PROJECT DESCRIPTION

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2 PROJECT DESCRIPTION

2.1 PIPELINE ROUTE

The BTC pipeline route has been carefully selected to respond to engineering, geo-technical, environmental, and social concerns. Following the decision to use Georgia as a transit country for the new pipeline, an intensive routing process was initiated to evaluate all possible routing options through Georgia. The corridor selection process was driven by the requirements of the Host Government Agreement, which defined a four-stage development process as follows:

- Corridor Selection (10km corridor of interest);
- Route Refinement (500 meter preferred corridor);
- Route Definition (100 meter specified corridor);
- Right of Way Alignment (32 and 44-meter construction corridors)[1]

The management of this process was achieved through implementation of the BTC Route Assurance Process throughout the corridor selection and subsequent route development. The primary social concern has been the avoidance and minimization of any adverse impacts, including those relating to economic and physical displacement. As a result,

- Settlement and other areas of population density have been avoided to minimize the potential effects pipeline construction will have on the public;
- AGI locations have been optimised to minimize acquisition of private land;
- Pipeline alignment has been optimised to maximize the potential for land reinstatement potential; and
- Sensitive environmental and high-risk geo-hazard locations have been avoided to minimize safety risks.

This chapter provides a brief discussion of project elements with temporary or permanent land acquisition requirements. It expands upon the project description provided in Chapter 1.

[1] Construction corridor for BTC alone is 32 meters. For BTC and SCP together, the construction corridor is 44 meters. Where the corridor intersects with environmentally sensitive areas, the ROW may be narrower than 32 meters. See BTC Environmental and Social Impact Assessment Draft for Disclosure (April 2002) and BTC ESIA Addendum Response to Comments from ESIA Disclosure Phase (September 2002) for full discussion of route selection. Both documents are available on www.caspiandevelopmentandexport.com

2.1.1 Defining the Pipeline Route

The BTC pipeline construction will include the process of surveying the ROW, including the pipeline centerline and any additional temporary workspaces. This may include flagging to indicate the construction workspace boundaries. Social and environmental specialists will participate in the pre-construction surveys in order for resources to be protected during the construction process.[2]

2.1.2 Surface Preparation and Grading

The BTC pipeline route will need to be cleared and graded to permit safe installation of the BTC pipeline and associated facilities/AGIs. This process will include the leveling and 'benching' (i.e., the establishment of flat areas or terraces) of terrain, stripping of cultivated areas, and the removal of scrub, trees and shrubs.

To ensure that the ROW can be properly reinstated and to allow the re-growth of vegetation, the topsoil and subsoil will be removed as required and stored separately. Surfaced roads and paved areas that are subject to open trench crossings will be prepared by removing material only directly over the width of the pipe trench. This material will be kept separate from other stripped or excavated material to minimize productivity losses to land after reinstatement. Since the land required for the project will be purchased at full cost, reinstating the land with care and giving access back to the affected people free of charge should be a net benefit to the affected people.

The topsoil will be stripped across the working width of the construction area by appropriate earth moving equipment and stored on the ROW. The topsoil stacks will not exceed 2m in height and will be kept free from disturbance to reduce the risk of physical damage and compaction. Vehicle movements will be confined to the 'running track' on underlying subsoil.

Excess material excavated during grading will be segregated from topsoil. Where necessary, measures will be taken to maintain the flow capacity of watercourses including ditches and drainage channels that cross the ROW, while at the same time ensuring a continuous running track for construction vehicles.

2.2 CORRIDOR CONFIGURATION IN GEORGIA

The Georgian section of the BTC pipeline will run for 248-km and have an external diameter of 46" along the entire Georgia section of the BTC pipeline up to the Turkish Border[3]. The pipeline will pass through 7 districts in Georgia, from east to west: Gardabani, Marneuli, Tetritskaro, Tsalka, Borjomi, Akhaltsikhe, and Adigeni. The pipeline will also cross the administrative boundaries of the city of Rustavi.

