FINAL

WREP Sectional Replacement Project

Environmental and Social Impact Assessment
Non-Technical Summary

Georgian Pipeline Company

AUGUST 2016

Contents

This document is the non-technical summary (NTS) of the Environmental and Social Impact Assessment (ESIA) for the Western Route Export Pipeline Sectional Replacement (WREP-SR) Project in Georgia. It describes the proposed Project and the potential impacts it may have on the physical and biological environment and on people. It also addresses the measures that the Project will implement with the aim of reducing adverse impacts and to enhance potential benefits, and describes how environmental and social issues will be managed during construction and operations.

The proposed WREP-SR Project involves the replacement and re-routing of certain sections of the existing operational pipeline. The aim is to help ensure the continuation of safe and efficient transport of oil from Azerbaijan through Georgia to the Supsa terminal on the Black Sea coast.

The WREP-SR Project Sections

The ESIA has been undertaken in accordance with the European Union Directive (2011/92/EU) on Environmental Impact Assessment (as amended). This is a requirement of the Host Government Agreement (HGA) between the Government of Georgia and the WREP oil companies. The ESIA was made available for review and comment throughout the disclosure period (April–May 2016). The ESIA was revised to address issues raised during disclosure and was re-submitted to the government for approval.

Box 1: WREP operator: GPC and BP relationship

GPC was formed in 1996, by the same companies that were the shareholder companies of AIOC at that time, in order to operate WREP in Georgia. The current GPC shareholders are the affiliates of the following companies: BP, Chevron, ExxonMobil, Statoil, Inpex, TPAO, Itochu and ONGC Videsh Limited. Subsequently, BP has taken over single operatorship of WREP, although rights and privileges under the HGA are secured for WREP under the GPC name.

The ESIA has therefore been written on behalf of GPC as the operating company for WREP. However, references are made to BP and BP policies and practices where relevant since BP holds the operatorship.

Introduction

Project overview

The proposed WREP-SR Project comprises:

- Re-routing and replacing three sections of pipeline to avoid high risk landslide areas
- Replacing two river crossings to reduce the risk of the pipeline being exposed by erosion of the river bed and banks.

The new sections are between 500m and 7.6km long and have a total combined length of approximately 13.6km.

Access to the pipeline sections will be along existing roads wherever possible. Some of these may need to be upgraded by the construction contractor in order to transport equipment, materials and people to and from the work sites. Eight short lengths of new roads, totalling about 1.7km, will also be required.

Replaced sections of pipeline will be decommissioned during the WREP-SR Project. This will involve cleaning and de-oiling the redundant pipeline before the new sections of pipeline are connected (tied in) to the existing pipeline.

The main work is scheduled to begin in late 2016 and be completed by the end of 2018.

Activity	2016	2017				2018			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mobilisation									
Preparation works									
Pipeline construction									
River Supsa crossings									
Pipeline de-oiling and tie-ins									
Removal from service									
Biorestoration									

Indicative construction programme

The WREP Sectional Replacement Project will be designed, built and operated in accordance with the provisions of the WREP Host Government Agreement (HGA) and Pipeline Construction and Operating Agreement (PCOA), appropriate international industry standards and practices, applicable Georgian law and BP policy.

ESIA process and methodology

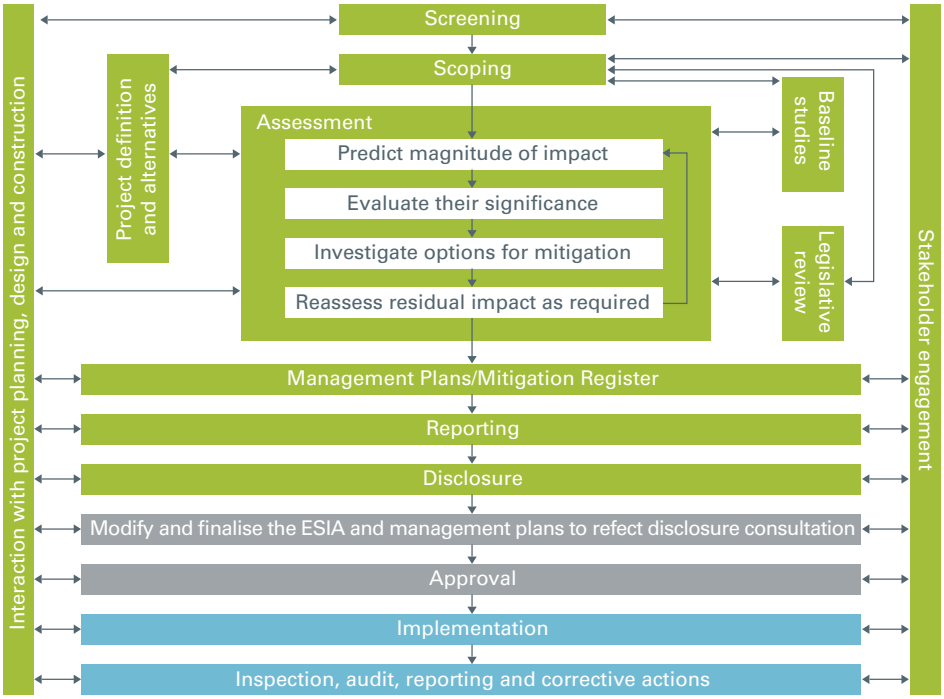
The ESIA has been prepared in line with the requirements of the HGA, which states that it must be conducted in accordance with European Union Directive on environmental impact assessment.

The purpose of the ESIA is to:

- Provide a baseline against which Project impacts can be assessed
- Identify and assess potential negative and positive environmental and social impacts of the Project
- Determine mitigation measures that will avoid, minimise or mitigate negative impacts and optimise potential positive impacts
- Inform option selection and Project design
- Consult with and obtain feedback from Project stakeholders.

In the ESIA, potential environmental and social effects resulting from the WREP-SR activities have been assessed against:

- Applicable regulations, standards and guidelines
- Existing environmental, cultural heritage and socio-economic conditions
- Issues and concerns raised by Project stakeholders.



