

Draft Initial Environmental Examination

October 2013

GEO: Urban Services Improvement Investment Program – Tranche 3 (Improvement of Ureki Wastewater System)

Prepared by United Water Supply Company of Georgia LLC of the Ministry of Regional Development and Infrastructure for the Asian Development Bank.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

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ინფრასტრუქტურის სამინისტრო
MINISTRY OF REGIONAL DEVELOPMENT AND
INFRASTRUCTURE OF GEORGIA



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2013 / 10 /23

To: Sanjay Joshi
Senior Urban Development Specialist
Central and West Asia Department
Asian Development Bank

Subject: Initial Environmental Examination for Ureki WW Project

Dear Mr. Joshi

The Ministry of Regional Development and Infrastructure of Georgia, herewith, endorses draft Initial Environmental Examination (IEE) prepared for the Ureki Wastewater Project, which is considered to be executed under Urban Services Improvement Investment Program.

Please find attached document.

Sincerely Yours,

Deputy Minister

Shota Murgulia

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October 2013

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Program – Tranche 3
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ABBREVIATIONS

ADB	-	Asian Development Bank
BOD	-	Biochemical Oxygen Demand
CA	-	Cross section area
CC	-	Civil Contractor
COD	-	Chemical Oxygen Demand
DC	-	Design Consultant
EA	-	Executing Agency
EIA	-	Environmental Impact Assessment
EIP	-	Environmental Impact Permit
EMP	-	Environmental Management Plan
GoG	-	Government of Georgia
GRC	-	Grievance Redress Mechanism
IA	-	Implementing Agency
IEE	-	Initial Environmental Examination
IP	-	Investment Program
IPMO	-	Investment Program Management Office
kg	-	Kilogram
km	-	Kilometre
lpcd	-	Litres per Capita per Day
M	-	Metre
MFF-IP	-	Multitranché Financing Facility Investment Program
mg/l	-	milligram per litre
mm	-	Millimetre
MoRDI	-	Ministry of Regional Development & Infrastructure
MPD	-	Maximum Permissible Discharge
PS	-	Pumping Station
SC	-	Supervision Consultant
uPVC	-	Un-plasticized Poly vinyl Chloride
UWSCG	-	United Water Supply Company of Georgia
WS	-	Water Supply
WWTP	-	Waste Water treatment Plant

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EXECUTIVE SUMMARY

1. It is proposed to improve the wastewater system in Ureki and Shekvetili under the Asian Development Bank (ADB) funded Urban Services Improvement Investment Program, which is under preparation stage. This Investment Program, implemented in seven towns, including Ureki - Shekvetili, will develop the water and sanitation services, which will improve quality of life and optimize the social and economic development. Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) and United Water Supply Company of Georgia (UWSCG) is the Implementing Agency (IA) of this Program. This subproject will be implemented from 2014 to 2017. Since the subproject is unlikely to have significant adverse impacts, it is classified as environment Category B, and accordingly an Initial Environmental Examination has been conducted. This is a summary of the IEE Report.

2. Ureki - Shekvetili is located at the Black Sea and lies some 360 km to the west from the capital city of Tbilisi. The service level of wastewater disposal is low. There is no water supply and sanitation system in the project area and the domestic sewage from households is currently discharged into unsealed cesspits, posing a threat to ground water and to human health. The subproject is therefore urgently needed. It is designed to meet the projected demand of 2040. This will be achieved by: (i) construction of a water supply system, which is subject of a parallel IEE, (ii) construction of a new sewer system; and (iii) construction of a new wastewater treatment plant (WWTP), of which the latter two are subject of this IEE.

3. Ureki and Shekvetili are surrounded by agriculturally used land. Animal husbandry for meat and milk products, as well as farming exists within the project area and its vicinity. Potato and corn are the important crops in the area. Industrial activities in Ureki and Shekvetili are of only minor importance. The project area shall be further developed as tourism resorts. Number of tourists in the Borough Ureki during one year on average equals to 50,000 persons. Ureki is equipped with 80 hotel-recreation and retreat centres for the tourists and family hotels of the private sector. The number of tourists in Shekvetili accounts for approximately 2,000 persons. Currently Shekvetili has hotel-recreation and retreat centres and family hotels as well. Further investments are planned in the future.

4. Ureki and Shekvetili do not have a centralized water supply and sanitation system. Population mainly takes water from wells in their yards. The water does not have drinking water quality as it is partly brackish due to its small distance to the Black Sea and it is polluted from the septic tanks located in the direct vicinity of the wells. Sewage is discharged into partly non-sealed septic pits, usually dug near the water wells in the yard, from where the liquid is leaking into the sandy soil. For this reason, the construction of a new wastewater system is required.

5. Wastewater project measures consist of the construction of a new wastewater collection network that covers Ureki and Shekvetili as well as of a new wastewater treatment plant.

6. The new WWTP will be located on a agricultural land between Ureki and Shekvetili, next to the railway line and at a distance of more than 500 m to the next settlements. The main collector will consist of two branches, a northern branch connecting Ureki and a southern branch connecting Shekvetili to the new WWTP. Total length of the main sewage collector is approximately 650 m. Wastewater will be discharged into Sepa River.

7. The Ureki-Shekvetili wastewater treatment subproject is relatively small in scale and involves straightforward construction. Regular maintenance is required. There are no protected areas impacted by the project. Environmental impacts will basically be limited to the construction period. After construction stage the project will have overall beneficial impacts on human health and life quality by providing the inhabitants of Ureki and Shekvetili with an

up to date sanitary system. Also the project will have beneficial impacts on the environment as the Sepa River will no longer be subject to untreated sewage pollution. Water quality and aquatic biota of Sepa River will benefit from the investment. Better water quality in the adjacent Black Sea will also support the tourism development.

8. Most of the predicted impacts are associated with the construction process. Impacts mainly arise from the generation of dust from soil excavation and refilling; disturbance of residents, traffic and activities in the town; increase of silt load in the river; loss of top soil, removal of trees, and from the disturbance to wildlife due to trenches. These are common impacts of construction, and following methods are suggested for their mitigation: (i) Utilizing surplus soil for beneficial purposes; (ii) Measures to reduce/control dust generation (cover/damp down by water spray; consolidation of top soil, cover during transport etc); (iii) Providing prior public information; (iv) conducting no construction in the river bed in fish breeding season; (v) restoring the top soil after construction, (vi) avoiding tree cutting through location alignment changes, and (vii) to avoid safety hazards construction site will be secured at critical segments.

9. There is no health and safety risks associated with the subproject, as the WWTP will be fenced. There will be no access for unauthorized persons. Generation of waste and dewatered sewage sludge is anticipated to be disposed on a waste disposal site.

10. The subproject is likely to have several positive benefits during operation. The citizens will be provided with collection and treatment of their wastewater, which will improve the quality of life.

11. To ensure that all the mitigation measures as suggested are implemented, a program of environmental monitoring is prepared. The Division of Resettlement and Environmental Protection (DREP) of UWSCG will oversee and be responsible for implementation of mitigation and monitoring measures. Provided the mitigation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of the subproject. There should in fact be positive benefits through major improvements in quality of life and individual and public health once the scheme is in operation.

I. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

12. This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

A. ADB Policy

13. Superseding the previous safeguard policies (the Involuntary Resettlement Policy, 1995, the Policy on Indigenous Peoples, 1998, and the Environment Policy 2002), ADB, has adopted a comprehensive Safeguard Policy Statement in 2009 (SPS, 2009). This Statement describes common objectives of ADB's safeguards, lays out policy principles, and outlines the delivery process for ADB's safeguard policy. It applies to all ADB-financed and administered projects, and their components including investment projects funded by a loan, grant or other means.

14. Aiming on promotion and sustainability of project outcomes by protecting the environment and people from projects' potential adverse impacts, the objectives of ADB's safeguards are to:

- avoid adverse impacts of projects on the environment and affected people, where possible;
- minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and
- help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

15. The objective of environmental safeguards is to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. All ADB funded projects are screened at initial stages of preparation and categorized according to significance of the project's potential environmental impacts. Projects are assigned to one of the following three categories:

Category A - Projects likely to have significant adverse environmental impacts, which are irreversible, diverse or unprecedented and may affect an area larger than the location subject to physical works. An Environmental Impact Assessment is required.

Category B – Projects with adverse environmental impacts that are less significant than those of Category A projects, are site-specific, generally not irreversible, and in most cases can be mitigated more readily than for Category A projects. An Initial Environmental Examination (IEE) is required.

Category C - likely to have minimal or no adverse environmental impacts; EIA is not required.

16. The Ureki - Shekvetili WS subproject has been classified as environmental assessment category B (some negative impacts but less significant than category A) according to the criteria laid down in the checklist for water supply projects of the ADB's Environmental Assessment and Review Framework (November 2010) that was especially prepared for the environmental assessment of the Georgia Urban Services Improvement Investment Program.

17. *ADB Review and Approval.* For Category B projects the Draft IEE report is reviewed by ADB's Operational Department (in this case Central & West Asia Department) and after addressing their comments, if any, the EA then officially submits the IEE reports to ADB. Completed reports are made available on the ADB website.

B. Georgian Law

1. Framework Legislation

18. The basic legal document is "The Constitution of Georgia", which was adopted in 1995. While the Constitution of Georgia does not directly address environmental matters, it does lay down the legal framework that guarantees environmental protection and public access to information with regard to environmental conditions.

19. Article 37, Part 3 states that "any person has the right to live in a healthy environment, use the natural and cultural environment. Any person is obliged to take care of the natural and cultural environment." Article 37, Part 5 states that "an individual has the right to obtain full, unbiased and timely information regarding his working and living environment."

20. Article 41, Part 1 states that “a citizen of Georgia is entitled to access information on such citizen as well as official documents available in State Institutions provided it does not contain confidential information of state, professional or commercial importance, in accordance with the applicable legal rules.

21. The **Law of Georgia on Environmental Impact Permit(2007)** defines the full list of activities on the territory of Georgia subject to mandatory ecological expertise. The Law defines the legal aspects of issuing an environmental permit, undertaking the ecological expertise, informing the public and participating in the given procedures. Under the Law, the environmental permit is the authorization to realize the planned activities. Under the Law, an environmental permit is issued by the Ministry of Environmental Protection and Natural Resources of Georgia based on the review/expertise of the application of an applicant for the environmental permit. The aim of the Law is to ensure the protection of a human health, natural environment, physical assets and cultural heritage during the activity.

22. The **Law of Georgia on Environment Protection (1997)** regulates the legal relations between the state establishments and physical or legal entities in the field related to the use of territorial waters, air space, including continental shelf and special economic zones, environmental protection and natural resources on the territory of Georgia. The Law regulates the standards of the environmental protection and issues of environmental management; it describes the economic sanctions, standards and issues of environmental impact, different issues of protection of the natural eco-systems and biodiversity, and global and regional management issues. In addition to the above-mentioned, the Law considers the major principles of waste management. The law defines the ecological requirements for the waste (Article 34). According to the provision of the given Article, an entrepreneur is obliged to reduce the origination of industrial, domestic and other types of waste, ensure their treatment, utilization, placement or burying by considering the environmental, sanitary-hygienic and epidemiological standards and rules. The Law defines the requirements for the placement of toxic, radioactive and other hazardous waste and prohibits their discharge in the surface water sources.

23. **Law of Georgia onLicenses and Permits(2005)**defines the list of activities needing licenses or permits, including so called “Environmental permit”. It also defines the requirements for the license or permit issue. The Law, together with the normative by-laws, regulates such organized activity or action, which relates to an indefinite circle of entities, is characterized by increased hazard to the human life or health, affects particularly important state or public interests or is related to the use of a state resource. The given Law regulates the field regulated by a license or permit; it gives a thorough list of licenses and permits, and establishes the rules to issue the licenses and permits, makes amendments to them or abolish them. Under the Law, a state regulation of the activity or action through a license or permit is undertaken only when the given activity or action is directly associated with the increased hazard to the human life or health or fields of state or public interests. The state regulation is undertaken only when the issuance of a license or permit is a real means to reduce the hazard in question or consider state or public interests. The aim and major principles of regulating the activity or action via licenses or permits are as follows:

- Provision and protection of human life and health;
- Safety and protection of a human’s residential and cultural environment;
- Protection of state and public interests;

24. **The Law of Georgia on State Ecological Expertise (2007).** Under the given Law, the ecological expertise is a necessary measure for making decision on the issuance of environmental and/or construction permit(s). The aim of the ecological assessment is to protect the ecological balance by considering the requirements of environmental protection, rational

use of natural resources and principles of sustainable development. A positive conclusion of the ecological expertise is mandatory for obtaining an environmental and/or construction permit. In addition, the holder of environmental and/or construction permit is obliged to comply with conditions specified in the ecological expertise conclusion. The process of ecological assessment is regulated by the Ministry of Environmental Protection and Natural Resources.

25. The procedure to be observed during ecological expertise, as well as the requirements on forming the expert commission is prescribed in the Provision on the Rule for Carrying out Ecological Expertise, which is approved by the Minister of Environment and Natural Resources Protection of Georgia. The full list of the activities, subject to mandatory ecological expertise for decision making on issuance of environmental permit or building permit, is specified by the Law of Georgia on Environmental Permit.

26. The state ensures protection of the environment and, correspondingly, protection of water as its main component in **The Law Georgia on Water(1997)**. All residents of Georgia are liable to ensure the rational and sustainable use and protection of water. They have to prevent its contamination, pollution and depletion. The dumping of industrial, household and other garbage and wastes in water bodies is prohibited according to this act. The disposal of industrial, household and other effluents into water bodies is permitted on the basis of a license by the Ministry. With the objective of protecting the Black Sea and preserving its ecological system, all natural and legal persons (including foreigners) are obliged to take measures for preventing pollution of the sea with wastewater from the sources of pollution located on the land. The use of a surface water body for discharging industrial, communal-household, drainage and other wastewater is allowed only under a water use license issued on the basis of the Ministry-approved multipurpose water utilization plans and water management balance-sheet.

27. The **Law of Georgia on Cultural Heritage(2007)**. Article 14 of the Law specifies the requirements for 'large-scale' construction works. According to this Article, a decision on career treatment and ore extraction on the whole territory of Georgia, as well as on construction of an object of a special importance as it may be defined under the legislation of Georgia, is made by a body designated by the legislation of Georgia based on the positive decision of the Ministry of Culture and Monument Protection of Georgia. The basis for the conclusion is the archeological research of the proper territory to be carried out by the entity wishing to accomplish the ground works. The entity wishing to do the ground works is obliged to submit to the Ministry the documentation about the archeological research of the territory in question. The preliminary research should include field-research and laboratory works. In case of identifying an archeological object on the territory to study, the conclusion of the arche-ological research should contain the following information: (a) a thorough field study of the archeological layers and objects identified on the study territory by using modern methodologies, (b) recommendations about the problem of conservation of the identified objects and planning of the building activity on the design territory, on the basis of the archeological research.

28. The aim of the **Law of Georgia on Public Health (2007)**is as follows: Promotion of the introduction of a good health and healthy lifestyle of the population; Creation of the environment, which is safe for a human health; Promotion of the protection of the reproductive health of a family; Prevention of infectious and non-infectious diseases. The Law defines the rights and obligations of the population and legal entities in the field of public health. Aiming at establishing the environment safe to the public health, the Ministry sets the qualitative standards for the environment safe for a human health (atmospheric air, water, soil, noise, vibration, electromagnetic radiation), including maximum permissible concentrations and rates of harmful impact. The standards are mandatory. Every person on the territory of Georgia is obliged not to carry out the activity, which causes a hazard of the infectious and non-infectious diseases to spread and helps the origination of the risks to human health;

protect the sanitary and epidemiological standards; to supply the information to the public health department about all emergencies caused by the violation of the sanitary norms in the production or technological process, etc. The observance of the standards is controlled by appropriate state structures. The responsibility for the internal and external audits rests with a certified, independent laboratory.

29. **Environmental Assessment and Review Framework(November 2010, EARF)** was established for the Asian Development Bank funded Georgia Urban Services Improvement Investment Program (or the Investment Program). This is prepared to adequately address the ADB Safeguard Policy Statement (2009) requirements and is to be endorsed by the Georgian government. Projects have to be assigned to Categories A, B, and C. General mitigation measures are listed for anticipated impacts. Following criteria shall be followed during investigation of a WWTP:

- distance to inhabited areas and cultural and touristic spots: at least 500 m
- discharge of the WWTP shall not cause any hazards to downstream users
- flooding of the river shall not endanger operation of the WWTP
- Project design shall ensure that sewage is treated at all times to wastewater discharge standards as per the “Technical Regulation of Environmental Protection, 2008 (Decree No.745), MoEPNR

2. Licenses & Approvals Required

30. Environmental assessment of various activities and development projects in Georgia is governed by the Law on Environmental Impact Permits (EIP). This Law notifies the list of the activities and projects, which are subject to ecological expertise and require Environmental Impact Permit. The Law also makes the public participation mandatory in the process of environmental assessment, ecological expertise and decision making on issuance of an environmental impact permit. Under this Law, various projects/activities have been divided into four categories based on their size, importance and potential environmental impact, and sets out permitting process for each category.

31. None of the components of the proposed water supply improvement subproject in Ureki and Shekvetili are notified in the Law on EIP and therefore environmental impact permit is not required.

32. The requirements related to EIA studies and the EIA report are set forth in the Order N31 of 15 May 2013 of MoENRP.

33. The **Law of Georgia “On the Red List and Red Book” (2003)** regulates the legal relations in the field of developing the Red List and Red Book, protecting and using the endangered species, except the legal issues of the international trade with endangered wild animals and wild plants, which within the limits of the jurisdiction of Georgia are regulated by virtue of the Convention ‘On the international trade with the endangered species of wild fauna and flora’ concluded on March 3 of 1973 in the city of Washington. According to Article 10 of the Law, any activity, including hunting, fishing, extraction, cutting down and hay-mowing, except particular cases envisaged by the present Law, Law of Georgia ‘On animal life’ and legislation of Georgia, which may result in the reduction in number of the endangered species, deterioration of the breeding area or living conditions, is prohibited. The Red List of Georgia was approved by the Presidential Decree No. 303 ‘On approving the Red List of Georgia’ (May 2, 2006).

34. Other National Environmental Legislations and Applicability

Legislation	Applicability	Remarks
Forestry Code of Georgia, 1999	Applicable to works located in forest areas	Requires permission from the Ministry of Economic and Sustainable Development (MESD). The project proponent shall submit application to the MESD, which in turn forwards it to the Forest Division of MoEPNR for its review and advise, based on which the MESD gives an approval to proceed with works in forest areas
Law on Ambient Air Protection, 2000		It stipulates Maximum Allowable Concentration (MAC) of various pollutants in Ambient Air; however the establishment of emission standards for various sources or activities is under process, therefore at present no standards are available
Law on System of Protected Areas, 1996	Applicable to works or activities in protected areas	Depending on the activity and type of protected area, permission for any work will be granted or denied
Technical Regulation of Drinking Water, 2007 (Decree N 349/N), the Ministry of Labour, Health and Social Affairs of Georgia	Applicable to water supply projects	Water supply and monitoring shall comply with the technical regulation
Rules of the Protection of the Surface Waters of Georgia from Pollution, 1996 (№130 order of the Minister of the Protection of the Environment and Natural Resources of Georgia)	Applicable to water supply projects	Source water quality shall comply with the provisions for domestic use
Technical Regulation of Environmental Protection, 2008 (Decree N745), Minister of the Protection of the Environment and Natural Resources of Georgia	Applicable to sewerage projects	Treated effluent disposal from sewage treatment plants shall comply with the specified standards
'Approval of Environmental Quality Standards' – approved by Minister of Health, Labour and Social Affairs [Decree number - 297n of August 16, 2001])		The Georgian standards for noise control as approved by the Decree of the Minister for Health, Labour and Social Affairs (297n of August 16, 2001) upon the 'Approval of Environmental Quality Standards'; specifying the tolerable and maximum admissible levels of noise for different zones

35. Some of the **International Treaties and Conventions** Ratified or Signed by Georgia are provided in the list below.

- Short List of the Ratified or Signed Conventions:
- Ramsar Convention on Wetlands (1996);
- United Nations Framework Convention on Climate Change (UNFCCC) (1994);
- Kyoto Protocol (1994);
- Kyoto Protocol (1999);
- Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal (1999);
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (1999);
- Convention on Biological Diversity (1994);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1996);
- Convention on Long-range Transboundary Air Pollutants (1999);

- Stockholm Convention on Persistent Organic Pollutants (2006);
- Convention on the Conservation of European Wildlife and Natural habitats (2008);
- The Vienna Convention for the Protection of the Ozone Layer (1995);
- Montreal Protocol on Substances that Deplete the Ozone Layer (1995).

