

No.11 Lernakert

Information on Existing Water Sources (Shirak)

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

No.11 Community Lernakert
District Artik
Marz Shirak

No.11 Community Lernakert
District Artik
Marz Shirak
Sampling date 11/Oct/2007

No	Water source	Latitude			Longitude			Atitude (m)	Yield(L/sec)		
		deg	min	sec	deg	min	sec		Min	Max	At site
1	Spring	40	32	37.4	43	58	27.9	2,227	5.0	10.0	8.0
2	Spring	40	33	14.1	43	57	4.2	2,040	10.0	15.0	10.0
3											
4											
5											
6											
7											
8											
9											
10											
<i>Notes:</i>											
<i>Latitude, Longitude, Atitude:</i>				<i>Measured at site</i>							
<i>Yield (Min, Max):</i>				<i>Interviewed to the Community</i>							
<i>Yield (at site):</i>				<i>Measured / estimated at site in summer of 2007</i>							

Users Acceptnce for water quality	Acceptable
Notes	
Alternative sources if any	

	Parameters analysed	Units	No.1	Guidelines	
				WHO	Armenia
<i>a</i>	pH			6.5-8	6.0 - 9.0
<i>b</i>	Temperature	Deg.C			
<i>c</i>	TDS	Mg/L		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	<0.01	0.05	0.05
5	Cu:Copper	Mg/L	n.d	2	1
6	F:Fluoride	Mg/L	0.22	1.50	
7	Hardness	Mg/L	120	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	0.020	0.070	0.250
11	Ni:Nickel	Mg/L	n.d	0.020	0.100
12	Nitrate(NO3+)	Mg/L	4.0	50.0	45.0
13	SO4:Sulfate	Mg/L	4.2	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	n.d	0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001	0.010	0.010
22	Sr:Strontium	Mg/L	0.1	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

No. 11 Marz Shirak Community Lernakert**1. ACCESSIBILITY TO THE SITE**

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

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°32'37,4"	43°58'27,9"	2,227	1963	Concrete	8.0	Yes
2	Spring	40°33'14,1"	43°57'04,2"	2,040	1960	Masonry	10.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	3,000	100	steel/iron	12.0	1970	Little	Yes
2	1,000	32	Steel	9.5		Little	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°33'26,0"	43°56'28,1"	1,964	Concrete	Rectangular	12×12×5	700	Yes

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	3,000	100	Steel	1960	Huge	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)
12	1960	1990	Yes	50	No

9. DRAINAGE SYSTEM

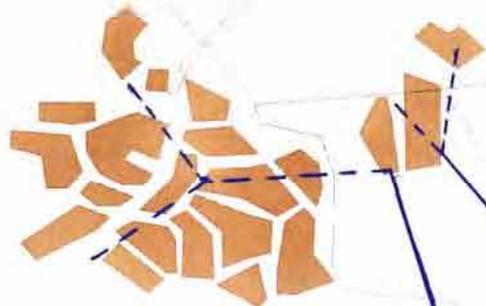
Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
Yes	Yes	DN300 keramik for German district

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	Shirak
Number and Name of Community	No.11 Lernakert
District	Artik

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	1,462
A2	Actual population in 2007	1,500
A3	Number of households	300
A4.1	Elderly people	241
A4.2	Population in labor force (age from 16 to 62)	679
A4.3	Children	580
A5.1	Pensioners	250
A5.2	Unemployed	30
A5.3	Receiving benefits	125
A6	Average monthly income of household (AMD)	17,000
A7	Number of medical ambulance station/first and health post	absent
A8	Number of beds in each medical ambulance station	0
A9	Number of school	1
A10	Number of pupils	450
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	475
	Annual Budget of the community 2005, in thousand AMD	374
	Annual Budget of the community 2006, in thousand AMD	680
	Annual Budget of the community 2007, in thousand AMD	956
	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	0
	Amount spent in drinking water sector 2006, in thousand AMD	1
	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:	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	yes
D2	Water use permit number	1028
D3	Date of expiry of water use permit	13.02.06-13.02.09
D4	Planned date of obtaining water use permit	-
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	120
D8	How many house connection household set the water meter	0
D9	Number of public taps	20
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?	fully 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 household a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	50

No.	Question	Answer
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	50
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1 Flat rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	from spring
D20	Are you satisfied with irrigation water supply volume?	insufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	nobody
E2	Position	-
E3	Telephone	-
E4	Quantity and present condition of the water supply facilities: spring/ intake	3-deteriorated
E5	Quantity and present condition of the water supply facilities:	1-rehabilitated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1-partially repaired
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
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?	residents
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?	by projects
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	1,000,000
	Others(AMD)	0
	Total (AMD)	1,000,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	residents 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	yes
F1.8	Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent



Lernakert

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
(1) 5000	100	steel/c.iron
(2) 1000	32	steel
DISTRIBUTION PIPELINE		
3000	100	steel



	N	E	H (m)
A	40°32'37.4"	43°58'27.9"	2227
B	40°33'14.1"	43°57'04.2"	2040
C	40°33'26.0"	43°56'28.1"	1964



C

2

Jatali

B

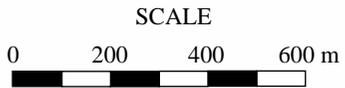
1

Yayli

A

LEGENDS

-  Spring intake
-  Not operating DRR
-  Transmission pipeline
-  Distribution pipeline



