

Environmental Management Plan

Loan 2860 (SF)
September 2014

ARM: Water Supply and Sanitation Sector Project - Additional Financing

Improvement of Water Supply Systems in Talin Town in
Aragatsotn Region

Prepared by the State Committee of Water System under the RA Ministry for Territorial
Governance for the Asian Development Bank.

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ASIAN DEVELOPMENT BANK FUNDED

**WATER SUPPLY AND SANITATION SECTOR
PROJECT - ADDITIONAL FINANCING**

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Subproject X

**IMPROVEMENT OF THE WATER
SUPPLY SYSTEMS OF ARAGATSOTN
REGION**

L2860-ICB-1-10/1

TALIN TOWN

ENVIRONMENTAL MANAGEMENT PLAN



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PROJECT - ADDITIONAL FINANCING**

Subproject X **IMPROVEMENT OF THE WATER
SUPPLY SYSTEMS OF ARAGATSOTN
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L2860-ICB-1-10/1 **TALIN TOWN**

Book X.1.3 **ENVIRONMENTAL
MANAGEMENT PLAN**

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Subproject X

**IMPROVEMENT OF THE WATER
SUPPLY SYSTEMS OF ARAGATSOTN
REGION**

L2860-ICB-1-10/1

TALIN TOWN

COVER OF THE DETAILED DESIGN

- | | |
|-------------------|--------------------------------------------------|
| Book X.1.1 | - General provisions and explanatory part |
| Book X.1.2 | - Technical specifications |
| Book X.1.3 | - Environmental management plan |
| Book X.1.4 | - Working drawings |
| Book X.1.5 | - Bill of quantities |
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LIST OF ABBREVIATIONS

DD	Detailed Design
EMP	Environmental Management Plan
SS EMP	Site Specific EMP
RA	Republic of Armenia
RA MoNP	RA Ministry of Nature Protection
RA MoH	RA Ministry of Health
RA MoTC	RA Ministry of Transport and Communication
RA MoC	RA Ministry of Culture
JV	Joint Venture
AWS ADB PMU	Armenian Water and Sewage Company/Project Management Unit of Asian Development Bank
EIA	Environmental Impact Assessment
WSSP	Water Supply & Sanitation Sector Project
WTP	Water Treatment Plant
MPE	Maximum Permissible Emissions
LSGB	Local Self-Government Bodies
TSC	Technical Supervision Company
DRR	Daily Regulation Reservoir

1. BACKGROUND OF THE PROJECT

Project implementation for the improvement of WSS systems will improve public health and environment for about 400,000 people (households and other consumers) living in 18 towns and up to 92 villages through providing safe, reliable and sustainable water supply. The outcome of the Project is improved access to safe, reliable, and sustainable WSS services managed on commercial principles and environmentally sound practices.

The Project will also support poverty reduction by (i) reducing the incidences of waterborne diseases and costs of medical care; (ii) improving the time poverty of women due to labor intensive housework such as water collection, which may allow them to participate more in social and economic activities; (iii) providing safer and more reliable water supply; and (iv) improving the quality of life of households in all the project towns and villages by improving their access to safe and sustainable drinking water.

Similar to the original WSSP, the Additional Financing Project will fund two project components which include: (i) municipal infrastructure rehabilitation and improvement; and (ii) management improvement and development which include gender features.

2. ENVIRONMENTAL AND SOCIAL SAFEGUARD DOCUMENTS

In accordance with the ADB Environmental policy (November, 2002) the Subproject is ranked to B category which does not need extended EIA, excluding also Environmental expertise, according to the RA law on “Environmental Impact Assessment” (issued on November 20, 1995) and the RA Government decree “Threshold of environmental impact activities subject to expertise” (N-193, 30 March 1999).

As a B Category Project ADB Policy required development of Initial Environmental Examination/ IEE reports for each Subproject (1 report) and site specific Environmental Management Plan/EMP (separately report for each lot of the subproject).

3. INTRODUCTION

This report is developed for Aragatsotn Subproject on the Improvement of WSS Systems in Talin town of Aragatsotn region, the design of which has been performed by the JV agreement of HGSN and JINJ LLCs. The rehabilitation of Water supply systems involves reconstruction of existing DRRs, water distribution systems, construction and reconstruction of new pipelines, valve nodes and water metering chambers of individual houses and apartment buildings.

As a result of the construction work implementation, as well as further operation and maintenance of the water supply systems there might be undesirable negative impacts on the environment.

It is expected that the impacts during construction work implementation will be the least and temporary, probably involving vegetation cut, soil erosion, air and water resource pollution by lubricants, household and construction waste.

At the Operation Stage the environmental impact, the main reason of which might be improper execution of operation requirements, will decrease.

The improvement activities will be considered environmentally friendly in case of water resource conservation, as well as rational and steady use.

The social and economic effects as a result of water supply system improvement are expected to be long-term, mostly positive, such as excluding potable and wastewater mixture, minimization of water pollution risk, prevention and exclusion of infection disease agents penetration into potable water, as well as water supply extension, providing steady water supply and rational water use.

Below the description of possible impacts and facilitating measures required during different stages of Water supply systems improvement project is provided.

➤ **Design stage**

The design works on water systems have been performed by the JV of HGSN and JINJ Ltd., which has been selected as a Consultant who provides services on civil works and public awareness campaign within the framework of “Water Supply and Sanitation Sector Project - Additional Financing”. The EMP includes articles on climatic conditions, relief, natural soil types, hydrology and biodiversity of the very package, requirements on obtaining the RA MoNP and other Ministries’ agreements, as well as fulfillment of executive parties’ contractual commitments during all stages. The Design documentation includes adequate environmental and social articles, as well as EMP and SSEMP. The Project Consultant is in charge to follow the appropriate statements of the RA Environmental and social legislation, as well as ADB instructions and strategy requirements.