The ESIA process

Baseline Surveys

Baseline environmental and social conditions were identified from a range of sources and field surveys as shown in Box 2. The sensitivity of the environmental and social receptors and the magnitude of potential impacts were then identified and used to determine impact significance. Potential and residual impacts (i.e. those remaining after the application of mitigation measures) were characterised as being of low, medium or high significance or as beneficial. Wherever practical, additional mitigation measures were identified to reduce further those adverse residual impacts that were considered to be of medium or high significance or to enhance those that were considered beneficial.

The mitigation and enhancement measures that have been proposed in the ESIA to reduce potential adverse impacts and enhance potential benefits have been captured in a commitments register. The commitments have been included in the construction contract and will be incorporated into management and monitoring plans.

Box 2: Environmental and socio-economic baseline surveys

Baseline information for this study was gathered from a range of sources including the EIA prepared for the original WREP Refurbishment and Construction Project (1996) and other desktop sources. Detailed baseline surveys conducted specifically for the WREP-SR ESIA were:

- Habitats, plants and animals along the pipeline re-route sections and access roads
- Macro-invertebrates in the River Supsa where the pipeline is to be replaced and River Liakhvi which may be used as a source of hydrotest water for the replaced sections
- Cultural heritage along the pipeline re-route sections and access roads
- Land contamination along the pipeline re-route sections
- Socio-economic conditions at national and regional levels and more specifically in communities near the proposed works
- Traffic survey on the road to Jvari monastery which will also be used by construction traffic
- Geohazards including landslides, soil classification and erosion susceptibility
- Hydrology, including surveys of watercourse crossings
- Surface water quality including sampling at significant watercourse crossings
- Topographic survey
- Sensitive receptors areas along the proposed re-route sections and access roads.

Baseline information was obtained from surveys undertaken between 2009 and 2016 using a combination of national and international scientists and experts.

Stakeholder consultation

Stakeholder consultation is of crucial importance in gaining an understanding of how a Project will affect stakeholders and to obtain their ideas and opinions on how the impacts should be managed. The feedback from consultation is an important influence on project design and implementation. The Project recognises the importance of consultation and that it is an early opportunity for stakeholders to become better informed about planned Project activities.

Before and during disclosure of the draft ESIA, consultations were undertaken with the following organisations and communities:

- National government departments
- Regional and local government authorities
- Communities that were identified as being closest to the re-route sections of pipeline and proposed access roads.

Box 3: Stakeholder consultation and disclosure

Settlements have been consulted through a series of face-to-face consultation meetings; copies of a Georgian language community pamphlet were printed and distributed in advance of these meetings. Trustees and residents representing a cross-section of the community attended each community consultation meeting. At the beginning of each consultation meeting, there was a brief presentation of the WREP SR Project, followed by a session for attendees to ask clarification questions, and provide views and comments on the proposed Project.

Meetings have been held with representatives of GOGC, Ministry of Environment and Natural Resources Protection (MENRP), Agency of Protected Areas, National Forestry Agency, Biodiversity Protection Service, the National Agency of Cultural Heritage Preservation and UNESCO Georgia.

The Draft ESIA was made available for public review and comment within regional and city government offices in Imereti, Guria, Mtskheta-tianeti and Kvemo Kartli; Gardabani, Tbilisi (GIdani-Nazaladevi), Mtskheta, Sachkhere, Chiatura and Lanchkhuti; and Tbilisi public library and BP offices. The NTS was made available in a public place within each territorial organ and at locations within each Project-affected community.

Feedback mechanisms available included feedback forms which were distributed with all copies of the ESIA and NTS and made available in all Project-affected communities, telephone, email/website or through the BP Community Liaison Officers. In addition comments could be made at public meetings which were held near the end of the disclosure period in Sachkhere, Chiatura, Lanchkhuti, Mtskheta, Gardabani and Tbilisi.

Details of the participants and the key views and comments raised were documented to provide a record of all community meetings. They were recorded in a database and taken into consideration during the preparation of the Final ESIA.

The physical environment

Georgia covers an area of about 69,700 square kilometres (about 26,900 square miles). Situated on the east coast of the Black Sea, it is bounded by Russia to the north, Armenia and Turkey to the south and Azerbaijan to the south and east.

Georgia location map

Rugged mountain ranges dominate Georgia's landscape, constituting about 85% of the total land area. The main ridge of the Caucasus Mountains, or Greater Caucasus, forms most of Georgia's northern border with Russia and contains the country's highest elevations, including Mount Shkhara (5,200m), Georgia's highest peak. The Lesser Caucasus Mountains occupy the southern part of the republic and rarely exceed an elevation of 3,000m (10,000ft). These two mountain systems are linked by the centrally located Surami mountain range, which bisects the country along a north-east– south-west axis and is crossed by the WREP. To the west of this range, the relief becomes much lower, and elevations are generally less than 100m (300ft) along the river valleys and the coast of the Black Sea. On the eastern side of the Surami range, a high plateau known as the Kartaliniya Plain extends along the Mtkvari River to the border with Azerbaijan.

The WREP follows the Mtkvari (Kura) River valley plain from the Azerbaijan/Georgian border, diverging northwards around Tbilisi. It crosses from eastern to western Georgia over the Surami mountain range, progressively losing height as it approaches the Supsa terminal on the Black Sea.

Rugged mountain ranges dominate Georgia's landscape

The landscape around Supsa is generally flat

Geohazards

Landslides are a common problem in certain areas of Georgia. A detailed assessment was undertaken to identify the risks posed by landslide-prone areas along the existing WREP route. Those sections of WREP that are in the areas of highest landslide risk have been identified for re-routing and replacement as part of this project.

Soil and sediment conditions

Given the close proximity of the majority of the WREP-SR Project to the existing WREP, the soil and sediment baseline conditions remain as described in the original WREP EIA (1996). This has been supplemented by additional desk-based research to assess the specific soil types encountered along the re-route sections where they deviate from the existing WREP line. A soil erosion assessment of the route was also undertaken to inform the design of reinstatement methods.

The re-routed pipeline sections are typically located on forest, agricultural or pasture land with minimal potential for land contamination. However, localised areas of land contamination may affect the WREP-SR Project primarily resulting from previous hydrocarbon contamination from pre-1996 pipeline operations, illegal tapping (removal) of oil, unregulated waste disposal and past agricultural practices.

