environmental and social impact assessment

Baku-Tbilisi-Ceyhan Oil Pipeline:
Azerbaijan

ADDENDUM

December 2002

AETC
Azerbaijan Environment and Technology Centre

ERM

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ADDENDUM

Baku – Tbilisi – Ceyhan Oil Pipeline Azerbaijan

Prepared for BP

By AETC Ltd/ERM

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GENERAL NOTES

Project No: **P8107**

Title: **Environmental and Social Impact Assessment Baku – Tbilisi – Ceyhan Oil Pipeline Azerbaijan ADDENDUM**

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TABLE OF CONTENTS

1 INTRODUCTION

This Addendum addresses comments received during disclosure of the draft Baku-Tbilisi-Ceyhan Pipeline Environmental and Social Impact Assessment (BTC ESIA). The subject of the ESIA and this Addendum is the onshore section of the BTC pipeline within the territory of Azerbaijan. This is defined as the pipeline, and all associated facilities, between the fence-line of the Sangachal Terminal and the Azerbaijan-Georgian border.

The BTC ESIA Draft for Disclosure was issued on 31st May 2002 and comprised three volumes:

- ESIA report
- A volume of Environmental and Social Route Maps
- A volume of Appendices (Technical Appendices and Environmental and Social Baseline Reports).

Copies of the full ESIA documentation and a Non-Technical Executive Summary were made widely available, both nationally and internationally, with copies in Azerbaijani, English and Russian. The availability of these documents was advertised in meetings, newspaper announcements, via the Internet and by television announcements in selected regions along the route. In order to adhere to International Finance Institution (IFI) requirements and to meet the national host government requirements, as defined in the Host Government Agreements (HGAs), a 60-day[1] disclosure and consultation period has taken place. Details of the 60-day consultation and disclosure process together with collection and analysis of the comments received are discussed in Section 2 of this report. Section 3 addresses developments to the Project Description, which have taken place since the ESIA draft for disclosure was issued. Sections 4 to 8 address comments received during the 60-day disclosure period.

Separate reports will be produced addressing comments received on the ESIA documents for the following related projects:

- BTC Pipeline in Georgia - 248km pipeline from the Azerbaijan-Georgia border to the Georgian-Turkish border
- BTC Pipeline in Turkey – 1070km pipeline from the Georgian-Turkish border to the Ceyhan Terminal on the Mediterranean Coast.

The ESIA draft for disclosure documentation, together with this Addendum report will constitute the formal submission to the Government for environmental approval for the project.

[1] This addendum actually addresses all comments received during a 75 day period (to 15th August 2002). Comments received after this time will continue to be addressed as appropriate within the project design and construction process.

2 CONSULTATION AND DISCLOSURE PROCESS

Following the publication of an ESIA Draft for Disclosure on the 31st May 2002, a disclosure period of more than 60 days has taken place in accordance with both international EIA standards and the HGA. Within this disclosure period a formal consultation process has been conducted which has involved the BTC project team working alongside the independent environmental and social consultants.

2.1 DOCUMENTATION

Full copies of the ESIA (including appendices) and/or Non-Technical Executive Summaries and community pamphlets, were made available to the following organisations and at the following public locations, in Azerbaijani, Russian, and English:

Full ESIA and Non-Technical Executive Summary:

- Ministry of Environment and Natural Resources
- Ministry of Culture
- Institute of Zoology
- Institute of Archaeology (Azerbaijan National Academy of Sciences, (ANAS))
- BP Research and Monitoring Group
- Institute of Botany, ANAS
- Ganja Municipal Hall
- Agstafa Cultural Centre
- Yevlakh Chess Club
- BP Villa Petrolea
- ISAR
- Central Akhundov Library
- Open Society Institute
- Eco Club
- Azerbaijan National Academy of Science
- UN Resource Centre.

Non-Technical Executive Summary only:

- Additional academics who participated in formal public meeting in Baku (see below and Appendix B)
- British Embassy
- Faculty of Geography, Baku State University
- Faculty of Biology, Baku State University
- Baku State University Library
- Azerbaijan State Oil Academy Library
- Azerbaijan Technical University Library
- Azerbaijan Economic University Library
- Institute of Geography (ANAS)
- Institute of Soil Sciences
- Institute of Irrigation

- Prezidium of ANAS
- State Land and Cartography Committee
- Ministry of Social Security
- Ministry of Health
- State Oil Company of Azerbaijan Republic
- State Committee on Melioration
- Ministry of Fuel and Energy
- Fire Brigade
- Hygiene and Epidemiology Committee
- Gosgortechnadzor
- Technical Library
- Lenin Library.

In addition the full ESIA in Azerbaijani, Russian, and English was posted on the internet website: www.caspiandevelopmentandexport.com.

Pamphlets were produced providing information on those issues of specific interest to communities along the route. These pamphlets, which covered issues such as employment, land, and infrastructure, were distributed to all pipeline affected communities as defined in the ESIA.

A separate, five-page summary of the land acquisition process for the project was also prepared and distributed to all pipeline affected communities.

2.2 MEETINGS

In mid-June a series of public meetings was convened in order to introduce the details of the ESIA and solicit feedback from the Azerbaijan government, interested experts, such as the academic community and NGOs as well as from the general public. Four meetings were held in Baku as follows[2]:

- June 12th Research and Monitoring Group (½ day)
- June 13th Scientific and Academic Community (½ day)
- June 14th National NGOs (½ day)
- July 31st National and International NGOs (1 day)

Three additional day-long public meetings were held in prominent locations along the pipeline route:

- June 17th Yevlakh,Yevlakh Chess Club
- June 18th Ganja, Office of Executive Authority
- June 19th Agstafa, Agstafa Cultural Club

These public meetings were advertised in key local newspapers and television channels and attracted 100-200 people on each occasion.

At all 7 of these meetings a brief presentation of the project and the ESIAs was made followed by a question and answer feedback session. Copies of non-technical executive summaries and community pamphlets were provided and there was a series of display boards to facilitate understanding of the project. All feedback

[2] A List of attendees can be found in Appendix B

received at the meetings was recorded in a systematic manner and entered into a central comments database.

Figure 2-1 Village Meeting in Garaberg, Ujar

In late June a 'community roadshow' was held along the pipeline route. This comprised the distribution of community pamphlets in Azerbaijani to all pipeline affected communities and a series of 8 community meetings at the following locations [3]:

- Govlar, Tovuz District
- Zeyem, Shamkir District
- Dalimammedli, Geranboy District
- Nabiagaly, Samukh District
- Leki and Amirakh, Agdash District
- Garaberg, Ujar District
- Sigirly, Kurdamir District
- Mugan, Hadjiqabul District.

These meetings involved a brief presentation of the project and the ESIA followed by a question and answer session where all feedback was recorded anonymously.

[3] Suitable locations were defined in co-operation with the Project Land Team and were chosen for ease of accessibility for all pipeline affected communities as well as affected land owners in each region. The villages are therefore not necessarily pipeline affected communities as defined in the ESIA.

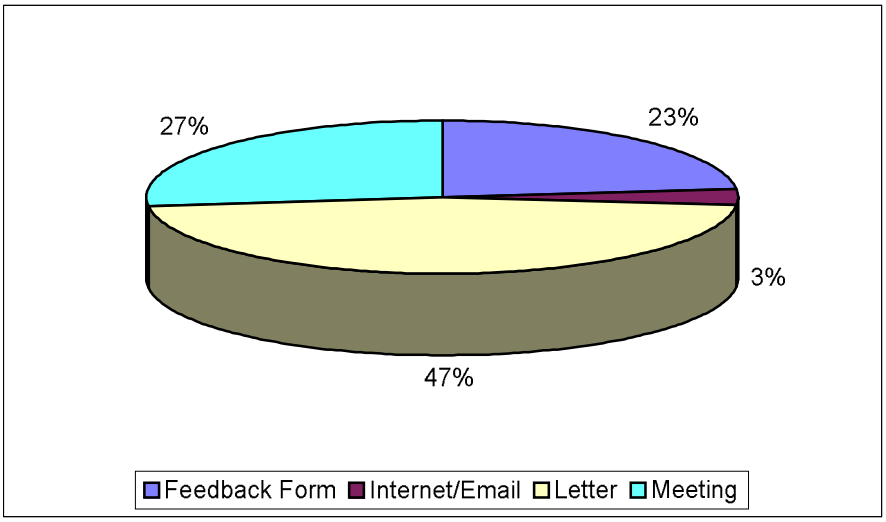
2.3 FEEDBACK AND COMMENTS

Figure 2-2 provides a breakdown of how comments were received. In addition to public meetings, comments on the ESIA and project have been sought via:

- Feedback forms distributed along the route in pipeline affected communities and available at sites housing ESIA documentation. These forms could be:
  - Completed and handed to the ESIA team during the community road show
  - Handed in to the BTC land team during their visits to communities
  - Mailed directly to the BP Azerbaijan head office
  - Deposited in drop boxes at the local library, municipal hall or other public buildings. The boxes were collected regularly by the BTC land team
- Feedback via the Internet site.

Formal, written responses to the draft ESIA were received from the Ministry of Environment and Natural Resources, the BP Research and Monitoring Group as well as several NGOs. BTC Co. acknowledges and appreciates the effort that went into producing these detailed reports.

Figure 2-2 Methods of Response



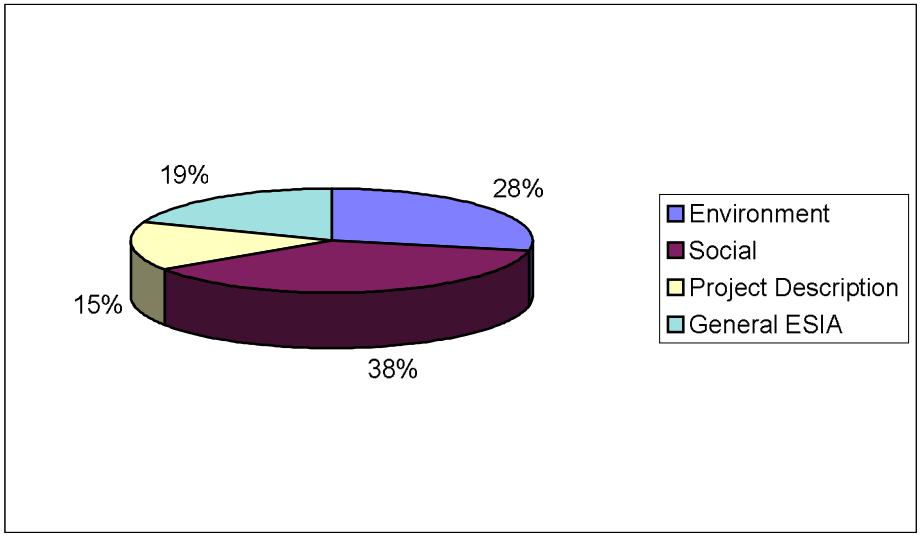
Comments from all sources have been collated into a single disclosure database, which the environmental and social consultants have analysed and used to prepare this Addendum. This database covers both BTC and SCP disclosure, as in general feedback was received that related to both pipelines. Where extensive reports or letters were received from a stakeholder, they have been broken down into topics and inserted into the appropriate section of the database. Responses have therefore not been provided to these reports as a whole, but rather to the individual comments where appropriate.

The database (sample illustrated in Appendix B) recorded the following information:

- Computer assigned entry number

- Date comment received
- Source of comment by principal stakeholder group
- Issue
- District from which the comment was received
- Organisation (if recorded)
- Name (if recorded)
- Method used for feedback (i.e. meeting/feedback form, etc)
- Comment or summary of comment.

Figure 2-3 Responses by Topic Area



By 15 August, 788 comments were recorded in the database. Figure 2-3 provides a breakdown of the type of feedback received. Of the 788 comments, 28% related to environmental issues, 38% to social or socio-economic issues, 15% to details of the project itself and 19% more generally on the ESIA process. Figure 2-4 and Figure 2-5 provide a breakdown of the number of comments received on environmental and social issues respectively. Access to the full database will be available on request to BP in Azerbaijan.

Sections 4 to 8 of this Addendum provide a summary of each of the issues recorded in the database, plus a response or appropriate revision of the ESIA. Full references to the appropriate section of the ESIA are also provided to facilitate comparison.

Figure 2-4 Analysis of Environmental Comments

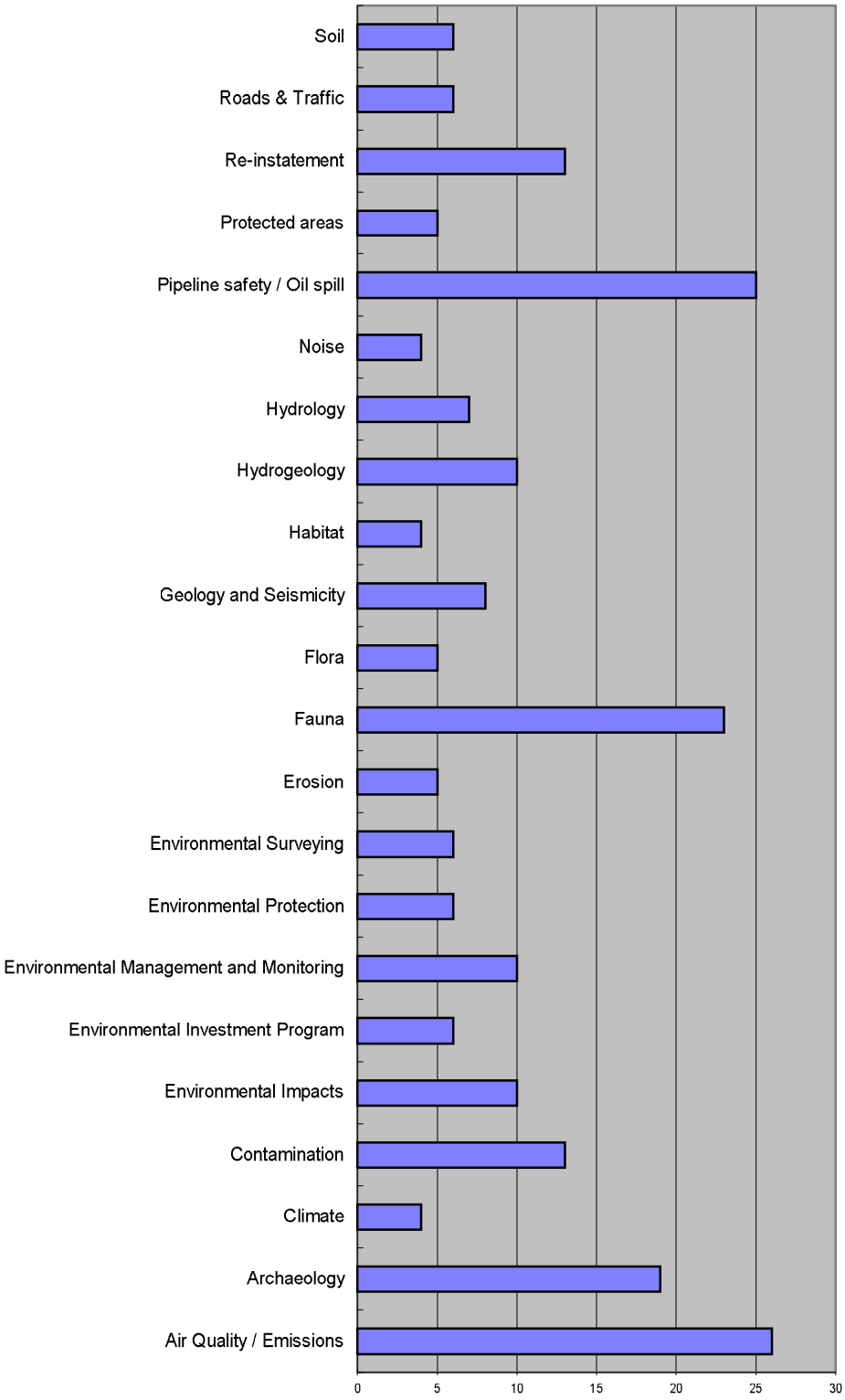


Figure 2-5 Analysis of Social Comments

3 PROJECT DESCRIPTION UPDATE

3.1 ROUTE REFINEMENT

Pipeline routing is an iterative process; the route is progressively refined during development of a project. The ESIA was based on Route 010 whereas the current version of the route is 011. The differences are very small and none exceed 250m in length; the most significant deviations are shown in the figures in Appendix A. None of the proposed minor route modifications has any significant negative impact when compared to the originally assessed route (Route 010).

