



**Enhancing water supply system for village Omalo and arrangement
of sewage system for hotel “Samzeo” in Omalo, Akhmeta
Municipality, Tusheti
(Public Private Partnership)**

Environmental Review

**WORLD BANK FINANCED
REGIONAL DEVELOPMENT PROJECT**

**Tbilisi, Georgia
July 2016**

ABBREVIATIONS

CH	Cultural Heritage
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ER	Environmental Review
MDF	Municipal Development Fund
MoE	Ministry of Environment and Natural Resources Protection
MRDI	Ministry of Regional Development and Infrastructure
RDP	Regional Development Project
SECHSA	Strategic Environmental, Cultural Heritage, and Social Assessment
WB	World Bank

Environmental and Social Screening and Classification

This Sub-project (SP) is part of Public-Private Infrastructure (PPI) Investment Program and is delivered in support to Ltd "Samzeo". "Samzeo" Ltd represents a boutique at least 22 room Hotel project, located in the heart of the Omalo village, which is 200 km away from Tbilisi International Airport. Village Omalo belongs to the Tusheti historical Region. According to territorial zoning, it belongs to Akhmeta Municipality. Omalo is a high-mountain (within the range of 1880-2000 meters altitude above the sea level) touristic center. In the summertime, Omalo is visited by quite a lot of tourists. As of the year 2015 statistics, approximate number of Omalo inhabitants was up to 25 in winter period increasing up to 500 inhabitants for summer season, apart from that tourists amounted up to 25,000 including foreign and local visitors. Due to its location and multitude of historical monuments, Omalo has a considerable potential in terms of its formation and development as a touristic and recreational area, therefore the population has constructed private hotels with well-furnished hotel rooms. Private investors are also interested to further promote development of tourist infrastructure, which will be beneficial and accessible to tourists. However, the above-mentioned activities are to certain extent hampered by poor transport conditions and lack of local utility networks. There is no power supply system neither in Omalo nor in Tusheti Region. Although, the village has a common water supply system with upper and lower zone reservoir farms (reservoirs and chlorination plants) and the water supply system is operating efficiently, still there are some 1-2 day interruptions in water supply during drought periods and peaks of water consumption. Thus, it is required to fill the system with water reserve and add a new source. As for the disposal of local wastewater, village Omalo population basically uses simple design earth, or concrete pits, which serve as septic. These facilities are located underground and do not cause insanitariness and environmental pollution.

Plan for "Samzeo" Ltd hotel Development covers about 2 600 m² land plot and includes 3 000 m² estimated construction spaces. Hotel "Samzeo" development implies creation (German Hotel Classification Criteria complaint) of at least 22 room boutique hotel in Omalo, which will be operated by professional hotel management team. Conceptually, the hotel will be designed to offer a synthesis and mix of friend & family getaway atmosphere, as well as providing adventurous and comfortable social gathering during main seasons. Key amenities will include: a restaurant/dining hall, conference facility, and other facilities.

In order to promote tourism development, enhancement of existing water supply system of the village Omalo and construction of new wastewater system is needed as existing water supply system is not sufficient to supply water to the hotel taking into account the further development of the tourism in region, and increased demand on water during peak touristic season. As there is not centralized sewage network and any wastewater treatment unit in village Omalo, provision of the wastewater system is also required for the hotel.

Based on the all above-mentioned the proposed SP envisages enhancing of the village water supply system, arrangement of the water supply and wastewater system for the hotel “Samzeo”.

(A) IMPACT IDENTIFICATION

<p>Has sub-project a tangible impact on the environment?</p>	<p>The SP will have a modest short term negative environmental impact while its long term impact is expected to be positive.</p>
<p>What are the significant beneficial and adverse environmental effects of sub-project?</p>	<p>The SP will have a long term positive social and environmental impact as the village will be provided with additional water recourses and enhanced water supply system. Arrangement of the water supply and the wastewater system for the hotel “Samzeo” will avoid contamination of the environment with waste water generated during the operation of the hotel.</p> <p>The SP is being implemented on the territory of Tusheti Protected Landscape and Tusheti National Park. Expected negative environmental impact is likely to be short term and typical for small and medium scale rehabilitation/construction works: noise, dust, vibration, and emissions from the operation of construction machinery; generation of construction waste. The works for rehabilitation of the existing old water system, installation of the new additional water supply and sewage systems, will have a very low risk of impacts on the protected areas and flora species exiting on the territory of Tusheti National Park.</p> <p>In course of construction activities and hotel operation generation of solid (construction and domestic) and hazardous waste is expected, which can cause contamination of the environment.</p> <p>During operation of the wastewater treatment unit (WTU), 10m³ sludge will be produced annually. Improper management of the sludge can also cause the contamination of the environment.</p> <p>Impacts related to the odors may appear in the process of WTU maintenance, sludge removal and final disposal.</p>

<p>May the sub-project have any significant impact on the local communities and other affected people?</p>	<p>The long term social impact will be beneficial as the SP will play a very important role in terms of tourism and local business development in Tusheti region. The hotel of “Samzeo” Ltd. that is under construction will be given opportunity to be provided with water supply and sewerage systems.</p> <p>Limited and temporary positive impact related to Job opportunities for construction workers during construction and limited during operation is expected. The sub project will be implemented under Public-Private Partnership (PPP) Investment Program to facilitate private sector development in the region and will have positive impact on private businesses and tourism development and creation of additional jobs opportunities during hotel operation as well.</p> <p>Negative impact is short term and limited to the construction site. They are related to the possible disturbance described above.</p>
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(B) MITIGATION MEASURES

<p>Were there any alternatives to the sub-project design considered?</p>	<p>During selection two possible WTU design alternatives have been discussed:</p> <ol style="list-style-type: none"> 1. Treatment of waste water through biological aeration method using compressors and other installations; where waste water is treated in bioreactors using aerators, air lifts and pumps. For power source was discussed operation of diesel generator. 2. Waste water treatment via septic and further re-cleaning of cleaned water on closed type filtration sand fields, no power source required. <p>Due to the fact that there is no centralized power supply system in village Omalo and population utilize solar, helio systems and electricity produced in this way are not sufficient, as far as its production is hampered by bad weather conditions which is quite frequent in mountain areas. So solar energy utilization for uninterrupted operation of WTU, pumps and other facility will not be reliable. Therefore, second alternative was selected, cleaning of wastewater using septic tank, with further retreatment on filtration sites, without power sources. The selected alternative is more economic and effective</p>
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	<p>based on the existing circumstances in village Omalo. Detailed discussion of technical and economic calculations of WTU's alternative options is provided in sub-project's explanation note.</p> <p>There was also discussed alternatives of sediments removal, generated during the septic operation and their final disposal:</p> <ol style="list-style-type: none"> 1. Sediments removal and disposal using sanitation vehicles based on agreement with United Water Supply Company of Georgia. 2. Sediments removal via special pump, drying up using open sludge drying areas and its final disposal at the territory designated by the local municipality in the village Omalo. <p>As, subproject implementation zone and sludge disposal territory will be located near the protected and cultural heritage areas, zones that are under high interest from tourists, and arrangement of open sludge drying areas will have adverse effect on the value of these zones, the first alternative was selected.</p>
<p>What types of mitigation measures are proposed?</p>	<p>The expected negative impacts of the construction phase can be easily mitigated. The contractor will be responsible for the waste disposal at the permitted location, use the quarry materials from the licensed quarries only or obtain materials only from licensed providers, prevent water and soil from pollution (fuel spills due to equipment failure, concrete spills etc.), avoid disturbance of population (noise, dust, emissions) through proper work/supplies scheduling, good maintenance of the construction machinery, etc. Topsoil will be stripped, stored appropriately and used for reinstatement and landscaping.</p> <p>There will be implemented relevant protective measures during construction activities to avoid impacts on protected landscape and flora species. Before starting of the SP required permits should be obtained from the Akhmeta municipality government and Ministry of environment and natural resources protection of Georgia, for implementation of construction works on the territories of Tusheti Protected Landscape and Tusheti National Park. All staff will be strictly prohibited from</p>

	<p>foraging, logging or other damaging activities. Trees along the construction site will be protected from cutting or unintentional damage by marking and cordoning off with fencing, their root system protected and any damage to the trees avoided.</p> <p>Impacts related to operation of the WTU, like odors and sludge generation may be easily mitigated through the WTU proper exploitation and sludge management. Sediments (sludge) will be removed using the special sludge removal vehicles owned by “United Water Supply Company of Georgia”. Machine will arrive in Omalo once a year to pump sludge from the hotel WWT unit, and transport and discharge in Telavi central sewage network. The sludge removal from the WTU will be carried out after completion of touristic season, before closing of the hotel.</p>
<p>What lessons from the previous similar projects have been incorporated into the sub-project design?</p>	<p>MDF have wide experience of implementation of medium and large scale rehabilitation and construction sub-projects financed by various donor organizations. Based on lessons learned from previous projects, design envisages not only rehabilitation of water supply and sewage networks but also arrangement of WTU for cleaning of generated waste water.</p>
<p>Have concerned communities been involved and have their interests and knowledge been adequately taken into consideration in sub-project preparation?</p>	<p>LSG representatives were actively involved in discussions together with beneficiary (Hotel “Samzeo”) regarding SP implementation. Interest and knowledge of local municipality were taken into consideration during the SP planning process.</p> <p>SP-specific EMP will be made available for Omalo community and will be discussed in a consultation meeting prior to the commencement of works.</p>