It is likely that additional contamination, particularly in the form of unregulated waste disposal (fly-tipping and landfill areas), will be identified during pre-construction surveys of the pipeline right of way (ROW) and access roads.

Biodiversity

Temperate mixed forests cover most of the region and are dominated by Georgian oak, ash, hornbeam and other broadleaf species. Coniferous forests, mainly fir, spruce and pine, grow at higher elevations. Together these forests support rich biodiversity with more than 1,000 plants, 400 vertebrates and 2,000 invertebrates recorded in the region.

Many Georgian forests have become fragmented, which has led to changes in their species composition. Grassland has developed in many areas where trees have been felled.

Degraded riparian forest

Mixed deciduous forest

Georgian oak–oriental hornbeam forest with butcher's broom

Field surveys of the flora and fauna along the proposed new sections were undertaken and supplemented by a literature review and mapping of protected areas. Natural and semi-natural habitats adjacent to access roads were also surveyed.

Some of the plant and animal species recorded during the surveys have high conservation value because they are rare and/or threatened.

During routing of the WREP-SR Project, emphasis has been placed on avoiding designated protected areas, as well as habitats or species sensitive to disturbance or of high conservation value.

Two re-route sections are close to, but outside, Tbilisi National Park (TNP) which covers around 21,000ha. TNP is an IUCN Category II reserve and is dominated by Georgian oak, beech, hornbeam, ash and wild pear. It is a particularly important area for biodiversity and includes over 40% of the plant species found in Georgia. Thirty-one plant species are Caucasian endemics (they are only found in the Caucasus) and another fourteen are Georgian endemics (only found in Georgia). Several other plant and animal species are included in the Georgian Red List of threatened and vulnerable species (2013). Some of these species are also found in the areas south of the designated area where a section of WREP will be re-routed.

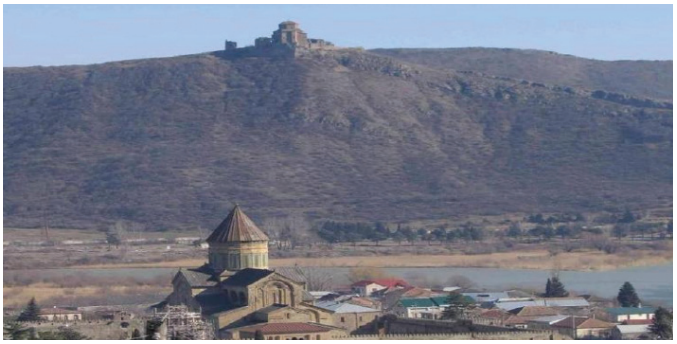
The Kolkheti wetlands National Park, Ramsar Site and Important Bird Area are to the north of the Supsa river crossings. However, they are more than 500m from the proposed works and will not be directly affected by the Project.

Cultural heritage

Georgia has a long and complex history which is reflected in the depth and nature of its archaeological record. The original construction of the WREP pipeline in 1997 revealed many sites of cultural importance which have informed the design of the current project.

Known archaeological sites within 100m of each pipeline re-route section and access road have been surveyed by independent Georgian experts. The extent and nature of identified features were taken into account during the pipeline routing process and avoided where possible.

The most significant sites in the vicinity of the pipeline are the monuments associated with Mtskheta, such as the Jvari monastery and the Svetitskhoveli cathedral, which are designated as a World Heritage Site. 1km of a proposed re-route is just within the Landscape Protection Zone of the World Heritage Site. An independent heritage impact assessment of potential impacts on the Mtskheta Landscape Protection Zone was undertaken by the International Council on Monuments and Sites (ICOMOS).



Mtskheta town (Svetitskhoveli Cathedral) and Jvari monastery (on top of hill) UNESCO world heritage sites

Social environment

National economy

The Georgian economy has grown significantly over the last decade, apart from the years 2008-9 during which there was negative GDP growth. The majority of the population (55%) work in agriculture, but this sector contributes less than 10% to the GDP as most production is for home-use rather than for sale at market.

Inflation is high and particularly affects the rural population and those on fixed incomes such as pensioners.

Roads

The road traffic fatality rate in Georgia is high at 13 per 10,000 vehicles (2006 data). The east-west highway in the main arterial road across Georgia and will provide access between the pipeline sections. Much of it has been upgraded and widened which should improve safety. Outside the larger settlements the community roads that will be used to access the pipeline are generally not surfaced, and in many cases they are in poor condition.

Settlements along the route

Information about the 15 settlements that are within 2km of the proposed works or 300m of an access road was obtained through interviews with community leaders.

Summer houses near access road

Dwelling near pipeline route

All the settlements are considered to be rural with the exception of Gldanula and Avchala Two which are located on the outskirts of Tbilisi. The population ranges from 190 people in Mamkoda to 6463 in Korbouli. With the exception of the settlements on the outskirts of Tbilisi, all villages close to the proposed works are characterized by a large proportion of self-employed people, working predominantly in the agricultural sector, either as farmers or livestock breeders. The majority of the residents of the Tbilisi settlements work as employees in a non-agricultural sector, either for the government or a private company. Many households in all settlements are reliant on additional sources of income such as pensions, state benefits, and remittances.

Engineering and route selection

The WREP-SR Project is the result of detailed assessment of options for the alignment of the new sections of pipeline and for the selection of methodology for activities including de-oiling and removal from service. This has been an iterative process and the design has been modified many times to take account of new information as it has become available.

The social and environmental implications of a no-development option were also considered. However, if the proposed works are not undertaken, the WREP will face ongoing risks from high risk landslides and rivers. The works are therefore considered to be essential.