3.2 DESIGN DEVELOPMENT

The project design has continued to develop during the period between the issue of the ESIA Draft for Disclosure in May 2002 and the preparation of this Addendum in August 2002. Table 3-1 below describes both:

- The significant developments to the project plans that have taken place which now form part of the base case proposal for the project, and
- The preliminary plans proposed by the Contractors that are considered likely to become part of the base case.

Table 3-1 Project Description Update

Subject	Text in Draft for Disclosure May 2002	Revision
Project Phases	The BTC pipeline project is a phased development focused on the following targets: • The BTC Phase 1 Development will enable the BTC Pipeline System to transport approximately 500 thousand barrels per day (mbd) of crude oil • The BTC Phase 2 Development will increase the capacity of the BTC Pipeline System from approximately 500 mbd to 1,011 mbd and will include expansion of certain facilities developed during the Phase 1 Development	During Phase 1 the system will transport up to approximately 580 mbd.
Project Schedule	The design and preliminary survey work required for the BTC pipeline commenced in 2000 and is ongoing. It is anticipated that the main BTC construction contract(s) will be awarded in mid 2002 with the aim of the main construction work commencing in Spring 2003. The pipeline construction period in Azerbaijan is likely to last for approximately 15 months. Filling and commissioning of the line is dependent on the completion of associated projects in Azerbaijan, Georgia and Turkey and is programmed to commence in mid-2004.	Filling of the line is dependent on the completion of associated projects in Azerbaijan, Georgia and Turkey and is programmed to commence in late-2004. At the latest, it is anticipated that the entire BTC pipeline system will become operational by early 2005.
BTC pipeline material	As a result of the engineering and constructablity analysis, and based on using API 5L Grade X70 grade steel, it is currently anticipated that five standard pipe wall thicknesses (12.7, 13.5, 14.3, 15.9 and 19.1mm) will be used for the project in Azerbaijan.	It should be noted that the precise range of wall thicknesses is to be verified as part on ongoing design. Wall thicknesses will be determined on the basis of pipeline operating pressures, ground profile at any one location, and the risks posed to safety and the environment associated with particular sections.
Leak Detection	The leak detection algorithm will be designed with the aim of identifying any leaks in excess of 1.0% of the flow rate being measured (from start-up through full flow). The system may also be able to identify smaller leaks over a longer period of time.	The leak detection algorithm will be designed with the aim of identifying any leaks in excess of 1.0% of the flow rate being measured (from start-up through full flow) in the shortest practicable time. The system may also be able to identify smaller leaks over a longer period of

Subject	Text in Draft for Disclosure May 2002	Revision
		time.
Pipeline Infrastructure	The BTC pipeline system will also include two dedicated intermediate pigging stations in Azerbaijan, pigging facilities integrated within the pump stations, a number of valve stations, a cathodic protection (CP) system, an optical fibre communications system, a leak detection system, and a computer-based Integrated Control and Safety System (ICSS). The system design has been based on fully automatic operation, however, some equipment at the pump station (PS A2) will require routine manual intervention. The Sangachal Terminal and the intermediate pump stations will be permanently manned.	The BTC pipeline system will also include two dedicated intermediate pigging stations in Azerbaijan (these are considered optional at present), a number of valve stations, a cathodic protection (CP) system, an optical fibre communications system, a leak detection system, and a computer-based Integrated Control and Safety System (ICSS). Design has been based on fully automated remote operation from Sangachal or Ceyhan terminals. The intermediate pigging stations in Azerbaijan are optional only, dependent on ongoing waxing studies and are no longer within the base case.
Block Valves and Other AGI's in Azerbaijan	18 block valves, 3 check valves, with additional block valves at intermediate pigging stations and pump stations	There will be 20 block valves, 3 check valves, with an option to include one or both additional intermediate pigging stations in place of one or two block valves.
General description of pump station facilities	Description of facilities at the pump station included: firewater system including fire ring main, jockey pumps, an electrically driven fire pump, two diesel driven fire pumps, fire monitors, foam monitors, a deluge system within the pump house, sprinkler systems within all buildings, and a retention pond	There will in addition now be a firewater storage tank.
General description of pump station facilities	The future pump station, PS-A2, is expected to occupy an area of approximately 8 to 9 hectares and will include the following facilities: • Three diesel/natural gas fuelled generators to provide on-site power generation	On-site power generation is initially provided by three (two duty and one standby) diesel fuelled generators, followed by three (two duty and one standby) gas fuelled generators when SCP gas becomes available. The diesel fuelled generators will be retained as "back-up" in the event of loss of SCP gas.
General description of pump station facilities	Local control room, controls and telecommunications system with an uninterruptible power supply (UPS), offices, warehousing, workshops, accommodation and a security gate house	There will also be electrical sub-station

Subject	Text in Draft for Disclosure May 2002	Revision
Facilities power generation	Power generation at pump station sites will be achieved by 3 diesel generators, each providing 50% (1.2 MW) of the sites power requirements. At any one time, two generators will operate while the remaining one generator provides a back-up. Exhaust gases from the generator engines will be emitted to atmosphere via appropriately designed vents. Emergency and essential power will be provided for instruments and telecoms.	During Phase 1, power generation at PS A2 will be initially provided by two (one duty, one standby) 100% rated 1.0 MW diesel fuelled generators. During Phase 2 this will be increased to three (two duty, one standby) 50% rated 1.0 MW gas fuelled generators when SCP gas becomes available.The diesel fuelled generators will be retained as "back-up."
Site storage tanks	A number of storage tanks will be included within the pump stations. The principal tankage will be as follows: • Fire water storage tank • Crude surge relief tank • Storage tank for pump driver diesel supplies (contingent on the adoption of diesel fuel alternative for the pump drivers) • Naptha/residue buffer tank (contingent on the adoption of diesel fuel alternative for the pump drivers) All hydrocarbon storage tanks will be provided with secondary containment designed to minimise environmental impact in the event of a spill.	More than one fire water storage tank is proposed, with a crude topping feed tank, and storage tanks for pump driver diesel supplies. The crude surge relief tank is no longer required and has should be deleted.
Crude topping plant (if required)	A summary of the key features of the CTP is presented below: • The topping plant would be capable of producing up to 248m^3/day of diesel	This quantity is now 290m^3/day.
Crude topping unit	Emissions to the atmosphere from the CTP would be vented through an appropriately designed flare stack.	The emissions from the crude topping plant will be from the pump station flare as well as from the fired heater stack.
Pigging facilities	The intermediate pigging stations will include the following features: • Onsite power generation (two diesel fuelled engine driven generator sets) • Wax/crude transfer pump (for re-injection back into the pipeline from	In the instance of the pump referred to this should read closed drain pumps (for re-injection back into the pipeline system from closed/open drain tanks).

Subject	Text in Draft for Disclosure May 2002	Revision
	closed/open drain tanks or to road tankers for offsite disposal) • Pig handling equipment, including cranage • Pig launcher/receiver • Open and closed drain system • Lighting • Buildings, the most significant of which will be: • A security gatehouse (22m^2) • Administration/maintenance/warehouse building (300m^2) • Pig launcher (100m^2) • Maintenance shelter (100m^2) • Telecoms, ICSS and Power generation (60m^2)	Road tankers and offsite disposal are no longer options being considered. The intermediate pigging station will also include: • Waste water treatment facilities • Diesel storage • Service water It should also be noted that studies are currently underway to determine whether some or all of the pigging stations in Azerbaijan are surplus to requirements. The ESIA represents the worst case scenario.
Control / telecommunications systems	If multiple simultaneous failures occur, communications could be lost to any stations between the failure points, but the operation and safety of the isolated sections of the pipeline system will be maintained under control of the local station ICSS.	The operation and safety of the isolated sections of the pipeline system will only be maintained under control of the local station ICSS when necessary.
Control / telecommunications systems	In the event of single or multiple failures of the communication system, satellite links will be available to provide essential voice co-ordination between operating personnel at strategic locations. Telephone/facsimile co-ordination of these strategic stations, operating in local mode, is expected to be an adequate contingency until primary communications are restored. The strategic stations will include all pump stations and the main control centres at Sangachal and Ceyhan.	A safety analysis has been commissioned to review continuing pipeline operations in the event of the scenarios described in this paragraph. The provision of satellite communication facilities to provide telephone and fax services in the event of pipeline cable breaks is now regarded as optional. The control / telecommunications system has been devised so that it will automatically commence a safe shut-down of the pipeline system two minutes after the failure of communication.
Construction overview	Construction of the pipeline and associated facilities will be undertaken by a contractor, or multiple contractors, experienced in major pipeline construction,	During August 2002 contracts were placed with CCC to build the Azerbaijan section of the pipeline and with

Subject	Text in Draft for Disclosure May 2002	Revision
	who will be contractually obliged to complete the works in accordance with applicable government regulations and requirements, project permits and authorisations and BP policies, plans and specifications.	Spie-Capag to build the pump stations.
Preliminary Planning Pipe-yard and Camp Sites Selected	Locations that were reviewed in the ESIA as potential pipe yards or construction camps are as follows: • Mugan • Kurdamir • Udjar • Leki • Guvekend • Yevlakh • Ganja • Deller • Zeyem • Boyuk Kesik • Poylu	Preliminary pipe yard and construction camp sites have now been viewed by the Construction contractor and the following are now being considered: • Mugan • Kurdamir • Leki • Yevlakh • Ganja • Poylu
Construction camps	It is anticipated that each camp will measure at least 500m by 500m and include the following facilities: • All communications – telephone, data and postal services, pay phones • Paved roads and hard standing for lorries and car parking (concrete or asphalt)	To avoid any misunderstanding it should be noted that: • The communications facilities mentioned are for official project-related use • Any roads that are installed within the construction camps will be either surfaced or hardstanding (ie possible gravel) so that they can safely accommodate all relevant plant and vehicles in the prevailing weather conditions.
Field coating	The BTC pipeline will be supplied with a factory-applied three-layer polyethylene coating. Field coating will be applied to all welds, fittings and areas where the factory coating has been damaged to provide a continuous coating along the BTC pipeline. Following welding, the joint area will be grit-blasted and a primer coat applied. The final polyurethane pipe coating will subsequently be applied.	Field joint coating will be a eurethane modified epoxy.

Subject	Text in Draft for Disclosure May 2002	Revision
Wax removal	Maintenance pigs will be used to remove or re-entrain wax that collects within the BTC pipeline or block valves. Following each pigging run the contents of the pig receiver will be drained to facilitate the removal of any residual wax collected by the pig. It is intended that collected wax will be pumped back into the BTC pipeline upstream of the mainline pumps. Alternatively, the oil may be warmed or pressurised to keep the wax entrained in the crude oil as it passes through the receiver. As a result of these measures, it is not anticipated that significant off-site disposal of waste waxes will be required in Azerbaijan.	Maintenance pigs will be used to remove or re-entrain wax that collects within the BTC pipeline. The oil will be warmed to keep the wax entrained in the crude oil as it passes through the receiver. As a result, it is not anticipated that significant off-site disposal of waste waxes will be required in Azerbaijan. Road tankers and offsite disposal are no longer options being considered.
Pump stations	At present, it is planned that pump station PS-A2 will be constructed on an area of agricultural land adjacent to the pipeline at approximately KP244. An alternative location for the pump station is currently being assessed. The new location is a parcel of municipal land to the west of the site discussed in this report, and to the east of the road that runs parallel to the Karabakh Canal. It is likely that the environmental factors associated with alternative location will be similar to, or less than, those assessed for the current location. However, specific environmental assessments will be conducted for the new site should the engineering studies indicate that re-siting would constitute a preferable option.	Evaluation of the alternative location has confirmed that it is preferable to the original location for engineering, environmental and social reasons. The new location is described and discussed in Section 3.3.2 and Appendix C of this Addendum.
Metering Station	Within Azerbaijan, a fiscal metering station will be installed at the Sangachal Terminal on the upstream side of the main line oil pumps. The next fiscal metering station along the BTC pipeline will be at the first Georgian pumping station, located just west of the Azerbaijan/Georgian border. These metering stations are considered in the ESIAs for Sangachal Terminal and Georgia respectively and they are not therefore considered further in this document. They do, however, contribute to the leak detection system for the pipeline in Azerbaijan. Operational metering systems, based around ultrasonic testing devices, will be provided at the pump station to support the management of the pipeline system.	In addition to those fiscal stations described there are also proposals to have additional tie-ins at Sangachal for third parties downstream of the ACG metering and upstream of the MOL pumps. Each of these would, if installed, include fiscal measurement of flow. Further, the final sentence should be as follows: Ultrasonic metering systems, will be provided at the head pump station to provide direct inputs to the leak detection and management of the pipeline system.

Subject	Text in Draft for Disclosure May 2002	Revision
Helicopters	Provision will be made for the use of helicopters to support normal operations. In particular, they may be used to facilitate routine surveillance of the BTC pipeline corridor. The strategic locations and the minimum requirements to facilitate helicopter services will be developed during the detailed design.	Provision will be made for the use of helicopters to support emergency operations. In particular, they will be used to facilitate emergency response, such as medical evacuation or spill equipment. The strategic need, locations, and the minimum requirements to facilitate helicopter services will continue to be developed during the detailed design.
Operation	It is expected that pump station PS-A2 would be permanently manned by up to 10 personnel and that approximately 20 to 30 further staff will be employed along the pipeline. The intermediate pigging stations would not be permanently manned by technical staff, but would typically have a crew of five workers during a pigging run. It is anticipated that security personnel will be present at the pigging stations on a permanent basis. Block valve sites would not be staffed under normal operating conditions.	Pump stations are now to accommodate up to 12 operational staff. As the intermediate pigging stations are now considered optional, consequently any manning requirements are dependant on this option being taken up. No operational manning is anticipated except for permanent security personnel.
Operation	Each pigging station will be supplied with raw water by means of a water truck, or where necessary bottled potable water. An above ground service water storage tank will provide on-site water storage capacity. An anticipated peak flow water requirement of $5m^3$ per hour is expected for the pigging stations	As the intermediate pigging stations are now considered optional, any such requirements are dependant on this option being realised.

3.3 IMPACT OF UPDATES TO PROJECT DESCRIPTION

3.3.1 General

None of the changes to the project description will result in any increased adverse environmental or social impacts. The revised location of the pump station, however, reduces the impacts of this facility as discussed in Section 3.3.2.

3.3.2 Revised Pump Station Location

The revised position of PS-A2 is on a parcel of municipal land about 600m to the west of the location discussed in the ESIA near KP 244. The orientation of the site and its relationship to the village of Yardili and local infrastructure is shown in Appendix C.

The new location offers several environmental, social and engineering advantages. Specifically the new location:

- Does not affect local landowners or any productive agricultural land. The former site was situated in agricultural land and cut through the middle of several productive and cultivated land plots. The new site places the pump station outside of the agricultural land removing the impact to productive land and interruptions to the cultivation cycles of the local landowners and users.
- Is adjacent to a road so does not require a long access road, thereby reducing the overall landtake
- Is further from the village of Yardili, thereby reducing the possibility of noise disturbance during construction or development of the pump station
- Does not significantly alter the air quality modelling presented in the ESIA
- Will be less visible when viewed from the village of Yardili and from the east as the site will be seen against the banks of the Karabakh canal
- Offers better opportunities for reducing the visual impact of the facility by planting trees to the north and south of the site.

4 RESPONSE TO COMMENTS: GENERAL

4.1 INTRODUCTION

Sections 4 to 8 of this Addendum address the comments received on the BTC ESIA Draft for Disclosure up to and including 15th August 2002. This effectively constitutes a disclosure period of approximately 75 days. As described in Section 2, all comments received have been logged into an electronic database. The comments are addressed in the following sections on a topic-by-topic basis, as logged into the database. The comments have been grouped into common issues and each issue is summarised into a sentence or paragraph (*printed in italics*), followed by a response to the issue (printed in plain text). For ease of reference, the sections also endeavour to follow the layout of subject headings within the ESIA documentation. This Section addresses comments of a general nature, Section 5 addresses comments related to the Project Description, Section 6 addresses comments related to environmental matters and Section 7 addresses comments related to social issues. Section 8 addresses comments on the management and monitoring of both social and environmental issues.

4.2 POSITIVE SUPPORT

Positive support for the project was received from a number of stakeholders, in particular from community members, primarily via feedback forms. In general, community members felt the pipeline would bring infrastructure and economic benefits as well as a community investment programme to areas around the pipeline. Support was also voiced for the standard and content of the ESIA.

4.3 ESIA METHODOLOGY

Several general comments were received regarding the methodology used to conduct the ESIA. These included requests that the project conduct a systematic assessment of the social and environmental impacts and develop mitigation measures on key issues. Certain specific queries were raised on some of the assessment ranking tables in Section 7 of the ESIA (ESIA Methodology).

