

5.0 ENVIRONMENTAL, LAND, COMMUNITY AND SOCIAL ISSUES FACED BY THE PROJECT

Summary

BTC Co has endeavoured to fully understand the particular environmental sensitivities associated with the chosen pipeline route. It is recognised that Turkey and the Caucasus region, by virtue of their geography, have a number of special environmental characteristics. Most notably, they contain a wide range of wildlife habitats, with a rich diversity of associated flora and fauna that is globally important because of the high degree of endemism. Of particular importance in this respect are:

- the desert plant communities of the Gobustan desert in Azerbaijan;*
- the primary forests of Georgia and Turkey, which harbour a wide range of plant communities and endangered animals such as the lynx, brown bear and wildcat;*
- the sub-alpine meadows of Georgia and Turkey which are particularly rich in plant species and associated fauna;*
- the montane and plain steppe grasslands which make up one of the main centres of plant endemism in Turkey; and*
- the wetlands of Georgia and Turkey, which have diverse plant communities, and are important for migratory and breeding birds, and – in some locations in Georgia – represent rare examples of high mountain wetland.*

Many of these habitats, especially in the forest and mountain areas also have a high landscape value. Unfortunately, large areas of land have already been degraded as a result of human use and soil erosion. The national governments of Azerbaijan, Georgia and Turkey have designated a number of protected areas in an attempt to preserve remaining areas of natural habitat, several of which are recognised as being internationally important.

Surface water is an important natural resource that is potentially sensitive to pipeline development activities and the main hydrological features along the pipeline route have been intensively investigated. Groundwater is an important source of drinking water in parts of all three countries crossed by the pipeline. The Borjomi springs in Georgia are internationally renowned for their therapeutic and/or potable qualities and are the basis of a commercially important mineral water industry in Georgia.

All of the countries crossed by the pipeline have a rich archaeological and historical heritage. The Gobustan Cultural Reserve in Azerbaijan, contains particularly important examples of human carvings and rock art dating back over 10,000 years.

BTC Co is determined to minimise any potential damage to the valuable environmental and cultural resources of the region and to adhere to the principle of 'no net loss'.

The project will affect, and be affected by, communities who live close to the pipeline route. BTC has consulted with these communities and regional and international experts to understand their concerns and aspirations for the project. This process has included the development of Public Consultation and Disclosure Plans for each

country, which set out the detailed arrangements for consultation and disclosure that are being applied at each phase of the planning, construction and implementation of the project. Communities vary in their attitudes to the project, and there are different priority issues along the pipeline route. Key issues include:

- desired economic benefit from the project;
- concerns over land-take for the project, and resulting loss of farming assets and income;
- over burdening of local infrastructure and supplies;
- desired upgrading of roads and other infrastructure;
- concerns over interactions between project workers and locals;
- health and safety risks to local communities; and
- nuisance from noise and vibration.

The project will not require anyone to relocate from their homes (no physical displacement). There will, however, be temporary and permanent loss of access to some land and some loss of agricultural assets. Detailed studies have been undertaken to understand the impact of these losses on peoples' livelihoods.

The project will have social and economic impacts for the three countries, which reach beyond the communities local to the pipeline route. BTC Co has undertaken research into the wider social and economic issues in the region as part of a Regional Review, which complements the individual ESIA's. BTC Co continues to engage in active dialogue to understand these issues and the role of the project.

The major social and economic issues for the project are:

- economic benefits of employment and procurement;
- community and social investment;
- domestic energy;
- ethical performance; and
- promoting and protecting human rights.

5.1 *Environmental Issues*

5.1.1 **Introduction**

All pipeline projects have the potential to cause harmful environmental affects. These are typically associated with disturbance during the laying of the pipeline and construction of associated facilities, emissions and discharges of waste materials during routine operation and through unplanned events such as accidents resulting in spills of oil. As well as addressing these generic concerns, BTC Co has endeavoured to fully understand the particular environmental sensitivities along the chosen pipeline route.

Above all, BTC Co has recognised the global importance of the region for biodiversity and the high value of the wide range of wildlife habitats, landscapes and natural resources that it contains. Although the pipeline has been routed for much of its length through areas with low conservation value and areas that have already been degraded by other uses, BTC Co is determined to minimise any potential damage to the valuable environmental resources of the region and to adhere to the principle of 'no net loss'. The particular environmental issues associated with the chosen pipeline route are summarised below.

5.1.2 **Natural habitats and biodiversity**

The conservation of natural habitats is essential to long-term sustainable development and the maintenance of a region's biodiversity. Land degradation and soil erosion pose major problems in Azerbaijan, Georgia and Turkey. High levels of poverty in rural areas have exacerbated degradation of the land in many areas, through illegal logging, over-grazing, hunting and wood scavenging from forests for heating and cooking. In a highly modified and in many places degraded environment, areas of undisturbed natural communities are especially valuable as refuges for many plant and animal species, in maintaining basic ecological functions and in arresting further degradation. The main sensitivities of natural habitats and biodiversity to pipeline developments are long-term and irreversible disturbance to soil and vegetation, and related ecological functions (for example as a result of excavation activities during construction of the pipeline, or soil erosion as a result of poor reinstatement).

5.1.2.1 *Habitats crossed by the pipeline*

The main natural or semi-natural habitats along the **Azerbaijani** section of the pipeline are desert, semi-desert, wetland and occasional scrub and trees (Table 5.1). The desert habitats generally occur in the drier eastern region of the country, while semi-desert is more prevalent in the wetter, western part of the country.

Table 5.1: Main habitats in Azerbaijan crossed by the pipeline

Habitat	Key features	Total length intersected by pipeline (kms) (% of pipeline route)
Desert/semi-desert	<ul style="list-style-type: none"> - 14 desert plant communities have been identified along the pipeline route. - The desert communities in the Gobustan Area are the most botanically important along the pipeline route. - Semi-desert habitat is more prevalent in the slightly wetter western part of the route. 	110 km (25%)
Scrub and trees	<ul style="list-style-type: none"> - Woodland is extremely restricted on the pipeline route. 	4 km (1%)
Wetland	<ul style="list-style-type: none"> - Numerous small-scale wetlands are located along the pipeline route. - There are four types: rivers, irrigation canals and ditches, marsh or chal meadow, lakes and ponds. - Due to the variable and turbid flow of many of the rivers, the associated vegetation is limited to the banksides and seasonally inundated margins. - Many irrigation ditches and canals occur in the extensive agricultural areas crossed by the pipeline, but their flora is usually limited. - The chal meadow marsh community develops in hollows and low-lying areas and is generally slightly saline, seasonally inundated and species rich. - Several man-made lakes occur along the proposed route, which support very similar vegetation to the river and canal banks. 	16 km (4%)
Agriculture	<ul style="list-style-type: none"> - Highly modified environment with limited conservation value. 	275 km (62%)

The **Georgian** section of the pipeline corridor can be characterised by four main botanical units as follows:

- semi-arid foothills and plain of eastern Georgia;
- eastern slopes of Javakheti upland towards the Kvemo Kartli Plain;
- Javakheti volcanic upland; and
- Tskratskaro-Tsikhisjvari-Akhaltsikhe region.

The pipeline corridor passes through or near to a number of important habitats in Georgia, as summarised in Table 5.2.

Table 5.2: Main habitats in Georgia crossed by the pipeline

Habitat	Key features	Total length intersected by pipeline (kms) (% of pipeline route)
Forest	<ul style="list-style-type: none"> - Tougay forest: remnant habitat of riparian forest that occurs particularly on islands in the Mtkvari River and the Potshkovi River; - Broad-leaved deciduous forest: the Tetrtskaro forest is a collection of contiguous fragments of primary and secondary forest containing oak, beech and hornbeam. The habitat also locally supports faunal diversity including endangered species of large mammals such as the brown bear; - Pine plantations: established 30 years ago to prevent erosion in the Tsalka area; and - Mixed forest: the Tsikhisjvari-Sakire forest is a mixture of conifers and deciduous trees with rare floral species and providing habitat for endangered mammals, amphibians, birds and other faunal groups. 	14 km (6%)
Sub-alpine forests and meadows	<ul style="list-style-type: none"> - Tkhratskaro and Kodiana: providing a forest and alpine meadows habitat of high conservation status supporting diverse floral associations and large mammals and avian fauna; and - Bedeni Plateau: with high mountain meadows of high conservation value and supporting abundant floral diversity. 	50 km (20%)
Wetlands	<ul style="list-style-type: none"> - Mt Tavkvetili is a relict volcano that provides a habitat for the Georgian endemic species of black grouse; - The extensive wetland in Narianis Veli is considerably modified by human activity, but still supports diverse flora and important waterfowl species; and - Patches of sedge-dominated wetlands occur in the upper reaches of the Ktsia River, representing a rare high-mountain habitat with valuable flora and fauna. 	7 km (3%)
Dry steppic grassland and scrub	<ul style="list-style-type: none"> - Shibljak: extensive patches of post-forest deciduous thickets having low conservation value; - Steppic grassland: various types of dry grasslands intensively used as pasture and heavily transformed by human impact; and - Phryganoid vegetation: small patches of sclerophyllous, thorny and summer-deciduous formations dominated by milk-vetch. 	90 km (36%)

Turkey has a rich and varied ecology due to its geographic location, variable climate, and geological and geomorphologic regime. It also displays a high degree of endemism. The country is situated at the intersection of three phytogeographic (or vegetation) regions: the Euro-Siberian, Irano-Turanien, and Mediterranean. The pipeline route skirts the first of these and passes through the other two.

The Irano-Turanien phytogeographic region covers the semi-arid central, eastern, and south-eastern parts of Anatolia dominated by a continental-type climate. Steppe is the dominant vegetation cover and oak (*Quercus*) brushwoods are widespread in the more humid conditions at the base of slopes and in valleys.

The Euro-Siberian and Mediterranean phytogeographic regions cover the northern and southern parts of Turkey respectively. However, mountain ranges running parallel to the sea in the north and south have prevented both the maritime climate and the associated mesophyl species (those favouring semi-humid conditions) from penetrating into the more arid interior. Furthermore, observation of the remains of local forests of black pine (*Pinus nigra ssp. pallasiana*), Scots pine (*Pinus sylvestris*), Cedar of Lebanon (*Cedrus libani*) and various oak species suggests an anthropogenic origin to the steppe vegetation of the interior. The main habitat types along the route are summarised in Table 5.3.