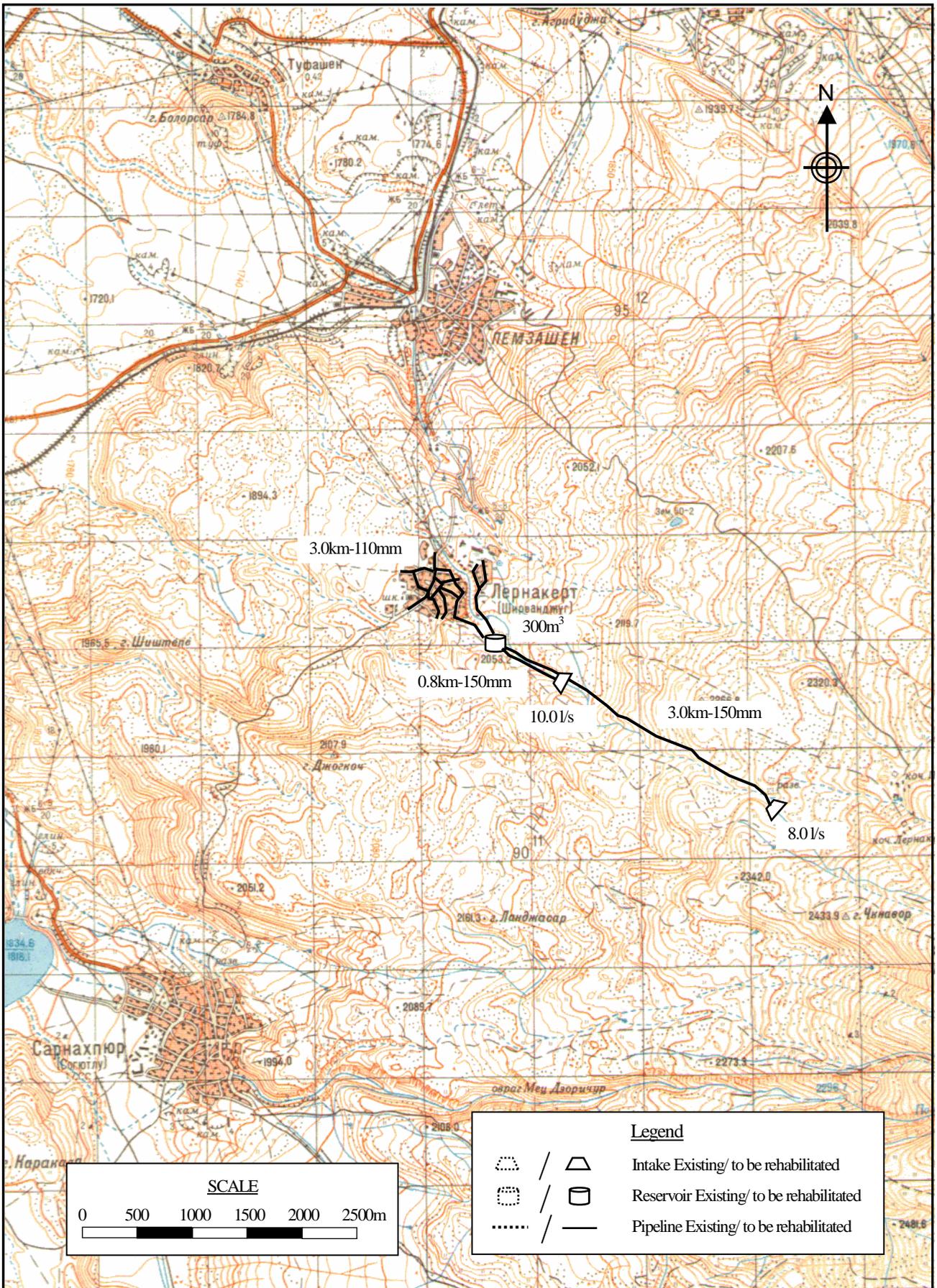
Shirak Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
11	Lernakert	JICA STUDY TEAM 2007

Marz : **Shirak**
Name : **Lernakert**

No.11

No.	Item	Quantity	Unit	Water demand (m3/d)
A. WATER DEMAND				
	1 Population	1,500	persons	150.0
	2 Factory	-	nos	0.0
	3 School (pupils)	450	pupils	4.5
	4 Medical Ambulance Station	-	nos	-
	5 Polyclinic	-	nos	-
	6 Livestocks (87lit/household)	300	household	26.1
	Sub-total			180.6
	Unaccounted for water (20%)			36.1
1	Average Daily Water Demand			216.7 m3/day
2	Maximum Daily Water Demand			260.1 m3/day
3	Maximum Hourly Water Demand			25.4 m3/hr
B. WATER SUPPLY PLAN				
	1 Water source type	Nr.	Total vol.	
	a Spring	1	10.0	lit/sec
	b Spring	1	8.0	lit/sec
	Total			1555.2 m3/day
	2 Required reservoir volume			304 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		m	
	110mm diameter		m	
	150mm diameter	3,800	m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
	300m3 capacity	1	nos	
4	Distribution pipe			
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter		m	
	110mm diameter	3,000	m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	180	nos	
6	Water meter installation	300	nos	
7	Public tap	3	nos	
8	Chlorination	2	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	Shirak	
No. 11	Lernakert	JICA STUDY TEAM