The construction corridor for the BTC pipeline will be a standard working width of 32-meters. If the SCP project is sanctioned, and if the BTC and SCP projects agree on a joint land acquisition strategy, the SCP pipeline will require an additional 12-meter width of land, which will be acquired at the same time as land needed for the BTC project but not cleared until the time the SCP pipeline will be constructed.

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[2] BP has updated the Environmental and Social Impact Assessment (ESIA) with Addendum (for government regulators) and Supplementary Lenders Information Pack (SLIP) (for lenders) that includes a significant section on the route selection process in Georgia. Both documents are available on www.caspiandevelopmentandexport.com.

[3] For more information on this, refer to the BTC ESIA Draft for Disclosure (April 2002).

The pipeline will be buried to a depth of about 1 meter.

2.2.1 Pump Stations

Two pump stations will be required in Georgia. The pump stations will require 32.47 hectares of land. An on-going optimisation study will assess measures to reduce the total areas. The pump stations will house the different facilities including; five mainline pumps and fuel gas turbine drivers in parallel, fuel storage facility, site for future installation of a fuel gas conditioning and metering unit, utilities (power generation, potable water, nitrogen, air, open and closed drain systems) and lighting as well as wastewater treatment facilities.

2.2.2 Valves and Pigging Stations

Valve stations will be located along the BTC pipeline route to facilitate maintenance and to isolate sections of the BTC pipeline in the event of accidental leakage. In each instance, the valve bodies will be buried in-line with the pipeline. There will be a total of 26 such stations, which will require about 5 hectares of land. Two forms of valve station are proposed:

- Block valve stations, housing valves that can be remotely operated or can be closed manually to restrict or stop pipeline flow; and

- Check valve stations, housing simpler valve devices that rely on gravity/reverse flow to close automatically when the pipeline flow is interrupted. Check valve stations involve a minimal land-take and require no additional power to operate the valve.

At the block valve sites, the valves themselves will be located underground with the valve actuator mechanism located above ground within a concrete structure. Each site will include an equipment room, which will also be within a concrete structure. Check valves have been located at specific sites to prevent back-flow into environmentally sensitive areas in the event of a spill.

A pipeline integrity gauge (PIG) is a device that is used for internally monitoring and cleaning pipelines. The pigging station will require 3.25 hectares of land[4]. All pigging operations require a means of loading pigs into the pipeline and retrieving them from it. These locations are referred to as pigging facilities. The BTC pipeline has been designed to facilitate the use of cleaning and inspection pigs.

Intelligent pigging will be carried out periodically (approximately every five to ten years) to check the integrity of the BTC pipeline. This is achieved by recording any changes in the BTC pipeline thickness and shape, and by inspecting for defects and cracks. Cleaning pigging will be undertaken more regularly, with the frequency being determined principally by the rate of wax build-up in the BTC pipeline. It is anticipated that such pigging will occur as frequently as once or twice a week for the duration of the BTC pipeline operation.

[4] There are pigging facilities in the two pump stations, thus there are three pigging facilities in all. Only one of these is independent and it requires 3.25 hectares of land.

2.2.3 Access Roads

The road conditions in a number of areas of Georgia are poor, with defects ranging from minor cracking of surface materials to significant potholes, and, in some cases, complete washout. To give adequate and safe access for equipment, materials and personnel to the construction sites and facilities, a number of existing roads and tracks will need to be upgraded and the construction of some new access roads will be required. Preference will be given to upgrading and/or widening existing routes rather than constructing new roads to minimize economic displacement. Selection of access roads will be completed and all arrangements for land and asset acquisition will be initiated at least 3 months prior to the use of the access road.

The decisions concerning the choice of access roads have not yet been finalized. The details of any new permanent roads will be agreed upon in advance with the relevant authorities. Typically, a temporary access road will consist of a layer of crushed stone which can be removed when no longer necessary. Permanent road repair/upgrade will be in accordance with approved plans and specifications and will typically be achieved using a combination of asphalt, concrete and aggregate. All lands and other assets affected by the temporary and permanent road works will be compensated fully in accordance with the principles and procedures established in Chapter 5.