Table 5.3: Main habitats in Turkey crossed by the pipeline

Habitat	Key features	Total length intersected by pipeline (kms) (% of pipeline route)
Forest	<ul style="list-style-type: none"> - Scots Pine forest: includes Posof, Ardahan and Sarikamis Forests and Scots Pine is accompanied by Caucasian spruce; - Black Pine forest: black pine is the main tree species that occurs on the the mountain slopes along the pipeline route between Goksun and Andirin; - Red pine forest: these forests have largely been replaced by maquis due to high disturbance, or have been turned over to agricultural use; and - Beech forests: oriental beech occurs between Cokak and the Kirksuyu Valley at the extreme edge of its range in Turkey. 	26 km (3%)
Scrub habitats	<ul style="list-style-type: none"> - Maquis vegetation, which has developed as a result of destruction and disturbance to Red pine forest, covers wide areas within this part of the pipeline route; and - Dominant species is Kermes oak which are generally grazed intensively by goats and rarely exceed 2m in height. 	35 km (3%)

Table 5.3 Main habitats in Turkey crossed by the pipeline (Continued)

Habitat	Key features	Total length intersected by pipeline (kms) (% of pipeline route)
Grasslands	<ul style="list-style-type: none"> - Alpine zone-Erzincan Plateau: heterogenous alpine and sub-alpine vegetation growing above the forest line; - Sub-alpine meadow-Posof Forest: sub-alpine meadows occur at altitudes over 2000m and are extremely species rich; - Montane steppe-Erzincan Plateau: the montane stepp in this region is one of the main centres of endemism in Turkey, because it forms a transition zone between the Euro-Siberian and Irano-Turanien phytogeographic regions; - Plain steppe-Erzincan Plateau: where the pipeline route traverses gypsum rocks within the Cappadocia region, a variant of plain steppe is found which is rich in special endemic plants; and - Rocky hillside-Pinarbasi to Sariz: the pipeline route crosses vegetation of rocky areas to the south-east of Kirkgecit village which is important for endemic plant species. 	472 km (44%)
Wetland	<ul style="list-style-type: none"> - Wet meadow-Erzurum Plain: formerly a very important wetland, but mostly now drained for agriculture, retaining considerable bird interest; - Riparian habitat-Karacay Creek: scattered shrubs with marshland occurring as a fringe along the riverbank; - Marsh-Zamanti River: fringe of marshland and thick hydrophilic vegetation along the edges of the river channels, with considerable importance for breeding fish; and - Aquatic habitat-Kura River: mixed communities of aquatic plants, providing good habitats for various fish species inhabiting the river. 	7 km (<1%)
Coastal habitats	<ul style="list-style-type: none"> - Some sand dune vegetation located on the beach near the Marine Terminal, that is specific to the sheltered sandy coasts of West and South-west Anatolia. 	1 km (<0.1%)
Agriculture	<ul style="list-style-type: none"> - Highly modified environment with limited conservation value. 	524 km (49%)

The proposed marine terminal site encompasses a variety of habitats, primarily maquis (scrub), semi-natural and managed wooded areas, agricultural areas and gardens associated with the site landscaping for the existing facilities. Loggerhead turtles (*Caretta caretta*) and Green turtles (*Chelonia mydas*) are known to use a beach located approximately two kilometres west of the proposed BTC marine terminal site for nesting.

Primary productivity in the Mediterranean is generally low compared to other seas, but can be locally high where conditions permit. In the Gulf of Iskenderun, the site of the Ceyhan Marine Terminal, primary productivity is two to four times higher than the adjacent sea. This area therefore constitutes an important fishery resource, with total fish production of over 21,000 tonnes per year. Commercial fisheries in the gulf include rainbow sardine (*Dussumeria aucta*), European anchovy (*Engraulis encrasicolus*), white seabream (*Diplodus sargus*), yellowstripe barracuda (*Sphyraena chrysoteania*) and common pandora (*Pagellus erythrinus*).

5.1.2.2 *The most sensitive habitat resources*

A number of the habitats described above may be considered to be particularly sensitive because of their rarity and/or the national and regional importance of the plant and animal communities they contain. These include:

Azerbaijan

- the desert plant communities of the Gobustan desert, which are nationally important and considered to be fragile with a long period required for recovery from disturbance.

Georgia

- the primary forests (both the broad-leaved deciduous forests - eg the Tetrtskaro forest - and the mixed conifer/broadleaved forests – eg the Tsikhisjavari-Sakire Forest), which support high plant biodiversity and associated rare fauna (eg the lynx and brown bear) and which remain relatively well preserved;
- the sub-alpine meadows which have high conservation status as they support diverse flora and associated endangered and critically endangered animals; and
- the wetlands, notably those in the Mt Tavkvetili area (Narianas Veli) which have diverse plant communities, are important for migratory and breeding birds and represent rare examples of high mountain wetland habitat.

Turkey

- the forests, especially the Scots pine forests (Posof, Ardahan, and Sarikamis forests);
- the sub-alpine meadows which, as in Georgia, have high conservation status because of their high plant diversity;
- the montane steppe and plain steppe grassland of the Erzincan Plateau which make up one of the main centres of plant endemism in Turkey; and
- the wetland areas of the Erzurum Plain, which are particularly important for their bird fauna.

5.1.3 Protected areas

Designation of protected areas and implementation of management plans are common approaches used to conserve and enhance natural habitats and hence biodiversity, and cultural history. The national governments of Azerbaijan, Georgia and Turkey have designated a number of protected areas in an attempt to conserve many of the important natural habitats referred to above.

During the pipeline route selection process, particular emphasis has been placed on avoiding sensitive and protected areas (Section 6.3.2). As a result, the route avoids all areas internationally-designated for the protection of nature (eg, officially designated International Union for the Conservation of Nature (IUCN) Category I-IV sites, and Ramsar wetland sites of international importance), including the Borjomi-Kharagauli National Park (IUCN Category II) and the Borjomi-Kharagauli State Nature Reserve (IUCN Category I), the Ardahan Forest in Turkey (an IBA area), and Lake Jandari on the Azerbaijani/Georgian border. .

Initial route definition and numerous re-routes were also required to avoid areas nationally designated for the protection of nature, for example the Gorchay and Shamkir Reserves in Azerbaijan and the Kelkit Wildlife Protection Area in Turkey.

Despite these re-routes, it was not possible to avoid all nationally designated protected areas, and in these instances the route was optimised to minimise the impact. The protected areas directly affected by the pipeline are summarised in Table 5.4, which also shows the re-routing measures taken to minimise impact.

Special construction methods and mitigation measures will be applied to areas where avoidance was not possible (Section 6). In some instances, habitat compensation will be undertaken (Section 7). This approach is in line with the IFC Policy on Natural Habitats (OP 4.04) and Cultural Property (OPN 11.03).

The designated and undesignated sites of conservation importance that are near to, but not directly affected by the pipeline are summarised in Table 5.5 and described in detail in the ESIA's.

Table 5.4: Protected Areas Directly Affected by the Project

Protected area (includes proposed areas)	Designation/status of protected area	Length of crossing and area directly affected (km/ha)	Percentage of area directly affected	Measures adopted to minimise impact (including compliance with IFC Safeguard Policies OP 4.04 Natural Habitats and OPN 11.03 Cultural Property)*
Azerbaijan				
Gobustan Cultural Reserve	Cultural Reserve	0.9km 4ha	<0.15%	<p>Re-routing enabled the distance from the pipeline and the nearest rock art to be over 1km; the distance from the pipeline to the most significant areas of rock art is over 10km. Route optimisation has meant that the distance traversed by the pipeline through the Reserve has been reduced to 900m, and preferentially passes through existing degraded areas. The working width of the combined BTC/SCP construction corridor will be reduced from 44m to 38m to minimise the area of disturbance.</p> <p>Implementation of Strategic Environmental and Cultural Management Plan for Gobustan.</p>
Proposed Gobustan State National Park	Proposed National Park	9km 40ha	<0.1%	<p>Route selection has minimised the length of the crossing of the Park to 9km, while preferentially utilising areas already degraded by human activity. Special construction techniques will be employed to minimise habitat disturbance, eg, reduced working width.</p> <p>Implementation of Strategic Environmental and Cultural Management Plan for Gobustan, which addresses rare species management. Capacity building by involving the Azerbaijan Institute of Botany in the re-instatement programme.</p>

Table 5.4: Protected Areas Directly Affected by the Project (continued)

Protected area (includes proposed areas)	Designation/status of protected area	Length of crossing and area directly affected (km/ha)	Percentage of area directly affected	Measures adopted to minimise impact (including compliance with IFC Safeguard Policies OP 4.04 Natural Habitats and OPN 11.03 Cultural Property)*
Georgia				
Ktsia Tabatskuri Managed Reserve	Designated but no management plan or active management	20km 44	0.2% - 0.3%	<p>Re-routing allowed the avoidance of areas of greatest sensitivity (ie, the Narianas Veli Wetlands and the Upper Ktsia River) – key areas for bird activity within the Reserve. Other measures include seasonal restrictions on construction activity; the prohibition of additional construction facilities, eg, access roads, borrow pits without prior BTC Co approval; the requirement for site-specific reinstatement plans and consideration of the site as part of the Environmental Investment Programme (see Section 7). The route preferentially follows areas already degraded due to grazing and drainage activities.</p> <p>Assistance will be provided to the Georgian government for management planning for the Reserve.</p>
Support Zone for Borjomi-Kharagauli National Park	Designated. No IUCN categorisation	40km 87	0.05 – 0.07%	<p>Route refinements within the Support Zone minimised the affects on high quality forest habitats occurring in this</p> <p>An Eco-compensation Plan including tree and shrub planting will be implemented. Assistance to the Georgian government will also being provided, targeted at rare species management planning.</p>

Table 5.4: Protected Areas Directly Affected by the Project (continued)

Protected area (includes proposed areas)	Designation/status of protected area	Length of crossing and area directly affected (km/ha)	Percentage of area directly affected	Measures adopted to minimise impact
Turkey				
Posof Wildlife Protection Area	Wildlife Protection Area	25.3km 71ha	0.2%	Routing minimised the impact on rhododendron habitat and hence the potential impact on Caucasian black grouse habitat. An Important Plant Areas (IPA) project will be implemented, together with tree planting in non-project areas.
Sarikamis Forest	Natural Site Area	3.2km 9ha	ca 0.05%	The pipeline route crosses the edge of this area and threaded through an existing narrow clearing. An Important Plant Areas (IPA) project will be implemented, together with tree planting in non-project areas.
Ulas and Alacorak Lakes	Potential Ramsar site			The pipeline crosses through the centre of the lake complex but has been routed to avoid the five lakes and the wetland areas.
Erzurum Plain	Designated as an Important Bird Area by BirdLife International, but has no legal protection			A 3,300ha complex of seasonally flooded grasslands and marshes, supporting a wide range of wetland birds. The pipeline passes through the IBA due to the constraints posed by the presence of the Erzurum aquifer. A major programme to drain a significant area of the marshes has been underway for many years. The pipeline route crosses the drained area. Detailed habitat surveys have been completed and will be used to implement specific mitigation measures to avoid impacts on breeding birds during construction.