Particular queries that were raised included:

- *Uncertainty as to whether EU and UK standards were being used to determine environmental impacts on issues such as air emissions, noise, water and dust*
- *Clarification of the error possibilities in determining distribution indices in Figure 15.1*
- *The comments that cumulative impacts should be assessed from all types of activities within the project (e.g. dust, noise, air emissions).*

Many of the comments revealed some confusion over the process and the terms and tools used when conducting an ESIA rather than a complaint over the methodology itself. The section on ESIA methodology (Section7) provides a 'signpost' to the rest of the ESIA sections, describing the entire ESIA process, including how impacts on each aspect of the environment and social issues are

assessed and ranked. The project specific assessment is undertaken in Sections 10 (Environmental Impacts) and 11 (Social Impacts), where a level of impact is assigned and mitigation measures are discussed. Residual Environmental and Social Impacts are discussed in Section 12. EU, UK and other International Standards form the basis of the assessment tables, provided in Section 7, against which the project has been assessed and so are integral to the ESIA process.

The distribution of Environmental Impacts, shown in Figure 15.1 is purely indicative and is based on professional judgement, as opposed to numerical calculations. Its purpose is as a visual tool to summarise the results of the ESIA.

Cumulative Impacts (Section 13) have been specifically assessed on an issue basis rather than documenting them as a project-by-project comparison.

4.4 ESIA DOCUMENTS

4.4.1 Documentation

It was noted that literature reviews formed part of the basis of many of the baseline studies, however there was concern that there were no references to original sources in the ESIA documentation. There was also concern that there had therefore been no analysis of scientific literature, particularly from Azerbaijani sources, that could have been used as a basis for the baseline studies.

The reports in the Baseline Appendix Volume consist of information gathered and synthesised from both literature reviews, compiled by Azeri Scientists, and field survey data, collected during surveys involving Azeri experts. In many cases, original sources were not referenced in specific sections of the main ESIA document. However, all sources have been referenced either in the Baseline Appendix Volume or in the list of references provided in Section 18 of the main ESIA volume.

4.4.2 Maps

The scientific community of Azerbaijan has expressed concern that the maps provided in the ESIA documentation are not politically sympathetic to, and do not accurately reflect, the territory of Azerbaijan. Of particular concern is the following:

- *Use of Russian rather than Azeri base maps for the environmental and social mapping volume, hence all place names are in Russian. These maps are undated and some map legends are in Russian*
- *On certain figures, Nakhichevan is named separately and shown in a different colour to Azerbaijan*
- *The map on the cover of the ESIA documents does not accurately reflect the relative lengths of the international borders of the countries shown*
- *The entire territory, including occupied territories of Azerbaijan have not been shown on some of the maps. Where occupied territories are shown, names of settlements within the occupied territories have not been provided.*

The Project have used base mapping obtained through the State Land and Cartography Committee of the Azerbaijan Republic. The mapping obtained was,

however, produced in the Soviet era and therefore, by default, the place names are in Russian. Wherever possible, the most up-to date mapping has been used. However it is recognised that the base mapping for the ESIA is often over 20 years old and that features such as settlements and rivers may have subsequently changed (often in both name and size). BP therefore flew the route in summer 2001 to obtain up-to-date aerial photography. This is presented, together with the base mapping, and selected photographs of the route, in Figure 5-1 of the ESIA.

The map on the cover of the ESIA is very small-scale and has been developed purely as a schematic representation of the region.

The maps provided in the ESIA were not intended to provide exhaustive detail of the settlements and rivers of the whole of Azerbaijan; they generally represent features close to the pipeline route corridor only. Wherever possible, settlements along the route of the pipeline have been referred to using their current accepted Azeri name. Since the maps are generally required to focus on the area around the pipeline corridor, the entire territory of Azerbaijan is deliberately not shown. Where Nakhichevan is shown, every effort has been made to illustrate it in the same colour as the rest of Azerbaijan, except where data was not available (e.g. Figure 8-3, Mean Annual Precipitation Map for Azerbaijan; Figure 8-6, Tectonic Units and Associated Faults).

4.4.3 Translation

Numerous queries have been raised, and clarifications requested, related to the translation of the ESIA documents into both Russian and Azeri from the original English text. There are cases where the meaning of a sentence or term may have become ambiguous in the Russian and/or Azerbaijani ESIA documents or the exact meaning may have changed. This was particularly noted in the sections on Flora and Fauna and the Glossary of Terms. It was also noted that the figure and table numbering, in some sections of the Russian and Azerbaijani documents was not correctly referenced. In addition, concern was raised that the translated text, particularly Russian, was sometimes too small to be easily read on some maps and figures.

Every effort has been made to provide ESIA documents in both Russian and Azerbaijani that are well translated, edited and presented. The Glossary of Terms, including the English/Latin/Russian/Azerbaijani flora and fauna glossary has been complied in conjunction with both local and western experts. However, it is recognised that translation into these languages may have inadvertently introduced factual errors and ambiguity into the original English text. BP is continuing to work with the translators to produce high quality Azerbaijani and Russian versions of all future ESIA documentation, in order to meet our commitment to producing culturally acceptable reports.

It is recognised that translation from English, particularly into Russian Cyrillic, often increases the amount of text characters required. Therefore, to fit onto the maps and figures, it was necessary to decrease the font size in some cases.

4.5 FINANCE

Several relatively varied queries were received about finance, primarily to clarify or confirm information within the ESIA. This included clarification of:

- *What the economic benefits of the pipeline will be for Azerbaijan*
- *Whether there would be any payments to the Azerbaijan rail authority for transportation through Azerbaijan*
- *How revenues from the project to the Azerbaijan government will be spent. There were also requests that this process be transparent and support communities affected by the project.*

Economic benefits of the pipeline are covered in Section 11.3 of the ESIA and within the Regional Review, entitled the 'Economic and Social Implications of ACG/BTC (and Shah Deniz) in the Regional and National Context'. This document will be made publically available once completed. The regional review also discusses the issues of state revenues from the project, as well as the management of the State Oil Fund, a development fund set up from government oil revenues.

The project will pay the Azeri Rail authority directly for all services provided.

4.6 LEGISLATION

The disclosure process brought to light new environmental legislation that was enacted in April 2002.

This legislation has been brought to the attention of the project legal team for further analysis of its relevance to the project.

5 RESPONSE TO COMMENTS: PROJECT DESCRIPTION

5.1 PROJECT DESIGN

5.1.1 Oil Composition

Data on the sulphur content of the oil has been requested.

The sulphur specification for all oil entering the BTC system (primarily ACG crude) is 1480mg/kg and the H_2S content must be less than 10ppm by weight.

5.1.2 Pipeline Routing

Justification has been requested for beginning with a 10km corridor before moving to a 500m corridor and then a 100m corridor during route selection.

When routing a pipeline it is standard practice to begin with a wide area of search that encompasses the proposed start and finish points. Within this area, major environmental, social and engineering constraints such as international and national protected areas, security zones, mountain ranges, geohazards, major rivers and towns were identified to allow the development of a wide 'corridor of interest' within which the pipeline could subsequently be routed.

Within this 'corridor of interest', which in this case was 10km wide, more detailed constraints information was developed so that a narrower 'preferred corridor' (500m wide) could be identified. Further detailed information, including field surveys was then obtained to allow the definition of a 'specified corridor' (100m wide) and ultimately a 'construction corridor' (44m wide for the BTC and SCP pipelines).

The 10km, 500m and 100m wide corridors have all been presented to the Government of Azerbaijan and their comments have been taken into account.

The routing process is described in more detail in Section 4.6 of the ESIA.

5.1.3 Pipeline Design

Several aspects of the pipeline design have been questioned, specifically:

- *The logic behind a design life of 40 years for the BTC pipeline, 30 years for the AGIs and 20 years for the mainline oil pumps and drivers*
- *Why the minimum wall thickness is 12.7mm in Azerbaijan but 14.7mm in Georgia*
- *The total length of the BTC pipeline, as there is a discrepancy between 1760km given in Section 1 and 1750km elsewhere in the documents*
- *The type of concrete used for pipe protection in waterlogged areas.*

The differences between the design life of the pipeline, the AGIs and the mainline oil pumps and drivers reflect the ease of maintenance or replacement. It is possible to

design a pipeline to last for at least 40 years, provided that it has good corrosion protection and it is desirable to make the pipe last as long as possible as it is expensive and disruptive to repair or replace a buried pipeline. In contrast, the AGIs, mainline oil pumps and drivers have components that will wear but are readily accessible for maintenance or replacement. It is therefore economically favourable to adopt a shorter design life but accept that some components will need replacing before the pipeline reaches the end of its life. An ongoing programme of maintenance will ensure the timely replacement of any worn components.

The selection of the material properties and the wall thickness of the line pipe to be used for each section of the pipeline is explained in Section 5.5.9 of the ESIA. The engineering teams took particular account of:

- International standards and design guidelines
- The anticipated loads that will be applied to the pipe, including those associated with potential seismic events
- Hydraulic optimisation
- Local social and environmental conditions including a full environmental sensitivity study
- Manufacturers' standard production specifications supplemented by specific project requirements to ensure/improve quality
- Limiting factors associated with the constructability of the pipeline (e.g. ease of welding) and the robustness of the line pipe during construction operations.

It is therefore not surprising that a different minimum wall thickness may be appropriate in different countries. The same safety standards are applicable over the entire length of the pipeline.

1750km is the correct two-dimensional length; it does not take account of topography.

Where required for pipe stability, concrete weight coating of between 90 and 150mm will be used to achieve a stability factor of 1.1 (empty pipe).

5.1.4 Helicopter Sites

Clarification of the number and design of helicopter take-off and landing sites has been requested.

Within Azerbaijan there will be a single helicopter site for the BTC project located at the BTC Pump Station (PS-A2) at KP 244 near Yardili. The Pump Station drawing in Appendix C shows the location, layout and landtake for the helipad. It is not proposed to use helicopters for frequent, routine pipeline operations. The helipad will have a tarmac surface that will measure 40m x 40m, with overall dimensions, including a safety zone, of approximately 270m x 100m.

5.1.5 WREP Experience

A number of comments were received, particularly from community members, on previous poor experience associated with construction and operation of the WREP. These related primarily to:

- *Degradation of roads*
- *Damage to irrigation channels and water pipes*
- *Inability to continue cultivating land above the pipeline or in the exclusion zone.*

Any concerns relating to the WREP have been passed on to the WREP project team. The BTC project has been designed to take into account the lessons learned from these projects, particularly in the areas of land, water resources and roads. It is expected that the measures developed will minimise grievances in this area. Nonetheless, a community channel for complaints will be established to identify any issues of concern, either with the Construction Contractor or with the BTC project in general, so that these can be more effectively managed. A specific grievance procedure will also be developed for any grievance on land issues.

5.2 PIPELINE CONSTRUCTION

5.2.1 Interface with Construction Contractor

A considerable number of comments have been received that relate to issues that are the responsibility of the Construction Contractor.

At the time of writing the ESIA a Construction Contractor for the pipeline and AGIs had not been appointed. During August 2002 contracts were placed with Consolidated Contractors International Company (CCC) to construct the pipeline and Spie-Capag to construct the pump station within Azerbaijan. Prior to initiating any construction work, the Contractors are required to prepare detailed plans for the management of issues such as:

- Camp locations
- Hydrotest details
- Reinstatement details
- Waste disposal locations including incineration and sewage disposal.

Within the ESIA we identified a number of potential construction camp locations. The Construction Contractor is currently evaluating these options and will decide shortly which ones will be used.

A survey of potential sources of hydrostatic test water along the pipeline route has shown that the number of reliable sources that can supply sufficient volume is limited. The discharge location(s) cannot be determined until the Construction Contractor has developed his hydrotest plan to take account of available equipment as well as detailed pipe profiles. Further details of the Hydrotest Programme will be discussed with appropriate Governmental Bodies once available.

A summary of the Reinstatement Specification for the project is provided in the ESIA. The Reinstatement Specification addresses both erosion control and biorestoration. In addition, a Biorestoration Technical Advice Note is being prepared to help the Contractor meet the requirements of the specification.

The requirements for waste management have been communicated very clearly to the Construction Contractor and will be rigorously monitored by BTC Co during construction. A Waste Management Specification sets out mandatory standards.

The Contractor is required to prepare a Waste Management Plan prior to construction, which outlines how they will achieve these standards. This Plan is subject to approval by BTC Co.

5.2.2 Use of Pipe Yards

We have been asked to explain in greater detail the activities that will take place at the pipe yards and to address the management of any hazardous materials (such as chemical cleaning fluids, degreasing solvents and corrosion inhibitors) that may be stored there. Clarification has also been sought about which yards will be used by the Construction Contractor.

The main purpose of a pipe storage yard is to store coated line pipe that has been delivered to the yard (by rail or road) and is awaiting delivery to the pipeline ROW. The yards will also be used for the maintenance and repair of the cranes and associated equipment that are required for handling the line pipe. There may also be some maintenance of other construction plant, equipment and vehicles associated with construction of the pipeline.

At the pipe yards there will be some office and welfare facilities for the personnel involved in the pipe handling and storage activities. It is anticipated that generally domestic liquid waste and sewage will be kept in buried holding tanks until removal for safe treatment elsewhere. However, if the pipe yard is located close to an existing, operating sewage handling system with spare capacity, that system may be utilised instead.

Substances that are stored and/or used at pipe yards typically include:

- Diesel fuel, for vehicles, cranes and equipment
- Lubricating oils, lubricants and greases
- Cleaning liquid and paints
- Industrial gas and LPG bottle-type containers
- Detergents and cleaning fluids
- Adhesive (for pipe coating repair purposes).

There is no requirement for storing or applying corrosion inhibitors.

The Construction Contractor will develop project specific health, safety and environmental (HSE) management plans which address all relevant aspects of HSE including the use of hazardous materials, prevention and control of spills and the protection of employee health and safety. The development and implementation of these plans is a contractual requirement. The plans will be subject to review and endorsement by BTC Co. prior to Contractor mobilization and implementation of the plans will be monitored through assurance processes set up by both the Contractor and BTC Co.

The sites to be used will be chosen by the Construction Contractor from the list of potential sites identified in the ESIA.

5.2.3 Use of Resources

Clarification has been sought on whether local resources such as water or aggregate will be needed by the project.

The project is currently designed to have little impact on community water sources as explained in Section 11.5.1.3 and Table 11.5, Issue I9. Full consultation will be carried out before use is made of any community water sources.

The use of local aggregates and other local goods and services is covered in Section 11.3.1.3 and Table 11-1 of the ESIA, where commitments are made to maximising opportunities for the provision of local goods and services.

5.2.4 Trenching and Backfilling

We have been asked to indicate the width of the excavated trench, the volume of surplus subsoil that may remain after backfilling and the fate of any surplus subsoil.

The width of the trench will typically be 1.5-2.5m, but will depend on a number of factors such as burial depth, soil type, ground stability and seismic considerations.

Trench width will vary with topography; as the depth of burial increases the width at the top of the trench increases. In rocky or stable ground the width at the top of the trench will be almost the same as at the bottom of the trench, i.e. approximately 200mm greater than the width of the pipe. In soft ground the base will be a similar dimension, but the top width will be greater as the sides will be sloped to ensure stability of the open trench. In the vicinity of fault line crossings a trapezoidal trench configuration will be used, as explained in Section 6.4.2 of this Addendum, which will increase the dimensions of the top and the base of the trench. In all instances the Contractor will seek to minimise the amount of soil removed to that volume necessary for a safe trench.

The majority of excess soil remaining after backfilling will be spread thinly over the construction corridor before the topsoil is replaced. In some areas, where ground conditions dictate, the requirement for disposal sites may arise but probably only for relatively small amounts of very stiff subsoils (e.g. mudstones). It is possible that in these areas there will be excess subsoil that cannot be spread over the construction corridor that will need to be disposed of off site. It may be possible to make this subsoil available to local communities. If disposal is required, suitable sites will be identified by the Contractor, and will be subject to approval by BTC Co. The Waste Management Plan will cover disposal of excess soil.

5.2.5 Horizontal Directional Drilling

We have been asked to provide details of the equipment that will be sited at the drill sites and to explain the treatment of cuttings.

Typically the following plant and equipment will be used for an HDD, although exact details will depend on the specific requirements at each crossing:

- Horizontal directional drilling rig
- Power packs
- Mud mixing unit

- Recycling plant with de-silters and de-sanders
- Mud motors and pump
- Drill pipe, in 9.3m lengths
- Magnetic guidance system
- Reamers and hole openers
- Mobile office and canteen.