2.3 TEMPORARY CONSTRUCTION FACILITIES

Temporary facilities comprise pipe/materials storage yards, warehousing, temporary project offices and worker camps. Earlier surveys have identified a number of suitable sites. Final location and number of sites will be determined by the construction contractor (a joint venture, Spie Capag/Petrofac appointed in August, 2002) and agreed upon with the BTC Management Team. Early indications are that Spie Petrofac will use the pipeyard sites at Gatchiani, Tetritskaro, Atskuri and Akhaltsikhe, and will have camps at Marneuli, Tsalka, Bakuriani and Akhaltsikhe[5]. BTC will assure that all principles, including those relevant for compensation and lease arrangements for the temporary acquired land, are complied with by the construction contractor. A total of 30 hectares of land will be used for up to 11 pipe yards. Up to seven worker camps will require 50 hectares. Details of pipe yards and construction worker camps are illustrated in Table 2.1 below.

Table 2.1 Temporary Facilities: Pipe Yards and Worker Camps

Name	Pipeyard	Worker Camp
Gardabani	X	
Gatchiani	X	X
Marneuli	X	X
Kotishi	X	X
Tetritskaro	X	X
Tsalka	X	X
Andeziti	X	X
Tsikhisjvari	X	
Atskuri	X	
Akhaltsikhe	X	X
Vale	X	

Source: BTC, 2002

[5] Bakuriani is not included in the table as the accommodation will be existing hotels that will be refurbished. As such, there is no land acquisition implication.

When additional needs emerge, Spie Capag Petrofac will be required to assess the environmental/social sensitivity of any additional or alternative sites other than those listed in the BTC ESIA and will ensure that acquisition is done in accordance with the principles outlined in Chapter 5. Full compensation for lands and other assets affected by temporary facilities will be paid prior to their utilization.

The above sites for pipe storage yards have been identified in earlier surveys based upon the following criteria:

- Availability of adequate rail siding or spur lines;
- Sufficient ground for pipe storage to meet anticipated quantities;
- Reasonable road access;
- Access to the ROW;
- Communications (landline/mobile systems);
- HSE requirements, in particular those relating to transportation;
- Availability of local labour force;
- Route maintenance;
- The duration of occupancy required for BTC/SCP.

The sites for worker camps have been identified in earlier surveys based on their location, suitability of ground, communications (landline/mobile systems) facilities, HSE requirements (in particular those relating to transportation), access to the ROW and the national road system, availability of local resources, including labor force, and required period of occupation.

The camps will be located at or near construction sites of proposed AGIs, at or near road/ rail depots or on previously developed sites where space may be offered.

Each camp will measure at least 500 by 500 meters and include: accommodation and offices, all relevant utilities – water supply and treatment, electricity, medical suite, site security – security hut at gate, helipad / airlift facilities (if deemed necessary as a result of the development of the project Emergency Response Plan), maintenance building, warehousing, kitchens, canteens and cold storage, postal services, paved roads, car parking (concrete or asphalt), boundary fences/walls, worship facilities, fuel storage, waste storage and incineration facilities, sewage treatment and disposal, recreation facilities, laundry, and equipment storage, welding and gas storage.

2.4 CONSTRUCTION PROCEDURE

BTC has engaged a highly experience joint venture made up of Spie Capag and Petrofac to install the pipeline and build the AGIs. Pipeline construction is a sequential process and comprises a number of distinct operations, undertaken by a large range of specialized and general crews (teams of workers and the necessary plant and equipment collectively referred to as the construction spread). Pipeline construction would be achieved using one or more conventional construction spreads to accomplish pipeline installation, and one or more special

section crews to accomplish watercourse crossings and other specialized pipe installations. Specific steps include:

Step 1 Survey and Stake-out: the pipeline construction corridor (32 metres) will be surveyed and pegged.