➤ **Construction stage**

The list of measures required to mitigate the environmental impact during construction stage is provided in the EMP matrix ([Appendix1](#)).

➤ **Operation stage**

During the operational stage it should be performed in accordance with operational rules and standards of the water supply to decrease the environmental impact.

During the construction stage the operation should be performed in accordance with the Operational rules and standards.

4. SCOPE OF WORKS

4.1 Description of existing water supply systems

The AWS CJSC serves the town of Talin. The water supply of the town is carried out from Karmrashen and Kentaghbyur catchments by gravity systems.

Karmrashen springs, the overall discharge of which is 10l/sec, are in the north-eastern part of the same village approximately at a distance of 13km from Talin town. The water is transmitted from here to the DRRs of Talin town through a cast iron pipeline with a diameter of 150mm. To the south of Karmrashen springs at a distance of 3km there is the sanitary zone of Karmrashen with its two catchments, the overall discharge of which is 20l/sec.

The water volume transmitted from the water springs is disinfected in the chlorination station situated in the area of the DRRs of Talin town.

The water distribution system of Talin town supplies water through 4 DRRs ($2 \times 1000 \text{ m}^3$ and $2 \times 250 \text{ m}^3$) with an overall capacity of 2500 m^3 . The DRRs feed nearly all the neighborhoods of the town, except for Miroyan neighborhood fed directly from the water main (drinking water, used by a few households of this neighborhood, is not disinfected). All the DRRs feeding the town are located in the same fenced area of the sanitary zone. The sanitary zone is taken care of, it is green and attended.

Waterline coming out of DRRs joint at the distributive node constructed near the fence. From here the water is given to the distribution network and distributed through the waterlines to different neighborhoods.

Water distribution network of the town of Talin was constructed in 1960s with cast iron and steel pipes. The total length of the distribution network is approximately 17km and it is completely in an emergency condition. Water is supplied by schedule because of leakages. Water distribution network is not zoned.

Approximately 4.5km polyethylene waterlines were constructed and 207 water metering chambers were laid in Talin town by previous ADB project. But it has not solved water supply issues of the community and currently there is need for improvement.

4.2 Description of the proposed rehabilitation works

The following measures have been proposed in the detailed design of Talin town for the water supply system improvement:

- Repair of DRRs with capacities of $2 \times 1000 \text{ m}^3$ and $2 \times 250 \text{ m}^3$,
- Repair of chlorination station,
- Reconstruction and construction of pipes with a total length of $L=19065,0 \text{ m}$ and diameters of $\text{de}50\text{-de}160$ with polyethylene pipes.
- Replacement of entry lines of 45 apartment and public buildings.
- Replacement of the entry lines of 569 private houses, installing water metering chambers.

- Construction and reconstruction of water supply (7) and fire hydrant chambers (5), buried valve junctions (58).
- all of the households in Talin town will get disinfected potable water

Works to be carried out within the framework of this package are summed up in Table 1.

Brief description of the works

Table 1

Works	M/U	t. Talin	Total
Repair of DRRs	m ³	2500	2500
Repair of chlorination station	piece	1	1
Reconstruction of water supply internal network with pipes of de50-de160 diameters, testing, washing, disinfecting	lm	19065	19065
Construction of the entry lines of private houses, installing water metering chambers	piece	569	569
Replacement of the entry lines of apartment and public buildings	piece	45	45
Construction, reconstruction of the water supply and hydrant chambers	piece	12	12
Construction of buried valve junctions	piece	58	58

After laying waterlines through the asphalted and improved streets, according to the DD, the cover of the trenches to be rehabilitated is to be of the same quality (view General Provisions Book X.1.1).

In all the trenches, where backfill on the sand protection layer is carried out with sand, a sign polyethylene tape is to be laid along the whole length of the trench at a height of 30.0cm from the top of the pipe.

5. BASELINE ENVIRONMENTAL CONDITIONS

5.1 Geographic location and climate of Talin town

The observed community of Aragatsotn Region is situated on the southern slopes of Aragats massive in the vicinity of Arten Mountain. It is at an altitude of 1585m. The distance of Talin town from capital Yerevan is about 70km and from Ashtarak town, the centre of the region, is 48km to the north-west.

The town of Talin is characterized by temperate continental climate. Winters are cold, and with a stable snow cover. Summers are hot. The average air temperature varies from +23 up to +25°C in July. Maximum temperature may reach +34°C. The average air

temperature in January varies from -14 up to -25°C. The annual quantity of atmospheric precipitations is 400-450 mm. The prevailing direction of winds is mainly northern and north-eastern.

Natural landscapes are dry steppes. Volcanic-erosion land forms and severely dissected surface are typical to the relief.

The possible earthquake intensity is on 8-9 scale, and the maximum horizontal acceleration is 0,4g .

5.2 Biodiversity

Flora: In the dry steppe and steppe landscape zones typical to the region of Talin there is brown and mountainous black earth. Plant species of mountainous steppe are presented by feather grass (*Stipa*), fescue grass (*Festuca*) and brome grass (*Bromus*) formations. *Tragacanth* is widespread, and among the steppe bushes the following types prevail: meadowsweet (*Spiraea*), nodding onion (*Spiraea*, *A.rupestre*) and prickly thrift (*Acantholimon*).

In higher mountainous parts there are alpine and subalpine lawns. Types of motley grass lawn-steppes may exist on slopes with different gradients and be represented by the types of medick (*Medicago* L.) and clover (*Trifolium* L.) species.

There is no forest cover in the region. In the vegetative area adjacent to the road there are: poplar (*Populus*), acacia (*Robinia*), maple (*Acer*), mulberry (*Morus*), wild apricot (*Armeniaca*), regular and narrow leafed ash (*Fraxinus excelsior*, *F.oxycarpa*), oleaster (*Elaeagnus*), willow (*Salix*), brier (*Rosa*).