STUDY FOR IMPROVEMENT OF
RURAL WATER SUPPLY AND
SEWAGE SYSTEMS IN RA

Marz : **Shirak**
No. : **11**
Name : **Lernakert**

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		m	8,040	
		110mm		m	9,680	
		150mm	3,800	m	13,140	49,932,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					49,932,000
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	1	nos	29,630,400	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					29,630,400
4	Distribution Pipe	50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	3,000	m	9,680	29,040,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					29,040,000
5	House Connection		180	nos	74,000	13,320,000
6	Water Meter Installation		300	nos	80,000	24,000,000
7	Public Tap		3	nos	90,000	270,000
8	Chlorilation Equipment		2	nos	500,000	1,000,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage concrete surfa		1,200	m	3,600	4,320,000
Total					AMD	152,247,800
					Equivalent to USD	498,324
					Equivalent to JPY	52,573,131
					AMD	USD
Investment Cost per household			300	HH	507,493	1,661
Investment Cost per person			1,500	persons	101,499	332

No.12 Lernut

Information on Existing Water Sources (Shirak)

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

No.12 Community Lernut
District Akhuryan
Marz Shirak

No.12 Community Lernut
District Akhuryan
Marz Shirak
Sampling date 20/Aug/2007

No	Water source	Latitude			Longitude			Atitude (m)	Yeild(L/sec)		
		deg	min	sec	deg	min	sec		Min	Max	At site
1	Spring	40	52	23.4	43	55	15.8	1,890	0.1	2.0	1.0
2											
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

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

Users Acceptnce for water quality	Acceptable
Notes	A water supply system has been constructed newly. Water leakage in water supply system is approximately 40%.
Alternative sources if any	

	Parameters analysed	Units	No.1	No.2	Guidelines	
					WHO	Armenia
<i>a</i>	pH		7.6	7.4	6.5-8	6.0 - 9.0
<i>b</i>	Temperature	Deg.C	13	14.3		
<i>c</i>	TDS	Mg/L	62	61	1000	1000
1	Al:Aluminum	Mg/L	n.d	n.d	0.10	0.50
2	B:Boron	Mg/L	n.d	n.d	0.70	0.50
3	Cl:Chloride	Mg/L	4	5	250	350
4	Cr:Chrome	Mg/L	n.d	n.d	0.05	0.05
5	Cu:Copper	Mg/L	n.d	n.d	2	1
6	F:Fluoride	Mg/L	0.12	0.12	1.50	
7	Hardness	Mg/L	110	110	500	700
8	Fe:Iron	Mg/L	n.d	n.d	0.30	0.30
9	Mn:Manganese	Mg/L	n.d	n.d	0.40	0.10
10	Mo:Molibdenum	Mg/L	0.020	0.020	0.070	0.250
11	Ni:Nickel	Mg/L	n.d	n.d	0.020	0.100
12	Nitrate(NO3+)	Mg/L	2.7	3.1	50.0	45.0
13	SO4:Sulfate	Mg/L	12.0	10.0	250.0	500.0
14	Zn:Zink	Mg/L	n.d	n.d	3.0	5.0
15	As:Arsenic	Mg/L	n.d	n.d	0.0	0.1
16	Ba:Barium	Mg/L	0.02	0.03	0.70	0.10
17	Be:Berillium	Mg/L	n.d	n.d	NA	0.00020
18	Cd:Cadmium	Mg/L	n.d	n.d	0.0030	0.0010
19	Pb:Lead	Mg/L	0.001	0.001	0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	n.d	0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001	0.001	0.010	0.010
22	Sr:Strontium	Mg/L	0.1	0.1	NA	7.0
23	CN:Cyanide	Mg/L	n.d	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

No. 12 Marz Shirak Community Lernut**1. ACCESSIBILITY TO THE SITE**

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

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°52'23,4"	43°55'15,8"	1,890	1930	Masonry	1.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,000	100	Ductile Iron	0.35	1990	Medium	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	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	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)
1	1913		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	Shirak
Number and Name of Community	No.12 Lernut
District	Akhurian

