	Steel
1200	150	

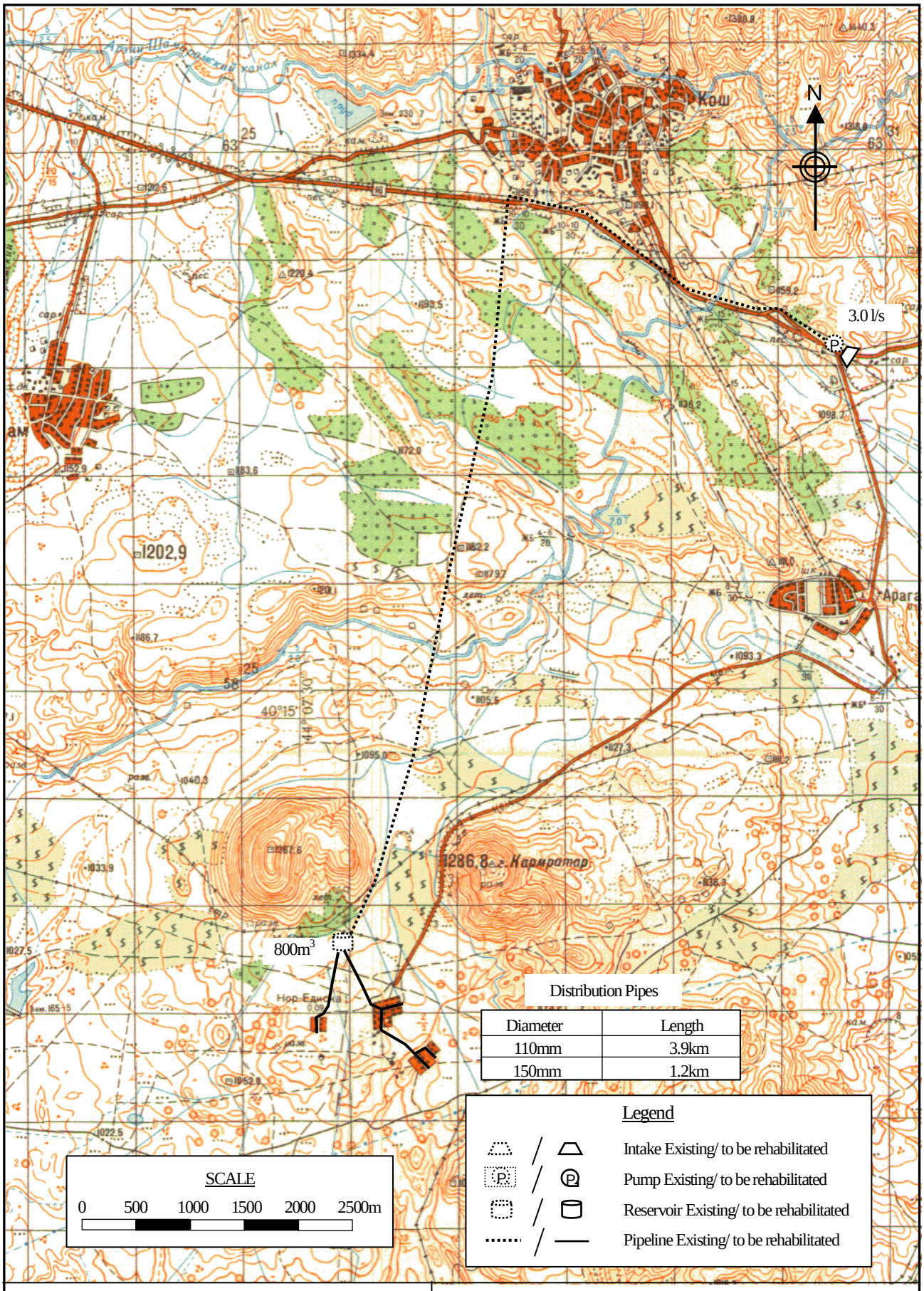
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
25	Nor Yedesia	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.25
Name : **Nor Yedesia**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	1,200	persons	120.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	270	pupils	2.7	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	230	household	20.0	
	Sub-total			142.7	
	Unaccouted for water (20%)			28.5	
1	Average Daily Water Demand			171.2	m3/day
2	Maximum Daily Water Demand			205.5	m3/day
3	Maximum Hourly Water Demand			22.3	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Existing pipeline	1	3.0	lit/sec		259.2	m3/day
	b						
`	Total					259.2	m3/day
	2 Required reservoir volume					267	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
No	Item	Quantity	Unit
	1 Intake		
	1m3	1	nos
	2m3		nos
	3m3		nos
	4m3		nos
	2 Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	3 Reservoir		
	4 Distribution pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	3,900	m
	150mm diameter	1,200	m
	200mm diameter		m
	250mm diameter		m
	5 House connection	-	nos
	6 Water meter installation	230	nos
	7 Public tap	3	nos
	8 Chlorination	1	nos
	9 Pumps	-	nos



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 25	Nor Yedesia	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **25**
Name : **Nor Yedesia**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	3,900	m	9,680	37,752,000
		150mm	1,200	m	13,140	15,768,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					53,520,000
5	House Connection			nos	74,000	
6	Water Meter Installation		230	nos	80,000	18,400,000
7	Public Tap		3	nos	90,000	270,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	2,040	m	3,600	7,344,000
	Total				AMD	80,401,700
					Equivalent to USD	263,163
					Equivalent to JPY	27,763,745
					AMD	USD
	Investment Cost per household		230	HH	349,573	1,144
	Investment Cost per person		1,200	persons	67,001	219

ARAGATSOTN MARZ
Talin District
No 25 Nor Yedesia

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		52.1																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		290.93	0.00	0.00	0.83	1.65	1.88	1.94	3.28	3.39	3.50	3.62	5.42	5.60	5.79	5.98	6.17	6.38	6.59	6.80	7.03	7.26	7.50	7.75	8.00	8.27	8.54	8.82	9.11	9.41	9.73	10.05	10.38	10.72	11.07	11.44	11.82	12.21	12.61	13.03	13.46	13.90
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				313																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		13.74			0.08	0.17	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.40	0.41	0.42	0.44	0.45	0.47	0.48	0.50	0.51	0.53	0.55	0.57	0.58	0.60	0.62
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		40.90			0.25	0.51	0.60	0.62	0.64	0.66	0.68	0.70	0.73	0.75	0.77	0.80	0.83	0.85	0.88	0.91	0.94	0.97	1.00	1.04	1.07	1.11	1.14	1.18	1.22	1.26	1.30	1.35	1.39	1.44	1.48	1.53	1.58	1.63	1.69	1.74	1.80	1.86
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.25	0.51	0.60	0.62	0.64	0.66	0.68	0.70	0.73	0.75	0.77	0.80	0.83	0.85	0.88	0.91	0.94	0.97	1.00	1.04	1.07	1.11	1.14	1.18	1.22	1.26	1.30	1.35	1.39	1.44	1.48	1.53	1.58	1.63	1.69	1.74	1.80	1.86
5. Pump replacement		0.00																0.00															0.00									
Sub-total		72.34	0.00	0.00	0.57	0.93	1.06	1.09	1.12	1.16	1.20	1.24	1.28	1.32	1.36	1.41	1.46	1.51	1.56	1.61	1.66	1.72	1.77	1.83	1.89	1.95	2.01	2.09	2.15	2.22	2.30	2.38	2.46	2.54	2.62	2.70	2.79	2.88	2.98	3.07	3.17	3.28
C Gross Income (A-B)		218.59	0.00	0.00	0.26	0.72	0.82	0.85	2.16	2.23	2.30	2.38	4.14	4.28	4.43	4.57	4.71	4.87	5.03	5.19	5.37	5.54	5.73	5.92	6.11	6.32	6.53	6.73	6.96	7.19	7.43	7.67	7.92	8.18	8.45	8.74	9.03	9.33	9.63	9.96	10.29	10.62
D Depreciation cost		76.30						2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
E Interest paid		24.81	0.02	0.04	0.47	0.91	1.04	1.05	1.05	1.05	1.05	1.05	1.05	1.02	0.99	0.96	0.93	0.90	0.87	0.83	0.80	0.77	0.74	0.70	0.67	0.63	0.60	0.56	0.53	0.49	0.46	0.42	0.39	0.35	0.31	0.27	0.24	0.20	0.16	0.12	0.08	0.04
F Net Income		117.48	-0.02	-0.04	-0.21	-0.19	-0.22	-2.38	-1.07	-1.00	-0.93	-0.85	0.91	1.08	1.26	1.43	1.60	1.79	1.98	2.18	2.39	2.59	2.81	3.04	3.26	3.51	3.75	3.99	4.25	4.52	4.79	5.07	5.35	5.65	5.96	6.29	6.61	6.95	7.29	7.66	8.03	8.40
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		117.48	-0.02	-0.04	-0.21	-0.19	-0.22	-2.38	-1.07	-1.00	-0.93	-0.85	0.91	1.08	1.26	1.43	1.60	1.79	1.98	2.18	2.39	2.59	2.81	3.04	3.26	3.51	3.75	3.99	4.25	4.52	4.79	5.07	5.35	5.65	5.96	6.29	6.61	6.95	7.29	7.66	8.03	8.40
OM Cost Recovery Ratio (A/B)		402%	0%	0%	145%	178%	177%	178%	293%	292%	292%	292%	423%	424%	426%	424%	423%	423%	422%	422%	423%	422%	424%	423%	423%	424%	425%	422%	424%	424%	423%	422%	422%	422%	423%	424%	424%	424%	423%	424%	425%	424%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	117.48	-0.02	-0.04	-0.21	-0.19	-0.22	-2.38	-1.07	-1.00	-0.93	-0.85	0.91	1.08	1.26	1.43	1.60	1.79	1.98	2.18	2.39	2.59	2.81	3.04	3.26	3.51	3.75	3.99	4.25	4.52	4.79	5.07	5.35	5.65	5.96	6.29	6.61	6.95	7.29	7.66	8.03	8.40
2. Depreciation cost	76.30	0.00	0.00	0.00	0.00	0.00	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
3. Interest Paid	24.81	0.02	0.04	0.47	0.91	1.04	1.05	1.05	1.05	1.05	1.05	1.05	1.02	0.99	0.96	0.93	0.90	0.87	0.83	0.80	0.77	0.74	0.70	0.67	0.63	0.60	0.56	0.53	0.49	0.46	0.42	0.39	0.35	0.31	0.27	0.24	0.20	0.16	0.12	0.08	0.04
Sub-total	218.59	0.00	0.00	0.26	0.72	0.82	0.85	2.16	2.23	2.30	2.38	4.14	4.28	4.43	4.57	4.71	4.87	5.03	5.19	5.37	5.54	5.73	5.92	6.11	6.32	6.53	6.73	6.96	7.19	7.43	7.67	7.92	8.18	8.45	8.74	9.03	9.33	9.63	9.96	10.29	10.62
B Finances																																									
1. Project Loan	105.13	2.36	1.67	43.17	44.40	12.89	0.36	0.28																																	
2. Local fund	35.88	0.79	0.56	14.61	15.24	4.47	0.12	0.09																																	
Sub-total	141.01	3.15	2.23	57.78	59.64	17.36	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	0.88	0.02	0.04	0.21	0.19	0.22	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total	0.88	0.02	0.04	0.21	0.19	0.22	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cash Inflow	360.48	3.17	2.27	58.25	60.55	18.40	1.53	2.53	2.23	2.30	2.38	4.14	4.28	4.43	4.57	4.71	4.87	5.03	5.19	5.37	5.54	5.73	5.92	6.11	6.32	6.53	6.73	6.96	7.19	7.43	7.67	7.92	8.18	8.45	8.74	9.03	9.33	9.63	9.96	10.29	10.62
APPLICATION OF FUNDS																																									
D Project disbursement	141.01	3.15	2.23	57.78	59.64	17.36	0.48	0.37																																	
E Total debt services																																									
1. Loan repayment	105.10											3.02	3.05	3.08	3.11	3.14	3.18	3.21	3.24	3.27	3.31	3.34	3.37	3.41	3.44	3.47	3.51	3.54	3.58	3.61	3.65	3.69	3.72	3.76	3.80	3.84	3.88	3.91	3.95	3.99	4.03
2. Interest paid	24.81	0.02	0.04	0.47	0.91	1.04	1.05	1.05	1.05	1.05	1.05	1.05	1.02	0.99	0.96	0.93	0.90	0.87	0.83	0.80	0.77	0.74	0.70	0.67	0.63	0.60	0.56	0.53	0.49	0.46	0.42	0.39	0.35	0.31	0.27	0.24	0.20	0.16	0.12	0.08	0.04
Sub-total	129.91	0.02	0.04	0.47	0.91	1.04	1.05	1.05	1.05	1.05	1.05	4.07	4.07	4.07	4.07	4.07	4.08	4.08	4.07	4.07	4.08	4.08	4.07	4.08	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.08	4.07	4.07	4.07	4.08	4.08	4.07	4.07	4.07	4.07
Total Cash Outflow	270.92	3.17	2.27	58.25	60.55	18.40	1.53	1.42	1.05	1.05	1.05	4.07	4.07	4.07	4.07	4.07	4.08	4.08	4.07	4.07	4.08	4.08	4.07	4.08	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.08	4.07	4.07	4.07	4.08	4.08	4.07	4.07	4.07	4.07
F Net Surplus Cash (A+C2)-E	89.56	0.00	0.00	0.00	0.00	0.00	0.00	1.11	1.18	1.25	1.33	0.07	0.21	0.36	0.50	0.64	0.79	0.95	1.12	1.30	1.46	1.65	1.85	2.03	2.25	2.46	2.66	2.89	3.12	3.36	3.60	3.84	4.11	4.38	4.67	4.95	5.25	5.56	5.89	6.22	6.55
Project Cost Recovery Ratio (%)																																									
Cost recovery by water fee (A/E)	168%	0%	0%	55%	79%	79%	81%	206%	212%	219%	227%	102%	105%	109%	112%	116%	119%	123%	128%	132%	136%	140%	145%	150%	155%	160%	165%	171%	177%	183%	188%	194%	201%	208%	215%	221%	229%	237%	245%	253%	261%
Cost recovery by water fee + subsidy ((A+C2)/E)	169%	100%	100%	100%	100%	100%	100%	206%	212%	219%	227%	102%	105%	109%	112%	116%	119%	123%	128%	132%	136%	140%	145%	150%	155%	160%	165%	171%	177%	183%	188%	194%	201%	208%	215%	221%	229%	237%	245%	253%	261%