* Note that further information about the measures taken to comply with IFC Safeguard Policies may be found in: *BTC Project and IFC Safeguard Policies OP 4.04 Natural Habitats and OPN 11.03 Cultural Property – Report for Lender Group*.

Table 5.5: Protected areas not directly affected by the pipeline, but in the vicinity of the project

Protected area in the vicinity of the pipeline	Description
Azerbaijan	
Barda State Forbidden Area	IUCN category IV. Rare Tugay river forest area of 7,500ha in the Barda/Agdas regions. Situated directly downstream from the Kura East River pipeline crossing. Closest point of pipeline is 6km.
Korchay Forbidden Area	Steppe/semi desert area of 27,050ha in the Samukh and Goranboy regions. Closest point of pipeline is 3km.
Samukh State Hunting Area	Covers 40,424 ha of primary wetland habitats and includes part of the Mingechaur Reservoir. Closest point of pipeline is 3.5km.
Shamkir State Forbidden Area	IUCN category IV. Rare Tugay river forest area of 10,000ha in the Shamkir Region. Closest point of pipeline is 5km.
Karayazi State Nature Reserve	IUCN category Ia. Rare Tugay river forest area of 4,900ha in the Kazakh region. Situated downstream of the Kurudera River pipeline crossing. Closest point of pipeline is 4km.
Karayazo-Akstafa State Forbidden Area	IUCN category IV. Rare Tugay river forest area of 17,873ha in the Kazakh region. Closest point of pipeline is 0.5km.
Jandari Lake proposed Ramsar site	Large wetland area known for its large numbers of wintering wildfowl. Closest point of pipeline is 3km.
Georgia	
Algeti State Nature Reserve	IUCN category I. Comprising 6,400ha of spruce and fir forest habitat.
Tetobi Managed Reserve	IUCN category IV. Comprising 3,100ha of the unique Tetobi forest.
Turkey	
Ardahan Forest Important Bird Area	Approximately 2,500ha of grazed montane steppe and Scots pine forest. Designated because the globally threatened Montagu's Harrier breeds within the area. Closest point of pipeline is 250m.
Gumushane-Kelkit-Cemali Wildlife Preservation Area	Potential IUCN category IV. Approximately 22,000ha, comprising montane steppe habitat with a high number of endemic plant species. Closest point of pipeline is 130m.
Kuru Lake potential Ramsar site	A large, shallow, eutrophic lake with extensive reedbeds and marsh, which is important for a number of nationally-threatened birds. Closest point of the pipeline is 1.25km.
Karatepe Aslantas National Park	Comprises 7,515ha in the Ceyhan River vally. Designated for its flora and fauna and also its historical assets. Closest point of pipeline is 1.4km.
Yurmurtalik Lagoons Nature Reserve	A wetland complex covering an area of 16,430ha, which is important for its plant communities, waterfowl and other animals including the loggerhead and green turtle. Closest point of pipeline is 20km.

5.1.4 Hydrology and surface water quality

Surface water is an important natural resource that is potentially sensitive to pipeline construction activities and operations. During construction the main concern is diminished water quality resulting from excavation works at river crossings and run-off from the Right of Way (ROW). During operations, there is the risk of an oil spill reaching a watercourse, resulting in local and downstream pollution.

The largest and most regionally significant hydrological features that the BTC pipeline crosses or approaches in **Azerbaijan** are as follows:

- the main stem of the Kura River system, which runs close by the route in the west, and is crossed by the pipeline twice (KP222 and KP411);
- 49 large Kura tributary rivers draining the Great Caucasus and Lesser Caucasus Mountains;
- Shamkir Reservoir and Reserve;
- Karayazi wetland near the Georgian border;
- Canal and pipe networks supplying drinking or irrigation water;
- the dry Gobustan area in the east, with flash flooding in wadis and rivers; and
- Jandari Lake (which straddles the Azerbaijani-Georgian border).

Of the above features actually crossed by the pipeline, 21 are regarded as significant watercourses. A selection of these are summarised in Table 5.6.

Table 5.6: Summary of Major Water Features in Azerbaijan Crossed by the Pipeline

Azerbaijan River System	Intersection with, or proximity to ROW (KP)	Description
Djeyrankechmes River	9.3	20 m wide wadi, which is often dry. Poor bank stability. Liable to flash flooding during periods of heavy rain. High sediment load during periods of flow.
Geokchay River	171.3	Narrow, canalised river in deep cutting. Vegetation indicates wide fluctuations in water level. High sediment load.
Turianchay River	193.5	Narrow, canalised river in deep cutting. Vegetation indicates wide fluctuations in water level. High sediment load.
Kura River (east crossing)	223.6	Wide (approx. 200 m), fast-flowing major river with extensive fishing and wildlife value. Sand and gravel extraction 200 m downstream.
Karabakh Canal	245.1	Fast flowing, concrete-lined major irrigation canal, approx 20 m wide.

Table 5.6: Summary of Major Water Features in Azerbaijan Crossed by the Pipeline
(continued)

Azerbaijan River System	Intersection with, or proximity to ROW (KP)	Description
Kurekchay River	276.5	Wide, braided gravel and cobble dominated channel with seasonal flow. River well used by villagers for washing, etc. Used by livestock.
Korchay River	292	Wide, dammed valley (both upstream and downstream) with braided, narrow (2 m) flowing channel within extensive area of marshy reed. Ecologically diverse. Used by livestock.
Ganjachay River	296	Deeply incised channel of variable width (approx. 15 m) but negligible flow. Dammed about 300 m downstream from pipeline crossing.
Gashgarachay River	316.7	Fast flowing, approx. 3 m wide river, with good species diversity. Used by livestock.
Karasu River	320.9	Narrow watercourse within a wide channel, mainly vegetated by reeds. Valuable bird habitat but relatively low risk of a spill spreading because of the reeds.
Shamkirchay River	332	Wide (approx. 150 m), braided channel composed largely of gravel and cobbles. Dry for most of the year but liable to flash flooding. Extensive gravel extraction from dry riverbed.
Zayamchay River	357	Wide (approx. 150 m), braided channel composed largely of gravel and cobbles. Seasonal flow. Archaeology (ancient bridge supports) within dry area of channel.
Tovuzchay River	377.1	Wide (approx. 100 m), cobble riverbed with narrow flowing channel. Seasonal flow.
Hasansu River	397.8	Fast flowing clear 'mountain' stream within deeply –incised steep vegetated valley. Ecologically diverse and valuable habitat.
Kura River (west crossing)	411	Major river – fast flowing and wide (approx. 300m) braided channel composed largely of gravel and cobbles. Extensive fishing.

The **Georgian** sector of the pipeline corridor crosses eight flood plains and approximately 120 watercourses that can be subdivided as follows:

- 6 major river systems;
- 27 minor rivers;
- 15 nameless streams;
- 49 nameless gorges;
- 19 irrigation canals; and
- 4 drainage canals.

A brief summary of the main features of the major rivers, floodplains and reservoirs traversed by, or adjacent to, the pipeline is given in Table 5.7.

Table 5.7: Summary of Major Water Features in Georgia Crossed by or Located in the Vicinity of the Pipeline

Georgian Water Feature	Intersection with, or proximity to ROW (KP)	Description
Mtkvari River East Mtkvari River West	28.8-29.2 210-212	The Mtkvari River rises at the springs on the northern-eastern slopes of Kizil Giadik mountain in Turkey, at an altitude of 2,720 m. The total length of the river is 1,364 km, the area of the water catchment basin is 188,000 km ² . The river length is 360 km in Georgia while the area of the catchment basin is 26,200 km ² . At the intersection point the ROW at runs almost parallel to the southern side of the river for approx 200 m.
Algeti River	53.5-53.54	The Algeti River rises on the eastern slopes of Trialeti Range, at an altitude of 1,900 m. It flows into the Mtkvari River at the village Kesalo. The river is predominately recharged by snowmelt and rain. The highest water level is observed in spring when 50% of the annual discharge occurs. Where the river intersects the ROW the northern bank is steeply sloped.
Ktsia River	137.8	The Ktsia River (Ktsia-Khrami, termed Khrami in lower reaches) originates from nine springs on the southern slopes of the Trialeti range, in the proximity of Tskhratskaro pass, at an altitude of 2,422 m above mean sea level (AMSL). The Ktsia flows into the Mtkvari River at the village of Shakhlisi. The river is approximately 201 km long; the water catchment basin occupies 8,340 km ² . The Ktsia intersects the ROW in four different places. The maximum flow rate observed at the station of Kushi nearest to the proposed crossing locations is 52.6 m ³ /sec. The river freezes along the channel edges for 15-20 days per year.
Potskhovi River North and Potskhovi River South	238 243	The Potskhovi River rises on the eastern slopes of Arsiani ridge in Turkey, at an altitude of 2,720 m AMSL. It flows into the Mtkvari River at the village of Kotlakhevi. The total length of the river is approximately 64km and the water catchment occupies 1,840 km ² . The Georgian sector of the river is approximately 35 km while the catchment basin is 1,331km ² .
Lake Tabatskuri	The lake lies from 1.3km to 2.4km to the south of the ROW between KP162-165	Lake Tabatskuri is one of the most important natural lakes in southern Georgia. The lake water is of low mineralisation (0.5g/l). The hydrocarbonate-calcic water reportedly complies with potable water and freshwater fishery standards.