An area of approximately 40m^2 is required to set up the drill rig. On the opposite side of the crossing an area of approximately 25m by 30m is required for the exit pit and mud lagoon. The area of the lagoons may vary, but will generally be around 5m by 10m, and 1.5m deep.

During drilling, rock cuttings are brought to the surface in the drilling fluid. They are passed through the recycling plant where they are filtered out and allowed to settle in a pit. On completion of drilling, the bentonite slurry and drill cuttings will be sampled and analysed before being taken off-site in approved road tankers, to a suitable waste disposal site. Disposal options proposed by the Contractor are subject to approval by BTC Co.

5.2.6 Reinstatement

One respondent stated that no contingency plans appear to have been considered for Right of Way restoration if the duration between BTC and SCP construction is significantly more than the anticipated one year.

If SCP is delayed for more than a year then the BTC pipeline will be fully reinstated. This is fully addressed in the Reinstatement Specification, which is summarised in the ESIA Technical Appendix Part 5.

We have been asked to define the time of year at which visual assessment will be undertaken to determine the erosion classes as defined in Table 3-1 of the Summary Reinstatement Plan (Technical Appendix Part 5).

The definitions are not dependant on observations being made at any particular time of year but should take account of any recent extreme, short duration, weather conditions (e.g. particularly heavy rainfall or very high winds).

The adoption of erosion class 3 or lower as the benchmark for reinstatement has been challenged.

Erosion class 3 was chosen as the benchmark because it represents increased stability for the more unstable sections of the pipeline, but is considered attainable. It would be unrealistic to reinstate sections that are currently erosion class 5 or 6 to a higher specification than erosion class 3. Furthermore, excessive stabilisation could cause other environmental damage, which would offset the benefits of reducing the erosion risk. Land that is currently erosion class 1 or 2 will be reinstated to that standard.

We have been asked to explain what erosion matting looks like.

Erosion matting is a woven mesh fabric that is made from jute or a similar biodegradable material. The Reinstatement Specification calls for the erosion

matting to have an open weave with 11mm x 18mm mesh size, 2mm thick fibres and a mass/area ratio of 500g/m^2. When saturated, the mat will absorb water to 500% of its dry weight.

Some respondents speculate that it will take 70 – 700 years to restore soil fertility.

Data from previous pipelines worldwide does not support this concern. Crop yields typically return to normal in 1-5 years after construction. Restoration of agricultural land is generally considered complete when there is no measurable crop loss in terms of quantity or quality.

The preservation of soil resources, when stored for a long period of time, is a cause for concern among some respondents. Sowing with seeds immediately after reinstatement has been suggested as a potentially useful technique.

Section 10.3.6.1 of the ESIA acknowledges the inverse relationship between soil fertility and the duration of soil storage, and explains the measures that will be taken to reduce these impacts. The timing of sowing agricultural land will be at the discretion of the individual farmers. In the desert and semi-desert sections, priority will be given to sowing those areas that are particularly susceptible to erosion or are ecologically important. If sufficient local seed can be obtained, other areas will also be sown.

A suggestion has been received that the reinstated pipeline should be fertilised and sown with nitrogen fixing crops.

Fertilisation of agricultural land will be in accordance with the land owner's requirements. In natural and semi-natural habitats, it would be inadvisable to use fertilisers or nitrogen fixing crops as this could upset the balance of the ecosystem. Most desert and semi-desert species depend on a low nutrient regime.

5.2.7 Testing

We have been asked to provide more certainty about the choice of non-destructive methods for testing welds and to provide information about potential environmental and social impacts.

As described in the ESIA all welds will be inspected according to the requirements of ASME, ASTM and BSI standards. Welds will be visually inspected and then subject to one or more of the following non-destructive testing techniques:

- Radiography
- Ultrasonic testing
- Magnetic particle inspection
- Dye penetrant inspection.

NDT inspectors will be qualified to Level II of the relevant PCN standard or ASTM-TC-1A standard. All NDT methods will be safe for project personnel and communities and will not have significant environmental impacts. There will be no risk to the environment or people resulting from radiation associated with NDT.

Rejected welds will be repaired and re-inspected or replaced as necessary. To minimise the number of tie-in welds completed below ground level, the pipe will be welded into the longest practicable strings, prior to lowering into the trench.

The hydrostatic test will also serve to test the integrity of the completed pipeline and the welds in particular.

Several comments related to the process of cleaning and hydrotesting the pipeline. Specific concern related to:

- *Not knowing the abstraction and discharge locations for the water*
- *The proposal to discharge water back to land or watercourses*
- *Which chemicals may be used to treat the hydrotest water before discharge*
- *Details of the applicable standards.*

There was also a common misconception that the pipeline will regularly be cleaned by flushing with water.

A survey has been conducted looking at potential sources of hydrostatic test water along the pipeline route. This has indicated that the number of reliable sources of water, of the quantity required for the hydrostatic test, is very limited. The detailed hydrostatic test plan will be developed by the Construction Contractor, but is likely to include testing the pipeline in sections, with the water being moved from section to section. Therefore it is currently difficult to predict exact discharge points for the test water. Until the source of the water and the duration of residence in the pipeline is known it is not possible to state exactly which chemicals will be required.

Section 5.12.7.2 of the ESIA describes the rigorous test procedures that hydrotest water will be subjected to before discharge to the environment is allowed. The sensitivity of the receiving environment will be taken into account when determining the suitability of water for discharge; this will include assessment as to whether or not the use of neutralising agents such as magnesium dioxide is appropriate. All water will be filtered before discharge. A Pollution Prevention and Management Plan will be prepared as well as a Hydrostatic Test and Monitoring Plan (or alternatively, this may be a section within the Pollution Prevention and Monitoring Plan). With adoption of these measures, discharge to land, or in some circumstances a surface watercourse, is preferable to taking the water away by road tanker for disposal at a waste disposal site as this has secondary impacts in terms of traffic and air emissions associated with vehicle use.

The choice of additives will depend on the source of the water and the duration of residence in the pipeline. However, use of chemicals will be minimised. Some respondents referred to the inclusion of glycol, cooling water and detergents, but none of these products will be used during cleaning or hydrotesting. The MENR will be informed of the source and discharge locations, the chemicals to be used, and treatment and disposal options as soon as these details are developed.

The applicable standard for hydrotesting is ASME B31.4.

Once the initial hydrotest is complete, no further washing of the pipeline is anticipated.

5.2.8 Waste Management

The number of incinerators and details of their emission control systems has been requested. We have also been asked to clarify which types of waste may be incinerated and to confirm that any buried waste will be buried at a dedicated waste disposal site and not capped in situ.

The Construction Contractor will determine the number of incinerators and their capacity as both parameters will depend on how he organises the work. The emissions control systems will be discussed with the consenting authority before approval is given for any incinerator.

The types of waste that may be incinerated is addressed in Section 5.12.6.3 of the ESIA, which states: "Inert and non-hazardous wastes that cannot be reused or recycled may be incinerated in an incinerator designed and operated in general accordance with EC Directive 89/369/EEC on Municipal Incinerators. Hazardous wastes may be incinerated in an incinerator designed and operated in general accordance with either EC Directive 1994/67/EC or EC Directive 89/369/EEC depending on the waste involved." Re-use of materials will always be considered before incineration is adopted. Any waste for burial will be taken to a dedicated waste disposal site.

The wisdom of spreading any wastes on land for agricultural purposes or transferring hazardous waste to a third party has been questioned.

As stated in Table 5.9 only non-hazardous waste (primarily surplus soil) will be considered for spreading on agricultural land. The composition of wastes will be analysed before disposal to ensure that no contamination of agricultural land (or other receptors) occurs. No agricultural land will be used for disposal without the agreement of the landowner/user.

If any hazardous waste is transferred to a third party, BTC Co. will ensure that the transfer is responsible and within the law. No such transfer will be considered if it could result in environmental damage. All waste disposal will be undertaken by a licensed waste contractor, and transfer consignments will be tracked using waste transfer notes. No waste will be transferred to a third party for re-use unless the end use is known. All waste transfer and disposal will be subject to audit by BTC Co.

We have been asked to consider re-use of activated carbon, which is listed as a construction waste product in Table 5.10.

Activated carbon will be a waste product from water treatment. The carbon will be contaminated with the chemicals it has adsorbed during water treatment, but as for all wastes, re-use will be considered if a suitable end use is identified. Possibilities include use for treatment of more heavily contaminated water, e.g. an effluent stream, or as a fuel stock.

One respondent commented that hazardous waste management should be conducted according to the Basel Convention, which has been ratified by Azerbaijan.

This is acknowledged and is implicit in the adoption of the EU Directives mentioned in Section 5.12.6.3 as the EU is a signatory to the Basel Convention.

We were asked to provide more detailed information about the treatment and utilization of run-off water from the AGIs and other sites.

Areas of the BTC facilities that have the potential to contaminate storm water flows (i.e. specific process and vehicle traffic areas) will have impermeable slabs collecting and directing storm water runoff to appropriate flow balancing and storm water treatment systems. Typically these will either be oily-water separators or sewage treatment units that treat to agreed discharge standards.

Areas that do not have the potential to contaminate storm water flows will, where possible, have permeable surfaces in order to maximise the recharge of clean rainwater to groundwater aquifers.

Reuse of water at all sites will be considered during the development of detailed design in conjunction with the Construction Contractors.

The volume of some of the wastes given in Table 5.10 has been questioned.

There are no extensive forest or woodland areas on the pipeline route in Azerbaijan. However, the number of individual trees to be removed along the length of the pipeline will be minimized, and we currently estimate that in the region of 75 mature trees will be removed over the 442 km. We will look to make good use of any trees that are removed, with the most likely route being to provide the timber to local communities.

5.3 PIPELINE OPERATION

5.3.1 Wax Management

It has been observed that the management of waste wax from pigging operations is not clear.

The philosophy for BTC is to keep all wax in the BTC pipeline system and not to remove it from the traps following pigging operations. Scraper pigs will be used to remove or re-entrain wax that collects within the BTC pipeline. Following each pigging run the pig receiver will be flushed with oil to transport the majority of the wax out of the pig receiver and return it to the pipeline flow. Nevertheless there may still be small amounts of wax recovered from the traps when the pigs are removed from them, despite measures taken to flush the traps. This wax will be manually recovered and stored temporarily prior to disposal. Pigging wax will be disposed of according to the waste management plan for operations and will comply with national and international standards.

5.3.2 Radioactive Scale

A few respondents commented that no data is included on the potential for the accumulation of radioactive scale on the internal surfaces of the pipeline system.

Radioactive scale is found in some offshore installations and is due to radioactive material precipitating out in the water phase with barium sulphate (scale). This scale then builds up on internal surfaces of the plant. The presence of scale is usually

found in equipment that is in 'high water service', particularly where seawater and produced water have the opportunity to mix. For radioactive scale to be an issue for BTC, the following conditions would be necessary:

- The presence of radioactive scale offshore
- Water in the BTC line
- Equipment that is in high water service.

There are operational procedures offshore on the Chirag platform, and there will be procedures for the Azeri platform, which monitor for the presence of radioactive scale. To date, this has not been an issue and this situation is unlikely to change. There is still very little produced water associated with the field as it is relatively immature.

Before crude oil is accepted into the BTC line, the water content must be less than 0.3%. Therefore there is very little water associated with BTC crude. Additionally there are no pieces of equipment associated with the BTC pipeline in Azerbaijan that are in high water service.

It is for these reasons that it is unlikely that there will be radioactive scale build up in any pieces of equipment associated with the BTC plant.

5.4 DECOMMISSIONING

Concern has been expressed about the long-term integrity of decommissioned sections of the pipeline, especially if they are 'underwater'.

As explained in Sections 5.11.1 and 5.11.2 of the ESIA, leaving the pipeline in situ will only be considered if it is not going to cause any environmental harm. If there is any risk, or potential risk, to the environment then the pipeline section will be removed.

5.5 SAFETY AND SECURITY

5.5.1 Pipeline safety

We have been asked about the reliability of the information that there may be anti-personnel mines in the military area that the pipeline crosses between KP 5 and KP 13.

During the design phase of the project, the Ministry of Defence highlighted the land between KP5 and KP13 as an area in which military training activities have been conducted. Our understanding is that the area was used for tank training exercises and that the risk arises from the possibility of unexploded shells rather than from anti-personnel mines.

BTC Co. has held discussions with the MoD regarding this, and other, areas along the route. Under the terms of the BTC HGA the Government of Azerbaijan is responsible for clearance of ordnance from the construction corridor. This work will be conducted prior to construction in these areas.

It has been suggested that a map showing the routes of BTC, SCP and WREP and their crossing points would be useful for emergency planning.

These maps are available but it is not possible to reproduce them in this Addendum as a scale of at least 1:10,000 is required as the pipelines are so close together. We have therefore included a table of the cross over points in Appendix E. A full risk assessment has been conducted which looked at the proximity of these pipelines. A detailed Emergency Response Plan will be prepared.

The safety of the project in relation to communities was raised as an important issue, particularly by community members themselves. This included concerns on how the safety of communities would be managed following the handover of the pipeline to the Government of Azerbaijan and the measures that will be applied to ensure safe oil transportation.

Comments also included requests for awareness raising amongst local communities so that explosives are not used close to the pipeline and buildings are not erected too close to the pipeline.

During public meetings, the general safety features of the pipeline were discussed. These features are covered in Section 5 of the ESIA.

The pipeline has been designed for safe use beyond the handover to the Azerbaijan Government, however responsibility for safety will then be transferred to the Government. This procedure is outlined in Section 5.11.3 of the ESIA.

Awareness raising sessions about safety issues will be held with communities during construction. These will cover safety issues related to both the construction and operation phases of the pipeline. Once it is operational the pipeline will be patrolled daily by inspectors on horseback; these patrolmen will talk to local people about safety issues during the course of their work.

5.5.2 Security

Security was raised as an issue at a regional and local level. The main comments are summarised as:

- *Clarification of who will provide security for the pipeline during construction and operation*
- *Clarification of security measures and of who will be responsible for security; pipelines were identified as a potential focus for terrorist groups*
- *Concern about the potential for human rights violations by any security forces used*
- *Concern that the presence of the project might exacerbate any conflicts within the country or region. An NGO stressed that the project would need to play a role in minimising conflict, and ensuring activities are in line with international humanitarian law, the Geneva Convention and other international standards*
- *Concern that security issues in Georgia could have an impact on Azerbaijan..*

The Regional Review discusses security in detail and the HGA defines the overall responsibility for providing security to the pipeline.

The Azerbaijan Government is responsible for the provision of security to the pipeline from the initial route selection stage onwards. However, day-to-day responsibility for pipeline security remains with BTC Co. During construction, responsibility will be delegated to the Construction Contractors to employ security staff along the pipeline route and at the facilities. Once operational, the pipeline will be patrolled daily any activities that could affect the integrity of the pipeline will be stopped immediately.

The Project is implementing the Voluntary Principles on Security and Human Rights[4], which includes a combination of risk assessments, consultations and working with governments.

Security considerations have been an integral part of decision making on the pipeline route and in the design of the pipeline and its above ground facilities. The objective is to protect the pipeline and reduce the risk of incidents by routing the pipeline as far away as possible from areas with know security concerns and conflict zones.

The Project is taking a role in encouraging host government security partners to demonstrate respect for human rights and ethical behaviour in providing security for the pipeline. BTC Co. has been liasing with the Azerbaijan government on the development of a Presidential decree to establish a Commission made up of relevant national and regional agencies. The Commission will establish a special service for the protection of the pipeline and to encourage a close relationship between the national service and the district and local authorities, working in close co-operation with the project team. BTC Co. is working with the Azerbaijan Commission to develop a comprehensive action plan that will include monitoring and training to ensure security in accordance with the country's commitments to human rights.

Concerns relating to security issues in Georgia have been forwarded to the Georgia project team.

[4] An agreement reached between a number of multinationals including BP, NGOs, and the UK and US governments for a framework that ensures respect for human rights and fundamental freedoms.

6 RESPONSE TO COMMENTS: ENVIRONMENTAL

6.1 CLIMATE

Some respondents commented that the climate has changed significantly since the Azerbaijan Climatic Atlas was published in 1993; rainfall is more intense and monthly and annual values have increased. They therefore asked if the pipeline design for watercourse crossings has taken this into account.

Rainfall and other climatic factors have been taken into account in the design of all watercourse crossings. International and national specialists have been involved in the assessment of all watercourse crossings and identified several river crossings, which needed more detailed study. For these rivers, historical flow data going back over 50 years was obtained and analysed. The river crossing design was amended accordingly. All river crossings will be buried to a minimum depth of 2m; for some rivers the burial depth will be increased to 4m. We are in the process of obtaining data for the past year for specific rivers.