Step 2: Clearing, Stripping and Earthworks: all existing structures, trees and vegetation will be cleared from the 32 metre corridor. The corridor will then be stripped and levelled. Topsoil and subsoil will be stockpiled separately for reuse during reinstatement. The stockpile will be used to mark the edge of the corridor for safety and security.

Step 3 Trenching: backhoes and trenching machines will be used to excavate a trench not less than 2.2 metres in depth. This will allow for a minimum one metre cover over the pipeline upon completion. In some cases, rock saws, explosives or jackhammers may will be required for trench excavation. Up to 15 kilometres of the pipeline trench may be open at any one time. Where the construction corridor is close to settlements, measures will be taken to limit public access to the active works area and trench. Safe trench crossings will be constructed to maintain public and stock access across the trench on public roads and paths.

Step 4: Pipe Stringing and Welding: pipe sections including factory manufactured bends will be delivered to secure pipe yards before onward transportation to the site. On site, sections will be raised and aligned on wooden blocks for welding.

Step 5: Field Coating: each pipe section will be delivered to the site with a factory applied polyethylene coating to prevent corrosion. Following welding, a further protective coating will be applied on site over the welds themselves.

Step 6 Pipe Installation and Backfilling: The pipeline will then be lowered into position in the trench by side-boom tractors and the trench backfilled and compacted. Any surplus material from trench excavations will be spread within the width of the construction corridor or disposed of as per agreements in the ESIA. Topsoil will be retained for spreading as the finish layer. Any affected drains will be restored.

Step 7 Crossings: are defined for special treatment in construction contract documents. Crossings include the following:

- Rivers
- Water courses, including aqueducts, canals, irrigation channels, and drains
- Public roads and tracks
- Rail tracks
- Underground services

Special techniques will be employed to ensure that there is no or limited disruption of service at designated “crossings”.

Step 8 Reinstatement: the construction contractor will be required to develop a project-specific Reinstatement Plan based on specifications contained in the construction tender documents. The full width of the construction corridor and any other works areas will be re-

instated in accordance with the Reinstatement Plan on completion of construction. Key reinstatement principles will be as follows:

- To strip and stockpile existing topsoil in such a manner that its quality and structure is retained for reuse following construction completion.

- To re-grade the works area upon completion as close to the original ground profile as possible and to ensure pre-project drainage patterns are restored.

- To undertake all necessary measures (ploughing, harrowing, fertilizer application, use of leguminous cover crops, etc) to restore the soil to its pre-project condition, or better, in terms of suitability for growing crops and pasture.

- To monitor effective restoration for a three-year period following reinstatement, and to undertake any additional restoration measures deemed necessary to restore the affected ground.

- Any public services, structures, roads, tracks, pavements or other facility affected by the construction works will be repaired or replaced to a condition that is at least as good as that found prior to construction.

The construction sequence is illustrated in Figure 2.1.