3. Administrative Structure in Georgia

36. Ministry of Environment and Natural Resources Protection of Georgia (MoENRP). MoENRP has the overall responsibility for protection of environment in Georgia. The Department of Permits of MoENRP is responsible for reviewing EIAs and for issuance of the Environmental Permits. MoENRP is the main state body pursuing state policy in the sphere of environment. Their functions for regulating economic or development activities with regard to environmental protection include:

- Issuing permits for project development (Environmental Impact Permit)
- Setting emission limits and issuing surface water intake and discharge consents
- Responding to incidents and complaint

37. For the projects, which do not require Construction Permit, the Environmental permit is being issued by the MoENRP on the ground of State Ecological Examination. State Ecological Examination is carried out by MoENRP upon official submission of Environmental Impact Assessment (EIA) prepared by project developers.

38. For projects requiring Construction Permit, no special permit is issued by MoENRP (according to “One window principle”, only one permit shall be issued for each activity). The Construction Permit is issued by the Ministry of Economy and Sustainable Development of Georgia, but the issuance of the Permit is subject to the consent of the MoENRP in a form of Conclusion of Ecological Expertise, as well as the Ministry of Culture (Centre of Archaeological Studies, Department of Monuments protection). Consent of the MoENRP in such cases should be issued according to the same procedures (EIA, public consultations; SEE etc.) as for issuing Environmental Permit.

39. The Ministry of Economic and Sustainable Development as an administrative body issuing a permit ensures the involvement of the MoENRP as a different administrative body in the administrative proceedings initiated for the purpose of permit issuance, in accordance with Georgia’s Law on Licenses and Permits.

40. As a rule, EIA permitting conditions contains requirement for informing MEPNR regarding fulfilment of the EIA permit conditions. This basically means giving information regarding implementation of Environmental Management and Monitoring Plans.

41. **The Ministry of Culture and Monument Protection of Georgia** is responsible for the supervision of the construction activities in order to protect archaeological heritage. In case if construction is to be carried out in a historic sites or zones of cultural heritage, consent of the Ministry of Culture is also required for issuing construction permit (If such is necessary).

II. DESCRIPTION OF PROJECT

A. Type of the Project

42. This is an urban wastewater project. It involves the construction of a new wastewater network including a number of pumping stations and the construction of a new wastewater treatment plant.

B. Need of the Project

43. The service level of urban water supply and waste water treatment at present is not satisfactory in Georgia. Services are not available to entire population and the serviced areas suffer from inefficient service levels. Systems are old and inefficient. The situation is not different in the project area, comprising the villages of Ureki and Shekvetili. Untreated sewage infiltrates into the underground and pollutes the ground water. This subproject is needed because there is no present wastewater infrastructure. Untreated sewage contaminates soil and surface water. It endangers human health. Both villages, Ureki and Shekvetili, shall be further developed to tourism resorts. Therefore the project is urgently needed.

44. Ureki and Shekvetili do not have a centralized wastewater system. Sewage is discharged partly into non sealed septic pits, usually dug near the water piping wells in the yard, from where the liquid is leaking into the sandy soil and entering into the water piping wells. For this reason, the development of a new wastewater system is required for the two towns.

45. The present sub-project is designed to improve the service standards of wastewater collection and treatment in Ureki-Shekvetili. It is designed to meet the maximum desired water demand by the year 2020 at an amount of 513 m³ per hour.

46. The development of the wastewater flow depends on the specific water consumption and the population numbers that have been estimated until 2040. The population figures are determined under the consideration of an annual growth rate of 3% in Ureki and 5% in Shekvetili.

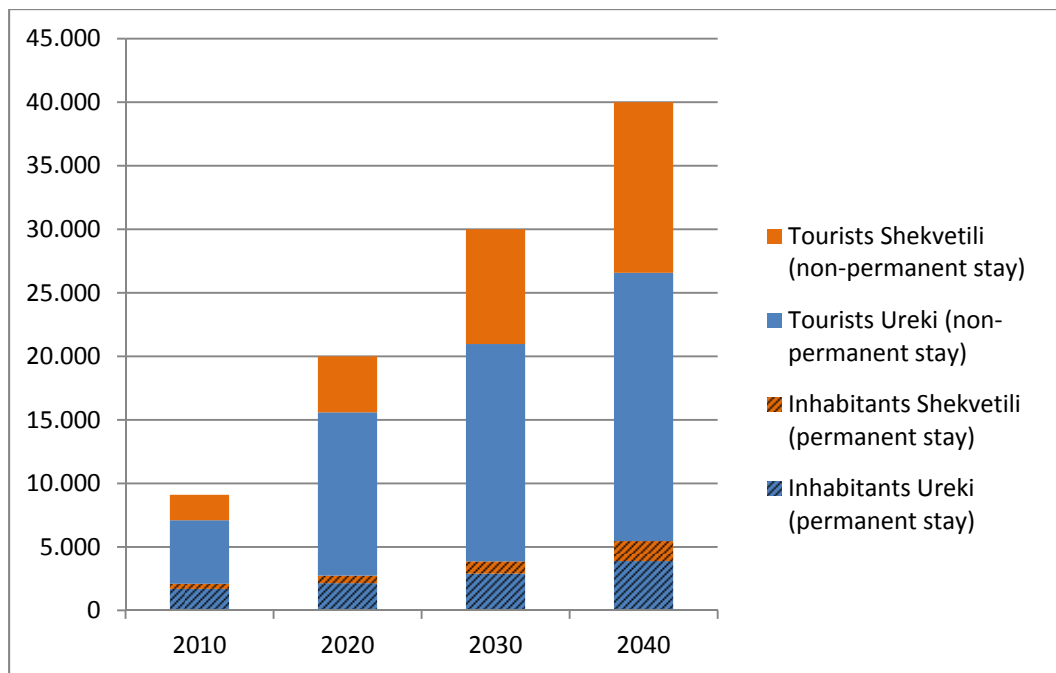


Fig. 1 Population figures

C. Location

47. This sub-project is located in Ureki borough, Guria region, Ozurgeti Municipality in West Georgia. The regional location of Ureki is shown in below map.



Map 1: Location of Ureki

48. The land use plan shows residential areas in green colour and hotel areas in violet colour. The wastewater system covers these areas. The drainage area is divided into three parts that are aligned in north - south direction (see Annex 3). The average elevation is 0.60 masl, the minimum -1.90 and the maximum 5.80 masl. The most northern area, Ureki, north of the River Sepa, has an area of 303 hectare. The general flow direction, which fol-

lows the slightly marked ground slope, is from north to south, towards the planned site of the wastewater treatment plant. Shekvetili, the second part, is south of the River Sepa, with an area of 222 hectare. Shekvetili beach has a size of 91.5 hectare. The longitudinal extension of the project area amounts 9.8 kilometres.



Map 2: Land use plan

49. The wastewater treatment plant (WWTP) will be constructed on a newly acquired, former agricultural land between Ureki and Shekvetili, next to the railroad and at a distance of more than 500 m from the next settlements. The location is shown in the figure below. The site is accessible by a road. The treated wastewater will be discharged via a pressure line into the river Sepa, which will feed into the Black Sea after about 500 m. The WWTP will have a final capacity cover about 40,000 population equivalents by 2040. In Tranche 3, the first phase of the WWTP with a capacity of 20,000 PE will be constructed.

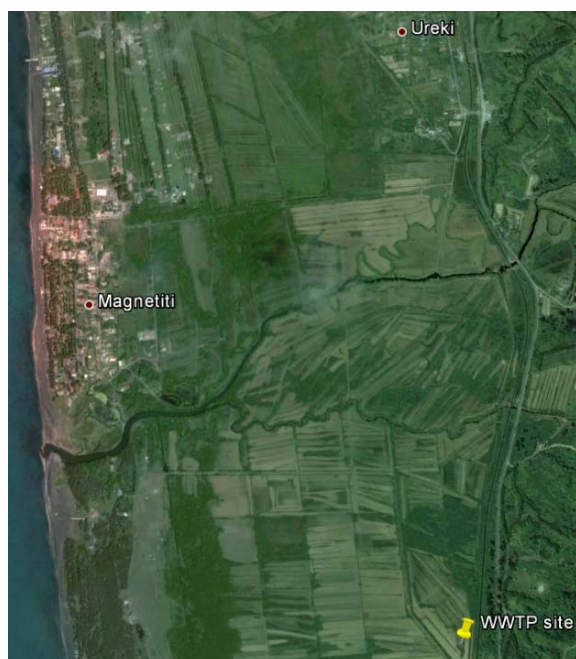


Fig. 2 Location of WWTP Ureki

D. Implementation Schedule

50. The study and design of the subproject was carried out in 2012 and 2013. The construction shall begin in 2014. All work should be completed by 2017.

51. A feasibility study was prepared for the construction of the water supply and sanitation system in Ureki and Shekvetili to meet the demand of the planning horizon 2040. The project is formulated for implementation under the ADB funded Investment Program. Works are proposed to be implemented through multi tranche funding. Table 1 shows the subproject and components selected for implementation in Ureki and Shekvetili, for which, according to ADB requirement, this IEE is conducted.

E. Sub Project Components

52. This subproject focuses on construction of a new sewerage system and a WWTP. The descriptions shown in Table 1 are based on the final design.

Table 1: Proposed Subproject & Components Waste Water System

Infrastructure	Function	Description	Location
Wastewater components of the subproject			
Main sewage trunk	To collect average flow of 6,511 m ³ per day by 2040	OD 225 – 5.2 km OD 500 – 2 km	Ureki and Shekvetili
Coarse screen	Screening and removal of coarse material	Width of spacing: 20 mm	Inflow of WWTP
Fine screen	Screening and removal of fine material	Width of spacing: 6 mm	Inflow of WWTP
Aerated Grit chamber	Sedimentation of grit (sand, gravel, coarse material)	Dimensions: 2.2 m x 18 m x 2.4 m; Quantity: 2	After screening

Infrastructure	Function	Description	Location
Wastewater components of the subproject			
Aeration tank	Activated sludge, denitrification, phosphorus removal, diffused air system	Dimensions: 46 m x 12 m x 6 m; Quantity: 6	After pre-sedimentation tank
Final Sedimentation Tank (rectangular tank)	Sedimentation of fine material, return sludge to reactor basin	Dimensions: 36 m x 6 m x 3.8 m. Quantity: 6	After aeration tank
Sludge storage tank (circular tank)	storage of sludge for dewatering	diameter: 10 m depth: 4.0 m	after final sedimentation tank
Dewatering unit	reduction of volume	60 – 120 m ³ /d	after final sedimentation tank
Outflow	Discharge of treated waste water into Black Sea	DN 400	After WWTP

1. Wastewater Treatment Plant

53. The wastewater treatment plant (WWTP) will be designed according to Georgian and European Standards. The application of these standards will result in a very robust treatment process, so that all required effluent criteria can be met even in case of shock loads.

54. All tanks will be constructed as compact concrete structures, so the space requirements will be much reduced compared with more nature orientated technologies like ponds or constructed wetlands. This compact design also results in a significant reduction of odour emissions.

55. Like for all wastewater treatment plants (WWTPs) in the project towns with a capacity up to 30,000 PE for Ureki and Shekvetili the activated sludge technology with an extended aeration is proposed. This process basically includes the following treatment steps:

- Screens
- Aerated grit chambers
- Aeration tanks
- Final sedimentation tanks
- Sludge storage tank
- Sludge dewatering

56. The activated sludge process is a very common treatment method and has been implemented many times all over the world. In the special case of the extended aeration, the aeration tanks are dimensioned in such a way, that the sludge is stabilized simultaneously in the wastewater treatment process. Therefore no additional process steps have to be implemented for the separate stabilization of the sludge. This makes the treatment process very simple and easy to operate. The technology of extended aeration is the most economic solution up to a capacity of approximately 30,000 to 40,000 PE.

57. The following diagram illustrates the treatment process of Ureki WWTP:

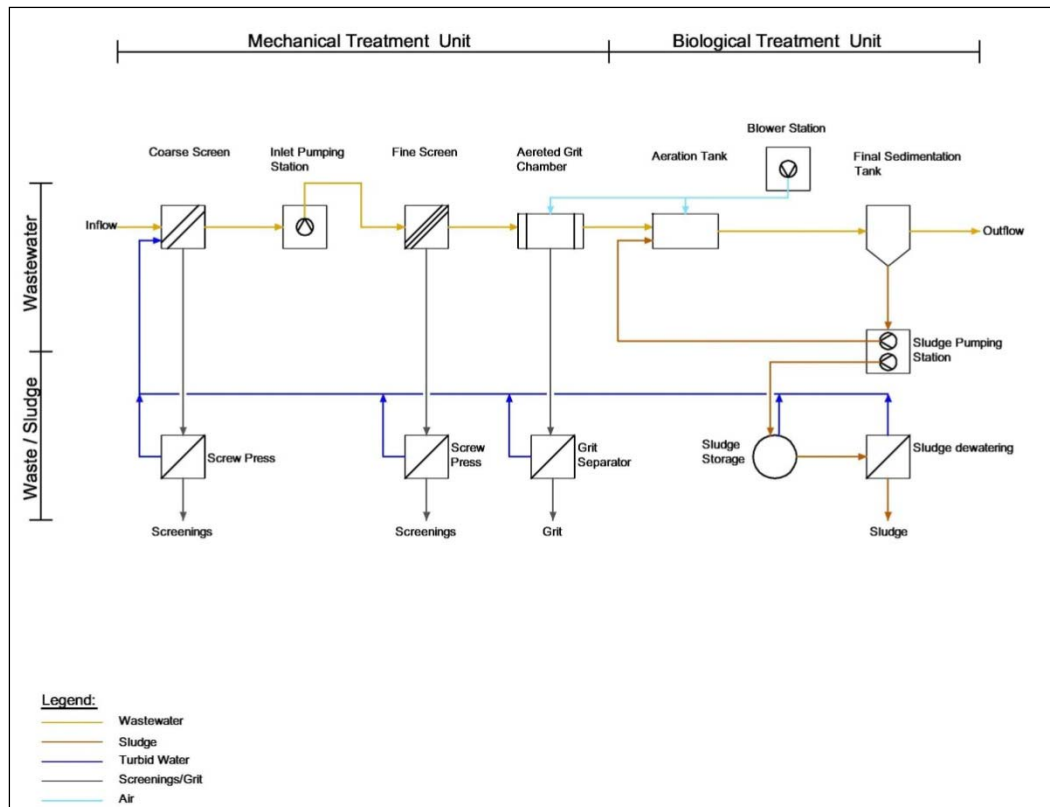


Fig. 3 Treatment process for proposed WWTP for Ureki and Shekviteli

58. *Sludge disposal.* After the sludge treatment, the sludge is stabilised, it is not digesting anymore and it has also been dewatered. As there is no industry in Ureki, no heavy metals will be in the treated sludge. The sludge quality and consistency will allow its disposal on a landfill. Sludge quantities amount to:

- 0.8 m³/d in winter 2020
- 6.8 m³/d in summer 2020
- 13.6 m³/d in summer 2040.

59. There is a temporary sludge storage area at the WWTP that has sufficient volume to store the sludge for 30 days in summer 2040, 60 days in summer 2020 and theoretical 510 days in winter 2020. From time to time the sludge shall be transported to the landfill of the town of Meria that is located between Ureki and Ozurgeti. This is a certified landfill. It is regulated by the Solid Waste Management Company under the Ministry of Regional Development and Infrastructure. UWSCG will provide transportation from the WWTP to the landfill.

60. Another alternative for the disposal of the sludge is its use as fertilizer in the agriculture. As there is no industry in Ureki and Shekviteli the sludge quality is expected to be suitable for this usage. The WWTP is equipped with a storage place with a volume of about 410 m³ where sludge is temporarily stored and can be collected by interested farmers. UWSCG would give away the sludge for free; transportation would have to be provided by the farmers. After some weeks of operation, when UWSCG will have a better understanding of the quality and quantity of the sludge, UWSCG will announce the possibility to collect sludge from the site of the WWTP. Depending on the seasonal demand for fertilizer, the UWSCG will manage the temporary storage at the WWTP in such a way that a potential demand can be best served.

61. In view of the lack of Georgian legislation with regard to the use of sludge in agriculture, European regulations shall be considered in case the sludge will be used as fertilizer. They provide that the use of sludge is prohibited:

- on grassland or forage crops if the grassland is to be grazed or the forage crops to be harvested before a certain period has elapsed (this period may not be less than three weeks);
- on fruit and vegetable crops during the growing season, with the exception of fruit trees;
- On ground intended for the cultivation of fruit and vegetable crops which are normally in direct contact with the soil and normally eaten raw, for a period of ten months preceding the harvest and during the harvest itself.