Among the types registered in the Red Book of RA plants in the surroundings of Talin town there is only *Merendera greuteri* Gabrielian –CR.

Fauna: In the described territory among mammals there are rabbits (*Lepus europaeus*), foxes (*Vulpes vulpes*), wolves (*Canis lupus*) and some rodents. Among amphibians and reptiles there are several types of toads, frogs, lizards and snakes, among the invertebrates there are types of grasshoppers (*Oedopoda coerulescens*, *Oe. Miniata*, *Pholidoptera*), crickets (*Phytodrymadusa armeniaca*), dipteran (*Tomomyza araxana*, *Bombilus schelkovnikovi*).

Among the bird types perching birds (*Passeriformes*) and birds of prey (*Falconiformes*) are widely common.

In subproject area there are no environmentally vulnerable or specially protected areas.

Works within the subproject will be carried out in only in the area of the settlement and cover rehabilitation of already the existing structures, Therefore they will have minimum temporary impact on the natural landscape.

Historic-cultural monuments. St. Katoghike church complex (IV-XX centuries) and St. Astvatsatsin church (VI century) are situated in the north of the administrative area of Talin town, as well as “Mets Talin” tomb valley (B.C. 4-3th millenium), situated at a distance of 1.5-2km from the town to the east.

All the rehabilitated DRRs are situated in the same sanitary zone enclosed by a fence. Although they are all situated in the inhabited area of the town, they are quite far from the abovementioned church complexes. The neareast inhabited house is located at a minimum distance of 500m from the DRRs. The nearest construction site is located at a minimum distance of 150m from the churches.

6. ENVIRONMENTAL AND SOCIAL IMPACTS

As a result of the implemented works aimed at the improvement of W&W systems the expected positive environmental and population health effects are as follows:

- water resource protection and sustainable use,
- excluding mixing of drinking, irrigation and sewerage water,
- preventing, excluding penetration of infectious disease viruses into drinking water,
- reduction of drinking water pollution hazard,
- providing high drinking water quality,
- improvement of health condition of population,
- water loss reduction,
- increasing duration of water supply to population,
- introduction of water metering system,
- increasing water consumption efficiency.

IEE revealed that the implementation of works foreseen by this package aimed at W&W systems improvement may have some negative influence on the landscape, environment and population of the settlements, which, however, will be temporary.

The latter might be mainly caused by construction work implementation, and expected to do little damage and be temporal. They can be prevented or mitigated as a result of best construction practice.

Based on the initial assessment, the following adverse impacts can be expected:

- air pollution
- noise
- traffic and pedestrian roads congestion
- soil erosion and soil eroding processes
- environment and water resources pollution by construction and household waste
- soil and water resources pollution by fuels and lubricants,
- soil and water resources pollution by chlorine.

However, these adverse impacts will be temporary, meanwhile the implementation of the works in this package will have a significant positive social effect directly improving the population life quality in Talin town, providing sustainable and reliable water supply and water resource rational use for more than 6,5 thousand people.

7. ENVIRONMENTAL IMPACT MITIGATION MEASURES

Adverse impacts on the environment and human health while implementing construction works for the improvement of water supply system in Talin town are possible during: (i) trenching for waterlines, (ii) construction of pits for regulator and water metering junctions (iii) repair of DRRs and chlorination station.

To prevent soil erosion processes in the inclined sites of waterlines, measures will be carried out for retaining the inclinations, minimizing the time period when the trenches of waterlines and pits for water metering junctions are left open.

At sites near the river and its tributary beds, the inclinations should be retained to prevent soil erosion.

- Remove the construction waste and bring the construction site to its former shape after the completion of the construction works;
- recover the asphalt* - concrete pavement, providing its previous good condition and quality;
- provide graveling with compaction on the streets with damaged and half-destroyed asphalt-concrete pavement, as well as on earth roads.

***Note:** The asphalt will be bought from specialized asphalt plant which is responsible for taking environmental impact mitigation measures. All asphalt plants function in accordance with RA Environmental legislation.

To prevent the topsoil layer damage, or landscape degradation, the topsoil should be stored on the assigned site, thereafter used for the areas restoration. The construction site should be cleaned from the household and construction waste providing the previous state of landscape.

To exclude land and water resources pollution with fuels and lubricants, the latter must be stored on a sealed surface, away from water resources, plan use of special tanks for their collection, which will then be removed to special sites envisaged for re-treatment.

To prevent environmental pollution with construction and household waste, remove construction waste to corresponding landfill of the community, having in advance a contract agreement with the community heads or landfill operators.

After the completion of each construction phase the Contractor shall organize disposal of construction waste to the sites allotted for the purpose of waste accumulation, according to the established order.

To exclude land and water resources pollution with chlorine, washing and disinfection of the water supply distribution network with chlorine will be organized in accordance with the calculations. Provide appropriate technical means; implement chlorine discharge to surface water body or land area after washing the pipes, according to the regime planned under the design.

Water quality change - Environmental monitoring plan must include also control over water quality and residual chlorine level.

To reduce dust during the construction works, the construction site and roads are to be regularly watered and kept in humid condition to exclude dust during wind and operating of machines.

To prevent air pollution, closed trucks are to be used during transportation of dusty construction material, In case it is impossible to avoid dust during the works, the workers shall be provided with protective masks.

To prevent noise, night work in residential areas is to be limited, and usage of machines/equipment with extra noise is to be avoided; installation of silencers if needed.

The construction equipment condition is to be checked on a regular basis and the noise will not be allowed to exceed the allowable standard. The workers dealing with noisy equipment shall be provided with protective devices (headphones).

