The third stage of works for the arrangement of the water supply system serving five villages in the Gardabani Municipality

Environmental and Social Screening and Environmental and Social Management Plan

WORLD BANK FINANCED
SECOND REGIONAL AND MUNICIPAL INFRASTRUCTURE DEVELOPMENT PROJECT

Tbilisi, Georgia

May 2021

Environmental Screening

The Sub-project (SP) area covers five villages of Gardabani Municipality located in Eastern Georgia, 30-80 km from Tbilisi. It covers 7 515 households, in overall 27 227 people (as of 2020 data).

All five villages are located in a region where groundwater and surface water resources are scarce, summers are hot, and water demand is high. Each village has its source of water supply, but this amount cannot satisfy even a quarter of the village population. The villages are supplied with water once every 3-5 days, and the population sometimes remains without water for weeks. Existing pipelines and reservoirs are out of order, poorly constructed, and depreciated; therefore, their further operation is not recommended.

The SP covers the third phase of the arrangement of the water supply system serving five villages of the Gardabani Municipality. The first and second stages of work are already underway, including the construction of headworks (underground drainage, wells, pumping station, chlorination plant, protective sanitary fence), water pipes, and reservoirs. The works of stage I are completed, and the works on stage II are nearing completion. At stage II of the project, the installations of new reserve tanks are underway, including:

1. Akhali Samgori - 2X500 m^3
2. Vaziani - 2X500 m^3
3. Akhalsopeli - 2X500 m^3
4. Norio - 2X750 m^3
5. Martkopi - 2X750 m^3

The third phase (Stage III) mainly includes the arrangement of a water distribution network for those five villages in the Gardabani Municipality, including village Akhali Samgori - 762 households, village Vaziani – 1 993 households, village Akhalsopeli – 760, village Norio - 1 400 households, and village Martkopi - 2 600 households.

All villages, except for Akhali Samgori, have a steel distribution network that is depreciated, oxidized, and in a state of disrepair. Due to this circumstance, for those villages completely new water distribution network should be arranged. An exception is Akhali Samgori, where the distribution network was partially replaced with polyethylene pipes (L=9.5 km) a few years ago.

Following the design, a new distribution network will be arranged by polyethylene pipes. To create single water distributing network for these villages, new and old networks will be connected.

In particular, the works on the SP area will cover:

- Water pipeline network with a length of 10365 m. and individual water meters - 762 sets in Akhali Samgori
- Water pipeline network with a length of 33800 m., individual water meter - 393 sets, for private houses - 2063 sets; for buildings – 1670 sets and 1X500 m^3 additional reservoir in Vaziani;
- Water pipeline network with a length of 23010 m. and individual water meters - 760 sets in Akhalsopeli;

- Water pipeline network with a length of 36840 m., individual water meters - 1400, and the lower zone reservoir 1X500 m^3. in Norio;
- Water pipeline network with a length of 73850 m., individual water meters - 2600 sets, and the lower zone reservoir 2X500 m^3 in Martkopi.

In total, there will be arranged pipe network with a length of 178.440 m. and water meters - 7585 sets.

Additionally, at stage III, 1X500 m^3 Vaziani tank, 2x500 m^3 reserve tanks in the middle zone of Norio, and 1x500 m^3 reserve tanks in the central area of Martkopi will be arranged.

(A) IMPACT IDENTIFICATION

Has sub-project a tangible impact on the environment?	The SP will not have significant or irreversible negative impacts on the environment. No sensitive environmental receptors will be affected.
What are the significant beneficial and adverse environmental effects of sub-project?	The SP is expected to have a positive long-term social impact by improving the water supply system in five villages of Gardabani Municipality. By implementing the SP, continuous water supply will be provided to the population resulted in improved and optimized water usage and sanitation. The SP envisages arrangement and rehabilitation of the existing water supply system/facilities, which is very old with significant leakages, causing lower network pressure and decreased delivery efficiency. Improvement of the water system, especially the elimination of leakages, will conserve entire water resources in the region, which will be counted as a benefit for the environment. The SP design materials include hydrological and geological studies, according to which water extraction from the underground aquifer at the rate will not cause adverse environmental impact. Expected negative environmental and social impacts are likely to be short-term and typical from small to medium scale construction, and rehabilitation works in the urban landscape: noise, dust, vibration, and emissions from construction machinery; generation of construction waste; disruption of traffic and pedestrian access. All the mentioned impacts are expected to be temporary and insignificant.