62. Sludge and soil on which it is used must be sampled and analysed. Sludge shall be analysed for heavy metals every 12 months. The limit values are:

	Limit values for concentrations of heavy metals in soils	Limit values for heavy metal concentrations in sludge	Limit values for amounts of heavy metals which may be added annually to agricultural land
	mg/kg of dry matter	mg/kg of dry matter	kg/ha/yr
Cadmium	1 - 3	20 – 40	0.15
Copper	50 - 140	1,000 - 1,750	12
Nickel	30 -75	300 – 400	3
Lead	50 - 300	750 – 1,200	15
Zinc	150 - 300	2,500 – 4,000	30
Mercury	1 - 1.5	16 - 25	0.1

Table 2: Limit values heavy metals

2. Main Sewage Collector (Trunk Sewer)

63. There are two main sewage collectors. One collector conveys the wastewater of Ureki to the WWTP, the other the wastewater of Shekvetili. Both collectors are pressure pipes. The main collector for Ureki starts at pumping station n° 15 from where the wastewater is pumped to the wastewater treatment plant. There are two collectors in parallel with diameters of DA 280 and DA 500. Their lengths are 1,972 m. The pressure pipe with the smaller diameter will be used in winter when only the residents are served, the larger pipe will be used in summer, during tourist season. The main collector that serves Shekvetili has a length of 5,190 m and a diameter of DA 225. The pipelines follow existing roads and lanes, thus keeping environmental impacts due to construction activities associated with pipe laying to a minimum. The main sewage collectors will be laid at a depth of approximately 2.2 m. Material to be used is polyethylene. The cross section of the trench for the main sewage collector will be as illustrated below:

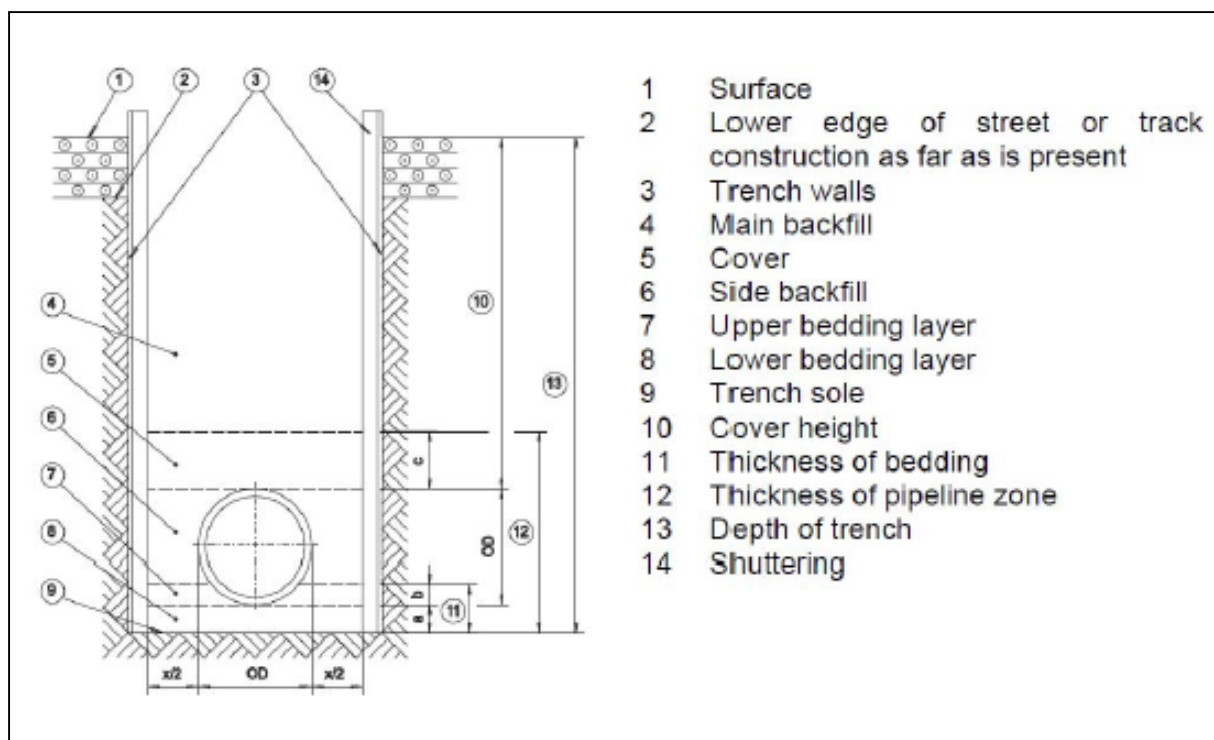


Fig. 4 Cross section of main sewage collector

F. Construction Activities

64. There are the following main elements in water and waste water supply components of the subproject:

- construction of sewer network including sewage pumping stations and main collector
- construction of waste water treatment plant

65. Construction practices of these works are described below:

66. *Laying of Sewer Lines including Main Sewer Trunk.* Sewer lines (DN 100 – 800) will be laid along existing streets in the town. The depth of the trench will be between 1 m and 4 m. Minimum width of the trench will be between 0.8 m and 0.9 m. The trench will be refilled with excavated soil and sand and compacted manually. The main sewage collector will be built in at a depth of approximately 2.2 m. Material to be used is polyethylene.

67. Excavated soil will be placed alongside, and the pipes will be placed in the trench. Pipes will be joined, after which excavated soil will then be replaced on beneath and sides. The trench will be refilled with excavated soil and sand and compacted manually. The depth of trench will be 1 m – 4 m depending on topographical conditions. Minimum width of the trench will be between 0,8 and 0,9 m. After construction part of trench will be occupied by pipe and sand layer, and trench is refilled with the excavated material.

68. Earthwork for construction of WWTP will consist of site clearing, trench excavation, grading, embankment filling and backfilling of excavation trench after built in of structures. Excavated soil will be placed alongside. Surplus soil will be used for other construction activities. Base of foundation will be gravel and sand.

69. The treatment installations and equipment will be designed according to the standards of the German DWA (German Association for Water, Wastewater and Waste). All tanks will be constructed as compact concrete structures, reducing the requirements for space in comparison with more nature oriented technologies as ponds or constructed wetlands. Main construction materials used for the various components of the WWTP are concrete and steel. Area of influence during construction comprises the construction site exhibiting an area of approximately 2 ha, the borrow areas required for material extraction and the haulage routes. Impacts arising within these areas during construction activities are described in the chapter impacts and mitigation measures.

70. *Source of construction materials.* Sand and aggregates will be sourced from licensed borrow areas. There is no designated disposal site for construction waste. It is generally disposed in low lying areas.

71. Water needed for civil works comprises potable water and construction water. Potable water shall comply with the national quality standards and shall not compete with the needs of the local population. Construction water and water to be used for dust suppression measures may be taken from the Sepa River or from ground water. Quantity of these resources is not a critical issue.

72. *Transportation routes.* The wastewater treatment plant is located at a large distance from any settlement. Access will be via the highway and a dirt road. For mitigation measures please refer to subsequent chapters.

G. Operation of Improved Wastewater System

73. The wastewater system will require repair and maintenance activities like cleaning inspection. Repair work will be conducted in the same way the pipe was laid.

74. The WWTP will require inspection and maintenance activities like physical and chemical analyses and disposal of stabilized sludge and compacted waste on a waste disposal site.

III. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

A. Physical Resources

1. Atmosphere

75. Project area is located at the south-east shore of Black Sea, which is a part of sub-tropical zone. The local climate is mainly formed under the influence of Black Sea and Caucasus mountains located at the north. The latter protects this area from encroachment of the north cold air masses resulting in mild and warm winter.

76. According to Supsa meteorological station (10 km apart from the Project zone), the average monthly temperature specified for the Project area varies from 4.5 °C to 23 °C. The coldest month of the year is January, and the hottest one is August. The average annual temperature is 13.5 °C. The absolute minimum and maximum temperatures around the area determined by multi-year observations is -18 °C and +41 °C respectively. The following table shows the annual temperature data determined in result of multi-year observations.

Temperature Month	January	February	March	April	May	July	July	August	September	October	November	December	Annual
Average	4.5	5.2	7.9	11.4	16.2	20.0	22.5	22.6	19.4	15.2	10.5	6.5	13.5
Average minimum	1.4	1.8	4.0	7.2	11.4	15.6	18.4	18.6	14.8	10.8	6.7	3.2	9.5
Absolute minimum	-17	-18	-11	-3	1	8	11	10	4	-3	-11	-15	-18
Average maximum	8.5	9.6	12.8	16.8	21.7	24.7	26.4	26.8	24.5	21.0	15.8	10.9	18.3
Absolute maximum	19	25	32	35	37	38	41	40	37	34	29	21	41

Table 3: Ambient air temperature pattern, °C

Temperature Month	January	February	March	April	May	July	July	August	September	October	November	December	Annual
Average monthly	4	4	8	13	20	24	26	25	21	15	10	5	15
Average minimum	-1	0	2	6	11	15	18	19	15	10	5	1	8
Absolute minimum	-19	-20	-12	-6	0	7	9	10	3	-5	-13	-17	-20
Average maximum	10	12	18	26	35	40	42	39	34	27	18	12	26
Absolute maximum	23	30	41	47	54	58	61	59	54	43	33	24	61

Table 4: Soil temperature pattern, °C

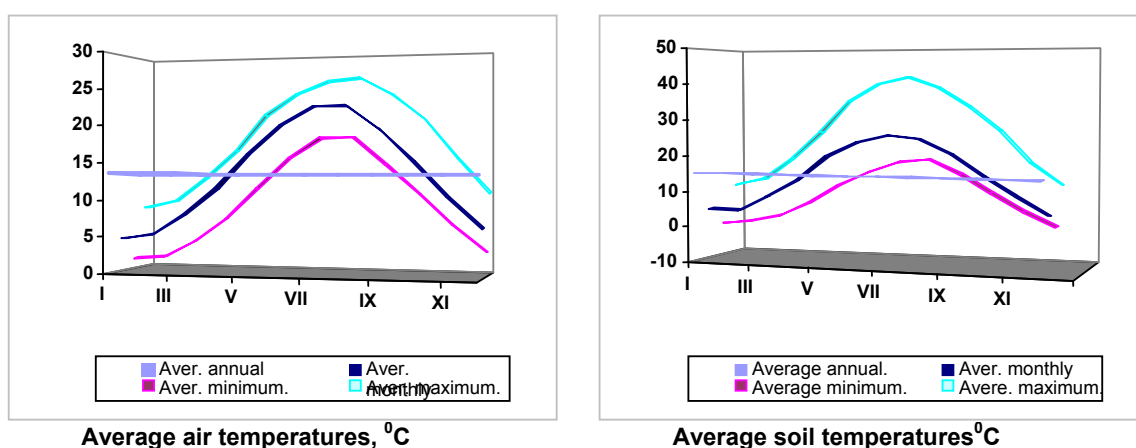


Fig. 5 Average annual air and soil temperatures

2. Rainfall and Humidity

77. The study area is humid due to Caucasus Range supporting to air condensation. The region is characterized by high precipitation rates with average annual rainfall as high as 2379 mm. The maximum precipitation events occur during July-October period. The precipitation pattern is seasonal, i.e. as a rule, summer and autumn are more humid compared to winter and spring. Precipitation and humidity data are shown in the following tables.

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
Monthly average	204	182	136	111	78	162	235	276	332	239	218	206	2379

Table 5: Precipitation, mm

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average Annual
Humidity %	80	80	79	79	80	82	84	86	86	84	80	78	82

Table 6: Relative air humidity, mm

3. Ambient Air Quality

78. For assessing the background pollution level of the ambient air it was found reasonable to apply the methodology approved by the Ministry of Environment and Natural Resources of Georgia (PD 52,04,186-89). This methodology has been developed for evaluating the base-line ambient air condition at the areas lacking any observation data applying the population based approach.

Population ('000)	Baseline pollution level, მგ/მ ³			
	NO ₂	SO ₂	CO	მტვერი
250-125	0 .03	0 .05	1 .5	0 .2
125-50	0 .015	0 .05	0 .8	0 .15
50-10	0 .008	0 .02	0 .4	0 .1
<10	0	0	0	0

Table 7: Recommended baseline pollution levels by population quantities

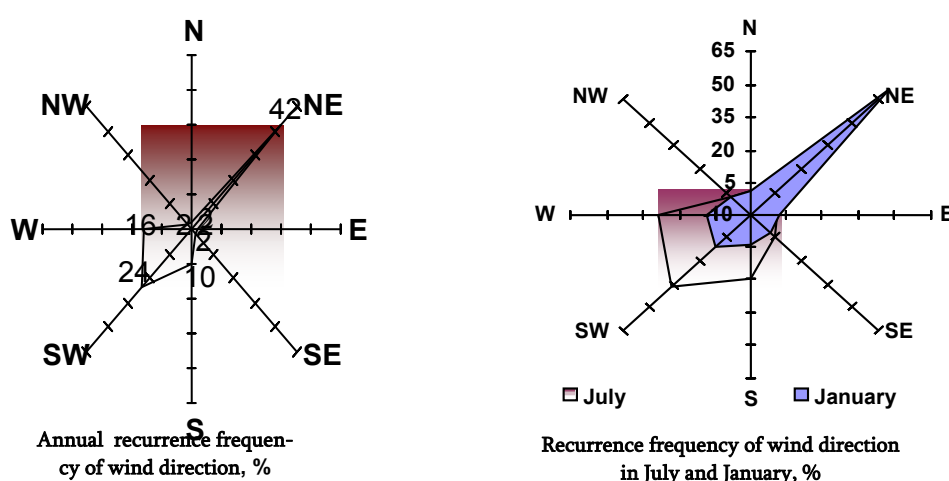
79. The baseline pollution data required for assessment of the ambient air impact were determined based on the above methodology accounting for Ureki, Tskaltsminda and Kvalnari population quantities (>10,000) as follows:

- Nitrogen dioxide: 0.008 mg/m³;
- Sulphur dioxide: 0 .02 mg/m³;
- Carbon oxide: 0 .4 mg/m³;
- Dust 0 .1 mg/m³.

4. Wind Pattern

80. According to data of Supsa meteorological station the north-east and south-west winds blowing from Caucasus Range dominate within the study area. The direction of dominated winds have the following seasonal pattern: the north-east winds blow during winter months, and the south-west winds are more common in summer. Average annual wind velocity is 2.2 m/s, and the maximum annual expected wind velocity 21 m/s.

81. The following charts illustrate directions and seasonal distribution of the dominated winds. The general wind parameters are provided in the table.



B. Topography & Soils

82. *Topography:* Ureki is located in the Ozurgeti District in the Guira region of Western Georgia on the Black Sea coast, approximately 20 km to the south of the city of Poti. It is a

seaside resort stretching along the coast. Topography is flat with a mean altitude above sea level of approximately 4 m. It lies approximately 360 km to the west from the capital Tbilisi. At the southern edge of Ureki the Sepa River discharges into the Black Sea. To the north of Ureki the River Supsa discharges into the Black Sea.

C. Surface Water

83. *Surface Water.* Georgia is rich in water resources; there are in all 26,060 rivers with a total length of ~ 59,000 km. Besides, there are many thermal and mineral water springs, lakes and man-made water reservoirs. These however are distributed unequally, with a major concentration in the western part of the country. Nearly all rivers of East Georgia flow into the Caspian Sea while the rivers in the west join the Black Sea. These two basins are separated by Likhi Ridge. The project area, Ureki, and Shekvetili in Osurgeti municipality, is situated approximately 25 km to the south of the estuary of Rioni River. The project area is drained by River Natanebi, discharging into the Black Sea south of Shekvetili, River Sepa, flowing along the southern edge of Ureki and River Supsa. River Supsa discharges into the Black Sea north of Ureki.

84. The major river located north of Project corridor is Supsa.

85. General Hydrological Features of Supsa River

86. Supsa river originates on the north slope of Adjara-Imereti Range, near Mepistskaro mountain and Jaligeki lake, approximately at 2600 m from sea level, and mouths into the Black Sea near village of Grigoleti. The length of this river from the head to the mouth is 108 km, average gradient – 28 ‰, catchment area – 1,130 km², and average absolute elevation – 970 m.

87. In the upper reach the river flows over the complex mountainous terrain with narrow and deep valleys. The remaining part of the catchment downstream of village of Bukistsikhe has more smoothed but extensively and deeply dissected shape with numerous tributaries.

88. The upper part of river catchment is mainly built by tuffaceous rocks, grainy sandstones and sandy clayey shales. In the remaining part of the catchment sand conglomerates dominate along with the various textured clays intersected by marl, cobble and sand layers. In the most the bedrocks are overlaid by loams.

89. In the upper reach the catchment is covered by alpine vegetation. The mixed forests grow up to 2,000 m above sea level. The major tree species of such forests include spruce, pine, beech and oak. Downstream village of Bukistiskhe, the significant part of the catchment is occupied by agricultural lots. Around 70% of the catchment is covered by forests.

90. Supsa river, as other Black Sea coastal rivers is characterized by frequent flash floods occurring during the entire year. The annual number of flash floods varies in the range from 15 to 27. Average flood levels at the upper, middle and lower reaches of the river are respectively 1.0-1.5, 1.5-2.0 and 2.5-3.0 meters.

Winter	Spring	Summer	Autumn
3-4	4-8	2-3	6-12

Table 8: Number of flash floods by season

91. In the most, the major (high level) flash floods occur in autumn. As a rule, the highest flash floods are 0.1-0.9 higher compared to the average ones. In the upper and middle

reaches of the river raising of the water level is related with spring floods beginning from the middle March and continuing to the end of May. The flood has several peaks resulting in increase of the water level by 0.3-0.6 m, and continuing from 5 to 10 days. The summer low flows are unstable and frequently interfered due to rains. In such periods fluctuation of the water level is in the range of 0.2-0.6 m.

92. The runoff regime depends on rainfall quantity and intensity. During year the monthly runoffs are distributed with two maximums falling in summer and autumn. The spring peak is observed during April-May, and the autumn one in October. The maximum flow at Chokhatauri is measured to 246 m³/s, at Khidmagala – 692 m³/s. The minimum flow in upper reach is of 0.4 m³/s, and in lower reach is of 4.08 m³/s. Specific discharge at upper and lower reaches are respectively 44.3 l/s*km² and 41.1 l/s/km². The following table shows distribution of the annual runoff by seasons at Chokhatauri and Khidmagala gauging stations.

Gauging Station	Winter	Spring	Summer	Autumn
Chokhatauri	15-17	36-50	18-25	17-23
Khidmagala	26	20-34	12-20	20-43

Table 9: Percentage of total runoff

93. Based on results of 1948-1955 observation series, the annual quantities of solid sediments transported by river (silt load) vary in the range of 110-230 thousand tones. The maximum turbidity is of 2,300 g/m². In January-February period, the river freezes along the banks for a short time. Average water temperature in the coldest month is in the range of 1.4-8.5 °C. The maximum water temperature of 24.2 °C is measured in August.

94. **Natanebi river** originates on the north slope of Meskheta Range, at 2,548 m above seal level, near Mt. Sakornia, and mouths into the Black Sea at village of Shekvetili. Total length of the river is 60 km, and catchment area – 657 km². The river is fed with snowmelt and ground water. Major floods occur in the spring. Low flow period is July-August. Flash flood may occur any time during year. The average flow is 33.5 m³/s. The river is used for powering the water mills and irrigation. The major tributaries are Bzhuzhi and Choloki.

95. **Sepa river** will be the receiving water body of the wastewater treatment plant originates at Mt. Sedubani. It is interesting that this river along its entire length of 17 km, from the head to the mouth into Black Sea has no tributaries at all. The river is fed by rainfall, snowmelt and ground water. Therefore high-water periods are characteristic in Spring and Autumn. During other periods of the year, low-water is characteristic to the river. Floods are related to large volumes of atmospheric precipitation. Significant water polluting sources are not located in the river Sepa valley. There is no use of the river water downstream of the discharge point. The water drains into the Black Sea.

96. On 28 September 2013 samples of the river water at the future discharge point were taken for analysis during development of MPD normatives. The research was conducted in the laboratory of scientific-research company “Gamma”.

No	Defined parameter, unit	Value
1	Weighted particles, mg/l	41.6
2	BDO, mg/l O ₂	1.7
3	N (total) mg/l	0.47
4	P(total) mg/l	<0.1
5	TPH. Mg/l	<0.04

Table 10: Baseline data water quality Sepa River

97. According to the results, concentration of harmful substances does not exceed norms of maximum permissible concentrations determined by normative document (Sanitary Norms and Rules on “Protecting Surface Water from polluting”) in the Sepa river.