Some readers have criticised the inclusion of only four climatic zones in the baseline climate description (Section 8.3.1) when Azerbaijan has nine climatic zones.

We understand that Azerbaijan has nine of the eleven climatic zones of the world. Four of the nine are found along the pipeline route.

6.2 EMISSIONS

6.2.1 Meteorological Data

The validity of using meteorological data from Tbilisi in the air emissions modelling for the Pump Station (PS-A2) has been questioned.

When modelling air emissions it is important that the input data is as complete as possible. We tried to source complete data sets relating to the geographic location of PS-A2 within Azerbaijan, but this was not available. We obtained a data set for Ganja, but the data capture was poor (~40%). The nearest complete data set we could obtain was for Tbilisi airport which we expected, from previous experience, would give highly conservative results.

The modelling was therefore carried out initially using the Tbilisi data and then repeated with the Ganja data. The results obtained using data from both sources are presented in the ESIA Technical Appendix, Part 4. As expected, the Tbilisi data resulted in predictions of higher concentrations. As it is scientifically unsound to report only results based on the incomplete Ganja data, the Tbilisi results were also reported.

As such assessments aim to be conservative, especially where there are uncertainties in the data used, the impact was assessed on the basis of the worst case results – i.e. those obtained using Tbilisi data.

6.2.2 Data Presentation and Interpretation

We have been asked to explain why the impact of air emissions has been compared to total emissions data for the whole country rather on the local populations of plants, animals and people that are more likely to be directly affected. The use of national emissions data that is 8 years old has also been questioned.

The ESIA was primarily based on the modelling results for NO_x, CO, SO_2 etc which take into account the local area and local population. Table 10-13 of the ESIA compares the modelling results to WHO and EU standards. The text states that the residual impact was determined "on the basis of the modelling results and the comparison of annual combustion emissions to the National Inventory", i.e. both were accounted for.

The table of comparison of BTC emissions to the National Inventory was included to enable the project to be viewed in a National context. We appreciate that the National data is relatively old (1994) but it was the most recent data that we had access to.

The number of permitted exceedences (e.g. in Table 10-4) has been questioned and we have been asked to state the height above ground level to which they relate.

When a standard is expressed in terms of a percentile, a number of exceedences are permitted. The use of percentiles with averaging periods allows the overall standard, or guideline value, to be kept at a low level whilst allowing for 'one-off' situations.

The standards are not set for a specific height. They apply to any height at which the population, or other receptor, can be exposed; this is generally taken to be 1-2m (i.e. head height) for people.

The statements in the footnotes to Table 10-5 that "VOC emissions from this source are not expected to be significant" and "methane emissions from this source are expected to be negligible in comparison to CO2 emission" have been challenged in the absence of data.

Insufficient data was available to quantify emissions from waste incineration during construction, as the choice of incinerator will be made by the pipeline Construction Contractor. The footnotes are based on professional judgement and past experience. As stated in Section 10.4 the quantity of waste to be incinerated will be small and all atmospheric emissions will meet emission limits values based on the requirements of the EU Directives 94/67/EC and 89/369/EEC on hazardous waste and municipal waste incineration.

Some respondents have commented that in Tables 10.7, 10.8, 10.12 statistical data for the annual emissions of Azerbaijan are given in tonnes, whereas the project's contributions are expressed as a percentage. The same respondents have noted that the assessment of residual impact from the release of greenhouse gases is defined in terms of climate change; impact at a local level is not taken into account.

BTC emissions are given in tonnes and as a percentage of national emissions.

It is not realistic to assess the impact of climate change at a local level, as climate change is a global phenomenon. However, as stated in Section 10.3.3.2 of the ESIA, relative to Azerbaijan national emissions the residual impact of construction emissions of greenhouse gases on climate will be low.

CO_2 and methane will not directly impact on human health. High methane concentrations would present a fire / explosive risk before impacting directly on human health, but even this would only occur at concentrations many times higher then those likely to be experienced during routine construction and operation of the pipeline system.

The inclusion of some data, detailed methodology and references in a Technical Appendix rather than the main ESIA document, was not liked by some scientists.

It was necessary to annex some of the more technical aspects of the assessment to make the main ESIA volume more readable by a wide audience. The appendices were prepared to provide the technical details for specialists.

We have been asked to clarify the types of waste that may be incinerated (inert/hazardous/non-hazardous) and to consider the risk of releasing heavy metals to the environment.

A detailed breakdown of anticipated wastes is given in Table 5.10 of Section 5.12.6 of the ESIA. Any waste that is combustible will be considered for incineration. Incinerators will be operated in accordance with EC directives 89/369/EEC, 94/67/EEC, 91/689/EEC and COM (97) 604 which will ensure that the release of heavy metals will be strictly controlled.

6.3 NOISE

We have received comments relating to noise emissions during construction. These included concerns about noise potentially exceeding 50dBA at night, the need to consider noise emissions at night separately from daytime emissions and the requirement for noise monitoring to ensure protection of the workforce and local residents.

Table 10-16 sets out the daytime and night-time noise limits that are proposed for the project. The 60dB(A) night-time limit in that table applies only to the boundary of the ROW and other construction areas; a much stricter night-time limit of 40dB(A) will apply at dwellings affected by pipeline construction noise and 45dB(A) will apply at dwellings affected by noise from the camps and other sites.

The Construction Contractor will monitor noise at sensitive locations outside the ROW and site boundaries. He will also monitor noise emissions within the working area to ensure that the workforce is not exposed to excessive noise levels. Construction staff will be provided with ear protection if they are exposed to unavoidable high levels of noise. All noise monitoring will be audited periodically by BTC Co.

The lack of noise measurements along the route has received comment as well as the lack of interpretation in the context of animals and Reserves.

Most activities during pipeline construction are short duration and transitory. At key locations where long term construction will occur, e.g. near PS-A2, noise measurements were taken.

Animals tend to acclimatise to noise very quickly. They do not react negatively in the long term unless noise levels are high enough to interfere with communication or cause damage to hearing. Such high noise levels are not expected to arise during construction or operation of the pipeline or facilities. No adverse noise effects are anticipated on fauna either inside or outside the wildlife reserves that are on, or close to, the route.

The efficacy of earth mounds or solid fencing for noise suppression, and the impacts associated with this method of mitigation, has been questioned.

The use of barriers for noise suppression is a proven technique that is widely used during pipeline construction. The noise reduction performance of any barrier is a function primarily of geometry; it is essential that they obscure the line of sight between the noise source and the receptor. Noise barriers generally give a reduction of between 5 and 20 dB(A), depending on the geometry. To put this reduction in context, for human receptors a 10dB (A) reduction represents more than a halving of the perceived noise level.

Bunds are typically constructed from top soil or excavated subsoil from that section of the pipeline works to reduce the impacts. Any solid fencing would be re-used along other sections of the pipeline.

6.4 GEOLOGY

6.4.1 Economic Geology

Concern was expressed about sand and gravel extraction operations in some rivers, and the effect that this may have on pipeline safety.

In those rivers where Third Party sand and gravel extraction or long term changes in river bed dynamics may affect the integrity of the pipeline, the following mitigation measures are proposed:

- Close consultation with the owner/operator and agreement with the Licensing Authorities for the Kura East, Shamkirchay and Tovuzchay sand and gravel extraction operations, on managing the risk to pipeline integrity
- Consideration of increased burial depth of the pipeline at the Shamkir crossing, to accommodate not only future aggregate extraction activities, but also the potential bed scour depth during periods of flash flood
- Increased surveillance of the pipeline route across these rivers
- Monitoring of changes in channel cross section at all crossings.

It is therefore considered that the residual risk to pipeline integrity associated with the excavation of sand and gravel at river crossings is low.

6.4.2 Seismicity

Clarification was requested about seismic zones crossed by the pipelines and the measures taken to ensure pipeline safety.

All geohazards, including seismic faults have been studied in detail. Only three faults along the route have been classified as active, i.e. they have moved in the last 10,000 years. Predicted movements on any of the faults do not exceed 1m. In crossing these faults the trench design has been modified to allow the pipe to move without losing integrity / containment during a seismic event.

The pipeline and trench (trench configuration, backfill, and wall thickness) have been designed to provide sufficient fault displacement capacity for 1,067-mm diameter pipelines. The approach used for the gas and oil pipelines is identical, except that differences in internal pressure and wall thickness were included in the analysis as applicable.

A trapezoidal trench configuration through fault crossing zones has been selected to allow for maximum pipe flexibility. This is a trench with shallow angle sidewalls (about 30º) that is backfilled with a loose to moderately dense, well-graded granular soil. A sand-shading configuration is used at the outer limits of the fault zones and consists simply of placing loose to moderately dense granular backfill (less than 22mm) around the circumference of the pipe, but the trench excavation itself may be standard construction, i.e., with near- vertical sidewalls. Surface traffic will be excluded from the pipeline right-of-way at the fault crossings to avoid unintentional compaction of the loose backfill. This trench configuration reduces the horizontal force as well as the axial force that the soil can transmit to the pipeline.

A diagram showing typical trench details across fault zones is provided in Appendix F.

6.4.3 Mud Volcanoes

Comments were made that all the mud volcanoes have not been shown on the maps presented in the ESIA documents. It was also stated that no description is given of the area impacted by mud volcanoes, present activity or areas of mud sediments from the volcanoes along the pipeline route. Further details have been requested on pipeline and trench design through these areas, to ensure pipeline integrity is maintained. The comment was made that no details of the specialists who have undertaken the work were provided in the ESIA documentation.

The maps provided in the ESIA document are indicative only. Their purpose is to illustrate the position of only those mud volcanoes that are close to, and hence may affect, the pipeline route. No attempt has been made to include all mud volcanoes in the area covered by the maps.

A field visit was made by Professor Barry Voight and Mark Lee, during the period 1 to 14 December 2001, to evaluate the mud volcanoes between KP0 and KP29 which potentially present a number of hazards to buried pipelines, including:

- Emission of combustible gas from vents in or near to the crater
- Differential ground movement associated with large fissures emanating around the crater and potentially extending (to 1km+) down the volcano flanks or along related fault structures
- Ground loading associated with the run-out of very large eruptive mudflows. Run-out of such flows may equal or exceed 3km, and their downstream thickness can exceed 5m.

The purpose of the work was to provide assurance for the chosen pipeline route and, if necessary, to suggest changes in routing required to further minimise the mud volcano risk.

Following discussions with mud volcano experts from the Azerbaijan Academy of Sciences, a work programme was undertaken, involving a combination of aerial photograph and satellite image interpretation, walk-over and visual inspection, detailed geomorphological mapping, materials sampling, and a trial pitting exercise on the lower slopes of Otman Bozdag and Turagay mud volcanoes. A laboratory test programme was also carried out on the samples.

The observations made were as follows:

- Between KP0 and KP15 the route avoids mud volcanoes (no mud volcano deposits occur within 1km of the route)
- Between KP15 and KP21 the route passes within 250-500m of relict large mudflows. The likelihood of a mudflow encroaching onto the ROW and also the potential for such an event to cause pipeline failure by loading, are considered to be negligible.
- Between KP21 and KP24 the route avoids mud volcanoes (no mud volcano features deposits occur within 1km of the route)
- Between KP24 and KP29 the route avoids the main axis of the Mud Volcano Ridge and does not pass within 500m of the existing mud volcano features. However, an extension of the specialised trenching for seismic fault crossings at KP24 was recommended, and has been adopted.

6.4.4 Geohazards

Comments were received stating that the issue of pipeline routing through salty and highly mineralized grounds, which are aggressive to concrete as well as technique of routing through subsidence ground was not considered.

BTC Co. is aware of the issue of highly mineralized soils and groundwaters along the route, and these issues have been fully considered in the design of the pipeline. The pipeline itself is made from very high quality steel. The pipeline will be coated with a very high quality coating that will provide excellent corrosion protection. There will also be a cathodic protection system that is designed to prevent corrosion of the line, both internal and external. The pipeline will be inspected for defects, using internal inspection tools, which will provide an early warning of any corrosion.

6.5 SOILS

Comments were made that the pipeline crosses an area characterised by a variety of soil types and that soil and vegetation type should be reflected on maps. It was also stated that the soil information and maps should contain detailed information on the thickness of the soil layer, mechanical properties, salinity, pH, susceptibility to erosion etc.

Habitat type (including main species of vegetation) is included on the set of environmental maps in Volume 2, Environmental and Social Route Maps. Detailed

information on soils along the route, on a KP-by-KP basis, has been included in the Reinstatement Specification, a summary of which is provided in the volume of Technical Appendices. Both sets of information are provided as part of the ESIA documentation.

Clarification was sought as to whether toxic elements and pH levels in the soil have been identified, particularly below the topsoil.

A comprehensive borehole survey was undertaken as part of the design stage of the project. This included borehole surveys at river, road, rail and canal crossings and at facility locations. A number of geotechnical parameters of the subsurface soil, including pH were tested. Where potential soil contamination was suspected, testing for possible contaminants was undertaken.

6.5.1 Erosion

Clarification was sought on measures that will be taken to protect the pipeline and reinstated soil in areas of high erosion. It was also suggested that local expertise should be used when assessing risks associated with erosion of soil. Some comments stated that erosion needs to be assessed, particularly northwest of Ganja.

A great deal of time has been spent during the design of the pipeline in order to identify areas prone to erosion and develop adequate mitigation and reinstatement techniques for such areas. The measures that will be taken to ensure that this issue is managed are outlined in the Reinstatement Specification, a summary of which is provided in Part 4 of the ESIA Technical Appendix Volume.

During the development of the Reinstatement Specification, advice was sought from specialists from Silsoe College, UK and the Institute of Soil Erosion, Azerbaijan.

Erosion has been assessed along the entire length of the pipeline; western experts have surveyed in detail those areas most prone to erosion, including the region to the northwest of Ganja. An erosion classification has been assigned to each kilometre of the pipeline route, and forms the basis for the reinstatement methodology. The erosion classification system is contained within the Reinstatement Specification.

6.6 CONTAMINATION

Concern was expressed that there is a lack of baseline information collected on soil salinity, hydrocarbons (including natural seepages from mud volcanoes), heavy metals and phenols and that such areas of contamination have not been identified along the route. There was also a request for the presentation of more detailed results of the sampling investigations that have been undertaken, since the reader was unable to substantiate the conclusions provided in the ESIA documentation. It also appeared unclear to some readers, which International Standards have been used for comparison.

A number of surveys have been undertaken in order to identify areas of contaminated land along the pipeline route. A detailed report of the results of these surveys has been produced under the requirements of the HGA. This report, entitled 'BTC and SCP Projects, Azerbaijan, Baseline Contamination Assessment' will be submitted as a separate document to the MENR. This will include more detail on the sampling programme that has been undertaken, including details of results, standards used and a comparison of the results with the standards.

The scientific community of Azerbaijan have raised concern that a radioactivity baseline has not been undertaken. The Azerbaijan Academy of Science outlines research that has been undertaken on levels of radioactivity along the route of the BTC pipeline in 1997-1998. The results indicate that the levels of radioactivity along the route vary within normal expected levels. However, concern has been raised that data is sparse for certain areas along the route, for example Ganja-Akstafa area. They also suggest that this data will aid in the definition of areas with increased tectonic activity, seismic hazards and mud volcanoes. It is considered that additional baseline radiometric work is important since construction and operation of the pipeline and facilities will change the baseline radiometric conditions.

The project does not contain any elements that will emit significant quantities of radiation, therefore a comprehensive baseline radiation field survey was not considered necessary. Detailed literature review was, however undertaken and the results are summarised in the ESIA document in Section 8.9.4.2. This indicates that levels of radiation along the route will not pose a risk to human health.

There was concern, and some misunderstanding, over the discussion of potential sources of contamination (section 8.9.2). There was a view that this was too conjectural and should be backed up with concrete results.

Following standard international practice, the first sections of the contamination baseline section detail contaminants that may potentially be present along the pipeline route. This is based on WREP experience, desk-top studies, literature reviews, historical information on past land-use along the pipeline route. Field surveying and sampling was subsequently undertaken which identified actual areas of concern along the pipeline route and at associated facilities, such as proposed pipe dumps and camps. The results of the field survey are discussed in later sub-sections of the contamination baseline and summary report in the ESIA. A detailed report of the results of these surveys has been produced under the requirements of the HGA. This report, entitled 'BTC Project, Azerbaijan, Baseline Contamination Assessment' will be submitted as a separate document to the MENR.

Comments were made that it is advisable to apply biological methods to remediate oil-contaminated land.