	The territory where the distribution network will be placed is registered as a property of Gardabani Municipality.
May the sub-project have any significant impact on the local communities and other affected people?	No new land take and resettlement is expected during the SP implementation. The SP is supposed to have a positive long-term social impact by improving the water supply in five villages, resulting in an improved water supply and sanitation for the population. Consequently, negative impacts for local communities are short-term and limited to the construction site.

(B) MITIGATION MEASURES

Were there any alternatives to the sub-project design considered?	As the SP envisages rehabilitation/arrangement of the existing water supply network, therefore, alternatives regarding the SP design were not considered.
What types of mitigation measures are proposed?	The expected negative impacts of the construction phase can be easily mitigated by the demarcation of the construction site, traffic management, good maintenance of the construction machinery, observance of the established working hours, and organized disposal of waste to the formally agreed locations. The contractor will be responsible for the waste disposal at the permitted landfill, use the quarry materials from the licensed quarries only, prevent water and soil from pollution (fuel spills due to equipment failure, row asphalt / concrete spills, etc.), avoid disturbance of population (noise, dust, emissions) proper traffic management, and good maintenance of the construction machinery, etc. Newly constructed reservoirs and laid pipes will be disinfected. The direct release of disinfectant into the natural environment will have negative environmental impacts. Therefore, deactivation of disinfectant will be required to avoid environmental damage.

What lessons from the previous similar projects have been incorporated into the sub-project design?	MDF has vast experience in implementing medium and large-scale water system rehabilitation projects financed by various donor organizations.
Have concerned communities been involved, and have their interests and knowledge been adequately taken into consideration in sub-project preparation?	The SP has been procured by Gardabani Municipality, taking into consideration the current needs and priorities of the local population. Due to circumstances related to the COVID-19 outbreak, conducting a remote public consultation on the SP may be required. Following national regulations in force by the rehabilitation and following the National Center for Disease Control (NCDC), MDF will structure the consultation process. If remote consultations are to be undertaken, MDF will use telephone communication to notify stakeholders of the planned public consultations on the draft ESMP. During the phone conversation, the information will be collected, and the most suitable format of virtual consultation will be planned. Those who have no means of communication, except for the phone, will be provided with information on the environmental and social aspects of the SP by phone. Suppose they require visualization of the project, along with the documentation to be reviewed. In that case, the authorized persons from the local municipality will visit them as per the regulations and recommendations set by the (NCDC) to familiarize them with the relevant documents. Draft ESMP, together with the contact information of the contact persons, will be disclosed on the website of MDF.

(C) RANKING

The project has been classified as environmental Category B according to the World Bank safeguards (OP 4.01) and requires Completion of the Environmental and Social Management Checklist for Small Construction and Rehabilitation Activities.

Social Screening

Social safeguards screening information		Yes	No
1	Is the information related to the affiliation, ownership and land use status of the sub-project site available and verifiable? (The screening cannot be completed until this is available)	✓	
2	Will the sub-project reduce people's access to their economic resources, such as land, pasture, water, public services, sites of common public use or other resources that they depend on?		✓
3	Will the sub-project result in resettlement of individuals or families or require the acquisition of land (public or private, temporarily or permanently) for its development?		✓
4	Will the sub-project result in the temporary or permanent loss of crops, fruit trees and household infra-structure (such as ancillary facilities, fence, canal, granaries, outside toilets and kitchens, etc.)?		✓
If answer to any above question (except question 1) is "Yes", then OP/BP 4.12 Involuntary Resettlement is applicable and mitigation measures should follow this OP/BP 4.12 and the **Resettlement Policy Framework**			