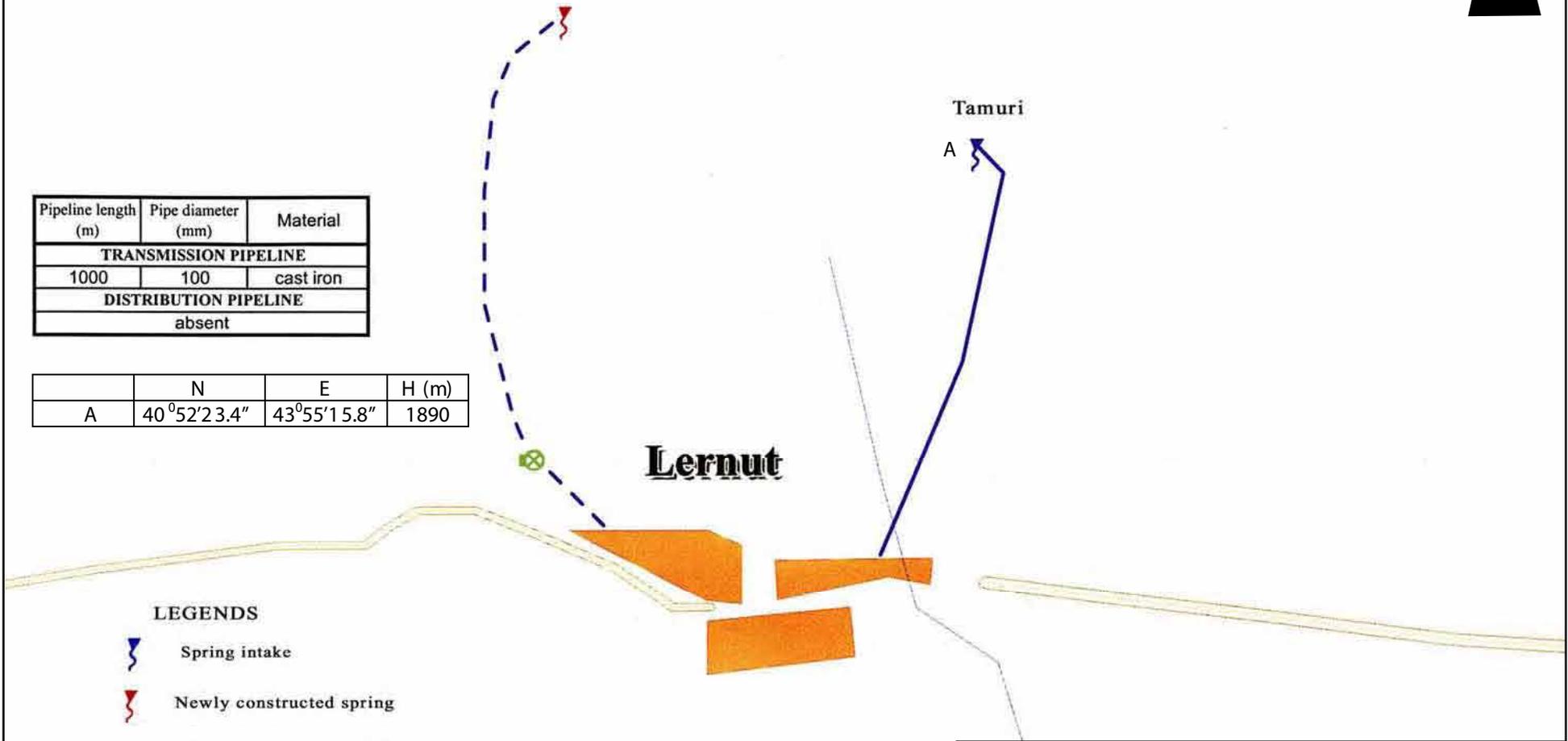
No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	210
A2	Actual population in 2007	203
A3	Number of households	67
A4.1	Elderly people	34
A4.2	Population in labor force (age from 16 to 62)	127
A4.3	Children	42
A5.1	Pensioners	36
A5.2	Unemployed	2
A5.3	Receiving benefits	6
A6	Average monthly income of household (AMD)	15,000
A7	Number of medical ambulance station/first and health post	absent
A8	Number of beds in each medical ambulance station	0
A9	Number of school	1
A10	Number of pupils	32
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	2,700
	Annual Budget of the community 2005, in thousand AMD	2,700
	Annual Budget of the community 2006, in thousand AMD	3,100
	Annual Budget of the community 2007, in thousand AMD	3,200
	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	0
	Amount spent in drinking water sector 2006, in thousand AMD	0
	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	1326
D3	Date of expiry of water use permit	13.02.07-13.02.10
D4	Planned date of obtaining water use permit	-
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	15
D8	How many house connection household set the water meter	0
D9	Number of public taps	2
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?	fully 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 household a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	200

No.	Question	Answer
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	200
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1 Flat rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	insufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	nobody
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-partially repaired
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	partially repaired
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?	residents
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)	0
	Repair cost (AMD)	0
	Others (AMD)	0
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	residents 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	yes
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	yes
F1.8	Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent



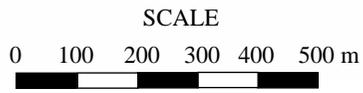
Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
1000	100	cast iron
DISTRIBUTION PIPELINE		
absent		

	N	E	H (m)
A	40°52'23.4"	43°55'15.8"	1890



LEGENDS

-  Spring intake
-  Newly constructed spring
-  Newly constructed DDR
-  Transmission pipeline
-  Newly constructed water main



Shirak Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
12	Lernut	JICA STUDY TEAM 2007