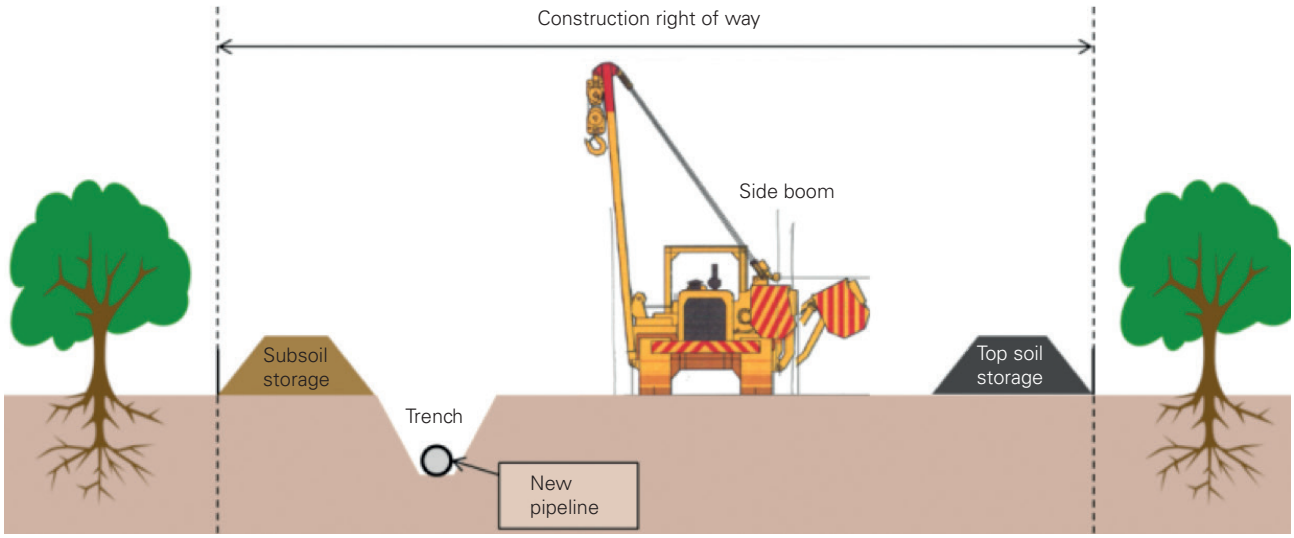
Route selection

Fine tuning of the route has been undertaken in sections that are particularly sensitive, such as close to Tbilisi National Park and the Landscape Protection Zone of the Mtskheta World Heritage Site. Through this process it has been possible to avoid Tbilisi National Park and reduce the length through the Mtskheta Landscape Protection Zone to 1km. Complete avoidance of the Mtskheta Landscape Protection Zone is not possible as the new section has to tie-in to the existing pipeline at a point that is within this zone.

Pipeline construction

The pipeline sections will be built in a strip of land known as the right of way. Generally the right of way will be 25m wide but this will be reduced, where practicable, through sensitive areas such as forest. Additional working areas will be required for the storage of pipe and materials and for de-oiling. So far as is possible these will be sited on land with low biodiversity value and no known cultural heritage features.

Pipeline construction comprises a number of distinct operations that are undertaken in sequence by a range of specialised and general crews. Pipeline construction will occur simultaneously at more than one location to make efficient use of the workforce and machinery, to meet programme requirements and work within constraints imposed by seasonal weather. There are likely to be specialist teams installing the major crossings, undertaking the tie-ins and de-oiling the redundant sections.



The two crossings of the river Supsa will be installed by drilling beneath the river bed which will avoid direct disturbance of the river channel. All other watercourses will be open cut.

Before each element of the construction programme begins, the contractor will develop detailed designs, drawings and method statements for the work to be performed. These will incorporate the mitigation measures outlined in the ESIA and the requirements of the Project and the regulatory authorities in Georgia.

De-oiling and removal from service of redundant sections

The existing sections of pipeline that are being replaced will be emptied of oil and cleaned. The oil in these sections will be pumped into temporary tanks and then returned to the pipeline. Specialist equipment will be used to maintain pressure within the pipeline during de-oiling. For the Supsa river crossings, the oil will be driven into existing storage tanks at Supsa terminal.

The redundant sections will be left in the ground, sectionalised and filled with air except at major road crossings where they will be filled with concrete and at the Supsa river where they will be filled with water. An environmental risk assessment has been undertaken to check the validity of this approach.

Hydrostatic testing

Each new pipeline section will be subjected to hydrostatic pressure testing to prove its strength and integrity. Water for testing will be abstracted from nearby streams and rivers without detrimental effect to the surrounding environment and existing resource users. After testing, the water may be reused in another section of pipe or discharged back to a river or stream. Discharge locations, treatment and rates will be agreed in advance with the relevant authorities.

Erosion control

An assessment of the route has been undertaken to identify areas of potential erosion and to support the development of appropriate erosion control measures for such areas. Based on the erosion assessment and the technical objectives of the Project, the following goals have been set:

- No risk of exposure of the pipe
- Very low risk of off-site pollution and sedimentation
- Lower risk of damage to bio-restoration by erosion of soils containing seed-bank resources, vegetative material and plants.

A suite of erosion control measures was developed for earlier pipeline repairs on the WREP and has proved effective. These measures will be implemented along the new sections of pipeline according to the erosion risk at each location.

Reinstatement

The full width of the right of way and all other temporary works areas used by the Project will be re-instated on completion of the works. The construction contractor will be required to develop a Reinstatement Plan which will incorporate reinstatement and erosion control measures.

Areas of sensitive natural habitats with a high soil erosion potential will be seeded with a mixture of native plant species to further encourage re-vegetation. In some areas carefully selected annual grasses may be sown to provide surface stabilisation while the slower growing native plants re-establish.

All reinstated areas will be monitored until they are stable and re-vegetation goals are achieved.

Environmental and socio-economic issues

This section outlines some of the key environmental and social considerations for the WREP-SR Project. It discusses potential Project impacts and mitigation measures, and the main residual impacts on receptors such as soils, surface water and groundwater, landscape, ecology, livelihoods, community health and safety. It concludes with a summary of non-routine and cumulative impacts.

Soils

Soil is an important environmental resource that can be adversely affected by pipeline construction activities and is an integral component of other resources such as landscape, ecology and agricultural land.

In order to mitigate soil compaction, erosion and settlement, the Project has committed to implement generic and location-specific measures, which are recorded in the Project Commitments Register and the Construction Constraints Register. Examples include storing excavated materials in a manner that prevents accidental mixing of topsoil and subsoil and in a location where they will not be compacted by vehicles.