To reduce disturbance to population because of overloaded roads, trucks will be provided with safe area. Waste on the construction site must not be accumulated and burnt, construction should be implemented in stages, adequate notice of construction activities must be given to the population, and the traffic flow should be regulated if required. Road signs, as well as temporary passes and bridges will be placed as alternative walk way, bypasses and barricades will be organized. Adequate lighting will be provided in the areas where passers-by or entry by public is likely. Provide access to the St. Astvatsatsin church by installing special bypasses, temporary passes and bridges.

To prevent hazards to workers and the population during the construction, the following must be implemented: fencing of the construction site control access of unauthorized people to the site; placing warning signs in dangerous places, regular examination of equipment by highly qualified staff, as well as carrying out regular safety audits; provision of first aid and safety training to construction staff.

Provide community participation in subproject design, which will minimize disruption to community social activities.

Drinking water quality change. Environmental monitoring plan must include also control over water quality and residual chlorine level. Hygiene and sanitation safety of drinking

water. Pipes should be capped during all period of time - starting from the purchase until the final installation.

To provide drinking water quality in Talin town, AWS will planned sampling of water from the water springs feeding the community, checking all the parameters required by the Ministry of Health. Water quality monitoring is carried out also by Public Health State Inspectorate under the Ministry of Healthcare, according to "Drinking Water. Requirements to the Centralized Water Supply System's Water Quality"; Quality Control № 2-III-A'2-1 sanitary rules and norms" (registered on 28.12.2002), document, which establishes the requirements to the drinking water quality, as well as the rules for quality control of water produced and supplied to residential area through water supply systems.

Since disinfecting is done by chlorine, also residual chlorine level monitoring must be done.

For mitigation or prevention of the above mentioned adverse impacts, mitigating measures are planned and environmental management plan EMP ([Appendix 1](#)), as well as site specific environmental management plan EMP ([Appendix 2](#)) were developed, which shall be followed by the contractor, controlling and supervising units.

The EMP is an environmental assessment document and is included in the detailed designs.

8. INSTITUTIONAL FRAMEWORK OF ENVIRONMENTAL MANAGEMENT

The organizational obligations for the proposed mitigating measures are distributed among the following agencies:

➤ ***Executive agencies, which are responsible for implementation of the measure.***

1. For this special task the executive agency (HGSN LLC and JINJ Ltd. joint venture) must provide in the design stage obtaining of all the required agreements and permits from corresponding state and local authorities, before tendering the construction works;
 - Conclusion of environmental expert examination (if needed),
 - Agreement of the State Agency for Protection of Historical and Cultural Monuments, if impact is envisaged by the design.
2. The executive agencies in the construction stage (construction contractors) will be responsible for physical implementation of mitigating measures planned under the EMP, as well as for obtaining of all permits and agreements required during the construction implementation. Those are:
 - Agreements from the local self-governing authorities for the sites allotted for transportation of wastes and construction garbage,

- Agreement of the State Agency for Protection of Historical and Cultural Monuments, if unexpectedly historical and cultural or archaeological monuments are discovered during the construction implementation.
- 3. Before commencement of the construction, the following permits and certificates must be obtained from ADB/PMU, if needed:
 - Cadastre certificate on the land allotment;
 - Water use permit, if needed.

➤ **Controlling agencies, which are responsible for controlling the executive units to provide implementation of the EMP measures by the latter**

1. AWS CJSC/ADB PMU environmental specialists will be responsible for in time, due and reliable implementation of the works and measures in the order under the EMP and SSEMP. The mentioned specialists will regularly visit the construction sites to provide due implementation of the measures aimed at mitigation of work impact. During the visits the possible gaps will be identified and the infringements in implementation of mitigating measures will be discovered, in accordance with the field visits checklist ([Appendix 3](#)).

The AWS CJSC/ADB PMU has the right also to require and check whether all permits are available and valid, all the measures and monitoring part under the EMP are implemented during the construction, in accordance with ADB guidelines and the RA environmental and social legislation.

2. HGSN LLC and JINJ LLC joint venture will also implement control of implementation of mitigating measures, during the construction. The environmental specialist shall make visits to control the EMP and SSEMP implementation and assess the situation according to the Emissions/Ambient Inspection Monitoring Form ([Appendix 6](#)).

➤ **State monitoring agencies, which are responsible for observing the extent and efficiency of EMP implementation and making corrections in the project, if needed.** The state monitoring agencies are as follows:

- State Environmental Inspectorate under the Ministry of Nature Protection, RA
- Public Health State Inspectorate under the Ministry of Healthcare, RA
- The State Agency for Protection of Historical and Cultural Monuments, RA, if necessary,
- The RA local self-governance bodies,
- The RA Ministry of Transport and Communication.

The amounts envisaged for implementation of environmental measures included in the EMP and SSEMP are included in the detailed design.

Implementation of mitigating measures for environmental impacts will be controlled regularly through visits to the construction sites. With the help of the specially developed check list the gaps and drawbacks will be discovered.

In case of not implementing or infringing the implementation of the mitigating measures, after warning, the next payment will be terminated until the infringement is completely eliminated.

9. ENVIRONMENTAL CONSULTATIONS

During the meetings organized within the framework of public awareness campaigns, the environmental and social impacts of the planned works were represented to the beneficiary and affected community of Talin town. To provide the presence of all beneficiaries, preliminary agreements were gained with the community head (Mayor), company staff, Environmental Information Center Orhus, environmental NGOs and other stakeholders.

The meeting in Talin town took place in the municipality in 05.06.2014. It was attended by the mayor, employees of the municipality, AWS, medical ambulatory, school and kindergaten, housewives, elderly people (35 people in total).

The involvement and active participation of women is ensured. There were participants from the more vulnerable groups, women and elderly people, for whom the improvement of the water supply systems is of vital importance.

During the meetings the works planned under the detailed design in each community were presented, after which the environmental specialist presented the possible adverse environmental impacts described in the environmental management plan for each design.

The latter is the description of the negative impacts on the environment, human health and safety of construction workers, which are possible during the subproject implementation, in the design, construction and operation stages. The list of the measures mitigating or preventing these possible negative impacts was also presented.