Marz : **Shirak**
Name : **Lernut**

No.12

No.	Item	Quantity	Unit	Water demand (m3/d)
A. WATER DEMAND				
	1 Population	203	persons	20.3
	2 Factory	-	nos	0.0
	3 School (pupils)	32	pupils	0.3
	4 Medical Ambulance Station	-	nos	-
	5 Polyclinic	-	nos	-
	6 Livestocks (87lit/household)	67	household	5.8
	Sub-total			26.4
	Unaccounted for water (20%)			5.3
1	Average Daily Water Demand		19.5	31.7 m3/day
2	Maximum Daily Water Demand			38.0 m3/day
3	Maximum Hourly Water Demand			8.2 m3/hr
B. WATER SUPPLY PLAN				
	1 Water source type	Nr.	Total vol.	
	a Spring	1	1.0	lit/sec
				86.4 m3/day
	Total			86.4 m3/day
	2 Required reservoir volume			99 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	700	m	
	90mm diameter		m	
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
	100m3 capacity	1	nos	
4	Distribution pipe			
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter		m	
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	52	nos	
6	Water meter installation	67	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 JICA STUDY TEAM
Marz	Shirak	
No. 12	Lernut	

STUDY FOR IMPROVEMENT OF
RURAL WATER SUPPLY AND
SEWAGE SYSTEMS IN RA

Marz : **Shirak**
No. : **12**
Name : **Lernut**

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	700	m	7,160	5,012,000
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					5,012,000
3	Reservoir	50m3		nos	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					12,968,300
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		52	nos	74,000	3,848,000
6	Water Meter Installation		67	nos	80,000	5,360,000
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	28,146,000
					Equivalent to USD	92,125
					Equivalent to JPY	9,719,177
					AMD	USD
	Investment Cost per household		67	HH	420,090	1,375
	Investment Cost per person		203	persons	138,650	454

No.13 Tsaghkut

Information on Existing Water Sources (Shirak)

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

No.13 Community Tsaghkut
District Amasia
Marz Shirak

No	Water source	Latitude			Longitude			Atitude (m)	Yeild(L/sec)		
		deg	min	sec	deg	min	sec		Min	Max	At site
1	spring	41	6	16.9	43	36	1.2	2,135	0.2	2.0	0.5
2	spring	41	6	19.0	43	36	6.7	2,124			
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

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

Users Acceptnce for water quality	Not acceptable
Notes	Poor water quality due to worms in water.
Alternative sources if any	

No.13 Community Tsaghkut
District Amasia
Marz Shirak
Sampling date 18/Aug/2007

	Parameters analysed	Units	No.1	No.2	Guidelines	
					WHO	Armenia
<i>a</i>	pH		6.7	7.1	6.5-8	6.0 - 9.0
<i>b</i>	Temperature	Deg.C	9.2	9.4		
<i>c</i>	TDS	Mg/L	62	57	1000	1000
1	Al:Aluminum	Mg/L	n.d	n.d	0.10	0.50
2	B:Boron	Mg/L	n.d	n.d	0.70	0.50
3	Cl:Chloride	Mg/L	5	4	250	350
4	Cr:Chrome	Mg/L	<0.01	0.01	0.05	0.05
5	Cu:Copper	Mg/L	n.d	n.d	2	1
6	F:Fluoride	Mg/L	0.25	0.28	1.50	
7	Hardness	Mg/L	130	150	500	700
8	Fe:Iron	Mg/L	n.d	n.d	0.30	0.30
9	Mn:Manganese	Mg/L	n.d	n.d	0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d	0.100	0.070	0.250
11	Ni:Nickel	Mg/L	n.d	n.d	0.020	0.100
12	Nitrate(NO3+)	Mg/L	3.1	4.0	50.0	45.0
13	SO4:Sulfate	Mg/L	3.0	3.0	250.0	500.0
14	Zn:Zink	Mg/L	n.d	n.d	3.0	5.0
15	As:Arsenic	Mg/L	n.d	n.d	0.0	0.1
16	Ba:Barium	Mg/L	0.02	0.01	0.70	0.10
17	Be:Berillium	Mg/L	0.00008	<0.00005	NA	0.00020
18	Cd:Cadmium	Mg/L	n.d	n.d	0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001	<0.001	0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	n.d	0.00100	0.00050
21	Se:Selenium	Mg/L	n.d	n.d	0.010	0.010
22	Sr:Strontium	Mg/L	n.d	n.d	NA	7.0
23	CN:Cyanide	Mg/L	n.d	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

No. 13 Marz Shirak Community Tsaghkut**1. ACCESSIBILITY TO THE SITE**

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

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	41°06'19,0"	43°36'06,7"	2,124	1989	Concrete	0.5	Yes
2	Spring	41°06'16,9"	43°36'01,2"	2,135		Concrete		Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	5,000	100	Polyethylene	0.47	1989	no	No

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	41°05'52,7"	43°36'53,3"	2,101	Steel	Circle	3×d=1m, l=20m	48	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	5,000	100	Polyethylene	1989	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)
0				0	