Environmental Management Plan

PART A: GENERAL PROJECT AND SITE INFORMATION

INSTITUTIONAL & ADMINISTRATIVE	
Country	Georgia
Project title	Second Regional and Municipal Infrastructure Development Project
Sub Project title	The third stage of works for arranging the water supply system serving five villages in the Gardabani Municipality - Martkopi, Norio, Akhalsopeli, Vaziani, and Akhali Samgori.
Scope of site-specific activity	SP covers the third phase of the arrangement of the water supply system serving five villages of the Gardabani Municipality. The third phase mainly includes arranging a water distribution network for five villages in the Gardabani Municipality, including village Akhali Samgori - 762 households, village Vaziani – 1 993 households, village Akhalsopeli – 760, village Norio - 1 400 households, and village Martkopi - 2 600 households. Following the design, a new distribution network will be arranged by polyethylene pipes. In particular, the works on the SP area will cover the arrangement of: • Water pipeline network with a length of 10365 m. And individual water meters - 762 sets in Akhali Samgori • Water pipeline network with a length of 33800 m., individual water meter - 393 sets, for private houses - 2063 sets; for buildings – 1670 sets and 1X500 m^3 additional reservoir in Vaziani; • Water pipeline network with a length of 23010 m. And individual water meters - 760 sets in Akhalsopeli; • Water pipeline network with a length of 36840 m., individual water meters - 1400, and the lower zone reservoir 1X500 m^3. in Norio; • Water pipeline network with a length of 73850 m., individual water meters - 2600 sets, and the lower zone reservoir 2X500 m^3 in Martkopi. In total, there will be arranged pipe network with a length of 178.440 m. and water meters - 7585 sets. Additionally, at stage III, 1X500 m^3 Vaziani tank, 2x500 m^3 reserve tanks in the middle zone of Norio, and 1x500 m^3 reserve tanks in the central area of Martkopi will be arranged.

Institutional arrangements (WB)	Task Team Leader: Axel Baeumler	Safeguards Specialists: Darejan Kapanadze – Environment; Davit Jijelava – Social.	
Implementation arrangements (Borrower)	Implementing entity: Municipal Development Fund of Georgia	Works supervisor: Consulting company Eptisa Servicios de Ingenieria S.L. Spain	Works contractor: (tbd)
SITE DESCRIPTION			
Name of institution whose premises are to be rehabilitated	Gardabani Municipality		
Address and site location of institution whose premises are to be rehabilitated	73 Davit Aghmashenebeli str., Gardabani Municipality Vakhtang Gagua, Head of Infrastructure, Construction and Spatial Planning Division of Gardabani City Hall (Tel: 598404261, Email: gardabani.infrastruqtura@gmail.com		
Who owns the land? Who uses the land (formal/informal)?	The SP area for the third phase works is registered as property of the Municipality. Usage of land portions in private ownership during project implementation (construction of water pipe networks) is not planned.		
Description of physical and natural environment around the site	The territory where the distribution network and facilities will be arranged is 25-60 km from Tbilisi. All five villages are located in a region where underground and surface water resources are small, summer is hot, and water demand is high The terrain relief of the villages is mainly with a medium slope, and some are mountainous. The climate is moderately humid, with relatively cold winters and hot summers. Coniferous and deciduous trees - hornbeam, oak, spruce, pines, and other vegetation grow on the slopes of the rivers of the Martkopi and Norio ravines. The average summer temperature is +25°C; +28°C, and in winter 0°C; + 2°C. The average annual precipitation is 422 mm; the coldest month is January +2°C. Seismicity - 9 points; standard depth of soil freezing - 0 cm; The primary sectors of the municipality's economy are tourism and agriculture. The average population density is 1.3 people per km^2.		
Locations and distance for material sourcing, especially aggregates, water, stones?	Distance to the nearest licensed borrow pit is approximately 10 km. The distance to the nearest Lilo landfill is about 12-15 km		