The community's residents were mainly concerned with the following possible problems arising during the construction works:

- infringement of traffic and pedestrians normal regime because of presence of open trenches for a long time, as well as improper rehabilitation of roads after the construction;
- hazardous situation for children and elderly people because of absence of warning signs and not limiting the construction site with tapes;
- pollution of the settlement with construction and household waste during the construction, as well as construction garbage not removed after the construction;
- termination of water supply for a long time (sometimes 1-2 days) during the construction;
- Improper washing and disinfecting of new pipes, resulting in unclean water in flats for a long time.

After representing the EMP, the environmental specialist asked the two communities' residents to get acquainted in detail with the environmental management plan and during the construction follow implementation of the measures included in the plan.

The environmental management plan was copied and distributed among the participants of the meeting, as well as in municipality.

Contact data of residential areas are:

➤ Talin town

Mayor: Sargis Aramyan

Tel. (+374 249) 2 25 46

E-mail: talin.aragatsotn@mta.gov.am

Environmental consultation



Talin town

10. GRIEVANCE MECHANISM FOR AFFECTED PUBLIC

A grievance mechanism for external stakeholders and affected public is a process focused mainly on receiving, evaluating, and addressing project-related grievances from affected communities at the level of the WSSSP. The grievance mechanism differs from other forms of dispute resolution (e.g. courts, administrative systems, etc.) in that it offers the advantage of a locally based, simplified, and mutually beneficial way to settle issues within the framework of the relationship between the WSSSP and the community.

Properly designed and implemented grievance management processes can benefit both the WSSSP and communities by increasing the likelihood of resolving minor disputes quickly, inexpensively, and fairly with solutions that reasonably satisfy both sides without taking the grievances to other (formal) dispute resolution body. Grievance mechanisms can help to identify and resolve issues before they are elevated to formal dispute resolution methods, including the courts. For a grievance mechanism to function effectively, it is important to define the grievance processing structure and to assign

responsibilities for the mechanism's implementation and make them clear for the stakeholders.

Contact details for questions, complains and recommendations from the external stakeholders of the WSSSP are as follows:

Hot line: 1 71 - AWSC Customers Support Calling Center,
Investment Program Coordination Department
Mrs. Lilit Hovhannisyan - Environmental and Social Impact Specialist

Address 8a Vardanants blind alley, Yerevan 0010, Armenia
Phone / Fax (+374 10) 542877
E mail: hovhannisyan@armwater.am

AWS CJSC will register all the complaints. The Complaints Log form is provided in [Appendix 4](#).

The focus of the grievance mechanism on the needs of affected communities is substantiated by the fact that they are directly, and in some cases significantly, affected during the project implementation but often lack viable options or capacity for raising their concerns through formal structures such as the courts. This is especially true for disadvantaged groups within communities. The WSSSP should periodically review the adequacy of the grievance process, with the participation of communities, and agree on modifications. The contact details will be provided in construction information posters and information leaflets distributed in the project affected communities during the public consultations. Questions and comments expressed during the public meetings will be recorded and addressed during the design and implementation of the WSSSP.

A grievance mechanism will be available to allow an AP appealing any disagreeable decision, practice or activity arising from disturbance during the construction works. APs during public consultation will be fully informed of their rights and of the procedures for addressing complaints whether verbally or in writing during consultation, survey, and time of compensation. This can be obtained through by ensuring full participation and consultation with the APs, and by establishing extensive communication and coordination among the affected communities, the PMU and town or community heads. The below grievance mechanism does not limit the citizen's right to submit the case to the court of law just in the first stage of grievance process.

11. ENVIRONMENTAL MANAGEMENT PLAN

The EMP and the SSEMP will be based on the results of IEE prepared by subproject and will include appropriate mitigation measures.

EMP consists of two components:

1. Mitigation measures and institutional responsibilities for implementation;
2. Environmental monitoring.

In case if an unanticipated environmental impact arises during the construction, the Table provided in [Appendix 5. Unanticipated Impact / Significant Incident / Accident Notice](#) will be filled up and attached to the varied orders.

The **Contractor** should strictly follow the environmental mitigation measures prescribed in the EMP and SSEMP. The costs foreseen for the implementation of all the measures prescribed in the EMP and SSEMP are included the total value of the Contract.

Notice on the failure to implement measures prescribed by the Technical Supervision Company (TSC) or the Client would be sent to the **Contractor** in written. After the Notice to Correct, the next recorded violation would trigger charging of liquidated damages in the amount of 0, 1% of the total value of the contract. The liquidated damages do not relieve the Contractor from remedying the violation. The recorded violation should be remedied in two working days period. Liquidated damages would be retained from the next Performance Certificate and after the completion of the construction activities the liquidated damages for the recorded violation will be retained from the Retention Money. In case of three liquidated damages the Contract could be terminated unilaterally.

Above described remedies of EMP violation will be included in the contracts for provision of works concluded by AWSC under the W&W project.