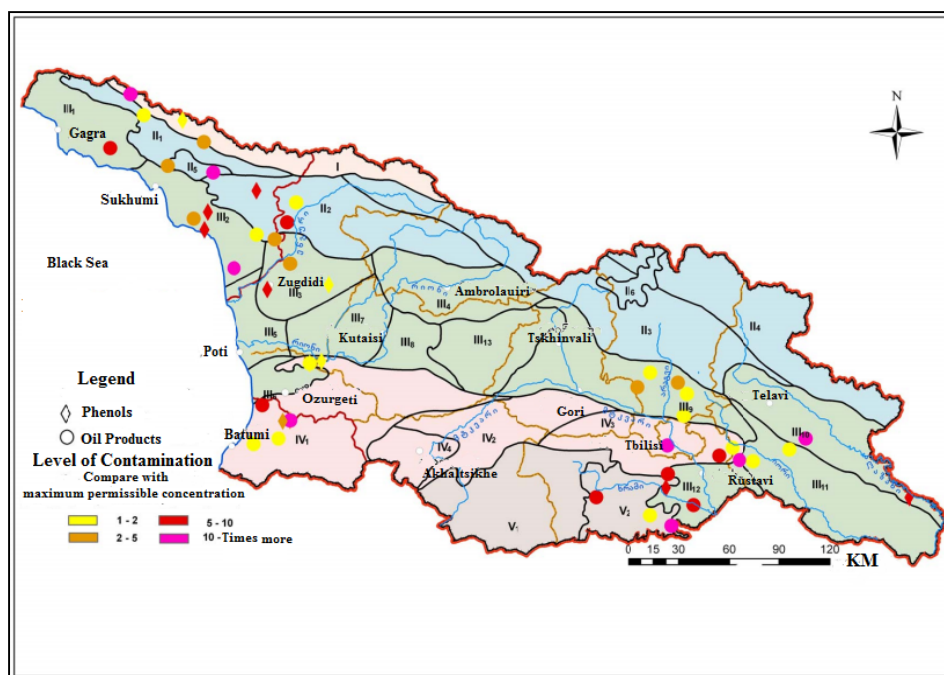


Map 3: River Network in Western Georgia

Groundwater

98. Based on the groundwater characteristics, Georgia is divided into five hydro-geological zones, which are further defined into sub-zones/districts. The project area, Ureki and Shekvetili, is in Zones III5 and III6. The well field is in Zone IV 1. The water bearing strata is of contemporary alluvial deposits characterized by a free groundwater table declining along the general flow of the rivers. The water table depths vary from 0.2 m to 2.0 m. At some locations, near the riverbeds and groves, groundwater is of very shallow depths (0.2 m). The aquifer is characterized by rich water resources. The aquifer is mainly fed from Rioni River and precipitation. Despite the aquifer is rich with water, its practical water use is limited. Groundwater quality at source is believed to be very good. Data are insufficient to assess whether more vulnerable groundwater (such as in alluvial deposits) is being contaminated by municipal, agricultural or industrial pollution;

99. While groundwater at deeper sources is expected to be very good, quality of shallow ground water that is currently used as a potable water source in Ureki and Shekvetili is very critical. Ureki does not have centralized water supply system. The population mainly takes water from private wells. This water cannot be used for drinking and is used only for technical means. The absence of a sewage network and nearby septic tanks aggravates the situation. Therefore the implementation of a new sewage system is necessary for the further functioning of the resorts in Ureki and Shekvetili.



Map 4: Hydro-geological Zones of Georgia

D. Geology

100. The terrestrial part of the study area, along the shoreline, is represented by accumulated plain built by lacustrine and boggy deposits and loose soils (clays, sands, occasionally gravel).

101. The beach strip is composed of sands with occasional gravel inclusions (grain sizes from 1mm to 1 cm). The sands are fine and medium grained (grain sizes vary from 0.1-0.25 mm to 0.25-0.5 mm). The sands are loose and unbounded without any visible cementation signs. By mineral composition, the sands are of polymict type with high content of the magnetite.

102. With respect to structure, the shelf and shoreline compose the entire block subjected to relatively recent raise with the rate of 2 mm/year. The raise and extensive sediment accumulation during Quaternary Period supported to creation of the 10 km wide plain and straight shelf (Janjgava, 1979). The shelf is organically adjoined by plain areas of the neighboring shoreline of the following stratigraphy (from the top down):

- Pebbles – thickness 15 m;
- Clays – 6 m
- Sands – 26 m.

103. The foregoing marine deposits are conventionally attained to the Holocene, while the abrupt lithofacies changes observed in the vertical section points to the Transgressive-Regressive Cycles of the neotectonic block structure.

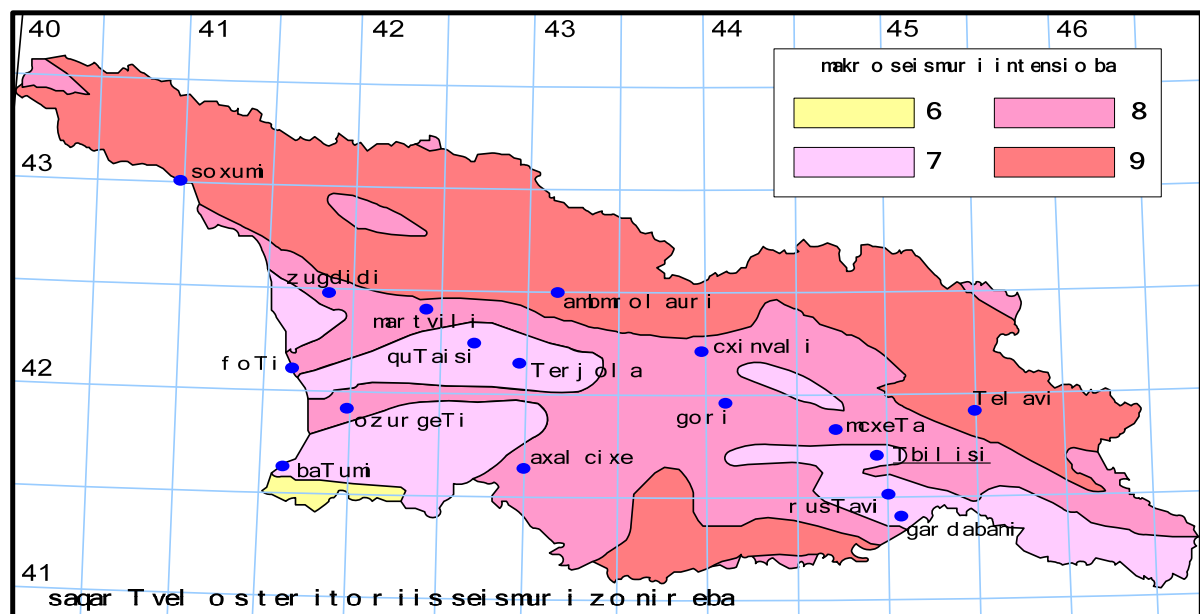
104. Assuming the peculiarities characteristic to the Quaternary Period of geological timeline, study of the river's solid runoff, wind and wave patterns together with the prevailed lithodynamic processes allows to delineate the following sub-zones between Supsa and Natanebi rivers:

- Sub-zone of Supsa Submarine Canyons
- Ureki-Natanebi Sub-zone, which is also fed by solid material transported by Supsa river.

105. Within the marine environment, the shelf zone is expanded down to 150-200 m depths. According to geophysical data, the aggregate thickness of Quaternary and Recent deposits within the strip between Supsa and Natanebi rivers varies in the range of 700-1000 m.

106. The lithological structure of the shelf is featured by very restricted and occasional distribution the crushed rock (grain sizes: 1mm-180cm). The bottom sediments of the shelf zone is mainly composed of sands (0.1mm-1.00m), silt stones (0.01mm-0.1mm), clays (finer than 0.01mm) and bottom silts. The following vertical pattern is observed in grain size distribution: 0-10 m: sands; 10-20 m – sands, succession of silt stones and clays; deeper of 20-25 m: mainly the recent silt formations.

107. The bottom silts are always saturated with water, and thus are featured by very high acceleration capacity, i.e. they are flowable. Such silts are readily dislocated from one place to another under the impact of any undercurrents flowing faster than 30 cm/s (Khachapuri-dze, 1990).



Map 5: Seismic zones of Georgia

108. Soil: The soils are structured by Quaternary deposits; their thickness is more than 100 m. Holocene deposits genetically represent marine deposits, but lithologically – sands and silty sands.

Noise Emission

109. As it was determined during audit, no stationary sources of noise and/or vibration emission exist in the study area limits. The major contributor to the noise emission around the Project area is a traffic flow along Batumi-Poti highway.

E. Ecological Resources

1. Biological Environment

110. About 40 per cent of the total geographical area of the country accounts for forests. The average density of forests is 163 m² per ha. 97 per cent of forests is located on mountains, the remaining 3 % are low-lying and flood plain forests in Kolkheti Lowlands and in Western Georgia.

111. The construction will not pose any hazard to the possible existence of the species included in the Red List since pipes will be laid in existing roads and the pumping station and the reservoirs on currently already used land.

112. Description of the biological environment assumes general characterization of the ecosystems, reviewing the flora diversity and identification of endangered animal species.

113. Such approach involves recording of the occurrence of terrestrial and aquatic fauna, including amphibians, reptiles, birds and mammals.

114. It should be noted that large part of the study area has already been reclaimed by human that provoked reduction of the significant part of original biocoenoses. Use of the deeply laid sands in the road construction works resulted in formation of the bogs and ponds scattered along the central motor road and sea shoreline.

115. Observation of the mammals around the area of interest is relatively hard task due to their scarcity. As reported by locals, these areas are occasionally visited by jackals, and sometimes nutria and mole may be found. From the amphibians only pond frogs may be met.

116. The area hosts the grass snake and dice snake. Both these species are related to the water bodies and pond areas.

117. The Project area also includes the sea-mouth of Supsa river and the offshore zone characterized by rich ichthyofauna. The fish species occurring in the lakes located within the Project area include the pike, carp, mullet, etc. Supsa river and the adjoined offshore area are characterized by quite a high diversity of fish species including Black Sea salmon, herring, golden mullet, pike perch, silver carp, Colchic nase, European anchovy, etc.

118. Black Sea provides the habitats for three dolphin species including common bottle-nose dolphin, porpoise and short-beaked common dolphin, which are well adapted to specific marine environment. However, nowadays the dolphins are endangered due to poaching and environmental pollution.

119. In the foregoing ecosystems and biotopes host are widespread the invertebrate groups including nematodes, leeches, mollusks, crustacea, arachnids.

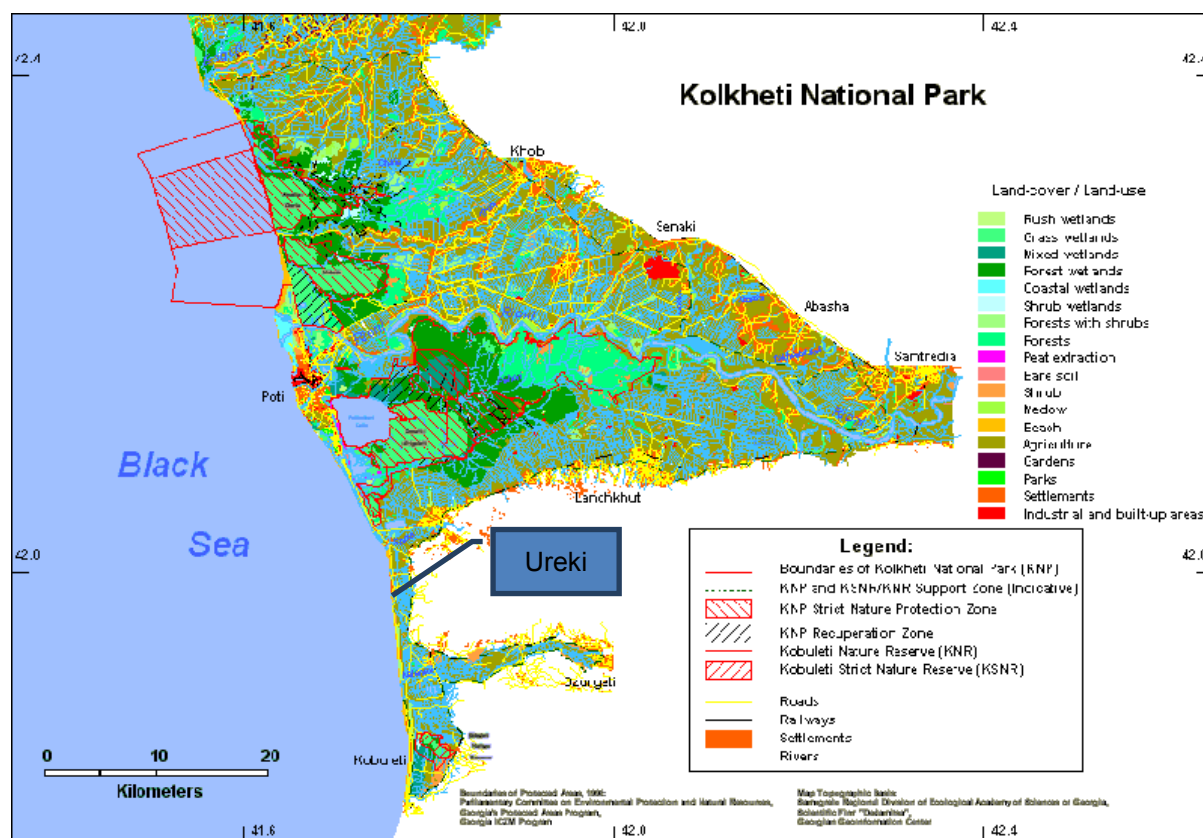


Map 6: Bio-geographic regions of Georgia

2. Protected Areas

120. There are 68 protected areas of different categories in Georgia under the administration of the Agency of Protected Areas, a Legal Entity of Public Law of the MoENRP. These represent 4.1% of the country's territory. The Law on Protected Areas System of 1996 provides for categories administered by different bodies, such as the Ministry of Food and Agriculture, the State Department of Forestry, local governments, and others. As the system is currently under review, protection status of existing areas may change and new areas for designation are likely to be identified by on-going projects. The Law does however define protected areas according to recognized IUCN categories.

121. The nearest protected area from the Project zone at about 8 km is Kolkheti National Park. Assuming the scope of Project works, any impact on this national park shall not be expected. The map below shows the borders of the National Park.



Map 7: Kolkheti National Park

F. Socio-Cultural Resources

122. Ureki town and Shekvetili village are located in Ozurgeti Municipality and administratively belong to the Guria Region

1. Demography

123. Population of Ozurgeti District is 77.9 thousand, and population density is 144 persons per sq.km. The district includes 1 city, 3 towns and 25 communities.

124. The table below shows population dynamics in Guria and Ozurgeti for 2003-2013 period. As evidenced from the table no significant changes occurred in the population quantity within the study area since 2003.

	2003	2004	2005	2006	2007	2009	2010	2011	2012	2013	
Guria	142.1	139.2	138.7	139.3	139.0	138.8	138.8	139.8	140.3	140.3	139.2
Ozurgeti Municipality	78.2	77.1	76.9	77.5	77.4	77.3	77.2	77.9	78.4	78.5	77.9

Table 11: Guria and Ozurgeti population figures

125. The present population of Ureki is 1,700. Shekvetili has a population of 400. Ureki and Shekvetili have a small permanent population that mainly lives from tourism and some agriculture. The number of hotels, guest houses, restaurants and small shops is constantly growing.

126. The following table presents the officially registered population and the number of tourists in the project area for the year 2012.

Table 12: Population and Tourists, 2012

Project Area	Population	Tourists
Ureki	1,700	5,000
Shekvetili	400	2,000

2. Education

127. The district has 63 public schools, 5 vocational and 2 higher (Ozurgeti Institute of Environmental Management, Guria Branch of Ivane Javakhishvili Tbilisi State University), education facilities, 34 libraries, 1 theatre and 1 museum.

128. One school is located at 7 Takaishvili str., Ureki town with 411 pupils and 39 teachers. According to data of the Ministry of Education of Georgia, no public school exists in village Shekvetili and this village children go to school located in village Natanebi.

3. Healthcare

129. The healthcare facilities available in the Municipality include 2 hospitals, Ozurgeti District Hospital “Medalfa” and Children’s Regional Health Centre.

130. There is an ambulatory or feldsher’s station in each village. In 2010-2012 21,358 GEL was allocated for current improvements of the ambulatories. Currently all such facilities are united into the Medalpha’s network.

131. The healthcare facilities are financed from the Central Budget or by insurance companies or patients’ payments. The most of medical facilities are obsolete and only partially rehabilitated.

132. In 2011 construction of the new hospital with 50 beds has been completed in the city. In addition PSP company builds a new private diagnostic centre in the city downtown.

4. Industry and Agriculture

133. Subtropical agriculture is a leading production sector, and includes crop husbandry, tea growing, citrus growing, viticulture, cattle breeding, poultry and beekeeping.

134. Due to prevailed climatic conditions, the major production sector in the Municipality is an agriculture and related processing industry. The local population is engaged in beekeeping, viticulture, cattle breeding, poultry and beekeeping. The trout farms have been developed since the late 1980s on the mountain rivers of the district (rivers Bzhuzha, Natanebi, Supsa and their tributaries).

135. Major industries comprise food and construction materials production facilities. The district is crossed by Transcaucasian railway.

5. Transportation Infrastructure

136. The area of the district is crossed by Samtredia-Batumi state highway. The district has well developed road network that in its most extent requires improvement of the surface course. Dirt roads are constructed to the powerhouse and headworks of the hydro power plant.

137. Ozurgeti is connected to the Georgian railway.

6. Natural Gas and Electricity

138. Supply of the natural gas for Ozurgeti residents is undertaken by private companies Sokar and Itera. As for 2012 almost 98% of the city along with villages Likhauri, Shemoqmedi, Chanieti, Ozurgeti, Gurianta, Naruja and Laituri were connected to service network. In total up to 5,000 customers.

139. Extensive work program is carried out by private company Energo-pro Georgia for installing the individual electricity meters. As for 1 October 2012 such meters were installed in 19 territorial units of the Municipality (city of Ozurgeti, town of Ureki and 17 villages) covering 70% of the total number of customers.

7. Waste Management

140. Two landfills are available in Ozurgeti. The first – Ureki-Natanebi Poligon (Ureki and Shekvetili Landfill) with total area of 2 Ha, and the second – Village Khvabreti Poligon (Ozurgeti Landfill) with total area of 4.5 Ha.

141. Total annual generated waste quantity is 36,000 cub.m.

142. The waste collection company operates in the Municipality, which services fully cover the city, Ureki and Shekvetili, and partially other 12 territorial units of the district. This company is subsidized from the local budget, although the financing is provided by private company. The company has 100 employees and operates 12 specialist vehicles and more than 500 waste bins.

8. Natural Resources

143. The mineral resources available in the district mainly include bentonite clays (Askana, Mtispiri), Kaoline (MakvaneTi), silica (Nagomari), Magnetite sands (Ureki), Mineral water springs, etc.

9. Historical Monuments

144. Among the important architectural monuments of the district are Likhauri Church, Shemoqmedi Monastery complex, “Petra” settlement, Askana fortress (2nd-4th c.c.), Gurieli palace, King Tamara’s Likhauri fortress, “Vashnavi settlement, etc.

145. There are many ancient burials, settlements, remains of the metal casting workshops (e.g. Late Classic Period casting workshops in Askana; Medieval settlement and burial grounds in Baileti, Pre-Late Classic Period metal casting workshops and Medieval settlement in Bakhvi, burial ground, settlement and remains of metal casting workshop in Shemoqmedi, Otogvini cave of Middle Bronze Age in Vakijvari, silver deposits in Pampaleti, Medieval cave in Jumati, “Chinari treasure” in Ureki.