(D) CATEGORIZATION AND CONCLUSION

Based on the screening outcomes,

subproject is classified as environmental Category

- A
- B
- C

Conclusion of the environmental screening:

1. Sub-project is declined
2. Subproject is accepted

If accepted, and based on risk assessment, subproject preparation requires:

- ✓ Completion of the Environmental Management Checklist for Small Construction and Rehabilitation Activities
- ✓ Environmental Review, including development of Environmental Management Plan

Risk Assessment of Eligible Subprojects

Sensitive receptors of the Natural and Social Environment around a subproject site	Yes / No?	Significant potential impact / high risk (check)	Low potential impact / low risk (check)
Natural Habitats, fragile ecosystems	No	Forests; wetlands; nesting/breeding areas, rest areas for migratory birds, wildlife corridors connecting protected areas, steep slopes, alpine and subalpine zone, green-fields	Strongly transformed urban or rural landscapes, industrial sites, brown-fields
Surface water bodies	Yes	Major rivers and river floodplains, trans-boundary water bodies and their tributaries, lakes; smaller water bodies which have high value for local communities or biodiversity	Small rivers and streams, artificial reservoirs and ponds which are not indicated as having high value for local communities or biodiversity <div style="text-align: right;">✓</div>
Groundwater sources	No	Deposits of the regional/national importance, mineral and/or thermal water sources, high groundwater table	Regular groundwater table
Valuable landscapes	Yes	Protected landscapes, landscapes of outstanding aesthetic value, Green-fields, recreational areas <div style="text-align: center;">✓</div>	Strongly transformed urban or rural landscapes, industrial sites, brown-fields
Physical cultural resources	Yes	Individual or general protection zones of cultural monuments, historical or traditional	No cultural resources

		sites (religious, burial, ritual)	
		✓	
Human settlements	Yes	More than 20 affected households; physical relocation needed	Less than 20 affected households, no physical relocation needed, no land take required
			✓
Geohazards: severe erosion, landslides, flooding	No	Recorded	Not recorded
<p>If a subproject is expected to carry high risk based on any of the above criteria of assessment, it is considered a high risk subproject. An environmental review has to be carried out and an environmental management plan developed;</p> <p>If a subproject is not expected to carry high risk based on any of the above criteria of assessment, it is considered a low risk subproject and an Environmental Management Checklist for Small Construction and Rehabilitation Activities has to be completed.</p>			

Social and Cultural Resource Screening of Subprojects

Social safeguards screening information		Yes	No
1	Is the information related to the affiliation and ownership status of the subproject site available and verifiable? (The screening cannot be completed until this is available)	✓	
2	Will the project reduce other people's access to their economic resources, such as land, pasture, water, public services or other resources that they depend on?		✓
3	Will the 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 project result in the temporary or permanent loss of crops, fruit trees and Household infra-structure (such as 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			
Cultural resources safeguard screening information		Yes	No
5	Will the project require excavation near any historical, archaeological or cultural heritage site?	✓	
If answer to question 5 is "Yes", then OP/BP 4.11 Physical Cultural Resources is applicable and possible chance finds must be handled in accordance with OP/BP and relevant procedures provided in the Environmental Management Framework .			

ENVIRONMENTAL ASSESSMENT

1. Introduction

1.1. Background Information

The Government of Georgia in collaboration with World Bank implements Regional Development Project (RDP). To encourage private sector investments in Kakheti in terms of mentioned project World Bank and the Government of Georgia started implementation of Public-Private Partnership component under RDP.

PPP program in Kakheti includes development of adjacent infrastructure for businesses (roads, arrangement of water and wastewater management, stable electricity, gasification and communication infrastructure) in order to support the development of tourism and agriculture in the region.

Within the PPP program, Ltd “Samzeo” submitted the application requesting arrangement and of the sewerage and water supply system for the hotel in the village Omalo (Akhmeta Municipality). MDF evaluated application, and established that company complies with the eligibility, scoring, and ranking criteria accumulating 10 score points, which means that investor passed World Bank and MDF evaluation criteria.

Village Omalo is located in Tusheti region of Akhmeta municipality, which is one of the most remote places in Georgia. Tusheti is very popular among the local and foreign tourists though quality infrastructure for tourism is not yet developed in the region.

Hotel “Samzeo” will be the first international standard hotel in the region satisfying expectations of foreign and local visitors. The two-storied hotel at least with 22 rooms is arranged at 2,600 m² land area with building space of 3,000 m², which includes the hotel rooms, restaurant/dining hall, conference facility etc. Conceptually, the hotel will be designed to offer a synthesis and mix of friend and family atmosphere.

Due to the existing situation and to support tourism development in the region, the SP aims at enhancing of water supply system for village Omalo and arrangement of water supply and sewage systems for hotel “Samzeo” in Omalo, Akhmeta municipality.

1.2. The Municipal Development Fund as Implementing Agency

The Municipal Development Fund of Georgia (hereinafter: the MDF) is a legal entity of public law, the objective of which is to support strengthening institutional and financial capacity of local government units, investing financial resources in local infrastructure and services and improving on sustainable basis the primary economic and social services for the local population (communities). MDF is designated as an implementing entity for the RDP and is responsible for its day-to-day management, including application of the environmental and social safeguard policies.

MDF prepares and submits to the World Bank for approval the Subproject Appraisal Reports (SARs), with safeguards documents attached. These may include, as case may be, an Environmental Review (ER) along with an Environmental Management Plan (EMP), an EMP prepared using the Environmental Management Checklist for Small Construction and Rehabilitation Activities, and a Resettlement Action Plan (RAP).

Key Stakeholders

Grant Recipient/ Borrower: Government of Georgia represented by the Ministry of Finance
Local Representation: Municipality of Akhmeta; the owners of buildings and structures

Sources of Funding/Financing: World Bank (WB) and Municipal Government (MG)/Government of Georgia (GOG)

Implementing Agency: MDF

Implementation Structure

World Bank (WB) Loan Agreement with the Government of Georgia; Project Implementation Agreement between the Borrower (Georgia) and MDF for the project; Investment Financing Agreement (IFA) for the funding of the enhancing water supply system for village Omalo and arrangement of water supply and sewage systems for hotel "Samzeo" in Omalo, between MDF and the Akhmeta Municipal Government (MG) .

2. Legislation and Regulations

According to the law of Georgia on Environmental Impact Permit (2008), the SP does not require preparation of EIA report and obtaining of Permit on Environmental Impact.

The SP triggers to the OP/BP 4.01 Environmental Assessment and OP/BP 4.11 Physical Cultural Resources of the World Bank.

According to the above mentioned safeguard policies, and the Environmental Management Framework (EMF) adopted for the RDP, the SP has been classified as B (+) category and requires preparation of Environmental Review (ER) and environmental Management Plan (EMP) in compliance with recommendations of the Strategic Environmental, Cultural Heritage, and Social Assessment (SECHSA), and EMF prepared for the project.

The SP has been adopted by the local municipality Sakrebulo.

3. Alternatives

During SP planning there were discussed different types for wastewater treatment, alternatives of wastewater treatment unit (WTU) placement, and ways for sediments removal and final disposal, generated during the WTU operation.

The following two possible design alternatives have been discussed for wastewater treatment:

1. Treatment of waste water through biological aeration method using compressors and other installations; where waste water is treated in bioreactors using aerators, air lifts and pumps. For power source was discussed operation of diesel generator.
2. Waste water treatment via septic and further re-cleaning of cleaned water on closed type filtration sand fields, no power source required.

Due to the fact that there is no centralized power supply system in village Omalo and population utilize solar, helio systems and electricity produced in this way are not sufficient, as far as its production is hampered by bad weather conditions which is quite frequent in mountain areas. So solar energy utilization for uninterrupted operation of WTU, pumps and other facility will not be reliable. Therefore, second alternative was selected, cleaning of wastewater using septic tank, with further retreatment on filtration sites, without power sources. The selected alternative is more economic and effective based on

the existing circumstances in village Omalo. Detailed discussion of technical and economic calculations of WTU's alternative options is provided in sub-project's explanation note.

There was also discussed alternatives of sediments removal, generated during the septic operation and their final disposal:

3. Sediments removal and disposal using sanitation vehicles based on agreement with United Water Supply Company of Georgia.
4. Sediments removal via special pump, drying up using open sludge drying areas and its final disposal at the territory designated by the local municipality in the village Omalo.

As, subproject implementation zone and sludge disposal territory will be located near the protected and cultural heritage areas, zones that are under high interest from tourists, and arrangement of open sludge drying areas will have adverse effect on the value of these zones, the first alternative was selected.

