REPORT OF THE POST-FINANCIAL CLOSE INDEPENDENT ENVIRONMENTAL CONSULTANT (IEC) BAKU-TBILISI-CEYHAN (BTC) PIPELINE PROJECT

FIRST SITE VISIT, FEBRUARY-MARCH 2004

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EXECUTIVE SUMMARY

This report represents the first post-financial close field visit in Azerbaijan, Turkey and Georgia made by the Independent Environmental Consultant (IEC) between February 29th to March 24th 2004 to monitor compliance with BTC Project Environmental and Social (E&S) commitments during actual Project development. The construction of the BTC pipeline system is underway and the winter conditions have only partially impacted construction activities, particularly in the mountainous regions.

During the visit IEC had the opportunity to meet with the three BTC in-country organizations (Azerbaijan, Turkey, Georgia), with BOTAŞ and with the EPC Contractors, reviewing documentation and interviewing the personnel in charge of implementing the E&S commitments and monitoring construction activities. The IEC visited several construction sites including activities along the ROW, several Above Ground Installations and the Ceyhan Marine Terminal.

Organization and Staffing: The different E&S management organizations of BTC, BOTAŞ and Contractors are in place and operational. Some of the organizations need to be strengthened, particularly in Azerbaijan and Turkey where additional senior personnel are needed to overcome the challenges posed by the significant physical extension of pipeline construction and the proposed accelerated construction programmed for the coming months.

E&S Documentation and Data Management: A significant effort to collect, process and analyze data from the field to identify critical conditions and to improve performances has been undertaken. The IEC has reviewed many of these data related, for example, to waste management, water consumption, water quality, pollution control, etc. An urgent need exists for improving the quality of raw data. In-country BTC organizations appear to lack the resources to technically review and ensure quality of field data (BOTAŞ in Turkey as well) and Contractors do not always have the experience to assess the importance and the significance of these data. The situation, as detailed in the full report, does not differ significantly among the three countries, although a slightly better condition in Georgia can be noted at this point in time, where a remarkable effort has been made by the BTC organization in Georgia to fill the gaps identified by internal audits and resolve chronic organizational issues, especially in the field of waste and wastewater management. Some of the documentation prepared by the different organizations to support E&S related activities (e.g., documents attached to Management of Change Requests, preconstruction surveys, etc.), during Project development have often been found to be technically inferior to the standards and the quality of the documents developed during the ESIA phase of the Project. The IEC recommends that BTC focus on this issue and work to make sure that the E&S assessment documents are prepared according to overall commitments and international standards and are not simply items to be checked off as part of formal compliance.

Waste Management: the recent production of waste has been limited because of reduced construction activities during winter. The Project is now planning to implement an accelerated construction program during spring and summer. significant amount of waste will be produced and the IEC has observed that the Project has only partially developed the necessary plans to properly manage the various waste streams that will be produced. A significant effort is still required to improve the condition of the sewage treatment plants (STPs) at camps, as required standards are still not achieved at many locations. The best example for achieving wastewater treatment compliance has been recently set by the Georgia Project team, who has made a significant effort to develop new management concepts and tools to improve STP performance, thanks to the direct involvement of the BTC organization. The other in-country organizations are encouraged to follow the same approach. Both Project incinerators in Azerbaijan and Georgia are not working properly and BTC needs to review the working procedures and make sure that senior/expert personnel are dedicated to the operation of these facilities. Solid waste should be properly stored and labeled to improve their tracking and the safety of the operators. The IEC acknowledges that significant improvements have been recently achieved by some Contractors (e.g., SPJV in Georgia and Azerbaijan; PLL in Lot C) and recommends that BTC make an effort to seek consistently high standards across the countries and the Contractors.

Potable water: there is a general lack of an appropriate monitoring of the quality and quantity of the use of potable water within the Project construction facilities. In Azerbaijan water testing is insufficient and baseline testing is missing. Sustainability studies should also be properly prepared. In Turkey sustainability studies have been prepared, but water quality testing is done inconsistently and not always for the same parameters. Baseline testing is not performed. In Georgia sustainability studies are not available, although baseline water quality tests have been performed using a local laboratory. The IEC recommends that all parties consistently conduct sustainability studies and implement water quality monitoring according to the commitments and to assure that, in case of non-compliant conditions, the Project reacts properly and mitigation measures are promptly applied. The IEC also recommends that local laboratories used by the Project are inspected by third-party assessors and Quality Control (QC) samples (i.e., duplicate samples) are periodically taken and analyzed by overseas laboratories accredited to international standards.