9. DRAINAGE SYSTEM

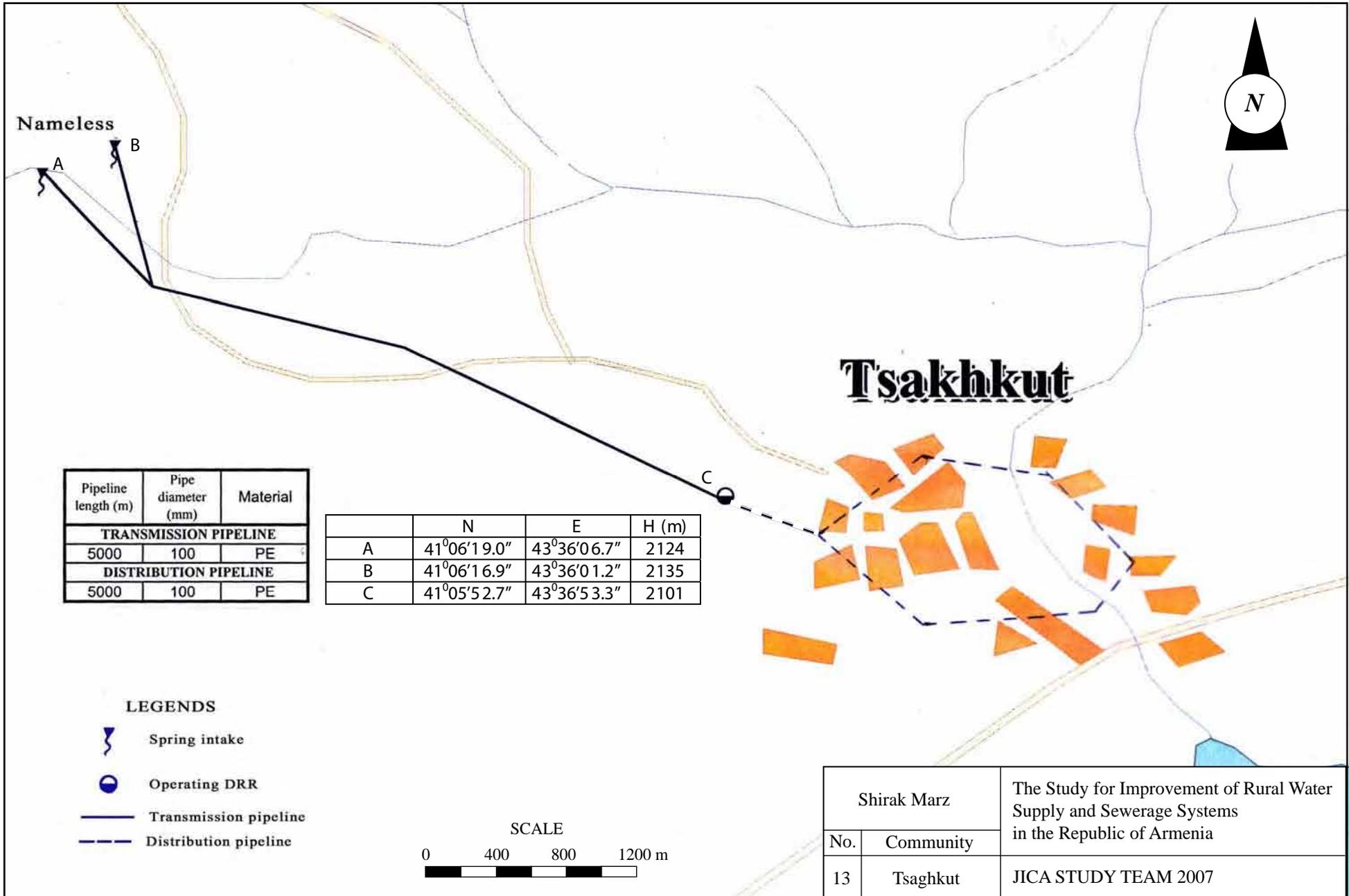
Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	Shirak
Number and Name of Community	No.13 Tsaghkut
District	Amasia

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	209
A2	Actual population in 2007	287
A3	Number of households	73
A4.1	Elderly people	10
A4.2	Population in labor force (age from 16 to 62)	237
A4.3	Children	40
A5.1	Pensioners	16
A5.2	Unemployed	0
A5.3	Receiving benefits	2
A6	Average monthly income of household (AMD)	150,000
A7	Number of medical ambulance station/first and health post	absent
A8	Number of beds in each medical ambulance station	0
A9	Number of school	1
A10	Number of pupils	40
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	5,000
	Annual Budget of the community 2005, in thousand AMD	4,700
	Annual Budget of the community 2006, in thousand AMD	3,800
	Annual Budget of the community 2007, in thousand AMD	1,700
	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	0
	Amount spent in drinking water sector 2006, in thousand AMD	0
	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	1027
D3	Date of expiry of water use permit	2006-2009
D4	Planned date of obtaining water use permit	-
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	10
D8	How many house connection household set the water meter	0
D9	Number of public taps	0
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?	fully 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 household a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	150

No.	Question	Answer
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	750
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1 Flat rate, 2 Having water tariff	flat rate
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	insufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	nobody
E2	Position	-
E3	Telephone	-
E4	Quantity and present condition of the water supply facilities: spring/ intake	2-deteriorated
E5	Quantity and present condition of the water supply facilities:	1-partially repaired
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1partially repaired
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	absent
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?	residents
E12	How do you repair the water supply facilities?	hired specialist from
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)	0
	Repair cost (AMD)	0
	Others (AMD)	0
E16	Do the residents participate in the O&M works?	earthwork, welding, manpower
E17	What kind of OM method is preferable to you?	residents 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.	yes
	Virgin forests, tropical forests	absent
F1.2	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	yes
F1.3	Habit of valuable species protected by domestic laws or international treaties	absent
F1.4	Likely salts cumulus or soil erosion areas on a massive scale	yes
F1.5	Remarkable desertification trend areas	absent
F1.6	Archaeological historical or cultural valuable areas	absent
F1.7	Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent
F1.8		