Within the construction corridor there are two small areas of pre-existing oil contamination. Bioremediation is being considered as one option for treatment of this contaminated soil.

6.7 HYDROLOGY AND WATER QUALITY

In the text of document it was mentioned that the Contractor should prepare concrete proposals for river crossings. Comments were made that these should be agreed with the Ministry of Ecology and Natural Resources (MENR) before construction commencement. and that detailed maps, plans and photos of river crossings should be provided

River crossing design will be subject to approval by the appropriate statutory authority. The Construction Contractor will prepare site-specific method statements for many of the major river crossings. These method statements will be subject to approval by BTC Co.

Concern was raised that there needs to be re-surveying undertaken at the river crossings due to the heavy rains this spring and the changes that may have taken place to the baseline data (particularly erosion) on the rivers. There was also concern that flooding will be a major impact on the pipeline integrity and that regular monitoring should be undertaken.

All the major river crossings along the pipeline route have been subject to ongoing surveys and analysis, particularly those liable to highly variable flow, flooding and channel erosion. Since the heavy rains in Spring 2002, BTC Co. has had specialists re-survey the river crossings. Flooding and the potential for lateral and vertical migration of the river bed has been taken into account during the design of the pipeline river crossings and adequate burial depths and set back distances have been incorporated into the design, based on the potential for erosion at the crossing point. It is anticipated that the daily horse patrol will undertake regular monitoring of the conditions of the river bed and banks at pipeline crossing points to ensure that there is no threat to pipeline integrity, or to forewarn if additional protection measures may be necessary.

There were questions raised about the time for contaminants to travel if they are accidentally spilled into watercourses.

Travel time for contaminants will be dependant upon flow of water within the rivers and hence the season. Many rivers along the pipeline route have greatly variable discharge rates, from zero much of the time, to occasional large flood events. Travel times and the location of sensitive downstream receptors such as abstraction points, reservoirs or ecological reserves will be considered in more detail during the preparation of the Oil Spill Response Plan, particularly when determining the location of oil spill response equipment. Modelling of oil spills into key surface waters will be undertaken before the Oil Spill Response Plan is finalised which will be before the pipeline is filled with oil.

There was concern amongst communities that construction may result in the contamination of local water sources, causing disease, ill health and loss of livestock.

The Contractor will develop a comprehensive Pollution Prevention Management Plan, which will outline the measure to be taken to avoid any spill of pollutant or release of sediment into watercourses or to groundwater. It will also outline the measures to be taken in the event that a spill may occur and will be subject to

approval by BTC Co. The Reinstatement Plan also outlines measures to avoid erosion, and hence sediment release to watercourses.

Comments were received from the academic community in Azerbaijan that parameters such as river depth, current velocity, hydrochemical composition, temperature, water level, seasonal changes and other hydrological parameters were absent from the ESIA document. Scientists also commented that there are no references to numerous studies by Azeri and Soviet researchers. It was also suggested that local expertise should be used when assessing risks associated with crossing points of rivers.

Numerous surveys and literature reviews have been undertaken during the conceptual and detailed design stages of the project in order to characterise the watercourse crossings and enable safe pipeline crossing design. Western experts have utilised a number of available datasets compiled by Azeri scientists during the development of pipeline design and writing the ESIA document. These are referenced in Section 1.2 of the Hydrology and Water Quality Baseline Appendix. Section 1.3 outlines the hydrology datasets that exist in Azerbaijan, and Section 1.4 discusses the limitations of the existing data. Parameters such as river depth, current velocity, hydrochemical composition, water level and seasonal changes are presented in the Hydrology and Water Quality Baseline Appendix and the River Corridor Survey Baseline Appendix. BTC Co. believes that all necessary surveys and data has been collected to date to enable safe design of the watercourse crossings and development of appropriate environmental and social mitigation measures

6.8 HYDROGEOLOGY

Concern was expressed over routing of the pipeline through the Karayazi Aquifer area. Questions were also raised as to what kind of additional protection measures will be undertaken during construction and operation of the pipeline in the Karayazi area.

Considerable effort was expended in looking at alternative routing (other than paralleling the WREP) for the pipeline in the Karayazi Area. After numerous surveys, investigations and discussion with the Azeri Authorities, it was concluded that a route through the Karayazi Aquifer was still the most appropriate option. Routing to the north would entail crossing a major seismic fault zone and an extensive military training ground with potential for unexploded ordnance. Routing to the south was discounted, primarily due to concerns over the proximity of the line to the Armenian border. Technically, Armenia and Azerbaijan have yet to resolve their regional conflict and it was concluded that construction of a pipeline to carry oil sourced in Azerbaijan, which passes close to previous areas of conflict, could create a significantly increased security threat to construction and operations personnel, as well as to the pipeline facilities themselves.

Routing issues are further discussed in the Karayazi Aquifer Routing Case Study; Appendix G. This shows that there are fewer significant issues for the WREP corridor than the other two options, and that the one key issue for the WREP Corridor (groundwater) is considered to be manageable.

The pipeline has been designed to minimize the potential for oil spills by conforming to international standards for pipeline design and construction. Appropriate protective measures have been designed into the pipeline system as outlined in Section 6.14, Oil Spill. Additional measures that will be taken in the Karayazi Aquifer Area are as follows:

- The pipeline wall thickness will be increased at certain locations through the aquifer in order to provide additional protection against corrosion and 3rd party damage. The identification of these locations will be based aquifer sensitivity and soil permeability
- BTC Co. is committed to an ongoing programme of investigation and monitoring in the Karayazi Aquifer region. This will entail identification of key potable water abstraction points that may be affected by a leak from the pipeline, and installation of a series of monitoring wells to enable early detection should a leak occur. Specific mitigation measures to be implemented should a leak be detected, including the location and content of oil spill response equipment, will be outlined in the Oil Spill Response Plan (which is discussed in more detail in Section 6.14).

These mitigation measures are further discussed in the Karayazi Aquifer Routing Case Study, Appendix G

Questions were raised about the level of detail in the modelling of subsurface migration of crude oil in the event of a spill in the Karayazi Aquifer. There was also concern that modelling of oil spills to surface waters, including topographic factors, has not been conducted.

Comprehensive modelling of the subsurface migration of crude oil between Goranboy and the Georgian Border (including the Karayazi Aquifer) was undertaken as part of the ESIA process. The modelling was based on a number of spill scenarios and realistic worst-case geological and groundwater migration conditions. The methodology and results are presented in detail in the report on Modelling of Subsurface Migration of Crude Oil, Part 6 of the Technical Appendix Volume.

The ongoing programme of investigation and monitoring in the Karayazi Aquifer region, to which BTC Co. has committed, will enable a more detailed hydrological model of the area to be developed. This will be taken into consideration during the development of the Oil Spill Response Plan.

Modelling of oil spills to surface waters, including topographic factors, has not been conducted at the time of ESIA preparation due to lack of availability of topographic data. BTC Co. will, however, undertake such modelling prior to pipeline commissioning, as part of the input to the Oil Spill Response Plan.

Questions were raised over the storage of hazardous materials close to areas where ground water is sensitive to pollution.

The Contractor will develop a comprehensive Pollution Prevention Management Plan, which will outline the measure to be taken to avoid any spill of pollutant into watercourses or to groundwater. This will include procedures for transporting, handling, storing, using and disposing of pollutants.

Concern was raised that when drilling wells for water supply along the route that approvals should be obtained in accordance with the Procedures of the Azerbaijan Republic. It was also commented that it is necessary to define locations, volumes required and water quality in advance and that, a hydrogeologist should be involved when making such decisions.

Any abstraction wells will be drilled in accordance with the international standards specified in the Host Government Agreement. BTC Co will of course keep the local communities and the Ministry of Environment and Natural Resources (MENR) informed of plans for water abstraction, and all legitimate concerns will be taken into consideration. BTC Co. is currently seeking information from the MENR relating to the current procedure in Azerbaijan for drilling of abstraction wells.

6.9 CULTURAL HERITAGE AND ARCHAEOLOGY

6.9.1 Gobustan

Several comments received related to the Gobustan Cultural Reserve. Specifically:

- *The designation 'Gobustan Cultural Reserve' is not recognised by some respondents who prefer the term 'Gobustan History and Arts Reserve'*
- *The need to have permission from the Ministry of Culture/Cabinet of Ministers to cross the Gobustan Cultural Reserve has been mentioned by some respondents*
- *Several respondents have questioned why it was not possible to route the pipeline around the Gobustan Cultural Reserve and seek further assurance that there will be no adverse impacts on the rock art.*

The term 'Gobustan Cultural Reserve' has been used during discussions with the Ministry of Culture and the Institute of Archaeology and Ethnology who have been working closely with the project team. We recognise that the official, full designation of the Reserve is the Gobustan State Reserve of History and Art.

Throughout the project design process, detailed discussions have been held with the Ministry of Culture and the Institute of Archaeology and Ethnology. Extensive field visits have also been undertaken to the site with both organisations. The reasons for crossing the Reserve have been explained and are understood by both organizations. The Institute of Archaeology and Ethnology has confirmed that there is no indication of any archaeology on the proposed construction corridor.

The route of the pipeline has been agreed with the Government of Azerbaijan through the route definition process set out in the HGA. The Government were provided with 10km, 500m and 100m route corridors, and provided comment on all of these. At no stage was any mention made of the Gobustan Cultural Reserve.

The issue of routing around the Gobustan Cultural Reserve is dealt with in greater detail in Appendix H.

Note: there was an error in the Russian text that gave the distance to the closest rock art as 1m rather than 1km. Not surprisingly this led to a group of comments about the unacceptable proximity of the pipeline to the rock art. The nearest example of rock art is 1km from the pipeline corridor. The distance was correct in the English and Azerbaijani language versions. We apologise for this error.

6.9.2 Archaeological Data

The presence of 'Norman tribes' has been questioned.

This question stems from a translation error where 'nomadic' was incorrectly translated as 'Norman' in the Russian language version.

6.9.3 Extent of Archaeological Investigation

We have been asked about the extent of archaeological investigation outside the 44m ROW and access for archaeologists during construction.

Archaeologists will be present on site during construction activities on the ROW. In the event that there are areas of archaeological interest outside the 44m corridor, but within the pipeline restriction zone, BTC Co. will discuss specific proposals for investigative work with the Institute of Archaeology and Ethnology.

6.10 ECOLOGY AND PROTECTED AREAS

6.10.1 Surveys

Some respondents sought additional information about the effects of the proposed pipeline on the fauna of the Kura valley and requested additional field surveys over a wider area, repeated at different times of year and with greater emphasis on fauna, especially invertebrates.

Ecological data collection is an ongoing process. Since completion of the ESIA an additional zoological survey has been undertaken by URS. The results will be submitted to MENR as soon as they are available (expected September 2002).

The scope and area of study has been carefully selected to provide an appropriate level of information in the context of the proposed pipeline activities. It is not considered necessary or realistic to collect field data for all species living 1km away from the pipeline. Ecological surveys have been undertaken during January, April/May, August/September and November to ensure seasonal coverage.

Where literature reviews, discussions with local scientists or past experience have indicated that species with very specific seasonal survey requirements may be present, additional surveys have been undertaken at the appropriate time of year e.g. *Iris acutiloba* in Gobustan was surveyed in April 2002.

Additional surveys will be undertaken before construction begins in sensitive locations as outlined in Section 10.3.12 of the ESIA. As with all ecological surveys that BTC Co. undertakes, we will work in conjunction with local experts to complete this work.

We have been asked why the exact river crossing is not shown on the River Corridor Survey sketches in Baseline Appendix, Part 5.

The approximate crossing points are shown rather than the precise crossing points, as one of the purposes of the survey was to provide ecological information which would be taken into account during design, and precise alignment, of the crossing.

6.10.2 Protected Areas

Some respondents dispute the proposed designation of a Gobustan State National Park. We have also been advised that the inclusion of Lake Jandari as a proposed Ramsar site is incorrect.

The proposal to designate a national park in Gobustan was information provided to BP by the ASCE during construction of the WREP. Subsequently we have received conflicting information about the status of the area, so erred on the side of caution when writing the ESIA. Regardless of designation, much of the area has high ecological, geomorphological and landscape value which has been taken into account during pipeline routing and design.

The confusion over Lake Jandari arose because in one publication it was described as a 'potential Ramsar site', which is not the same as a 'proposed' site. Only 'proposed' sites are offered the same level of protection as designated Ramsar sites. None-the-less, Lake Jandari is an important wetland, especially for wintering wildfowl and waders.

6.10.3 Habitat

We have been asked to clarify the origin of the data in Table 8.1, which identifies the proportions of the various habitats crossed by the pipeline.

As stated in Part 1 of the Baseline Appendix, this data was derived from the various ecological surveys. At the time it was prepared ortho-rectified aerial photographs showing the pipeline route were not available. Subsequent examination of these has identified some changes to land use that have occurred since the surveys were completed; some new areas have been cultivated whereas others are no longer in production. The figures in Table 8.1 should therefore be taken as indicative of the relative proportions of the various habitats and not as absolute values.

6.10.4 Flora and Fauna

It has been commented that the number of species cited for various animal groups is inconsistent in the ESIA and the numbers given are disputed by some academics. The distribution of species within Azerbaijan has also been questioned.

There is variation among the data sources used for species numbers and distribution, which is reflected when the authors are quoting from different sources. The numbers cited should be taken as indicative rather than absolute as there is restricted up to date survey data for Azerbaijan in general.

The need to ensure animal welfare during construction and operation of the pipeline has been commented on.

BTC Co. will ensure high standards of animal welfare throughout construction and operation of the pipeline. No cruelty will be tolerated. The detailed Oil Spill Response Plan will cover animal rescue and clean up in the event of a crude oil spill.

Some scientists have expressed the opinion that too much emphasis has been place on the spur-thighed tortoise, which they do not regard as endangered.

Although the spur-thighed tortoise is relatively common in Azerbaijan it is an International Red Data Book species and is classified as 'Internationally Vulnerable'. It is the species with the highest international level of designation along the route and should therefore be afforded a high level of protection.

Some scientists have challenged statements about the inclusion of certain species in the proposed, revised version of the Azerbaijan Red Data Book.

We believe that this situation has arisen because several different groups have proposed species for inclusion in the next version of the Azerbaijan RDB. It is likely that some of the proposed species will not be afforded RDB status. The information cited in the ESIA has been collated from consultation meetings with various local scientists. Whenever discrepancies have been brought to our attention we have sought to resolve them through discussion with the relevant scientific institution. If it has not proved possible to resolve the discrepancy, BTC Co. has erred on the side of caution and assumed the species to be proposed.

A discrepancy in the fish spawning periods cited in the ESIA has received comment.

The periods of October to May and October to June are used in the ESIA. The period of spawning is not absolute and will depend on prevailing conditions such as temperature. Most species have usually finished spawning by the end of May but on occasion spawning may extend into the first part of June. The mitigation proposals assume the latter scenario so that they address the worst case.

Concern that there is insufficient data on birds and 'Important Bird Areas' in the ESIA and a request that the sensitivity to oil spills of wetlands outside of the pipeline route be factored into the detailed design phase to minimise potential oil leaks in these areas.

Additional bird data was collected during the appropriate season (April and May) this year. BTC Co's risk based approach to spill planning takes will take into account sensitive habitats and this will feed into future design and construction work.

6.11 TRAFFIC AND ROADS

Queries were raised that when undertaking road traffic surveys, weekend and night-time traffic was not surveyed. There was also concern that there was no indication in the ESIA as to which parts of Azerbaijan the survey was undertaken.

BP's safety regulations did not allow travelling during the hours of darkness and the use of non-approved accommodation during the traffic survey. This restricted the ability to keep survey staff on site for a 12-hour survey period, and in general, an 8-hour survey period was completed. It also did not allow for night-time surveying to be undertaken. The impact of the project on existing night-time traffic patterns will, however, be minimal, since night time driving is unlikely; if any does take place it will be severely limited.

In order to assess the variation in traffic flows throughout both the week and weekend, two survey sites were surveyed over a 7-day period. A full list of all survey

site locations is provided in the Traffic Assessment, Appendix 4 of the Baseline Appendix Volume of the ESIA.

Communities identified the condition of roads as a major concern, and this was re-enforced by several explicit comments at public meetings during disclosure. Community members identified where roads had been degraded from use by the WREP operations team, and put forward requests for road improvements as part of the Community Investment Programme. Road safety was also identified as a potential issue.

Section 11.5, Issues I1-I5 of the ESIA describes the mitigation measures to be used to ensure roads are maintained during project construction and operation. The Construction Contractor is required to develop a Transport Management Plan which will include safety aspects such as route planning, appropriate timing of deliveries through small villages to avoid busy traffic periods, and safety awareness raising with communities.