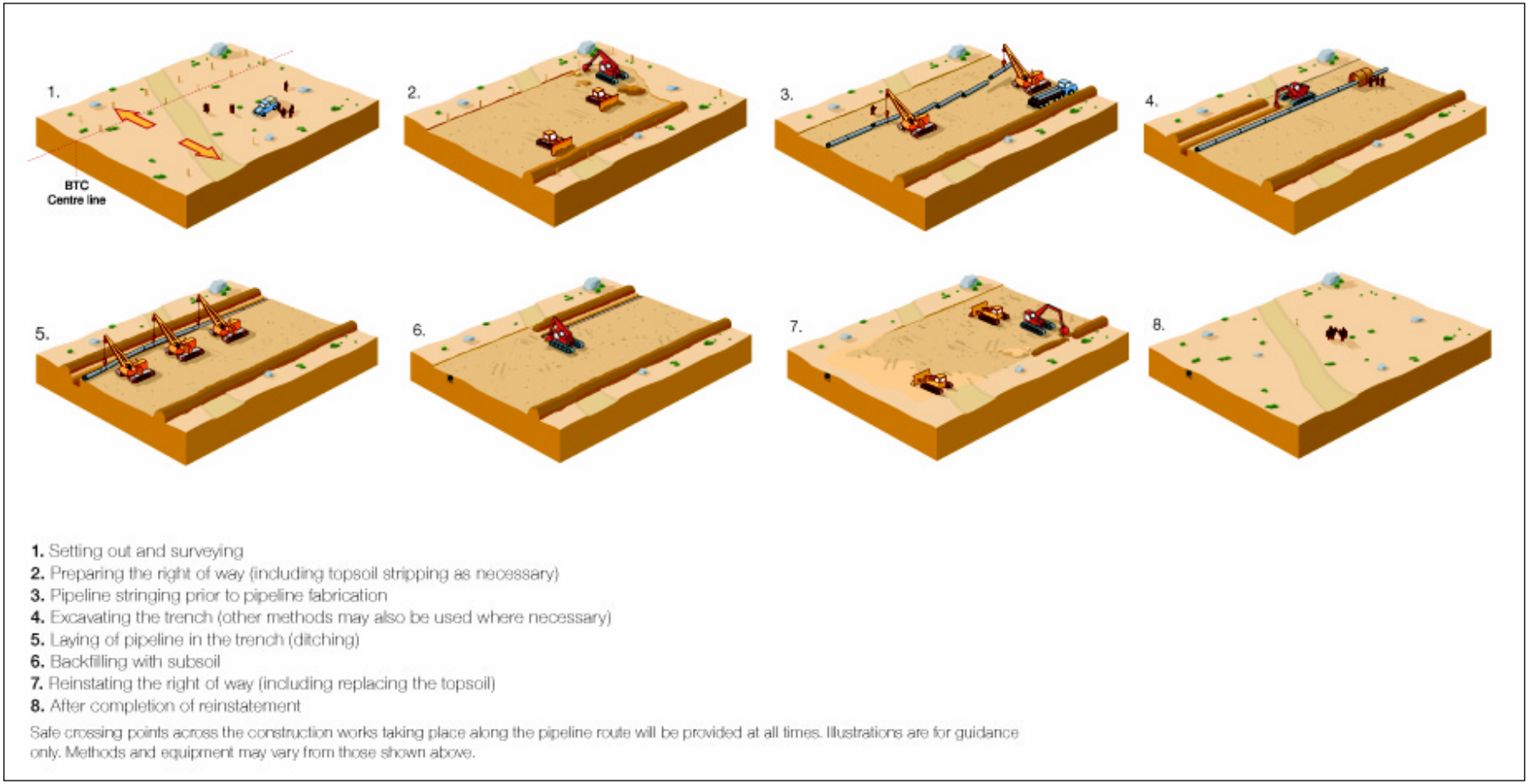
Prior to the commencement of each element of the construction program, the construction contractor(s) will develop detailed designs, drawings and/or method statements for the work to be performed. These documents will incorporate the reasonable requirements of landowners and occupiers, the social mitigation measures and the requirements of the regulatory authorities in Georgia and the project ESIA.

2.5 OPERATIONS AND MAINTENANCE

The Main Center Control Room would be located within the Sangachal Terminal. As an emergency response center, a high-level communication network (telephone/e-mail) would be established between the Sangachal Terminal and the existing Emergency Response Center in BP's offices in Baku.

