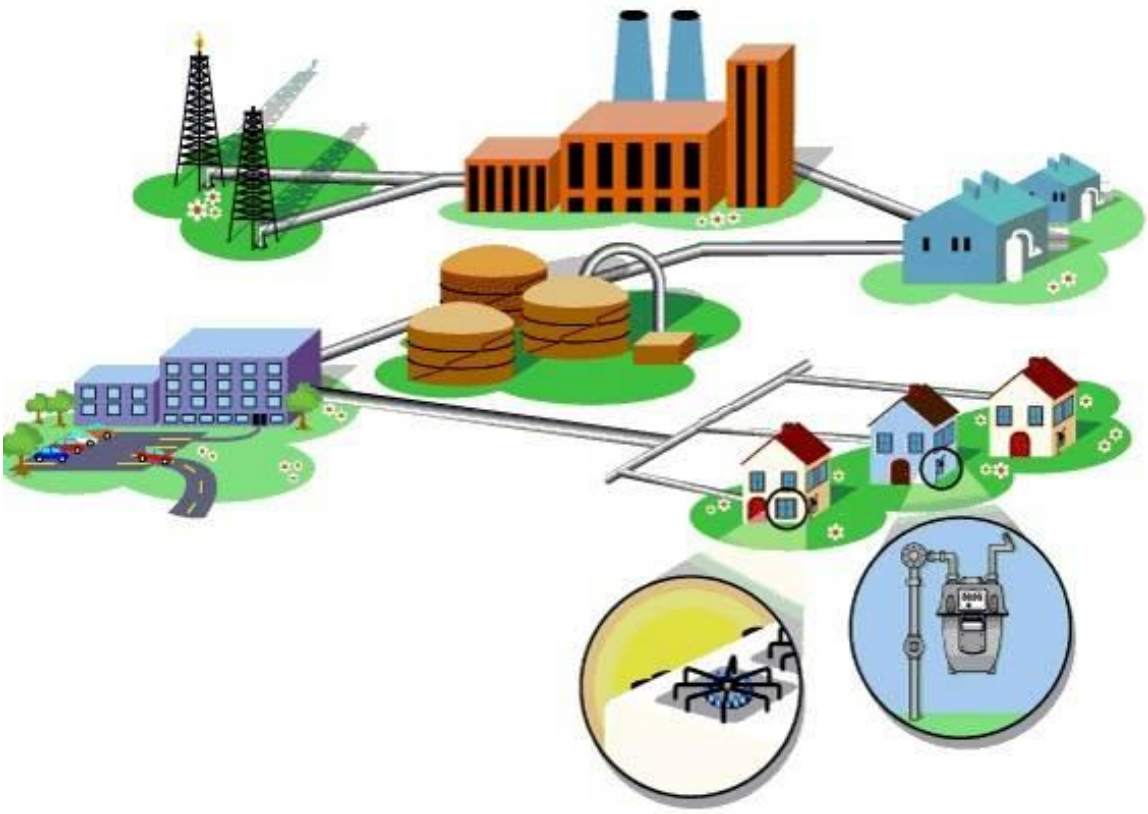
საქართველოს ნავთობისა და გაზის კორპორაცია
Georgian Oil & Gas Corporation

East-West Gas Pipeline Rehabilitation Project (Phase IV)

EA Scoping Report for Sectional Rehabilitation of the 87 KM East-West Main Pipeline between Saguramo and Kutaisi



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GEORGIA

East-West Gas Pipeline Rehabilitation Project

(Phase IV)

USAID
FROM THE AMERICAN PEOPLE

Prepared for:

USAID

2012

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List of Acronyms

GOGC	Georgian Oil and Gas Corporation
GTC	Georgian Gas Transportation Company
GoG	Government of Georgia
USG	Government of United States of America
PGIP	Power and Gas Infrastructure Program
FIZ	Free Industrial Zone
FTZ	Free Touristic Zone
HGA	Host Government Agreement
BS	Black Sea
EWGPS	East-West Gas Pipeline System
MEP	Ministry of Environmental Protection
CENN	Caucasus Environmental Non-Governmental Organization Network
HSE	Health, Safety, Environment
USAID	The United States Agency for International Development
EA	Environmental Assessment
EMP	Environmental Management Plan
E&S	Environmental and Social
DCC	Document Control Center
GIS	Geographic Information System
Dn	Diameter of Pipe
KP	Kilometer Post
GPS	Global Positioning System
ROW	Right-of-Way
AGRI	Azerbaijan–Georgia–Romania Interconnector
LNG	Liquefied Natural Gas
CNG	Compressed Natural Gas

1. Introduction

Georgia is heavily dependent on import to supply critical industries and to satisfy residential demand on natural gas. The imported gas for domestic consumption is delivered to Georgia from Azerbaijan via high pressure gas pipelines. The country also serves as a transit route for Russian gas to Armenia. High pressure gas system has several corridors: (i) the North-South Corridor, which transits gas from Russian Federation to Armenia, and (ii) the East-West Corridor, which distributes gas for domestic consumption. There also are two other relatively smaller corridors: Kakheti corridor delivering gas to Kakheti region and Southern corridor supplying gas mainly to the southwestern parts of the country. City of Saguramo located close to the capital Tbilisi is the central hub of the system. The main gas pipeline system is owned by JSC Georgian Oil and Gas Corporation (GOGC), which is founded as a 100% state owned enterprise. It is operated by the Georgia Gas Transportation Company Ltd. under a long-term lease agreement.

Significant portion of the pipeline was constructed during Soviet times. At present the old sections of the gas main system are amortized significantly, which makes it extremely difficult and sometimes almost impossible to undertake the necessary maintenance and repair in a timely, safe and quality manner. Therefore, the East-West Gas Pipeline System (EWGPS) requires an immediate and comprehensive rehabilitation program to (i) secure the safe and reliable supply of gas the most parts of the country, (ii) bring the infrastructure back to an acceptable level of technical integrity, and (iii) improve GOGC's capacity to sustain and further develop the operational and financial performance of the pipeline.

In recognition of the urgent need for pipeline construction/rehabilitation, in 2010, the Government of Georgia approached the United States Government with the request to provide financial support for the rehabilitation of the EWGPS under the USAID Georgian Power and Gas Infrastructure Program (PGIP). Shortly thereafter, in February 2010 an Assistance Agreement was signed between the Government of Georgia and US Government, under which funds were allocated to finance the rehabilitation/construction works on the EWGPS.

The activities under PGIP project will support USAID's objective of promoting energy security through greater access to natural gas supplies for households in Western Georgia, encourage the development of the Poti Free Industrial Zone (FIZ) on the Black Sea coast, accelerate growth of touristic infrastructure, including Free Touristic Zones and secure power exports through reliability related infrastructure improvements.

In addition, the recent EU initiative on the development of strategic Southern Energy Corridor creates prospective for the Georgia's East-West main gas pipeline, after rehabilitation, to become a basis for successful implementation of planned large-scale international energy transit projects such as AGRI, BS, LNG/CNG and others, aiming to provide additional routes for bringing gas from Caspian and Central Asia deposits to the Black Sea coast with subsequent transit to Europe.

Within the framework of PGIP under the Phase I of the East-West Main Pipeline rehabilitation project, 30 km Senaki-Poti pipeline was constructed, which extended the EWGPS to Georgia's Black Sea Coast. This new construction made relatively clean natural gas available to 20-25,000 families, which never before has access to the gas grid. Provision of inexpensive fuel allowed rural population to discontinue usage of firewood and brought benefits in terms of biodiversity preservation and elimination of indoor air pollution with resulting human health issues. Additionally, gas is now

available on the Black Sea coast for future transit projects and in Free Touristic and Industrial Zones promoting economic development of the entire region.

The objective of the consequent Phases II and III was to fully rehabilitate Abasha-Senaki and Kutaisi-Abasha sections of the EWGPS with the total length of 76 km as they represent the most critical component of the infrastructure. Design has considered construction of a new 700 mm line to substitute the heavily corroded but operational old sections, currently representing the only source for the gas supply to the Western Georgia. 29 km Abasha-Senaki pipeline is currently in the construction tendering phase, with the material procurement completed and relevant permits obtained. 47 km Kutaisi-Abasha section is in the final stages of design and permit acquisition, while material supply contract has been finalized with the successful bidder and the first shipment of materials is underway. Following the implementation of the Phases I through III a completely new 700 mm pipeline will come online all the way from Kutaisi to the Black Sea Port of Poti.