Safety: The IEC acknowledges the effort made by the BTC organization to adopt the highest safety standards during Project development. During the field visit some observations were made with regards to safety, mostly related to the proper implementation of good practices and safety mitigation measures to reduce the risk during construction. The IEC recommends that the Project review safety management aspects at camps and temporary construction facilities (storage yards, access to ROW). Particular attention should be paid to significant activities provided by third parties (such as aggregate suppliers, concrete suppliers, disposal sites, etc) to verify that sufficient safety, as well as E&S standards are being applied.

Reinstatement: Different practices and conditions were observed across the three countries, which to a certain degree depend on location and the status of construction, but which also depend on personnel capabilities and experiences. In Azerbaijan, as recognized by BTC, reinstatement is still not sufficiently addressed and additional erosion and sediment controls are needed, particularly at the river crossings. In Lot C in Turkey good reinstatement and good management of the top soil along the ROW was observed, but construction resources were not found to be sufficient to complete the required work according to the commitments at river crossings. In Georgia the topsoil preservation procedures need to be reviewed, especially considering that only partial reinstatement of the ROW will be undertaken until final installation of the SCP pipeline.

Archaeology: the overall field archaeological program along the ROW in all three countries appears to be consistent with Project commitments. Discoveries have been made that will enrich world cultural heritage. As the field excavations come to a close, the responsibility for compiling, interpreting, preserving and presenting the findings will rest with the host governments. The BTC Project has a substantial investment into cultural heritage management and the commitment to manage this investment according to international standards. Fulfilling this obligation will require a close cooperation with the relevant government entities, especially when the excavations are complete. IEC recommends that the BTC Project look for the means to strengthen the interrelationships between the all parties involved, BTC, BOTAŞ in Turkey, and host Government agencies, with the goal of taking the maximum advantage of the work completed to date to enhance our shared cultural patrimony.

Environmental Investment Programmes: During the mission, the IEC was briefly updated on the status of the Environmental Investment Programmes (EIP) in the three countries. No detailed review has been conducted on the priority themes identified in the ESAP, although it is noted that the programs are ongoing and appear to be adequately managed by BTC.

General Conclusions: After about one year from the start of the construction activities, the E&S management system is still on a learning curve, which might be expected, given the complex nature of the Project in terms of engineering goals and managerial structure. Nevertheless, a sufficient level of performance is not yet being consistently achieved and a significant gap still exists between the stringent Project

standards and the status of their actual field implementation in all three countries. Nevertheless, the remarkable turnaround being achieved in Georgia after findings of their own internal performance audits must be recognized. It is now the turn of the other two BTC in-country organizations to react. Their E&S management systems are developed, but need to demonstrate improved field performance. More generally, the E&S management organizations (including BOTAŞ) needs more resources and senior staff, especially in the field of topsoil management, ROW reinstatement and waste management, to strengthen the current organizations, especially considering the length of construction along the ROW and that accelerated construction programs have been approved in the three countries.

The IEC recognizes that most of the numerous non-compliant conditions observed in the field and described in this report were minor. Nevertheless, they indicate shortcomings in the implementation of the E&S management system developed by the Project and the commitments defined in the ESAP. The Project now needs to act to strengthen its E&S management organization and improve field performance.

1 INTRODUCTION

D'Appolonia S.p.A.(D'Appolonia), located in Genoa, Italy, has been appointed as the post-financial close Independent Environmental Consultant (IEC)¹ to the Lender Groups for the Baku-Tbilisi-Ceyhan (BTC) Pipeline Project (BTC Project)² and the Azeri, Chirag and deepwater Gunashli (ACG) Phase I Project (Phase 1 Project)³. The BTC Project is currently under development and will be owned by BTC, a company formed by a consortium of the Main Export Pipeline Participants (MEPs)⁴. Construction of the BTC Project is underway in Azerbaijan, Georgia and Turkey. The Phase 1 Contract Area covers the Azeri, Chirag and Deepwater Gunashli fields and is being developed by Participating Production Sharing Agreement (PSA) Contracting Parties.⁵