ARAGATSOTN MARZ
Talin District
No 25 Nor Yedesia

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	290.93	99.7%
	Subsidy	0.88	0.3%
	Total	291.81	100.0%
2	**Expenditure**		
	OM cost	72.34	24.8%
	Loan repayment	105.10	36.0%
	Interest paid	24.81	8.5%
	Surplus cash	89.56	30.7%
	Total	291.81	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																									
1. Investment Cost	94.39	2.30	1.64	39.44	39.32	11.10	0.33	0.26																																	
2. Operation and Maintenance Cost																																									
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	7.09			0.08	0.17	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	20.90			0.25	0.49	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Pump replacement																	0.00															0.00										
Sub-total	37.12			0.57	0.90	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Total Outflow	131.51	2.30	1.64	40.01	40.22	12.09	1.32	1.25	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
B BENEFIT																																								
1. Water Tariff	182.69	0.00	0.00	0.83	1.65	1.88	1.94	3.28	3.39	3.50	3.62	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42
2. Subsidy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Inflow	182.69	0.00	0.00	0.83	1.65	1.88	1.94	3.28	3.39	3.50	3.62	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42	5.42
NET BENEFIT	51.18	-2.30	-1.64	-39.2	-38.6	-10.2	0.62	2.03	2.40	2.51	2.63	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43

FIRR = 2.27%

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-0.10	-2.53	-1.80	-43.1	-42.5	-11.3	0.59	2.00	2.40	2.51	2.63	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43
	2	Capital cost 20% up	-8.97	-2.76	-1.97	-47.1	-46.4	-12.4	0.55	1.98	2.40	2.51	2.63	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43
2	1	OM cost 10% up	6.18	-2.30	-1.64	-39.2	-38.7	-10.3	0.52	1.93	2.30	2.41	2.53	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
	2	OM cost 20% up	3.59	-2.30	-1.64	-39.3	-38.8	-10.4	0.42	1.83	2.20	2.31	2.43	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
3	1	Revenue 10% down	-3.57	-2.30	-1.64	-39.3	-38.7	-10.4	0.43	1.70	2.06	2.16	2.27	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89
	2	Revenue 20% down	-15.90	-2.30	-1.64	-39.3	-38.9	-10.6	0.23	1.37	1.72	1.81	1.91	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	1.74%	3.01	33.19%
	2	Capital cost 20% up	1.28%	7.76	12.89%
2	1	OM cost 10% up	2.12%	0.72	139.65%
	2	OM cost 20% up	1.97%	1.55	64.43%
3	1	Revenue 10% down	1.53%	4.84	20.65%
	2	Revenue 20% down	0.72%	21.63	4.62%

No.26 Zovasar

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.26 Community Zovasar
District Talin
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Dzori-1 spring	40	28	33.4	44	1	6.1	2,709	10	15	4.0
2	Dzori-2 spring	40	28	35.3	44	0	52.8	2,669	3	10	
3	spring in thecomm.	40	28	29.1	43	57	4.8	2,122	8	12	8.0
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Not acceptable
Notes	Spring intakes are in deteriorated condition, they have leakages. The water mains do not receive the flows fully. 2l/sec flow is given to Zovasar, the remaining is given to neighboring communities. Poor water quality.
Alternative sources if any	No alternative water sources are availables

No.26 Community Zovasar
District Talin
Marz Aragatsotn
Sampling date 12/Sep/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.7				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	5					
c	TDS	Mg/L	17				1000	1000
1	Al:Aluminum	Mg/L	<0.08				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	4				250	350
4	Cr:Chrome	Mg/L	0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.12				1.50	
7	Hardness	Mg/L	45				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	0.9				50.0	45.0
13	SO4:Sulfate	Mg/L	2.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	n.d				NA	0.00020
18	Cd:Cadmium	Mg/L	n.d				0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001				0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	n.d				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml	n.d				-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml	n.d				0	0
26	Total bacteria	bacteria per 1 ml	n.d				-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.26 Community Zovasar
District Talin
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	1		31	2.1	Not Identified
2	2		29	2.1	Not Identified
3	3		29	2.1	Not Identified
4	4		21	1.4	Not Identified
5	5		20	1.4	Not Identified
6	6		22	1.4	Not Identified
7	7		28	1.4	Not Identified
8	8		136	9.0	Not Identified

No. **26** **Marz** Aragatsotn **Community** Zovasar

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Difficult	
2	Transmission pipeline	Difficult	Difficult	Pipeline is mostly far from the road
3	Reservoir	Fair	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°28'33.4″	44°01'06.1″	2,709	1977	Concrete	4.0	Yes
2	Spring	40°28'35.3″	44°00'52.8″	2,669	1977	Concrete		Yes
3	Spring	40°28'29.1″	43°57'04.8″	2,122	1916	Concrete	8.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	6,300	200	Steel	3.8	1987	Little	No
2	200	80	Steel	4.5		Medium	No

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°28'34.9″	43°57'27.2″	2189	Steel	Circle	d=2m,h=6m	18	No

5. CHLORINATION EQUIPMENT

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	No			

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,000	200	Steel	1977	Medium	Yes
2	1,000	80	Steel		Medium	Yes
3	1,100	50	Steel		Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
2	1968	1977	No	0	Yes

9. DRAINAGE SYSTEM

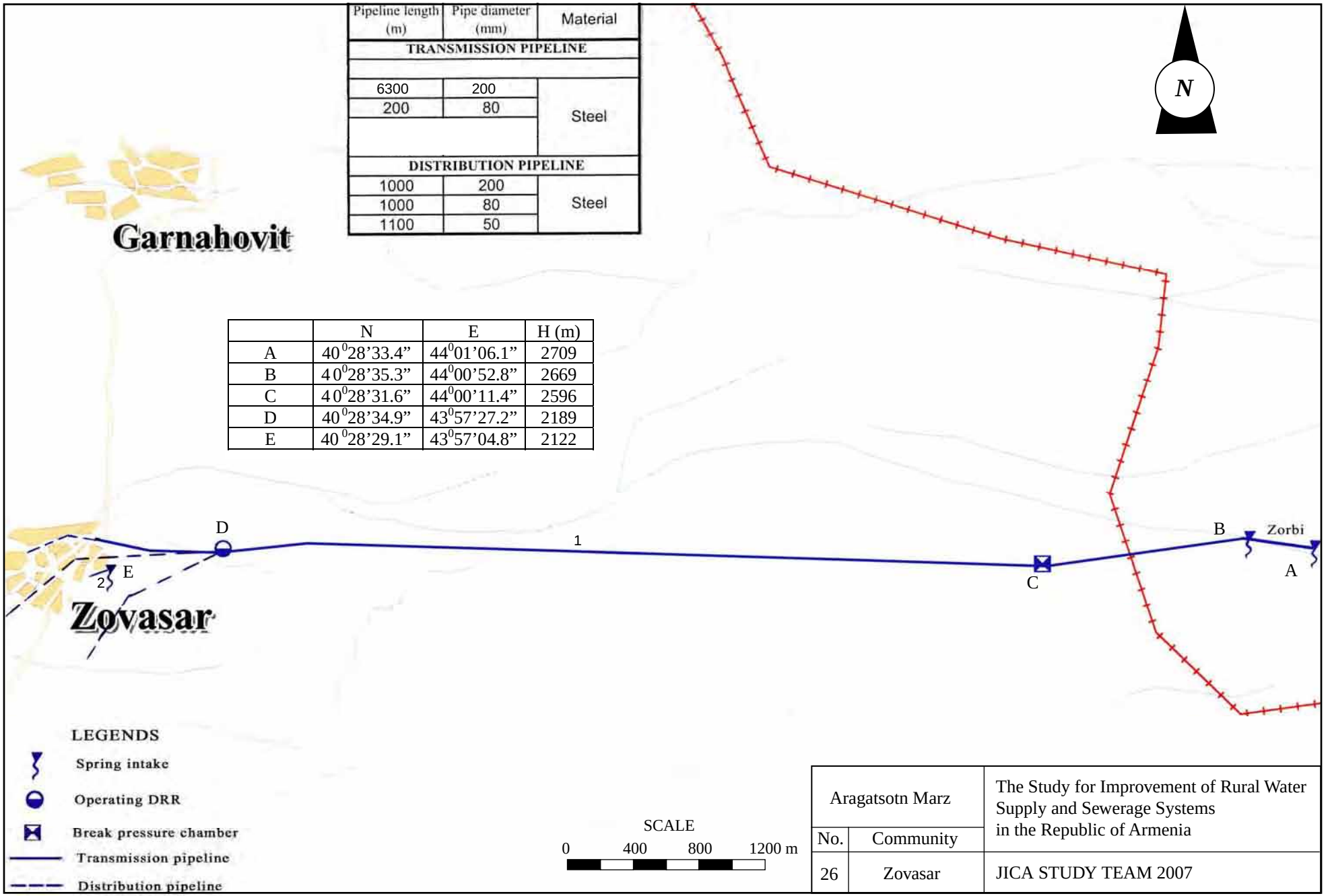
Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.26 Zovasar**
District	**Talin**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	670
A2	Actual population in 2007	730
A3	Number of households	120
A4.1	Elderly people	70
A4.2	Population in labor force (age from 16 to 62)	470
A4.3	Children	190
A5.1	Pensioners	103
A5.2	Unemployed	0
A5.3	Receiving benefits	48
A6	Average monthly income of household (AMD)	15,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	117
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	300
	Annual Budget of the community 2005, in thousand AMD	200
	Annual Budget of the community 2006, in thousand AMD	650
	Annual Budget of the community 2007, in thousand AMD	700
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	125
	Amount spent in drinking water sector 2005, in thousand AMD	125
	Amount spent in drinking water sector 2006, in thousand AMD	120
	Amount spent in drinking water sector 2007, in thousand AMD	125
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	is not planned
D5	Present condition of the water supply volume of Domestic use	sufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	100
D8	How many house connection household set the water meter	0
D9	Number of public taps	3
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	very pleased
D13	Are hours of water supply convenient?	-
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	400
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	400
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	from own lake
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Ghazaryan Karapet
E2	Position	1-st class specialist
E3	Telephone	with the help of administration head
E4	Quantity and present condition of the water supply facilities: spring/ intake	absent
E5	Quantity and present condition of the water supply facilities:	1 deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	absent
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	administration head
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	150,000
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	150,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	resident participation
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
6300	200	Steel
200	80	
DISTRIBUTION PIPELINE		
1000	200	Steel
1000	80	
1100	50	