146. No historical or archaeological monuments are located within the limits of the Project corridor and in adjacent areas.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Summary of Activities and Anticipated Impacts

147. This paragraph provides a brief description of anticipated site-specific impacts related to the construction phase of the sub-project “Improvement of Ureki Waste Water system”

#	Construction Phase. Potential Impacts During Construction Works	Risk	Sites
1	Dust, noise, vibration	High Risk	In the process of excavation of the trenches for sewer pipes, foundations for collectors and pump stations at Ureki town and Shekviteli village. The waste water treatment plant is distanced from settlements, therefore no impact caused by vibration, noise or dust is expected.
2	Pollution of surface water during construction and rehabilitation works	Moderate Risk	The wastewater treatment plant is located near the Sepa river, Other sides are distanced from the river.
3	Impacts on Archaeological Sites	Low Risk	No damage to any archaeological site shall be expected. The pipe laying, collectors and pump station sites in Ureki and Shekviteli are located in the areas of extensive on-going human impact.
4	Impacts on traffic	High Risk	Town of Ureki is a resort where the number of residents increases 2-3 times during tourist season. Since the rehabilitation works will be implemented within the town boundaries, the risk of disturbance of vehicular and pedestrian traffic is high.
5	Landslides, slumps, slips and other mass movements.	Moderate Risk	No large scale earthworks are planned under the Project. Despite this, the landslide processes may be triggered during construction of the waste water treatment plant and pump station.
6	Impacts on flora and fauna	Low Risk	All Project sites are located within the area have been experiencing the severe human impacts. Therefore, no influence on flora and fauna shall be expected during implementation of the Project.
7	Pollution risk for ground waters	High Risk	Depth for sewer pipe trenches are 1-1.75 m. Depth for collector trench is

#	Construction Phase. Potential Impacts During Construction Works	Risk	Sites
			<p>2.2 m. Level of ground water at the same area is 2 m, therefore there is a high risk of ground water pollution</p> <p>No major spills of fuel and lubricates at construction sites due to leakages are expected.</p> <p>The spills, which are likely to cause groundwater contamination may occur during fuelling construction machinery at the construction sites and/or construction camps.</p>
8	Pollution risk for air quality	Moderate Risk	Air pollution may occur in the inhabited areas, including town of Ureki and village of Shekvetili.
9	Poaching by construction workers	Low Risk	Supsa and Natanebi rivers
110	Hazardous Construction Wastes	Low Risk	Small quantities of hazardous wastes will be generated as a result of vehicle operations and the maintenance activities.
111	Impact on existing infrastructure	Low Risk	Electric power transmission systems, existing water supply and drainage channel systems and channels
112	Poor sanitation and solid waste disposal in construction camps and work sites (sewerage, sanitation, waste management)	Low Risk	<p>Camp will not be used as living facilities because it is expected that majority of the employees would be local persons.</p> <p>The construction camp would be equipped with a bio toilet and other necessary infrastructure.</p>
113	Construction Related Impacts at the Quarrying Sites	Low Risk	The exploration of the borrow pits should be conducted by the licensed companies or the Contractor has to obtain its own license. However, potential impact of the increased quarrying activities on river bed and floodplain landscape, ichthyofauna and groundwater should be considered.

B. Air Quality

1. Noise and Dust Caused by Construction Activities and Emissions of Harmful Substances into the Atmosphere Air

148. Noise and emissions of harmful substances are typical impacts of construction. Air quality will be affected during construction by emissions from vessels, equipment, and land vehicles in work activities at work locations. During the sewer pipe and pump station installation stage the rehabilitation works are to be carried out in Ureki streets. The noise and dust generated in course of excavating the trenches will cause nuisance of the local residents that will further increase during tourist season assuming growth of the local population on the account of holiday makers.

149. As for WWTP, the noise and dust generated during construction/rehabilitation works practically will not affect the population since these facilities are located far from the residential areas.

150. Impact as noise and vibration shall be expected during construction materials haulage to the WWTP site.

Mitigation Measures

151. These impacts can be reduced by a variety of measures, many of which are common in most urban construction. These include:

- Require adherence to engine maintenance schedules and standards to reduce air pollution.
- Use of defined, well planned haulage routes and reductions in vehicle speed where required;
- Periodically water down temporary roads on site;
- Cover trucks carrying cement, gravel, sand or other loose materials;
- Wet or cover trucks carrying stone/ sand/ gravel;
- Haul materials to and from the site in off peak traffic hours;
- Halting work during excessive winds.
- Immediately replacing defective equipment and removing it from the work site
- No truck movements in inhabited areas between 22:00 and 6:00.

Operation Phase

152. No permanent dust emission sources will exist during operation phase. It is expected that in small quantities dust will be generated only during maintenance works.

153. The noise will be continuously generated at pumping stations. However, since the nearest residential building is located far apart, no such noise will affect the population.

Mitigation Measures

154. The standard approaches shall be employed to reduce the dust and noise pollutions during maintenance works as follows:

- Periodically water down temporary roads on site;
- Immediately replacing defective equipment and removing it from the work site
- No truck movements in inhabited areas between 22:00 and 6:00.

C. Water Quality

1. Contamination of Surface Water

Construction Phase

155. During implementation of the Project the risk of surface water contamination is of medium level.

156. The surface water may be contaminated due to improper placement of the excavated soil, poor management of construction camps, improper storage of construction materials and leakage of fuel and lubricates from construction machinery.

157. The wastewater network will not be put into operation before at least one line at the wastewater treatment plant is in operation. Both Works contracts (for network and for WWTP) will run in parallel and the construction schedule will be defined in the tender documents so that the final connection of households and hotels to the sewer network will not take place before the WWTP has been commissioned. There will be no temporary discharge of collected wastewater into the Sepa River before the completion of the WWTP.

Mitigation Measures

158. The following mitigation measures shall be implemented:

- Where works are in progress, erosion control and sedimentation facilities including sediment traps and straw bale barriers or combinations thereof will remain in place;
- Lubricants, fuels and other hydrocarbons will be stored at least 100m away from water bodies.
- Topsoil stripped material shall not be stored where natural drainage will be disrupted.
- Solid wastes will be disposed of properly (not dumped in streams).
- Guidelines will be established to minimize the wastage of water during construction operations and at campsites.
- During construction, machinery and transport will be used by the contractor, both have potential of causing contamination to under ground and above ground water assets. There is need to compile temporary drainage management plan before commencement of works.
- Proper installation of temporary drainage and erosion control before works within 50m of water bodies should be done

Operations phase

159. The operation of the wastewater treatment plant involves various processes:

- Screening
- Sedimentation
- Aeration
- Final sedimentation
- Sludge thickening
- Sludge dewatering

160. The wastewater treatment will generate waste, which will comprise of the following:

- Screenings from coarse and fine screen
- Grit from aeration
- Sludge from biological treatment

161. The operation of the wastewater treatment plant will generate treated wastewater. The quality of the effluent is according to European and Georgian regulations and can be discharged into the surface water without harm. Georgian legislation requires the preparation of a Report on the Maximum Allowable Discharge into Sepa River that was prepared by Gamma Scientific Laboratory, Tbilisi. The permissible concentrations were determined as shown in the table below. They are based on calculations of the concentration of effluent in the receiving water body. The calculations take into account the background concentration existing in the water object for each indicator, the category of the water object, the maximum permissible concentrations of substances in the water and their assimilation capability. The report confirms the applicability of the norms for Sepa River. The design of the wastewater treatment plant is in line with these effluent quality parameters.

N°	Ingredients	Permissible concentration, Mg/l
1.	Suspended solids	30
2.	BOD ₅	25
3.	COD	125
4.	Total Nitrogen	15
5.	Total Phosphorus	2

Table 13: Maximum Permissible Discharge

162. The table below presents the decisive parameters for untreated wastewater (inflow WWTP), treated wastewater (outflow WWTP), Sepa river, and the dilution of effluent and river water in comparison to the Georgian environmental standards. The loads were calculated for the peak season in 2020 and 2040 with a minimum discharge of 0.63m³/s during a dry summer month. The values of diluted water are below the limit values of the Georgian legislation.

Pollution load	BOD5	COD	Suspended Solids	Total N	Total P
	mg/l	mg/l	mg/l	mg/l	mg/l
Inflow WWTP	292	584	341	54	9
Outflow WWTP	25	125	30	15	2
Sepa river (baseline)	1.7	15	41.6	0,47	0,01
Operational case: Dilution of effluent and river water, 2020	3.33	23	40.79	1.49	0.15
Operational case: Dilution of effluent and river water, 2040	4.75	29	40.08	2.37	0.27
Environmental Standards	6	30	< 0.75 +	15	2
Failure of operation: Mix of untreated wastewater and Sepa River in 2020	26.90	64.39	67.59	5.2	0.79

Table 14: Water quality in peak season 2020 and 2040

163. The wastewater treatment plant will be designed and constructed in several lines so that even if one line fails, for a short time the other line(s) will remain in operation.

Mitigation Measures

164. Improper disposal of the waste will pollute receiving water bodies. Following measures shall be incorporated into the design:

- Provide a container solution for collection of screenings and grit.
- Provide a proper sludge collection and treatment for achieving stabilised and dewatered sludge.
- Dispose the dried sludge in a landfill.

165. Regular monitoring will be conducted at WWTP to ensure that the treated water meets standards. There is occupational health and safety risk involved while working in

WWTP, however all the necessary precautionary measures are included. Adequate manpower, operation and maintenance equipment will be provided. Necessary training will also be provided to the personnel. No impacts due to disposal of sludge are envisaged as the sludge will be dried before its disposal. The treatment and drying processes kill enteric bacteria and pathogens.

166. In case all lines of the wastewater treatment plan fail, the following mitigation measures shall be implemented:

- Reduction of sewage pumping and using the network as temporary storage volume (feasible in low season 2020 for 2 days, in peak season 2040 for about 8 hours.)
- Notification of government agencies, including local government, regional offices of the Ministry of Environment and Natural Resources ;
- Notification of population;
- Notification of services at adjacent facilities;
- Accelerated repair;
- Keeping spare parts in stock at the service centre.
- Temporarily prohibition of swimming in River and close beach areas;
- Measurement of oxygen level in the river;

167. It is necessary that staff is trained adequately before taking over the WWTP from design-build contractor, and it should also be provided with necessary technical manuals in Georgian language.

2. Ground Water

168. Ground water level at the project area is 2 m. therefore potential impact arises from implementation and maintenance of contractors' yard, transport, maintenance of vehicles and handling and storage of lubricants and fuel. The required provisions for contractor's yard are described in the chapter on impacts and mitigation measures concerning quality of soils.

169. Basically, the construction of the wastewater network during construction and operation has no impact on the ground water.

D. Soils Quality and Topsoil Management

170. During the construction, impacts soils are mainly due to earthworks and the operation of the contractor's yard.

171. The works for the transmission mains comprise material excavation, pipe laying and backfill of material including compaction. Material will be stored temporary alongside the trench and refilled after pipe lying. Therefore impacts associated with earthworks for trench laying are of temporary nature. Excavated soil will be placed alongside the trench, and the pipes will be placed in the trench manually. A sand layer of 30 cm thickness will be laid on top of the pipe, after which the trench will be refilled with excavated material and compacted manually. The excavation is expected to generate surplus material. Surplus material will be used as embankment fill as far as possible.

172. Construction of the pumping station and collector, as well as WWTP may lead to disturbance or loss of topsoil. Therefore the Contractor shall implement the following measures:

- The top soil of about 1 ft depth (0.3 m) shall be removed and stored separately during excavation work, and after the construction of the main trunk the same soil shall be replaced on the top, in unpaved areas;

- Subject to advance consent of the local self-governance authorities, the excess topsoil remained after construction of the new pumping station, reservoir and WWTP will be used at other Project sites or handed over to the appropriate authorities.

Mitigation Measures

173. The following practices will be adopted to minimize the risk of soil contamination and topsoil loss:

- The contractors will be required to instruct and train their workforce in the storage and handling of materials and chemicals that can potentially cause soil contamination.
- Solid waste generated during construction and at campsites will be properly treated and safely disposed of only in demarcated waste disposal sites.
- Construction chemicals will be managed properly
- Clearly labelling all dangerous products,
- Fuel tanks (diesel or oil) should be placed in a concrete pool which its perimeter walls will be at least 1.0 m high with the concrete or plastered masonry wall,
- A proper floor drain should be installed on the slab of the concrete pool for safely discharging the leakages.

Operation Phase

174. During operation phase, the soil may be contaminated due to water leakage from the damage pipe. In case such damage is not detected in a due time, the area may be severely contaminated..

175. Soil contamination may also occur during performance of the planned or emergency repair works.

Mitigation Measures

176. Sewage pressure in the pipelines must be continuously monitored during entire operation phase. In addition, the relevant mitigation measures shall be implemented during maintenance works.

E. Biological Environment

1. Impacts during Construction

177. The impacts on flora and fauna during implementation of contractor's yard will be minimised during site selection and installation. The following measures need to be implemented to avoid any impacts on flora and fauna:

- Avoid tree cutting
- In unavoidable cases, plant two trees of same species for each tree that is cut for construction
- The trench shall not be kept open in the night/after working hours. This will avoid any safety risk to wild animals.

2. Impacts during Operation

178. Operation of the water supply components of the subproject will not have any significant negative impact on the biological environment.

F. Traffic

1. Impacts during Construction

179. The construction of the water network will be mainly conducted along existing roads in the city. Although work will not require land acquisition it could still have economic impacts, if the presence of trenches, excavated material and workers discourage customers from visiting shops and other businesses, which lose income as a result. These losses however will be short in duration.

180. Implementation of the following best construction measures will reduce the inconvenience and disturbance:

- Informing all residents, tourists and businesses about the nature and duration of any work well in advance so that they can make necessary preparations if necessary;
- Providing wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required
- Increasing workforce to complete the work in minimum time in these stretches
- Initial situation of private properties has to be re-established after construction

181. Another aspect of the work that has economic implications is the transportation of material to the site and surplus soil from the site to locations where it can be put to beneficial use as recommended. There will be truck movements carrying material. Although this is not significant, considering the narrow roads, it could disrupt traffic in the Town. Dust generated during the transport may also impede the commercial and trade activities, which are predominantly located along the main roads. The transportation of material/waste shall be implemented by the Civil Contractor in liaison with the town authorities, and the following additional precautions should be adopted to avoid effects on traffic:

- Plan transportation routes in consultation with Municipality and Police
- Schedule transportation activities by avoiding peak traffic periods.
- Use tarpaulins to cover loose material that is transported to and from the site by truck
- Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water/unloading inside a barricaded area
- Clean wheels and undercarriage of haul trucks prior to leaving construction site

2. Impacts during Operation

182. As the operation and maintenance activities would be conducted within the existing facilities no impact is envisaged on economic resources. Repairs and leaks of the water supply pipes will be minor and localized. In fact, the improvements to the water supply system will bring various benefits. Availability of good infrastructure facilities will add to the quality of life, and there will be more people interested to live and visit, which will bring new investments and boost economic development.

G. Other Wastes from Construction Activities

1. Municipal Waste

183. Municipal waste may be generated on the Storage area. Mainly this is rubbish, plastic or glass bottles, glasses, waste food, etc. and a stationary waste. Waste should be collected both by the specially assigned personnel and the workshop workers on the area. The waste is placed into 0.24m³ plastic containers and further a local Sanitary Service takes it to landfills. The following should be taken into account:

- Generation of dust should be avoided;
- Plastic containers should be closed to prevent spread of the smell and also to avoid contact of rodents and insects with the waste.

184. The personnel involved in the handling of hazardous and non-hazardous waste will undergo specific training in:

- Waste handling
- Waste treatment; and
- Waste storage.

185. Burning of waste on any construction site is forbidden with the exception of stub and small branches from felled trees and bushes, which is better to be burned in order to avoid pest dissemination.

2. Medical waste

186. Medical waste is generated in the Medical Care and Control Point and belongs to hazardous waste category. This waste is collected in special plastic boxes and is transferred to a contractor for farther incineration. It is recommended that the medical waste is directly transferred to a contractor from the place of its consolidation. While disposal of the medical waste the following requirements are to meet:

- Medical waste must be disposed in special plastic boxes, which can be hermetically closed.
- Medical waste for farther incineration should be transferred to a certified contractor (Batumi municipal waste operator).

3. Non hazardous construction waste

187. Non hazardous construction waste may be generated on the Storage and construction area and will be collected by contractors workers. Waste disposed first on the sites of origin, and then moved to construction waste temporary storage facility before transferred to a contractor. While disposal construction wastes both on the sites and at the temporary storage facilities the following requirements are to meet:

- Place of disposal of the waste concerned must be enclosed.
- The waste must not have access to drainage water.
- Waste must be immediately removed from the working sites.
- Waste must be placed in secondary protective basins.
- This waste can be transferred only to a certified contractor.

4. Waste during operation phase

188. An important aspect of increased water supply is that of increased sewage generation, which needs to be treated and disposed properly without causing any impacts. In case of inadequate facilities, disposal of untreated sewage into rivers/streams is common and therefore it offers a potential impact to surface and groundwater.

189. At present, there is no proper sewerage system in the Project Area. Although there is a system covering about 50% town population, there is no treatment facility and untreated sewage is disposed into a stream that discharge in River Sepa near the Ureki City. Rest of the people depend on individual facilities like pit latrines or septic tank-soak pit system.

190. With the increase in water supply, the total sewage generation from the project area will be 1.5-4 m³ per day (related with season), with most of it generating from Ureki City and Shekvetili – from both resident and tourism areas. Without any proper sewage collection and treatment system, the disposal of the large quantities of sewage will have negative impacts on receiving environment, particularly on Sepa River, underground water and coastal waters.

191. It is therefore necessary that: (i) Sewerage system with adequate treatment facilities, which can treat the sewage to Georgian standards and dispose safely, shall be provided; the urban and tourism areas (Ureki City and Shekvetili) shall be provided with sewerage system on priority (ii) The above measures shall be implemented along with the water supply system improvement

192. The WWTP will be designed in a staged approach with 20,000 PE at stage 1 and 40,000 PE at stage 2 for the design horizon 2040. The design standards will be according to European and Georgian regulations. The effluents of the future WWTP will discharge via recipients (Sepa River) into the Black Sea. Basically the Black Sea should be considered as a sensitive water body since the water exchange with the connecting Mediterranean Sea and the Atlantic Ocean is very low and eutrophication especially of coastal waters cannot be excluded. The construction of the wastewater network and the treatment of the wastewater will considerably improve the water quality of Sepa River and adjacent coastal area of the Black Sea.

193. Impacts during operation phase of the WWTP refer to discharge of treated water into the Black Sea which will result in positive impact, since situation will improve essentially as compared to present situation due to long-term and sustainable waste water treatment:

- Improvement of sea water quality at the beaches
- Improvement of water quality in Sepa River

194. An improved water supply system will cause an increased waste water flow. Waste water will be collected in a sewerage system and treated in a WWTP without infiltration of untreated sewage into surface water and ground water. During operation stage no effects on surface water and ground water is envisaged. The effluent criteria for the WWTP are summarized in the following table:

Parameters	EU effluent standard	Effluent standard according to Georgian law	Effluent criteria acc. to Max. Permissible Discharge Study
BOD ₅	25 mg/l O ₂ (without nitrification)	25 mg/l O ₂ (without nitrification)	25 mg/l
COD	90 mg/l	125 mg/l	125 mg/l
Suspended Solids	35 mg/l	30 mg/l	30 mg/l
Total - N	15 mg/l N (10,000 to 100,000 PE)	15 mg/l N (10,000 to 100,000 PE)	15 mg/l N (10,000 to 100,000 PE)

Parameters	EU effluent standard	Effluent standard according to Georgian law	Effluent criteria acc. to Max. Permissible Discharge Study
Total - P	2 mg/l P (10,000 to 100,000 PE)	2 mg/l P (10,000 to 100,000 PE)	2 mg/l P (10,000 to 100,000 PE)

Table 15: Effluent criteria for future WWTP in Ureki

195. The following wastes should be disposed on the waste disposal site located next to the WWTP:

- compacted waste collected from the screen and from the grit chamber
- Sand and gravel from the grit chamber
- compacted and dewatered sludge from the sedimentation tank

196. Sludge can also be burnt to produce electric power. Mechanical composting is also possible. It is required that sludge should be used in such a way that the quality of surface and groundwater is not impaired. As it is unlikely that the sludge contain any heavy metals, land disposal is also an option.

197. Regular operation of main sewage collector will not affect ground water.

198. Impacts may occur in case of leakages. Therefore main requirement for maintenance of the main sewage collector will be for the detection and repair of leaks. Repairs will be conducted in essentially the same way that the pipes were laid. Trenches will be dug to reveal the leaking area and the faulty connection will be re-fitted, or the pipe will be removed and replaced if necessary.

H. Impacts on Archaeological Sites

199. Land clearance works, grading and excavations are associated with the risks of damaging underground archaeological remnants. However in the case of the proposed Project no archaeological monuments are expected to be touched during construction phase since pipes will run along and inside existing roads as far as technically feasible. There is a low probability for chance finds of archaeological objects. However, during construction, new archaeological findings it is shall be expected, therefore, therefore, special care should be taken not only at the new construction sites, but also at construction camps and storage areas.