4. Subproject Description

The SP envisages enhancing of water supply system for the village Omalo and arrangement of the sewage system for the hotel "Samzeo" in Omalo

Enhancing of water supply system for the village Omalo

The works for enhancing of water supply system will include arrangement of catchment on the water spring (1÷2,7 l/sec) located at 2,7 km distance westward to the village Bochorma, at 2381 m reference mark. Based on the respective test results, quality of water meets potable water requirements (test results are hereby attached).

From the catchment, connection to the village network will be arranged by means of the gravity pipeline. The above-mentioned route starts at the source catchment reference mark (2381 m altitude above sea level) and ends at the head of the water supply system existing in village Omalo (at 2251 m reference mark), where the water pipeline will be connected to the existing collecting well. Geometric difference between the reference marks is $2381-2251=130\text{m}$; average slope - 0,044, which provides for uninterrupted gravity flow of water through the pipes. The pipeline route passes through complex geographic relief, from the steep slope to the rocky road, with numerous bottlenecks, collapsed shale flanks. It is required to move the debris and clean the road. The pipeline passes through the inner side of the foothill slope (not the steep section), with deepening of 1,5m, which is adopted considering a (1,05+0,45m.) freezing level. The project envisages installation of the water pipeline by using steel pipes, since there is great probability of water remaining in the pipes during wintertime, which may result in their damaging from frost.

Arrangement of the Hotel Water Supply System

According to the design, water supply to the hotel under construction will be performed through connection to the pressure pipeline $d=108/4$; $l=3\text{km}$ outbound from the existing upper reservoir, by arrangement of branching with a $d=108\text{mm}$ $l=290\text{m}$ pipe. In the reservoir existing in Zeda Omalo water will be chlorinated by using the existing chlorination facility, for this purpose it is required to supply chlorine-containing agent to the building. One valve will be installed on the branching of the pressure pipeline, the other one will be installed on the existing pipe, which will regulate distribution of water discharge. In the same place, at 2010,5 meter reference mark, at 290 meter distance from the hotel, a $4X4X4(h)$ size 50m^3 capacity reservoir will be installed for storage of regulation, emergency fire-fighting reserves. Capacity of the reservoir is calculated considering an expected 24-hour water discharge rate.

Arrangement of the Wastewater System

For provision of the hotel with wastewater system and required water treatment unit, a respective feasibility study was carried out and various alternatives of treatment were discussed. Based on the fact that there is no centralized power supply in village Omalo and the population in most part utilizes solar helio - devices for obtaining hot water, and generates electric power by means of solar batteries. 3,6kwt/h energy source is required for putting into operation of the treatment unit, which due to mountainous conditions (cloudiness, rainy weather) is rather costly and cannot be considered as a reliable source, a decision to utilize two-stage complete biological treatment was made based on technical-economic analysis of various alternatives.

This type of treatment in particular implies:

I stage – clarification of water in the septic with sludge digestion. 30mg/l. suspended particles; with reduction to 30mg/l. of biological oxygen demand;

II stage – biological treatment of water in the sand filtration grounds, as a result of which 15mg/l suspended particles will be derived with reduction to 15mg/l. of biological oxygen demand;

Therefore, the project envisages arrangement of the sewage header, treatment unit, septic, filtration grounds, retaining wall, chlorination facility and such other required utilities. According to the design solution, a 150m³ (10X6X2,5(h) typical septic and underground filtration grounds will be arranged, where the wastewater will undergo complete treatment, and as a result of this process initial 360mg/l. concentration of biological oxygen demand will be reduced to 15mg/l. Capacity of the septic will be calculated based on the number of hotel rooms and expected daily volume of wastewater and considering reserves.

After lead-time in the septic tank and its treatment, the water will be discharged to the distribution contact well, in case of necessity of restoring conveyance capacity of filtration grounds in the contact wells, chlorinated water will be supplied to them occasionally.

From septic store water flows into filtration ground via distribution contact chamber with dimension of (26X8)X2, which consists of two sections. Water distribution system is designed at filtration grounds with perforated polyethylene D=160; PN10 mark pipes with length of 258m. Also water conduit distribution polyethylene pipes d=160; PN10; pipeline of perforated pipes with length of 258m will be collected into two cleaned water inlet well. Water distribution system pipe will be connected down into well N9;10; inlet distributing pipe for simple cleaning purpose will connect to well N 9 and N10 at upper section and end with dead double flange, with stainless wrench-bolts and with rubber gaskets. Cleaned water will be collected in these wells, where secondary chlorination will be conducted with dose of 3 gr/m³.

Cleaned water through corrugated pipe d=200mm will go to catchment gully and end with concrete heads with dimension of 0,5X0,5X0,5(h); at sewerage header into well N18 two valves will be installed with epoxy coating, from where starts emergency bypass line d=200mm corrugate pipe.

Septic working mode will depend on hotel complex mode and tourist season (4-6 months). By the end of the season pipes and septic should be discharged from water, washed, sealed and prepared for next season. Steel pipe d=50mm is delivered on WTU in order to provide drinking water quality for cleaning filtration ground pipes and for chlorination needs. In septic tank, during 180 days approximately 9.4m³/year sediment will be accumulated which is 6.3 % of septic volume. It should be removed after season completion once in a year. In case of necessity filtration pipes will be washed with provided chlorinated water into contact chamber. Recovery of filtration layers is possible with its processing by low concentration of chlorination water (10 gr/m³) which should be done episodically (once in 3-4 months) with spraying limy chlorine 2% water solution 3-6 lit. on 1 meter (length of the pipe). It should be conducted simultaneously with washing one section of the septic.

Controlling of WTU operation will be conducted one time during 4 months, which implies water sampling from filtration site drainage system, laboratory testing and registering.

Water chlorination should be done with amount of 5mg/l in well N11, in compliance with hotel water consumption and based on laboratory analyses conducted into cleaned water to check chlorine concentration. For quick analyze express laboratory tests can be applied. For chlorination and in case of septic's emergency discharge in well N11 arrangement of independent pipeline d=32mm chlorine resistant, high pressure polyethylene pipe is foreseen. Chlorination (3,6X3,6X3,6(h)) unit will be located at the beginning of WTU on high benchmark for gravity delivery of chlorinated water. Single grouted chlorine resistant tanks - two solvent and one dispenser tank will be placed the in chlorination building. From the building chlorinated water flows into contact well through chlorine resistant d=32 pipe and into well N11 where cleaned water outlet pipe and emergency pipe connect.

Treated water through 74 m length outlet pipe will be discharged into the natural gorge and absorbed by soil or evaporated along the 720 meter long ravine. Consequently, flowing of the treated water into the nearest surface waterbody is not expected.

Distance from WTU territory to the hotel is approximately 177 meters and to the nearest residential building 296 m. SP envisages fencing of sanitary protection zone with galvanized grid and gate installation.

Expected duration of the SP is 4 months.

5. Baseline Environmental Conditions

Location and population

The SP site is located in the historical region of Tusheti and comprises villages Omalo and Bochorma and their adjacent territories, and comprises populated and non-populated territories. According to territorial zoning, it belongs to Akhmeta Municipality, Kakheti region, Georgia.

Akhmeta municipality is located in the north-east part of Georgia, bordered by Dagestani Republic and Telavi Municipality from the east, Sagarejo and Telavi Municipalities from the south, Dusheti and Tianeti Municipalities from the west and Republic of Chechen-Ingush from the north.

The most of the municipality's territory is presented with a hilly relief. The slopes of Caucasian Mountains make up the Northern and the central part of the municipality. The municipality area is 2583 sq. km that is the 3.1% of the whole territory of Georgia.

Tusheti is located on the northern slopes of the Greater Caucasus Mountain Range. Altitude of Tusheti is 1650-4493 meters; the region occupies about 896 square kilometer area and has the shape of an irregular pentahedral depression, with its south-eastern axis reaching 40 km in length and 25 km in width.

SP will be implemented in a high-mountain (within the range of 1880-2000 meters altitude above the sea level) area having a considerable potential in terms of its formation and development as a touristic and recreational center. It lies between the Greater Caucasus Mountain Range and the Pirikita Range of Tusheti. Due to its high mountain location (1880 meters above sea level) on the northern slopes of the Greater Caucasus Mountain Range and the absence of well-maintained roads, region was largely isolated from the rest of Georgia for most of the year. The only access road is through the Abano-Pshaveli-omalo motor road that passes at 2,850 meters above sea level. Distance from Akhmeta to Omalo is 90 km.

Population of Kakheti region amounts to 318. 900. Akhmeta Municipality: total number of community population is 41.641, Minorities -25%, IDP-s-20, vulnerable - 1275 (social package recipients) and people living below poverty level 27.6%.