Table 5.8: Summary of Major Water Features in Turkey Crossed by or Located in the Vicinity of the Pipeline (continued)

Turkish Watershed and River System	Intersection with, or proximity to ROW (KP)	Description
Yesilirmak watershed	Ilgar (KP526) Acioz (KP618)	The pipeline route traverses the upper part of the Yesilirmak watershed, close to its boundary, and crosses three rivers within it – the Ilgar, Tuzlakonagi, and Acioz. There are no monitoring stations for water quality along these rivers.
Kizilirmak watershed	Acisu (KP636, 660) Tatli (KP674)	The Kizilirmak watershed is the second biggest watershed of Turkey, with a drainage area of 78,180 km ² . The pipeline route crosses two rivers within the Kizilirmak watershed – the Acisu and Tatli. The water quality survey of the Acisu and Tatli Rivers confirmed that they are polluted especially in terms of total coliform bacteria.
Seyhan watershed	Zamanti (KP796) Sariz (KP880)	The Seyhan watershed has a drainage area of 20,450 km ² . The pipeline route crosses two rivers within the Seyhan watershed – the Zamanti and Sariz. The Zamanti River is heavily polluted, at least in its lower reaches, which are industrialised and intensively farmed.
Ceyhan watershed	Huseyinli (KP912) Kesis (KP1003) Ceyhan (KP1036) Mercin (KP1055)	The Ceyhan watershed has a drainage area of 21,982 km ² . The pipeline route crosses four rivers within the Ceyhan watershed – the Huseyinli, Kesis, Ceyhan and Mercin.

5.1.5 Groundwater resources

The greatest potential risk to groundwater resources from the pipeline project is from an oil spill. While the risk of a spill is very small, the consequences could be significant. Unconfined aquifers are significantly more vulnerable to oil spills than confined aquifers.

From Sangachal on the east coast of **Azerbaijan** to the Kura River at KP223, there is likely to be little conflict between potential contamination from the pipeline and potable groundwater interests. This is because the subsurface sediments are generally fine-grained, groundwater recharge is very low, and groundwater is typically saline and not suitable for exploitation as potable water resources. Regional head gradients are also likely to be dominantly upwards. In the immediate vicinity of the Kura River, high permeability alluvial sediments occur, and are therefore likely to have potential value as aquifers (KP217-225). Such deposits are also likely to be efficient at transporting spilled or leaked contaminants via the sub-surface to the Kura River.

West of the Kura River, through Yevlakh and in the western outskirts of Yevlakh, confined aquifers are exploited for reserves of fresh groundwater. These resources are typically confined by at least 10m of clay and therefore unlikely to be affected by any spill from the pipeline.

Further west, especially west of the Goranchay River, on the Ganja-Kazakh Piedmont Plain, unconfined groundwater becomes progressively fresher and should be regarded as an exploitable resource. Its sensitivity to contamination thus increases.

In the valleys of the major rivers draining the north-eastern slope of the Lesser Caucasus, for example the Tovuzchay River, groundwater resources are more vulnerable to oil spills as a result of the highly permeable surface sediments and the shallow water table. A spill in such valleys may have particularly significant implications because contaminants may migrate rapidly downwards to groundwater resources, down-valley through fluvial sediments, or laterally to surface watercourses through fluvial sediments.

Large portions of the Karayazi Plain between the west Kura crossing and the Azerbaijani/Georgian border have similar geological characteristics and are regarded as vulnerable to oil spills. In this area, inhabitants are known to use shallow groundwater for drinking water supply. Shallow groundwater also supports wetland areas of considerable ecological value.

Groundwater along the **Georgian** section of proposed pipeline route is abundant and generally of high quality. The eastern part of the proposed route is characterised by a shallow water table and by localised poor quality, owing to high salinity, biological or chemical contamination. The central part of the route is characterised by aquifers occurring in volcanic rocks and yielding numerous springs and high quality water. These springs are the main water supply source for local populations.

The western part of the Georgian sector is characterised by low permeability rocks that locally overlay pressurised mineral water aquifers, including the Borjomi springs. The Borjomi springs are internationally renowned for their therapeutic and potable qualities and were responsible for the development of a health centre in the early 1820s. The water was first bottled in 1890.

In addition to the Borjomi mineral water that originates at great depth, there are other deep but unexploited mineral water resources near Bakuriani and Tsikhisjvari, and numerous small fresh water springs that occur at relatively shallow depths. The shallow spring water is used by locals for drinking, and bottled and sold (undiluted or in combination with mineral water) as 'Borjomi water'.

The **Turkish** sector of the pipeline route passes over four major groundwater resources:

- Pasinler Plain (KP259-278): The aquifers of the Pasinler Plain are the Pliouaternary alluvial formations comprising inter-bedded clay, sand and gravel. Unconfined aquifers are widespread on the plain. The approximate thickness of the aquifer varies from 200 m to 100 m. Towards the Hasankale fault, this thickness is reduced by the fault to between 20-70 m. Groundwater piezometry in the confined aquifer reaches +4.00 m in the middle of the plain and groundwater level drops to –30 m along the plain boundary. Transmissivity in the aquifers may vary between 50 and 70 m²/day;

- Erzincan Aquifer (KP488-519): The plain comprises three major parts; namely: Erzurum Plain comprising both confined and unconfined aquifers; Kumbet Plain comprising units that are composed of Quaternary sand and gravel deposits, underlain by Pliocene sand and gravel layers. The aquifer is unconfined and pinches out near its boundary. The third part is the Cinis Plain where deposits are composed of Quaternary sand and gravel deposits, and the aquifer is unconfined with a thickness between 20-40 m;
- Goksun Plain (KP909-924): In the Komursuyu Valley of the Goksun Plain, there is Quaternary and Pliocene-aged gravel and conglomerate aquifer between 100m and 150m thick. At the north and west of the plain Palaeozoic-aged limestone occurs and at the south-east Cretaceous-aged limestone exists; and
- Adana-Ceyhan Plain (KP1029-1061): Aquifers on the Adana-Ceyhan Plain are composed of Quaternary and Pliocene sand and gravel units. There are two aquifer zones in the southern part of the plain where the alluvial formation reaches a thickness of 500m. The dominant aquifer type is unconfined with a thickness of 100m. In coastal areas, the groundwater quality in this zone is poor due to seawater intrusion. Below the unconfined aquifer zone, there exists a confined aquifer zone within the clay layer reaching a depth of 150 m. The groundwater in this zone is of high enough quality for drinking purposes.

Groundwater quality is high in both Adana - Ceyhan Plain and Goksun Plain unconfined aquifers, and is used as a drinking water supply by local communities. The Erzincan aquifer and Pasinler Plain are also a source of drinking water for communities living along this section of the route.

5.1.6 Landscape

The pipeline route encounters a wide variety of landscapes as it winds its way west from approximately sea level at Sangachal, between the Greater and Lesser Caucasus Mountains and into north-eastern Turkey, where it reaches a maximum elevation of 2,827 m, before diagonally crossing the eastern Anatolia region and southern Turkey to Ceyhan. The topographic variations along the pipeline route together with the main habitats and land uses are briefly outlined below and discussed in detail in the Environmental and Social Impact Assssments (ESIAs).

West of the Sangachal Terminal in Azerbaijan the route passes over the arid, flat plain interspersed with low-lying hills and mud-volcanoes. As the pipeline enters the flat, alluvial plains of the fertile Kura River valley, the landscape is dominated by intensive agriculture fed by a network of irrigation channels. Long stretches of rolling hills provide grazing land for livestock. These features characterise the landscape westwards beyond the Azerbaijani-Georgian border, where semi-desert steppe gives way to humid sub-tropical mountainous steppe, sub-alpine and alpine meadows, and, at elevations of between 1,000 - 2,500 m, oak, beech and coniferous forests. The landscape value is generally higher in the central and western part of the route in Georgia because of the high terrain elevation and absence of man-made structures.

In north-east Turkey, the BTC pipeline follows a sinuous route that crosses half the length, and nearly the entire breadth, of Anatolia before crossing the Taurus Mountains and descending steeply, emerging on the Cukurova Plain on the northern shore of the Gulf of Iskenderun. The principal landscapes comprise the broad plains and upland mountains that form the Anatolian Plateau. These are interrupted by high mountains

and broad valleys that contribute to a wide range of habitats and land uses, reflected by variations in population densities and local economies.

5.1.7 Cultural heritage

Cultural heritage refers to sites, structures, and remains of archaeological, historical, religious, cultural, or aesthetic value. Loss of cultural heritage is irreversible and for that reason heritage areas and archaeological sites are legally protected in most countries. Loss of heritage is also normally avoidable, and for this reason cultural heritage has figured prominently in all phases of planning and design. Carefully managed development projects can actually contribute to the knowledge, understanding and protection of a project area's cultural heritage, and this has been a feature of the project's archaeology management strategy.

Azerbaijan has a wealth of evidence for earlier human societies that lived in the area. All stages of human development have been encountered on archaeological sites in the country. Archaeologists have recorded monuments of the Palaeolithic, Mesolithic, Neolithic and Eneolithic eras, together with Bronze and Iron Ages. Azerbaijan is also rich in the cultural remains of later developed social states, such as the various settlements, caravanserais, defensive walls and burial grounds.

The region has always been an important trade route, both east to west and north to south, but it is mainly during the Middle Ages that many of the important trading centres such as the cities of Shabran and Shamkir developed. These cities were based on the wealth of traders and passing contacts travelling along the Great Silk Road from Asia to the Mediterranean.

In Azerbaijan, the pipeline follows one of the historic east-west routeways passing between the two Caucasian mountain ranges. Relatively close to the pipeline corridor, there are two major trading cities, Shamkir and Shirvan both dating from medieval times. This part of Azerbaijan also contains the most productive soils of the country and has a long history of farming. The earliest farmers were the Neolithic Kura Araks, whose remains are found all over Transcaucasia, through the Anatolian Plateau and into parts of Iran and Iraq. The area around Akstafa contains many large settlement mounds, or tepe, formed from the occupational debris of many hundreds of years of existence. These date from the late Neolithic and Bronze Ages.

