

Initial Environmental Examination

Semestral Report
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ARM: Water Supply and Sanitation Sector Project – Settlements of Megri Region

Prepared by Armenian Water and Sewerage Company for the Republic of Armenia and the Asian Development Bank.

**ASIAN DEVELOPMENT BANK FUNDED
WATER SUPPLY AND SANITATION SECTOR PROJECT**

**WATER SUPPLY AND SANITATION SYSTEM IMPROVEMENT
IN THE SETTLEMENTS OF THE REPUBLIC OF ARMENIA**

INITIAL ENVIRONMENTAL EXAMINATION

Subproject SETTLEMENTS OF MEGRI REGION



1.1 Scope of work

The purpose of this sub-project is improvement of drinking water supply to Agarak town and Karchevan village in Meghri region of the RA Syunig marz.

For this purpose, the following is planned to be implemented:

For town Agarak and village Karchevan water supply systems improvement the following activities are planned to be implemented at the above mentioned sites:

For Agarak water treatment plant it is planned:

- To completely repair 2 Agarak WTP building,
- To repair technological pipe-lines, and to reconstruct perforated pipes that feed the clarification chambers and eliminate the waste,
- To change all valve nodes,
- To construct reagent chamber,
- To repair turbulent junctions,
- To install total L=90.0 m long PE pipe-lines,
- To install total L=199.0 m long steel pipe-lines,
- To construct wastewater and chlorination water reserve chambers,
- To repair filter cleaning pump station building cover and roof,
- To reconstruct covers of the 2x200m³ round DRRs.
- To install general power electricity supply network to WTP building, as well as heating constructions.

The DD also plans the deconstruction of the 1/3 part of WTP building that will not be repaired.

For WTP – Agarak water main and the DRRs it is planned in the DD:

- To connect the newly constructed about 2.5km long section to the water main that will bypass Agarak Steel-molybdenum plant: The new water main passes through village Karchevan, routing Agarak-Karchevan highway,
- To construct pressure reducing valve node and outflow chamber on the water main,
- To repair the existing 2x200m³ capacity DRRs,
- To change all inlet and outlet technological pipes at DRRs territory,
- To construct valve nodes and water elimination chamber,
- To construct valve nodes on the way to DRR and within the network,
- To fence DRRs territory,
- To construct L=160 m long pipe-line from DRRs to the network.

For village Karchevan distribution network it is planned:

- To completely construct village Karchevan distribution network, providing individual inlet lines for all individual households,
- To implement zoning within the distribution network (two main zones) to avoid unallowable high pressures.

1.2 Description of the present water supply systems of Agarak town and Karchevan village

For town Agarak rivers Vahravar and Ayri, as well as Agarak deep wells serve as water sources.

Water from the rivers is supplied to Agarak WTP gravity system through 2 water intake structures (with total flow of 70L/sec). The WTP is located at 1285.0-1290.0m absolute altitude north-west from the town.

Inside the WTP building also water disinfecting is done through ALLDOS chlorination equipment installed recently.

From the WTP water is collected in $W=2 \times 200 \text{m}^3$ DRRs in the WTP area, from there is supplied to Agarak and Karchevan through separate systems.

Through Agarak town water supply network the water, bypassing the $2 \times 200 \text{m}^3$ DRRs (which are not operational for more than 30 years and are not useful for further operation) is given to the distribution network.

Water distribution network of the town is mainly implemented from 50÷200mm, L=9.1km long steel, cast iron and polyethylene pipes.

During recent years almost the entire distribution network of the private sector was replaced by PE pipes, which is 3.6km long.

The sector of multi-apartment buildings of the town is served from deep wells by two-step pumping. Deep wells are located 0.6km south-east from town Agarak, at 600.0-605.0m altitudes. The actual flow of each of the deep wells is 45L/sec, depth – 45m, water level - 20m. Through N=45kV I step pumps water from the deep wells is supplied to the DRR in the area, from where through N=160kV II step pumps – to town Agarak.

Water chlorination here is implemented without dosing, by directly mixing the chlorine solution with the water in the DRR.

The 5.5km long network of multi-apartment buildings has been launched in the 1970-80s and is in fully deteriorated condition, not useful for further operation and is subject to complete replacement.

Agarak town wastewater network also needs repair. There are frequent cloggings here, the main reason for them being water insufficiency and some minor defects.

The 1.5km long $d=400 \text{mm}$ sewerage collector of the town, which was launched in 1965, needs full reconstruction, and the $10\,000 \text{m}^3$ capacity wastewater treatment plant of the town has not been operating already 20 years and is not subject to further operation.