Village Omalo, as well as the other villages of Tusheti mountainous region due to its hard climate and living conditions, is abandoned by the local residents and there are no permanent residents. The owners of the houses visit their historical living places in summertime. In recent years, region is visited by quite a lot of tourists, but due to its location and climate conditions touristic season covers only summertime (start in late June and ends in the beginning of September). As of the year 2015 statistics, approximate number of Omalo inhabitants was up to 25 in winter period increasing up to 500 inhabitants for summer season, apart from that tourists amounted up to 25,000 including foreign and local visitors

Climate

The climate is cold and belongs to Alpine Climatic Zone. According to the climatologic data (Omalo data), in the vicinity of the road alignment the average annual temperature is + 3,50C. The absolute minimum is -360C, the absolute maximum of + 310C. The annual volume of precipitation is 748 mm. Snow cover weight is 110 KPa. 121 is the number of days with permanent snow cover. Standard depth of seasonal soil freezing for coarse-grained soil is 171 cm. Maximum wind velocity once in every 20 years - 18 m/sec. The prevailing wind direction is north and north-west.

Geology and geomorphology

The both longitudinal gorges (Prikita and Gometsari Alazani valleys) of Tusheti, and Nakaicho-Makratela ridge are built of Jurassic slate. In several places, there are intensive accumulation of limestone travertine. Flora developed on the substrate like this is fairly peculiar and differs from the other flora species presented on the rest of areas.

In the eastern part of Tusheti, the difference between altitudes is more than 2500 m; the lowest point is located at 1600 m level and the highest one - at 4275 m altitude above the sea level. The relic erosive plains are preserved in the areas of villages Shenako, Lower Omalo and Diklo, adjoining the area of inflow of both Alazani rivers (Pirikita and Gometsari).

Brief description of hydrographical network

The town of Akhmeta is situated on the intersection of three rivers: the Alazani, the Ilto and the Orvili.

The rivers of Tusheti (Alazani, Ilto and Orvili) are rich in River trout (*Salmo trutta fario*). According to the present data, four species of reptiles are found in Tusheti such as: Smooth snake (*Coronella austriaca*), Grass-snake (*Natrix natrix*), Dice snake (*Natrix tessellata*) and the Transcaucasian ratsnake (*Elaphe hohnackeri*), there are also six species of amphibians: the Green Hop toad (*Bufo viridis*), Caucasian Hoptoad (*Bufo verrucosissimus*), Asia Minor frog (*Rana macronemis*), Common Tree-frog (*Hyla arborea*), Caucasian Mud-diver (*Peodytes caucasicus*) and a Pond frog (*Rana ridibunda*).

Tusheti Protected Landscape - Tusheti Protected Landscape is located on the Akhmeta Municipality territory and its area is 27,903 ha. The Protected Landscape was established in **2003** and includes all villages existing in Tusheti. This type of protected areas allow sustainable use of natural resources and development of eco-tourism in order to contribute towards conservation objectives and traditional agricultural sectors development.

Tusheti protected landscape is distinguished by charming historical villages of Tusheti. There are preserved unique cultural heritage monuments, villages, folk-art patterns, agricultural tools and household items in these villages.

Spectacularly Tusheti varies from other protected areas, because here natural monuments are combined with historical and cultural buildings, traditions, rites and customs.

Protected landscape is managed by the Administration established by a local Municipality, which governs the area in cooperation with the Agency of Protected Areas.

Tusheti National Park — The park established in 2003 and occupies an area of 83007 hectare. It is located in the eastern part of the Caucasus, in Tusheti depreition, at an altitude of 900-4800 meters. There are preserved alpine meadows, glaciers and river outfalls, some important cenoses, rare and endangered animal species and endemic relics unit species in the Tusheti national park,also, the unique pine forest and the represented foresting species - birch, high-mountain oak, mountain ash, sawlow.

Tusheti National Park is managed by Tusheti Protected Areas Administration.

Vegetation

The vegetation of Tusheti is characterized by high level of endemism. 230 representatives of domestic flora are endemic to Caucasus (more than 20% of total amount of Caucasus endemic species) and 11 species are endemic to Georgia.

Among endemic species found in Tusheti Strict Nature Reserve and Tusheti National Park the following can be distinguished: Tushetian Monkshood (*Aconitum tuscheticum*), Iberiaarberry (*Berberisiberica*), Bellflower (*Campanula*), Bearnutttree (*Corylusiberica*), lily (*Pancratium*), Tushetian Dog-rose (*Rosa tuschetica*), Tebulo's buttercup (*Ranunculus tebulosus*), et al. Some endemic species to Caucasus can be found here, such as: Black or Radde's birch (*Betula raddeana*), Caucasian fritillaries (*Fritillaria caucasica*), yellow Caucasian fritillaries (*Fritillaria lutea*), Juliana Primrose (*Primula juliae*), Caucasian rhododendron (*Rhododendron caucasicum*), squill (*Scilla arborea*), etal.

Fauna

60 species of mammals, about 120 species of birds, 4 - of reptiles, 6 - of amphibians and 1 species of fish are widespread in Tusheti.

These weathered slopes of Caucasus and inaccessible cliffs are the homeland of the East Caucasian tur, chamois and Bezoar goat. Another Caucasian endemic species – the Caucasian Snowcock, is a neighbor of tur. One more beauty of nature – Caucasian Black grouse lives in the Caucasian rhododendron shrubs and birch groves.

The representative of large ungulate animals Roe deer can be often found in the forests of Tusheti and very rarely – Red deer. Wild boar regularly visits Tusheti from neighboring Dagestan.

History and Culture

The first known information about Tusheti's history comes from the 3rd century BC, during the reign of King Parnavaz. Ptolemaos, a Greek geographer from the 2nd century AD, provided the first known written

information about the tribes – known as the “Tus-Koi” - living in the Caucasus Mountains. According to artifacts found during the archeological excavations, the region was settled as early as the Bronze Age. Ruins from pre- and early Christian fortresses, burial mounds, cultural sites and residential houses were discovered here. Archeologists have also found burial mounds with jewelry, copper and ceramic dishes, weapons, horse decorations, and households and ritual items.

Every village of Tusheti is a historical monument in itself. There are monuments of cultural and economic value: summer dwellings and their adjacent territories in the gorges of Kvakhidistskali, Larovanistskali, upper stream of Gometsati’s Alazani and Tsovatiskskali.

Some important facts from the reality of Tusheti past and present have to be taken into consideration:

A) Mixture of Orthodox Christian & Pagan believes:

During the 4th century AD, Tusheti was a hideout for mountainous pagans fighting against Christianization. According to local legend, the region has always been a safe haven for people on the run – either from enemies during wartime or nobles during peace. By the 9th century the Tushi population converted to Christianity and had established close ties to the rest of Georgia, especially Kakheti. Although Tusheti had close contact with the other parts of Georgia, it developed differently. For example, during the medieval ages feudalism did not reach Tusheti. During long winter seasons, the region was partly isolated. Several reasons determined the mixture of Christianity and rare elements of pagan customs in reality of Tusheti. Places of worship for the Tushi are known as "Icons and Crosses", where shrines for their protective deity were housed in stone structures. These sacred spaces are shaped like a square, with a small entrance from one side. Together with the sacred building, there are small huts for prayers, a cellar and a brewery. Sometimes the shrine is decorated with horns of deer and Caucasian goats. Each of the shrines is dedicated to a different deity. There are number of stories about the worshiping places of Tusheti. All of the worshiping places still have their own importance.

B) Some periods of development in Tusheti are still unknown, although it is a fact that for centuries the population was divided into clan-communities. This form of the social hierarchy was satisfactory for a people living without a central leader or government. However, this type of leadership is only realistic if there are no conflicts in society, since public opinion is the only real form of influence and people depended on their neighbors to keep their word and fulfill promises. In this society, all men had equal rights and freedoms. Preference was given to intelligence, experience, compassion, oratory skills and courage, with power being passed through the generations of clans gradually. The region has withstood many wars during their violent history but the people’s spirit has never been broken. Still nowadays people respect fairness, honesty and integrity. These characteristic features should be taken into account while negotiating or discussing important issues to community. All initiators of all projects related to Tusheti have to avoid disintegration of community identity.

C) Architectural value of village Omalo:

Old Omalo and Keseli fortress existing there was constructed in XVIII century and is represented by the following historic buildings:

1. Barn
2. Keseli fortress
 - a) Upper tower
 - b) Middle tower
 - c) Lower tower
3. Residential buildings 1-7;
4. Mill

5. Burial Ground

Due to its old age and rare and vernacular architecture, Village Omalo (Old Omalo) was included in the list of cultural heritage monuments of national importance under the Decree N665 of November 7, 2006 of the President of Georgia. There is an Omalo Ethnographic Museum functioning in the Keseli fortress, in Village Omalo.

D) One of the treasures of Tusheti is the local cuisine, known for its diversity, environmentally clean products and talented chefs; in Tusheti both the men and the women prepare food. The population produces cheese from the milk of the local sheep, known throughout Georgia for its quality. It is 35.88% cream. Cuisine of Tusheti and unique cheese can be considered as one of the highlights supporting rural tourism development in Tusheti.

E) Folk Traditions

The people of Tusheti work very hard. For centuries they built towers and bridges, made beautiful rugs, nags - a decorated bag used while traveling by horse - and colored socks, and Nabadi coat and hats from felt. They also wrote poems and songs, which were passed from one generation to another.