Mitigation Measures

200. To avoid this risk, preliminary preventive studies and archaeological supervision during the earth-works is necessary. Supervisory procedures and all other necessary measures should be agreed with the Ministry of Culture when obtaining the construction permit, in accordance with the rules of the permit issuance. According to the article 14 of the Law on Cultural Heritage, Permit on conducting quarrying activities in Georgia, as well as construction of an object of a special importance as it may be defined under the legislation of Georgia, is issued by a competent authority based on the positive decision of the Ministry of Culture, Monument Protection of Georgia. The basis for the conclusion is the archaeological research of the proper territory to be carried out by the entity wishing to accomplish the ground works. The entity wishing to do the earth-works is obliged to submit the Ministry the documentation about the archaeological research of the territory in question. The preliminary research should include field-research and laboratory works.

201. Therefore steps should be taken minimize the risk. This should involve:

- Contractor should put in place a protocol for conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve:
- Having excavation observed by a person with archaeological field training. Supervisory procedures and any other necessary measures shall be agreed with the Ministry of Culture;
- Stopping work immediately to allow further investigation if any finds are suspected;
- Calling in the state archaeological authority if a find is suspected, and taking any action they require ensuring its removal or protection in situ.

202. At the construction stage archaeological monitoring should be ensured by the contractor under the supervision of the Ministry of Culture, Monument Protection of Georgia. The budget necessary for the archaeological supervision and other agreed works should be fixed under the construction works appraisal.

I. Socio-Cultural Resources

1. Impacts during Construction

203. There are various social-cultural resources (such as schools, hospitals, churches, university) in the town. The construction impact will include noise and dust, and interrupted access due to movement of heavy vehicles transporting material and waste. Mitigation will therefore be needed to protect socio-cultural resources and to enable usage by local people and visitors to continue throughout the construction work. This will be achieved through several of the measures recommended above (under the impacts on air quality), including:

- Limiting dust by removing waste soil quickly; by covering and watering stockpiles, and covering soil with tarpaulins when carried on trucks
- Providing wooden walkways planks across trenches for pedestrians and metal sheets where vehicle access is required
- Increasing the workforce in to complete the work quickly

204. There is invariably of safety risks when substantial construction such as this is conducted in an urban area, and precautions will thus be needed to ensure the safety of both workers and citizens. The Contractor will be required to formulate and implement health and safety measures at construction sites, which should include such measures as:

- Following standard and safe procedures for all activities – such as provision of shoring in deeper trenches (> 2 m)
- Excluding public from the site – enclosing the construction area and provide warning and sign boards, and security personnel
- Providing adequate lighting to avoid accidents
- Ensuring that all workers are provided with and use appropriate Personal Protective Equipment - helmets, hand gloves, boots, masks, safety belts (while working at heights etc.)
- Maintaining accidents records and report regularly
- Traffic control. Irregular control of trucks by local police (radar control, safety control). Speed limits to be introduced within construction areas and on access roads.
- Yellow / orange warning tape to protect workers and pedestrians from falling into building pits, to prevent pedestrians from entering the construction site.

Warning signs to prevent accidents within the construction site and on access roads.

205. Economic Benefits. There could be some short-term socio-economic benefits from the construction work if local people gain employment in the workforce. To ensure that these benefits are directed to local people, the Contractor should be required to employ as much of his labour force as possible from the local communities in the vicinity of construction sites. Drawing of majority of workforce from local communities will avoid problems that can occur if workers are imported, including social conflicts and issues of health and sanitation due to labour camps. If temporary labour camps are to be provided, Contractor should ensure that they are maintained well with proper water supply and sanitation facilities. In unavoidable case of sourcing labour from other areas, provide adequate housing facilities so that there are no impacts and conflict with the local people. Following measures shall be followed:

- Establish temporary labour camps in consultation with the local authority
- Shall be located away from water bodies
- No clearance of trees vegetation shall be allowed for establishment of camp
- Provide all basic amenities (water supply and sanitation, waste collection & disposal, first aid facilities, etc.)
- Contractor shall provide fire wood and no worker shall be allowed to cut any tree
- Ensure regular and clean maintenance of the camp

2. Impacts during Operation

206. As the operation and maintenance activities would be conducted within the facilities, no impacts on socio-cultural resources envisaged.

207. Regular water quality surveillance program shall be implemented to avoid any public health risk as detailed below:

- Conduct regular water quality monitoring at well fields; results of monitoring conducted at this feasibility stage can be used as base values to study the change in the water quality in future
- Develop & implement a water quality monitoring program for distribution system according to the Georgian Law

208. The improved water supply system will bring numerous benefits when it is operated. The main beneficiaries will be the citizens of Ureki, who will be provided with a constant supply of better quality water, which serves a greater proportion of the population, including urban poor. This will improve the quality of life of people as well as raise standards of both individual and public health. This should lead to economic gains as people will be away from work less and will spend less on healthcare, so their incomes should increase. Improvement in infrastructure will bring more economic opportunities.

209. The improved and expanded water supply system would require additional workforce – both skilled and unskilled, for operation and maintenance, and therefore creates new employment opportunities for local people.

J. Vibration

1. Impacts during Construction

210. Construction activities are likely to generate noise and vibration from usage of equipment and haulage of construction materials/waste. This project however does not involve high noise/vibration generating activities like pile-driving or rock cutting. Appropriate personal protection equipment needs to be provided for workers at the site. Haulage of materials/waste, and operation of backhoe (if used for transmission main trench excavation in the town), will also generate noise, but will be limited in duration and require no special measures. During the construction period, the Georgian noise quality standards should be adhered to by the Contractor. This specifies that noise level should not exceed 70 dBA (with indicative level of 55 dBA) from 7 am to 11 pm and 60 dBA (with indicative level of 55 dBA) from 11 pm to 7 am. Sensitivity to noise increases during the night hours in residential neighbourhoods. Following measures therefore shall be implemented:

- Provide prior information to the local people about the work
- No construction of activities shall be conducted in the night
- Provide personal protection equipment like ear plugs to the workers at the noisy working site
- Sound barriers should be erected at schools and hospitals if the distance to the construction site is 50 m or less than 50 m

211. Another important activity is haulage of construction material and waste to and from site. Roads in the town are narrow and not in good condition. Following measures shall be included to avoid nuisance due to haulage of material and waste.

- Schedule material and waste haulage activities in consultation with local authorities
- No night time haulage activity; limit to day time off peak hours
- Educate drivers: limit speed between 20-25 km/h and avoid use of horn in the town
- Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement

212. As for the construction vibration is considered, none of the activities in the subproject has potential to generate significant vibration, and there are no sensitive structures in the proximity of the site. Therefore there are no likely impacts.

2. Impacts during Operation

213. There are no sources of noise or vibration from the operation activity of the new water supply system.

K. Construction Camps

214. The establishment of contractor's work camp may cause adverse impacts if various aspects such as liquid and solid waste management, equipment maintenance, materials' storage, and provision of safe drinking water are not addressed properly. The site for the work yard will be selected by the contractor in agreement with the Municipality, UWSCG and the supervisor.

215. To ensure that potentially resulting impacts are kept at a minimum the contractor will be required to prepare the following plans or method statements:

- Layout plan of the work camp including a description of all precautionary measures proposed to avoid potential adverse impacts on the receiving environment (surface and ground water, soils, ambient air, human settlement);
- Sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses or ground-water;
- Waste management plan covering the provision of garbage bins, regular collection and disposal in a hygienic manner, as well as proposed disposal sites for various types of wastes (e.g., domestic waste, used tires, etc.) consistent with applicable national regulations; and
- Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from Rioni River. Storage facilities for fuels and chemicals will be located at a safe distance to the river. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.
- These plans will be approved by the Engineer prior to beginning of construction activities.

216. Prior to establishment of the work camp(s) the contractor shall conduct consultations with local authorities to identify sources of potable water for the workforce that will not compete with the needs of the local population. Potable water for the workforce shall comply with the national quality standards. Construction water should be sourced from the local water supply.

L. Construction Related Impacts at the Quarrying Sites

217. The quarries and borrow pits will be finally selected by the contractor. The exploration of the borrow pits should be conducted by the licensed companies or the Contractor has to obtain its own license. However, potential impact of the increased quarrying activities on river bed and floodplain landscape, ichthyofauna and groundwater should be considered.

Mitigation Measures

218. The exploration of the borrow pits should be conducted by the licensed companies. In case if the constructing company intend to perform quarrying activities, the company has to obtain related license. Potential impact of the increased quarrying activities on ichthyofauna, groundwater and landscape should be considered anyway. Validity of licenses for the abovementioned companies is a main mechanism to guarantee that most of impacts related to quarrying will be mitigated. License is provided by the MoENRP only on a basis of preliminary assessment (including limits and conditions for reinstatement). The Regional Services of the MoENRP and Environmental Inspectorate are in charge to control compliance of the quarrying company's performance. The role of the UWSCG within this plan should be to ensure timely and permanent involvement of the MoENRP in construction supervision.

219. The measures aimed on mitigation of the dust and emission impacts, as well as potential river contamination due to improper fuelling and vehicle operation should be the same as above described pollution prevention measures, but control on this sensitive site should be stricter. Contractor's environmental personnel shall pay attention to this site during monitoring.

M. Cumulative Impacts

220. Project is designed to improve environmental quality and living conditions in Ureki through the improvement of water supply system. The potential negative impacts identified on various environmental parameters, during both construction and operation, in the previous sections of this report, are localized and temporary.

221. By nature, impacts such as on air quality and on people (due to disturbance, nuisance and safety risk of construction activity) can have cumulative impacts, as all the construction activities are conducted simultaneously. These are common impacts associated with any construction activity, and as discussed in the earlier sections, there exists proven and easy-to-implement measures to mitigate these impacts.

222. No cumulative impacts envisaged during the operation stage.

V. ANALYSIS OF ALTERNATIVES

A. Site Alternatives

223. The wastewater treatment plant (WWTP) will be constructed on a newly acquired, former agricultural land between Ureki and Shekviteli, next to the railroad and at a distance of more than 500 m from the next settlements. The location is shown in the figure below. The site is accessible by road. The treated wastewater will be discharged via a pressure line into the river Sepa, which will feed into the Black Sea after about 500 m.

224. At the beginning of the project, UWSCG proposed to use the site of the old wastewater treatment for the construction of the new plant. As this site is slightly too small and also too close to houses and hotels in Ureki, other locations were investigated. In a first step government owned land in the project area was identified but no feasible location could be determined. In a second step, potential sites under private ownership were taken into consideration. Two sites were chosen for the central location in the project area, their land use and their distance to settlements.

225. One alternative site is located approximately 1,200 m to the East of the existing WWTP, adjacent to the railroad track, on the left hand bank of a small tributary to the Sepa River. The chosen site is located approximately 1,500 m to the Southeast of the existing WWTP site and 750 m to the south of the alternative site 1. It is also adjacent to the railroad track and has an access road. Both sites are shown in Figure 6). The land use for the alternative site is agricultural (field) intermingled with forest. The land use for the chosen site is agricultural.

226. The chosen site was selected for its better accessibility. The alternative site would have required the construction of an access road that would have crossed more private land.

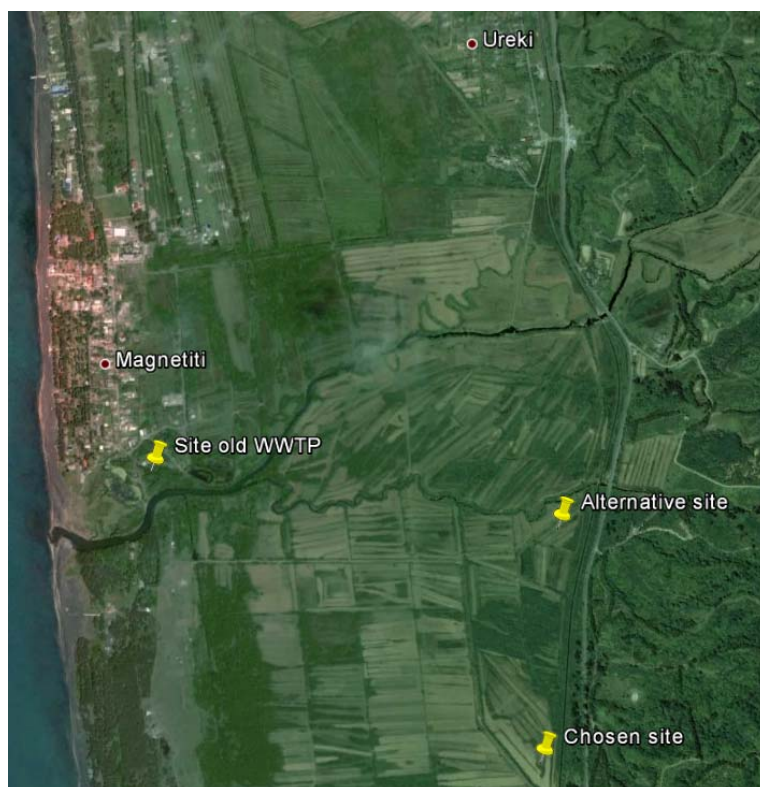


Fig. 6 Selected site for waste water treatment plant and site alternatives
(Source: Google Earth).

B. Treatment Alternatives

227. Different treatment processes were compared in the feasibility study. While the construction of the new WWTP will be tendered as design-build contract and the contractor will be responsible for the detailed design of the plant, in the following, different technical options for the treatment process were compared and a rough preliminary design was presented. The new WWTP will remove the carbon compounds and also nutrients and phosphorus contained in the wastewater to the greatest possible extent. For this purpose, a number of different wastewater treatment processes applied in various WWTPs across the globe, adapted to the particular conditions of each site and wastewater quality are known. Examples are the activated sludge and biofilm process or the membrane technology.

228. The membrane technology, the biofiltration and the anaerobic process are sophisticated wastewater treatment processes that require much experience in the design and in the construction of the plants. Particularly the operation of such systems demands a highly qualified and experienced work force in order to ensure the proper treatment of the wastewater.

229. Other treatment alternatives are the activated sludge (aeration) and the biofilm process (trickling filter). These treatment methods have been successfully applied for many decades and in many countries of the world. These two processes have a good treatment performance and a high buffer capacity with regard to the wastewater quality as well as the wastewater inflow quantities. Furthermore, the treatment process is easy to operate and monitor. Most maintenance works can be carried out by the staff of the wastewater treatment plant.

230. For these reasons, the aeration and biofilm processes were chosen for a more detailed comparison of technical options. In order to determine the most feasible option for the

WWTP the following three alternatives of the aeration and biofilm process were investigated and compared in technical and financial terms:

- Aeration tank with secondary sedimentation
- Sequencing-Batch-Reactor(SBR) process
- Trickling filter (biofilm process)

231. The dimension of each alternative was based on the design criteria and the allowable effluent quality. A net present value calculation of the three alternatives was carried out. As a result, the aeration system with the secondary sedimentation the most economical solution for the WWTP Ureki

VI. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

232. Most of the main stakeholders have already been identified and consulted during preparation of this IEE, and any others that are identified during project implementation will be brought into the process in the future. Stakeholders of this project include:

- People who live, and work near construction sites of facilities in Ureki, Shekvetili and Laituri well field
- UWSCG as implementing agency
- Other government regulatory institutions
- Municipality of Ozurgeti
- NGOs and CBOs working in the affected communities;
- Other community representatives (prominent citizens, religious leaders, elders, women's groups);
- The beneficiary community in Ureki and Shekvetili in general; and
- The ADB, as funding agency

233. A public meeting was held in Ureki on 16 July 2013 to which stakeholders were invited. The consultative meeting was organized with representatives from the local population of Ureki, Shekvetili and Natanebi. Local population from Shekvetili and Natanebi villages were delivered by minibuses organized by the Ozurgeti service centre of UWSCG. The meeting covered the water supply system as well as the wastewater system and WWTP, the latter being subject of a separate IEE. An additional consultation was held during the preparation of the LARP with land owners affected by resettlement. The total number of participants in all meetings was sixteen (16). Twelve (12) of them were AP. Also, representatives of Ozurgeti Municipality and the local service centre attended consultation.

234. There is no infrastructure and households downstream of the discharge point into Sepa river. The short distance to the black sea is mainly of wet land as well as wild bushes and forest on both sides of the river. There is no access to the river for fishing and leisure activities.

235. There are no households close to the WWTP. This distance to the next house is more than 500 m. Landowners of the WWTP site were contacted and informed. A LARP was prepared.

236. By giving advertisements in advance, attendance of a wide range of related people to the meetings was encouraged. During the Public Consultation Meetings, citizens were informed about the activities to be carried out within the scope of the project, environmental

effects of the project and measures to be taken against these effects. Opinions, ideas and suggestions of the local residents and related people were received during the meeting.

237. Public Opinion. Consultation with affected population was undertaken

- to ensure their informed participation in the design, implementation and monitoring of the project measures and their impacts on the environment, as well as the efforts to minimize and the mitigate impact when avoidance is not possible;
- to introduce the project benefits to the local population that accrue to them as a result of project implementation;
- to incorporate all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

238. The following topics were discussed during the meeting:

- project context and rationale
- expected start and end of the project
- benefits of the project to local population and to the country as a whole
- the environmental issues and mitigated measures related to the project

239. The public consultation showed a support for the Ureki subproject by the local population. During public consultation importance of a good cooperation between the local population, the contractor and UWSCG has been discussed. Local population were aware of the need to improve the water and sanitation system services. Residents also were of the view that the proposed project will improve the public health, the environment, and the socio-economic development of Ureki. Findings, list of participants, key concerns, and data are provided in Annex 1 of this report.

240. The residents were mainly interested in the start and the duration of the project, the impacts and benefits of the sub-project as well as in the planned social safeguard measures. UWSCG explained the schedule of works and underlined that impacts are mainly limited to construction works and temporary. The Contractor will have to follow an Environmental Management Plan to minimize impacts and carry out mitigation measures. The principal benefit will be the 24 h supply with drinking water after completion of the project. Topics with regard to resettlement were discussed and are described in the Land Acquisition and Resettlement Plan.

241. This IEE Report in Georgian language will be distributed to the interested public. Report will be available for review in Tbilisi (at UWSCG Head Office), and Ozurgeti (at UWSCG Service Centre and the Town Hall). It will also be disclosed to public by making it available on websites of UWSCG, MoRDI and ADB, together with the IEEs prepared for the other subprojects.

VII. GRIEVANCE REDRESS MECHANISM

242. The contractor is obliged to implement the environmental management plan during the whole construction period and the supervising consultant will monitor these activities. The consultant will point out any deviations from the EMP and make sure that the contractor addresses all issues of the EMP in a timely and professional manner.

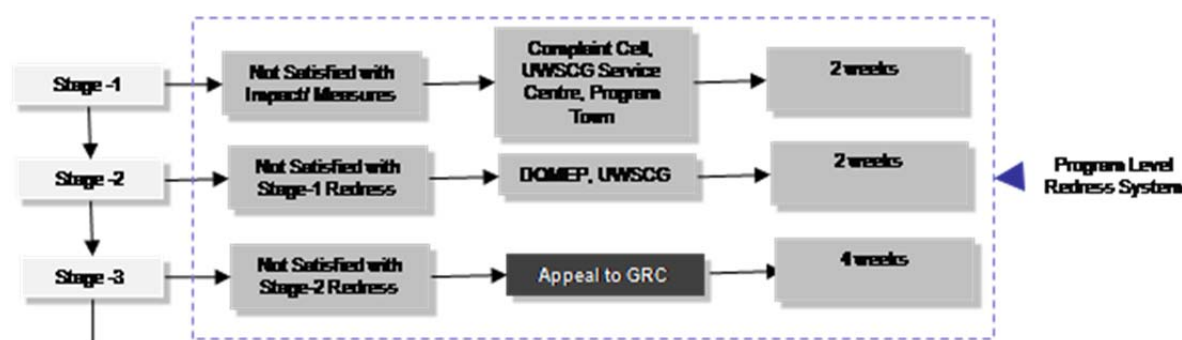
243. A grievance resolution mechanism will be set up to allow an AP appealing any disagreeable decision, practice or activity arising from project implementation. APs will be fully

informed of their rights and of the procedures for addressing complaints whether verbally or in writing during planning and implementation of the project. Care will always be taken to prevent grievances rather than going through a redress process. This is achieved by ensuring full AP participation and consultation, and by establishing extensive communication and coordination between AP, UWSCG, and the local government. The affected population and stakeholders may send their grievances, related to the project induced environmental impacts and nuisance to UWSCG or directly to the administrative bodies responsible for the environmental protection. The MoENRP and concerned municipalities are obliged to respond on the grievances, which have been received from population or other interested parties in accordance with the Administrative Code of Georgia.