As the analysis of already completed construction and material procurement demonstrate, significant savings were made in the total budget allocated for the rehabilitation during 2010-2011. This was mainly achieved through the usage of efficient technologies and materials and also through the promotion of objective, transparent and competitive bidding process during the selection of the potential contractors. The decision of the Government of Georgia to contribute to the project by providing pipes and other materials needed for the construction of Senaki-Poti section was another important factor. Therefore, the Ministry of Energy and Natural Resources proposed to use the available financial resources for the rehabilitation of additional sections of the East-West Gas Pipeline within the Phase IV of the project. The Ministry officially communicated this proposal to the USAID in December 2011 and received a positive response in January 2012. As per USAID regulations, the proposed new sections have to go through all relevant environmental and technical review processes to be approved for funding. GOGC has started the design development and detailed field surveys following the receipt of the general consent. It should be noted that preliminary studies for the proposed sections were completed before the proposal was made and for certain sections detailed assessments are also available within the framework of previously developed projects.

The proposed Phase IV envisages a comprehensive rehabilitation of the remaining sections along the EWGPS. As noted, gas from Azerbaijan first reaches Saguramo near Tbilisi and then it flows to the west. Therefore, the delivery of adequate volumes of gas, as well as technical security of supply is dependent on the reliability of the entire EWGPS from Saguramo to Poti. The system is comprised of 500 and 700 mm diameter sections. These 500 mm diameter sections are serious bottlenecks, preventing a full scale utilization of the pipeline capacity and significantly decreasing the flow rate. 500 mm sections are also the oldest constructed much earlier in the 1960s and are still in operation. Elimination of these bottlenecks will increase the the flow rate and correspondingly decrease the risk of accidents. Additionally, as the statistical maintenance data suggests, specific sections on EWGPS are more prone to accidents than the others, which is caused by a combination of different factors including the initial design decisions, quality of construction and others. Those sections were also included in the Phase IV.

The total length of the sections proposed initially, based on preliminary rough estimations, for Phase IV was approximately 60 km, which was reflected in the Initial Environmental Examination (IEE) prepared by the USAID in February 2012. However, it has been decided that this EA Scoping Report and a future Environmental Assessment will in total cover 87 km portion of the East West Pipeline Rehabilitation project. This seems advisable as a) the actual savings after implementation of Phases I, II and III may allow rehabilitation of a longer section of the pipeline; b) this approach will allow the selection of the most optimal segments of the pipeline to be rehabilitated using the USAID funding

based on the findings of studies undertaken for the entire 87 km sections; and c) the Government of Georgia and GOGC may decide to build those segments of the pipeline using its own money which is a difference between 87 km and the length of the pipeline section to be actually funded by USAID under phase IV. Therefore, it is considered desirable to undertake screening and prepare scoping and EA documents for the 87 km length of the pipeline in order to facilitate further detailed design and construction works, even if funding source is different in the future. It should also be stressed that the environmental conditions along the extended sections do not differ significantly from those assessed in the IEE.

The planned rehabilitation project includes two main sections: Zetafoni-Kutaisi 34 km section and Gori-Kareli 53 km section. Both sections can be subdivided into two main segments based on the need for rehabilitation: Gori-Kareli includes 8 km 500 mm bottleneck, which requires replacement both from capacity and integrity point of view. So is 23 km segment of Zestafoni-Kutaisi, which is a continuation of the 47 km Kutaisi-Abasha line currently in the bidding process. Unlike these two segments, the remaining 45 km of Gori-Kareli section and 11 km of Zestafoni-Kutaisi section are 700 mm lines. However, based on the maintenance data these particular segments have suffered the highest number of accidents in the past due to a quality of initial construction and represent the next most critical component of the system.

It should be noted that Gori-Kareli section was the most critical (requiring urgent intervention) part of the Saguramo-Kutaisi 100 km project that was under development by GOGC in 2010. Based on 2010 studies, the main components of the field research and, most importantly, the environmental assessment, are already available for the subject section. GOGC will, however, verify the major outcomes of those studies through repeated field surveys to make sure the data has not changed or become outdated.

Rehabilitation of the selected sections will result in a comprehensive upgrade of the entire East-West Main pipeline. This is especially important following the recent diversification of the gas supply to Georgia. Adequate technical condition of the EWGPS will create the possibility to fully benefit from this diversity; it will make the supply scheme more flexible and enable to reach the adequate flow rate. This proposal is also consistent with the general plan of the country's government to make relatively cheap and clean natural gas universally available in all parts of the country. Connections of the new customers, as well as expansion of the industrial activities in Free Industrial Zone on the Black Sea Coast and increase in number of tourists in the Free Touristic Zones are likely to become drivers of the higher demand for natural gas. In these circumstances, rehabilitation of the EWGPS would be essential to ensure both supply security and adequate flow rate.

Objectives of the Scoping Report

Scoping is defined as a procedure for determining the extent of and the approach to an EA. It involves the following tasks:

a) the identification of relevant or significant issues to be examined;
b) the involvement of relevant authorities, interested parties and affected groups
c) the identification and selection of alternatives; and
d) the determination of the content of further study.

As a condition of participation in the rehabilitation work, the USAID requires that the works conform to their Guidelines for Environment Assessment (http://www.usaid.gov/our_work/environment/compliance/reg216.pdf) as) 22 CFR 216.

The purpose of this Environmental Scoping Report is to ensure compliance of the EA process with provisions of 22 CFR 216. The objectives of scoping report are as follows:

- Determination of the scope and significance of issues to be analyzed in the Environmental Assessment, including direct and indirect effects of the project on the environment.
- Identification and elimination from detailed study of the issues that are not significant or have been covered by earlier environmental review, or approved design considerations, narrowing the discussion of these issues to a brief presentation of why they will not have a significant effect on the environment;
- Description of: (a)timing for preparation of environmental analyses, including phasing (if/where appropriate); (b) variations required in the format of the Environmental Assessment, (c) the tentative planning and decision-making schedule; and (d) description of how the analysis will be conducted and the disciplines that will participate in the analysis.

2. Description of the Project

2.1 Purpose

Government of Georgia (GoG) is undertaking strategic investments in gas infrastructure aimed at enhancing the energy security of the country. At present Kutaisi-Abasha and Abasha-Senaki sections of the East-West Gas Pipeline System (EWGPS) are in the process of complete rehabilitation. Abasha-Senaki material delivery is in the final stages of completion and construction tendering is underway. Kutaisi-Abasha will start with several months interval. Current proposal, the sectional rehabilitation of approximately 87 km sections between Saguramo and Kutaisi is a continuation of the previous three phases and reinforces the benefits those projects will deliver. Considering the constantly growing demand on gas, especially with the connection of new consumers and increase in industrial activity, the project will (i) provide affordable fuel to households and contribute to the reduction of poverty (ii) facilitate industrial development in urban areas (iii) support agricultural development and small enterprises (iv) strengthen Georgia's potential for transiting energy resources to the EU and world markets.

The implementation of sectional rehabilitation is critical for:

- Dozens of municipalities linked to pipeline main branches in Western Georgia and parts of Eastern Georgia;
- Black Sea coastline resorts-recreational area (Batumi, Kobuleti and newly declared Zugdidi-Anaklia Free Touristic Zone);
- Poti FIZ (Free Industrial Zone), specifically requiring high pressure to ensure planned quantities and taking into account development perspectives;
- Ensuring safe and reliable supply of the natural gas and also for raising the level of energy security in the country.

The project bears strategic importance and is aimed at raising the energy and political security of the country and resolving social and ecological problems. The upgraded system allows for its future consideration as a basis for the new transit projects for delivery of the additional gas from Caspian fields to the Black Sea coast for the purpose of its further re-export. If necessary, the reverse plan of gas supply may also be launched from Poti towards the regions, following construction of the CNG/LNG receipt/re-gasification terminal at the Black Sea coast or directly from CNG/LNG tankers. Hereby, the upgraded system should be considered as one of the potential opportunities for both: diversification of the gas supply to Europe and raising the energy security of Georgia.