During their migratory life in the 13-14 centuries, the people of Tusheti produced a "Tushi sheep" as a result of selection process, in full compliance with their rugged climate and terrain. These sheep are able to walk long distances and provide high quality wool, which is later processed and rugs and socks are made.

The population prides itself on its wool production, which is still done, by women, according to the old customs which produce little waste. The wool is used to make rugs that are famous throughout the country for their unique colors and designs. Women use natural dyes and the rugs are sewn in cross patterns, although various geometrical figures, animals and birds are also used. The wool is also used to make Tusheti hats, a wool cap that warriors traditionally wore under their helmets for further protection during battles. In families these hats were made by the women, while they were produced by workshops in the lowlands.

Sheep traditionally have played a major role in the Tusheti economy and most men work as shepherds. However there are also crops like barley and wheat. Handicraft production is valuable addition to community's income from tourists and visitors.

F) A significant part of life in Tusheti is dedicated to entertainment and recreation. By tradition, the year – and its holidays – are strictly managed according to a very unique calendar that dictates when people must work and when they can rest. According to a set calendar, which is calculated after Easter, the cycle of festivities begins in the villages 100 days after Easter. Just like their ancestors, locals hold celebrations, brew beer and prepare a lot of food. Celebrations in Tusheti start with a prayer, and then there is a horse-riding competition, where winners are given flags and sheep as a prize. Celebrations close with songs and dances accompanied by the accordion.

Celebrations of Tushi people are great festivals, combined with colorful rituals.

Tourists are always welcome to attend or participate in local festivals. These dynamic festivals often are key reasons for tourists to travel to Tusheti. However, it should be special limits while constructing or developing new infrastructure to keep alive this "fragile land".

Existing Infrastructure:

There is a common centralized water supply system in the village with an upper and lower zone reservoir farms (reservoirs and chlorination plants). The water supply system is operating efficiently; still there are

some 1-2 day interruptions in water supply during drought periods and peaks of water consumption. Thus, it is required to fill the system with water reserve and add a new source.

There is missing power supply system neither in Omalo nor in Tusheti Region. Mostly, the population utilizes solar helio - devices for obtaining hot water, and generates electric power by means of solar batteries.

There is no municipal sewage system in Omalo. Population uses earth or concrete dry pit toilets. Waste water drains down earth canals and is freely released.

Distance to the nearest licensed borrow pit is approximately 72 km.

Distance to the nearest official municipal landfill is approximately 102 km.

6. Analysis of Potential Impacts

6.1. Construction Phase

Social Impacts

- **General set of social issues.** The long-term social impact will be beneficial (improvement of local population living conditions and growth of tourist flow, attraction of private sector investment in tourism infrastructure). Significant social impact of construction activities, like change of local demographic structure, influx of new settlers, secondary development, job opportunities, and an increase of AIDS risks is not envisaged.
- **Resettlement Issues.** No new land take and involuntary resettlement are expected.
- **Positive impact related to Job opportunities for construction workers.** Limited and temporary.
- **Traffic Disruption.** The main road leading to Tusheti villages passes through village Omalo which may be impacted depending on the volumes of construction material to be delivered and the location from where it shall be provided. The contractor will be responsible for the arrangements for keeping traffic disruption to the possible minimum. Due to complexity of landscape and challenging nature of driving through Tusheti, special attention should be given to technical condition of all types of vehicles (trucks, construction machinery, etc.) to be used during works in Tusheti. Horses and such other transport might be required for the transportation of construction materials from borrow pits and motor road to the site.
- **Safety and Access.** There will be reduced access to areas adjacent to SP site and potential hazards to vehicles and pedestrians during rehabilitation downtime.
- **Impact on cultural heritage.** All residential houses, buildings of worship, community buildings and towers are under high risk of damage & collapse. There is a risk that vibration and upheaval by heavy equipment may cause damage of historical buildings.

The implementation of the civil works envisaged under the SP may cause the risks of the non-specific and specific impacts, which are described below.

Non-specific¹ possible impacts related to:

¹ Note: under this item we consider only the impacts related to the civil works on infrastructure rehabilitation. Impacts on cultural heritage related to specific conservation/restoration activities focused directly on the monuments

- Generation of construction waste;
- Noise, emissions and dust generation at the construction sites and material transportation routes;
- Safety on construction site;
- Traffic disruption;
- Damage of existing underground infrastructure and utilities;
- Construction run-off leading to soil/ water pollution
- Exploration of quarries for the needs of construction material supply
- Risks of soil and/or water contamination due to improper waste and hazardous material management, improper vehicle maintenance and fueling operations, fuel leakages etc.
- Damage to natural vegetation
- Disturbance of fauna
- Generation of waste and pollution due to poor sanitation in workers camps
- Specific type of indirect impacts on cultural heritage, related to the cases when unsuitable facilities are constructed and operated near the historical monument, sacred sites, cemeteries, traditional recreational or leisure zone change the perception and “atmosphere” of monument or site, affect traditional way of life and habits of local community.

Construction activities within the historical/cultural zone are always associated with certain risks of physical damage to valuable historical or architectural buildings, monuments or archaeological sites. Excavations in close vicinity with the buildings, vibration related to vehicle operations and heavy equipment may lead to structural damages of historically valuable buildings. Excavations may damage archaeological artifacts.

Pollution Related Impacts

Improper handling, storage, use and disposal of construction materials and wastes could pose a risk of water/ soil contamination at the construction site and storage site. Improper maintenance and fueling of equipment could also lead to potential contamination of soil and to some extent – water (near the crossings of the unnamed seasonal stream). The latter is less probable.

Soil Pollution

Potential pollutants from a project of this nature include the following (this list is not exhaustive):

- Diesel fuel, lubrication oils and hydraulic fluids, antifreeze, etc. from construction vehicles and machinery
- Miscellaneous pollutants (e.g. cement and concrete)
- Construction wastes (packaging, stones and gravel, cement and concrete residue, wood, etc.)

Extremely small amount of hazardous wastes (e.g. waste oils, oily rags, spent filters, contaminated soil, etc.) constituting about 0.1% of total amount of the wastes.

Water Pollution

Water pollution may result from a variety of sources, including the following:

- Spillages of fuel, oil or other hazardous substance, especially during refuelling
- Releasing silty water from excavations
- Silt suspended in runoff waters (“construction water”)

- Washing of vehicles or equipment
- Exposure of contaminated land and groundwater

Spillages may travel quickly downhill to a watercourse or water body. Once in a watercourse, it can be difficult to contain the pollution that can then affect a wide area downstream. It is therefore vital that prompt action is taken in the event of any potential water pollution incident.

Once the working width has been stripped of topsoil, the subsoil becomes exposed. During earthworks in a wet weather, this may result in uncontrolled release of suspended solids from the work area.

Air Pollution and Noise

Potential impact of air pollution is minimal and related to operation of vehicles and heavy machinery at the construction site and during transportation of materials.

- Noise and vibration arising from heavy machinery and vehicles
- Air emissions (from vehicles, bulldozers, excavators etc.)
- Dust (from vehicles).
- Fumes may be a concern linked to supply and transportation of materials

Construction Related Waste

Inert Construction Wastes

The following types of inert waste are anticipated to be generated as a result of these activities:

- Natural materials (soil and rock);
- Contaminated soil with non-hazardous substance or objects;

Non Hazardous Construction Wastes

In summary, the main non-hazardous construction wastes will include the following:

- Timber (small amount of removed bushes).
- Metals (including scrap metal and wire) – negligible amount of metal waste is expected.

Hazardous Construction Wastes

Small quantities of the hazardous wastes will arise mainly from the vehicle maintenance activities. A number of hazardous wastes, which could be generated, includes:

- liquid fuels;
- lubricants, hydraulic oils;
- chemicals, such as anti-freeze;
- contaminated soil;
- spillage control materials used to absorb oil and chemical spillages;
- machine/engine filter cartridges;
- oily rags, spent filters, contaminated soil, etc

Transport related impacts

- Noise & Vibration Impacts
- Traffic congestion (nuisance)
- Air pollution
- Refuelling, maintenance and vehicle cleaning and related risks of soil and water contamination

Topsoil losses due to topsoil stripping

- Topsoil washout due to improper storage and reinstatement
- Silt runoff to watercourses and water bodies
- Exposure of contaminated land

Flora. Potential impact is minimal, because subproject will not require clearing of considerable areas from vegetation, or cutting trees. This would imply compact temporary placement of construction materials and waste at the work site, movement of vehicles strictly along the existing earth roads, and quick backfilling of earth upon laying of a water supply sewage pipelines.

Fauna. As long as the works are to be carried out inside and in immediate proximity to the village, no direct impact on fauna is expected. One indirect impact may be disruption of animals from excessive noise from the work site, which may be mitigated by keeping machinery in good technical condition, minimizing the use of noisy technological processes, and respecting work hours. Another negative impact may come from poaching. Construction workers must be strictly forbidden from hunting.