APPENDIX 1. ENVIRONMENTAL MANAGEMENT MATRIX

Works and possible impacts	Proposed mitigating measures	Monitoring	Responsible bodies
Construction			
<p><i>1. Air pollution, noise, traffic congestion</i></p> <ul style="list-style-type: none"> – Dust and noise during the construction works – Disturbance to population because of overloaded roads 	<ul style="list-style-type: none"> - Install fencing around construction site - regularly water the construction site and roads, - limit night work in residential areas, - Avoid usage of machines/equipment with extra noise; installation of silencers if needed, - Provide safe area for trucks, - Do not accumulate and burn waste on the construction site, - Carry out construction in stages, give adequate notice of construction activities to the population, - Provide corresponding road signs, barricades, organize bypasses - Provide adequate lighting for the construction site, if necessary, - Proper lighting in suitable places where passers-by or entry by public is likely, - Provide community participation in subproject design, which will minimize disruption to community social activities. 	Daily site inspection	Constructor, Consultant, PMU
<p><i>2. Environmental pollution</i></p> <ul style="list-style-type: none"> – Soil erosion processes – Environment pollution with construction waste 	<ul style="list-style-type: none"> - In inclined sites of the waterline measures for retaining the inclinations shall be carried out, - Minimize the time during which trench and pit excavations for regulation and metering nodes are open - Rehabilitate disturbed surfaces as soon as possible after completion of construction activity, according to the design - Store oil, fuels and lubricants on a sealed surface, away 	Daily inspection of construction contract and maintenance	Constructor, Consultant, PMU

Works and possible impacts	Proposed mitigating measures	Monitoring	Responsible bodies
<ul style="list-style-type: none"> – Land and water resources pollution with fuels and lubricants - Land and water resources pollution with chlorine 	<p>from water resources,</p> <ul style="list-style-type: none"> - Remove construction waste to corresponding landfill of the community, having in advance a contract agreement with the community heads or landfill operators, - Organize works for washing the water supply distribution network with chlorine, according to technical calculations. Provide appropriate technical means. - Implementation of chlorine discharge to surface water body or land area after washing the pipes, according to the regime planned under the design, MPV. 		
<p><i>Health and Safety</i></p> <ul style="list-style-type: none"> – Hazards for Workers and the population 	<ul style="list-style-type: none"> - Install fencing around construction site - Control access of unauthorized persons to site - Place warning signs in dangerous places - Carry out regular examination of equipment by highly qualified staff, as well as make regular safety audits, - Provide first aid and safety training to construction staff 	<p>Daily inspection throughout construction stage. Monthly inspection of accident reports and complaints register</p>	<p>Constructor, Consultant, PMU, Population</p>

APPENDIX 2. SITE SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

Water supply systems improvement of Talin town - I package

No	Construction Activities	Hazards to Consider	Likelihood of risk/Value	Construction of risk/Value	Risk/Value	Environmental Management Measures
1.	Construction/reconstruction of DRRs, chlorination station, internal water network <u>inside</u> the residential areas	Dust	Certain/5	Major/3	15	- Regularly water the construction site and roads.
		Noise	Likely/3	Major/3	9	- Limit night work in residential areas. - Avoid usage of machines/equipment with extra noise, installation of silencers if needed.
		Disturbance to population because of overloaded roads	Certain /5	Major/3	15	- Provide safe area for trucks. - Carry out construction in stages, give adequate notice of construction activities to the population - Provide corresponding road signs, temporary safety bridges as alternative walk way, and tape fencing for safety purposes. - Provide adequate lighting for the construction site. - Proper lighting in suitable places where passers-by or entry by public is likely
		Construction and household waste	Certain /5	Major/3	15	- Do not accumulate and burn household waste on the construction site. - Do not mix household waste with construction waste and place them into dustbins. - Remove construction waste to corresponding landfill of the community, having in advance a contract agreement with the community heads or landfill operators. - Exclude filling of the construction and household waste into the rivers and their tributaries.
		Pollution with fuel and lubricants	Likely/3	Major/3	9	- Fuel and lubricants must be stored on a sealed surface, away from water and soil resources, - Regularly check the technical conditions of machines and equipment in use
		Pollution with chlorine	Certain /5	Catastrophic/5	25	- Implement disinfection of water supply pipelines with chlorine according to technical calculations. - Provide appropriate technical means. - After washing of pipes discharge of chlorine to surface water body or land area according to the established order and background concentration of the water body.

APPENDIX 3. FIELD VISITS CHECKLIST

ՀԱՎԵԼՎԱԾ 3. ԴԱՇՏԱՅԻՆ ԱՅՑԵՐԻ ՍՏՈՒԳԱԹԵՐԹ

Դիտողություններ ստուգաթերթիկի լրացման վերաբերյալ /Comments on completing monitoring form

<i>Իրականացված մեղմացուցիչ միջոցառումները՝</i>	Mitigation implemented:
“Այո” = մեղմացման ծրագիրը իրականացվել է	“Yes” = mitigation program has been implemented
“Ոչ” = մեղմացման ծրագիրը չի իրականացվել	“No” = the mitigation program has not been implemented
“Ո/Կ” = Կիրառելի չէ	“N/A” = not applicable

<u>Ընդհանուր տեղեկատվություն</u> <u>General information</u>	Ամիս/ամսաթիվ DD/MM/YY			Corrective Action Request ուղղիչ միջոցառումների աստիճան	
	Ենթաձրագիր / Subproject				
	Տեղակայում / Location				
	Շին. կազմակերպություն/ Constriction contractor				
	Մարզ / Marz				
	Համայնք/ Community				
<u>1. Նախագծում</u> <u>Design</u>					
Անհրաժեշտությամբ Required permissions	1.1 Բնապահպանական փորձաքննության եզրակացություն / EEC	Այո Yes	Ոչ No	Ո/Կ N/A	
	1.2 Հողհատկացման գրավոր համաձայնություն / written consent on land acquisition	Այո Yes	Ոչ No	Ո/Կ N/A	
	1.3 Պատմամշակութային փորձաքննություն / assessment of impact on cultural heritage	Այո Yes	Ոչ No	Ո/Կ N/A	
<u>2. Շինարարություն</u> <u>Construction</u>					
Անհրաժեշտ Required permissions	2.1 Շին. թափոնների տեղադրման գրավոր համաձայնություն / written consent on disposal of construction waste	Այո Yes	Ոչ No	Ո/Կ N/A	
	2.2 Ի՞նչ է՞նչ է՞նչ Օ՞րեն չէ՞ք դ՞նիք «Գնահատել»-ը Նշանակալից պահպանություն / Contractor holds license for extraction of natural resources	Այո Yes	Ոչ No	Ո/Կ N/A	
	2.3 Ի՞նչ է՞նչ է՞նչ Օ՞րեն չէ՞ք դ՞նիք «Գնահատել»-ը «Գնահատել»-ը պահպանություն / Contractor holds permit for operating concrete/asphalt plant	Այո Yes	Ոչ No	Ո/Կ N/A	
	2.4 Գրավոր համաձայնություն պատմամշակ. հուշարձանի անսպասելիորեն հայտնաբերման դեպքում / written consent in case of sudden discovery of cultural heritage	Այո Yes	Ոչ No	Ո/Կ N/A	
<u>3. Հասարակության Իրազեկում</u> <u>Public awareness</u>					