	N	E	H (m)
A	40 ^{0}28’33.4”	44^{0}01’06.1”	2709
B	4 0^{0}28’35.3”	44^{0}00’52.8”	2669
C	4 0^{0}28’31.6”	44^{0}00’11.4”	2596
D	40 ^{0}28’34.9”	43^{0}57’27.2”	2189
E	40 ^{0}28’29.1”	43^{0}57’04.8”	2122

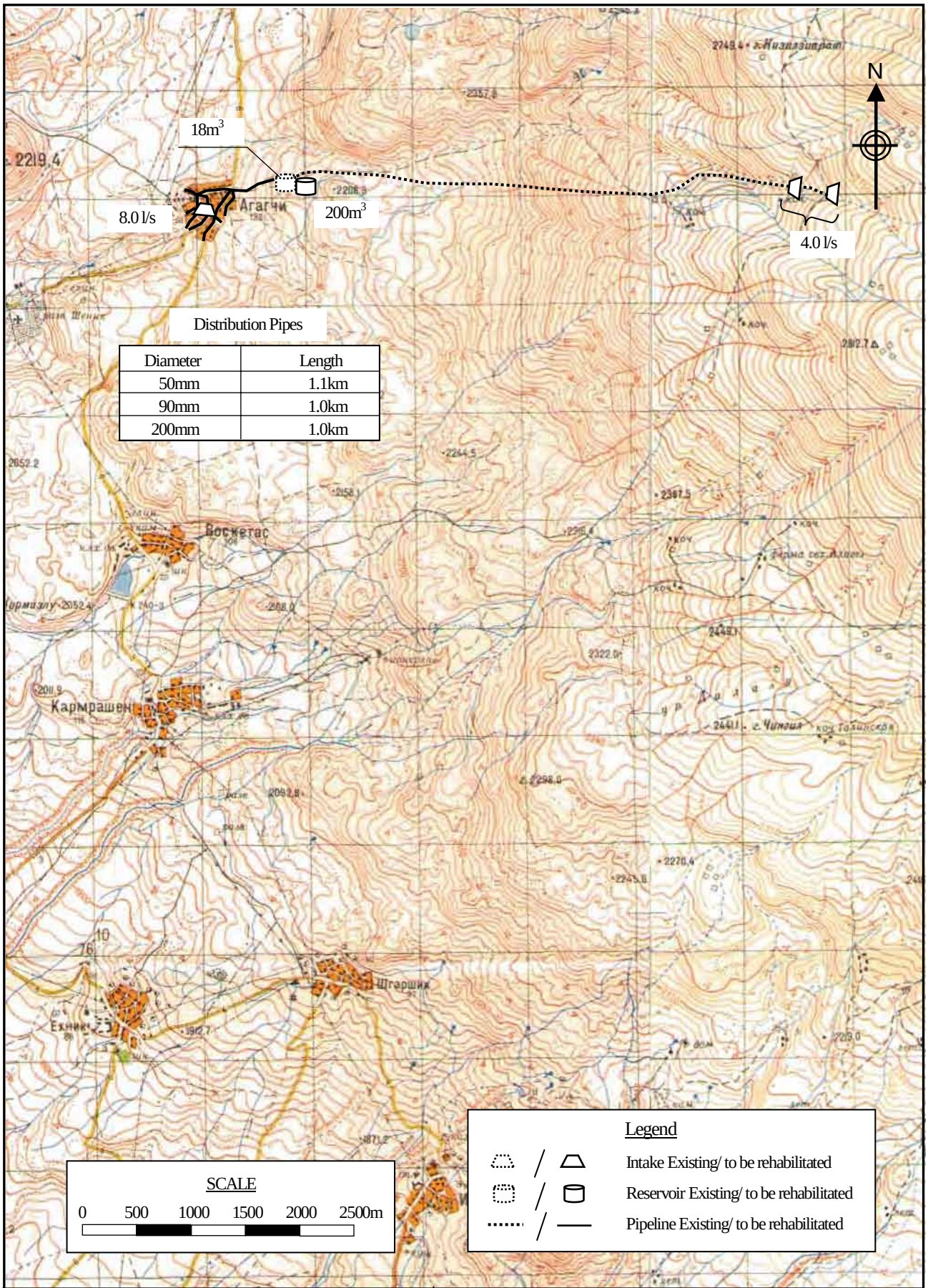
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
26	Zovasar	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.26
Name : **Zovasar**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	730	persons	73.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	117	pupils	1.2	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	120	household	10.4	
	Sub-total			84.6	
	Unaccouted for water (20%)			16.9	
1	Average Daily Water Demand			101.5	m3/day
2	Maximum Daily Water Demand			121.8	m3/day
3	Maximum Hourly Water Demand			16.5	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	3	12.0	lit/sec		1,036.8	m3/day
`	Total					1,036.8	m3/day
	2 Required reservoir volume					198	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
No	Item	Quantity	Unit
1	Intake		
	1m3	3	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	200m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter	1,100	m
	75mm diameter		m
	90mm diameter	1,000	m
	110mm diameter		m
	150mm diameter		m
	200mm diameter	1,000	m
	250mm diameter		m
5	House connection	20	nos
6	Water meter installation	120	nos
7	Public tap	2	nos
8	Chlorination	1	nos
9	Pumps	-	nos



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 26	Zovasar	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **26**
Name : **Zovasar**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	3	nos	367,700	1,103,100
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					1,103,100
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3	1	nos	22,524,600	22,524,600
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					22,524,600
4	Distribution Pipe					
		50mm	1,100	m	5,520	6,072,000
		75mm		m	7,160	
		90mm	1,000	m	8,040	8,040,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm	1,000	m	19,440	19,440,000
		250mm		m	27,040	
	Sub-total					33,552,000
5	House Connection		20	nos	74,000	1,480,000
6	Water Meter Installation		120	nos	80,000	9,600,000
7	Public Tap		2	nos	90,000	180,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	1,240	m	3,600	4,464,000
	Total				AMD	73,403,700
					Equivalent to USD	240,258
					Equivalent to JPY	25,347,245
					AMD	USD
	Investment Cost per household		120	HH	611,698	2,002
	Investment Cost per person		730	persons	100,553	329

ARAGATSOTN MARZ
Talin District
No 26 Zovasar

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		30.9																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		172.48	0.00	0.00	0.49	0.98	1.11	1.15	1.95	2.01	2.08	2.14	3.21	3.32	3.43	3.54	3.66	3.78	3.91	4.03	4.17	4.30	4.45	4.59	4.75	4.90	5.06	5.23	5.40	5.58	5.77	5.96	6.15	6.36	6.57	6.78	7.01	7.24	7.48	7.72	7.98	8.24
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				186																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		8.18			0.05	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		24.84			0.15	0.31	0.36	0.37	0.39	0.40	0.41	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.72	0.74	0.77	0.79	0.82	0.84	0.87	0.90	0.93	0.96	0.99	1.03	1.06	1.09	1.13
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.15	0.31	0.36	0.37	0.39	0.40	0.41	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.72	0.74	0.77	0.79	0.82	0.84	0.87	0.90	0.93	0.96	0.99	1.03	1.06	1.09	1.13
5. Pump replacement		0.00																0.00															0.00									
Sub-total		50.72	0.00	0.00	0.44	0.67	0.74	0.75	0.79	0.81	0.84	0.87	0.89	0.93	0.95	0.99	1.01	1.06	1.10	1.12	1.16	1.20	1.24	1.28	1.32	1.36	1.41	1.47	1.50	1.56	1.61	1.67	1.72	1.78	1.84	1.90	1.96	2.02	2.09	2.16	2.22	2.30
C Gross Income (A-B)		121.76	0.00	0.00	0.05	0.31	0.37	0.40	1.16	1.20	1.24	1.27	2.32	2.39	2.48	2.55	2.65	2.72	2.81	2.91	3.01	3.10	3.21	3.31	3.43	3.54	3.65	3.76	3.90	4.02	4.16	4.29	4.43	4.58	4.73	4.88	5.05	5.22	5.39	5.56	5.76	5.94
D Depreciation cost		69.65						1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
E Interest paid		22.90	0.02	0.04	0.43	0.84	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.94	0.91	0.88	0.86	0.83	0.80	0.77	0.74	0.71	0.68	0.65	0.62	0.58	0.55	0.52	0.49	0.46	0.42	0.39	0.36	0.32	0.29	0.25	0.22	0.18	0.15	0.11	0.07	0.04
F Net Income		29.21	-0.02	-0.04	-0.38	-0.53	-0.59	-2.56	-1.80	-1.76	-1.72	-1.69	-0.64	-0.54	-0.42	-0.32	-0.20	-0.10	0.02	0.15	0.28	0.40	0.54	0.67	0.82	0.97	1.11	1.25	1.42	1.57	1.75	1.91	2.08	2.27	2.45	2.64	2.84	3.05	3.25	3.46	3.70	3.91
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		29.21	-0.02	-0.04	-0.38	-0.53	-0.59	-2.56	-1.80	-1.76	-1.72	-1.69	-0.64	-0.54	-0.42	-0.32	-0.20	-0.10	0.02	0.15	0.28	0.40	0.54	0.67	0.82	0.97	1.11	1.25	1.42	1.57	1.75	1.91	2.08	2.27	2.45	2.64	2.84	3.05	3.25	3.46	3.70	3.91
OM Cost Recovery Ratio (A/B)		340%	0%	0%	112%	147%	150%	153%	247%	248%	248%	246%	361%	357%	361%	358%	362%	357%	355%	360%	359%	358%	359%	359%	360%	360%	359%	356%	360%	358%	358%	357%	358%	357%	357%	357%	358%	358%	358%	357%	359%	358%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	29.21	-0.02	-0.04	-0.38	-0.53	-0.59	-2.56	-1.80	-1.76	-1.72	-1.69	-0.64	-0.54	-0.42	-0.32	-0.20	-0.10	0.02	0.15	0.28	0.40	0.54	0.67	0.82	0.97	1.11	1.25	1.42	1.57	1.75	1.91	2.08	2.27	2.45	2.64	2.84	3.05	3.25	3.46	3.70	3.91
2. Depreciation cost	69.65	0.00	0.00	0.00	0.00	0.00	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
3. Interest Paid	22.90	0.02	0.04	0.43	0.84	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.94	0.91	0.88	0.86	0.83	0.80	0.77	0.74	0.71	0.68	0.65	0.62	0.58	0.55	0.52	0.49	0.46	0.42	0.39	0.36	0.32	0.29	0.25	0.22	0.18	0.15	0.11	0.07	0.04
Sub-total	121.76	0.00	0.00	0.05	0.31	0.37	0.40	1.16	1.20	1.24	1.27	2.32	2.39	2.48	2.55	2.65	2.72	2.81	2.91	3.01	3.10	3.21	3.31	3.43	3.54	3.65	3.76	3.90	4.02	4.16	4.29	4.43	4.58	4.73	4.88	5.05	5.22	5.39	5.56	5.76	5.94
B Finances																																									
1. Project Loan	96.85	2.36	1.67	39.61	40.72	11.85	0.36	0.28																																	
2. Local fund	33.05	0.79	0.56	13.41	13.97	4.11	0.12	0.09																																	
Sub-total	129.90	3.15	2.23	53.02	54.69	15.96	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	14.35	0.02	0.04	0.38	0.53	0.59	0.57	0.00	0.00	0.00	0.00	1.43	1.36	1.27	1.20	1.11	1.04	0.95	0.84	0.74	0.65	0.55	0.45	0.33	0.21	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total	14.35	0.02	0.04	0.38	0.53	0.59	0.57	0.00	0.00	0.00	0.00	1.43	1.36	1.27	1.20	1.11	1.04	0.95	0.84	0.74	0.65	0.55	0.45	0.33	0.21	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cash Inflow	266.01	3.17	2.27	53.45	55.53	16.92	1.45	1.53	1.20	1.24	1.27	3.75	3.75	3.75	3.75	3.76	3.76	3.76	3.75	3.75	3.75	3.76	3.76	3.76	3.75	3.75	3.76	3.90	4.02	4.16	4.29	4.43	4.58	4.73	4.88	5.05	5.22	5.39	5.56	5.76	5.94
APPLICATION OF FUNDS																																								
D Project disbursement	129.90	3.15	2.23	53.02	54.69	15.96	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	96.86											2.78	2.81	2.84	2.87	2.90	2.93	2.96	2.98	3.01	3.04	3.08	3.11	3.14	3.17	3.20	3.23	3.26	3.30	3.33	3.36	3.40	3.43	3.47	3.50	3.54	3.57	3.61	3.64	3.68	3.72
2. Interest paid	22.90	0.02	0.04	0.43	0.84	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.94	0.91	0.88	0.86	0.83	0.80	0.77	0.74	0.71	0.68	0.65	0.62	0.58	0.55	0.52	0.49	0.46	0.42	0.39	0.36	0.32	0.29	0.25	0.22	0.18	0.15	0.11	0.07	0.04
Sub-total	119.76	0.02	0.04	0.43	0.84	0.96	0.97	0.97	0.97	0.97	0.97	3.75	3.75	3.75	3.75	3.76	3.76	3.76	3.75	3.75	3.75	3.76	3.76	3.76	3.75	3.75	3.75	3.75	3.76	3.75	3.75	3.76	3.75	3.76	3.75	3.76	3.75	3.76	3.75	3.75	3.76
Total Cash Outflow	249.66	3.17	2.27	53.45	55.53	16.92	1.45	1.34	0.97	0.97	0.97	3.75	3.75	3.75	3.75	3.76	3.76	3.76	3.75	3.75	3.75	3.76	3.76	3.76	3.75	3.75	3.75	3.75	3.76	3.75	3.75	3.76	3.75	3.76	3.75	3.76	3.75	3.76	3.75	3.75	3.76
F Net Surplus Cash (A+C2)-E	16.35	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.23	0.27	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.26	0.41	0.54	0.67	0.83	0.97	1.13	1.29	1.47	1.63	1.81	2.01	2.18
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	102%	0%	0%	12%	37%	39%	41%	120%	124%	128%	131%	62%	64%	66%	68%	70%	72%	75%	78%	80%	83%	85%	88%	91%	94%	97%	100%	104%	107%	111%	114%	118%	122%	126%	130%	134%	139%	143%	148%	154%	158%
Cost recovery by water fee + subsidy ((A+C2)/E)	114%	100%	100%	100%	100%	100%	100%	120%	124%	128%	131%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	107%	111%	114%	118%	122%	126%	130%	134%	139%	143%	148%	154%	158%