During initial corridor evaluation in Azerbaijan, approximately 70 confirmed or potential archaeological sites were identified in the vicinity of the proposed alignment. The pipeline route has been selected to avoid the majority of these potential sites. In some cases this was not possible given other engineering or environmental constraints, or owing to the perceived surface extent of the site. Following re-routes a total of nine

areas of interest remain within a 44 m corridor, centred on the pipeline route. Additional archaeological investigations, including intrusive excavation work, are being conducted at these sites prior to construction. These investigations are proceeding with the assistance of the Institute of Archaeology and Ethnography, under the Azerbaijan Academy of Sciences.

The pipeline route will unavoidably cross the Gobustan Cultural Reserve for approximately 900 m. The main feature of the reserve and the Gobustan area are the many hundreds of rock drawings or petroglyphs of humans and animals together with other evidence of human occupation. The rock art dates back 10,000 years, with some carvings being interpreted as even older. Rock decoration in Gobustan continued into the historic period as evidenced by a Roman inscription and possible depiction of Arab traders. The pipeline route runs approximately 1 km to the north of Djingir Dag, one of three hills in the area that are famous for their carvings.

The routing of the pipeline through the Gobustan Reserve will not result in any impact on its cultural resources as the rock art will not be disturbed and extensive field investigations have failed to identify any relics on the construction corridor. The area is already heavily degraded, but archaeologists will be present during excavation activities to advise on the need for future re-routes or other appropriate mitigation measures. The width of the construction corridor will be reduced through the Reserve and significant control measures will be implemented to ensure that all work is restricted to the construction corridor and does not impinge upon other areas of the Reserve.

Georgia has a long written history and a wealth of historic sites, monuments, and artefacts. It also has archaeological sites dating to periods long before written records began. Its earliest archaeological sites date to the late Pliocene geological epoch nearly two million years ago, and have yielded early hominid fossils (*Homo erectus*). Later remains include churches, monasteries, castles, and fortifications, which date to the well-known medieval period.

Among the best known and most frequently encountered archaeological remains in Georgia are those of the Middle and Late Bronze Age Periods (approximately 3000-800 BC). This period marks the earliest substantial evidence of social stratification, which is exemplified by objects of intricately worked gold and semi-precious stones that are among Georgia's national treasures. The best known of these objects have been recovered from the kurgans, burial chambers of the Trialeti Culture (3000-1500 BC) where presumed warrior leaders were buried. This category of site is, according to literature search and site reconnaissance, the most abundant type of heritage resource present in the pipeline corridor.

Field studies conducted along the Georgian section of the pipeline corridor and research of archival material, revealed the presence of 51 archaeological sites and just over 200 cultural monuments in the vicinity of the pipeline. As a result of careful initial route selection and a number of re-routes, the 44 m-wide corridor avoided all cultural monuments and 36 archaeological sites. The 15 archaeological sites that could not be avoided have been further evaluated, resulting in the identification of 8 sites that were recommended by local scientists for full excavation and data recovery. This type of excavation and mitigation is designed to capture sufficient amount of artefacts and data to counter the construction damage done.

A wide range of historic monuments from the Bronze Age, Iron Age, Medieval and Modern Period have been identified in the 10 km wide corridor centred on the project

right of way. The most numerous of these are vaulted churches, but the most important from a historical perspective are the Bronze Age fortified settlements, which date from the second and third millennia BC. These settlements are also known as “cyclopean” fortresses, because of their boulder construction technique. None of these monuments, however, are crossed by the pipeline alignment.

Turkey has been a cradle of many different cultures and civilisations and has served as a bridge between eastern and western cultures. The earliest settlements in Anatolia date from the Paleolithic age.

The first great cultures arose around 3,000 BC in the late Bronze Age with the Hattis ruling central Anatolia around 2500-2000 BC. During the end of the third millennium BC a large-scale southward migration of Indo-European people took place. During this time the Hittite people moved through Caucasia to central Anatolia and settled alongside the Hattis. While never destroying their cities or the people, by 1750 BC the Hittites had replaced the Hattis as the rulers of Anatolia. The Great Hittite Kingdom then expanded and flourished for almost 600 years. In the meantime, the Hurri civilisation, ruled by the Mitanni kingdom of Indian descent, was established in eastern Anatolia.

At the end of this period, the Hittite Kingdom collapsed when new waves of migrating people arrived. Not until 1000 BC did a new civilisation, the Urartus, rule eastern Anatolia. While western Anatolia saw several new civilisations during the ensuing years, the next major change in eastern Anatolia was the conquest of the region by the Persians in about 500 BC. This was followed in due course by the Greek conquest under Alexander the Great and subsequently by the Romans.

In the west, the Romans were followed by one thousand years of Byzantine civilisation, but in central and eastern Anatolia, the Seljuk Turks arrived from 1071 AD, bringing with them the religion of Islam. During this era, the road system was re-developed, and the period is characterised by great learning with advanced studies in geography, astronomy, medicine, architecture and philosophy all taking place. This civilisation was replaced gradually by the Ottomans who ruled for 600 years until 1923, when the modern Republic of Turkey was established.

Field surveys along the Turkish sector of the pipeline indicate the presence of 179 archaeological sites within one kilometre either side of the pipeline route. These sites include a range of features such as mounds/tumulus, graveyards, roads, tombs and settlements. Seventy-six of these are within a 100 m corridor centred on the pipeline route, with re-routes having avoided 40 sites. Twelve sites will require additional investigation, with at least four being excavated prior to construction. In addition, 32 sites will be fenced to avoid accidental damage during construction. The significance of these features and further details on proposed mitigation measures are discussed in Section 6.

Further information

Further information about the environmental issues associated with the pipeline route can be found in:

- *The separate project ESIAs produced for Azerbaijan, Georgia and Turkey.*
- *BTC Project and IFC Safeguard Policies OP 4.04 Natural Habitats and OPN 11.03 Cultural Property – Report for Lender Group*
- *Project Environmental Investment Plan*

These can be accessed via the project's website
www.caspiandevlopmentandexport.com.

5.2 *Land and Community Issues*

5.2.1 Introduction

Although the pipeline has been routed so that it will not require any resettlement of individuals or communities from their homes, communities living on or near the pipeline route are bound to experience some effects from the project. There will also be unavoidable disruption to the use of agricultural land. Whilst the majority of the pipeline route passes through low population, rural or semi-rural areas where low-intensity grazing activities predominate, the project will involve impacts on land, productive assets, and livelihood through:

- temporary use of land for construction purposes;
- permanent acquisition of land (or imposition of rights to construct and operate a pipeline under existing ownership) for the pipeline alignment and permanent above ground installations (AGIs); and
- imposition of restrictions on land use adjoining the pipeline.

The project will impact privately owned land, municipal and state land, some of which is leased to private entities and individuals.

There will be temporary disruption to communities during the laying of the pipeline and construction of associated facilities, effects from the influx of construction workers, and the knock-on effects of more jobs and procurement in the locality. Concerns also arise around safety for local residents and their property during construction of the pipeline, and in the event of accidental rupture during the use phase of the pipeline.

The project has carried out extensive research and consultation to understand the particular areas of concern for communities along the chosen pipeline route. These issues are summarised below.

5.2.2 Expectations and concerns of project affected communities

Surveys were conducted among communities along the pipeline corridor and near to the sites proposed for associated infrastructure to determine their attitude to the development of pipelines, and specifically the BTC pipeline and SCP.

In general, the overall attitude to pipeline development in **Azerbaijan** was positive but cautious. From the initial consultations with communities along the proposed pipeline route, the main perceived benefits related to employment opportunities. The dominant concerns about the pipelines related mainly to damage or impediments to crop irrigation and grazing areas.

Key issues raised by the communities were access to energy, employment, land, construction workers and community investment. Some of the specific findings of the Azerbaijani section of the survey are as follows:

- 94% of all respondents stated they were essentially positive about the construction of the oil pipeline;
- villagers along the route are wary of indirect benefits such as improved roads, after experience with previous pipeline construction activities;
- respondents (mainly those employed in the state sector, i.e. health, education and social work) thought the pipeline would be beneficial to the state budget and improve the country's economic situation. Most respondents not working in the state sector were doubtful about the benefit to the state budget, noting that the average rural Azerbaijani farmer has seen little if any direct benefit from oil and gas projects and foreign investment in the past;
- some of the wealthier landowners along the route expressed an interest in working and renting equipment during the pipeline construction process;
- a few respondents mentioned opportunities for social interaction with the construction team as a benefit;
- respondents mentioned improved social infrastructure as a benefit; and
- some respondents mentioned that they would like to use the construction crew's heavy machinery for their own needs.

Next to employment, access to electricity and gas supply was one of the most important issues for communities along the pipeline corridor, e.g. only 11% of people stated that they have regular access to electricity and 12% of people have a piped supply of gas.

Most people within the proposed route corridor want improvements to their gas and electricity supply and hope that some increase to their energy supply will result from the pipeline, although most recognise that this would not come directly from the line itself. There is concern among some villagers that in the end they will not benefit from an increased energy supply and all the country's oil and gas will go to Turkey.

The most frequently reported concern associated with the construction of the pipelines was the longer-term temporary or permanent land-take. The longer construction period was also seen as contributing to the deterioration of main and internal village roads, increased dust and noise pollution.

In **Georgia**, the attitude towards the pipeline was overall positive, although concerns do exist. People were generally optimistic that the construction and operation would bring both direct and indirect benefits.

Employment was by far the most important benefit perceived from the construction and operation of the BTC pipeline. Compensation for the land used during construction and operation is very important to the respondents, and the improvement and repair of roads is also considered to be significantly beneficial.

The issue of access to energy was extremely important to all those interviewed, both at the community level and the district and regional government level. District and regional

government representatives noted that power shortage was the most important issue facing Georgia today.