LEGISLATION	
National & local legislation & permits that apply to project activity	The SP has been classified as low-risk Category B according to the World Bank policies and the ESMF. Georgian legislation does not require any environmental review, approval, or permit for the SP. Though according to the national regulatory system: - Construction materials must be obtained from licensed providers, - If a contractor wishes to open quarries or extract material from the riverbed (rather than purchasing these materials from other providers), then the contractor must obtain licenses for extraction. - If a contractor wishes to operate its own asphalt or cement-concrete mixing plant (rather than purchasing these materials from other providers), then the contractor must obtain an environmental permit with established limits of pollutant concentrations in emissions and a technical report on the inventory of atmospheric air pollution stationary source agreed with the Ministry of Environmental Protection and Agriculture (MoEPA). - Permanent placement of the inert material (cut the ground and sedimentary soil) generated in the course of earthworks in a selected location must be approved by local (municipal) governing bodies in written; - If over 200 tons of non-hazardous waste or over 1000 tons of inert materials or over 120 kg of hazardous waste is generated annually as a result of the contractor's activities, the contractor shall prepare and obtain approval of MoEPA on the Waste Management Plan, prepare the report on waste inventory and appoint an environmental manager, whose identity information should be submitted to the MoEPA in accordance with the requirements of the Waste Management Code. - If topsoil is produced, the contractor must adhere to the steps defined by the Georgian legislation. - If tree cutting or replanting will become necessary during the project implementation, the construction contractor will inventor the trees to be cut down or to be replanted before starting the construction and submit to MoEPA (for Red Listed tree species) and Gardabani Municipality City Hall (for trees not included in Red List) for obtainment tree cutting permission. The permission document will include the compensation measures based on the presented inventory. The compensation fees will be paid within the scope of the project as well as compensation activities will be implemented by the construction contractor. The trees shall be cut under the supervision of a designated specialist. GOST and SNIP norms must be adhered.
PUBLIC CONSULTATION	

When / where the public consultation process will take /took place	Following national regulations in force by the time of rehabilitation and following the National Center for Disease Control (NCDC), MDF will decide to structure the consultation process. If remote consultations are to be undertaken, MDF will use telephone communication to notify stakeholders of the planned public consultations on the draft ESMP. During the phone conversation, the information will be collected, and the most suitable format of virtual consultation will be planned. Those who have no means of communication, except for the phone, will be provided with information on the environmental and social aspects of the SP by phone. If they require visualization of the project, along with the documentation to be reviewed, then the authorized persons from the local municipality will visit them as per the regulations and recommendations set by the (NCDC) to familiarize them with the relevant documents. The information booklets reflecting detailed information about the forthcoming consultation meetings will be placed at the most visited places in the village

GRIEVANCE REDRESS MECHANISM

An appropriate grievance redress mechanism was established to solve grievances of Project-Affected People, as required. Gardabani Municipality has assigned a responsible person – Vakhtang Gagua, Head of Infrastructure, Construction and Spatial Planning Division of Gardabani City Hall (Tel: 598404261, Email: gardabani.infrastruqtura@gmail.com, 73 Davit Aghmashenebeli str., Gardabani). A contact person from the MDF is Nutsa Gumberidze (Tel: +995 598 88 20 19, feedback@mdf.org.ge, 150 Davit Aghmashenebeli ave., 3rd floor, 0112 Tbilisi, Georgia.)

If the grievance is not unsolved at the local level, it will be lodged to the MDF. As for grievance monitoring, MDF registers received compliances, comments, and how the compliance was addressed. During public consultations, the local population will be informed about the grievance redress process and receive information about contact persons.

ATTACHMENTS

Attachment 1: Situation plan, photos, and ortho-photo;

PART B: SAFEGUARDS INFORMATION

ENVIRONMENTAL /SOCIAL SCREENING			
Will the site activity include/involve any of the following?	**Activity/Issue**	**Status**	**Triggered Actions**
	1. Building rehabilitation	[ ] Yes [ ] No	See Section **A** below
	2. New construction	[ ] Yes [ ] No	See Section **A** below
	3. Individual wastewater treatment system	[ ] Yes [ ] No	See Section **B** below
	4. Historic building(s) and districts	[ ] Yes [ ] No	See Section **C** below
	5. Acquisition of land[1]	[ ] Yes [ ] No	See Section **D** below
	6. Hazardous or toxic materials[2]	[ ] Yes [ ] No	See Section **E** below
	7. Impacts on forests and/or protected areas	[ ] Yes [ ] No	See Section **F** below
	8. Handling / management of medical waste	[ ] Yes [ ] No	See Section **G** below
	9. Traffic and Pedestrian Safety	[ ] Yes [ ]No	See Section **H** below

[1] Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.
[2] Toxic / hazardous material includes but is not limited to asbestos, toxic paints, noxious solvents, removal of lead paint, etc.