Nameless



Tsakhkut

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
5000	100	PE
DISTRIBUTION PIPELINE		
5000	100	PE

	N	E	H (m)
A	41°06'19.0"	43°36'06.7"	2124
B	41°06'16.9"	43°36'01.2"	2135
C	41°05'52.7"	43°36'53.3"	2101

LEGENDS

-  Spring intake
-  Operating DRR
-  Transmission pipeline
-  Distribution pipeline



Shirak Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
13	Tsaghkut	JICA STUDY TEAM 2007

Marz : **Shirak**
Name : **Tsaghkut**

No.13

No.	Item	Quantity	Unit	Water demand (m3/d)
A. WATER DEMAND				
	1 Population	287	persons	28.7
	2 Factory	-	nos	0.0
	3 School (pupils)	40	pupils	0.4
	4 Medical Ambulance Station	-	nos	-
	5 Polyclinic	-	nos	-
	6 Livestocks (87lit/household)	73	household	6.4
	Sub-total			35.5
	Unaccounted for water (20%)			7.1
1	Average Daily Water Demand		25.4	42.6 m3/day
2	Maximum Daily Water Demand			51.1 m3/day
3	Maximum Hourly Water Demand			11.1 m3/hr
B. WATER SUPPLY PLAN				
	1 Water source type	Nr.	Total vol.	
	a Spring	1	0.5	lit/sec
				43.2 m3/day
	Total			43.2 m3/day
	2 Required reservoir volume			133 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		m	
	110mm diameter		m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
	50m3 capacity	1	nos	
4	Distribution pipe			
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter		m	
	110mm diameter	5,000	m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	63	nos	
6	Water meter installation	73	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 JICA STUDY TEAM
Marz	Shirak	
No. 13	Tsaghkut	

STUDY FOR IMPROVEMENT OF
RURAL WATER SUPPLY AND
SEWAGE SYSTEMS IN RA

Marz : **Shirak**
No. : **13**
Name : **Tsaghkut**

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		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
3	Reservoir	50m3	1	nos	8,363,900	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					8,363,900
4	Distribution Pipe	50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	5,000	m	9,680	48,400,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					48,400,000
5	House Connection		63	nos	74,000	4,662,000
6	Water Meter Installation		73	nos	80,000	5,840,000
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	2,000	m	3,600	7,200,000
Total					AMD	75,791,300
					Equivalent to USD	248,073
					Equivalent to JPY	26,171,714
					AMD	USD
Investment Cost per household			73	HH	1,038,237	3,398
Investment Cost per person			287	persons	264,081	864

SHIRAK MARZ
Amasia District
No 13 Tsaghkut

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	13.0																																								
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		72.25	0.00	0.00	0.00	0.47	0.47	0.48	0.82	0.84	0.87	0.90	1.35	1.39	1.44	1.49	1.54	1.59	1.64	1.69	1.75	1.81	1.87	1.93	1.99	2.06	2.12	2.19	2.27	2.34	2.42	2.50	2.58	2.67	2.75	2.85	2.94	3.04	3.14	3.24	3.35	3.46
B Operating Costs																																										
1. Staff salary	person																																									
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	kg/yr																																									
Pouring volume	AMD/kg	78																																								
Unit rate		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		3.42	0.00	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.09	0.09	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					
3. Electricity (for pump)		0.00																																								
4. Maintenance cost		25.47																																								
Pump repair		0.00	0.00	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	0.71	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		
Pipe 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	0.00	0.00	0.00
Pipe repair		0.00	0	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	0.71	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		
5. Pump replacement		0.00																																								
Sub-total		46.59	0.00	0.00	0.24	0.66	0.68	0.70	0.72	0.75	0.78	0.80	0.82	0.85	0.87	0.91	0.94	0.97	1.00	1.04	1.07	1.11	1.14	1.18	1.22	1.25	1.30	1.35	1.38	1.44	1.48	1.53	1.59	1.64	1.69	1.75	1.80	1.86	1.92	1.99	2.05	2.12
C Gross Income (A-B)		25.66	0.00	0.00	-0.24	-0.19	-0.21	-0.22	0.10	0.09	0.09	0.10	0.53	0.54	0.57	0.58	0.60	0.62	0.64	0.65	0.68	0.70	0.73	0.75	0.77	0.81	0.82	0.84	0.89	0.90	0.94	0.97	0.99	1.03	1.06	1.10	1.14	1.18	1.22	1.25	1.30	1.34
D Depreciation cost		72.10																																								
E Interest paid		23.40	0.02	0.04	0.06	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.92	0.89	0.86	0.83	0.79	0.76	0.73	0.70	0.67	0.64	0.60	0.57	0.54	0.51	0.47	0.44	0.40	0.37	0.33	0.30	0.26	0.23	0.19	0.15	0.11	0.08	0.04	
F Net Income		-69.84	-0.02	-0.04	-0.30	-1.18	-1.20	-3.28	-2.96	-2.97	-2.97	-2.96	-2.53	-2.49	-2.44	-2.40	-2.35	-2.30	-2.25	-2.20	-2.14	-2.09	-2.03	-1.98	-1.93	-1.85	-1.81	-1.76	-1.68	-1.63	-1.56	-1.49	-1.44	-1.36	-1.30	-1.22	-1.15	-1.07	-0.99	-0.92	-0.84	-0.76
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		-69.84	-0.02	-0.04	-0.30	-1.18	-1.20	-3.28	-2.96	-2.97	-2.97	-2.96	-2.53	-2.49	-2.44	-2.40	-2.35	-2.30	-2.25	-2.20	-2.14	-2.09	-2.03	-1.98	-1.93	-1.85	-1.81	-1.76	-1.68	-1.63	-1.56	-1.49	-1.44	-1.36	-1.30	-1.22	-1.15	-1.07	-0.99	-0.92	-0.84	-0.76
OM Cost Recovery Ratio (A/B)		155%	0%	0%	0%	71%	69%	69%	114%	112%	112%	113%	165%	164%	166%	164%	164%	164%	164%	163%	164%	163%	164%	163%	165%	163%	162%	164%	163%	164%	163%	162%	163%	163%	163%	163%	163%	164%	163%	163%	163%	163%