In the Phase I of the rehabilitation work, in 2011 a new Senaki-Poti 30 km main pipeline was completed to accelerate the development of the Poti Free Industrial Zone (FIZ), and to deliver gas to the population of the region (to about 20-25 thousand households of Poti, Senaki and Khobi region lower zone) and the small enterprises. Currently gas distribution network is under construction to give families access to gas supply.

Phases II and III, which are currently underway, will put in operation a completely new 700 mm pipeline all the way from Kutaisi to Senaki.

To have consistency in terms of design and to satisfy anticipated increase in demand, the East-West Gas Pipeline Rehabilitation Project Phase IV envisages the replacement of the approximately 87 km long sections from Zestafioni to Kutaisi (34 km) and from Gori to Kareli (53 km). The exact length of

the pipeline segments to be supported under Phase IV will depend upon the exact value of cost savings after previous rehabilitation Phases. This will eliminate the remaining 500 mm bottlenecks preventing full scale utilization of the EWGPS capacity and replace the statistically most problematic 700 mm sections.

After the completion of Phase IV there will be no sections having diameter other than 700 mm at the entire EWGPS. The project will also address a highly critical problem along the EWGPS – the crossings of various waterways. The initial design for crossings and the quality of construction are highly inadequate. In most cases, the pipes are not lowered at an adequate depth per hydrological conditions, which makes them vulnerable to negative influence of various hydraulic processes. Moreover, anti-erosion measures were also seldom undertaken. Scouring and damage of pipes on the crossing areas is therefore one of the most common problems further aggravated by frequent floods. Following the proposed project, waterway crossing will be fully rehabilitated with complete consideration of hydrological conditions and the need for anti-erosion measures. This will eliminate a very acute risk to the pipeline integrity, especially given the fact that some of the small rivers along the route are prone of severe flash floods during the spring.

2.2 Need for the Rehabilitation Work

The routine inspections of the selected pipeline section have identified multiple damages caused by various different factors. First of all the 500 mm sections are the oldest, constructed in 1960s and are still in operation. As is the case with the rest of the old section, during the last 15-18 years the pipeline operates without electrochemical/cathode protection (due to ransacked or deteriorated equipment) which is absolutely necessary, considering that significant portion of the pipeline passes through the corrosion-aggressive soils with low electric resistance. This became a reason for multiple corrosion damages along the pipeline, including cases of complete perforation of the pipe. Additionally, initial design, adherence to the construction rules and norms and quality of implemented works are in many cases inappropriate. The nonstandard bends and different implanted sections of 700 mm pipes are also creating problems for PIGing and removal of water infiltrated due to perforation damages. The liquidation/repair of such damages requires significant resources, involving gas losses and methane emissions due to emptying of kilometers of pipeline to conduct welding, replacements and tie-ins.

All the above made it impossible to operate section as a main gas pipeline and to ensure reliable supply of high pressure natural gas to Western Georgia, parts of Eastern Georgia and Poti Free Industrial Zone (FIZ). Due to poor condition of the pipeline, currently the allowed pressure in the main is only 7 bar (0.7MPa), which is much lower than capacity of the EWGSP required to meet the developed demand of the region. Initially it was planned to conduct rehabilitation of the section between Saguramo and Kutaisi by reconstruction of existing pipeline, which in fact has very limited capacity. But after the EU's decision on the development of strategic Southern Energy Corridor and prospect for the Georgian East West main gas pipeline to become a part of the new projects for the gas supply to Europe, it became obvious that the limited capacity will not address growing demand and the strategic goals of the EU energy initiatives. Additionally, growing local demand, connection of more consumers and increase in economic activity are likely to require fully functional and technically stable line all across the country.

Based on economic development trends and anticipated increase in demand, the minimum required capacity was recalculated by the GOGC experts, and it is proposed that the rehabilitation and development of Georgia EWGPS (including sections from Azerbaijani border to Saguramo and from Saguramo to the Black Sea coast, including Poti FIZ and Anaklia FTZ) should consider 700 mm diameter for all sections of the main East-West gas pipeline. This decision will allow Georgia to

address anticipated demand for the gas export from the region to the world market, including the prospective volumes made available after Shakh-Deniz Phase-2 completion and after approval of Turkmenistan-Azerbaijan gas pipeline project. This decision will allow Georgia to satisfy demand for the gas supply within the region, and the gas export from the region to the world markets. It is important to consider the high probability for the implementation of Shakh-Deniz Phase-2 and the Turkmenistan-Azerbaijan (Trans-Caspian) gas pipeline projects that will sharply increase the gas transit volumes through the territory of Georgia and predetermines the necessity for increase of gas transporting infrastructure capacity.

2.3 Technical Overview

The sections between Saguramo and Kutaisi proposed for rehabilitation (total of 87 km) are located in two different parts of the country. Zestafoni-Kutaisi 34 km section is located in Imereti Region (Western Georgia), it crosses Bagdati and Zastafoni Municipalities and represents a continuation of the Kutaisi-Abasha 47 km line. Gori-Kareli 53 km section is located in Shida Kartli Region (Eastern Georgia). It crosses Gori, Kareli and Khashuri municipalities. Project envisages installing permanent equipment and facilities necessary for operation of 87 km sections of the gas pipeline. It is proposed to lay a new 700 mm pipeline parallel to the existing 500 and 700 mm pipeline at the safe distance from the existing pipe. The construction width of the RoW is preliminarily determined as 25 m and the schemes for trenching, top-soil/sub-soil storing, stripping, lowering, machinery movement, etc., are designed to meet specific conditions of the route.

The design of crossings (roads, channels) will be based on recent experience and typical engineering solutions used for oil and gas pipelines in Georgia. In particular, for the secondary and rural roads the underground crossing will be arranged under the reinforced concrete slabs, without additional structural coating of the pipe. The crossings of railway and main drainage channels will be undertaken using pipe pushing method.

At the preliminary stage three methods for river crossings are considered: aerial crossing, open cut crossing and horizontal directional drilling (HDD). The selection of an appropriate method per each particular crossing will be made based on comparative analysis of the options involving technical, economic and environmental factors. Additionally, outcome of the implementation of HDD for the River Rioni Crossing planned within the Phase III will also be taken into account during the decision making, although the rivers to be crossed by project pipeline are of much smaller size.

The pipe lowering level/depth will be 0.8-1.0 m for regular soils and 2.0 m under the roads. The depth of river crossings will be calculated for each particular case based on hydrology and scoring data.

3. Legislation and Regulatory Framework

3.1 Overview of the National Environmental Legislation

The Environmental Impact Permits are issued by the MoE (competent authority) under a procedure involving a) environmental impact assessment, b) ecological examination and c) public participation. The detailed procedures are mainly determined by the Law on Ecological Examination (dated December 14 2007, in force since January 1st, 2008, replaces/abolishes the old Law on State Ecological Expertise of 1996), the Law on Licenses and Permits (dated June 25, 2005) and the Law on Environmental Impact Permit (dated December 14, 2007, in force since January 1st, 2008, replaces/abolishes the old Law on Environmental Permit -1996, the Decree No 154 "On the Procedure and Terms for Issuance of an Environmental Permit" Sept 2005 amended February 3, 2006.

The Law on Environmental Impact Permit contains the list of activities subject to EIA and the related procedures and regulates the issuance of environmental impact permits. According to this list the projects of the new pipelines and major reconstruction of the existing pipelines are subject to EIA and environmental permit. According to the Law a developer, seeking a permit, prepares the EIA, organizes public discussion in 50 (to 60) days after disclosure, considers comments received from public, takes other measures as appropriate and, afterwards, applies to the MoE for a permit (when construction permit is required application is submitted directly to the Ministry of Economic and Sustainable Development, which then contacts MoE for environmental clearance). The MoE carries out the ecological examination of the project (for which the EIA hearing has already been conducted) and issues a permit within a timeframe of 20 days. The Conclusions of the ecological examination (expertise) are the prerequisites to the Environmental Impact Permit and the Construction Permit. In this context, in line with conclusions of the ecological examination, the approvals received from the other Ministries/Departments relevant to the Project are also prerequisite for issuing the environmental permit.

With regard to public consultation of EIA the Law on Environmental Impact Permit establishes the details on the succession of procedures, i.e. EIA coordination, timeframes for information disclosure and public discussion. The Law determines how the outcomes of public discussions shall be documented. It also specifies documents to be submitted for obtaining permits, and provides the details on the procedure of permit issuance and the role of the MoE and the developer in this process.