Landscape. The project design does not envisage any substantial changes of landscape. The works for rehabilitation of the existing old water system, installation of the new additional water supply and sewage systems, will have a very low risk of impacts on the protected areas and flora species existing on the territory of Tusheti National Park. The original relief will be reinstated. The only irreversible impact is limited to cutting of small amount of bushes during the headwork and pipeline construction.

6.2. Operation Related Impacts

- Increase of the number of tourists will result in the increased volume of waste and waste water; mismanagement of the waste may contaminate and damage the existing environment.
- During operation of WTU, 10m³ sludge will be produced annually. Improper management of the sludge can also cause the contamination of the environment;
- Impacts related to the odors may appear in the process of WTU maintenance, sludge removal and final disposal;
- Activities such as tours to archaeological sites may conflict with local traditions and/or religious beliefs.

7. Environmental Management Plan

Based on the expected impacts on social and natural environment and on cultural heritage, and proposed mitigation measures described above which are related to the construction activities under the SP, environmental Management Plan (EMP) has been developed, which is attached (page 28) and is an integral part of this ER. ER including EMP is part of the civil works contract and implementation of EMP requirements is binding for the contractor.

7.1. Institutional Framework for EMP Implementation

Civil works contractor is obligated to adhere to the EMP and good construction practices. In order to meet this obligation, a contractor shall have at least one environmental specialist in the team, who is able to fully understand recommendations of the EMP and professionally apply prescribed mitigation measures to the contractor's daily operations.

Construction Contractor requirements

The contractor is required:

1. To obtain construction materials only from licensed providers;
2. If contractor wishes to open quarries or extract material from the river bed (rather than purchase these materials from other providers), than the contractor must obtain licenses for inert material extraction;

3. If contractor wishes to operate its own asphalt plant (rather than purchase these materials from other providers), then the contractor must obtain an environmental permit with an established ceiling of pollutant concentrations in emissions;
4. If contractor wishes to operate its own concrete plant (rather than purchase these materials from other providers) than the contractor must prepare technical report on inventory of stationary source of atmospheric air pollution and agree it with the Ministry of Environment and Natural Resources Protection (MoENRP);
5. Construction waste must be disposed of at the Telavi municipal landfill in accordance with written agreement with the Solid Waste Management Company of Georgia Ltd, operating under the Ministry of Regional Development and Infrastructure. The records of waste disposal will be maintained as proof of proper management as designed.

Copies of extraction licenses (if applicable), agreed technical report on inventory of atmospheric air pollution for operating concrete plants (if applicable), and waste disposal agreement must be submitted to the MDF prior to commencement of works.

GOST and SNIP norms must be adhered to.

Supervisory company commissioned by the MDF is responsible for establishment of the strong field presence in the SP area and keeping a close eye on the course of works. Along with ensuring consistency with the design and quality of works, the supervisor is mandated to keep track of EMP implementation by the construction contractor, reveal any deviations from the prescribed actions, as well as identify any unexpected environmental issues should they emerge at any stage of works. The company will be responsible for ensuring that the following requirements are met: (i) Georgian environmental regulations; (ii) environmental permits are obtained; (iii) waste is disposed at a licensed disposal site; (iv) any other requirements identified by the MoENRP and agreed with the MDF; and (v) Environmental Management and Monitoring Plans are implemented.

MDF is responsible for liaising with local municipality authorities, local community and the civil works contractors, concerning environmental issues associated with implementation of this EMP and Environmental Guidelines for Contractors.

7.2. Costs of Implementation

Costs of implementing the proposed individual mitigation measures are small and difficult to single out from the costs of construction operations. Nonetheless, it is recommended that Bill of Quantities presented in the tender documentation carry a line item for the disposal of waste and excess materials. Other costs of adherence to good environmental practice and compliance with this EMP are expected to be integrated into the pricing of various construction activities.

7.3. Environmental Monitoring

The Environmental and Social specialists of MDF and representatives of the construction Supervision Company hired by the MDF are responsible for monitoring social, environmental and cultural Heritage issues related to the SP.

Based on risk assessment and the EMP, a relevant monitoring program has been developed. Monitoring of sensitive receptors should be implemented before, during, and after construction and during

operation of the camp site. Types and Frequency of monitoring may vary from simple visual inspection to complex analyses, depending on the risks. Monitoring measures include site supervision, verification of permits, monitoring of compliance of the contractor's performance and environmental impacts like: noise, dust, soil and water pollution and air emissions etc. The recognized best-practice of monitoring and analytical methods will be used during environmental monitoring of construction site related activities. The results of environmental monitoring and occurred noncompliance / incidents and ways for their resolution will be summarized in the relevant monthly and Quarterly reports.

The environmental monitoring plan for the SP is summarized in the Table below (page 33).

7.4. Reporting on EMP Implementation

Technical supervisor prepares monthly and quarterly progress reports, which include information related to the EMP implementation and environmental performance of the contractor. The reports provide information on the main types of activities carried out within the reporting period, status of any clearances/permits/licenses which are required for carrying out such activities, mitigation measures applied, and any environmental issues emerging in relations with suppliers, local authorities, affected communities, etc. Technical supervisor must highlight any cases of incompliance with EMPs, inform on any acute issues brought up by the contractor or revealed by supervisor himself, and propose corrective actions.

MDF reviews monthly and quarterly progress reports provided by the technical supervisor. The MDF, through its environmental specialists, shall report on quarterly basis (1 report per 3 months) to the WB on the status of environmental compliance of construction works. Such reporting shall contain information on all violations identified and the actions taken for fixing of such cases. MDF shall inform the WB on any major environmental issues at any time, independently from the schedule of regular reporting.

7.5. Remedies Against EMP Violation

MDF, as a client of construction works, will be responsible for enforcing compliance of contractor with the terms of the contract, including adherence to the EMP. For minor infringements, an incident which causes temporary but reversible damage, the contractor shall be given 48 hours to remedy the problem and to restore the environment. If restoration is done satisfactorily during this period, no further actions will be undertaken. If it is not completed during this period, the MDF will arrange for another contractor to do the restoration, and deduct the cost from the offending contractor's next payment. For major infringements, causing a long-term or irreversible damage, there will be a financial penalty up to 1% of the contract value in addition to the cost of restoration works.

8. Public Awareness

ER including EMP will be discussed with beneficiary community prior to commencement of works. The information regarding SP activities should be open and available for all stakeholders.

9. Grievance Redress Mechanism

Appropriate grievance redress mechanisms will be established to solve APs grievance, as required. A responsible person will be assigned to receive, review and react to the APs grievances, as required