244. UWSCG on its part, in order to provide a direct channel to the affected and concerned citizens for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, will establish a Grievance Redress Mechanism. A Complaint Cell and a Grievance Redress Committee will be established for each Investment Program town at the local UWSCG service centre, which will function throughout the construction period. The procedures adopted and the responsibilities of various project agencies in grievance redress are discussed in the following paragraph. During the public consultation process, UWSCG (the IA) will inform the stakeholders about the Grievance Redress Mechanism and provide contact details of persons responsible for grievance collection and response. These details will also be made available on UWSCG website. The DREP at the head office of UWSCG will be available for the local complaint cells for establishing direct links to relevant environmental authorities.

245. The Complaint Cell at the UWSCG Service Centre in the Investment Program town will accept complaints regarding the environment safeguard issues in implementation of subprojects under the respective town. A three stage grievance redress mechanism is indicated in Fig. 6 below. The grievances received and actions taken will be included into the environmental monitoring reports submitted to ADB.

Fig. 7 Grievance Redress Mechanism



- (i) Complaints received (written or oral communication) by the Complaint Cell (CC) will be registered in database system, assigning complaint number with date; Complaint Cell will inform the complainant the time frame in which the corrective action will be taken.
- (ii) Complaint resolution will be attempted at Ureki level with the involvement of Community leaders and informal mediators.
- (iii) The Complaint Cell and the Investment Program Management Office (IPMO), which is the Project Management and International Relations Department at UWSCG, will investigate the complaint to determine its validity, and assess whether the source of the problem is indeed due to subproject activities; if inva-

- lid, the Complaint Cell will intimate the complainant and may also provide advice on the appropriate agency to be approached.
- (iv) If the complaint is valid, the Complaint Cell will check the environmental management plan (EMP) of the subproject whether this issue was identified and mitigation was suggested; if yes, the Complaint Cell and UWSCG IPMO will direct the civil works Contractor to take immediate actions as per the EMP.
 - (v) If this is an unanticipated issue, the UWSCG IPMO will to identify mitigation measures and advise the civil works Contractor accordingly and a corrective action should be taken and a Corrective Action Plan (CAP) prepared.
 - (vi) The Complaint Cell will review the civil works Contractor's response on corrective action and update the complainant within two weeks.
 - (vii) If the complainant is not satisfied with the action taken by the Contractor within two weeks from the start of corrective action as directed the Complain Cell, the grievance will be directed to the Division of Resettlement and Environment Protection of UWSCG.
 - (viii) The DREP will review the issue with the IPMO and relevant Service Centre and may ask for additional information or conduct site visit, and will advise the IPMO and relevant Service Centre on actions to resolve the issue.
 - (ix) The Service Centre will submit the interim report in a week to DREP on the status of the complaint investigation and follow-up actions, and final action taken report within two weeks of completing the action. The DREP will intimate the complainant of the same.
 - (x) If the complainant is still dissatisfied with the action taken or decision, he/she may approach the Grievance Redress Committee (GRC, see below) established in the town

246. **Grievance Redress Committee (GRC).** GRC will be established to resolve the unresolved issues at Stage 2 and this will function throughout the construction period, and will have hearings on need-basis. GRC will have following members:

- Chairman of the GRC – Head of Department of Social issues at Ureki Municipality
- Ozurgeti, Chokhatauri and Lanchkhuti United Service Centre
Head: Iason Tsintsadze
Address: #26 Eristavi Street.
E-mail: iasontsintsadze@mail.ru
Phone: + 995 577 380 590
- Designated informal leader of sub-project affected community
- Female AP
- Member of IPMO
- Local NGO representative

247. Considering the anticipated impacts, it is not expected that there is any likely issue which will remain unresolved in the Stage 3 of the process. In the unlikely event of dissatisfaction after Stage 3, the complainant can approach ADB with a complaint. ADB has in place a system under the ADB Accountability Mechanism, where people adversely affected by ADB-assisted projects can voice and find satisfactory solutions to their problems. An affected person can file a complaint (mail, facsimile, electronic mail, or by hand delivery) with the:

Complaints Receiving Officer, Accountability Mechanism
Asian Development Bank Headquarters
6 ADB Avenue, Mandaluyong City 1550, Philippines
Email: amcro@adb.org, Fax +63-2-636-2086

248. Complaints will also be accepted by any ADB office such as a resident mission, regional office or representative office, which will forward them unopened to the CRO.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

A. Institutional Arrangements

249. Following agencies will be involved in implementing the Investment Program:

- (i) Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) responsible for management, coordination and execution of all activities funded under the loan. MoRDI will have overall responsibility for compliance with loan covenants.
- (ii) United Water Supply Company of Georgia (UWSCG) is the project Implementing agency (IA), which will be responsible for administration, implementation (design, construction and operation) and all day-to-day activities under the loan. An Investment Program Management Office (IPMO) is established within the UWSCG for all Investment Program related functions. The IPMO, which is the Project Management and International Relations Department at UWSCG will coordinate implementation of subprojects across all towns, and ensure consistency of approach and performance.
- (iii) UWSCG as responsible IA for the project recruited a Supervision Consultant (SC). The national and international team of consultants will assist UWSCG as project supervision for the construction of Ureki WW project. The SC will also provide capacity building training to contractor staff for management and operation and maintenance for the Project. The SC will assist UWSCG in assuring that the project is implemented according to the specified standards. This SC assignment will include the supervising of the implementation of the environmental management plan.
- (iv) All mitigation measures during construction have to be implemented by the contractor that will be monitored by the supervision consultant (SC). Implementation of EMP of this project require an experienced Environmental Management Specialist (EMS), employed by the SC, to spend a total of around 9 months for project construction period, conducting routine observations and surveys, and preparing quarterly reports.
The Contractor has the following obligations:
 - to employ environmental consultant responsible for developing and implementing the construction phase EMP and for provision of corresponding information to UWSCG and SC;
 - to prepare SSEMP;
 - to develop, if required, a Spoil Disposal Plan and Construction Waste Disposal Plan agreed with the MoENRP and Local Government;
 - to prepare and update Construction Schedule;
 - The SSEMP implementation costs should be included into the construction budget
- (v) ADB is the donor financing the Investment Program.

250. DC will be responsible for incorporation of mitigation measures in design and construction.

251. The environmental specialist (ES) assists and advise the Division of Resettlement and Environmental Protection (DREP) and the UWSCG in program implementation in compliance with the, ADB Safeguard Policy Statement, 2009 and National Legislation, and oversee the work of DCs and SCs in safeguard compliance. The ES will support UWSCG in preparing and submitting bi-annual reports to ADB for review.

252. Implementation of mitigation and monitoring measures during operation will be the responsibility of DREP. Government regulatory agencies such as MoENRP will also monitor the environmental performance. In addition the Contractor should employ an environmental specialist who will ensure that the site specific EMP (SSEMP) is prepared and implemented. SSEMP should be endorsed by SC and approved by UWSCG.

B. Costs for Environmental Management Plan

253. The costs for Environmental Management of the project shall mainly consist of the (i) monitoring of works by the EMS who will be employed by the SC; (ii) baseline and regular parametric measurements of noise, dust and emission (water quality testing may not be needed unless water supply sources will be affected by the construction works). All of the implementation of mitigation measures shall be part of the contractual works and obligation of the Contractor.

254. The cost for the environmental management for construction period is tentatively estimated.

Table 16: Environmental management cost table

Item	Quantity ¹	Unit Cost*	Total Cost	Remarks
Baseline Parametric Measurements	6	200 USD	1,200	To be conducted by the Contractor for noise, air emissions, dust (and water, if necessary) measurements
Monthly Parametric Measurements (at least 6 sites)	216	200 USD	43,200	Tests to be conducted by the Contractor at 6 sites x 36 months monthly monitoring
Environmental Management Specialist (SC)	9 months	2,500 USD	22,500	The costs are included in the contract signed between UWSCG and SC and no additional costs will occur.
Miscellaneous			6,690	10% for above items
Subtotal			73,590	Total for above
Contingency			8,831	12% of Subtotal
GRAND TOTAL			82,421	For the entire construction period of 36 Months

C. Performance Indicators

255. Based on the identified impacts of the project the performance indicators can be established. The objective of the EMP is to eliminate, avoid, minimize and if not possible, compensate the affected entities or individuals by the project. During the initial stage of the project, the Contractor, under the supervision of the CS Consultant, should establish the baseline parameters of the work sites and make appropriate parametric measurements which shall be the basis for comparison in the entire project. This shall include physical parameters on noise, dust, air emissions (water quality if necessary) and related local community concerns. Mitigation measures shall be implemented or improved based on the level of non-conformance to the identified performance indicators. The environmental monitoring and management shall focus on the Contractor's conformance to these performance indicators throughout the entire duration of the project.

256. In establishing the performance indicators local as well as international standards and guidelines are used as reference. In addition, local social and community concerns should also be utilized as performance indicators of the project. These performance indicators are Tabulated below.

¹To be established by CS Consultant and international environmental specialist.

Table 17: Environmental performance indicators

Environmental Aspect	Parameter	Performance Indicator	
Air Emission ²	Nitrogen (IV) Dioxide	0.2 (mg/m ³) max	0.04 (mg/m ³) Daily Average
	Sulphur Dioxide	0.5 (mg/m ³) max	0.05 (mg/m ³) Daily Average
	Carbone Monoxide	5 (mg/m ³) max	3 (mg/m ³) Daily Average
	Soot (Carbone black)	0.15 (mg/m ³) max	0.05 (mg/m ³) Daily Average
Dust	PM10 (WHO Guidelines ³)	20 µg/m ³ annual mean	50 µg/m ³ 24-hour mean
Noise ⁴	Noise Levels for residential areas at 7am – 11 pm	55 Indicative Level L _a dBA	70 Maximum Admissible Level L _a max dBA
	Noise Levels for residential areas at 11pm – 7am	45 Indicative Level L _a dBA	60 Maximum Admissible Level L _a max dBA
Social and Community Concerns ⁵	Traffic	Number or Complaints	
	Impairment of Access	Number or Complaints	
	Public Safety	Number or Complaints	
	Disruption to Utilities	Number or Complaints	
	Curtailement of Social and Business Activities	Number or Complaints	

²Environmental Quality Norms approved by the Order #297N (16.08.2001) of the Ministry of Labour, Health and Social Protection (as amended by the Order No 38/n of the same Ministry of 24.02.2003). The quality of atmospheric air (pollution with hazardous matter) is also defined by the order of the Minister of Environment Protection and Natural Resources (#89, 23 October 2001) on approval of the rule for calculation of index of pollution of atmospheric air with hazardous pollution

³<http://www.who.int/mediacentre/factsheets/fs313/en/>

⁴The Georgian standards for noise control as approved by the Decree of the Minister for Health, Labour and Social Affairs (297n of August 16, 2001) upon the 'Approval of Environmental Quality Standards', which specify the tolerable and maximum admissible levels of noise for different zones

⁵From the EMP Table

Table 18: Environmental Impacts and Mitigation Measures

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Pre-Construction				
Possible removal of terrestrial habitat. Loss of the top soil	Sites rehabilitated before contractor leaves site upon completion of construction activities. Planting and stabilization of site, including replacement of any native plant species	Construction Contractor	Construction and labor camp, storage area. WWTP, main sewage collector, construction road	Part of construction cost
Construction				
Ambient Air and Local Dust ⁶	<ul style="list-style-type: none"> • Cover or damp down by water spray on the excavated mounds of soil to control dust generation; • Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process; • Bring the material (aggregate and sand) as and when required; • Ensure speedy completion of work and proper site clearance after completion; • Damp down unsatisfied /bad condition roads to avoid dust generation while using for transport of waste/material • Use tarpaulins to cover loose material that is transported to and from the site by truck • Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water/unloading inside barricaded area • Clean wheels and undercarriage of haul trucks prior to leaving construction site <p>Don't allow access in the work area except workers to limit soil disturbance and prevent access by fencing</p>	Construction Company	Excavation areas for trenches at Ureki town and Shekvetili village	Part of construction cost

⁶Environmental Quality Norms approved by the Order #297N (16.08.2001) of the Ministry of Labour, Health and Social Protection (as amended by the Order No 38/n of the same Ministry of 24.02.2003). The quality of atmospheric air (pollution with hazardous matter) is also defined by the order of the Minister of Environment Protection and Natural Resources (#89, 23 October 2001) on approval of the rule for calculation of index of pollution of atmospheric air with hazardous pollution

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	<p>The Contractor shall coordinate with local Traffic Management Department to minimize construction traffic impact in the following topics:</p> <ul style="list-style-type: none"> • Temporary parking restrictions, • Pedestrian and cyclist diversion routes where construction prevents access, • Temporary traffic signals, • One way scheme, • Maintaining local residential access at all times, • General traffic diversion routes where roads are closed. • Sound barriers should be erected at schools and hospitals if the distance to the construction site is less than 50 m 	Contractor	Transportation routes of construction materials	Part of construction cost
Noise Pollution ⁷	<ul style="list-style-type: none"> • Maintain machinery and vehicle silencer units to minimize noise • Keeps noise generating activities associated with construction activities to a minimum and within working hours. • Notify the residents of Ureki town close to the Project area prior to commencement of the construction phase. • Vehicles and machinery that are used intermittently should not be left idling condition for long period of time. • Equipment used on site will be quietest reasonably available. • Haul routes for construction traffic entering and leaving the site will be selected to ensure noise levels at noise sensitive receptors are kept at a minimum. 	Construction Contractor	Excavation areas for trenches at Ureki town and Shekviteli village	Part of construction cost
Impact on surface water bodies due to construction ⁸	<ul style="list-style-type: none"> • In case of heavy rain, protect open trenches from entry of rain water by raising earthen bunds with excavated soil • Confine construction area including the material storage (sand and aggregate) so that runoff from upland areas will not enter the site 	Construction Contractor	Project area	Part of construction cost

⁷The Georgian standards for noise control as approved by the Decree of the Minister for Health, Labour and Social Affairs (297n of August 16, 2001) upon the 'Approval of Environmental Quality Standards', which specify the tolerable and maximum admissible levels of noise for different zones

⁸Rules of the Protection of the Surface Waters of Georgia from Pollution

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	<ul style="list-style-type: none"> Ensure that drains are not blocked with excavated soil 			
Soil Contamination	<ul style="list-style-type: none"> The contractors will be required to instruct and train their workforce in the storage and handling of materials and chemicals that can potentially cause soil contamination. Solid waste generated during construction and at campsites will be properly treated and safely disposed of only in demarcated waste disposal sites. Construction chemicals will be managed properly Clearly labelling all dangerous products, Fuel tanks (diesel or oil) should be placed in a concrete pool which its perimeter walls will be at least 1.0 m high with the concrete or plastered masonry wall, A proper floor drain should be installed on the slab of the concrete pool for safely discharging the leakages. 	Construction Contractor	Construction site Camp	Part of construction cost
Impact on Flora and Fauna	<ul style="list-style-type: none"> Avoid tree cutting In unavoidable cases, plant four trees of same species for each tree that is cut for construction The trench shall not be kept open in the night/after working hours. This will avoid any safety risk to people, domesticated, stray or wild animals. The Contractor shall ensure that the work site be kept clean, tidy and free of rubbish that would attract animals. 	Construction Contractor	WWTP, main sewage collector, construction road Camp	Part of construction cost
Impact on Traffic	<ul style="list-style-type: none"> Informing all residents and businesses about the nature and duration of any work well in advance so that they can make necessary preparations if necessary; Providing wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required Increasing workforce to complete the work in minimum time in these stretches Initial situation of private properties has to be re-established after construction 	Construction Contractor	Construction site Access Road	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Hazardous Materials	<ul style="list-style-type: none"> Comply with all national, regional and local legislation with regard to the storage, transport, use and disposal of petroleum, chemical, harmful and hazardous substances and materials. Establish an emergency procedure for dealing with spills or releases of petroleum. Storage of all hazardous material to be safe, tamper proof and under strict control. Petroleum, chemical, harmful and hazardous waste throughout the site must be stored in appropriate, well maintained containers. Any accidental chemical / fuel spills to be corrected immediately. 	Construction Contractor	Construction site Storage Area	Part of construction cost
Solid Waste	<ul style="list-style-type: none"> Place of disposal of the waste concerned must be enclosed. The waste must not have access to drainage water. Waste must be immediately removed from the working sites. Waste must be placed in secondary protective basins. This waste can be transferred only to a certified contractor. <p>The personnel involved in the handling of hazardous and non-hazardous waste will undergo specific training in:</p> <ul style="list-style-type: none"> Waste handling Waste treatment; and Waste storage. 	Construction Contractor	Construction site Storage Area Camp	Part of construction cost
Loss of top soil	<ul style="list-style-type: none"> Top soil of about 1 ft depth (0.3 m) shall be removed and stored separately during excavation work, and after pipeline construction the same soil shall be replaced on the top. 	Construction Contractor	WWTP, main sewage collector	Part of construction cost
Erosion due to excavation/refilling	<ul style="list-style-type: none"> Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer. In the steep slopes, local grass species shall be planted on the refilled trenches. 	Construction Contractor	All construction sites	Part of construction cost
Impact on air quality due to emissions from construction equipment/vehicles	<ul style="list-style-type: none"> Ensure that all equipment & vehicles used for construction activity are in good condition and are well maintained Ensure that all equipment & vehicles confirms to emission and 	Construction Contractor	Ureki and Shekviteli residential area	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	noise norms			
Socio-economic benefits from employing local people in construction work	<ul style="list-style-type: none"> To the extent possible labour force should be drawn from the local community 	Construction Contractor	All construction sites	Part of construction cost
Impacts due to import of labour and establishment of temporary labour camps	<ul style="list-style-type: none"> In unavoidable case of sourcing labour from other areas, provide adequate housing facilities so that there are no impacts and conflict with the local people: <ul style="list-style-type: none"> Establish temporary labour camps in consultation with the local authority Shall be located away from water bodies No clearance of trees vegetation shall be allowed for establishment of camp Provide all basic amenities (water supply and sanitation, waste collection & disposal, first aid facilities, etc.) Contractor shall provide fire wood and no worker shall be allowed to cut any tree Ensure regular and clean maintenance of the camp 	Construction Contractor	Temporary labour camps	Part of construction cost
Safety risk – public and worker	<ul style="list-style-type: none"> Follow standard and safe procedures for all activities – such as provision of shoring in deep trenches (>2 m) Exclude public from the site – enclose construction area, provide warning and sign boards, security personnel Provide adequate lighting to avoid accidents Ensure that all workers are provided with and use appropriate Personal Protective Equipment - helmets, hand gloves, boots, masks, safety belts (while working at heights etc.); Maintain accidents records and report regularly Trench construction shall be taken up in small segments, so that work (excavation, pipe laying and refilling) in each segment is completed in a day. No trenches shall be kept open in the night/after work hours. 	Construction Contractor	All construction sites	Part of construction cost
Historical, archaeological chance finds during excavation	<ul style="list-style-type: none"> Contractor shall put in place a protocol for conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve: 	Construction Contractor	All construction sites	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	<ul style="list-style-type: none"> ○ Having excavation observed by a person with archaeological field training; ○ Stopping work immediately to allow further investigation if any finds are suspected; ○ Calling in the state archaeological authority if a find is suspected, and taking any action they require to ensure its removal or protection in situ.. 			
Cumulative impacts – repeated disturbance to roads and people	<ul style="list-style-type: none"> • Schedule the construction activities in harmony with the other on-going works • Schedule works before road work 	Civil Contractor, SC	Transmission line works, works on water supply network in the town	Part of construction cost
Operation Phase				
Disturbance/ nuisance/ noise due to operation activity including haulage of waste, dewatered sludge	<ul style="list-style-type: none"> • Plan transportation routes in consultation with Municipality and Police • Schedule transportation activities by avoiding peak traffic periods • Use tarpaulins to cover loose material that is transported to and from the site by truck • Educate drivers: limit speed between 20-25 KMPH and avoid use of horn in the town • Provide prior information to local people about work; 	UWSCG	WWTP, access road	Part of operation costs
Influx of insects, rodents	<ul style="list-style-type: none"> • Regular waste and sludge disposal on landfill, regular cleaning of the facility 	UWSCG	WWTP	Part of operation costs
Temporary discharge of untreated water into Sepa River	<ul style="list-style-type: none"> • Reduction of sewage pumping and using the network as temporary storage volume (feasible in low season 2020 for 2 days, in peak season 2040 for about 8 hours.) • Notification of government agencies, including local government, regional offices of the Ministry of Environment and Natural Resources ; • Notification of population; • Notification of services at adjacent facilities; • Accelerated repair; • Keeping spare parts in stock at the service centre. • Temporarily prohibition of swimming in River and close beach 	UWSCG	WWTP, River Sepa	Part of operation cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	areas; • Measurement of oxygen level in the river twice a day;			

D. Monitoring

257. Monitoring describes (a) monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations that will signal the need for corrective actions; and (b) monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

258. A program of monitoring will be required to ensure that all concerned agencies take the specified action to provide the required mitigation, to assess whether the action has adequately protected the environment, and to determine whether any additional measures may be necessary. Regular monitoring of implementation measures by Civil Contractors will be conducted by the SC, on behalf of Implementing Agency. Monitoring during operation stage will be conducted by the UWSCG.