Each of the contractors will prepare a Pollution Prevention Plan that will detail the measures to be adopted to avoid accidental spillages and procedures for clean-up if a release occurs.

In the unlikely event of soil contamination occurring in a sensitive area as a result of de-oiling activities, the consequence could be of medium significance as clean-up and recovery may take at least six months depending on the size of the spill. However, the probability of such a release occurring is considered to be very low.

Landscape and visual impacts

The works are located in a variety of landscapes, some of them with intrinsic aesthetic value. The pipeline will be buried throughout its length. While construction of the pipeline will be a clearly visible activity, it will also be temporary and is not viewed as having a significant potential for landscape or visual impact. In the longer term, however, the visibility of the pipeline, and therefore the degree of impact, will depend on the success of reinstatement and the speed of recovery.

Typical landscape in West Georgia

Section RR-001 near Tbilisi National Park

Areas of the pipeline route with landscape value and sensitivity are where it is:

- Close to the boundary of Tbilisi National Park
- Within the landscape protection zone of the Mtskheta World Heritage Site.

Impacts on the landscape will result from the levelling of working areas and the need to keep a running track along the pipeline to allow access for inspection and maintenance.

All temporary works areas will be reinstated with the aim of returning the visual integrity of the landscape to it's original condition or a form in keeping with the surrounding topography. Erosion protection measures will be installed on ridges and side slopes. There may be a permanent change to topography where the pipeline runs on steep side slopes in order for access to be gained easily in the event of an emergency.

For the majority of construction activities, once mitigation measures have been employed, the residual landscape and visual impacts will be of low significance. Impacts on the Mtskheta landscape protection zone are discussed below in the Cultural Heritage section.

Surface water resources

The WREP-SR Project has the potential to affect surface water resources through:

- The discharge of sediment into watercourses
- Accidental releases of potentially toxic materials
- Disruption to flow rates
- Consequential effects of the above on habitats and community use.

River and stream crossing points have been selected to reduce the impact on sensitive hydrological and ecological features. Each crossing has been individually designed following a detailed watercourse survey.

During construction there is a risk of heavy rainfall washing sediments off the right of way and into watercourses. This will be controlled the installation of sediment control fencing and sediment traps etc.

River erosion

River crossing

In order to reduce the risk of contamination by oils and chemicals, hazardous materials will not normally be stored in floodplains or within 50m of a watercourse. Oil spill clean up equipment will be available where hazardous materials are stored and personnel will be trained to use such equipment. An Emergency Response Plan will be developed for the Project which will detail actions to be taken if a contaminant enters a watercourse.

Each pipeline section will be hydrotested, using water from nearby streams or rivers. The rate of uptake of water from streams or rivers will be controlled to prevent any reduction in flow or negative impacts on downstream users. Where practical, water will be re-used between sections to reduce the total volume required for testing. After testing, the water quality will be analysed, and if necessary treated, to check it meets the Project water quality standard. It will then be discharged back into a watercourse at a controlled rate.

Residual impact on surface waters will generally be short term with only minor increases in sediment levels.

Groundwater resources

Groundwater quality, flow and availability may be affected by pipeline construction.

The material used to fill the trench after the pipeline has been installed will be compacted, but may have higher permeability than the undisturbed ground. At locations where the trench is on an incline, solid barriers will be installed during backfilling to prevent it becoming a preferential route for groundwater flow.

Groundwater abstraction could have an adverse effect on the yield of nearby boreholes, wells or springs. Wetlands supported by groundwater may also be sensitive to any lowering of groundwater levels. If groundwater abstraction is necessary, an environmental and social review will be undertaken to determine the aquifer characteristics and assess potential impacts. Permission to drill and abstract groundwater will be obtained from the relevant Georgian Authorities and the abstraction rate will be based on the results of the review and in accordance with the permit conditions.

Stringent pollution control measures will be implemented to avoid contamination of groundwater resources. Any water that is discharged to the ground or a watercourse will be tested first to ensure it meets the Project Environmental Standards.

Following implementation of the proposed mitigation measures the significance of the residual impacts on groundwater quality and flows (both impeded and preferential) during construction is considered to be of low significance.

Biodiversity

The new pipeline sections will not directly affect any ecologically protected areas. The route through the areas of high biodiversity interest, such as dense woodland near Tbilisi National Park, has been selected very carefully to avoid sensitive habitats and reduce the number of trees that will be removed. The width of the working area will be reduced through the woodland where this does not compromise construction operations. As a result, there will only be a small loss of forest habitat. Certain plant species that are of high conservation value will be moved from the ROW before construction begins and planted nearby so that they are not lost from the area. The ESIA makes provision for species–specific protection measures.

Ophrys

Smooth-leaved elm

The main animal of conservation importance that could be affected is the burrow dwelling spur-thighed tortoise as it is vulnerable to being buried during construction activities. Specific mitigation measures are therefore proposed for this species. The importance of preserving the spur-thighed tortoise will be explained to the contractors. Any tortoises that are found within the working corridor during construction will be moved to safety, at least 50m from the works.

The Project will undertake a monitoring programme to check that there are no Eastern Imperial Eagle nest sites close to the construction areas. If any are found that could be disturbed by construction noise, the Project will seek to avoid construction in this section during the breeding season.

Tortoise

Eastern imperial eagle

Pre-construction bat emergence surveys will be carried out at locations where potential bat shelters were identified during field surveys. If protected species of bats are found to be roosting in any structures or trees that will be removed, a mitigation strategy will be designed with the aim of reducing bat disturbance.

Ecologists will accompany the construction crews when they are setting out the centreline and clearing vegetation along the working corridor. The ecologists will check that routing constraints are adhered to and will participate in decisions concerning fine-tuning of the route e.g. to avoid mature trees or species that are on the Georgian Red List.

Throughout the Project, workspace boundaries will be clearly demarcated in sensitive areas and pre-construction ecological surveys will be undertaken to record details of trees and rare species that will be lost; this information will be used in development of detailed biorestoration measures.

The running track along redundant re-routed sections of pipeline will be reinstated, except where access is required e.g. by patrols. Biorestoration measures will be defined for each of these sections, and will aim to return the land to a condition that is compatible with adjacent areas.