	3.1 Արդյո՞ք շին.աշխատանքների վերաբերյալ բնակչության համապատասխան իրազեկում կատարվել է՝ համաձայն նախագծի / Is the awareness of population done by relevant notification regarding construction works according to the project design?	Այո Yes	Ոչ No	Ո/Կ N/A	
	3.2 Առկա՞ է համայնքի մասնակցություն շինարարական աշխատանքներին՝ համաձայն նախագծի / Is there community's participation in construction works according to the project design?	Այո Yes	Ոչ No	Ո/Կ N/A	
	3.3 Առկա է ցուցանակ, որն ապահովում է բողոքարկման մեխանիզմի լիարժեք գործելը՝ համաձայն նախագծի (պատասխանատու կազմակերպությունների կոնտակտային տվյալներ): / Are there notes providing proper operation of grievance redress mechanism according to the project design (contacts of responsible person/company)?	Այո Yes	Ոչ No	Ո/Կ N/A	
	3.4 Բողոքների գրանցման թերթիկում նշված բողոքը լուծում ստացել է ողջամիտ ժամկետներում: / The complaint stated in the Grievance Log was resolved in reasonable time period.	Այո Yes	Ոչ No	Ո/Կ N/A	
4. Անվտանգություն <u>Safety</u>					
Բանվորների անվտանգություն Safety of workers	4.1 Արդյո՞ք աշխատանքներն սկսելուց առաջ բանվորներն անցել են անվտանգության դասընթացներ / հրահանգավորում: Առկա՞ է մատյան/ Did workers receive safety training before starting work - site induction? Is there a journal?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.2 Արդյո՞ք բանվորներն ապահովված են անվտանգության հանդերձանքով/ առկա է (օր. բաճկոնակներ, սաղավարտներ, երկարաձիտ կոշիկներ, ձեռնոցներ, ակնոցներ, շնչադիմակ, այլ) Are safety uniforms available (eg. vests, helmets, high boots, gloves, glasses, mask)?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.3 Արդյո՞ք բնակավայրի տարածքում խրամուղիների վրա տեղադրված են կամրջակներ (հետիոտնի կողմից առավել ինտենսիվ օգտագործվող հատվածներում)/ Are there bridges installed over the trenches in residential areas (particularly the areas actively used by pedestrians)?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.4 Վտանգավոր նյութերի հետ աշխատող բանվորները կրո՞ւմ են անվտանգության հատուկ հանդերձանք: / Do workers dealing with hazardous materials wear special protective uniform?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.5 Սարքավորումները/մեխանիզմները կահավորվա՞ծ են արդյունավետ խլացուցիչներով: /Are equipment fitted with effective silencers?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.6 Աղմուկի աղբյուրին մոտ աշխատող բանվորները կրո՞ւմ են արդյոք ականջակալներ: Do workers in the vicinity of sources of high noise use ear-protection gear?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.7 Շինարարության մեջ ներառված տեխնիկական միջոցների պարբերական զննումներ կատարվո՞ւմ են՝ անվտանգությունն ապահովելու նպատակով / Are regular studies of equipment used for construction for safety matter?	Այո Yes	Ոչ No	Ո/Կ N/A	

	4.8 Արդյո՞ք շին. հրապարակներում/ ճամբարներում առկա են առաջին բուժօգնության ցուցաբերման միջոցներ (դեղատուփ և այլն): / Is first aid kit available at the construction sites/ camps?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.9 Շինարարության մեջ ընդկրկված աշխատակազմի համար առաջին բուժօգնության ուսուցման կազմակերպվե՞լ է / Have First aid training organized for construction staff?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.10 Շինարարական հրապարակներում / ճամբարներում առկա՞ են արդյոք հակահրդեհային միջոցներ (հակահրդեհային վահան, կրակմարիչներ, գործիքներ/սարքավորում, ավազ և այլն): Are fire-resistant measures available on construction sites/ camps (fireproof shield, fire extinguisher, existence of tools/equipment, sand, etc.)?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.11 Վերջին ստուգայից հետո պատահարի (եթե եղել է) մասին հաշվետվության ձև լրացվե՞լ է: / Has an incident (if any) report form been filled up after the last oversight?	Այո Yes	Ոչ No	Ո/Կ N/A	
Բնակչության անվտանգություն Safety of population	4.12 Երթևեկության սահմանափակման կամ խախտման ժամանակ համապատասխան ճանապարհային նշաններ կամ պատնեշներ տեղադրվա՞ծ է, շրջանց կազմակերպվա՞ծ է / Are there road signs or fences installed, as well as bypass organized during interrupted or limited traffic?	Այո Yes	Ոչ No	Ո/Կ N/A	
	4.13 Արդյո՞ք փողոցային լուսավորություն ապահովվա՞ծ է, նաև այն հատվածներում որտեղ հավանական է անցորդների ելումուտը համապատասխան նշանների և լուսավորության ապահովում / Are there provided adequate street lighting, as well as proper signage and lighting in suitable places when passers-by or entry by public is likely?	Այո Yes	Ոչ No	Ո/Կ N/A	
<u>5. Շինարարության իրականացման ժամանակ կառավարման միջոցառումներ</u> <u>Management measures during construction</u>					
Շին.հրապարակի/ տեղանքի շահագործում / Operation on area/construction site	5.1 Արդյո՞ք մեքենաների համար ապահով տարածք առկա է շին.հրապարակում / Is there available safe place at the construction site for vehicles?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.2 Արդյո՞ք յուղերի և քսուկների համապատասխան պահեստներ առկա են շին.հրապարակում / Are there available storage for oils and lubricants at the appropriate part of the construction site?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.3 Արդյո՞ք շինարարական հրապարակը/ճամբարը պատշաճ տեղադրված է (օր. ցանկապատ, հանդերձարան): / Is construction site/camp properly placed (ex. fencing, dressing room, etc.)?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.4 Արդյո՞ք շին. հրապարակներում/ճամբարներում առկա են շարժական զուգարաններ: / Is mobile toilet available at the construction sites/ camps?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.5 Արդյո՞ք շինարարական տեխնիկան և մեխանիզմները սարքին վիճակում են (վառելիքի, յուղերի և քսանյութերի արտահոսքի բացառում և այլն): / Are construction machinery and equipment in order (prevention of leakage of fuel, oil, lubricants, etc.)?	Այո Yes	Ոչ No	Ո/Կ N/A	