259. Most of the mitigation measures are fairly standard methods of minimizing disturbance from building in urban areas (maintaining access, planning work to minimize public inconvenience and traffic disruptions, finding uses for waste material, etc). Monitoring of such measures normally involves making observations in the course of site visits, although some require more formal checking of records and other aspects. The regular control and inspection during general construction activities in Ureki is needed.

Table 19: Environmental Monitoring Plan for construction of WWTP at Ureki

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
Pre construction					
Tender documentation	Environmental Issues	Once before bid announcement	Environmental audit of bidding documents to ensure relevant sections of the EMP have been included	The bidding document shall reflect all environmental mitigation measurements	SC
Contract documentation with Contractor	Environmental Issues	Once before contract signature	Environmental audit of contract documents to ensure relevant sections of the EMP have been included	The bidding document shall reflect all environmental mitigation measurements	SC
SSEMP	Preparation of the document	Before Construction start	Environmental audit of SSEMP to ensure that all Environmental requests are reflected.	The bidding document shall reflect all environmental mitigation measurements	SC
Construction					
Ambient Air	Dust	Continual	Visual assessment during the Works Impact Monitoring Compliance Monitoring	If dust levels are above acceptable visual levels, implement dust suppression techniques (wetting down area) and/or assess weather conditions and maybe temporarily cease works until conditions ease	SC
Noise	(15 minute) Noise Levels	Only as required: Periodic attended	+20 dBA for short term (< 4 weeks)	If noise action level is exceeded then review	

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
		Monitoring at hourly intervals at nearest potentially sensitive receivers.	+10 dBA for medium term (4 – 26 weeks) Impact Monitoring Compliance Monitoring	work practices and noise control procedures, including maintenance of equipment, installation of silencers, provision of noise barriers and modification of work hours.	
Water Quality	Quality/ Contaminant concentrates	Continual In rain weather	guideline / licence requirements (whichever is Applicable) Impact Monitoring Compliance Monitoring	If contaminant concentrations/licence conditions are exceeded, review disposal options and decide on most applicable. Report any accidents of licence (of applicable) to issuing authority.	SC
Waste Management Implications	Segregation, Storage and transport of wastes	Monthly inspection	visual assessment during the Works; - Field inspection, - Report of waste volumes generated Report and record all leakages and spills Impact Monitoring	Solid waste cycled as 0 % of movement of solids or liquid waste through the soil, rocks, water, atmosphere.	SC

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
			Compliance Monitoring		
Ground	Soil Monitoring and Erosion Control	Continual	Assess adequacy of sedimentation/ environmental controls on-site Impact Monitoring	If controls have failed or are found inadequate, cease works immediately and repair to an acceptable standard	SC
Ecological Resources	Fauna and Flora	Continual	Minimal ecological impacts Impact Monitoring	Required to ensure the recommended mitigation measures are properly implemented.	SC
Landscape and Visual	Surface treatment of temporary structures	Once at the Completion of work	Minimum disturbance of the original landscape Impact Monitoring	Required to ensure the recommended mitigation measures are properly implemented	SC
Operation					
WWTP quality monitoring, inflow	BOD ₅ , COD, Nitrogen, Phosphorus	weekly	Compare with design parameters		UWSCG
WWTP quality monitoring, aeration tank	Oxygen	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Sludge volume	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Dry matter contents	Thrice per week	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Dry matter contents of return sludge	Weekly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Microscopical analysis	Twice per week	Compare with design parameters	Adjust treatment process	UWSCG

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
WWTP quality monitoring, outflow	Temperature, pH, suspended solids	daily	compare with permission	Adjust treatment process	UWSCG
WWTP quality monitoring, outflow	BOD ₅ , COD, NH ₄ -N, NO ₃ -N, P _{gesamt}	weekly	compare with permission	Adjust treatment process	UWSCG
WWTP quality monitoring, outflow	NO ₂ -N	monthly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, outflow	Coliforms	monthly	Monitor development		UWSCG
WWTP quality monitoring, sludge treatment	temperature, pH	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	dry matter contents	monthly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	loss on ignition	monthly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	sludge gas	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	sludge production (watered, de-watered)	as required	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring	energy consumption	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring	Methane	monthly	Check occurrence	Check sludge treatment installations	UWSCG
River Sepa water quality monitoring	Suspended particles, BOD _{overall} , COD, Total Nitrogen, Total Phosphorus	weekly	Sample taking, water analysis, compare with baseline data	Compare with effluent quality, adjust treatment process	UWSCG
WWTP operation	Noise	monthly	Compare with Georgian standards for noise control	Inspect installations	UWSCG
WWTP operation	Odor	monthly	Compare with normal odor levels	Inspect installations	UWSCG

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
Infrastructure		Monthly inspection	VisualAssessment, PublicComplaints ComplianceMonitoring	If breaks/ failuresoccur, close, isolation valves (or plug manholes)immediately andrepair / replace toan acceptablestandard.	UWSCG
Sepa River during fail-ure of WWTP	O ₂	Twice per day			UWSCG

260. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal construction contract, so there are no additional costs to be included in the EMP. Costs of design-related mitigation measures (such as construction of laboratory) are included in the budgets for the civil works.

261. Monitoring of implementation of mitigation measures by contractor during construction will be conducted by Environmental Management Specialist of SC. The review of design and contract to check the inclusion of all design-related mitigation measures will be conducted by Environmental Specialist of UWSCG.

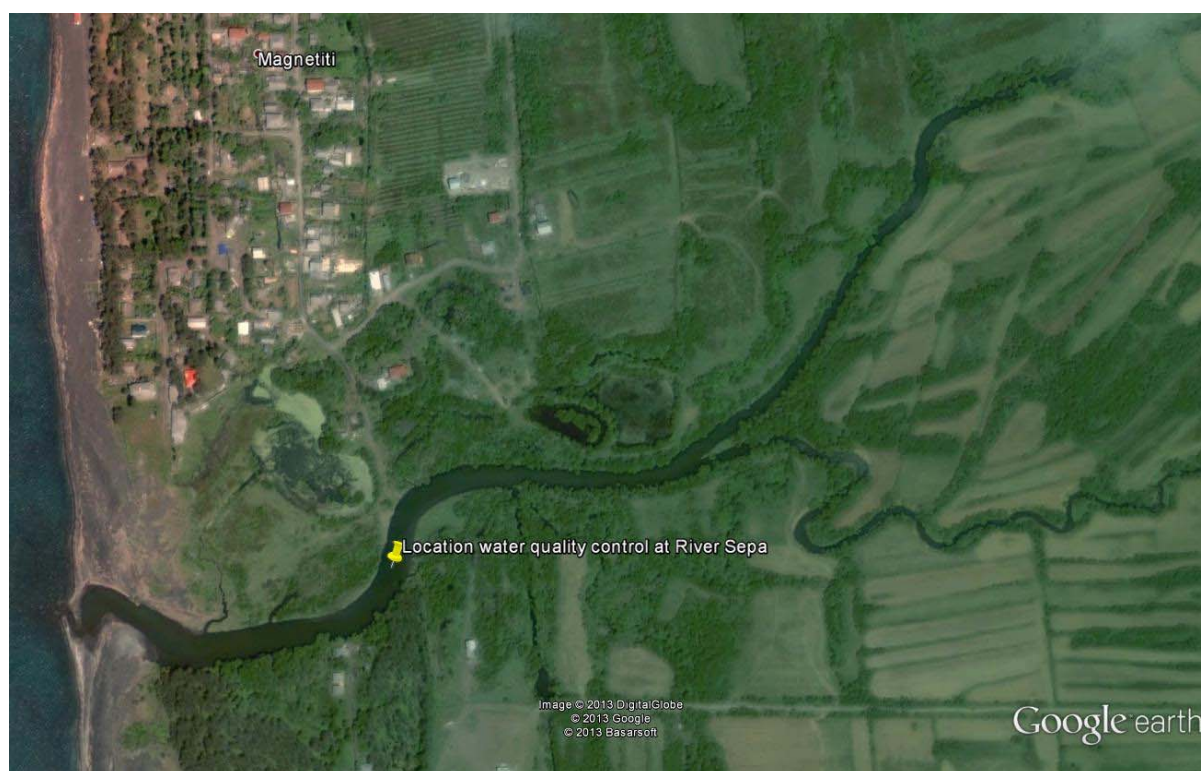


Fig. 8 Location for monitoring of water quality of River Sepa

IX. CONCLUSION AND RECOMMENDATION

A. Recommendation

262. The environmental impacts of infrastructure elements proposed in the wastewater system improvement subproject in Ureki and Shekviteli have been assessed and described in the previous sections of this document. Potential negative impacts were identified in relation to design, location, construction and operation of the sub project components. Mitigation measures have been developed to reduce all negative impacts to acceptable levels.

263. Mitigation measures were discussed with engineering specialists, and some measures have already been included in the designs.

264. Regardless of these and various other actions taken during the IEE process and in developing the project, there will still be impacts on the environment when the infrastructure

is built and when it is operating. Appropriate monitoring measures to guarantee the long term and sustainable operation of the WWTP are presented in a monitoring plan.

265. When operating, the WWTP, the sewage main collector and its associated sewage system, will have overall beneficial impacts to human health and the environment as it will provide the inhabitants of Ureki and Shekvetili with a new sanitation system and also will contribute to better ground water quality of Ureki and Shekvetili due to long-term and sustainable wastewater treatment.

266. The main beneficiaries of the improved system will be the citizens of Ureki and Shekvetili, who will be provided with a new wastewater collection and treatment system. This will improve the quality of life of people as well as raising the standards of both individual and public health as the improvements in hygiene should reduce the incidence of disease associated with poor sanitation. This should lead to economic gains as people will be away from work less and will spend less on healthcare, so their incomes should increase.

267. Mitigation will be assured by a program of environmental monitoring conducted during both construction and operation to ensure that all measures are provided as intended, and to determine whether the environment is protected as envisaged.

268. The recommendation of this Environmental Assessment process is that all mitigation, enhancement and monitoring activities proposed here shall be implemented in full. This is essential to ensure that the environmental impacts are successfully mitigated; this is the responsibility of UWSCG.

B. Conclusion

269. The environmental impacts of the proposed WWTP and sewage main collector have been assessed by the Initial Environmental Assessment reported in this document.

270. An Environmental Management Plan (EMP) has been prepared and will be implemented during the project implementation. The EMP identifies the potential environmental impacts arising from the project along with a set of the mitigation measures to reduce the impacts to acceptable levels. It also includes the institutional arrangements for implementing the EMP to ensure its effectiveness

271. The overall conclusion of the IEE is that provided the mitigation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of location, design, construction or operation of the subproject. There should in fact be positive benefits through major improvements in quality of life and individual and public health once the scheme is in operation. The citizens of Ureki will benefit from the collection and treatment of the wastewater. Project will stimulate economic growth. Standard of individual and public health will improve as a result of the project. Project will generate new job opportunities.

Appendices

Minutes of Meeting of Public Hearing on 16th of July 2013

LCC “United Water Supply Company of Georgia”

Public Hearing Meeting
Improving the Water Supply and Sanitation System in Ureki

Initial Environmental Examination Report

17:00pm

Minutes

Ureki

16.07.2013

The meeting was attended by the local Governor of Ozurgeti municipality Mr. Konstantine Sharashenidze. The following persons attended the meeting:

1. Beso Nibladze - "United Water Supply Company of Georgia, LLC" (UWSCG), Head of Environmental Protection and Resettlement Division;
2. Bidzina Inaishvili - Attorney of Ozurgeti Municipality in Ureki;
3. David Tsertsvadze - "United Water Supply Company of Georgia, LLC" (UWSCG), Local Service Centre;
4. Ketevan Chomakhodze - "United Water Supply Company of Georgia, LLC", Environment Specialist;

The following residents of Ureki attended:

1. Zviad Iominashvili - local resident, AP
2. Tamar Gadakhabadze - local resident
3. Merab Makharadze - local resident, AP
4. Guri Makharadze - local resident, AP
5. Diner Makharadze - local resident, AP
6. Lasha Archvadze - local resident
7. Ivane Shovnadze - local resident, AP
8. Midodashvili Eka - local resident
9. Irine Gorgoshia - local resident
10. David robakidze - local resident

Public Consultation

The public consultation meeting was held on July 16, 2013 at 17:00pm in Ureki, at the Cultural Centre of Ueki. The consultative meeting was organized with representatives from the local population of Ureki, Shekvetili and Natanebi. Local population from Shekvetili and Natanebi villages have been delivered by minibuses organized by the Ozurgeti service centre of UWSCG. The meeting covered the water supply system as well as the wastewater system and WWTP, the former being subject of a separate IEE.

By giving advertisements in advance, attendance of a wide range of related people to the meetings was encouraged. During the Public Consultation Meetings, citizens were

informed about the activities to be carried out within the scope of the project, environmental effects of the project and measures to be taken against these effects. Opinions, ideas and suggestions of the local residents and related people were received during the meeting.

Public Opinion

Consultation with affected population was undertaken

- to ensure their informed participation in the design, implementation and monitoring of the project measures and their impacts on the environment, as well as the efforts to minimize and the mitigate impact when avoidance is not possible;
- to introduce the project benefits to the local population that accrue to them as a result of project implementation;
- to incorporate all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

The following topics were discussed during the meeting:

- project context and rationale
- expected start and end of the project
- benefits of the project to local population and to the country as a whole
- the environmental issues and mitigated measures related to the project

The public consultation showed a support for the Ureki subproject by the local population. During public consultation importance of a good cooperation between the local population, the contractor and UWSCG has been discussed.

Local population were aware of the need to improve the water and sanitation system services. Residents also were of the view that the proposed project will improve the public health, the environment, and the socio-economic development of Ureki.

The Following questions have been asked from the local population:

#	Questions from local residents	Answers from the United Water Supply Company of Georgia
1	When will the project start?	In 2014, project will start after the 3 Tranche is signed by the Government of Georgia and ADB and a Construction Company is selected based on the 2 stage selection process.
2	What is the duration of the project?	36 months.
3	Name of the employer of a Ureki Water Supply System	United Water Supply Company of Georgia, LLC
4	What are objectives of Environmental Assessment?	To examine the project's potential negative and positive environmental impacts and to recommend any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance

#	Questions from local residents	Answers from the United Water Supply Company of Georgia
		To formulate Environmental Management Plan: mitigation measures and monitoring program
5	What are objectives of Social Assessment	Identify affected persons and assess the Project's socioeconomic impacts on them Formulate and recommend measures to minimize or eliminate negative impacts
6	What mitigation measures will be undertaken to minimize the impact of WWTP construction and operation?	Impacts on air quality during operation of WWTP due to odour emissions. Mitigation Measure The odour emission components of the WWTP are the inflow, the screens and the aerated grit chambers. As a mitigation measure these components will be covered. Environmental Impact Impacts on air quality during operation of WWTP due to noise emissions. Mitigation Measure The noise emission components of the WWTP are the blower, the pumps and the overflow weirs. As a mitigation measure the blower and the pumps will be covered. Overflow weirs are constructed in a manner that covering is also possible if required.
7	What type of impact on environment is associated with the project?	Environmental impacts that are associated with the project are only site specific. Impacts are mostly confined to the construction stage of the project and are therefore temporary. For permanent environmental impacts during operation stage, suitable mitigation measures will be implemented.
8	What will be benefit for local population from the rehabilitation of the water supply system in Ureki?	The Project will have overall beneficial impacts on quality of life for the citizens of Ureki. It will stimulate economic growth by constant supply and good quality of drinking water and sanitation system which is a prerequisite for tourism development.
9	Will local population employed by contractor?	Yes. Contractor will ensure involvement of local population in construction works.

There were no other comments or/and opinions from local population.

It should be mentioned also that public consultations with local population has been were carried out during the first week of June, when the representatives of the Resettlement and Environment Protection Division, UWSCG has series of meetings and consultations with local population of Natanebi, Shekvetili and Ureki, including resettlement issues of WWTP construction.

Photos of the public consultation:



Chance Finds Report Form

Please contact: _____
To discuss find, on: _____

Date of Find: _____ Person who identified find: _____

Description of Initial Find: _____

Was work stopped in the immediate vicinity of the find?

☐ Yes ☐ No

Was an archaeologist contacted?

☐ Yes ☐ No

Archaeological Detail:

Date of inspection: _____

Reporting Archaeologist: _____

GPS coordinates:

Photo Record:

Zone: _____ N: _____ E: _____

☐ Yes ☐ No

Does Chance Find Correspond to a known PNG National Museum site?

☐ Yes ☐ No

If Yes, which site code: _____

If No, temporary site code is: _____

If No, new Museum site code is: _____

Description of Find (fill in applicable information) (use additional pages if required):

Artefact type: _____

Max artefact length (in mm): _____

Max artefact width (in mm): _____

Max artefact thickness (in mm): _____

Max artefact platform width (in mm): _____

Approximate number of artefacts at site:

- ☐ 1
☐ 2 to 10
☐ > 10
☐ > 50

Approximate size of site:

Site area: _____ m²

Site length: _____ m

Site height (max) (for rockshelters/caves): _____ m

Other: _____

Brief description of site and vegetation (e.g., surface sediment type, ground surface visibility, distance to nearest freshwater source, attach site sketch if necessary):

Brief description of find(s):

Statement of Significance (scientific, spiritual, historic, aesthetic and emotive and any evidence of stratification):

Appendix 3

SC 1:15000

SC 1:7500

SC 1:7500

2

1

2

1





KOCKS
INGENIEURE
Lead Management



Tbilisi, Georgia

Georgian Urban Services Improvement
Investment Program

UREKI DETAILED DESIGN
SEWERAGE OVERVIEW
SCALE 1 : 15 000

Drawing-No. :
URE-02-WW-1

Date :
NOVEMBER 2012

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