Most of the ecological impacts resulting from pipeline construction will be temporary as the disturbed areas will be reinstated quickly. The only impact on ecology of medium significance will be loss or disturbance of protected species and modified forest structure.

Air quality and greenhouse gases

During construction the main potential impacts to air quality will be from dust, particularly where vehicles are moving along the right of way or un-surfaced tracks. In order to limit areas affected by dust, vehicle movements will be restricted to defined access routes and the right of way; a strict speed limit will be enforced on the right of way and unmade access tracks. Dust generation will be visually monitored and measures such as the imposition of tighter speed limits will be implemented where necessary to avoid causing harm or nuisance to people, animals or crops. A short-term increase in dust levels is unavoidable, but they are considered to be of low significance as background dust levels are high during windy conditions and when existing vehicles travel along unmade tracks.

Temporary working areas will be reinstated as early as practicable after completion of each section to limit the duration of impacts. However, where construction vehicles will be passing close to houses or schools, the residual impact could be of medium significance due to the sensitivity of the receptors and their close proximity to the road. Particular attention will be paid to the implementation of the proposed mitigation measures at these locations.

Nitrogen gas will be used during pipeline de-oiling and commissioning and will be vented to the atmosphere on completion of the operations. Nitrogen constitutes 78% of air and will dissipate quickly from the point of emission.

Although there will be emissions from moving vehicles, fixed plant and generators these are short term and unlikely to cause any ambient air quality problems. Equipment will be maintained regularly in accordance with the manufacturer's recommendations to reduce emissions to a level that is as low as reasonably practicable. The quantity of greenhouse gases emitted from temporary construction activities is considered to be very small in relation to the national GHG emissions.

Noise and vibration

Construction is inevitably a noisy activity but is temporary in nature. Increased noise and vibration levels may be caused by the movement of vehicles and the use of construction equipment such as pumps, compressors and generators.

Before construction begins, the contractor will undertake a visual survey and create a record of the external condition of buildings that are close to access roads. During construction, noise and vibration monitoring will be undertaken at selected locations during movement of heavy equipment to provide further data and to inform the development of more detailed mitigation measures. This information will provide a baseline against which future changes in noise levels or the condition of buildings can be assessed.

Construction work will usually be restricted to daylight hours except for certain operations where 24 hour working is necessary. Local residents will be forewarned of planned activities that are noisy and there will be a mechanism for the lodging of complaints and for determining action in response to complaints. Noise will be monitored against the Project environmental standards and appropriate noise abatement equipment will be used to prevent disturbance where necessary.

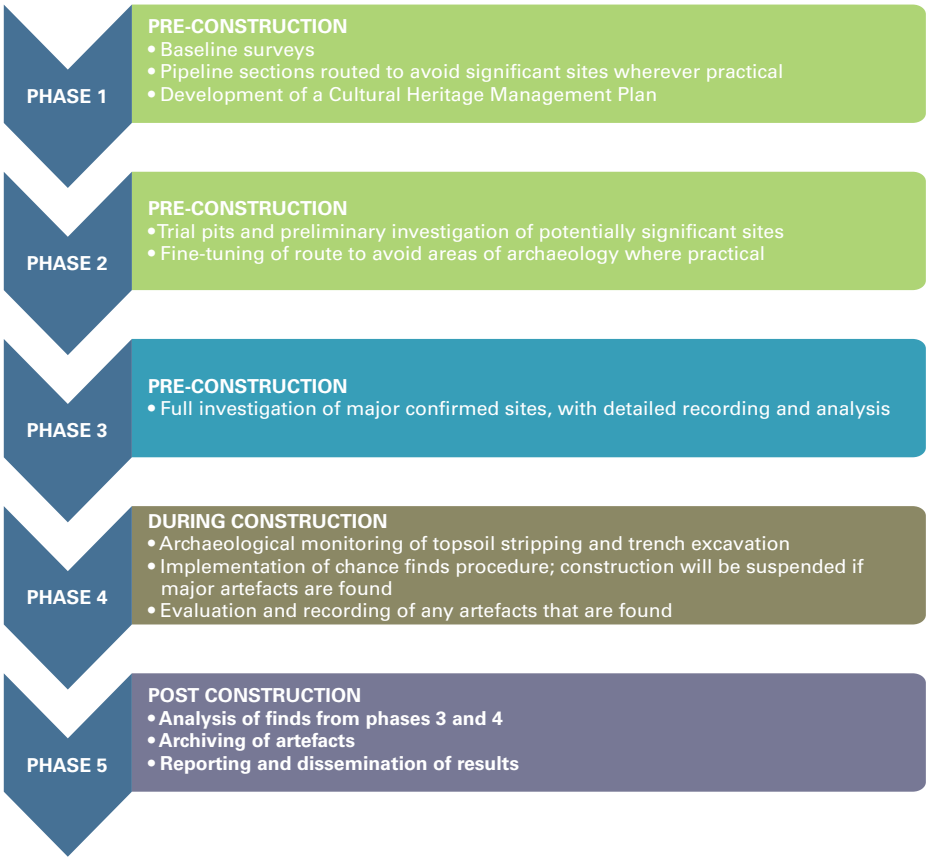
The proposed mitigation measures will reduce the impact of noise and vibration during construction, and generally result in a low residual impact. However, at certain sensitive receptors noise or vibration from construction traffic may be of medium significance.

During commissioning and testing the residual impact associated with noise emissions will be of low significance and short duration.

Cultural heritage

Cultural heritage resources, especially archaeology, were important considerations throughout the planning of the WREP-SR Project. The cultural heritage of an area may be adversely affected by a large-scale construction project if it is not managed sensitively. The Project team has placed considerable emphasis on identifying cultural heritage sites and routing the pipeline sections to avoid them. Where complete avoidance has not been possible due to other constraints, such as topography or other pipelines, known sites have been investigated and recorded.

An independent heritage impact assessment of potential impacts on the Mtskheta Landscape Protection Zone was undertaken by the International Council on Monuments and Sites (ICOMOS), which concluded that WREP SR Project is unlikely to have a direct impact on Mtskheta World Heritage Site monuments and will have only a temporary impact on intangible values. The ICOMOS study also concluded that construction within Jvari Monastery LPZ is acceptable on condition that a specific heritage monitoring plan is implemented during construction.