PART C: MITIGATION MEASURES

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
0. General Conditions	Notification and Worker Safety	(a) The local construction and environment inspectorates and communities have been notified of upcoming activities (b) The public has been notified of the works through an appropriate notification in the media and/or at publicly accessible sites (including the site of the works) (c) All legally required permits have been acquired for construction and/or rehabilitation (d) The Contractor formally agrees that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and the environment. (e) Workers' PPE will comply with good international practice (always hardhats, as needed masks and safety glasses, harnesses, and safety boots) (f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
A. General Rehabilitation and /or Construction Activities	Air Quality	(a) During pneumatic drilling/wall destruction, dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at the site (b) The surrounding environment (sidewalks, roads) shall be kept free of debris to minimize dust (c) There will be no open burning of construction/waste material at the site (d) There will be no excessive idling of construction vehicles at sites (e) Truckloads should be confinement and protected with lining (f) Vehicles/equipment discharging black smoke must be scheduled for maintenance immediately (g) Limit vehicles speed to 35-40 km on unpaved surfaces (h) Watering of unpaved surfaces and roads
	Noise	(a) Limit activities to daylight working hours; (b) During operations, the engine covers of generators, air compressors, and other powered mechanical equipment shall be closed, and equipment placed as far away from residential areas as possible (c) Maintaining equipment in good working order so that extraneous noises from mechanical vibration creaking and squeaking are reduced to a minimum (d) Shutting down equipment when it is not directly in use, except where the equipment is required to run continuously.
	Water Quality	(a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off-site and causing excessive turbidity in nearby streams and rivers (b) Septic effluent will be removed/transported by special equipment and discharged in the municipal sewage system

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
	Waste management	(a) Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities (b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers (c) Construction waste will be collected and disposed of properly at the agreed location (d) The records of waste disposal will be maintained as proof for proper management as designed (e) Whenever feasible, the contractor will reuse and recycle appropriate and viable materials (except asbestos)
	Material supply	a) Use existing plants, quarries, or borrow pits that have appropriate official approval or valid operating license b) Obtain licenses for any new quarries and/or borrowing areas if their operation is required c) Reinstate used sections of quarries and/or borrowing areas as extraction proceeds on or properly close quarries if extraction completed and license expired d) Haul materials in of peak traffic hours e) Place speed regulating, diverting, and warning signs for traffic as appropriate
	Soil contamination	a) Construction Company should organize and cover material storage areas. Lubricants, fuel, and solvents should be stored and used for servicing machinery exclusively in the designated sites with an adequate lining of the ground and confinement of possible operation and emergency spills b) Spill containment materials (sorbents, sand, sawing, chips etc.) should be available on construction sites. c) Mobile drip tray and Spill kits will be provided during the refueling process d) The material storage sites and embankments should be protected from washing out during heavy rainfalls and flooding through covering by impermeable materials
	Topsoil Management	(a) Remove topsoil of about 0.3 m depth and store separately during excavation work. (b) In order to avoid the topsoil erosion, keep the height of its piles below 2 m and the inclination of the slope - below 45^{o}; (c) Arrange water diversion channels along the perimeter of the topsoil fill and protect piles against the scattering by the wind blow; (d) In case of storing the topsoil for long, periodically loosen it or saw grass; (e) Excess topsoil will hand over to the appropriate authorities; (f) In case of spills of oil/lubricants, localize/clean the spilled product in the shortest possible time; (g) Equip with drip pans the appliances creating the risk of groundwater pollution when in operation; (h) Wash the vehicles preferably at private car-washing areas; (i) Using temporary water diversion channels; (j) Fill the holes in a timely manner.