See Section 7.2 of the Addendum for responses on Community Investment Programme.

6.12 TOURISM

The lack of consideration of the residual impact of construction on tourism has been criticised.

This issue was not addressed in the ESIA report as there is no indication that there will be any significant residual impact on tourism.

6.13 OIL SPILL

The subject of oil spills has been raised as a concern at public meetings and also by members of the Azerbaijan scientific community. People are interested in learning more about the potential for a spill or leak and what measures will be in place for prevention and clean-up.

The pipeline has been designed to minimize the potential for oil spills by conforming to international standards for pipeline design and construction. Appropriate protective measures have been designed into the pipeline system as follows:

- The pipeline will be buried to increase protection against 3rd party interference
- Strong community liaison and daily surveillance will ensure risks of accidential damage are minimized
- Pipeline design includes a very high quality external pipe coating to protect against corrosion
- The pipeline will be fabricated from very high quality steel which will minimise risks from corrosion
- A cathodic protection system will be installed to minimise corrosion
- The pipeline will be inspected internally (by an 'intelligent pig') for defects, which will provide an early warning of any corrosion.

- A risk assessment has been undertaken to define the optimum locations for block valves along the route to limit the amount of oil spilled should a leak occur. Block valves will be located at sensitive receptors such as rivers and areas of high groundwater vulnerability
- Installation of heavy walled pipe at particularly sensitive locations.

Comprehensive methods of leak detection are also part of the project design and implementation. These include:

- Installation of a leak detection system
- Installation of a system of groundwater monitoring wells in the Karayazi Aquifer area
- Pipeline surveillance, including daily horseback patrols
- Monitoring of river crossings for signs of instability or erosion

BTC Co. considers that response preparedness in the event of a spill is of vital importance despite the low probability of a leak occurring. The following will be undertaken in order to ensure that in the event of a spill, any potential damage to the environment is minimised:

- Develop a comprehensive Oil Spill Response Plan (see below)
- Purchase and locate equipment to deal with a spill quickly and effectively
- Provide all necessary resources in terms of personnel
- Assign specific responsibility to deal with an incident

Questions were raised during consultation about how the project will respond in the event of an oil spill, in particular who will be responsible for the cleanup in both physical and financial terms.

In line with best industry practice, the project will develop an Oil Spill Response Plan prior to the project becoming operational. A document entitled Oil Spill Response: Planning, Framework for Development of a Comprehensive Oil Spill Response Capability for the BTC Project, is included in the Technical and Baseline Appendix Volume of the ESIA. This has been published at this time in preparation for the General Oil Spill Response Plan and Area Specific Oil Spill Response Plans. The General Oil Spill Response Plan is now in development and will be publicly released once it is complete. The plan will also address financial responsibility in the event of an oil spill. It is important to note that in the unlikely event of a spill occurring, BTC Co. will not wait to assign responsibility or liability in order to respond. All resources will immediately be made available to deal with the spill. The first priority will be to get the situation under control.

6.14 ENVIRONMENTAL INVESTMENT PROGRAMME

There were several requests for further information on the proposed environmental investment programme as well suggestions for projects and sites that could be a focus for the programme.

A detailed Environmental Investment Programme is currently being developed across all three countries through which the BTC pipeline passes. The objective of the programme will be to provide additional environmental benefits to Azerbaijan, Georgia and Turkey. It is proposed that the BTC and SCP project teams will identify

2-3 projects in each country, which will be implemented in combination with NGOs, academics and donor agencies.

Criteria for identifying potential projects are being developed and, for Azerbaijan, will include alignment with the aims of the National Environmental Action Plan, the draft Azerbaijan Biodiversity Action Plan, the BP Caspian Region Biodiversity Action Plan and the plans and programmes of other stakeholders including donor agencies and IFIs. This approach will ensure that the Environmental Investment Programme is complementary to existing and planned programmes and does not duplicate effort.

Projects proposed through the disclosure process have been included in the list of potential projects for assessment against the programme's criteria and objectives.

7 RESPONSE TO COMMENTS: SOCIAL

7.1 ACCESS TO ENERGY

The issue of access to energy was raised both at public meetings and through feedback forms. In general, interested parties sought clarification on how the project would improve access to energy at the community level along the route, and felt that this was an important issue for the project to consider.

During public meetings a fuller explanation of how Azerbaijan would benefit from increased energy supplies was provided. In summary, gas from the Shah Deniz field will be provided to the Azerbaijan government under a sales and purchase agreement (currently being negotiated). In addition gas associated with oil from the ACG field is already provided to the Azerbaijan government free of charge.
The proposed pipelines will not directly provide energy to communities along the route. The pipelines are very high pressure systems for the export of hydrocarbons. On no account should anyone try and obtain energy supplies directly from these pipelines.

7.2 COMMUNITY INVESTMENT PROGRAMME

Clarification of, and suggestions for, the Community Investment Programme were collected mainly from community meetings and community feed back forms. Most of the requests for assistance were to improve local infrastructure and services such as gas or water lines, water supplies in general, repair/refurbishment of schools or municipal buildings, and road repairs.

One NGO commented that any Community Investment Programme must go beyond simple projects such as road or infrastructure repairs, and must invest more in community development such as democratic development, education, and poverty alleviation.

During the public disclosure meetings the framework for the community investment programme was explained. The programme will include some direct community infrastructure projects, but will also have an extensive component of sustainable community development that focuses on:

- Rural development and agricultural improvement
- Economic development and income generation
- Social infrastructure development
- Health and sanitation.

These themes for the Community Investment Programme within Azerbaijan have been selected based upon extensive consultation with stakeholders at all levels of society, including communities, NGOs, international finance institutions and State authorities. The themes address some of the key issues that have arisen during the development of the ESIA and Resettlement Action Plan reports.

The project will partner with NGOs with experience in these fields, to deliver sustainable community programmes. A Request For Proposals (RFP) will be

released by the end of October. This RFP will invite NGOs to put forward proposals for projects within the four areas identified above, and will detail the criteria and objectives that the projects and the implementing partners are required to meet.

All specific suggestions for projects to be included within the project Community Investment Programme have been recorded by region, and will be considered in the framework of the overall programme as described above.

7.3 CONSULTATION

Several requests for additional consultation were received as follows:

- *Additional consultation and involvement of NGOs interested in the social impacts of the pipeline*
- *For presentation of the regional review.*

An additional one day workshop was held with NGOs towards the end of the disclosure period to discuss all of their issues of concern in more detail.

The regional review will be made public when complete. This will be available on the internet at www.caspiandevelopmentandexport.com and at various locations in hard copy format.

An extensive consultation programme has been followed, involving NGOs, academics, government departments and other interested groups, throughout the ESIA process. This process is described in detail in the Public Consultation and Disclosure Plan, Technical Appendix 8 of the ESIA. In summary, consultation has been structured as shown in Table 7-1.

Table 7-1 Consultation Summary

Phase	Time	Type of Activity
Phase 1: Meetings with NGOs and other stakeholders	October 2000	Introductory workshops and meetings with government authorities.
Phases 2 to 3: Community consultations	November to December 2000	Consultation with community leaders and with a sample of individual householders. 73 interviews with most senior government representatives in each community identified as project affected. 814 semi-structured interviews were also held with a sample of the householders.
Phase 4: Community consultations on Pipe Yards and Construction Camp	August 2001	Additional consultations carried out to identify communities and households that may be in direct proximity to sites proposed for potential worker construction camps or storage yards for construction equipment and pipe. Villages within 2kms of potential locations for pipe yards and villages up

Phase	Time	Type of Activity
		to 5kms from a potential site for a major construction camp were consulted.
Phase 5: BTC ESIA Initiation	October to December 2001	Visits to each of the communities potentially affected by the BTC pipeline to test whether the earlier SCP data was valid for both projects; to assess changes in perceptions or cumulative perceptions as a result of the construction of an oil, as opposed to a gas, pipeline first as well as the construction of two pipelines rather than just one; to raise awareness of the BTC project; to collect baseline data and carry out consultation specifically in relation to BTC. Project leaflets were also distributed to every location on a number of occasions, specifically informing the inhabitants about the pipeline projects (i.e. Introduction of BTC) as well as of construction camp/yard developments or AGI developments, depending on the actual activities likely to be witnessed at the settlement.
Phase 6: BTC and SCP consultation on mitigation	November 2001 to January 2002	Testing of basic mitigation measures during interviews conducted as part of Phase 5 above. Meetings with Specialist Organisations (National and International) to canvas views on mitigation measures for particular issues, both environmental and social.
Phase 7: BTC and SCP Consultation for Disclosure of Draft ESIA	May to July 2002	3 formal public meetings along the route plus 4 meetings for NGOs and academics in Baku to discuss the findings of the draft ESIA. Community 'road show' to highlight and discuss the findings of the draft ESIAs at 8 locations along the route.
Phase 8: Consultation in lead up to and during Construction	September 2002 onwards	Extensive consultation with communities affected by construction through project community liaison team and project land team.

7.4 DEMOGRAPHICS

Data provided in Section 9.2.4, the socio-economic baseline, particularly within Tables 9-2 and 9-3 was queried.

Table 9-2 was sourced from official statistics and Table 9-3 from information provided by local executive offices, and reflects any gaps in current statistics at the national and local level. Given that the tables point to a heavy predominance of ethnic Azeris and Muslims, any inaccuracies in the tables were not considered to have a significant impact on the baseline results.

7.5 EMPLOYMENT

Almost 10% of the feedback collected during disclosure related to the issue of employment. Most of the comments were requests for clarification on employment opportunities expected within the project, recruitment procedures and direct requests for jobs.

Specific issues that were raised included:

- *The importance of ensuring that local skilled workers have access to skilled jobs*
- *Concern over employee working conditions, particularly if all workers are hired by the Contractor rather than by BTC Co.*
- *Concern that the recruitment procedure must remain transparent and that sufficient information is provided before construction begins on the number of jobs available including a breakdown of skilled, semi-skilled and unskilled positions*
- *Clarification over who will monitor the recruitment process*
- *Request for further details on the number of women expected to be employed on the project and what special measures will be taken for their protection.*

These points are answered in Sections 7.5.1 to 7.5.5 below.

7.5.1 Recruitment Procedures

Recruitment is dealt with in Section 11.3.1 and Table 11-2 (Issues E1-E4) in the ESIA. The table includes measures to ensure a fair and transparent recruitment process, the establishment of recruitment information centres and the timely provision of information on job availabilities. The Construction Contractor will be monitored by the BTC project team, to ensure that these measures are implemented effectively.

The joint BTC Co. and Contractor project team will retain responsibility for all employment for the project. The project team will keep existing district recruitment centres informed of activities, but all hiring of personnel to work on the project will be through specifically established centres.

7.5.2 Direct Requests for Jobs

During the consultation meetings members of the public were advised that all employment on the project would be through project information centres, and that they would be informed when and where these centres would be established, and the procedure for registering their interest in employment.

In addition, in the lead up to construction in each District, community liaison teams will continue to provide clear information on employment opportunities as well as where and when additional information can be obtained.

7.5.3 Ensuring Appropriate Working Conditions

The Construction Contractor is required by the conditions of the contract to uphold BTC Co's employee policies (employees, relationships and ethics) and to abide by national and international employment legislation, particularly the eight Core International Labour Organisation (ILO) conventions (Section 11.2, Table 11-2 Issue E5). Monitoring of the Construction Contractor will include regular audits of human resource management procedures.

7.5.4 Women in Employment

Anti-discrimination measures which meet standards outlined in the ILO conventions are required by the BTC project and these will ensure that women get equal access to all jobs available, and to equal pay, and that they are not discriminated against in any other form, including with regard to maternity arrangements.

7.5.5 Monitoring of Recruitment Process

One of the key roles of the BTC Project management team will be to monitor the recruitment process to ensure that all requirements of the contract have been met.

7.6 HEALTH

Concern was raised by several community members about whether there would be an impact on community health from the project. These concerns included requests for information on measures that will be taken to minimise any impacts and particularly whether specific health centres would be constructed in affected areas.

One Baku-based NGO felt that health figures within the baseline were inaccurate.

Another NGO stressed there should be measures defined within the project for the following:

- *Training on communicable diseases*
- *Controls on community drinking water to ensure hygiene quality*
- *Application of hygiene standards*
- *Waste disposal plan*
- *Identification of land potentially contaminated with anthrax.*

This NGO also felt that there needs to be a more detailed health baseline conducted, particularly for epidemiological data.

The health figures quoted in Section 9.2.5 and 9.4.6 of the ESIA were obtained from official statistics, community surveys and a variety of international reports including

the Azerbaijan Human Development Report, UNDP 2000, WHO, and the ICRC website. Full references can be found in Section 18 of the ESIA. The problem of sourcing accurate health data is recognised and there may be some discrepancies between the data used and other sources. However, it is felt that the figures quoted provide an accurate general picture of the health situation along the pipeline.

Measures to be taken to protect both community and construction worker health were outlined during public meetings and within community brochures. These measures can be found in Section 11.6, Table 11-6 (Issues C2, C5 and C6) of the ESIA report. Health centres within the construction camps will be open to construction workers only. However the community investment programme may involve some projects that focus on improving community health awareness, see Section 7.2 above.

The following issues were explicitly mentioned during the ESIA disclosure process, and the references indicate where additional information can be found in the ESIA report:

- Training on communicable diseases (Section 11.6, Table 11-6, Issue C5)
- Controls on community drinking water to ensure quality (Section 11.5, Table 1-5, Issue I10 and Section 5.11.7.3)
- Waste disposal plans (Section 5.11.6 and 5.11.7)
- Contaminated land (Section 10.3.7).

The Construction Contractor will apply international hygiene standards, particularly within the construction camps. These include measures relating to sanitation, food handling and transportation, washing facilities and general worker welfare.

More detailed health data gathering was not conducted during the ESIA baseline surveys as risks to the health of the population are not considered high. The biggest concern relates to the potential spread of communicable diseases. To develop a baseline on communicable diseases would require an extensive testing programme as part of the data gathering process, as existing statistical information is often inaccurate. Testing was considered an invasion of privacy of community members, which might unnecessarily raise concerns and tensions, and hostility towards the project.

All foreign workers will be required to have the appropriate immunisations before arriving in the country. Health awareness and communicable disease training will be provided to both workers and communities close to construction camps where large numbers of workers will be located.

7.7 HUMAN RIGHTS

During one public meeting, a community member sought clarification on whether any human rights would be infringed by the BTC project. One NGO also provided an analysis of the interaction between the project, government and human rights for Azerbaijani citizens. The key point was made that the Project needs to promote human rights for both workers and communities affected, by providing an example of international best practice. This must include respect for:

- *International covenants such as the Universal Declaration of Human Rights and ILO conventions*

- *Democratic principals in general*
- *National legislation and regulations*
- *Corporate policies.*

Issues where the protection or promotion of human rights should be considered included:

- *Consultation with project-affected people*
- *Management of security arrangements*
- *Management of land acquisition*
- *Working conditions for employees*
- *Relationship with Government*
- *Assessment of environmental impacts on project affected communities.*

During the public meeting, measures to protect human rights were outlined. These included measures designed to protect employee's working conditions (ESIA Section 11.3, Issue E5), consultation and negotiation procedures with regard to the land acquisition (ESIA, Section 11.4) and the community liaison programme including grievance procedures (ESIA Section 11.6, Issue C9).

In addition, BP's corporate policies, which cover human rights[5], have been adopted by the project, and these ensure that the project will promote international best practice in the management of human rights. This has included the development of an ESIA to identify and manage the impacts of the project on project affected communities.

Also refer to Sections 7.3, 5.5.2, 7.9.2, and 7.5.

7.8 INTERNATIONAL AND REGIONAL ISSUES

Three comments relating to international and regional issues were received during public meetings:

- *Concern that the independent consultants managing the ESIA are not local to Azerbaijan and may not be able to understand local issues*
- *Request for facilitation of NGO consultation at the regional level between NGOs from all three countries affected by the BTC and SCP projects, to discuss regional and international issues rather than just those that are specific to each country*
- *Request for comment on the Nagorno Karabakh conflict and occupied territories from an international perspective.*

These issues are addressed in Sections 7.8.1 to 7.8.3 below.

7.8.1 Understanding of local issues

The use of local consultants and specialists during the ESIA process was explained at the public meetings. It is a requirement of the HGA that international consultants are employed to develop the ESIA. However, for the collection and analysis of both environmental and social issues, local expertise was drawn upon. In particular, to conduct consultation with communities along the route, where cultural sensitivity

[5] Relevant policies include: Ethical Conduct, Relationships and Security.

was an important issue, a team of local social specialists was employed. This local team assisted in drafting the questionnaires used, carried out all of the interviews and compiled the databases with all of the results.