Often detailed information on cultural heritage features only becomes available during the construction phase of a project. Therefore, an archaeological strategy for the Project has been created to allow for the progressive assessment and mitigation of the effects of construction of the re-route pipe sections and any widening of access roads.

A framework for developing a Chance Finds Procedure is included in the ESIA. The procedure will outline the actions to be implemented in the event of a find during the topsoil stripping or trenching activities.

At sensitive locations, the Cultural Heritage Monitor will watch the removal of topsoil and trench excavation during construction. If any new areas of archaeology are found, he/ she will use the Chance Finds Procedure to determine the appropriate course of action. This will include consultation with the relevant approved Georgian Heritage institutions and the Ministry of Culture and Monument Protection. In some cases it may be possible to make minor adjustments to the route of the pipeline and avoid damage to the feature.

Avoidance is prioritised, however in certain cases the pipeline route may not be easily moved, and sites will need to be excavated and recorded before construction continues in the area. The additional information that this will add to the cultural heritage record of Georgia will be a positive benefit. A Chance Finds Procedure will be included in the Cultural Heritage Management Plan.

Through implementation of the proposed mitigation measures, the negative impact on the cultural heritage resource of Georgia will generally be reduced to low significance, and the positive benefits will be maximised. For the part of the route within or close to Mtskheta World Heritage Site landscape protection zone, the residual impact is assessed as being of medium significance due to high sensitivity of the area.

Community health and safety

The main Project-related activities that could affect community health and safety are:

- Safety risks to local residents, the workforce and livestock as a result of construction work and associated activities
- Increased risk of traffic accidents on roads and access tracks
- Increased risk of respiratory illnesses from changes in air quality due to construction dust
- Disturbance to sleep patterns from increased noise levels
- Increase in disease vectors such as rodents (if solid/liquid wastes are not managed adequately)
- Potential conflict between security personnel and local community members.

In order to reduce the risk of traffic accidents the construction contractor will be required to use only the agreed Project access routes and to comply with the Project speed limits. The works will be planned to avoid delivery of heavy loads near schools at times when children are likely to be walking to/from school or playing in the streets. All drivers will undergo safety and environmental awareness training and will be required to adhere to BP driving rules. Driving performance will be assessed and monitored with additional training provided if necessary.

Construction areas will be clearly demarcated and protective barriers erected along sections close to communities or where local people are known to cross the route regularly. Protective barriers will also be used at locations where unaccompanied animals are known to graze regularly. Pre-construction consultation will be undertaken with landowners, occupiers and users to establish their requirements for temporary fencing. Land users and local communities will be consulted to determine where access for people animals or vehicles needs to be maintained across the working corridor.

Designated Community Liaison Officers (CLOs) will be the primary point of contact between the local communities and the Project and will meet local communities to explain the dangers associated with the construction works. Particular emphasis will be placed on talking to children and explaining the dangers of construction sites and open excavations. The CLO will also advise them of the routes that will be used by construction vehicles and will explain that extra care will be needed when using or crossing these routes.

During construction, security providers will be carefully selected. Rules of engagement will be devised, and training provided to all personnel. The Project will implement the Voluntary Principles on Security and Human Rights.

The pipeline will be built to international standards. Local residents will be advised of activities that could threaten the integrity of the pipeline, such as the extraction of aggregate. The pipeline will be patrolled daily and the inspectors will intervene if any third party interference is identified under existing operations procedures. The redundant pipe sections will be regularly monitored for indications of subsidence during operation.

With implementation of the proposed mitigation measures, the residual impacts on community health and safety will generally be of low significance. However, due to the potentially serious consequences of accidents associated with open excavations, road traffic or conflicts between community members and security personnel, the residual impacts for these issues are of medium to high significance.

Land ownership and use

BP, on behalf of GOGC, will acquire land servitude rights to a 50m by 13km corridor for a permanent easement and safety zone (c. 65ha). Following completion of the new pipeline sections, existing land users will be able to continue to use the land except for land used for the permanent above-ground facilities, subject to certain restrictions on building and excavations over the pipeline. Prior consultation will be undertaken with authorities, landowners and occupiers including graziers before taking access to land.

On completion of construction, the pipeline corridor will be reinstated to as near to the original condition as possible, including the reinstatement of field boundaries. This will allow farmers to resume grazing over the pipeline corridor and undertake other agricultural activities that do not conflict with the land use restrictions that will be applied when the pipeline is operating.

The Project will apply fair and transparent procedures for determining compensation for land acquisition.

Implementation of mitigation measures will aim to ensure that incomes from farming are maintained and that there is minimal disruption to land users or access. The residual impacts are generally considered to be of low significance.

Employment and livelihoods

The detailed labour requirements for the Project will not be known until the appointment of the construction contractor. It is currently estimated that approximately 350 people will be employed at the peak period, in 2017, during construction of the Project.

The Project will also provide direct service opportunities for companies at the regional, and possibly national levels. However actual purchasing decisions will be contingent upon local suppliers offering sufficient quality and reliability to meet the Project requirements.

Communities closest to the construction area will be notified in advance about job vacancies and given priority in terms of employment to the extent possible. Job seekers will be asked to provide evidence that they have not just moved into the area and applications for employment will only be considered if submitted in person at designated centres. These precautions should reduce applications from people not living locally.

The contractor will provide training to ensure that local employees gain new and/or improved skills while working on the Project. This will include induction and refresher training to ensure that all recruits have the necessary skills base to undertake their jobs.

The likelihood of bees being affected by construction is considered to be low. Nevertheless, the Project will prepare an inventory of bee hives within 300m of pipeline construction areas and access routes before the start of construction. An independent bee expert will be employed to determine any impacts on bees and/or honey production and develop appropriate mitigation measures.

Overall the Project is expected to have a small beneficial effect on local employment and incomes during construction but no impact once it is operational. It is inevitable though that some people will be disappointed not to secure employment on the Project which is considered to be of medium significance.