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
	Safe functioning of the water supply disinfection system via chlorination	a) Upon completion of washing and disinfection of pipes and reservoirs, the disinfection solution will be neutralized by the contractor before releasing to the environment – to avoid damage to terrestrial or aquatic organisms. This is achieved by the application of a reducing agent - sodium bisulfate. The reducing agent, in turn, must be applied by the contractor at the precise dosage to neutralize the disinfectant – but no more, since reducing agent residuals are also detrimental to aquatic ecosystems. Releasing of neutralized water to the environment by the contractor will be agreed upon with the local municipality. b) Operations & Maintenance Training (upon facility start-up) will be executed by works contractor, including supply of Operation Manual in the Georgian Language.
H. Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	(a) In compliance with national regulations, the contractor will ensure that the construction site is adequately secured and construction-related traffic regulated. This includes but is not limited to ▪ Signposting, warning signs, barriers, and traffic diversions: the site will be visible, and the public warned of all potential hazards ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ Active traffic management by trained and visible staff at the site, if required, for the safe and convenient passage for the public. ▪ Ensuring safe and continuous access to office facilities, shops, and residences during renovation activities, if the buildings stay open for the public.

PART D: MONITORING PLAN

Activity	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
CONSTRUCTION PHASE						
Supply with construction materials	Purchase of construction materials from the officially registered suppliers	In the supplier's office or warehouse	Verification of documents	During the conclusion of the supply contracts	To ensure technical reliability and safety of infrastructure	MDF, Construction supervisor
Transportation of construction materials and waste; Movement of construction machinery	Technical condition of vehicles and machinery; Confinement and protection of truckloads with lining; Respect of the established hours and routes of transportation	Construction site	Inspection	Unannounced inspections during work hours and beyond	To limit pollution of soil and air from emissions; Limit nuisance to local communities from noise and vibration; Minimize traffic disruption.	MDF, Construction supervisor, Traffic Police
Earth Works	The temporary storage of excavated material in the pre-defined and agreed upon locations; Backfilling of the excavated material and/or its disposal to the formally designated locations; In case of chance finds immediate suspension of works, notification of the	Construction site	Inspection	In the course of earthworks	Prevent pollution of the construction site and its surroundings with construction waste; Prevent damage and loss of physical, cultural resources	MDF, Construction supervisor

Activity	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
	Ministry of Culture and Monument Protection, and resumption of works exclusively upon formal consent of the Ministry.					
Sourcing of inert material	Purchase of material from the existing suppliers if feasible; Obtaining of extraction license by the works contract and strict compliance with the license conditions; Terracing of the borrow area, backfilling to the exploited areas of the borrow site, and landscape harmonization; Excavation of river gravel and sand from outside of the water stream, arrangement of protective barriers of gravel between excavation area and the water stream, and no entry of machinery into the water stream.	Borrowing areas	Inspection of documents Inspection of works	In the course of material extraction	Limiting erosion of slopes and degradation of ecosystems and landscapes; Limiting erosion of river banks, water pollution with suspended particles, and disruption of aquatic life.	MDF, Construction supervisor
Generation of construction waste	The temporary storage of construction waste in specially allocated areas;	Construction site; Waste disposal site	Inspection	Periodically during construction and upon complaints	Prevent pollution of the construction site and nearby area with solid waste	MDF, Construction supervisor

Activity	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
	Timely disposal of waste to the formally designated locations					
Traffic disruption and limitation of pedestrian access	Installation of traffic limitation/diversion signage; Storage of construction materials and temporary placement of construction waste in a way preventing congestion of access roads	At and around the construction site	Inspection	In the course of construction works	Prevent traffic accidents; Limit nuisance to local residents	MDF, Construction supervisor
Cleansing of newly laid pipes and reservoir	Dissolution or chemical deactivation of disinfecting solvent at an allowable concentration of residual chlorine in drinking water prior to release	Endpoints of pipelines	Inspection of cleansing works	In the course of pipeline washing, by the time of completion of their installation	Prevent pollution of soil, groundwater, and surface water with concentrated chlorine	MDF, Construction supervisor
Workers' health and safety	Provision of uniforms and safety gear to workers; Informing of workers and personnel on the personal safety rules and instructions for operating machinery/equipment, and strict compliance with these rules/instructions	Construction site	Inspection	Unannounced inspections in the course of work	Limit occurrence of on-the-job accidents and emergencies	MDF, Construction supervisor