Village water is supplied through Agarak's WTP-Karchevan $\varnothing 150 \text{mm}$ L=3.5km long water main. There is not water distribution network in the village, only through the central street about 600m long $\varnothing 100 \text{mm}$ water line is passing, which is completely in emergency situation. There are several public taps on the water line.

The residents have pipelines constructed by their own strength from the nearby public tap to their houses (mainly over ground), and are supplied from those sources according to internally agreed schedule.

The village has not a sewerage system. All private houses have pit toilets.

The leakage level in both residential areas is significant. Water consumption metering is not carried out properly in the system.

1.3 The geographical location and climate of the residential areas

Agarak town and Karchevan village are located in southern part of Syunik marz, at 380.0km distance from Yerevan. The region has dry, continental climate. Absolute maximum air temperature is 41°C. Absolute minimum air temperature is -18°C.

Annual precipitation is 283mm, eastern and western winds with 1.6m/sec velocity are predominant. Once in 20 years winds with 28m/sec velocity are possible. Snow cover thickness reaches 27cm, pressure – 50kg-f/m².

Maximum soil frost depth is 20cm.

From landscape point of view the area is located in mid-mountainous and foot parts of Zangezur ridge south-eastern ranges. From the relief origination point of view the area is ranked to the type of mountains composed of volcanogenic-fragmental and land carbonate rocks and is a high mountainous region with indented relief.

According to the initial data the total number of population as of 01/01/09 was 6303. According to the data of “Demographic catalogue of Armenia, 2007” the annual growth rate of the population is 0.8% (see Table 2-3).

The residential areas are located at 555-970m altitudes.

1.4 Biodiversity and sensitive nature areas

From geomorphologic point of view it is located on large V-shaped fragmental slopes and hills of the narrow gorge of river Karchevan.

In the geological structure of the area the groups of intrusive rocks of Middle Eocene Oligocene age take part: granodiorite monzonite quartz diorites, syenites, nepheline and alkaline syenites, which are covered by layers of Quaternary age alluvial, eluvial, deluvial-proluvial, deluvial formations - clay, sand, fragmental soils. Thickness of fragmental formations varies in a range of 0.5÷3.0m.

From hydro-geological point of view the area is included in the region of fracture waters of various eruptive rocks.

From hydro-geological point of view the area is scarce of water. Underground waters are related to both bedrocks and alluvial rocks, belong to fractural cavity, porous-cavity, partially terrain water types.

From seismotectonic point of view the area is located within the folded zone of Armenia. According to the tectonic map of Armenia, a tectonic deep fault passes north to south direction along Karchevan river bed. The area is considered one of the most seism active zones of Armenian upland.

Among dangerous physical-geological processes are extensive surface washing by surface waters, erosion intrusive weathering and destruction .

Syuniq marz Agarak region is characterized with brown carbonate stepped earth, there are also valley-terrace pebble lands here.

The landscape is extensively of low-lying mountainous type, there are also semi-desert and plain parts. Xerophil plant species are predominant - Amygdalus fezlina, Cerasus incana, Juniperus polycarpus, Paliurus spina-christi.

Among animals European buck, brock, wild boar are spread.

Agarak area is located within Meghri floristic region. Among endangered species registered in the Red Book of Armenia are Diosparios lotus, Calutea komarovii.

In the sub-project implementation area there are not specially protected zones. The covered communities do not have also sites of cultural, archaeological or historical importance. These data were obtained as a result of interviews with the village administration heads. The information was gathered on the basis of the following survey form.

B1. Are any of the following areas located inside or around the village or project site?

		Yes	No	Not identified
B1.1	National park, protected area designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or protected areas	1	2	3
B1.2	Virgin forests, tropical forests	1	2	3
B1.3	Ecological important habitat areas (coral reef, mangrove wetland, tidal flats)	1	2	3
B 1.4	Habitat of valuable species protected by domestic laws or international treaties	1	2	3
B 1.5	Likely salts cumulus or soil erosion areas on a massive scale	1	2	3
B 1.6	Remarkable desertification trend areas	1	2	3
B 1.7	Archaeological, historical or cultural valuable areas	1	2	3
B 1.8	Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	1	2	3

1.5 Environmental Impact

The Initial environmental examination (IEE) identified that negative impact on landscapes, flora and fauna of the residential areas where improvement of water supply systems will be done is not expected.

The detailed environmental examination is planned to be implemented in the course of the detailed design when all the construction or reconstruction sites will be approved.

Based on the detailed environmental examination, the sub component will be estimated by category and if needed, environmental management plan, as well as monitoring plan will be prepared.