The overall role of D'Appolonia within the BTC and ACG Projects is to assess and report to the Lender Group on the compliance with the environmental and social provisions contained within the respective project Environmental and Social Action Plans (ESAPs), the associated Contractor Control Plans (CCPs), and BTC/ACG Management Plans and with EHS management systems. This report summarizes the results of D'Appolonia's first field visit held between February 29 and March 24, 2004. This initial trip focused on the BTC Project only. The Phase 1 Project will be reviewed during D'Appolonia's second trip scheduled for July 2004.

³ The Lender Group for the Phase 1 Project (Phase 1 Finance Parties) means IFC and EBRD.

⁵ Also termed the "Phase 1 Sponsors" includes Amerada Hess Corporation, BP Corporation North America Inc., Statoil ASA and Union Oil Company of California.

¹ IEC Team members: Roberto Carpaneto (Team Leader), Paolo Lombardo (Team Coordinator), and William J. Johnson (Team Member).

² The Lender Group for the BTC Project (BTC Finance Parties) comprises the International Finance Corporation ("IFC"), the European Bank for Reconstruction and Development ("EBRD"), Compagnie Française d'Assurance pour le Commerce Extérieur ("COFACE"), Her Majesty's Secretary of State acting by the Export Credits Guarantee Department ("ECGD"), Euler Hermes Kreditversicherungs-AG ("Hermes"), Japan Bank for International Cooperation ("JBIC"), Nippon Export and Investment Insurance ("NEXI"), Overseas Private Investment Corporation ("OPIC"), Servizi Assicurativi del Commercio Estero ("SACE"), the Export-Import Bank of the United States ("US EXIM") and any other export credit agencies and commercial lenders and any other providers of debt financing or political risk insurance for the BTC Project, including, for the avoidance of doubt, the Sponsor Senior Lenders.

⁴ Also termed the "BTC Sponsors" includes Amerada Hess Corporation, BP International Limited, BP Corporation North America, Inc. ConocoPhillips, ENI International, B.V., INPEX Corporation, ITOCHU Corporation, SOCAR, Statoil ASA, TOTAL, S.A., Türkiye Petrolleri A.O. and Union Oil Company of California.

The primary objective of D'Appolonia's first visit was to verify the implementation of BTC Project commitments established in the Environmental & Social Action Plan (ESAP), final at the time of financial closure (February 2004), and supporting documents developed to assure implementation of the ESAP including Contractor Implementation Plans and Procedures (CIPPs) and associated Method Statements and Procedures. D'Appolonia's review has included the environmental and social (E&S) and health and safety (H&S) management activities of BTC, the Turkish State Petroleum Pipeline Corporation (BOTAŞ) in the case of Turkey, and the individual Engineering, Procurement and Construction (EPC) Contractors. Emphasis has been placed on evaluating compliance primarily on the reactions of the BTC/BOTAŞ and the individual Contractors to non-compliant situations based on the following:

- Random checking of individual non-compliances identified by BTC/Botaş or individual Contractors and reviewing the mechanisms followed by the responsible organizations to identify, address, correct and follow up non-compliant situations, as well as the documentation demonstrating the implementation of appropriate procedures.
- In-depth review of symptomatic non-compliances, which may indicate a deficiency in the process of compliance management and identifying mechanisms and the procedures the BTC Project proposes to follow to make sure that similar situations will not occur again.

Most of the findings identified in this report have been based on field observations, and interactions with the individuals actually responsible for the field implementation of the ESAP.

Weather conditions prevented a review of construction operations along the entire pipeline. In particular, it was not practical to visit Lot A in Turkey or the western portions of the pipeline in Georgia. The scope of the visit on a day-by-day basis is presented in Appendix A.

Subsequent sections of this report provide the following:

- Section 2 presents the review of the Project in Azerbaijan
- Section 3 presents the review of the Project in Georgia
- Section 4 presents the review of the Project in Turkey
- Appendix A presents the trip itinerary
- Appendix B presents lists of non-compliances with the ESAP, with relevant observations and recommendations for Azerbaijan, Georgia and Turkey, respectively.