Apart of the above legislation directly related to the preparation of the EIA and issuance of Environmental Permit, there are also other environmental laws, regulations and standards that should be followed by developer or its consultant during the preparation of EIA. These laws and regulations are Law on Protected Areas, Law on Wildlife, Law on Minerals, Law on Environmental Protection Services, Law on Protection of Ambient Air, Law on Water, Forest Code, other.

The overview of the national legislation in more details is usually presented in the full-scale EIA reports.

3.2 Overview of the USAID Environmental Regulations

USAID Environmental Policy and EA procedures are laid out in the USAID Environmental Regulation CFR 216. The purpose of these guidelines is (i) to establish a process for the review of environmental and social impacts; (ii) to ensure that projects that are undertaken as part of programs, funded under USAID with eligible countries, are environmentally sound; (iii) are designed to operate in compliance with applicable regulatory requirements, and, (iv) as required by the legislation are not likely to cause a significant environmental, health or safety hazard.

With regard to the scoping, implementing entities are expected to prepare scoping document prior to development of EA document. The objectives of scoping report are as follows:

- Determination of the scope and significance of issues to be analyzed in the Environmental Assessment, including direct and indirect effects of the project on the environment.
- Identification and elimination from detailed study of the issues that are not significant or have been covered by earlier environmental review, or approved design considerations, narrowing the discussion of these issues to a brief presentation of why they will not have a significant effect on the environment;
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4. Project Alternatives

Initially, following the general pipeline rehabilitation practice, it was proposed to simply replace the selected pipeline sections within the existing RoW. But after proper analysis of the existing pipeline features and technical constraints, GOGC rejected this option and started to consider other possibilities within the existing RoW. Replacement of the operational 500 and 700 mm line with the new 700 mm pipeline within the current alignment, with excavation/removal of the old pipe may have very severe negative consequences (i) social impact - resulting in massive continuous interruptions of gas supply to the Western Georgia and the entire Black Sea coast during construction activities, (ii) technical viability - difference in pipeline diameter, requiring to replace all existing substructures (valves, connections, pressure reduction stations, etc.), which is not efficient from both cost and timing point of view, and (iii) environmental impact - related to pollution from dismantling and disposal of the old pipeline. Retaining the old pipeline section will significantly minimize the overall disturbance and allow change/switch function of the existing 500 and 700 mm pipeline from being main to now become distribution pipeline with lower standards for capacity/pressure and with lower maintenance/repair requirements. Minimum connections (pressure reduction stations) will be required to supply gas from the new 700 mm main to the old 500 and 700 mm distribution network.

From environmental point of view, the construction of a new 700 mm pipeline within the existing RoW through the already disturbed areas, without extensive activity on replacement/removal and dismantling of existing pipeline, is preferable in terms of impact scale.

Based on above, old pipeline will not be removed. Two alternatives are currently under discussion: the new 700mm pipeline, considered to be laid completely in parallel with the EWGP route, - is presented as a Blue Alternative, and the pipeline with the sections rerouted from the existing EWGP alignment - is presented as a Red Alternative.

There are subsections that are the same for the both alternatives and that run in parallel with the existing EWGP main.

4.1 Zestafoni-Kutaisi 34 km Section

Blue Alternative

This alternative suggests to precisely follow the alignment of the existing line and to lay the new 700 mm pipeline at a safe distance from the currently operated one. Major advantage of this proposal is that it avoids disturbance of the new areas and locations and has smaller scale impact on the environment as the corridor of the existing pipeline is an already disturbed area with relatively less ecological value. Additionally, old corridor also has existing access roads and other infrastructure that can be used for operation and maintenance of both pipelines thus limiting the impact related to putting this infrastructure in place in the new corridors.

However, the Blue Alternative has important disadvantages. They are listed below:

- The old line pipeline was originally designed not exactly as a straight main, but actually followed from settlement to settlement as a distribution network main. Thus, the alignment is not fully efficient in certain areas to be followed by the new 700 mm main and actually makes the section longer requiring more resources in terms of labor and material as well as disturbing larger areas;

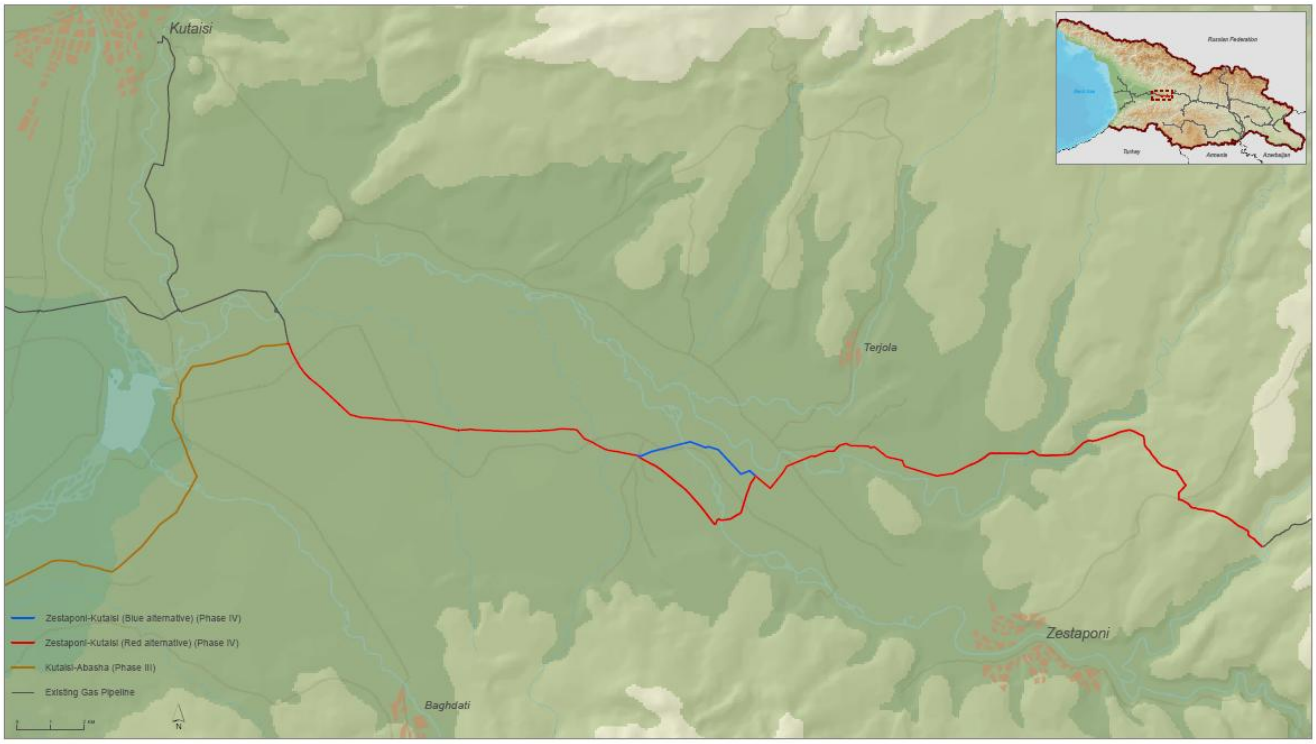
- WREP (Western Route Export Pipeline, operated by BP) and the existing 500 gas pipeline both cross the River Kvirila in the same location. Adding a third pipeline crossing in the area would be highly problematic both from construction and from maintenance point of view. The adverse impact on the regular regime of the river flow will be further aggravated following the installation of the third pipeline;
- The current location of the River Kvirila crossing has a highly unstable hydrology. In 1999 WREP crossing in this location was scoured and a completely exposed pipeline fell into the river directly. The BP had to shut down the pipeline due to safety and environmental concerns;
- There is a newly developed vineyard in the existing pipeline corridor with the length of around 2.5 km. Following the existing route would require a complete removal of grapes with related severe social and commercial consequences, especially considering that vineyard is part of state program sponsored by MoA, and that the grapes in Georgia represent part of national identity/heritage. It is not in line with GOGC policy to remove or affect such businesses. According to the local sources, current alignment of the pipeline is located close to the so called Sacred Mountain (as referred to by the locals). There is historic evidence that an ancient castle was located on top of the mountain. Initial archeological assessments suggest that the area is most likely a valuable research site.