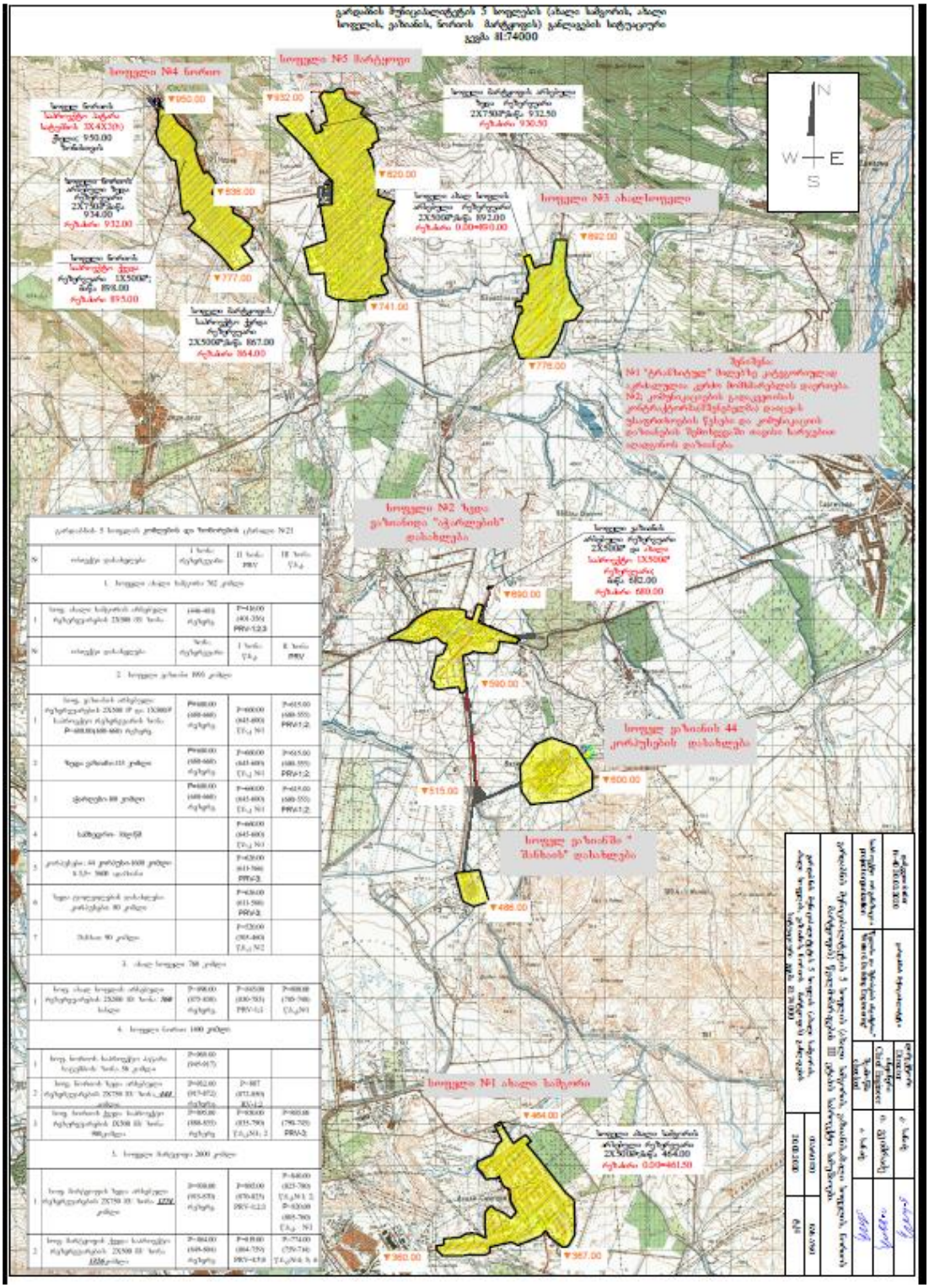
Activity	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
OPERATION PHASE						
Maintenance of rehabilitated water supply system	Installation of warning/ notification signs; Demarcation and installation of special fences and signs around the bore holes and the reservoir to protect sanitary norms and quality of water; Disposal of waste from the repair works to the designated landfill.	Rehabilitated pipe system	Visual inspection	During maintenance works	Prevent accidents and disruption at water supply systems	UWSC
Safe functioning of the water supply disinfection system via chlorination	Operations & Maintenance Training upon facility start-up is executed by works contractor.	Potable water treatment facility	Inspection	Upon start-up of water supply system operation	Prevent environmental damage due to operational and emergency release of chlorine	UWSC