ARAGATSOTN MARZ
Talin District
No 26 Zovasar

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	172.48	92.3%
	Subsidy	14.35	7.7%
	Total	186.83	100.0%
2	**Expenditure**		
	OM cost	50.72	27.1%
	Loan repayment	96.86	51.8%
	Interest paid	22.90	12.3%
	Surplus cash	16.35	8.8%
	Total	186.83	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																									
1. Investment Cost	87.00	2.30	1.64	36.19	36.07	10.21	0.33	0.26																																	
2. Operation and Maintenance Cost																																									
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	4.47			0.05	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	12.69			0.15	0.30	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Pump replacement																	0.00															0.00									
Sub-total	26.28			0.44	0.64	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Total Outflow	113.28	2.30	1.64	36.63	36.71	10.91	1.03	0.96	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
B BENEFIT																																								
1. Water Tariff	108.21	0.00	0.00	0.49	0.98	1.11	1.15	1.95	2.01	2.08	2.14	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21
2. Subsidy	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.42	0.36	0.32	0.25	0.21	0.15	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Inflow	110.45	0.00	0.00	0.49	0.98	1.11	1.15	1.95	2.01	2.08	2.14	3.67	3.63	3.57	3.53	3.46	3.42	3.36	3.28	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21
NET BENEFIT	-2.83	-2.30	-1.64	-36.1	-35.7	-9.8	0.12	0.99	1.31	1.38	1.44	2.97	2.93	2.87	2.83	2.76	2.72	2.66	2.58	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51

FIRR = -0.16%

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-33.43	-2.53	-1.80	-39.8	-39.3	-10.8	0.09	0.96	1.31	1.38	1.44	2.97	2.93	2.87	2.83	2.76	2.72	2.66	2.58	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
	2	Capital cost 20% up	-41.60	-2.76	-1.97	-43.4	-42.9	-11.8	0.05	0.94	1.31	1.38	1.44	2.97	2.93	2.87	2.83	2.76	2.72	2.66	2.58	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
2	1	OM cost 10% up	-27.09	-2.30	-1.64	-36.2	-35.8	-9.9	0.05	0.92	1.24	1.31	1.37	2.90	2.86	2.80	2.76	2.69	2.65	2.59	2.51	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44
	2	OM cost 20% up	-28.92	-2.30	-1.64	-36.2	-35.9	-9.9	-0.02	0.85	1.17	1.24	1.30	2.83	2.79	2.73	2.69	2.62	2.58	2.52	2.44	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
3	1	Revenue 10% down	-32.74	-2.30	-1.64	-36.2	-35.8	-9.9	0.00	0.80	1.11	1.17	1.23	2.60	2.57	2.51	2.48	2.41	2.38	2.32	2.25	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
	2	Revenue 20% down	-40.22	-2.30	-1.64	-36.2	-35.9	-10.0	-0.11	0.60	0.91	0.96	1.01	2.24	2.20	2.16	2.12	2.07	2.04	1.99	1.92	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.62%	-7.39	-13.53%
	2	Capital cost 20% up	-1.04%	-8.43	-11.86%
2	1	OM cost 10% up	-0.32%	-4.86	-20.58%
	2	OM cost 20% up	-0.47%	-6.56	-15.24%
3	1	Revenue 10% down	-0.84%	-8.06	-12.41%
	2	Revenue 20% down	-1.59%	-8.97	-11.14%

No.27 Ttujur

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.27 Community Ttujur
District Aparan
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	2 ground springs	40	35	6.2	44	28	46.2	2,160	0.7	4.0	2.0
2	3 springs	40	32	45.0	44	31	4.0	2,306	0.5	2.0	1.5
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	In winter time the internal network (connections to households) does not receive water because of water scarcity.
Alternative sources if any	No alternative water sources are availables

No.27 Community Ttujur
District Aparan
Marz Aragatsotn
Sampling date 09/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		6				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	10.3					
c	TDS	Mg/L	33				1000	1000
1	Al:Aluminum	Mg/L	n.d				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	4				250	350
4	Cr:Chrome	Mg/L	n.d				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.02				1.50	
7	Hardness	Mg/L	40				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.8				50.0	45.0
13	SO4:Sulfate	Mg/L	3.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	0.00006				NA	0.00020
18	Cd:Cadmium	Mg/L	0.0001				0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001				0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	n.d				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.27 Community Ttujur
District Aparan
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	2			0.0	Not Identified
2	3			0.9	Not Identified
3	5			2.3/2; 4.3/1	Not Identified
4	6			1.5/3; 2.8/1; 4.3/1; 15/1	Identified in 6 sample

No. 27 **Marz** Aragatsotn **Community** Ttujur

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Unknown	
2	Intake	Difficult	Unknown	
3	Transmission pipeline	Difficult	Unknown	Pipeline is mostly far from the road
4	Reservoir	Fair	Possible	

2. INTAKE STRUCTURE

No.	Water main	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°35'06.2″	44°28'46.2″	2,160	1953	ground	2.0	Yes
2	Spring	40°32'45.0″	44°31'04.0″	2,306	1988	Concrete	1.5	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	2,500	100	Steel	1.4	1973	Medium	Yes
2	3,000	100	Steel	0.9	1988	Medium	Yes
	2,000	125	Steel		1988	Medium	Yes
	3,000	150	Steel		1988	Medium	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°34'27.7″	44°27'40.2″	1,972	reinforced concrete	Rectangular	6x12x4	250	No

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Reservoir	Liquid	Once a year

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	2,620	80	Steel	1980	Huge	Yes
2	800	100	Steel	1980	Huge	Yes
3	170	150	Steel	1980	No	No