ENVIRONMENTAL MANAGEMENT PLAN

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
Pre-Construction Phase			
Obtaining of required permits/licenses and preparation of contracts	Incompliance to Georgian Law and World Bank requirements	<p>Obtaining permits required by Georgian legislation. These include:</p> <ul style="list-style-type: none"> – Permit for disposal (stockpiling) of surplus soil – Licenses for inert material extraction – Permits for production of such construction materials that is required for activity subject to ecological examination. – Other permits required by the national law <p>For waste disposal, agreements should be made with solid waste management companies on household waste and construction waste disposal to the official municipal landfills.</p>	Construction contractor
Consultations with local community and other stakeholders	<p>Incompliance with the World Bank requirements</p> <p>Failure to consider opinion and interests of stakeholders in decision-making</p>	<ul style="list-style-type: none"> – Meeting with local community and other interested parties to provide information about planned activities and obtain their feedback – Public consultation meeting with local population and discussion of SP ER including EMP 	MDF, Construction supervisor
Arrangements for implementation of environmental measures	<p>Incompliance with Georgian Law and World Bank requirements</p> <p>Significant environmental and social impacts</p>	<ul style="list-style-type: none"> – Appointing a person responsible for protection of social and natural environment and EMP implementation (environmental manager) – Training of workers regarding social and environmental protection measures to be implemented – Delivery of supplies required for implementation of planned mitigation measures 	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
Construction Phase			
Construction works, including: <ul style="list-style-type: none"> - Preparation of construction sites - Earth works - Installation of facilities - Machinery operations - Transportation operations 	Deterioration of ambient air	<ul style="list-style-type: none"> - Vegetation clearing prior to commencement of construction works - Proper stockpiling of stripped soil/ excavated ground - Reinstatement of the sub-project territory immediately after finalizing construction works - Covering of loose construction materials during transportation - Imposing of a speed limit for transportation operations - Minimizing idle running time for project machinery - Ensuring that project machinery is in good technical condition 	Construction contractor
	Propagation of noise and vibration	<ul style="list-style-type: none"> - Implementation of transportation operations only during day-time - Limitation of machinery speed in residential areas - Minimization of idle running period for machinery - Ensuring that machinery is in good technical condition 	Construction contractor
	Soil pollution	<ul style="list-style-type: none"> - Provision of staff with toilets and bathrooms. - Ensuring that machinery is well maintained - Refueling of machinery using respectively equipped refueling trucks, and using of drip trays during refueling operations - Refueling and maintenance of machinery only at especially designated sites, where topsoil is stripped and gravel layer is arranged - Ensuring that construction materials are appropriately stockpiled - Ensuring that all spills are cleaned up immediately, and contaminated soil is respectively disposed off - Cleaning up of the entire sub-project territory from construction waste as soon as the construction works are finalized. 	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
		<ul style="list-style-type: none"> – Implementation of the proposed waste management measures. 	
	Water pollution	<ul style="list-style-type: none"> – Implementation of the measures proposed for prevention of soil pollution: <ul style="list-style-type: none"> • Arrangement of silt barriers at topsoil / subsoil stockpiles • Implementation of the proposed waste management measures 	Construction contractor
	<p>Incompliance with the requirements of the “Waste Management Code”</p> <p>Environmental pollution with solid and liquid wastes</p>	<ul style="list-style-type: none"> – Assignment of Environmental Manager and submit an information on his/her identity to the Ministry of Environment and Natural Resources protection of Georgia; – Inventory of the waste, preparation and cause the Ministry of Environment and Natural Resources of Georgia to approve the Waste Management Plan for the Company; – Burning of waste should be prohibited – Separated collection of different types of wastes – Designation of special sites for waste accumulation, and implementation of pollution prevention measures there – Disposal of solid waste (except for spoil and hazardous waste) on landfills, based on the contract made with a Solid Waste Management Company of Georgia. Inert construction waste may be disposed at the site officially allocated by the local municipal government – Hazardous waste should be handed over to the permitted waste management company, on a contractual basis – Spoil should be delivered to a pre-selected site. Permit on the disposal of spoil should be obtained prior to disposal. 	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
		<ul style="list-style-type: none"> – Maintenance of a waste management logbook to record wastes generated on site and waste flow 	
	Impact on traffic flow	<ul style="list-style-type: none"> – Impose speed limitation to the sub-project machinery – Ensure that sub-project machinery move using only pre-determined routes 	Construction contractor
	Health and safety risks	<ul style="list-style-type: none"> – Protection of construction site from random access to the site. – Implementation of measures recommended for air protection and noise abatement – Imposing of speed limitation to the sub-project machinery – Ensuring that sub-project machinery move using only pre-determined routes – Demarcation of work sites and installation of warning signs 	Construction contractor
	Damage to private property	<ul style="list-style-type: none"> – Ensuring that sub-project machinery move using only pre-determined routes – Imposing of speed limitation to the sub-project machinery – Full compensation for all losses incurred 	Construction contractor
	Conflicts with local population or other affected people	<ul style="list-style-type: none"> – Meeting with local population (if required) – Reception and addressing of complaints/grievances 	Construction contractor Construction supervisor, MDF
	Occupational health and safety risks	<ul style="list-style-type: none"> – Informing of the sub-project labor about potential health and safety risks, and instructing them regarding safety measures to 	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
		<p>be adhered (before launching construction works and during civil works)</p> <ul style="list-style-type: none"> – Ensuring that required personal protection equipment (e.g. helmets, gloves, etc.) is supplied and used by workers as appropriate – Ensure safety of machinery operations – Provision of safety signs for high risk zones – Implementation of measures recommended for air protection and noise abatement – inform the personnel about transportation conditions and rules for safe movement 	
	Impact on the protected areas	<ul style="list-style-type: none"> – Protection of the all recognized natural habitats and protected areas in the immediate vicinity of the activity from damage, exploiting or pollution – Arrangement of fencing at construction territory along the Tusheti National Park – Prohibition of hunting, foraging, logging or other damaging activities – Inventory of large trees in the vicinity of the construction site, Marking and cordoning off with fencing of the large trees along the road and protection them from cutting or unintentional damage. 	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
	Impact on cultural heritage	<ul style="list-style-type: none"> – Prohibition of machinery entry in the territories of CH monuments – Cleaning up and reinstatement of the sub-project area immediately after completion of construction works – Suspension of construction operations in case of chance finds during earth works, informing the Ministry of Culture and Monument Protection about the chance finds and resuming works only after issuance of the respective permission. 	MDF, Construction contractor
Operation Phase			
Maintenance of Water supply and sewerage systems	Water supply disruption Environmental pollution with solid and liquid wastes	<ul style="list-style-type: none"> – keeping of the water supply network in good technical conditions – Regularly deliver solid waste from the site to the municipal landfill of Telavi Municipality, on the basis of a contract made with the municipal waste management company – Burning of waste should not be practiced – keeping of the Sewage collector systems and biological wastewater treatment facility in good technical condition – sludge removal from the WTU after completion of tourist season, before closing of the hotel 	Infrastructure Operator company Akmeta Municipality

ENVIRONMENTAL MITIGATION AND 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 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 truck loads with lining; Respect of the established hours and routes of transportation	Construction site	Inspection	Unannounced inspections during work hours and beyond	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
Earthworks	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 Ministry of Culture and Monument Protection, and resumption of works exclusively	Construction site	Inspection	In the course of earth works	Prevent pollution of the construction site and its surroundings with construction waste; Prevent damage and loss of physical cultural resources; Prevent topsoil losses.	MDF, Construction supervisor

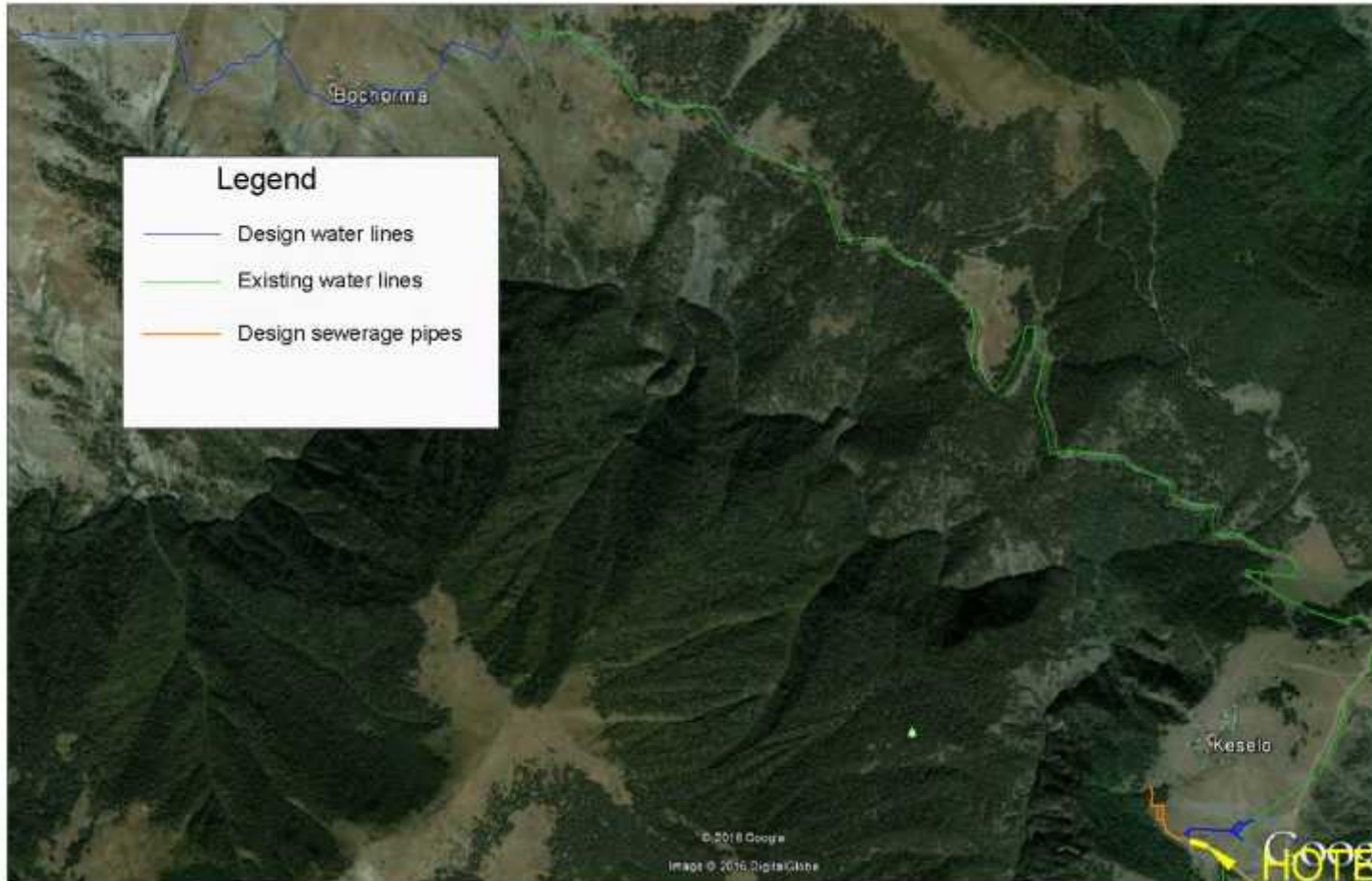
Activity	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
	<p>upon formal consent of the Ministry.</p> <p>Topsoil is striped before starting of the earthworks;</p> <p>Proper topsoil storage practice is applied; Temporary protective silt fencing is erected;</p> <p>Striped topsoil is used for reinstatement and landscaping.</p>			<p>Construction period: starting from topsoil stripping and ending with reinstatement</p>		<p>MDF, Construction supervisor</p>
<p>Sourcing of inert material</p>	<p>Purchase of material from the existing suppliers if feasible;</p> <p>Obtaining of extraction license by the works contract and strict compliance with the license conditions;</p> <p>Terracing of the borrow area, backfilling to the exploited areas of the borrow site, and landscape harmonization;</p> <p>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</p>	<p>Borrowing areas</p>	<p>Inspection of documents Inspection of works</p>	<p>In the course of material extraction</p>	<p>Limiting erosion of slopes and degradation of ecosystems and landscapes;</p> <p>Limiting erosion of river banks, water pollution with suspended particles and disruption of aquatic life.</p>	<p>MDF, Construction supervisor</p>