Red Alternative

Providing that existing RoW has a range of complexities mentioned above, GOGC decided to consider rerouting parts of the Zestafoni-Kutaisi section and to lay the new 700 mm pipeline in a different corridor. It is proposed to move approximately 5 km segment north from the current location between the villages Argveta and Akhali Sviri. The proposed reroute runs through already disturbed agricultural areas.

Advantages and impact reducing factors of the Red Alternative are as follows:

- The current proposal turns the section into a straight line, with more efficient alignment (compared to the Blue Alternative route) allowing cost minimization during material procurement, construction and operations/maintenance. The reroute is approximately 2 km less than the existing pipeline route;
- The proposed crossing of the River Kvirila is located further north from the existing point of crossing. This is a more stable section of the river from the hydrology point of view;
- As only one pipeline crossing will be located on this territory, this will reduce the potential negative impact on the river regime compared to the Blue alternative;
- There are no major archeological sites along the proposed route;
- Removal of the newly developed large vineyard will be avoided.



Map 1-1 Alternatives for Zestafoni-Kutaisi 34 km Section

4.2 Gori-Kareli 53 km Section

Blue Alternative

The concept of the given alternative is the same as for Zestafoni-Kutaisi and it suggests to directly follow the alignment of the existing 500 and 700 mm lines and to lay the new 700 mm pipeline at a safe distance from the currently operated one.

Major issues related to the Blue Alternative for Gori-Katerli are listed below:

- The old 700 mm pipeline is located in the close proximity of the village Breti. Due to the proposed new construction some structures north of the village will have to be dismantled as they fall into the safety consequence area of the pipeline;
- Breti is a historical village with the old churches and other cultural monuments. The sacred remains of the Saint Piros Breteli are located in the village church. There is also Dirbi Nunnery close to the proposed route. Construction activities may cause disturbance to the locals and pilgrims coming to the areas. Extensive movement of the equipment might impact the integrity of the historical structures as certain accesses are located in the vicinity. Additionally, due to its historic significance, preliminary archeological review suggests that there might be important archeological sites within the RoW;
- Village water supply system is located within the proposed route (in parallel with existing gas main) and it will be required to cross number of water pipes and lay the pipeline close to the water (artesian) wells. Water supply facilities are protected by sanitary zone and construction activities within the sanitary zone may affect the quality of water due to spills or ground water contamination. This poses an increased risk to health and well-being of the local population;
- The existing pipeline crosses a large landslide zone Shashkaveti. The blue alternative alignment of the pipeline directly cuts through the landslide body, which will further destabilize the area and create risk to the integrity of the existing as well as the proposed pipeline;

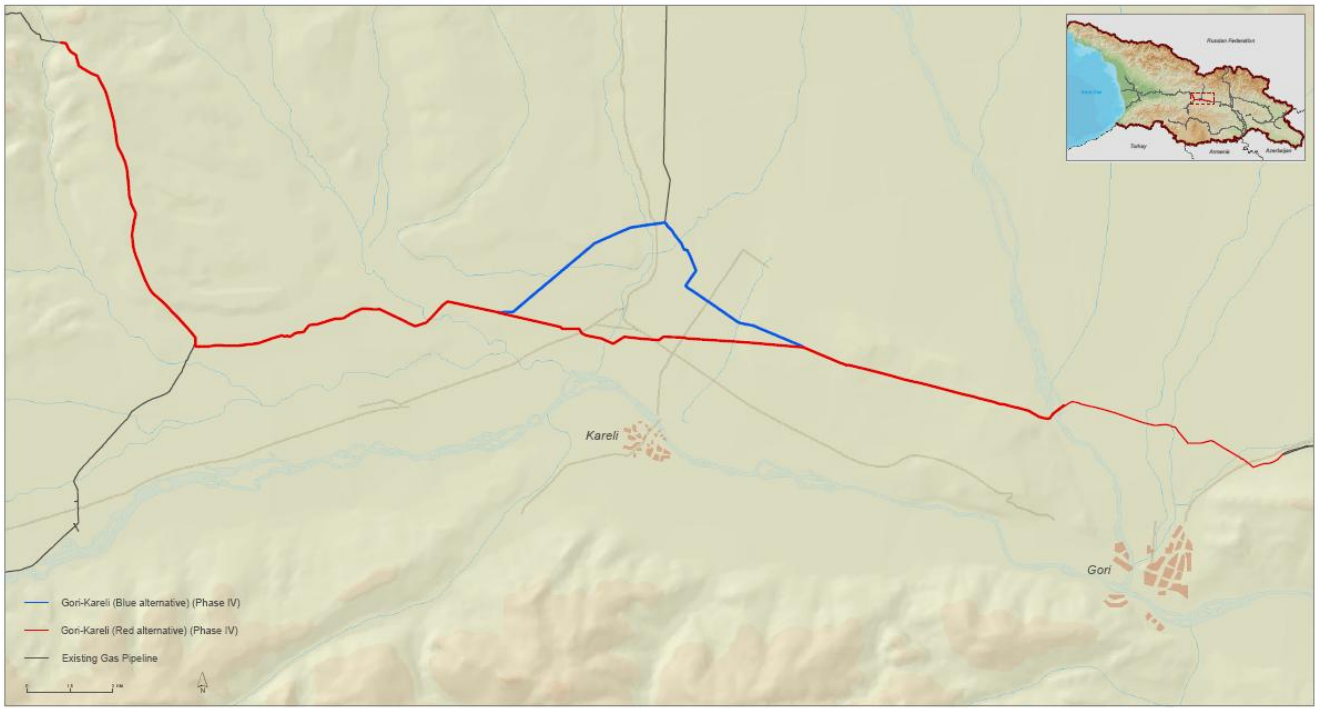
- Similar to the River Kvirila crossing case (at Zestafoni-Kutaisi section) analyzed above, at the point of crossing of the river Frone three pipelines will be located within the narrow crossing area adversely affecting the river regime and complicating operation and maintenance;
- The existing route is not the most efficient. It takes a sharp turn towards the north close to the village Sasireti eventually returning to the straight alignment.

Red Alternative

Red alternative considers rerouting of approximately 10 km pipeline segment to the south.

These are the major considerations taken into account for the Red Alternative:

- The new alignment completely avoids the Breti village and crosses already disturbed agricultural areas only, thus having less adverse impact in terms of land acquisition;
- Proposed route has lower archeological value based on the initial assessments and is not located close to any historical or cultural monuments of high importance;
- It avoids drinking water supply areas and only crosses several irrigation channels;
- Proposed route is geologically more stable and no active landside zones were detected in the vicinity. Additionally, the landscape is more flat unlike the Blue Alterative, where several hills and small mountains are present. This reduces the potential visual impact that pipeline shelves cut in the hills and mountains are likely to cause and reduces risk of erosion, which is obviously high for the hilly areas. It also simplifies the construction with related financial benefits.
- The new route is approximately 3.5 km less than the existing one.
- It will have more straight alignment and will not bare distributional functions.
- The new alignment has less crossings with other linear infrastructure.



Map 1-2 Alternatives for Gori-Kareli 53 km Section

4.3 No Action Alternative

Gas pipeline between Saguramo and Kutaisi currently represents the only route of the gas supply to the Western Georgia. Present condition of the sections selected for the rehabilitation and the level of structural/corrosion degradation of the pipes and insulation allows maintaining pressure not higher than 7 bar, which is very low for the main, and does not give any possibility to satisfy even the minimum standards for transmission of planned/required quantities. It may create serious threat if left to continue operations with an increased pressure. 500 mm sections are serious capacity limitations and are also likely to be subjected to higher stress if pressures in the system are increased. The recent construction of Senaki-Poti 700 mm main pipeline section and full-scale rehabilitation of the system from Kutaisi to Senaki predetermines the need for increase of the capacity/diameter at Saguramo-Kutaisi section as a part of comprehensive rehabilitation of the EWGPS (GOGC has already constructed 50km of 700mm Pipeline at Gardabani-Navtlugi section, another 30 km of 700 mm pipeline at Navtlugi-Saguramo section is under construction). Thus, the need for sectional reconstruction between Saguramo and Kutaisi is not disputable and the "no-action" alternative cannot be considered.

4.4 Conclusion

Based on above analysis the GOGC experts are advising the Red Alternative for both sections as preferable due to following arguments:

- Better location and alignment of the route from both technical and environmental point of view;
- Less urbanized, but already disturbed agricultural areas;
- Less risk of geohazards caused by critical hydrodynamic and geologic processes;
- Less resettlement and compensation issues;
- Less archeological sites.