Infrastructure and services

Access routes have been selected to minimise the use of village roads by construction vehicles. The contractor will instigate a programme of repairs, upgrades and widening of access roads so that they are suitable for use by construction traffic. During construction, potholes will be repaired if they are dangerous or likely to increase the vibration risk to fragile buildings.

Where pipe sections are laid across minor tracks and roads, it may be necessary to close the track or road for a short period in the interest of public safety. Where this is necessary, the contractor will provide at least 72 hours notice to affected communities, and will provide a bypass or alternative route. After construction, the contractor will repair access roads so that their condition is at least as good as before construction.

Risk assessment and oil spill prevention

The primary driver for the Project is to ensure continued safe operation of WREP. As the WREP is an operational pipeline system, the design has been subjected previously to a quantified risk assessment (QRA) and valves have been positioned to reduce the risk of oil reaching the most sensitive receptors in the unlikely event of a leak.

There is an oil spill response plan (OSRP) and emergency response procedure in place that has been approved by GIOC, as representative of the Georgian Government. There is also an established network of containment sites and pollution control equipment. Once tie-ins are complete and the WREP is re-commissioned, the existing pollution control and emergency response systems will also cover the new sections.

An environmental risk assessment was undertaken for the WREP-SR Project to assess the risks posed to the environment and communities by de-oiling and removal from service of the pipeline sections that are being replaced. De-oiling and cleaning will be undertaken over a period of several months. In the unlikely event of an unplanned release, groundwater quality directly beneath the release location may be affected, although this will decrease rapidly with distance from the source. In order to reduce the risk of soil spill during de-oiling, activities will be very carefully controlled and monitored. Detailed procedures will be followed and temporary storage tanks will be either double skinned or within bunds that can contain 100% of the volume of the largest tank. De-oiling sites will be manned and secure.

Oil spill response

GPC has an approved Oil Spill Response Plan (OSRP), containment sites and spill clean-up resources for the WREP pipeline system.

The BP incident management system optimises the use of the facilities and resources available to deal with any spills. Their response to an incident is to prioritise in the following order:

1. People: Employees, contractors, suppliers, customers and communities
2. Environment: Air, water, land, spillages and areas of sensitivity
3. Property: BP, joint venture companies, contractors, communities and third-party facilities
4. Business: Supply, production and reputation.

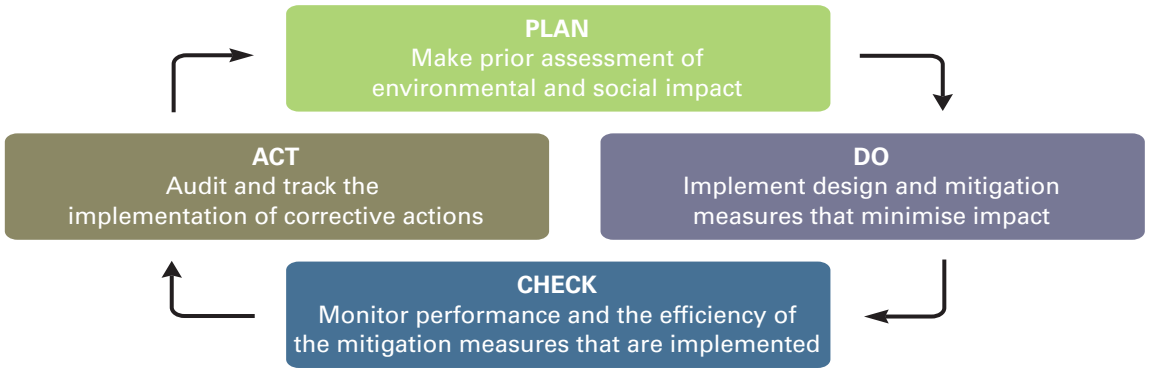
All personnel receive training to make sure they understand their roles and responsibilities in the event of a spill and are competent to carry out their assigned duties.

The operational OSRP will be used during de-oiling and the results of the environmental risk assessment will be used to determine the locations where deployment of oil spill response resources will be prioritised.

The ESIA has identified measures that will be implemented that aim to reduce and mitigate potential adverse environmental and social impacts, and to enhance the potential benefits, from the Project.

The potential construction impacts will be mitigated through the implementation of good construction practice and the application of site-specific measures to protect specific or sensitive receptors. Beneficial impacts will also be enhanced through these mechanisms. The construction contractors will be required to prepare management plans that incorporate the mitigation measures detailed in the ESIA.

The Project's approach to environmental and social management applies the 'plan, do, check, act' principles of environmental and social protection to all activities for which it is responsible.



The above principles will be applied to the WREP-SR Project through implementation of:

- A construction phase environmental and social management system
- The construction phase environmental and social management plans and procedures which will provide the mechanism for implementation of each and every construction phase mitigation measure and commitment identified by the ESIA process.

The suite of management plans that the construction contractors will develop will include:

- Reinstatement Plan
- Ecological Management Plan
- Waste Management Plan
- Pollution Prevention Plan
- Resources Management Plan
- Infrastructure and Services Management Plan
- Community Health, Safety and Security Plan
- Community Liaison Plan
- Local Recruitment and Training Plan
- Procurement and Supply Plan
- Cultural Heritage Management Plan
- Infrastructure and Services Management Plan.

The Project Environmental and Social Management System will also contain an Emergency Response Plan, an Oil Spill Response Plan, and a Pipeline De-oiling Spill Response Procedure.

Contact details

The Non-Technical Summary that accompanied the draft ESIA was widely disseminated and made available for a period of 45 days at public locations (e.g. libraries) and via the internet. The ESIA and NTS have been revised to address any legitimate omissions or errors identified during disclosure. The revised ESIA and this revised NTS were submitted formally to the Georgian Oil and Gas Corporation (GOGC), Ministry of Economy and Sustainable Development and the Ministry of Environment and Natural Resources Protection for approval.

Contact details for the WREP SR Project are:

BP Exploration (Caspian Sea) Ltd. Georgia
24 Sulkhan Tsintsadze Street
0160
Tbilisi
Georgia
wrepsresiageorgia@bp.com

The NTS and the ESIA are available on www.bpgeorgia.ge.