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
7	1980	2005	Yes	100	Yes

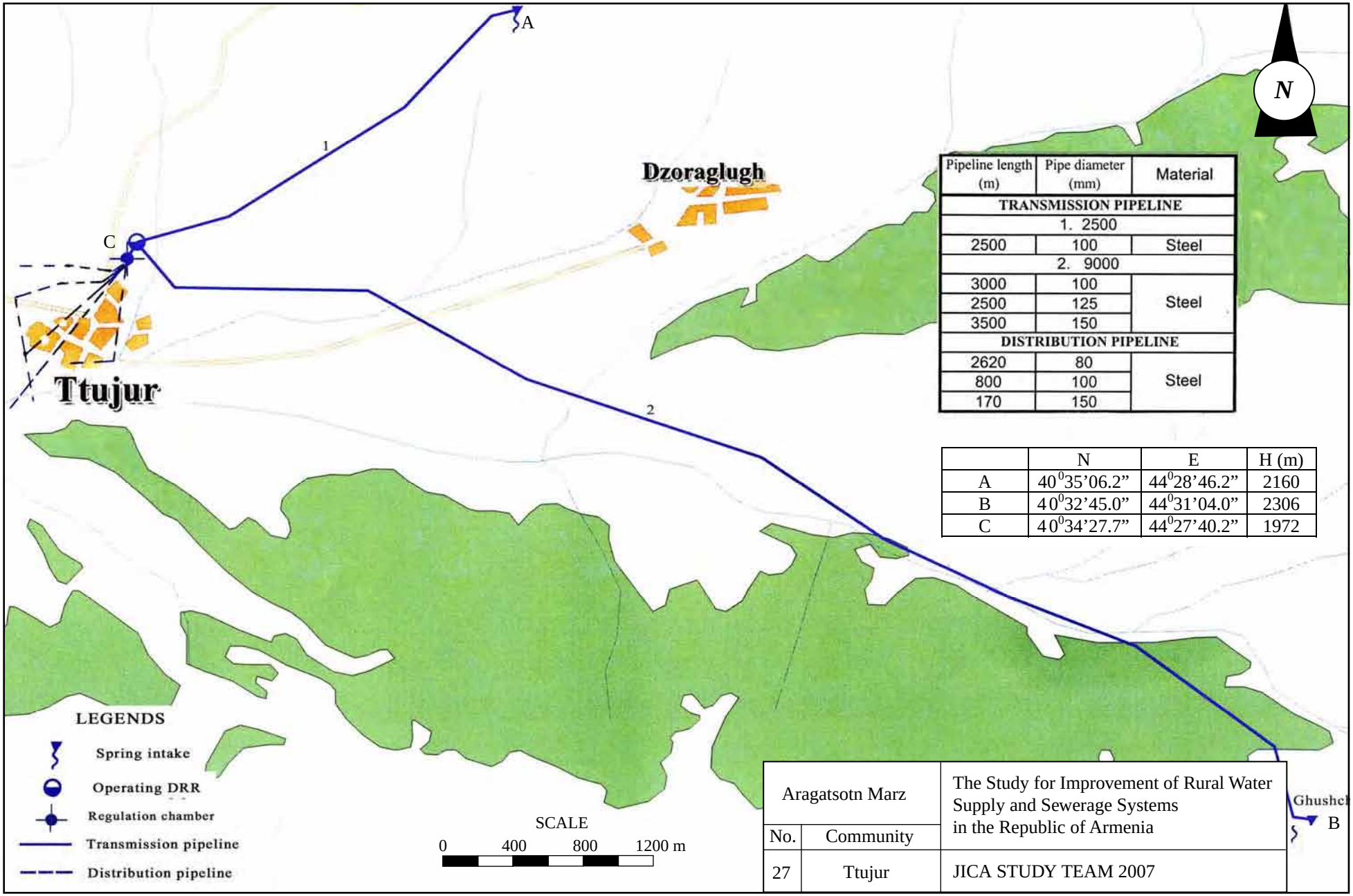
9. DRAINAGE SYSTEM

Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.27 Ttujur**
District	**Aparan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	356
A2	Actual population in 2007	411
A3	Number of households	83
A4.1	Elderly people	62
A4.2	Population in labor force (age from 16 to 62)	251
A4.3	Children	104
A5.1	Pensioners	60
A5.2	Unemployed	0
A5.3	Receiving benefits	8
A6	Average monthly income of household (AMD)	20,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	64
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	1,717
	Annual Budget of the community 2005, in thousand AMD	1,297
	Annual Budget of the community 2006, in thousand AMD	1,725
	Annual Budget of the community 2007, in thousand AMD	732
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	400
	Amount spent in drinking water sector 2005, in thousand AMD	350
	Amount spent in drinking water sector 2006, in thousand AMD	400
	Amount spent in drinking water sector 2007, in thousand AMD	0
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	yes
D2	Water use permit number	1431
D3	Date of expiry of water use permit	17.06.07-17.06.10
D4	Planned date of obtaining water use permit	
D5	Present condition of the water supply volume of Domestic use	almost sufficient
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	60
D8	How many house connection household set the water meter	0
D9	Number of public taps	7
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs public tap
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs tap
D11	What time of day water is given?	irregularly in HHs
D12	Are you pleased with duration of domestic water supply?	autumn - spring displeased
D13	Are hours of water supply convenient?	not convenient at all
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	500
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	difficult to answer
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Aslanyan Grigor
E2	Position	administrtion head
E3	Telephone	(094)827004
E4	Quantity and present condition of the water supply facilities: spring/ intake	2 deteriorated
E5	Quantity and present condition of the water supply facilities:	2 deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1 rehabilitated·
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated will be rehabilitated by program
E8	Quantity and present condition of the water supply facilities: public tap	partially repaired
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community and residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	volunteers from community
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	450,000
	Others(AMD)	0
	Total (AMD)	450,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	water fee
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
1. 2500		
2500	100	Steel
2. 9000		
3000	100	Steel
2500	125	
3500	150	
DISTRIBUTION PIPELINE		
2620	80	Steel
800	100	
170	150	

	N	E	H (m)
A	$40^0$35’06.2”	$44^0$28’46.2”	2160
B	$40^0$32’45.0”	$44^0$31’04.0”	2306
C	$40^0$34’27.7”	$44^0$27’40.2”	1972

Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
27	Ttujur	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.27
Name : **Ttujur**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	411	persons	41.1	
	2 Factory	-	nos	0.0	
	3 School (pupils)	64	pupils	0.6	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	83	household	7.2	
	Sub-total			48.9	
	Unaccouted for water (20%)			9.8	
1	Average Daily Water Demand			58.7	m3/day
2	Maximum Daily Water Demand			70.4	m3/day
3	Maximum Hourly Water Demand			13.3	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	2	3.5	lit/sec		302.4	m3/day
`	Total					302.4	m3/day
	2 Required reservoir volume					160	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**			
No	Item	Quantity	Unit	
1	Intake			
	1m3	2	nos	
	2m3		nos	
	3m3		nos	
	4m3		nos	
2	Transmission pipe			
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter	10,500	m	
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
4	Distribution pipe			Done by PRSP
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter		m	2620m rehabilitation
	110mm diameter		m	800m rehabilitation
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	23	nos	
6	Water meter installation	83	nos	
7	Public tap	1	nos	
8	Chlorination	1	nos	
9	Pumps	-	nos	

Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 27	Ttujur	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **27**
Name : **Ttujur**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	2	nos	367,700	735,400
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					735,400
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm	10,500	m	8,040	84,420,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					84,420,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
5	House Connection		23	nos	74,000	1,702,000
6	Water Meter Installation		83	nos	80,000	6,640,000
7	Public Tap		1	nos	90,000	90,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa		m	3,600	
	Total				AMD	94,087,400
					Equivalent to USD	307,958
					Equivalent to JPY	32,489,594
					AMD	USD
	Investment Cost per household		83	HH	1,133,583	3,710
	Investment Cost per person		411	persons	228,923	749

ARAGATSOTN MARZ
Aparan District
No 27 Ttujur

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		17.8																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		99.61	0.00	0.00	0.26	0.53	0.64	0.66	1.12	1.16	1.20	1.24	1.86	1.92	1.98	2.05	2.12	2.19	2.26	2.33	2.41	2.49	2.57	2.66	2.74	2.83	2.93	3.02	3.12	3.23	3.33	3.44	3.56	3.67	3.79	3.92	4.05	4.18	4.32	4.46	4.61	4.76
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				108																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		4.75			0.02	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.20	0.21	0.22
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		35.80			0.20	0.42	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.97	1.00	1.03	1.07	1.10	1.14	1.18	1.22	1.26	1.30	1.34	1.38	1.43	1.48	1.53	1.58	1.63
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.2	0.42	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.97	1.00	1.03	1.07	1.10	1.14	1.18	1.22	1.26	1.30	1.34	1.38	1.43	1.48	1.53	1.58	1.63
5. Pump replacement		0.00																0.00															0.00										
Sub-total		58.25	0.00	0.00	0.46	0.73	0.85	0.87	0.90	0.94	0.97	1.00	1.03	1.07	1.10	1.13	1.17	1.22	1.25	1.30	1.33	1.38	1.43	1.47	1.52	1.57	1.62	1.68	1.73	1.79	1.85	1.92	1.98	2.05	2.11	2.18	2.24	2.32	2.40	2.48	2.56	2.65
C Gross Income (A-B)		41.36	0.00	0.00	-0.20	-0.20	-0.21	-0.21	0.22	0.22	0.23	0.24	0.83	0.85	0.88	0.92	0.95	0.97	1.01	1.03	1.08	1.11	1.14	1.19	1.22	1.26	1.31	1.34	1.39	1.44	1.48	1.52	1.58	1.62	1.68	1.74	1.81	1.86	1.92	1.98	2.05	2.11
D Depreciation cost		89.25						2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
E Interest paid		28.61	0.02	0.04	0.51	0.99	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.18	1.15	1.11	1.07	1.04	1.00	0.96	0.93	0.89	0.85	0.81	0.77	0.73	0.69	0.65	0.61	0.57	0.53	0.49	0.45	0.40	0.36	0.32	0.27	0.23	0.18	0.14	0.09	0.05
F Net Income		-76.50	-0.02	-0.04	-0.71	-1.19	-1.42	-3.98	-3.55	-3.55	-3.54	-3.53	-2.94	-2.88	-2.82	-2.74	-2.67	-2.62	-2.54	-2.48	-2.40	-2.33	-2.26	-2.17	-2.10	-2.02	-1.93	-1.86	-1.77	-1.68	-1.60	-1.52	-1.42	-1.33	-1.23	-1.13	-1.01	-0.92	-0.81	-0.71	-0.59	-0.49
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-76.50	-0.02	-0.04	-0.71	-1.19	-1.42	-3.98	-3.55	-3.55	-3.54	-3.53	-2.94	-2.88	-2.82	-2.74	-2.67	-2.62	-2.54	-2.48	-2.40	-2.33	-2.26	-2.17	-2.10	-2.02	-1.93	-1.86	-1.77	-1.68	-1.60	-1.52	-1.42	-1.33	-1.23	-1.13	-1.01	-0.92	-0.81	-0.71	-0.59	-0.49
OM Cost Recovery Ratio (A/B)		171%	0%	0%	56%	73%	75%	76%	124%	123%	124%	124%	181%	179%	180%	181%	181%	180%	181%	179%	181%	180%	180%	181%	180%	180%	180%	180%	180%	180%	179%	180%	179%	180%	180%	181%	180%	180%	180%	180%	180%	180%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-76.50	-0.02	-0.04	-0.71	-1.19	-1.42	-3.98	-3.55	-3.55	-3.54	-3.53	-2.94	-2.88	-2.82	-2.74	-2.67	-2.62	-2.54	-2.48	-2.40	-2.33	-2.26	-2.17	-2.10	-2.02	-1.93	-1.86	-1.77	-1.68	-1.60	-1.52	-1.42	-1.33	-1.23	-1.13	-1.01	-0.92	-0.81	-0.71	-0.59	-0.49
2. Depreciation cost	89.25	0.00	0.00	0.00	0.00	0.00	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
3. Interest Paid	28.61	0.02	0.04	0.51	0.99	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.18	1.15	1.11	1.07	1.04	1.00	0.96	0.93	0.89	0.85	0.81	0.77	0.73	0.69	0.65	0.61	0.57	0.53	0.49	0.45	0.40	0.36	0.32	0.27	0.23	0.18	0.14	0.09	0.05
Sub-total	41.36	0.00	0.00	-0.20	-0.20	-0.21	-0.21	0.22	0.22	0.23	0.24	0.83	0.85	0.88	0.92	0.95	0.97	1.01	1.03	1.08	1.11	1.14	1.19	1.22	1.26	1.31	1.34	1.39	1.44	1.48	1.52	1.58	1.62	1.68	1.74	1.81	1.86	1.92	1.98	2.05	2.11
B Finances																																									
1. Project Loan	121.67	2.36	1.67	46.88	48.23	21.89	0.36	0.28																																	
2. Local fund	41.59	0.79	0.56	15.87	16.54	7.62	0.12	0.09																																	
Sub-total	163.26	3.15	2.23	62.75	64.77	29.51	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.82	0.00	0.00	0.20	0.20	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	108.10	0.02	0.04	0.51	0.99	1.21	1.22	1.00	1.00	0.99	0.98	3.89	3.86	3.84	3.79	3.76	3.75	3.70	3.68	3.64	3.61	3.57	3.52	3.49	3.45	3.40	3.37	3.32	3.27	3.23	3.20	3.14	3.09	3.03	2.98	2.90	2.86	2.79	2.74	2.66	2.61
Sub-total	108.92	0.02	0.04	0.71	1.19	1.42	1.43	1.00	1.00	0.99	0.98	3.89	3.86	3.84	3.79	3.76	3.75	3.70	3.68	3.64	3.61	3.57	3.52	3.49	3.45	3.40	3.37	3.32	3.27	3.23	3.20	3.14	3.09	3.03	2.98	2.90	2.86	2.79	2.74	2.66	2.61
Total Cash Inflow	313.54	3.17	2.27	63.26	65.76	30.72	1.70	1.59	1.22	1.22	1.22	4.72	4.71	4.72	4.71	4.71	4.72	4.71	4.71	4.72	4.72	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.72	4.72	4.71	4.71	4.72	4.71	4.72	4.71	4.72	4.71	4.72
APPLICATION OF FUNDS																																								
D Project disbursement	163.26	3.15	2.23	62.75	64.77	29.51	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	121.67											3.50	3.53	3.57	3.60	3.64	3.68	3.71	3.75	3.79	3.83	3.86	3.90	3.94	3.98	4.02	4.06	4.10	4.14	4.18	4.23	4.27	4.31	4.35	4.40	4.44	4.49	4.53	4.58	4.62	4.67
2. Interest paid	28.61	0.02	0.04	0.51	0.99	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.18	1.15	1.11	1.07	1.04	1.00	0.96	0.93	0.89	0.85	0.81	0.77	0.73	0.69	0.65	0.61	0.57	0.53	0.49	0.45	0.40	0.36	0.32	0.27	0.23	0.18	0.14	0.09	0.05
Sub-total	150.28	0.02	0.04	0.51	0.99	1.21	1.22	1.22	1.22	1.22	1.22	4.72	4.71	4.72	4.71	4.71	4.72	4.71	4.71	4.72	4.72	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.72	4.72	4.71	4.71	4.72	4.71	4.72	4.71	4.72	4.71	4.72
Total Cash Outflow	313.54	3.17	2.27	63.26	65.76	30.72	1.70	1.59	1.22	1.22	1.22	4.72	4.71	4.72	4.71	4.71	4.72	4.71	4.71	4.72	4.72	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.72	4.72	4.71	4.71	4.72	4.71	4.72	4.71	4.72	4.71	4.72
F Net Surplus Cash (A+C2)-E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	28%	0%	0%	0%	0%	0%	0%	18%	18%	19%	20%	18%	18%	19%	20%	20%	21%	21%	22%	23%	24%	24%	25%	26%	27%	28%	28%	30%	31%	31%	32%	33%	34%	36%	37%	38%	39%	41%	42%	44%	45%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ARAGATSOTN MARZ
Aparan District
No 27 Ttujur