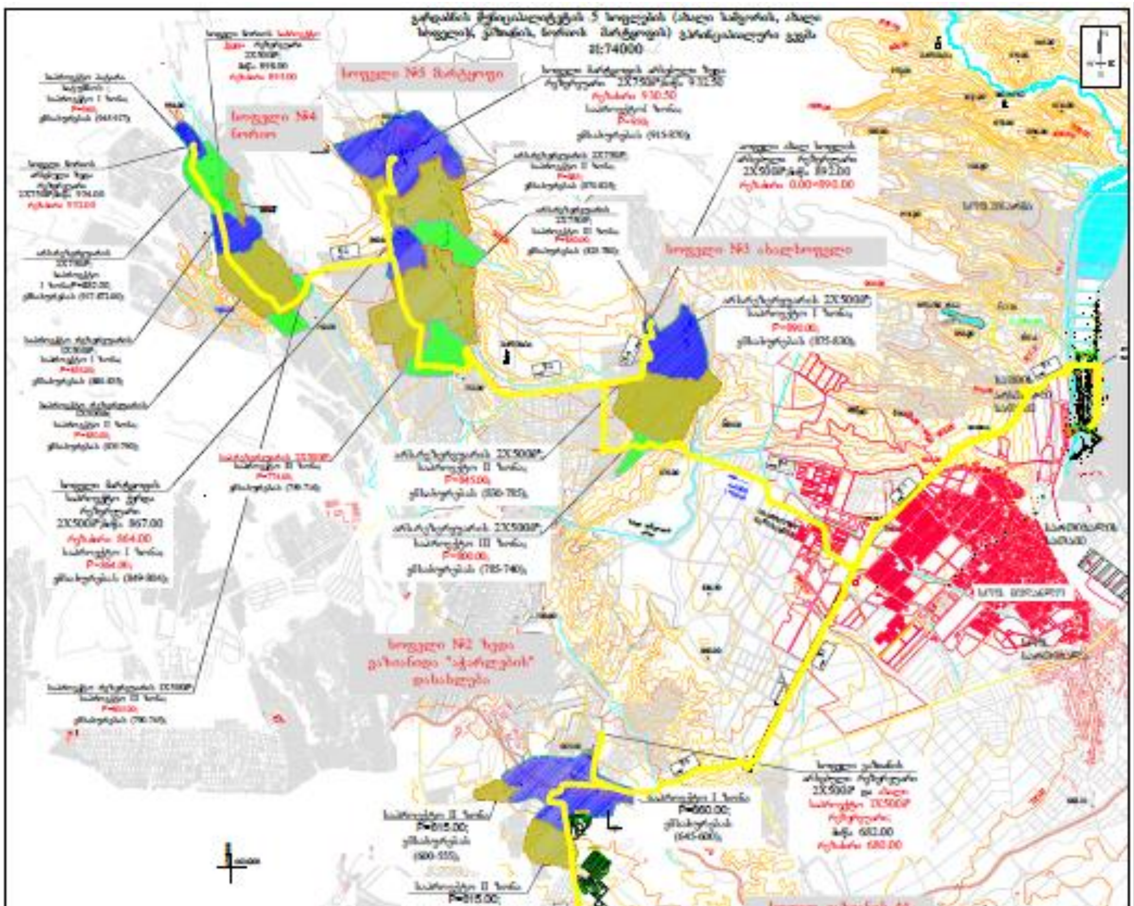
Annex 1 – photo materials and situation plan of the SP

Location for water pipeline 	Location for water pipeline 
Location for water reservoir 	

Ortho-photo of the SP site

Situation plan of the SP

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