	5.6 Արդյո՞ք փորված, հանված, քանդված նյութերը և շինարարական ջարդոնները ժամանակին տեղափոխում են նախնական կուտակման վայրերից դրանց համար նախապես նախատեսված և համաձայնեցված վայրեր: Are excavated and demolished materials and construction waste timely removed from the places of preliminary accumulation and disposed to initially planned and agreed places?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.7 Ապահովվա՞ծ են շինարարական հրապարակները աշխատող մարդկանց համար սանիտարահիգիենիկ պայմաններով: / Are workers at the construction site provided with proper sanitary and hygienic conditions?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.8 Արդյո՞ք շինարարական աշխատանքների իրականացման ժամանակ շինհրապարակի / ճամբարի տեղակայման և թափոնների ժամանակավոր կուտակման համար նախագծով նախատեսված տարածքներից և օտարման գոտու սահմաններից դուրս բերրի հողերի և բնապահպանական տեսանկյունից խոցելի տարածքների օգտագործումը վերահսկվում է: / Is use of fertile lands or other environmentally sensitive areas located outside the easement zone and other than the areas envisaged in design for establishment of construction sites/camps and waste temporary accumulation sites during construction works overseen?	Այո Yes	Ոչ No	Ո/Կ N/A	
	5.9 Արդյո՞ք վերահսկվում են վտանգված բուսական և կենդանական տեսակների առկայությունը շինարարական հրապարակում/ճամբարում: Do endemic species of flora and fauna exist in the area of construction site?	Այո Yes	Ոչ No	Ո/Կ N/A	
<u>6. Օդի ժամանակավոր աղտոտում</u> <u>Temporary air pollution/dust</u>					
	6.1 Շինանյութ տեղափոխող բեռնատարների վրա ծածկ օգտագործվո՞ւմ է / Are they using cover for the vehicles transporting construction waste?	Այո Yes	Ոչ No	Ո/Կ N/A	
	6.2 Արվում է շինարարության տարածքի խոնավեցում ջրի շիթով / Are they moisturizing of the construction site by water?	Այո Yes	Ոչ No	Ո/Կ N/A	
<u>7. Հողի էրոզիա</u> <u>Soil erosion</u>					
	7.1 Արդյո՞ք գաղիվար տեղերում հողի էրոզիայի կանխարգելման միջոցառումներ իրականացվել են ըստ նախագծի / Are there soil erosion prevention measures at the slope places according to the project design?	Այո Yes	Ոչ No	Ո/Կ N/A	
	7.2 Արդյո՞ք փոսորակների հետլիցքը ժամանակին է կատարվել / Was the backfill of pits done timely?	Այո Yes	Ոչ No	Ո/Կ N/A	
	7.3 Արդյո՞ք բուսահողը տեղափոխվել և պահեստավորվել է ըստ նախագծի: / Is the vegetative soil moved and stored according to the project design?	Այո Yes	Ոչ No	Ո/Կ N/A	
	7.4 Արդյո՞ք շին.աշխատանքների ավարտից հետո վնասված մակերեսները (մասնավորապես ուշադիր լինել բուսահողին) վերանորոգվել/ վերականգնվել/	Այո Yes	Ոչ No	Ո/Կ N/A	

Other remarks/ clarifications

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APPENDIX 3. COMPLAINT LOG

MARZ, COMMUNITY, SUBPROJECT _____

Request number	Date complaint received	Method of complaint (phone, letter, internet, in-person, other)	Details of complaint	How was the complaint resolved/mitigation measures	Resolution status*	Any follow-up from the requestor Yes/No	Notes
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							

**<In progress>* or *<Resolved>* (If resolved, state the date)

Filed by PMU Environmental Specialist: _____

Date: _____

APPENDIX 4. UNANTICIPATED IMPACT / SIGNIFICANT INCIDENT / ACCIDENT NOTICE

Date/ Location Of Incident	Description of incident/Impact including Magnitude and Control Action taken at the time	Evaluation of Consequences	Corrective Action Required including Deadline, and Lessons Learned

Jointly signed by:

Site Supervision Engineer:_____ Date:_____

Contractor:_____ Date:_____

Appendices:

(e.g. photographs, laboratory reports, etc.)

APPENDIX 5.EMISSIONS / AMBIENT MONITORING FORM

Parameter	Date / Location	Measured By	Monitoring Method / Equipment used	Result	Performance Standard	% Exceedence	Reason for exceedence and Corrective Action Request if works related	Resolution Status of previous CAR

APPENDIX 6. SUBPROJECT LAYOUT

PACKAGE X.I. TALIN TOWN