PROJECTED CASH FLOW 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				
SOURCES OF FUNDS																																														
A Internal Cash Generation																																														
1. Net Income		-69.84	-0.02	-0.04	-0.30	-1.18	-1.20	-3.28	-2.96	-2.97	-2.97	-2.96	-2.53	-2.49	-2.44	-2.40	-2.35	-2.30	-2.25	-2.20	-2.14	-2.09	-2.03	-1.98	-1.93	-1.85	-1.81	-1.76	-1.68	-1.63	-1.56	-1.49	-1.44	-1.36	-1.30	-1.22	-1.15	-1.07	-0.99	-0.92	-0.84	-0.76				
2. Depreciation cost		72.10	0.00	0.00	0.00	0.00	0.00	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06			
3. Interest Paid		23.40	0.02	0.04	0.06	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.92	0.89	0.86	0.83	0.79	0.76	0.73	0.70	0.67	0.64	0.60	0.57	0.54	0.51	0.47	0.44	0.40	0.37	0.33	0.30	0.26	0.23	0.19	0.15	0.11	0.08	0.04					
Sub-total		25.66	0.00	0.00	-0.24	-0.19	-0.21	-0.22	0.10	0.09	0.09	0.10	0.53	0.54	0.57	0.58	0.60	0.62	0.64	0.65	0.68	0.70	0.73	0.75	0.77	0.81	0.82	0.84	0.89	0.90	0.94	0.97	0.99	1.03	1.06	1.10	1.14	1.18	1.22	1.25	1.30	1.34				
B Finances																																														
1. Project Loan		100.30	2.36	1.67	2.24	92.42	0.97	0.36	0.28																																					
2. Local fund		34.05	0.79	0.56	0.74	31.72	0.17	0.04	0.03																																					
Sub-total		134.35	3.15	2.23	2.98	124.14	1.14	0.40	0.31																																					
C Subsidy from Government																																														
1. Subsidy for O&M cost		0.86	0.00	0.00	0.24	0.19	0.21	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		97.14	0.02	0.04	0.06	0.99	0.99	1.00	0.90	0.91	0.91	0.90	3.35	3.34	3.32	3.31	3.29	3.27	3.25	3.23	3.20	3.18	3.15	3.14	3.12	3.07	3.06	3.05	3.00	2.98	2.95	2.91	2.90	2.85	2.83	2.78	2.75	2.71	2.66	2.63	2.59	2.55				
Sub-total		98.00	0.02	0.04	0.30	1.18	1.20	1.22	0.90	0.91	0.91	0.90	3.35	3.34	3.32	3.31	3.29	3.27	3.25	3.23	3.20	3.18	3.15	3.14	3.12	3.07	3.06	3.05	3.00	2.98	2.95	2.91	2.90	2.85	2.83	2.78	2.75	2.71	2.66	2.63	2.59	2.55				
Total Cash Inflow		258.01	3.17	2.27	3.04	125.13	2.13	1.40	1.31	1.00	1.00	1.00	3.88	3.88	3.89	3.89	3.89	3.89	3.88	3.88	3.88	3.88	3.89	3.89	3.88	3.88	3.89	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88			
APPLICATION OF FUNDS																																														
D Project disbursement		134.35	3.15	2.23	2.98	124.14	1.14	0.40	0.31																																					
E Total debt services																																														
1. Loan repayment		100.26																																												
2. Interest paid		23.40	0.02	0.04	0.06	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.92	0.89	0.86	0.83	0.79	0.76	0.73	0.70	0.67	0.64	0.60	0.57	0.54	0.51	0.47	0.44	0.40	0.37	0.33	0.30	0.26	0.23	0.19	0.15	0.11	0.08	0.04					
Sub-total		123.66	0.02	0.04	0.06	0.99	0.99	1.00	1.00	1.00	1.00	1.00	3.88	3.88	3.89	3.89	3.89	3.89	3.88	3.88	3.88	3.88	3.89	3.89	3.88	3.88	3.89	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88	3.89	3.88			
Total Cash Outflow		258.01	3																																											