BTC pipeline surveillance will include: patrolling, aerial survey, vantage point survey, leakage survey, as well as liaison with owners/occupiers, tenants and authorities. The surveillance program will monitor the entire BTC pipeline length, however particular attention will be paid to sensitive locations including settlements, watercourse crossings, and rail and road crossing

Figure 2.1 Construction Sequence



2.5.1 Restrictions of Use

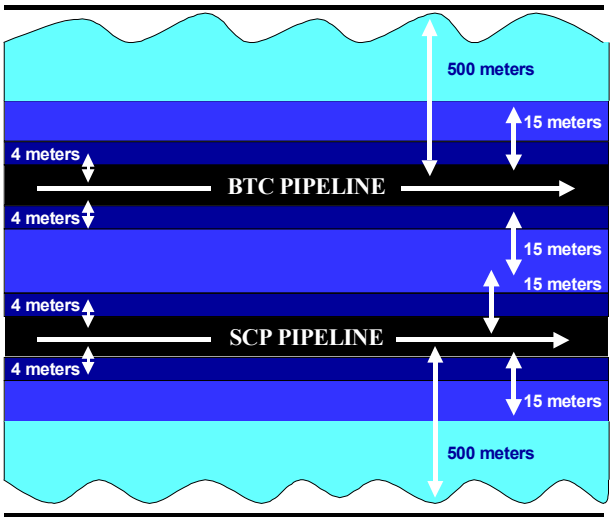
Restrictions of use are typically applied around crude oil pipelines and related installations to protect the integrity of the pipeline, to reduce the potential for accidental damage, and to minimize risks to people and communities living and working in the immediate vicinity. Such restrictions can,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

2.5.2 Pipeline Corridor

"Restrictions of use" will be applied to a 58-metre corridor (referred to as the pipeline "protection zone") that will extend 7 metres either side of the total 44-metre construction corridor for both projects. Restrictions will apply throughout the operational life of the projects. The restrictions will be consistent with international codes and will be considerably less restrictive on land owners and users than Soviet standards that have historically been applied to crude oil and natural gas pipelines in Georgia. Restrictions of use to be applied within the 58-metre corridor are illustrated in Figure 2.2 and described in Chapter 6.

As described in the foregoing section, regular horseback patrols will be conducted along the pipeline for liaison with owners, users and occupiers and to monitor activities within the 58-metre pipeline protection zone.

Figure 2.2 Pipeline Protection Zones



Zone 1: Four meters to either side of each pipeline, is the most restrictive zone and prohibits building construction, tree planting, deep ploughing, use of explosives and other specifically identified activities. As the pipelines are located within the 44m construction corridor owned or controlled by the Projects, these restrictions will be automatically imposed on the land parcel at the end of the construction phase.

Zone 2: Fifteen meters to either side of each pipeline, prohibits habitable buildings, but allows normal agricultural activities to proceed.

Zone 3: Five hundred meters to either side of each pipeline which restricts major developments (hospitals, schools, etc) apply and where the Projects wish to be generally involved in planning issues.

2.6 PROJECT SCHEDULE

The design and preliminary survey work required for the BTC pipeline commenced in 2000 and is ongoing. As noted earlier, the main BTC construction contract was awarded in August 2002 to the joint venture Spie Capag/Petrofac with the aim of the main construction work commencing in Spring 2003. The pipeline construction period in Georgia, excluding time for testing and commissioning, is likely to last for approximately 15 months. The filling and commissioning of the line is dependent on the completion of associated projects in Azerbaijan and Turkey and is scheduled to commence in mid-2004. It is anticipated that the entire BTC pipeline system will become operational by early 2005.

The period between the award of the construction contract and the commencement of the pipeline construction work will be used by the project Management Team and the pipeline and facility construction contractors for various enabling and preparatory works including: field verification of identified environmental and social receptors; clearance and establishment of some temporary facilities (worker camps, pipe yards, temporary roads, etc.) and land acquisition for this purpose; and upgrading of infrastructure (e.g. roads, railway and land/asset acquisition for this purpose . Spie Capag/Petrofac will acquire land following the rules and procedures established in Chapter 5. To this end, it will work closely with the project Land Team. The Sponsor is ultimately responsible for monitoring the contractor's temporary land acquisition activities. The contractor, prior to acquiring or leasing any land for short-term purposes, will inform the LTO and will share all the relevant information indicating that they have fully

complied with the criteria set forth. The LTO will check each site for assurance that the guiding principles have been met.