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	99.61	47.8%
	Subsidy	108.92	52.2%
	Total	208.53	100.0%
2	**Expenditure**		
	OM cost	58.25	27.9%
	Loan repayment	121.67	58.3%
	Interest paid	28.61	13.7%
	Surplus cash	0.00	0.0%
	Total	208.53	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	108.88	2.30	1.64	42.82	42.71	18.82	0.33	0.26																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	2.59			0.02	0.05	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	18.24			0.20	0.40	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Pump replacement																	0.00															0.00								
Sub-total	29.96			0.46	0.69	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Total Outflow	138.84	2.30	1.64	43.28	43.40	19.62	1.13	1.06	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
B BENEFIT																																							
1. Water Tariff	62.61	0.00	0.00	0.26	0.53	0.64	0.66	1.12	1.16	1.20	1.24	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
2. Subsidy	81.22	0.00	0.00	0.20	0.20	0.21	0.21	0.00	0.00	0.00	0.00	2.67	2.68	2.69	2.68	2.69	2.71	2.70	2.72	2.71	2.72	2.72	2.71	2.72	2.72	2.71	2.72	2.71	2.70	2.70	2.71	2.69	2.69	2.67	2.66	2.63	2.63	2.61	2.60	2.57	2.56
Total Inflow	143.83	0.00	0.00	0.46	0.73	0.85	0.87	1.12	1.16	1.20	1.24	4.53	4.54	4.55	4.54	4.55	4.57	4.56	4.58	4.57	4.58	4.58	4.57	4.58	4.58	4.57	4.58	4.57	4.56	4.56	4.57	4.55	4.55	4.53	4.52	4.49	4.49	4.47	4.46	4.43	4.42
NET BENEFIT	5.00	-2.30	-1.64	-42.8	-42.7	-18.8	-0.26	0.06	0.36	0.40	0.44	3.73	3.74	3.75	3.74	3.75	3.77	3.76	3.78	3.77	3.78	3.78	3.77	3.78	3.78	3.77	3.78	3.77	3.76	3.76	3.77	3.75	3.75	3.73	3.72	3.69	3.69	3.67	3.66	3.63	3.62

FIRR = **0.21%**

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-37.90	-2.53	-1.80	-47.1	-46.9	-20.7	-0.29	0.03	0.36	0.40	0.44	3.73	3.74	3.75	3.74	3.75	3.77	3.76	3.78	3.77	3.78	3.78	3.77	3.78	3.78	3.77	3.78	3.77	3.76	3.76	3.77	3.75	3.75	3.73	3.72	3.69	3.69	3.67	3.66	3.63	3.62
	2	Capital cost 20% up	-48.12	-2.76	-1.97	-51.4	-51.2	-22.5	-0.33	0.01	0.36	0.40	0.44	3.73	3.74	3.75	3.74	3.75	3.77	3.76	3.78	3.77	3.78	3.78	3.77	3.78	3.78	3.77	3.78	3.77	3.76	3.76	3.77	3.75	3.75	3.73	3.72	3.69	3.69	3.67	3.66	3.63	3.62
2	1	OM cost 10% up	-29.78	-2.30	-1.64	-42.9	-42.7	-18.9	-0.34	-0.02	0.28	0.32	0.36	3.65	3.66	3.67	3.66	3.67	3.69	3.68	3.70	3.69	3.70	3.70	3.69	3.70	3.70	3.69	3.70	3.69	3.68	3.68	3.69	3.67	3.67	3.65	3.64	3.61	3.61	3.59	3.58	3.55	3.54
	2	OM cost 20% up	-31.87	-2.30	-1.64	-42.9	-42.8	-18.9	-0.42	-0.10	0.20	0.24	0.28	3.57	3.58	3.59	3.58	3.59	3.61	3.60	3.62	3.61	3.62	3.62	3.61	3.62	3.62	3.61	3.62	3.61	3.60	3.60	3.61	3.59	3.59	3.57	3.56	3.53	3.53	3.51	3.50	3.47	3.46
3	1	Revenue 10% down	-37.22	-2.30	-1.64	-42.9	-42.7	-18.9	-0.35	-0.05	0.24	0.28	0.32	3.28	3.29	3.30	3.29	3.30	3.31	3.30	3.32	3.31	3.32	3.32	3.31	3.32	3.32	3.31	3.32	3.31	3.30	3.30	3.31	3.30	3.30	3.28	3.27	3.24	3.24	3.22	3.21	3.19	3.18
	2	Revenue 20% down	-46.76	-2.30	-1.64	-42.9	-42.8	-18.9	-0.43	-0.16	0.13	0.16	0.19	2.82	2.83	2.84	2.83	2.84	2.86	2.85	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.85	2.85	2.86	2.84	2.84	2.82	2.82	2.79	2.79	2.78	2.77	2.74	2.74

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.23%	-18.98	-5.27%
	2	Capital cost 20% up	-0.63%	-13.33	-7.50%
2	1	OM cost 10% up	0.08%	14.82	6.75%
	2	OM cost 20% up	-0.04%	-59.54	-1.68%
3	1	Revenue 10% down	-0.41%	-15.07	-6.64%
	2	Revenue 20% down	-1.11%	-11.90	-8.41%

No.28 Tlik

Information on Existing Water Sources (Aragatsotn)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.28 Community Tlik
District Talin
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Chlkanneri main	40	22	37.8	43	41	19.1	1,432	-	-	-
2	Akhuryan river	40	25	3.2	43	37	2.4	1,295	63m3 in 3 days		-
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Not acceptable
Notes	Currently no water is supplied to Tlik from this water main, though it was planned to supply 2,5l/sec in the past. River water is used for non-drinking purposes. Community feels poor water quality.
Alternative sources if any	No alternative water sources are available

No.28 Community Tlik
District Talin
Marz Aragatsotn
Sampling date 27/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.6				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	24					
c	TDS	Mg/L	78				1000	1000
1	Al:Aluminum	Mg/L	n.d				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	13				250	350
4	Cr:Chrome	Mg/L	<0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.02				1.50	
7	Hardness	Mg/L	235				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.8				50.0	45.0
13	SO4:Sulfate	Mg/L	30.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	<0.00005				NA	0.00020
18	Cd:Cadmium	Mg/L	n.d				0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001				0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	<0.7				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.28 Community Tlik
District Talin
Marz Aragatsotn

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not Identified	Not Identified
1	2		166	15.0	Not Identified
2	3		164	15.0	Not Identified
3	4		207	21.0	Not Identified
4	5		138	9.0	Not Identified
5	6		141	9.0	Not Identified
6	7		154	15.0	Not Identified

No. **28** **Marz** Aragatsotn **Community** Tlik

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Difficult	
2	Intake	Fair		
3	Transmission pipeline	Difficult	Difficult	Pipeline is mostly far from the road
4	Reservoir			No resvoir

2. INTAKE STRUCTURE

No.	Water main	N	E	El. (m)	Year	Material	Volume *1 (l/s)	Rehabilitation Necessity (Y/N)
1	Transmission	40°22'37.8″	43°41'19.1″	1,432	1972	Steel	0.0	Yes
2	River/stream	40°25'3.2″	43°37'2.4″	1,295	1997	Steel	0.2	No

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	300	80	Steel	0.0	1972	Medium	Yes
	3,000	100	Steel			Medium	Yes
	3,200	150	Steel			Medium	Yes
2	500	100	Steel	0.2	1997	no	No

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°24'37.8″	43°41'19.1″	1,342					Yes

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Break pressure ta	Powder	Twice per month

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	800	80	Steel	1972	Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
Yes (1nos)	Commercial	Centrifugal	-	-	-	-	No

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
3	1972		No	0	Yes

9. DRAINAGE SYSTEM

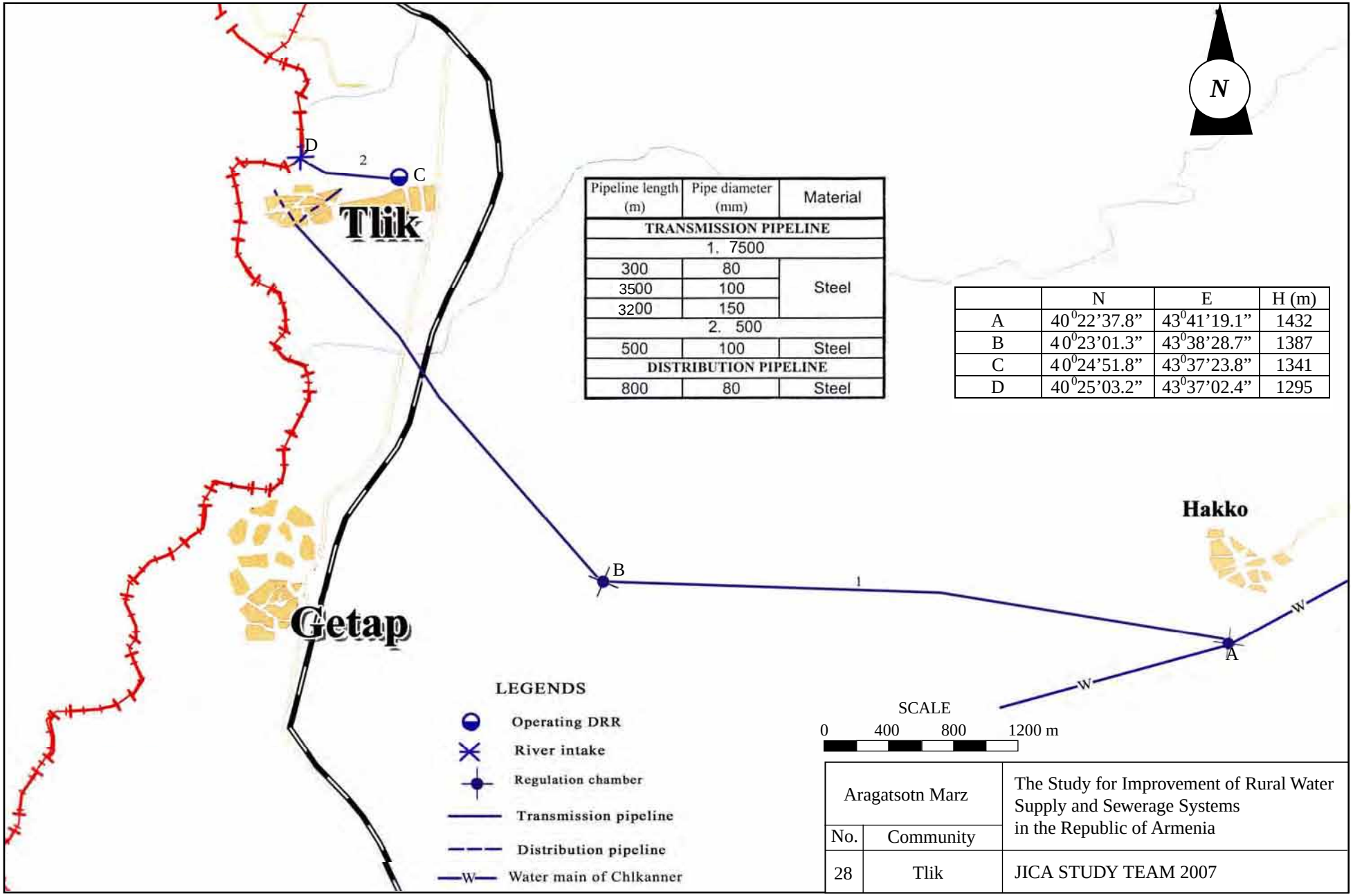
Existence	Rehabilitation	Remarks
No	Yes	

Note 1: 0.2lit/sec is calculated from intake yield 63m3/3days.