In addition to first argument regarding better alignment, which is improved and optimized significantly comparably to initial one, it should be noted that new pipeline design also considers to specifically and precisely address all previous design and construction errors/problems that have been accumulated for several decades and were well studied by GOGC.

5. Overview of Anticipated Impacts

The scope of the anticipated impacts is based on the reference information and findings of the field visits undertaken during screening and the site reconnaissance carried out in Autumn 2011-Winter 2012 within the frame of feasibility analysis. The data was collected for the both alternatives in order to enable better assessment and comparison.

The potential sources of impacts on gas pipeline construction stage are related to site clearance, establishment of access and construction corridor, trench excavation, backfilling, site restoration etc. While construction will be in progress there will be movement of heavy machinery on site, causing **emissions, noise, potential pollution** by fuels, oil and grease etc.

During the clearance activities and trench excavation, the large surface of soil can be exposed to the rains and water, causing **increase of turbidity**, may be **silting or erosion** at some areas etc. The clearance will generate significant amount of the **topsoil** to be stored properly, handled and reused during the reinstatement of the corridor. In the same period impacts are estimated from the refueling activities, damaged equipment operation etc., special considerations should be respected in order to minimize such impact risks.

During the installation of pipe the welding and coating activities will be in conducted. All these will cause generation of different types of **waste**, which can affect the environment. Proper waste management practices will be required in order to minimize such impacts. During the excavation activities, there is a chance that groundwater will be infiltrating into the excavated channels. It is estimated that water will be pumped out and discharged in the channels. This can cause increase in turbidity of water and **impact on surface water** body, where the pumped water is discharged.

The impacts on surface waters and soils are estimated after the installation of the pipeline during the **hydro testing activities**, the pipeline should be filled up with water and the water should be discharged somewhere after the hydro testing is finished.

The impacts on soil, water and vegetation is also expected during the **demobilization** of the construction compounds (camps, staging areas) and removal of support infrastructure. The impacts can be caused by generated hazardous and non-hazardous materials, **construction debris**, demobilization of warehouses and vehicle maintenance facilities, sanitary facilities etc.

The potential impacts during the operation period are expected due to frequent movement of the maintenance crews along the pipeline corridor, potential for **methane gas emissions** from the damaged sections of pipelines (underground and under the water), **repair and maintenance activities** etc.

In terms of **bio-diversity** no significant impact on flora and fauna is expected along the entire route due to crossing mostly disturbed agricultural areas. There are only total of 3-4 km out of 87at the end of the Zestafoni-Kutaisi pipeline section in Kutaisi area where rare tree species (in particular Caucasian Zelkova, Imeretian Oak, having seldom distribution) may be affected. At the EA stage the mitigation measures will be developed to minimize/avoid direct impact on these species.

5.1 Determination of Category and Scale of Impacts

The above described impacts represent the **direct impacts** type and are correspondingly addressed in this chapter. No significant **indirect impacts** (secondary or chain impacts) such as degradation of surface water quality by the erosion of land cleared (like it may occur in road or railroad case) are expected, because most part of both Zestafoni-Kutaisi and Gori-Kareli 700 mm sections in both alternative cases follow in parallel with the existing pipelines along the already disturbed areas. The proposed alternatives are also routed through already disturbed, mostly agricultural lands. The ROW will be restored to the baseline conditions including residual impacts of previous projects and maintenance activities.

Impacts of the construction works are expected to be mainly **temporary** and relatively minor because the construction period will be very short (about 6-8 months), the construction activity impact source is moving along the ROW, the preferred Red alternative route is mostly at a good distance from surrounding houses, and there are no other especially sensitive features nearby. Disturbance, when close to residential areas, can be reduced by commonly used mitigation measures (construction traffic planning, noise control by working hours spraying to reduce dust, etc.). The environmental impacts of the proposed works that may arise during both construction and operation phases may be classified in four groups, that will be discussed in EA: (i) Impact on Physical Environment: geology and soil, groundwater and surface water, noise, vibration, air quality, (ii) Impact on Biological Environment: flora and fauna, rare and endangered species, (iii) Impact on Socioeconomic Environment: land use, utilities, socio-economics (employment, local businesses, etc.), traffic, cultural heritage (archeology, architecture, etc.)

Cumulative impacts occur when the addition of single impacts from a number of individual events results in a compounding effect. Although each impact may not be significant alone, cumulatively, these impacts may be significant if they occur close together in terms of location and time, resulting in incremental, widespread, often slow change of environmental conditions. For both Alternatives the combination of construction effects such as dust, noise, and visual impact will cause very little disruption to those living and working along the proposed pipeline route, giving the fact that the closest settlements are located mostly at the distance of 200-300m and more from the pipeline. There may be cumulative impact generated by locating of new 700 mm pipeline within the same RoW with old 500 and 700 mm pipelines. This impact will not be significant due to change of function of existing pipelines to the low pressure distribution pipeline that will reduce accident risks. In the areas where proposed pipeline is located close to WREP, the cumulative risks will be reduced by laying the new pipeline at the safe distance from WREP. These impacts will be discussed in details at the EA stage.

The main factor, determining the scope of the EA study, as well as the **scale/significance** of the environmental and social impacts generated by implementation of the sectional rehabilitation project, is that construction is mostly within the existing RoWs along the already disturbed agricultural areas.

CHECKLIST FOR ENVIRONMENTAL CONSEQUENCES Yes (Y), Maybe (M), No (N) or Beneficial (B)	**RED**	**BLUE**
Zestafoni-Kutaisi 34 km Section		
1. Earth Resources		
a. grading, trenching, or excavation	Y	Y
b. geo hazards (mostly from River Kvirila hydrodynamic activity)	N	Y
c. contaminated soils or ground water on the site	M	M
d. offsite overburden/waste disposal or borrow pits required	N	N
e. loss of high-quality farmlands	N	N
2. Agricultural and Agrochemical		
a. impacts of inputs such as seeds and fertilizers	N	N
b. impact of production process on human health and environment	N	N
4. Air Quality		
a. temporary increase in onsite air pollutant emissions	Y	Y
b. violation of applicable air pollutant emissions or ambient concentration standards	N	N
c. substantial increase in vehicle traffic during construction	Y	Y
d. demolition or blasting for construction	N	N
e. substantial increase in odor during construction or operation	N	N
f. substantial alteration of microclimate	N	N
5. Water Resources and Quality		
a. river, stream or lake onsite or within 50 meters of construction	Y	Y
b. withdrawals from or discharges to surface or ground water	Y	Y
c. excavation or placing of fill, removing gravel from, a river, stream or lake	M	M
d. onsite storage of liquid fuels or hazardous materials	M	M
6. Cultural Resources		
a. prehistoric, historic, or paleontological resources within 30 meters of construction	M	M
b. site/facility with unique cultural or ethnic values	N	Y
7. Biological Resources		
a. vegetation removal or construction in wetlands or riparian areas	Y	Y
b. use of pesticides/rodenticides, insecticides, or herbicides	N	N
c. construction in or adjacent to a designated wildlife refuge	M	M
d. rare and endangered species	Y	Y
8. Planning and Land Use		
a. potential conflict with adjacent land uses	M	Y
b. non-compliance with existing codes, plans, permits or design factors	N	N
c. construction in national park or designated recreational area	N	N
d. create substantially annoying source of light or glare	N	M
e. relocation of >10 individuals for +6 months	N	N
f. interrupt necessary utility or municipal service > 10 individuals for +6 months	N	N
g. substantial loss of inefficient use of mineral or non-renewable resources	N	N
h. increase existing noise levels (permanent)	N	N
9. Traffic, Transportation and Circulation		
a. increase vehicle trips >20% or cause substantial congestion	Y	Y
b. design features cause or contribute to safety hazards	N	N
c. inadequate access or emergency access for anticipated volume of people or traffic	N	N
10. Hazards		

	RED	BLUE
a. substantially increase risk of fire, explosion	N	N
b. fuels stored on site +3 months	Y	Y
c. create or substantially contribute to human health hazard	N	N
11. Other Issues (to be used for categories not captured under1 through 10 above)		
a. Substantial adverse impact	N	N
b. Adverse impact	N	Y
c. Minimal impact	Y	Y