2.7 SUMMARY OF LAND REQUIREMENTS

Land requirements for the BTC project in Georgia include:

- Land required for the 32-meter wide BTC construction corridor
- If the SCP project is sanctioned, and if SCP and BTC agree on a joint land acquisition strategy, an additional 12-meters of land, adjacent to the 32 meter BTC construction corridor, for purposes of SCP construction, for a total of a 44 meter construction corridor
- Land required for the AGI sites
- Land required for new permanent access roads from AGI sites to the nearest suitable public road
- Land required for special construction areas, such as river crossings.

If SCP is built, there will be a need to impose use restrictions on additional land to service and safeguard the two pipelines. As a result, assuming that SCP is constructed alongside the BTC pipeline, a total of 58 meters of land will have restrictions on its use, although these restrictions will allow the performance of almost all types of agricultural activities. The total land requirements of the project for permanent and temporary facilities are provided in Table 1.1 (see Chapter 1).

BTC Co. will acquire private and public land for the 44-meter corridor and AGI sites in the project areas directly from the landowners. Upon SCP sanction, the intention is to subdivide the 44 meter construction corridor into two parallel and contiguous 22-meter corridors. BTC Co. will transfer one 22-meter corridor, and all SCP AGIs, to SCP.

Once the acquisition phase is completed, it is anticipated that BTC Co. will maintain the new privately held land parcels in the original sub-divided form, rather than consolidate the 44-meter-construction corridor into a large continuous land parcel. This will help maintain the direct connection with the ex-landowners and make it easier to enter into arrangements with ex-landowners at the end of the construction phase.

BTC Co is initially purchasing the 44m wide construction corridor from private owners affected by the pipeline route. This approach has been adopted due to the absence of a legal framework within Georgian Statute to permit less than ownership rights which would confer the degree of protection required by BTC Co for safe pipeline operation and maintenance. Alterations to Georgian Law are currently being pursued which would confer the necessary degree of operational control, while permitting the ownership and use of the land to be handed back to the original owners. BTC Co does not wish to become a long-term landowner in Georgia and as soon as the legal mechanisms are in place, legally binding Servitudes or Easements will be negotiated with the former owners. The timescale for this process is dependent upon Georgian Parliament but is not expected to be longer than the three year period of occupation for construction purposes.

Upon completion of construction and reinstatement of the construction corridor, BTC Co will enter into contractual agreement with previous owners to permit them to use the land again, with

some restrictions. If amendments to existing laws fail or are not sufficient for BTC Co use, then BTC Co would retain ownership but would maintain a contractual agreement to let previous owners use the land. The aim is to write the contract in such a way as to ensure that it is fully transferable and fully inheritable. Therefore, the best case will be, subject to pending legislation, to return the ownership right to the original owner subject to restrictions. The worst case will be that BTC Co. retains ownership but allows previous owners use rights, in addition to having been paid in full for the land. This message is being conveyed through the land teams and through the local NGO, APLR.

2.8 MEASURES TAKEN TO MINIMIZE LAND ACQUISITION AND RESETTLEMENT IN GEORGIA

Several measures were adopted to minimize land acquisition and resettlement in Georgia. These included the following:

- Adoption of a shared corridor with the SCP project to reduce by 30 percent the overall area to be cleared for construction by the two projects
- Use of international performance based standards to define areas around the pipeline to be subject to restrictions of use, rather than the far more restrictive Soviet SNIPs codes
- Development of a project specific tree planting guideline to minimize the areas alienated from tree cropping and vineyard use (see Chapter 6)
- Careful siting of all AGIs and access roads to place them wherever possible on state or municipal land rather than privately owned land
- Siting of all AGIs to limit length of access roads
- Nearly 10 iterations of the pipeline route to reduce impacts on private and cultivated land.