Main concerns cited by those surveyed along the Georgian sector of the pipeline route included:

- land disturbance and its associated environmental damage;
- safety;
- the risk of jobs being given to foreigners in preference to locals;
- absence of benefits from construction at the local village level;
- dust and noise;
- the perception that the construction of the project will result in increased demand for energy from the local power grid, thereby placing further demands on supplies that were already depleted; and
- impacts on local infrastructure particularly sewage and waste disposal arising from construction camps.

The general attitude of communities surveyed along the **Turkish** sector of the pipeline was positive or neutral towards the project. Many agreed that the BTC project was important and would bring important economic and strategic benefits to Turkey. There are also hopes and expectations that the project will bring benefits to the local area. Approximately 90% of all surveyed households support the project. Fewer households in rural areas (85%) are supportive of the pipeline, possibly because they have been more closely affected by previous experience with pipeline projects such as the NATO pipeline, the East Anatolian NGP and the Kirkuk-Yumurtalik pipeline, some of which was negative.

There are no significant differences in attitudes between provinces with the exception of rural Erzincan, where only 47% of households support the pipeline, potentially correlating to previous experiences. These high levels of support must be understood in the context of high expectations for employment.

The main perceived benefit from the project is direct employment (54% of households). Expectations of employment were highest in Adana (81%) and lowest in Erzincan (30%). Local sourcing was also raised during consultation as a potential benefit. 13% of households expect no benefits from the pipeline project.

Approximately 48% of households have no concerns associated with the proposed project and 23% of households particularly those without previous experience did not feel in a position to comment. The main concerns raised during consultation are listed below:

- land and resource damage;
- land compensation;
- social harmony;
- roads and traffic - particularly potential damage to roads and increase in traffic particularly during harvest periods; and

- pollution- particularly noise and dust.

5.2.3 Management of employment expectations

Unemployment levels in the rural communities along the pipeline route are high. Despite the project's efforts to maximise the number of local people employed, the number of people who will gain employment either during construction or operation are likely to be lower than local expectations. Residents living in settlements directly affected by the project who are unsuccessful in their job applications may become frustrated when they do not gain employment. It is also likely that residents of settlements just outside the directly affected project area will be concerned that they will not get priority access to jobs despite their relative proximity to the pipeline route. Furthermore, district centres in the area may also anticipate greater employment opportunities than actually exist. These unmet expectations could create resentment towards those who succeed in getting jobs, and also towards the project.

BTC Co is using the extensive consultation activities, described in section 6.2.3, to understand and address these expectations.

5.2.4 Land issues

A range of potential and actual impacts on land and livelihoods has been identified, together with corresponding mitigation measures. Relevant issues include:

- temporary loss of use of cultivated land, with resultant loss of income for owners/lessees/other users for the three to four year construction period (assuming SCP construction will follow on from BTC);
- potential for local conflict over land compensation payments;
- permanent loss of land (and any related income) for large AGIs, block and check valve locations, access roads and other ancillary works;
- potential impairment of livelihood in areas adjacent to the pipeline and ancillary facilities that are affected by restrictions on use (particularly affecting vineyards, orchards and other tree crops);
- temporary loss of use, or physical constraints on movement, on grazing land and pasture;
- loss of structures and land attachments (e.g. wells, fences, drying yards, animal pens, water tanks, etc) in the construction corridor;
- possible impacts on irrigation and drainage systems;
- loss of trees/perennial crops in the construction corridor;
- loss of annual/seasonal crops in-ground at the time land is occupied for construction;
- loss of other productive assets (such as fish ponds).
- loss or restriction of access to communally-used forests;
- impacts on enterprises (including loss of productivity, downtime); and

- loss or damage to community property and resources.

5.2.4.1 Land Use along the pipeline route

Some grazing is seasonal and nomadic. Arable crops including wheat, maize, cotton, are grown at varying locations along the route, along with horticultural and viticultural activities in more temperate climates. Some root crops are cultivated in higher rainfall areas or areas with richer soils and access to irrigation. Specific details for each country are given below.

The major land use categories encountered along the **Azerbaijani** sector of the pipeline route are summarised in Table 5.9.

Table 5.9: Land-use Categories Crossed by the ROW (%): Azerbaijan

	Total
Rain-fed agriculture	22
Irrigated agriculture	62
Grazing	10
Non-agriculture (desert)	6

Surveys conducted along the pipeline route indicate that 86% of communities are engaged in vegetable cultivation, 57% in growing grain and almost all of them in small amounts of animal husbandry.

Irrigation is particularly important in Azerbaijan where up to 75% of all cropland is irrigated, compared to 43% in Georgia and 15% in Turkey. However, since the commencement of the privatisation of the agricultural sector in 1996, many irrigation networks are owned by a small number of individuals who now charge high prices for their usage. Many farmers living within the pipeline corridor can no longer afford to pay for irrigation and therefore have difficulties working their land. Instead, they are renting their land out to farmers who have access to machinery and water, and who can afford the higher usage fees.

While 95% of people interviewed have their own land only 50% use this for cultivation, and 17% do not use their land at all, due to water shortage, lack of good facilities or other reasons.

The main source of cash income along the pipeline corridor is derived from crops and animal husbandry. This income is supported by a range of secondary sources ranging from state sector jobs to hunting, fishing and gathering.

The major land uses encountered along the **Georgian** section of the pipeline route are summarised in Table 5.10. In Georgia, land, its ownership and use, is an important part of the social economy. This is particularly evident in the survey area where the majority of the population relies on the land for subsistence and income. The land is used for three main productive activities: crop cultivation, livestock raising/grazing, timber harvesting and wood-cutting.

The main purpose of crop cultivation in all districts was found to be for 'own use'. Nearly 80% of those interviewed in all districts responded that they consume most of the agricultural products they produce.

Table 5.10: Land-use Categories Crossed by the ROW (%): Georgia

	Azerbaijani/ Georgian Border- Rustavi	Rustavi- Tetritskaro	Tetritskaro- Tsikhisjvari	Tsikhisjvari - Georgian/ Turkish Border	Total (%)
Agricultural	5.2	11.6	6.4	11.0	13.9
Forest			3.5	10.4	5.6
Meadow	4.0	5.2	40.0	30.0	51.1
Pastureland	10.4	4.4	43.3	11.4	28.2
Scrub		1.0		2.0	1.2
Total length (km)	19.6	69.0	93.2	64.8	

The overwhelming majority of people (87%) surveyed along the Georgian sector of the pipeline said that agricultural production had decreased in the last five years. The main reasons cited for decreased productivity were drought, lack of technology, and less use of both chemical fertilisers and chemical pesticides owing to lack of money.

In **Turkey**, land use along the pipeline route is also predominantly rural and agricultural (Table 5.11). Surveys along the actual pipeline route indicate a mixture of resource ownership and usage patterns, as summarised in Box 1.

The two main sources of livelihood (both wage and subsistence) along the whole Turkish sector of the pipeline corridor are agriculture and livestock production. Subsistence agriculture dominates, although sales to markets have greater importance in Erzurum, Erzincan, Osmaniye, Kahramanmaras and Adana.

Table 5.11: Land-use Categories Crossed by the ROW (%): Turkey

	Posof - Horasan	Horasan - Cayirli	Cayirli - Imranli	Imranli - Sariz	Sariz - Ceyhan	Total (%)
Meadow	12.4	3.7	0.7	1.9	0.4	3.9
Scrub	0.0	0.2	1.4	0.8	14.2	3.3
Rain-fed agriculture (fallowed)	30.1	57.8	26.0	71.6	17.4	41.6
Rain-fed agriculture (not fallowed)	0.0	0.0	0.0	0.0	15.1	3.0
Irrigated agriculture	1.1	25.8	17.7	4.9	33.3	15.7
Pastureland	53.7	12.1	50.0	20.7	11.6	29.4
Forest	2.7	0.0	2.7	0.0	7.8	2.6
Other	0.1	0.5	1.4	0.2	0.2	0.4
Total length (km)	226	195	188	249	212	1,070

5.2.4.2 Impact of the project

A summary of land-owners, lessees and informal dwellers affected by temporary or permanent loss of land, assets, impacts to existing livelihoods or restrictions of use is included in the Table 5.12. This approximates the total number of project affected households. The BTC pipeline will affect an estimated 17,716 households. The majority of these households will only be affected for the nominal three- year construction period. A much smaller number will experience permanent loss of use of land that is required for AGIs and related access roads.

Table 5.12: Summary of Project Affected Households

Category of Project Affected Households	Azerbaijan (58 metre corridor)	Georgia (58 metre corridor)	Turkey (28 metre corridor)	Total
Land owners	3,921	3,110	5,970 + 3,017 zilyet	16,018
Lessees	153	257	1,080	1,490
Informal users	6	-	About 50	56
Enterprise workers	152	N/A	N/A	152
Total Affected Households	4,232	3,367	10,117	17,716

Land requirements for the project are summarised in Table 5.13.

Table 5.13: Summary of Project Land Requirements

Project Component	Land Area Required for the BTC Project (Hectares)							
	Azerbaijan		Georgia		Turkey		Total	
	Temporary use of land	Permanent use of land	Temporary use of land	Permanent use of land	Temporary use of land	Permanent use of land	Temporary use of land	Permanent use of land
Pipeline construction corridor	1,970	-	1,088	-	2,903	-	5,961	-
Construction camps, pipe yards	219	-	30	-	100	-	349	-
AGIs & access roads	-	26	-	70	-	101	-	197
Total	2,189	26	1,118	70	3,003	101	6,310	197

Land impacts in each country are summarised as follows:

In **Azerbaijan**, the only land that will be permanently acquired will be for AGIs and associated access roads (about 26 hectares in total). The remaining 2,189 hectares will be temporarily used only for the construction period of the BTC and South Caucasus Pipeline (SCP) projects (nominally three years¹). It will be secured by the State through leases, and sub-granted to the project for pipeline construction purposes. Ownership of this 2,189 hectares of land will remain vested with existing land owners. After construction, land-owners will be able to resume use of their land subject to some restrictions.

In **Georgia**, BTC Co will purchase (obtain ownership rights) for the full 44-metre wide construction corridor as well as AGI sites and their access roads. With the exception of the 70 hectares required for AGIs and access roads, BTC Co. will allow ex-land owners (and long term lessees) to use their former land (the balance 1,118 hectares) free of charge, but subject to some restrictions of use.