CHECKLIST FOR ENVIRONMENTAL CONSEQUENCES Yes (Y), Maybe (M), No (N) or Beneficial (B)	**RED**	**BLUE**
Gori-Kareli 53 km Section		
1. Earth Resources		
a. grading, trenching, or excavation	Y	Y
b. geo hazards (mostly from landslide activity)	N	Y
c. contaminated soils or ground water on the site	M	M
d. offsite overburden/waste disposal or borrow pits required	N	N
e. loss of high-quality farmlands	N	N
2. Agricultural and Agrochemical		
a. impacts of inputs such as seeds and fertilizers	N	N
b. impact of production process on human health and environment	N	N
4. Air Quality		
a. temporary increase in onsite air pollutant emissions	Y	Y
b. violation of applicable air pollutant emissions or ambient concentration standards	N	N
c. substantial increase in vehicle traffic during construction	Y	Y
d. demolition or blasting for construction	N	N
e. substantial increase in odor during construction or operation	N	N
f. substantial alteration of microclimate	N	N
5. Water Resources and Quality		
a. river, stream or lake onsite or within 50 meters of construction	Y	Y
b. withdrawals from or discharges to surface or ground water	Y	Y
c. excavation or placing of fill, removing gravel from, a river, stream or lake	M	M
d. onsite storage of liquid fuels or hazardous materials	M	M
6. Cultural Resources		
a. prehistoric, historic, or paleontological resources within 30 meters of construction	M	M
b. site/facility with unique cultural or ethnic values	N	Y
7. Biological Resources		
a. vegetation removal or construction in wetlands or riparian areas	Y	Y
b. use of pesticides/rodenticides, insecticides, or herbicides	N	N
c. construction in or adjacent to a designated wildlife refuge	M	M
d. rare and endangered species	Y	Y
8. Planning and Land Use		

	a. potential conflict with adjacent land uses	M	M
	b. non-compliance with existing codes, plans, permits or design factors	N	N
	c. construction in national park or designated recreational area	N	N
	d. create substantially annoying source of light or glare	N	M
	e. relocation of >10 individuals for +6 months	N	N
	f. interrupt necessary utility or municipal service > 10 individuals for +6 months	N	M
	g. substantial loss of inefficient use of mineral or non-renewable resources	N	N
	h. increase existing noise levels (permanent)	N	N
9.	**Traffic, Transportation and Circulation**		
	a. increase vehicle trips >20% or cause substantial congestion	Y	Y
	b. design features cause or contribute to safety hazards	N	N
	c. inadequate access or emergency access for anticipated volume of people or traffic	N	N
10.	**Hazards**		
	a. substantially increase risk of fire, explosion	N	N
	b. fuels stored on site +3 months	Y	Y
	c. create or substantially contribute to human health hazard	N	N
11.	**Other Issues** (to be used for categories not captured under1 through 10 above)		
	a. Substantial adverse impact	N	N
	b. Adverse impact	N	Y
	c. Minimal impact	Y	Y

5.2 Ecological Settings, Potential Environmental and Social Impacts

Ecological Settings

The main outcome of the initial assessment of environmental settings is that there are no areas prone to severe geological hazards (except for the Shashkaveti landslide zone in the Blue Alternative of the Gori-Kareli section and the Dilikauri Landslide for Zestafoni-Kutaisi section) or restriction zones (e.g. protected areas or extremely sensitive environmental receptors) – that may prohibit project implementation. The only restricted zone in the vicinity of the project is Ajameti Nature Reserve, by-passed by the Zestafoni-Kutaisi section. The most sensitive area along the Blue Alternative of Zestafoni-Kutaisi section is the River Kvirila crossing, where the River Kvirila is intensively washing the banks.

Access Roads

Access to the site may be organized from various points. Contractor will need to assess methods of access and obtain necessary clearances. Contractor should also establish staging and pipe storage area and pipe delivery paths. The access roads will cross whether they can withstand heavy loads, such as side-booms. Considering that access roads to and along the RoW will usually run in parallel and in immediate proximity to the drainage channels and ditches, special attention will be paid to avoid damage of the channel banks. It should be noted also that 80% of the new alignment follows the existing pipeline route, where the access roads remain since initial pipeline construction, and are permanently used for the pipeline maintenance purposes till today.

Land Acquisition

For the most part, the works closely follow the GOGC owned pipelines for both Alternatives. Due to earlier mismanagement of ROW land issues, acquisition of the Right of Way easements is still anticipated for those areas. More work will be needed for the reroutes, but as noted in the analysis of alternatives, for the Zetsafoni-Kutaisi section Red Alternative avoids removal of the 2.5 km long vineyard and Gori-Kareli section avoids demolition of houses within the safety consequence zone.

Most likely arrangements will be needed for compensations and to establish servitude agreements with the owners. At most locations the lost crops will have to be compensated. Both alternatives of Kareli-Gori section cross number of vegetable gardens and orchards.

Productive Land
There are mostly agricultural lands along the both Alternatives of both sections. Agricultural land use by local residents will be affected and compensation issues may arise. Cattle grazing occur in some areas. No major settlement within the 100s of meters sight (except for village Breti of the Blue Alternative of the Gori-kareli Section). No significant commercial or industrial interests expect for the vineyard in the Blue Alternative of the Zestafoni-Kutaisi section. The Blue Alternative of Gori-Kareli section crosses village infrastructure and may affect commercial and industrial interests in addition to agricultural lands.

Resettlement
No residential or other buildings are affected along the Red Alternative of Gori-Kareli section. Blue alternative will require demolition of several houses within the safety consequence zone. No buildings are visible along the RoW of Zestafoni-Kutaisi except for one area, where the proposed route comes close to the cemetery and a newly constructed local church. Although the pipeline will not directly affect those areas, construction activities might cause some disturbance. This issue will be specifically analyzed during the EA process in order to plan and conduct the construction with the most limited possible impact and within the shortest timeframe. Agricultural production is evident almost all along the routes, cattle grazing also occurs in the area. Where agricultural production is evident along the route, the detailed cadastral investigation is undertaken to establish servitude agreements. There are orchards crossed by both alternatives of Gori-Kareli, requiring compensation. As mentioned above, the new alignment (Red Alternative) completely avoids village Breti (resettlement and heritage issues) and the newly developed large vineyard (remarkable compensation issues).

Other Social Impacts
Impacts from workers (up to 100-150 per section) and staging areas for the construction period is anticipated. Kutaisi, Zestafoni, Gori, Kareli and/or nearby villages could be used for housing and catering the contractor's workforce. Recruiting possibilities for local unskilled labor will also be assessed and maximized as far as possible.

Visual Impact
A short-term visual impact from the presence of RoW and construction crews is anticipated. Long-term scarring of landscape would be easily mitigated if grading and recontouring is done correctly and topsoil reinstated fully. Permanent residual visual impact may appear from aerial crossings (such as River Cholabauri aerial crossing at Zestafoni-Kutaisi section). Using underground rather than aerial crossings would constitute the adequate mitigation.

Watershed Protection Area
Different water-bearing complexes may be identified within the study area, comprising deep circulation and shallow groundwaters. However, less valuable groundwater resources and less aquifers sensitive to the project impacts are present in the area expect for the Blue Alternative of Gori-Kareli Section, where the drinking water supply wells are located within the impact zone. At some locations at Zestafoni-Kutaisi section the groundwater table is close to the land surface (but not as close as it was for Senaki-Poti and Kutaisi-Senki sections during construction of Phases I and II), which makes site vulnerable to pollution and contamination of agriculture areas. Water infiltration into the trench and safe dewatering is expected to be an issue during the construction. According to the RoW design the Zesatfoni-Kutaisi Section will cross 10 rivers (r. Khmordoli, r. Cholaburi, r. Kvirila, r. Lukhuta, r.

Rushava, r. Dzusa, r. Buja, r. Dilikauri Chanel, r. Narula and one nameless Chanel). The biggest river is the River Kvirila and the smallest is the nameless Chanel. Gori-Kareli Section will cross 8 rivers (r. Western Tortla (Kurbalula), r. Mejuda, r. Adzula (Pshena), r. Didi Lishvi, r. Bebuila, r. Eastern Prone (Kornistskali), r. Ptsa (Western Prone), r. Chorchana). The biggest river is the River Liakhvi, but the existing crossing will be maintained. Therefore, no significant impact is anticipated here. The smallest is the River Bebuila. For most of the listed rivers, flooding probability may be high in spring or autumn seasons.