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.28 Tlik**
District	**Talin**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	220
A2	Actual population in 2007	112
A3	Number of households	65
A4.1	Elderly people	7
A4.2	Population in labor force (age from 16 to 62)	52
A4.3	Children	50
A5.1	Pensioners	16
A5.2	Unemployed	0
A5.3	Receiving benefits	2
A6	Average monthly income of household (AMD)	30,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	24
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	600
	Annual Budget of the community 2005, in thousand AMD	600
	Annual Budget of the community 2006, in thousand AMD	800
	Annual Budget of the community 2007, in thousand AMD	600
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	200
	Amount spent in drinking water sector 2005, in thousand AMD	200
	Amount spent in drinking water sector 2006, in thousand AMD	200
	Amount spent in drinking water sector 2007, in thousand AMD	200
	Amount spent in drinking water sector 2008, in thousand AMD	200
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat, cereals
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	is not planned
D5	Present condition of the water supply volume of Domestic use	absent
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	0
D8	How many house connection household set the water meter	0
D9	Number of public taps	3
D10.1	How is the regime of water supply in your community in the dry season?	no water at all
D10.2	How is the regime of water supply in your community in the wet season?	no water at all
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	mainly displeased
D13	Are hours of water supply convenient?	mainly inconvenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	50
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	250
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	there is not a specialist
E2	Position	-
E3	Telephone	-
E4	Quantity and present condition of the water supply facilities: spring/ intake	absent
E5	Quantity and present condition of the water supply facilities:	1 deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	absent
E7	Quantity and present condition of the water supply facilities: net/distribution pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	1 partially repaired
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community
E12	How do you repair the water supply facilities?	partially repaired
E13	Who is in charge of the repair work in the community?	hired specialist from community
E14	How you prepare O&M costs?	donation from residents
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	200,000
	Labor cost (AMD)	0
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	200,000
E16	Do the residents participate in the O&M works?	no
E17	What kind of OM method is preferable to you?	resident participation
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	yes



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
1. 7500		
300	80	Steel
3500	100	
3200	150	
2. 500		
500	100	Steel
DISTRIBUTION PIPELINE		
800	80	Steel

	N	E	H (m)
A	$40^0$22’37.8”	$43^0$41’19.1”	1432
B	$40^0$23’01.3”	$43^0$38’28.7”	1387
C	$40^0$24’51.8”	$43^0$37’23.8”	1341
D	$40^0$25’03.2”	$43^0$37’02.4”	1295

Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
28	Tlik	JICA STUDY TEAM 2007

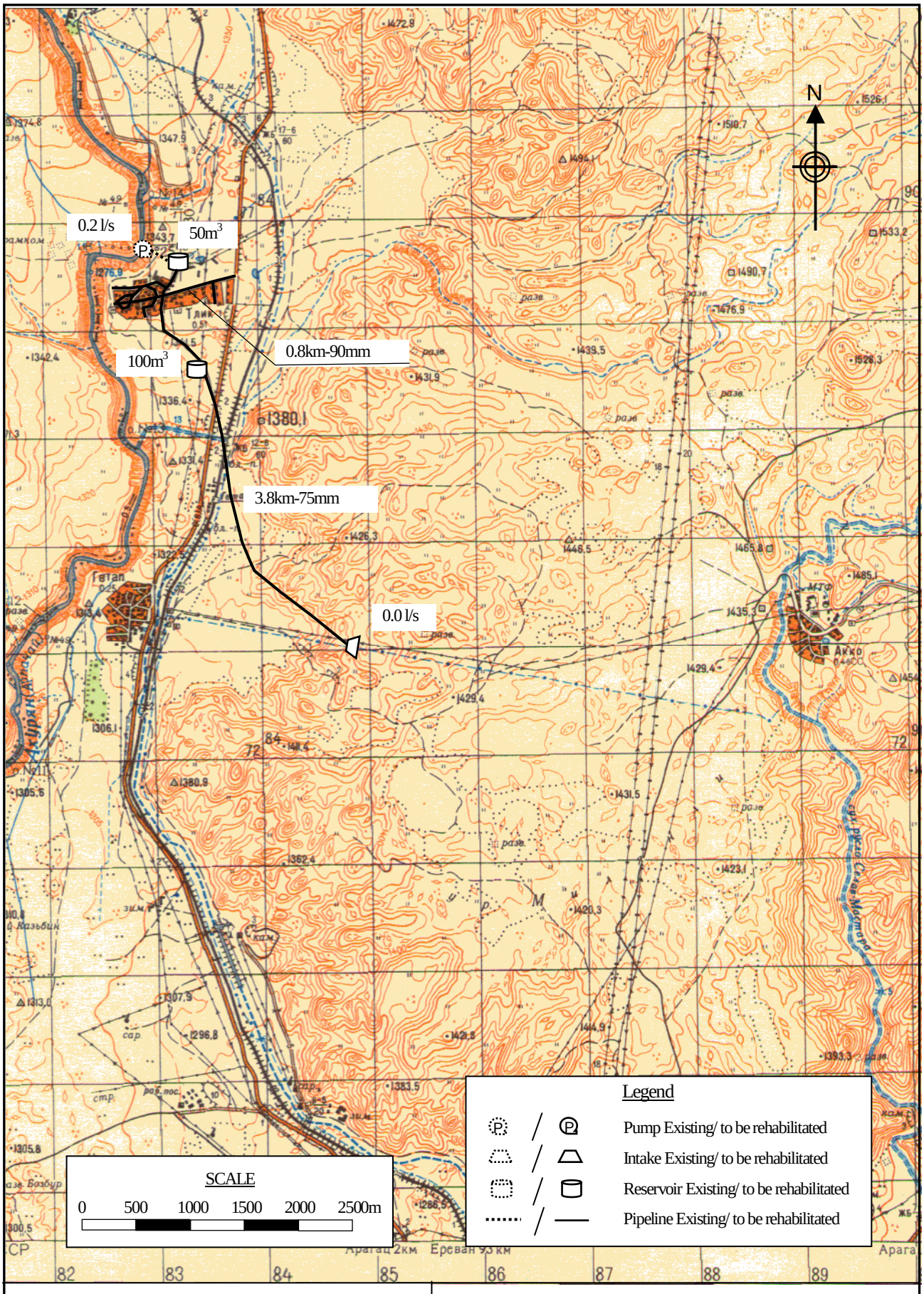
Marz : **Aragatsotn** No.28
Name : **Tlik**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
1	Population	112	persons	11.2	
2	Factory	-	nos	0.0	
3	School (pupils)	24	pupils	0.2	
4	Medical Ambulance Station	-	nos	-	
5	Policlinic	-	nos	-	
6	Livestocks (87lit/household)	65	household	5.7	
	Sub-total			17.1	
	Unaccouted for water (20%)			3.4	
1	Average Daily Water Demand		13.8	20.5	m3/day
2	Maximum Daily Water Demand			24.6	m3/day
3	Maximum Hourly Water Demand			6.0	m3/hr

B	**WATER SUPPLY PLAN**						
1	Water source type	Nr.	Total vol.				
a	Existing pipeline	1	0.0	lit/sec		0.0	m3/day
b	River	1	0.2	lit/sec		17.3	m3/day
`	Total					17.3	m3/day
2	Additional water source						
2	Required reservoir volume					72	m3

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit	
1	Intake			
	1m3	1	nos	
	2m3		nos	
	3m3		nos	
	4m3		nos	
2	Transmission pipe			
	50mm diameter		m	
	75mm diameter	3,800	m	
	90mm diameter		m	
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
	50m3 capacity	1	nos	For river
	100m3 capacity	1	nos	For water main
4	Distribution pipe			
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter	800	m	
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	65	nos	
6	Water meter installation	65	nos	
7	Public tap	1	nos	
8	Chlorination	1	nos	
9	Pumps	-	nos	



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Aragatsotn	
No. 28	Tlik	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **28**
Name : **Tlik**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm	3,800	m	7,160	27,208,000
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					27,208,000
3	Reservoir					
		50m3	1	nos	8,363,900	8,363,900
		100m3	1	nos	12,968,300	12,968,300
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					21,332,200
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm	800	m	8,040	6,432,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					6,432,000
5	House Connection		65	nos	74,000	4,810,000
6	Water Meter Installation		65	nos	80,000	5,200,000
7	Public Tap		1	nos	90,000	90,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	320	m	3,600	1,152,000
	Total				AMD	67,091,900
					Equivalent to USD	219,599
					Equivalent to JPY	23,167,699
					AMD	USD
	Investment Cost per household		65	HH	1,032,183	3,378
	Investment Cost per person		112	persons	599,035	1,961