In **Turkey**, the eight metre wide pipeline corridor and land for AGIs and access roads will be purchased (ownership title). Land in the 28 metre construction corridor will be leased for the pipeline construction period. With the exception of the land required for AGIs and roads (about 101 hectares), land-owners and users will be able to resume use of the remaining 3,003 hectares of land, subject to some restrictions of use.

Overall, 197 hectares of land will be permanently alienated from agricultural use. Existing owners and users will be able to resume most agricultural activities on the balance 6,310 hectares subject to some restrictions of use (Resettlement Action Plan Part A Section 3.10).

5.2.4.3 Operations Activities Potentially Affecting Land Owners and Users

There are potentially three types of activities during the operations phase that may affect adjacent landowners and users. These are as follows:

- regular patrol and inspections of the pipeline corridor (on foot, horseback and by vehicle) and liaison with adjacent owners and users;
- occasional maintenance access; and
- response to incidents.

Throughout its operational life, the BTC pipeline will be regularly inspected (on foot, horseback and vehicles). BTC Co inspection staff will need to regularly pass up and down the eight metre pipeline corridor. Functions of the inspections will include:

- liaison with affected landowners and users;
- inspection of above ground installations and river crossings; and
- monitoring of land owners and users' compliance with 'restrictions of use'.

¹ Provision has been made in land agreements for additional compensation to be paid in the event the construction period is protracted beyond three years.

The BTC pipeline is designed to minimise the need for ongoing maintenance. It is possible, however, that on infrequent occasions it may be necessary for men, vehicles and equipment to pass along an 8-metre wide strip directly over the pipeline to undertake maintenance activities or repairs. Wherever possible, such activities will be scheduled outside of growing seasons to avoid the need to damage in-ground crops. On occasion, there may be incidents necessitating emergency access along the pipeline. Dependent on the season when such incidents occur, such access may necessitate damage to crops, which would be compensated for in line with the principles of the RAP.

5.2.4.4 Restrictions of Use

Restrictions of use are typically applied around crude oil pipelines and related installations to protect the integrity of the pipeline, to reduce the potential for accidental damage, and to minimize risks to people and communities living and working in the immediate vicinity. Such restrictions can, in some cases, limit the types of installations that may be constructed or the activities that can be conducted by owners or users within a prescribed zone. Restrictions of use will apply to activities such as:

- construction of buildings or livestock pens;
- storage of fodder, haystacks;
- ploughing deeper than 30 centimetres;
- fires and use of explosives; and
- some types of tree planting.

5.2.5 Infrastructure and services

Infrastructure and services along the route are, on average, in a dilapidated state and often non-existent or ineffective.

Overall, transport infrastructure is in a poor condition. Some trunk roads are reasonably maintained, though the quality of secondary and tertiary roads is poor. Poor roads are often cited as one of the major problems for communities located along the pipeline route.

Access to energy is a major problem throughout the region, particularly in Azerbaijan and Georgia, with communities receiving an infrequent supply of electricity and gas, or none at all. In Turkey, all settlements surveyed along the pipeline route are connected to the national grid. On average, however, only half of the households receive regular supplies. This results in a high reliance on gas, which is often not available, wood, which is cut and gathered by the communities themselves, and dried dung.

Water supply is a problem in almost all communities, with some receiving running water for a few hours a day, or no piped water at all. Piped water is generally more readily available for communities along the Turkish section of the pipeline route, though water quality and quantity remains a problem for approximately half of the households surveyed.

The availability of sanitation services ranges from less than one third for settlements surveyed along the Turkish sector of the pipeline route to non-existent in many of the surveyed communities in Georgia and Azerbaijan. Provincial towns such as Erzurum and Erzincan are better serviced in this respect with formal sewerage systems available to over 80% of households.

Poor water supply and inadequate sanitation are major contributing factors to high incidences of water-borne diseases such as typhoid, dysentery and Hepatitis A.

5.2.5.1 Upgrading of infrastructure

Significant benefits for local settlements will be realised should BTC Co and other parties be successful in linking project infrastructure needs into existing infrastructure and service plans (e.g. road upgrades, sewage treatment, waste management and water supply), thus resulting in long-term benefits for local communities. These opportunities are particularly strong in relation to settlements that are located close to pump stations and have very limited infrastructure. Efforts by BTC Co to link infrastructure in this way will have additional benefits by strengthening relationships with residents and local communities.

It should also be noted that upgrading of roads, and building of new roads to support the project can bring unwelcome impacts. Easier access can bring unplanned developments, increases in hunting and exploitation of wild resources, increased traffic and traffic speeds.

5.2.5.2 Increased load on existing structure

Given the poor state of existing infrastructure in many parts of the pipeline route, any increased burden on that infrastructure as a result of the project will be significant.

5.2.5.3 Unplanned disruptions to infrastructure and services provision

Despite best efforts, in a project of this size it is likely that there will be instances when infrastructure or services (e.g. roads, irrigation channels, water supply, electricity supply) are disrupted without notice or prior planning. Such disruptions could affect people living over large areas and, although temporary, there is a possibility that an unplanned disruption could hinder the income generation and subsistence activities of those affected. Such instances would need to be dealt with through the compensation and complaints procedure to prevent serious impacts on the ability of those affected to maintain their livelihoods and to prevent them becoming a source of tension with the project.

5.2.5.4 Unmet expectation of better access to energy

Access to energy is perceived at national level and among pipeline-affected communities to be of high importance, particularly in Azerbaijan and Georgia. The project will not provide communities with additional power directly, and so expectations among the communities will not be met.

5.2.6 Health and safety of local communities

5.2.6.1 Accidents involving community members

There is a small chance that accidents involving local community members may occur at some stage during project activities. This could include traffic-related accidents, accidents involving the open trench or other mishaps

5.2.6.2 Health impacts of construction camps

There is some potential for increased incidences of communicable diseases such as AIDS, amongst local communities exposed to the temporary influx of construction workers.

5.2.7 Interactions with local communities

5.2.7.1 Cultural issues

Where comparatively high numbers of external construction workers come into a locality, there are bound to be some concerns (especially amongst rural Muslim communities) about anti-social behaviour including the potential for rowdiness and nuisance to women.

5.2.8 Nuisance from noise

The rural setting of large sections of the pipeline and associated facilities in all three countries means that ambient noise levels, particularly at night, can be expected to be low or very low (typically less than 20 dB(A) at night). Hence, any significant noise generated by the project will be noticeable. However, background noise levels can be significantly higher during periods of strong winds, with levels typically in the range of 45 - 55 dB(A).

5.2.8.1 Potential impacts

Construction of the pipeline will include the following noise-generating activities:

- Right of Way (ROW) preparation and soil stripping;
- trenching and blasting;
- pipe stringing, welding and laying;
- backfilling; and
- movement of vehicles.

Generally, these activities involve mobile plant moving along the pipeline ROW. Construction activities will not occur continuously but in phases, with peaks of activity separated by longer periods of relative inactivity. Each construction team will progress along the works at an average of between approximately 700 m and 1,000 m per day, depending on local conditions. Each team will follow the previous activity after a period of a few days and will pass by at a similar rate of progress. At certain locations (primarily where the pipeline crosses roads or railways) trenchless crossing methods may be used. At these sites, activities could last in the order of three to four weeks (i.e. the period from initial mobilisation to the equipment leaving the site). Noise-generating

activities will occur intermittently, generally during the day. Sheet piling may also be required for trenchless crossing locations, but during the daytime only. Sheet piling can also give rise to vibration. However, levels of vibration generally fall to levels that are not perceptible beyond 100 m.

Blasting may also be required in certain areas where rocky substrates prevent trenching by other means. This may give rise to noise and vibration at receptors located within the vicinity of the pipeline works.

5.3 *Social and economic issues*

5.3.1 Introduction

Building the pipeline will bring investment into the three countries through which it passes. The pipeline itself will allow Azerbaijan to realise profits from the sale of Caspian oil, whilst the other countries will benefit from pipeline tariffs. The distribution of this wealth can bring about issues, which have been seen in other oil projects around the world (these were discussed in Section 3).

BTC has endeavoured to find out the specific issues surrounding the socio-economic impacts of the project. In addition to the research and consultation carried out for the ESIA's, further understanding of the issues has come from the Regional Review and development of the Resettlement Action Plans (RAPs – see Section 6). Continuing dialogue with stakeholders will ensure that the issues, and the role of the project, will be fully understood.

5.3.2 Employment and procurement

Development of the offshore oil and gas fields and the onshore pipelines offers a variety of direct and indirect opportunities to stimulate employment and local business within all three countries, particularly in Azerbaijan. Already BP (in its role of project operator) directly employs close to 1,350 people across the three countries and spends \$50 million annually in Azerbaijan on operational expenses. Eighty per cent of those currently employed are nationals and of those, national staff fill over 60% of professional positions. Further, contractors and suppliers employ thousands of additional people stemming from the procurement of goods and services (e.g., drilling, supply boats, catering).

As is true with the oil and gas industry around the world, the projects are capital intensive. Labour requirements occur primarily during the construction phases. Nevertheless, employment created by the projects (whether temporary or permanent) is important given the high level of unemployment and underemployment in Azerbaijan, Georgia and eastern Turkey. The community surveys and consultations conducted for the ESIA's indicated that securing employment is one of the primary concerns for communities that are immediately affected by the projects and for the wider population.

In 2000, the national average income in **Azerbaijan** was 203,400 manats per month (US\$46). Incomes are considerably lower than this national average in rural communities along the pipeline route.

National average unemployment was estimated to be around 25% in 2000, and up to 50% in some districts. The problem of unemployment is particularly serious for those aged between 18 - 30, as well as for internally displaced persons and refugees. With

such a high proportion of the population seeking work, wage levels remain low and working conditions are extremely poor. There is generally a high level of unemployment along this section of the route. All communities surveyed stated that they had members who would be available for temporary work indicating conditions of under-employment.

Much of the relevant area of rural **Georgia** is characterised by high levels of unemployment. Approximately 80% of the adults surveyed are unemployed or under-employed. Among those who are steadily employed, half are employed in the state sector, which is characterised by long delays in the payment of salaries, with the remainder involved in subsistence farming. Only 3% of people interviewed reported being employed in the private sector. The social survey clearly indicates that lack of paid work opportunities is one of the greatest problems at both the household and village level.