Anticipated Environmental Impacts

Earth Resources
- Impact from excavation along the 34 and 53 km sections;
- Impacts from creation of new temporary access roads (if/when necessary), as well as grading and drainage arrangements for existing roads, construction sites and staging areas;
- Contamination of ground by construction, operational and accidental spills (fuels, other).

Agricultural
- Pipeline route goes through agricultural and pasture lands and several orchards;
- Temporary difficulties in moving cattle across the RoW.

Air Quality
- Emissions from construction vehicles and other equipment;
- Emissions of fumes from welding and coating materials;
- Release of methane during tie-in process evacuation of line gas;
- Dust control maybe required.

Water Resources and Quality
- Special consideration to be given to operational and accidental spilling (fuel, oil, concrete) during construction of pipeline crossings over the rivers;
- Discharge of hydrostatic test water;
- Pollution of the river with heavy metals if waste generated from pipe welding and coating materials is not managed and disposed properly;
- Temporary fuel storage areas will be located in the storage yards, no bulk quantities are expected.

Cultural Resources
- Possibility of chance findings during excavation works.

Biological Resources
- Temporary insignificant loss of habitats and flora due to the new route construction;
- Temporary impact on ichthyofauna during the river crossing activities;
- Impact on rare tree species (in particular Caucasian Zelkova, Imeterian Oak).

Planning and Land Use
- Short term (single season) exclusion of land from agricultural production along the ROW;
- Temporary land requirement for access to construction sites and associated safety zones, in order to:
  - ✓ Move machinery along the RoW;
  - ✓ Establish staging camps for workers and supplies;
- Easement for extra land and/or additional accesses to the RoW (if/where necessary).

Traffic, Transportation and Circulation

- Significant short-term noise impacts with the use of the heavy machinery and various types of construction equipment.

Visual Impact

- Temporary visual impacts from the presence of staging areas;
- Continued scaring of landscape if construction section not reinstated;
- Longer term impact of discarded waste if not managed properly.

Social Issues

- Short-term and localized social impacts due to safety risks to community members;
- Negative impacts on local infrastructure (use of access road, siting of the storage yards);
- Introduction of short-term labor force into the community, including possible health risks;
- Positive short-term impact on employment during the course of the construction (unskilled labor);
- Need for oil and fuel storages.

Mitigation Options

Mitigation measures recommended in the EA will be reflected in the EMP-s and attached to the bidding documents covering in particular: waste management, emissions and noise management, reinstatement management, pollution prevention and management, community engagement, emergency response (for spills potentially affecting groundwater and drainage network), other. The GOGC will undertake careful supervision over the contractor's activities on implementation of EMPs.

6. Description of EA Methodology, Scope and Schedule

The environmental screening for both proposed route alternatives was made considering options along the existing RoWs. The main methodology for baseline information collection and analysis is based on best practice adopted worldwide. At the first stage, the information available on specific sectors is collected from published sources including books, periodic publications, scientific journals etc. It should be also considered that the subject pipeline exists for more than 30 years and GOGC has accumulated sufficient data on RoW conditions, scale and nature of existing and anticipated environmental impacts. The collected information is analyzed along the existing pipeline RoW. After the analysis the information is screened during the site visits conducted by different experts. The field reconnaissance data is analyzed in conjunction with desk study outcomes. The aim of conducted studies is to:

- Document the existing site conditions;
- Identify and describe the sensitive issues/sections;
- Identify needs for protection/mitigation measures;

The field investigations were performed in Autumn 2011 and Winter 2012 by the independent experts. The series of field trips covered the RoWs under both proposed alternatives, as well as adjacent territories, which can be considered as subject to indirect impact.

The main methodology for the impact analysis and the criteria against which the effects to the local environment will be assessed at the detailed EA stage are as follows:

- Characteristics of the proposed development (e.g. scale, use of natural resources, quantities of pollution and waste generated);
- Sensitivity of the areas likely to be affected by the development; and
- Characteristics and significance of the potential effects (magnitude and duration).

The environmental effects of the Project will therefore be predicted for each relevant environmental topic (e.g. physical, biological, social) by comparing baseline environmental conditions (i.e. the situation without the Project) with the conditions that would prevail were the Project to be constructed and operated. The primary purpose of identifying the significant effects of a project is to inform the decision-makers in a way that an informed and robust consent decision can be reached.

6.1 EA Content Outline

Based on the scoping analysis presented in previous chapter, as well as the experience from preparation of Senaki-Poti 30 km pipeline project EA Report (submitted by GOGC and approved by USAID in September 2010) and Kutaisi-Senaki 76 km project EA report (submitted by GOGC and approved by USAID in July 2011) the following scope/content is proposed for the Sectional Rehabilitation of Saguramo-Kutaisi 87 km pipeline project EA Report:

Executive Summary

Introduction

Description of the Project (Purpose, Technical Overview)

Legislation and Regulatory Framework (Legislation for Environmental Protection, National Legal Framework for EA, Other Legislation Relevant to EA Context, Environment Protection Standards and Norms)

Project Alternatives (description, comparison analysis)

Affected Environment / Baseline Condition (General Provision, Methodology for Desk Studies and Field Investigation; Geography and Topography; Climate; Geology, Geomorphology and Soils; Hydrology and Hydrogeology; Seismic Conditions; Air and Water Quality; Flora and Fauna; Socio-Economic and Cultural Environment).

Environmental Consequences (Environmental Impacts; Potential Sources of Impacts; Impact Types and Categories; Impact on Landscapes; Geology and Soils, Impact on Air Quality; Impact on Water Quality; Noise and Vibration; Impact on Flora; Impact on Fauna; Social Impact; Land Acquisition and Resettlement; Impact on Communities (Alteration of Social Environment); Summary of Significant Impacts;

Environmental Mitigation and Management (Environmental Management System, Environmental Mitigation and Monitoring Plan, Environmental Emergency Response Plan, Environmental Training, Additional Mitigation Measures)

Public Consultations (Information Disclosure, Venue, Attendants, Documentation and Handouts, Presentations, Q&A Session)

List of Preparers

Annexes (Maps, Design Plans, Project Site Photographs, other)

6.2 Schedule for EA Process

The following schedule is proposed for the EA process:

- for the EA process the baseline survey was completed in Winter 2012, the scoping meetings are scheduled to be held in April 2012 in project affected areas.
- the completion of the EIA report under the Georgian legislation, its disclosure and submission to MoE for Ecological Examination and issuance of Environmental Permit is planned for September 2012.
- EIA public consultations to be held in June 2012.
- after the approval of Scoping Report by USAID, the English version of the EA Report will be completed in May-June 2012.

As noted in the introduction, public hearings were conducted for Saguramo-Kutaisi 100 km project in summer 2010 and the local population that will be affected by the proposed Gori-Kareli project is already aware of the urgent need for rehabilitation and the potential impacts. However, GOGC will plan and implement public disclosure of this new proposal again as required by the applicable USAID and national regulations.

7. Points of Contact

If you have any questions or comments to GOGC concerning this document, please get in touch with us at the following contacts:

Department of Construction Supervision
East-West Gas Pipeline Rehabilitation Project
Georgian Oil and Gas Corporation
21 Kakheti Highway, Tbilisi, 0190, Georgia
+995 (32) 224-40-40 ext. 234
DCC@GOGC.ge
www.GOGC.ge

Annex A. General Location of Phases I through IV along the East West Main Pipeline

Annex B. Project Site Photographs

Stripped Pipe across the Agricultural Lands

Stripped Pipe Inside the River Western Tortla

Exposed Pipeline in the River Rushava

Exposed Pipeline across the Gully Crossing

Exposed Pipeline across the Eastern Tortla

River Ksani Section

River Ksani Crossing

River Liakhvi Crossing

Stripped Pipe across the Agricultural Lands

Aboveground Section with the Damaged Supports

Corroded Pipeline over the Channel Crossings

Stripped Pipeline Overgrown with small Trees


Exposed and Stripped Pipe Sections


Secondary Roads

Exposed Pipeline Sections in the Water across the Channel Crossings

Pipeline ROW Going Uphill

Exposed Pipeline in the Poorly Backfilled Trench

Damaged Road Crossing

Pipeline Section in a Heavily Eroded Area