ARAGATSOTN MARZ
Talin District
No 28 Tlik

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		6.2																																							
Unit rate	AMD/m3				120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	123.96	128.05	132.28	136.64	141.15	145.81	150.62	155.59	160.73	166.03	171.51	177.17	183.01	189.05	195.29	201.74	208.39	215.27	222.38	229.71	237.29	245.13	253.21	261.57	270.20	279.12	288.33	297.84	307.67
Sub-total		38.58	0.00	0.00	0.30	0.59	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.70	0.72	0.74	0.77	0.79	0.82	0.85	0.87	0.90	0.93	0.96	1.00	1.03	1.06	1.10	1.13	1.17	1.21	1.25	1.29	1.33	1.38	1.42	1.47	1.52	1.57	1.62	1.67	1.73
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				1																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		35.40			0.48	0.50	0.51	0.53	0.55	0.56	0.58	0.60	0.62	0.64	0.66	0.69	0.71	0.73	0.76	0.78	0.81	0.83	0.86	0.89	0.92	0.95	0.98	1.01	1.05	1.08	1.12	1.15	1.19	1.23	1.27	1.31	1.36	1.40	1.45	1.50	1.54	1.60
2. Chlorine																																									
Pouring volume	kg/yr				38																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		1.67			0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.08
3. Electricity (for pump)		13.14			0.08	0.16	0.19	0.20	0.20	0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.36	0.37	0.38	0.39	0.41	0.42	0.43	0.45	0.46	0.48	0.49	0.51	0.53	0.54	0.56	0.58	0.60
4. Maintenance cost		41.64			0.25	0.52	0.61	0.63	0.65	0.67	0.69	0.72	0.74	0.76	0.79	0.81	0.84	0.87	0.90	0.93	0.96	0.99	1.02	1.06	1.09	1.13	1.16	1.20	1.24	1.28	1.33	1.37	1.41	1.46	1.51	1.56	1.61	1.66	1.72	1.78	1.83	1.89
Pump repair					0.13	0.27	0.32	0.33	0.34	0.35	0.36	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.56	0.57	0.59	0.61	0.63	0.65	0.68	0.70	0.72	0.74	0.77	0.79	0.82	0.85	0.88	0.90	0.93	0.97	1.00
Pipe repair					0.12	0.25	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.39	0.40	0.41	0.43	0.44	0.45	0.47	0.48	0.50	0.52	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.72	0.74	0.76	0.79	0.81	0.84	0.87	0.90
5. Pump replacement		25.65																9.76															15.89										
Sub-total		117.50	0.00	0.00	0.82	1.20	1.33	1.39	1.43	1.47	1.52	1.58	1.62	1.67	1.73	1.79	1.85	11.66	1.98	2.04	2.11	2.17	2.24	2.32	2.39	2.49	2.56	2.64	2.73	2.82	2.92	3.00	19.00	3.21	3.32	3.42	3.54	3.66	3.78	3.91	4.02	4.17
C Gross Income (A-B)		-78.92	0.00	0.00	-0.52	-0.61	-0.66	-0.72	-0.76	-0.80	-0.85	-0.91	-0.95	-0.97	-1.01	-1.05	-1.08	-10.87	-1.16	-1.19	-1.24	-1.27	-1.31	-1.36	-1.39	-1.46	-1.50	-1.54	-1.60	-1.65	-1.71	-1.75	-17.71	-1.88	-1.94	-2.00	-2.07	-2.14	-2.21	-2.29	-2.35	-2.44
D Depreciation cost		63.70						1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
E Interest paid		21.09	0.02	0.04	0.40	0.78	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.62	0.60	0.57	0.54	0.51	0.48	0.45	0.42	0.39	0.36	0.33	0.30	0.26	0.23	0.20	0.17	0.14	0.10	0.07	0.03
F Net Income		-163.71	-0.02	-0.04	-0.92	-1.39	-1.54	-3.43	-3.47	-3.51	-3.56	-3.62	-3.66	-3.66	-3.67	-3.69	-3.69	-13.45	-3.72	-3.72	-3.74	-3.74	-3.75	-3.78	-3.78	-3.82	-3.83	-3.84	-3.87	-3.89	-3.92	-3.93	-19.86	-4.00	-4.02	-4.05	-4.09	-4.13	-4.17	-4.21	-4.24	-4.29
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-163.71	-0.02	-0.04	-0.92	-1.39	-1.54	-3.43	-3.47	-3.51	-3.56	-3.62	-3.66	-3.66	-3.67	-3.69	-3.69	-13.45	-3.72	-3.72	-3.74	-3.74	-3.75	-3.78	-3.78	-3.82	-3.83	-3.84	-3.87	-3.89	-3.92	-3.93	-19.86	-4.00	-4.02	-4.05	-4.09	-4.13	-4.17	-4.21	-4.24	-4.29
OM Cost Recovery Ratio (A/B)		33%	0%	0%	37%	49%	50%	48%	47%	46%	44%	42%	41%	42%	42%	41%	42%	7%	41%	42%	41%	41%	42%	41%	42%	41%	41%	42%	41%	41%	41%	42%	7%	41%	42%	42%	42%	42%	42%	41%	42%	41%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-163.71	-0.02	-0.04	-0.92	-1.39	-1.54	-3.43	-3.47	-3.51	-3.56	-3.62	-3.66	-3.66	-3.67	-3.69	-3.69	-13.45	-3.72	-3.72	-3.74	-3.74	-3.75	-3.78	-3.78	-3.82	-3.83	-3.84	-3.87	-3.89	-3.92	-3.93	-19.86	-4.00	-4.02	-4.05	-4.09	-4.13	-4.17	-4.21	-4.24	-4.29
2. Depreciation cost	63.70	0.00	0.00	0.00	0.00	0.00	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
3. Interest Paid	21.09	0.02	0.04	0.40	0.78	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.62	0.60	0.57	0.54	0.51	0.48	0.45	0.42	0.39	0.36	0.33	0.30	0.26	0.23	0.20	0.17	0.14	0.10	0.07	0.03
Sub-total	-78.92	0.00	0.00	-0.52	-0.61	-0.66	-0.72	-0.76	-0.80	-0.85	-0.91	-0.95	-0.97	-1.01	-1.05	-1.08	-10.87	-1.16	-1.19	-1.24	-1.27	-1.31	-1.36	-1.39	-1.46	-1.50	-1.54	-1.60	-1.65	-1.71	-1.75	-17.71	-1.88	-1.94	-2.00	-2.07	-2.14	-2.21	-2.29	-2.35	-2.44
B Finances																																									
1. Project Loan	89.37	2.36	1.67	36.40	37.39	10.91	0.36	0.28																																	
2. Local fund	30.50	0.79	0.56	12.32	12.83	3.79	0.12	0.09																																	
Sub-total	119.87	3.15	2.23	48.72	50.22	14.70	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	78.92	0.00	0.00	0.52	0.61	0.66	0.72	0.76	0.80	0.85	0.91	0.95	0.97	1.01	1.05	1.08	10.87	1.16	1.19	1.24	1.27	1.31	1.36	1.39	1.46	1.50	1.54	1.60	1.65	1.71	1.75	17.71	1.88	1.94	2.00	2.07	2.14	2.21	2.29	2.35	2.44
2. Subsidy for debt services	110.44	0.02	0.04	0.40	0.78	0.88	0.89	0.89	0.89	0.89	0.89	3.46	3.46	3.46	3.47	3.46	3.46	3.47	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.47	3.46	3.46	3.46
Sub-total	189.36	0.02	0.04	0.92	1.39	1.54	1.61	1.65	1.69	1.74	1.80	4.41	4.43	4.47	4.52	4.54	14.33	4.63	4.65	4.70	4.73	4.77	4.83	4.86	4.92	4.96	5.00	5.06	5.11	5.17	5.21	21.18	5.35	5.40	5.46	5.53	5.60	5.68	5.75	5.81	5.90
Total Cash Inflow	230.31	3.17	2.27	49.12	51.00	15.58	1.37	1.26	0.89	0.89	0.89	3.46	3.46	3.46	3.47	3.46	3.46	3.47	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.47	3.46	3.46	3.46
APPLICATION OF FUNDS																																								
D Project disbursement	119.87	3.15	2.23	48.72	50.22	14.70	0.48	0.37																																	
E Total debt services																																									
1. Loan repayment	89.35											2.57	2.59	2.62	2.65	2.67	2.70	2.73	2.75	2.78	2.81	2.84	2.87	2.90	2.92	2.95	2.98	3.01	3.04	3.07	3.10	3.14	3.17	3.20	3.23	3.26	3.29	3.33	3.36	3.39	3.43
2. Interest paid	21.09	0.02	0.04	0.40	0.78	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.62	0.60	0.57	0.54	0.51	0.48	0.45	0.42	0.39	0.36	0.33	0.30	0.26	0.23	0.20	0.17	0.14	0.10	0.07	0.03
Sub-total	110.44	0.02	0.04	0.40	0.78	0.88	0.89	0.89	0.89	0.89	0.89	3.46	3.46	3.46	3.47	3.46	3.46	3.47	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.47	3.46	3.46	3.46
Total Cash Outflow	230.31	3.17	2.27	49.12	51.00	15.58	1.37	1.26	0.89	0.89	0.89	3.46	3.46	3.46	3.47	3.46	3.46	3.47	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.47	3.47	3.46	3.46	3.46	3.46	3.47	3.46	3.46	3.46
F Net Cash Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ARAGATSOTN MARZ
Talin District
No 28 Tlik

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	38.58	16.9%
	Subsidy	189.36	83.1%
	Total	227.94	100.0%
2	**Expenditure**		
	OM cost	117.50	51.5%
	Loan repayment	89.35	39.2%
	Interest paid	21.09	9.3%
	Surplus cash	0.00	0.0%
	Total	227.94	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	80.32	2.30	1.64	33.26	33.13	9.40	0.33	0.26																																
2. Operation and Maintenance Cost																																								
Salary	18.24			0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Chlorine	0.75			0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Electricity	6.63			0.08	0.07	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Mantenance cost	21.27			0.25	0.50	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Pump replacement																	6.00															6.00								
Sub-total	58.89			0.82	1.07	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	7.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	7.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Total Outflow	139.21	2.30	1.64	34.08	34.20	10.65	1.58	1.51	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	7.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	7.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
B BENEFIT																																							
1. Water Tariff	25.01	0.00	0.00	0.30	0.59	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
2. Subsidy	168.27	0.00	0.00	0.52	0.61	0.66	0.72	0.76	0.80	0.85	0.91	3.52	3.56	3.63	3.70	3.75	13.57	3.89	3.94	4.02	4.08	4.15	4.23	4.29	4.38	4.45	4.52	4.61	4.69	4.78	4.85	20.85	5.05	5.14	5.23	5.33	5.43	5.54	5.65	5.74	5.87
Total Inflow	193.28	0.00	0.00	0.82	1.20	1.33	1.39	1.43	1.47	1.52	1.58	4.19	4.23	4.30	4.37	4.42	14.24	4.56	4.61	4.69	4.75	4.82	4.90	4.96	5.05	5.12	5.19	5.28	5.36	5.45	5.52	21.52	5.72	5.81	5.90	6.00	6.10	6.21	6.32	6.41	6.54
NET BENEFIT	54.07	-2.30	-1.64	-33.3	-33.0	-9.3	-0.19	-0.08	0.22	0.27	0.33	2.94	2.98	3.05	3.12	3.17	6.99	3.31	3.36	3.44	3.50	3.57	3.65	3.71	3.80	3.87	3.94	4.03	4.11	4.20	4.27	14.27	4.47	4.56	4.65	4.75	4.85	4.96	5.07	5.16	5.29
FIRR =	**2.33%**																																							

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	2.34	-2.53	-1.80	-36.6	-36.3	-10.3	-0.22	-0.11	0.22	0.27	0.33	2.94	2.98	3.05	3.12	3.17	6.99	3.31	3.36	3.44	3.50	3.57	3.65	3.71	3.80	3.87	3.94	4.03	4.11	4.20	4.27	14.27	4.47	4.56	4.65	4.75	4.85	4.96	5.07	5.16	5.29
	2	Capital cost 20% up	-5.20	-2.76	-1.97	-39.9	-39.6	-11.2	-0.26	-0.13	0.22	0.27	0.33	2.94	2.98	3.05	3.12	3.17	6.99	3.31	3.36	3.44	3.50	3.57	3.65	3.71	3.80	3.87	3.94	4.03	4.11	4.20	4.27	14.27	4.47	4.56	4.65	4.75	4.85	4.96	5.07	5.16	5.29
2	1	OM cost 10% up	5.81	-2.30	-1.64	-33.3	-33.1	-9.4	-0.32	-0.21	0.10	0.15	0.21	2.82	2.86	2.93	3.00	3.05	6.27	3.19	3.24	3.32	3.38	3.45	3.53	3.59	3.68	3.75	3.82	3.91	3.99	4.08	4.15	13.55	4.35	4.44	4.53	4.63	4.73	4.84	4.95	5.04	5.17
	2	OM cost 20% up	1.74	-2.30	-1.64	-33.4	-33.2	-9.6	-0.44	-0.33	-0.03	0.02	0.08	2.69	2.73	2.80	2.87	2.92	5.54	3.06	3.11	3.19	3.25	3.32	3.40	3.46	3.55	3.62	3.69	3.78	3.86	3.95	4.02	12.82	4.22	4.31	4.40	4.50	4.60	4.71	4.82	4.91	5.04
3	1	Revenue 10% down	-2.72	-2.30	-1.64	-33.3	-33.1	-9.5	-0.33	-0.22	0.07	0.12	0.17	2.52	2.56	2.62	2.68	2.73	5.57	2.85	2.90	2.97	3.03	3.09	3.16	3.21	3.30	3.36	3.42	3.50	3.57	3.66	3.72	12.12	3.90	3.98	4.06	4.15	4.24	4.34	4.44	4.52	4.64
	2	Revenue 20% down	-15.34	-2.30	-1.64	-33.4	-33.2	-9.6	-0.47	-0.37	-0.07	-0.03	0.01	2.10	2.13	2.19	2.25	2.29	4.14	2.40	2.44	2.50	2.55	2.61	2.67	2.72	2.79	2.85	2.90	2.97	3.04	3.11	3.17	9.97	3.33	3.40	3.47	3.55	3.63	3.72	3.81	3.88	3.98

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	1.88%	2.39	41.84%
	2	Capital cost 20% up	1.48%	5.77	17.34%
2	1	OM cost 10% up	2.09%	1.13	88.64%
	2	OM cost 20% up	1.85%	2.57	38.95%
3	1	Revenue 10% down	1.58%	4.72	21.19%
	2	Revenue 20% down	0.75%	21.12	4.73%