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?)
	entry of machinery into the water stream.					
Generation of construction waste	Temporary storage of construction waste in especially allocated areas; Timely disposal of waste to the formally designated locations	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
Protection of vegetation and landscape	Construction territory along the Tusheti National Park is cordoned off with fencing. Large trees along the road are marked and cordoned off with fencing and protected from cutting or unintentional damage. Protected area in the immediate vicinity of the activity is not damaged or exploited.	At construction site along the Tusheti National Park	Inspection	Periodically during construction and upon complaints	Protection of adjacent landscapes and vegetation	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						
Generation of waste from maintenance of rehabilitated water supply and sewerage system	Proper management of solid waste	Municipal area	Inspection	Throughout operation of the sport complex	Prevent pollution with solid waste	Akhmeta municipality
Disruption of traffic and pedestrian access during maintenance works	Scheduling of maintenance works in at less busy seasons and proper signage of maintenance area	Sites of the arranged systems	Inspection	Throughout operation of the systems	Minimize nuisance to local residents and visitors	Akhmeta Municipality
Servicing of water supply and sewage schemes	Water supply scheme does not leak and water supply uninterrupted Sewage system operate smoothly	Rehabilitated facilities	Inspection	During operation of facilities	Prevent water loss and water logging of the site Prevent pollution of surface and ground water with untreated sewage	Akhmeta municipality
Sludge management	Hotel is closed; Sludge is removed from the WTU and properly discharged	WTU and hotel territories	Inspection	After completion of tourist season	Prevent pollution of surface and ground water with untreated sewage To avoid damage of waste water	Akhmeta municipality

Attachment 1: Site location and pictures

Map 1: Site Visualization through the google map



Map 2: Arrangement of additional water source and a supply system from that source to the existing water collector chamber



- Map 3: - Arrangement of water supply system (pipeline, reservoir) and necessary connection infrastructure for existing water pipeline;
- Arrangement of cost and energy efficient sewerage treatment system (Chlorination plant, septic and sewerage sand filter) to provide safe sewerage outfall from hotel to the nature;



Connection point of new water pipe to the existing one in Omalo near the Hotel

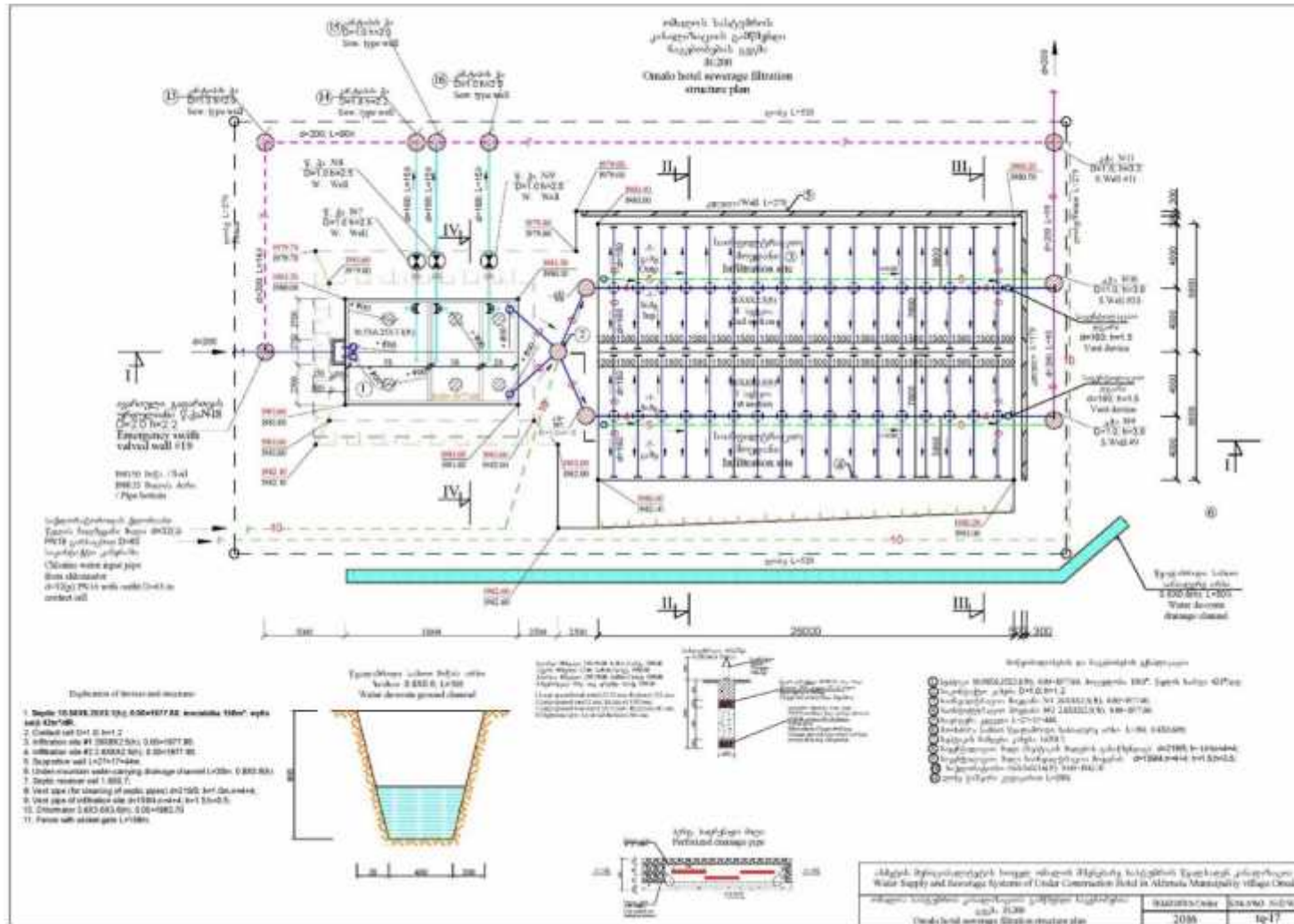


Sewage pipeline road through the path



Attachment 2: Plan and Sections of the Wastewater Treatment Unit

Plan of the WTU



Attachment 3: Water Test Results

გარემოს ეროვნული სააგენტო
 გარემოს დამაინჟინერების მონიტორინგის დეპარტამენტი
 ატმოსფერული ჰაერის, წყლისა და
 ნიადაგის ანალიზის ლაბორატორია
 www.nsa.gov.ge

ხსნ 6

№1124 (I)

ახმეტის მუნიციპალიტეტი
 სოფ. ომალო

№	ინგრედიენტები	ერთეული	მიღებული შედეგები	ზღვ.*	გამოყენებული მეთოდები
1	სიხისტე	მგ/ლ	0.71	7-10	ტიტრიმეტრული
2	ტუტიაინობა	მგ/ლ	34.0	-	ტიტრიმეტრული
3	ნიტრიტები	მგN/ლ	0.010	0.06	ISO 10304-1:2007
4	ნიტრატები	მგN/ლ	0.063	10	ISO 10304-1:2007
5	ფოსფატები	მგ/ლ	0.060	3.5	ISO 10304-1:2007
6	სულფატები	მგ/ლ	3.061	250	ISO 10304-1:2007
7	ქლორიდები	მგ/ლ	0.090	250	ISO 10304-1:2007
8	ზრომი	მგ/ლ	0.017	-	ISO 10304-1:2007
9	ფტორი	მგ/ლ	0.036	0.7	ISO 10304-1:2007
10	E-Coli	300 მლ-ში	2	არ დაიშვება	მემბრანული ფილტრაციის მეთოდი
11	ტოტალური კოლიფორმები	300 მლ-ში	4	არ დაიშვება	მემბრანული ფილტრაციის მეთოდი

ზღვ.* - ზღვრულად დასაშვები კონცენტრაცია

№1124 (1)

ახმეტის მუნიციპალიტეტი
 სოფ. თმალო

№	ინგრედიენტები	ერთეული	მიღებული შედეგები	ზღვ*	გამოყენებული მეთოდები
1	pH		7.26	6-9	ISO 10523:2010
2	რკინა, Fe	მგ/ლ	0.0843	0.3	ISO 11885:2007
3	თუთია, Zn		0.1042	3.0	

ზღვ - ზღვრულად დასაშვები კონცენტრაცია

Attachment 4: Minutes of Public Consultation Meeting