The pipeline provinces of **Turkey** have low levels of GDP per capita. With the exception of Adana, all provinces have levels below the average for Turkey. The northern five provinces are ranked between 60 and 75 of 81 provinces in Turkey in terms of GDP per capita (81 being the lowest). In terms of income, settlements surveyed in Adana and Erzurum have the highest income levels (Osmaniye has the lowest) and Adana and Kayseri the highest ranking in terms of assets (eg, luxury goods such as cars and washing machines) whereas Gümüşhane and Kars have the lowest.

Wages are an important income source for 23% of urban households but only 9% of rural households. Pension income is also important and is the second main source for provinces with urban areas within the corridor (e.g. Erzurum and Sivas) correlating with greater reliability on formal employment.

Unemployment is approximately 7% for the surveyed settlements although under-employment is higher; 70% of those surveyed in rural areas and 45% in urban areas would accept a temporary job.

5.3.2.1 Effect of the project

Although a precise number has yet to be developed, upwards of 6,000 people could be employed temporarily by the projects' construction contractors during peak construction activities across the three countries (Table 5.14). For the pipeline projects, many of these jobs will be on a rolling basis with the pace matched to the speed of pipe laying and with people temporarily employed to work on specific sections of the route. Following construction, BP estimates that around 850 will be directly employed by 2005/06 to support the operations phases. These will be primarily technical jobs, such as technicians, engineers, drillers, and project and business managers.

The projects will continue to require a wide range of goods and services. Current estimates (for all oil-related projects) indicate that spending for goods and services sourced from within the three countries could be as high as \$4.8 billion through the construction phases. For the pipeline projects, operational expenditure is forecast to peak by 2009 at \$200 million per annum for the three countries combined. All expenditure in-country is expected to have an additional 'multiplier' effect on the local economies (estimated to be circa 1.4), under which monies spent trigger secondary spending on raw materials and other local goods and services, with corresponding employment and economic benefits. Despite this, the project needs to guard against creating unrealistic expectations.

Table 5.14: Estimated Total Direct Employment During Construction and Operation

	Azerbaijan	Georgia	Turkey	Total
Construction phase	2,300	2,500	5,000	9,800
Operation phase	250	250	350	850

5.3.3 Community and social investment

Traditionally, the development of large projects has been accompanied by sponsorship and philanthropic contributions to local communities. As with employment, a large part of the challenge is to balance real opportunities with high community expectations. Many people are looking to the participating companies to address significant social needs, including the provision of essential services that lie within governments' sovereign remit.

The projects will be implementing a multi-million dollar programme of community investment, with the aim to support local social infrastructure and stimulate economic opportunities. The programme will be based on best practices developed by donor and development agencies and will involve NGOs and other organizations as implementing partners. BP's broader social investment programme will support education, local enterprise development and other activities which extend the contributions to the wider population

5.3.4 Domestic energy

The dissolution of the Soviet Union resulted in the fragmentation of an integrated energy network that provided cheap energy for its citizens. The downturn in economic activity following Azerbaijan's and Georgia's independence in the early 1990's left these countries without the financial capability to construct reliable national energy systems or upgrade and maintain equipment and energy infrastructure. The problem of access to energy is compounded by the fact that historically, energy prices have been substantially lower than the cost of supply, and energy companies seldom recovered full payment from their consumers. The accumulation of arrears or payment in barter goods have in turn resulted in difficulties maintaining energy systems and buying fuel. Georgia has had particular difficulties paying for imported oil and gas. The inefficient use of energy is prevalent throughout the region due to a combination of old generating equipment and inefficient fuel sources (such as mazut – heavy oil), losses throughout the distribution system, and lack of incentives for users to reduce waste.

Other BP oil developments will help meet domestic needs in Azerbaijan and Georgia, as well as shipping larger volumes to Turkey, but the pipeline itself will not provide more oil to the communities along its route. The principal challenge for the projects is managing expectations: some people in Azerbaijan and Georgia hope the projects will solve all the energy problems faced by the countries.

5.3.5 Ethical performance

In all three countries, governments have committed to combat corruption and improve administrative governance and transparency. Overcoming corruption is driven by both economic logic - corruption stunts growth and hinders foreign direct investment - and the countries' development aspirations. Effective implementation of these government efforts could induce further foreign direct investment.

Some external observers of the projects have expressed concern that the agreements between the host governments and the project sponsors are less than transparent. They have also voiced concern about the projects being implemented in a less than ethical manner and that revenues from the projects will reinforce corrupt behaviours.

The projects provide the opportunity to demonstrate that business can be conducted in an ethical and transparent manner. The projects can also serve as a model for good corporate governance.

5.3.6 Human Rights

Oil and gas development requires the creation of careful working relationships with governments, communities, and individuals over matters such as land acquisition and security. All landowners and land users affected by the projects need to be treated fairly and with respect for their individual and human rights. As in any country, sovereign governments hold the responsibility for safeguarding their people.

5.3.6.1 Vulnerable groups

BTC recognises the fact that it is always important to identify vulnerable groups such as women, ethnic or religious minorities, the very poor or other socially and economically disadvantaged groups upfront and to understand power dynamics between various groups when mapping the local community and while addressing the impacts of the project in the area. Therefore, the BTC Project has undertaken a comprehensive stakeholder engagement programme, which includes national, regional, and more importantly community level stakeholders who will be directly affected from the Project.

The impact assessment studies undertaken for both the RAP and the EIA showed that there are a number of categories of people who have been recognised as potentially disadvantaged through particular circumstances. As a result, plans have been developed to ensure these groups are not further disadvantaged by the project. By the early identification of these groups and implementation of specific measures, the BTC project is committed to ensuring all categories of people are treated fairly.

The outcome of the socio-economic surveys and consultation meetings with the affected population along the pipeline route indicates that the impacts of land acquisition, construction and operation phases will be issue-based rather than ethnicity or religious based and these issue-based impacts are systematically addressed during the course of RAP preparation and in the definition of the entitlements.

In **Azerbaijan**, five principal vulnerable groups affected by the project have been identified and thoroughly consulted. These groups are as follows:

- employees of state agricultural enterprises who are reliant on use of land for their livelihood in lieu of wages;
- internally displaced people (IDPs);
- informal land users;
- some elderly couples and individuals; and
- women-headed households abandoned by husbands now living abroad.

Specific measures developed by the project to ensure these vulnerable groups have access to compensation and benefits arising from the project are described in Section 1.7 of Part B of the RAP.

In **Georgia**, female headed households, the elderly and poor have been identified as potentially vulnerable groups that will require particular attention during implementation and monitoring. For more information on the assessment of vulnerability in Georgia, reference should be made to Section 4.8 of the RAP for Georgia.

In **Turkey**, thirteen potentially disadvantaged groups have been identified for special attention during the resettlement process. Some of these groups include:

- land users in areas designated as ‘forest’ by the Ministry of Forestry, but where land parcels have yet to be registered with the Title Deeds Registry Office;
- users of village lands, informal tenants and squatters who may not be recognized in land acquisition and expropriation documentation;
- landowners who have shared ownership in land parcels with multiple owners, or those involved in cases of disputed land ownership;
- absentee landowners who will not readily be able to attend negotiation meetings at the outset of land acquisition; and
- fishermen at Ceyhan, who do not presently have recognized rights to compensation under Turkish laws.

Kurdish speaking households

In parallel with the identification of the ethnic groups the BTC Project studied all the potential environmental and social impacts that might occur during the land acquisition, construction and operation phases in the areas where different ethnic and religious groups are living as part of the whole impact identification and mitigation development processes for the EIA and RAP. The outcome of these social impact assessment studies show that language/ethnic groups are unlikely to be disadvantaged since there is no difference in the potential impacts of expropriation and construction activities between Kurdish-speaking and non-Kurdish speaking Turkish households.

Although the Kurds constitute an ethnic minority with distinct language and dialects in a complex socio-political environment, the group does not meet key characteristics of indigenous people as defined in World Bank’s *OD 4.20* In particular, project affected Kurdish communities are not:

- i. primarily involved with subsistence orientated production;
- ii. reliant/dependent on local natural resources; and
- iii. isolated or disconnected from larger socio-economic structures of the area.

The socio-economic baseline data for RAP showed that although there is not a statistically significant difference between the Turkish and Kurdish speaking Turkish households in terms of impacts on land and their livelihoods, Kurdish speaking Turkish households appear somewhat better off. Table 2 shows that households that also speak Kurdish lose a smaller percentage of their land and of their income as a result of the expropriation activities of the Project. However, fewer of the Kurdish-speaking Turkish households have formal title to their land; rather they have customary ownership of the land. For instance, 55% of Kurdish speaking Turkish households, in contrast with 70% of all other households, have registered title deed for the land they own. A predominant majority (over 90%) of those without a formal title are customary owners. Nevertheless, the Project has initiated a process of formalisation of the customary ownership of all affected groups

Table 5.15: Potential Impacts of Expropriation on Kurdish-speaking Turkish Households

	Size of Affected Plot (m ²)	Proportion of Project affected land to total land holdings (%)	Proportion of potentially lost income due to expropriation to total income (%)
Kurdish-speaking Turkish households	12,273	4.9	0.4
Non-Kurdish speaking Turkish households	16,109	5.1	0.5
Overall	15,714	5.0	0.5

Source: Household questionnaires, RAP (681 plots-based)

For a more comprehensive explanation of potentially vulnerable groups in Turkey, reference should be made to Annex 4.5 of Part D of the RAP.

Further information

Further information about the land, community and social economic issues associated with the pipeline route can be found in:

- *The separate project ESIA's produced for Azerbaijan, Georgia and Turkey.*
- *Public Consultation and Disclosure Plan*
- *The Resettlement Action Plan:*
 - Part A – Overview*
 - Part B – Azerbaijan*
 - Part C – Georgia*
 - Part D- Turkey*
- *National & Regional Review – economic, social and environmental overview of the Southern Caspian oil & gas projects*
- *Project Community Investment Plan*
- *Project Environmental Investment Plan*

These can be accessed via the project's website www.caspiandevlopmentandexport.com.