7.8.2 Regional and International issues NGO consultation

BTC Co. welcomes NGO consultation at the regional level and would be happy to participate and provide information to a regional NGO discussion if invited.

7.8.3 Nagorno Karabakh

During the public meeting, sympathy was extended to all those who had suffered during and since the Azerbaijan-Armenia war over the Nagorno Karabakh. Implications of the conflict have been fully considered within the design of the pipeline. The BTC pipeline has been routed to avoid the occupied territory and should not have any impact on the dispute.

7.9 LAND ISSUES

7.9.1 General Land issues

A large proportion of feedback from communities along the route related to the land to be used for construction and operation of the pipeline. Issues included:

- *Concern that construction and operation may disturb irrigation, thereby affecting land cultivation. Clarification of irrigation management was also sought*
- *Comments that the project's land documentation process has helped move forward land privatisation in Azerbaijan*
- *Clarification requests about the impacts of the project on land*
- *Clarification about when land owners and users will need to stop cultivating land required for the project and requests that adequate warning is given to land owners and users. In addition, clarification was sought on when normal land use can be re-commenced.*
- *Concern was expressed about how land owners and users will be able to continue irrigation and hence cultivation of land plots severed by pipeline construction*
- *Clarification about the size of exclusion zones around the pipelines and on the types of activities permissible and restrictions in force within these zones. In particular, land users sought further information on permissible crops and tree restrictions. Where restrictions will be in place, community members sought further information on compensation measures*
- *Clarification about who will own the land above the pipeline during pipeline operation.*

The impacts of the project on land are covered in the ESIA – Section 11.4, Table 11-3 and Section 11.5. A summary of key issues is presented below.

7.9.1.1 Irrigation

The Construction Contractor is required to ensure that flow is maintained in irrigation channels during construction of crossings, or to provide alternative irrigation sources. The Contractor is also required to ensure that landowners and users

continue to have access to land which is dissected by the ROW. Any irrigation channels that are disrupted must be re-instated immediately following construction.

Following reinstatement, landowners will be able to develop new, shallow, irrigation channels across the pipeline ROW in consultation with BTC Co.

- Some major irrigation canals will be crossed using non-open cut techniques to avoid any desruption to flow.

7.9.1.2 Land cultivation

Landowners and users should continue to cultivate their land until approached directly by the project land team and advised to stop. The timing of when to stop land cultivation in each region will depend upon the detailed construction schedule to be developed by the Contractor. BTC Co. will provide as much advance warning as possible about the exact construction schedule via the community liaison teams. The land and community liaison teams will provide advice on when cultivation can re-commence.

7.9.1.3 Restrictions within the exclusion zone

Once the pipelines are operational, an exclusion zone of 15m either side of each pipeline will be established. Normal agricultural practices may continue within this exclusion zone, including the development of small irrigation channels (up to 30cm deep and with BTC Co. agreement), however deep ploughing and the planting of trees will be restricted. The land and community liaison teams will be able to provide information on the minimum allowable distance from the pipe for different tree species.

The following work and activities will be **prohibited** within this zone:

- Construction of any building whether habitable or not
- Construction of any facility or the erection of any installations, including livestock enclosures
- Storage of fodder, fertilisers and materials, making of haystacks and straw stacks.
- Fires of any sort
- The construction of passages, vehicular accesses and roads
- The construction or use of parking lots for tractors, agricultural machinery or other machine driver vehicles
- The use of explosives, piling or similar activities
- The pouring of any acid, alkali solutions or other inflammable corrosive or toxic fluids
- Any welding or flames, except as required for activities in section below, as approved by Operator and carried out under Operator permit supervision
- Interference with any marker post or cathodic test point including relocation, burying, breaking or knocking down
- Interference of any kind with any of Operator's equipment in the zone including, opening and closing valves, switching on and off any communication of logging devices, interfering with any power supplies
- Significant change to the ground profile
- Alter, divert or otherwise interfere with any drainage ditches, irrigation canals or dykes and banks that protect the pipeline and the pipeline zone

from damage add erosion control materials/measures
- Alter, divert or otherwise interfere with the dykes and banks designed to contain any oil spill or protect adjoining areas in the event of an oil spill
- Any activity which may cause the pipeline or the zone each side of the pipeline to be flooded
- Agricultural activities greater than 30cms deep, or with machinery greater than 10.6 tonnes weight, a ground bearing weight of greater than 1.01 kg/cm^2 or greater than 7.63 tonnes single axle load
- Planting of trees not in accordance with the permitted types. The land team can advise on the minimum allowable distances for different tree types.

The following activities are **prohibited** within the zone, except with full approval by BTC Co, and if they are being carried out under the Operator's permit system, and Operator supervision:
- Installation of lines (including electrified stock fencing), cables or pipes of any kind either under the land, or over the land (whether surface laid or on poles)
- Installation of essential agricultural fences
- Road, track or railway construction
- Construction of new irrigation (greater than 30cms deep) or drainage ditches
- Excavations
- Small alterations in the ground profile.

The following activities are additionally prohibited within 4m of the pipelines:
- Any activity which could interfere with the performance of pipeline patrols and other necessary operational activities
- Any activity which could cause or lead to damage to the pipeline
- The passage of any vehicles (not permitted under Permitted Activities across the pipelines), if greater than 1.5 tonnes weight, except at designated pipeline crossing points, or with full approval of Operator, and carried out under Operator's permit system and supervision
- Construction of new irrigation (greater than 30cms deep) or drainage ditches
- Taking of soil samples, including survey, mining, reclamation or other such works
- Boreholes, for any reason whatsoever
- Any alteration to the ground profile
- Any material alteration to the zone affecting support of the surrounding soil to the pipeline
- Any increase in the cover over the pipeline however caused
- Any decrease in the cover on the pipeline however caused (including agricultural activity)
- Any placement of substances, including general rubbish, wastes or detritus.

7.9.1.4 Land ownership

The project proposes only to lease temporarily the land needed for pipeline construction. Land that will be used permanently for above ground facilities will be

permanently acquired. The majority of land will therefore remain with its current owner.

7.9.2 Land Acquisition and Compensation Process

Feedback regarding the land acquisition and compensation process was received as follows:

- *Requests for further information on compensation procedures and demands that the land acquisition process will be effective. Clarification was sought on how municipal land will be compensated for, and in particular whether private users of municipal land will receive compensation. Information was also requested on compensation procedures for land used and for restrictions on cultivation during operation*
- *Requests that the Land Valuation Commission (Section 11.4.10 of the ESIA) includes a lawyer whose responsibility is to protect the interests of the landowners and users*
- *Clarification about why government land valuations have not been used*
- *Requests for details of the land take needed by region (including location of pipe yards) and clarification on the process of moving from documentation within a 100m corridor to compensation within a final 44 m corridor*
- *Requests that compensation for land use is paid directly to local landowners*
- *Clarification of how compensation will be calculated when crop rotation is practiced, particularly if plots are in their fallow year during the period of land documentation*
- *Clarification of the timing of compensation payments*
- *Clarification of how the new acquisition process will affect existing WREP agreements*
- *Requests for advice on the correct procedures if a landowner has been incorrectly documented*
- *Concern that the land acquisition process has not yet been finalised.*

An outline of the compensation process was provided at all public meetings and commitment was given to clarification of any measures still outstanding through the community liaison and land teams, as the construction period approaches and the land acquisition process takes place.

The Resettlement Action Plan (RAP) details all land acquisition and compensation procedures. A summary of this document will be available in mid September and the full RAP will be released in October, when it will go through a disclosure process where feedback from the public will be sought, recorded and responded to.

7.9.2.1 Summary of land acquisition and compensation process

The key objectives of the land acquisition and compensation process are as follows:

- To pay fair compensation based on market value, full replacement cost or loss of income, as the case may be, for (i) temporary use of land for construction purposes; (ii) permanent acquisition of land for AGIs; and, (iii) any restrictions on use that will be applied to areas adjoining the pipeline

corridor and other facilities
- To minimise disruption to trunk irrigation infrastructure
- To allow landowners, lessees and other users to resume their pre-project activities on the land around the pipeline upon completion of construction (subject to some restrictions to ensure public safety)
- To adopt design standards that minimise restrictions on use of adjoining land
- To keep affected people and communities fully informed about the project, the process that will be followed to acquire and compensate for land, and their related rights and avenues for redress.

Land acquisition and determination of compensation sums will be conducted in accordance with the laws of the Republic of Azerbaijan, including the HGA.

Landowners, registered users and other users will be compensated for impacts arising from the project's temporary or permanent use of land. This will include private users of municipal land. Compensation will be paid directly to the landowner or user and will be paid at least 30 days before the beginning of construction on the land. Compensation will cover loss of land, loss of any structures or other fixed assets, and any loss of income from crops, directly caused by the project. The principles are summarised in Table 7-2.

Table 7-2 Summary of Principles for Compensation

Type of Impact	Principles for Compensation
Permanent acquisition of land - for AGIs, block and check valves, permanent access roads and other ancillary works.	Cash compensation based on market value in accordance with Azerbaijan Law. Cash compensation equivalent to replacement cost for any structures, attachments or other fixed assets on the subject land.
Temporary loss of use of cultivated land during construction – for pipeline corridor, construction camps, pipe storage yards and temporary access roads.	Cash compensation to cover loss of profit from crops during the construction period [(estimated crop yield x area disturbed by the project x retail price) – production costs] x number of years of construction period. Cash compensation equivalent to replacement cost for any structures, attachments or other fixed assets on the project affected land.
Temporary loss of use of grazing land	Cash compensation for temporary loss of grazing area.
Loss of trees, vines and perennial crops	Cash compensation will be provided based on the cost of planting, labour and fertiliser inputs required to bring the tree or vine to maturity, plus the cost of the lost production for the period it will take a replacement sapling to reach the production level of the tree/vine at the time it is lost to the project.
Loss of annual or seasonal crops	Adequate advanced notice of the pipeline construction schedule will be provided to affected farmers so that farmers don't unnecessarily lose crops. *Cash compensation based on market rates.
Loss of structures, attachments and other fixed assets on project affected land.	Cash compensation equivalent to replacement cost.
Accidental damage to houses or other structures caused by project	Project will make good the damage or meet reasonable cost for repair.
Restrictions on use - following the construction period, some restrictions will apply as discussed in Section 7.9.1.3	The project will provide cash compensation to landowners affected by restrictions on land use.

There are eleven steps in the land acquisition and compensation procedure and these are summarised below:

1. SOCAR and the project developer prepare an application for allocation of land for the pipeline project for approval by the Azerbaijan Cabinet of Ministers (completed)
2. State Land Coordinating Committee (SLCC) with district and municipal Lands Department researches land titles and ownership details to identify project affected landowners, lessees and users (completed)
3. SLCC, SOCAR and the BP land acquisition team hold meetings in each municipality to advise land owners, lessees and users of the need to acquire their land for the project and of the procedures that will be followed (completed)

4. Preliminary agreements are signed between SOCAR, SLCC and BP and affected land owners. In agreements, land owners confirm their willingness to enter land acquisition negotiations (completed)
5. A survey and loss assessment is carried out to measure all land, assets, and livelihood impacts as a basis for calculating compensation payable for temporary and permanent use of land
6. Final negotiation of compensation between Joint Land Acquisition Team and each project affected landowner, lessee and user
7. Execution of Final Land Acquisition agreements
8. Payment of compensation by BP hand-to-hand with affected landowners, lessees and users not less than 30 days before land is required for construction
9. Signing of Restriction of Use agreements with each and every land owner
10. Issue of new or amended ownership certificates
11. Monitoring by BP Community Liaison Officers of any complaints or grievances arising from the project.

Steps 1-4 have now been completed. Step 5 is underway.

The compensation process implemented for the BTC project will not impact on existing WREP land agreements.

7.9.2.2 Access to legal resources

BTC Co. will sponsor an Azeri legal NGO to provide land owners and users with independent, clear advice on their rights prior to and during the land acquisition and compensation process.

7.9.2.3 Government land valuations

Government land valuations have been used as the basis of compensation calculations. The government land valuations will be the minimum value used during negotiations, however compensation payments are likely to be greater than these values and will include other factors such as crop and duration calculations.

7.9.3 Resettlement

Two requests were received for clarification regarding whether there would be any physical resettlement.

The project team stressed during public meetings that there would be no physical resettlement of households for construction of the pipeline. BTC Co. is, however, preparing a Resettlement Action Plan to address 'Economic Displacement' i.e. impact upon livelihood. The BTC Project RAP is in effect a detailed explanation of the land acquisition and compensation process.

7.10 WATER (SOCIAL)

The use of local water sources was identified as an issue by several respondents. Primarily there were requests that the project drill additional wells, which could then be used by communities as well.

There was also a concern that any water used must be treated to international standards.

The project has been designed to ensure that there will be no impact on communities and households in respect of their access to water. For this reason,for potable water the project is likely to use either bottled drinking water or truck deliveries. Other water needs will be drawn from local sources but with monitoring to ensure that the project's supply does not have an impact upon community needs.

All drinking water will meet World Health Organisation standards and all waste water will be treated to at least World Bank environmental performance guidelines prior to discharge.

The drilling of community wells may be considered as part of the community investment programme under social infrastructure development.

8 RESPONSE TO COMMENTS: MANAGEMENT AND MONITORING

Monitoring of the implementation of mitigation measures proposed in the ESIA was seen as vital by many of those providing feedback. We have been asked to clarify who will be carrying out monitoring during construction and operation. Some respondents felt that it would increase transparency of the construction process if there is an element of public/NGO monitoring. We have also received suggestions about the employment of specific specialists for ecological monitoring.

The mitigation measures outlined within the ESIA will form the basis of the management plans that will be developed by the Construction Contractor or by BTC Co. The Contractor is required to implement all of the measures specified as his responsibility within the Invitation to Tender, which included social and environmental requirements. Implementation of all other mitigation measures identified in the ESIA will be the responsibility of BTC Co. The Construction Contractor's specific implementation plans are not yet available, but will be subject to approval by the BTC project team.

To assure both the BTC project team and external stakeholders that these implementation plans are both developed appropriately and rolled out effectively, the BTC environmental and social management team will conduct routine monitoring of all issues, as specified in the Monitoring Plan outlined in Section 14.3.16 of the ESIA. This will include internal auditing of the activities of the Construction Contractor, routine internal reporting on all issues to the BTC environmental and social management team, and external reporting via the BTC project website.

Before construction begins the BTC environmental and social managers will develop an audit programme and protocols. These will be shared with the IFIs and other interested parties on request. The IFIs will also periodically monitor and audit the project.

As stated in Section 6.10.1 of this Addendum, BTC Co. will plan and execute further ecological work in conjunction with local scientists.

Some respondents stated that the concept of environmental management and monitoring as part of the project EMS, and associated environmental management and control plans, is sound in principle. However, they go on to say that the implementation and success of the various plans, on a site-specific basis, will depend upon the clear and adequate contractual transfer of responsibilities through the construction and operational phases.

BTC Co. recognises that the implementation of the commitments outlined in the ESIA are, in many cases, contingent on the Construction Contractor's environmental management system. The main mechanism for the transfer of responsibility from BTC Co. to the Contractors is initially through the contractual agreements put in place at contract award. During pipeline construction, compliance and monitoring will be carried out by both BTC Co. and the Contractors.

The Construction Contractors will develop project specific health, safety and environmental (HSE) management plans which address all relevant aspects of HSE. The development and implementation of these plans is a contractual requirement. The plans are subject to review and endorsement by BTC Co. prior to Contractor mobilisation. BTC Co. will maintain an assurance and monitoring role during construction to ensure that the requirements of the contract and of the ESIA are implemented. There will also be external monitoring from groups that may finance the project, such as the World Bank and EBRD.

The project is setting up a performance monitoring system which uses key performance indicators (KPIs) to track performance in key areas including health, safety, environment and social responsibility. This performance monitoring system includes tracking compliance with agreed plans. The performance monitoring system can be used to provide incentives to the Contractor and conversely, if necessary will be used as a means to implement appropriate sanctions for non-compliance. These could range from corrective action through termination of work activities to termination of the contract.

Appendix A
Route Maps
(showing route 011 deviations from route 010)

Appendix B
Public Consultation

Appendix C
Revised Pump Station Location

Appendix D
Typical Road and River Crossings

Appendix E
Inter-relationship of BTC, SCP and WREP Routes

Appendix F
Fault Crossing Diagram

Appendix G
Karyazi Aquifer Case Study

Appendix H
Gobustan Reserve Case Study