2 AZERBAIJAN

The BTC Project in Azerbaijan includes the first Pump Station (PSA1) at Sangachal Terminal near Baku and 443 km of pipeline extending from the PSA1 to the border with Georgia. The corridor followed by the pipeline is close to the existing Western Route Export Pipeline (WREP) and is also the corridor that will be subsequently followed by the South Caucasus Pipeline (SCP), which will transport gas from the Shah Deniz field to the Georgian/Turkish border in a separate, related project. The BTC Project in Azerbaijan includes several permanent Above Ground Installations (AGIs) including the first Pump Station at the Sangachal Terminal (PSA1), an Intermediate Pigging station (IPA1) near KP 125, and a second Pump Station (PSA2) near KP 245, as well as necessary block and check valves. PSA1 was not visited as the Sangachal Terminal facilities will be visited during the next mission when the Phase 1 Project is reviewed.

In addition to the permanent facilities, the pipeline is associated with several temporary facilities, which include:

- Temporary construction camps (Mugan near KP 65, being discontinued; Kurdamir near KP 129, occupied; Yevlakh near KP 235, occupied; Tovuz near KP 376, construction started; Kurdamir for IPA1; PSA2 camp)
- Dump Yards for pipe (Umbaki near KP 0; Mugan near KP 65; Kurdamir near KP 129; Yev lakh near KP 235; Gandja on NE edge of town of Ganja; A gstafa next to town of Agstafa near KP 400; Beyuk Kassik next to the Georgia border near KP 440).

At the time of the visit, weather was not a constraint to working and nearly all of the pipeline route and active facilities could be visited.

2.1 CONSTRUCTION STATUS

The BTC Project in Azerbaijan uses two prime Contractors, Consolidated Contractors International Company (CCIC) responsible for pipeline construction and Spie-Capag Petrofac Joint Venture (SPJV), responsible for the AGIs. Current (March 2004) construction progress is as follows:

• *Facilities* – Pump Station PSA1 at Sangachal Terminal (not visited during this trip) is reported to be 50% complete in terms of the main civil works; PSA2 is reported to be at a 50% overall completion; and the Intermediate Pigging station IPA1 is reported to have an overall completion of 25%.

• *Pipeline* – ROW clearing and grading 317 km (stopped at that point because reinstatement too far behind); pipe stringing, 284 km; trenching, 142 km; pipe in ground, 122 km; backfilled, 111 km; reinstatement, 20 km (BTC has not given approval to any of the reinstatement).

Pipeline construction is being conducted with a single spread. At the end of 2003, BTC contemplated adding a second spread, but this has not proved necessary. A double jointing facility has been established at Yevlakh instead. Horizontal directional drilling (HDD) has been completed beneath Chiyni village and a 1,100 m HDD was being conducted at the time of the visit beneath Garabork village. Azerbaijan has 15 major rivers and 2 canal crossings. At the time of the D'Appolonia visit, approximately seven river crossings and two canal crossings were completed, but not reinstated and two river crossings were under construction. The completed crossings of the Djeyrankechmez and Kushkarchay Rivers and the Shamkir Chay and Ganja Chay river crossings under construction were visited during this mission.

2.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES

2.2.1 Resources and Organization - Observations

The following subsections discuss the environmental management organizations of BTC and EPC Contractors. The social management organizations are outlined in Section 2.9.

BTC

The extent of construction along the ROW, as described in Section 2.1, is placing a significant strain on the E&S organizations of both BTC and CCIC to monitor the pipeline activities. The open ROW is significantly longer than the relevant commitments, which state that no more than 15 km of trench to be open at any one time on each spread (Commitment Register, Commitment No. 862); and that Contractor will have no more than 10 km of continuous or 15 km total trench open at any one time (Commitment Register, Commitment No. 45). This is considered a *Level II Non-Compliance* with the above Commitments (see Section 2.6). During the visit this was apparent at certain locations where significant construction activities were ongoing without the presence of an environmental monitor to ensure that all environmental mitigation measures were properly implemented (e.g. construction operations during the Shamkir river crossing - a major river crossing - was observed to be conducted with no environmental oversight by either BTC or CCIC, although it was known in advance that this activity would be taking place).

BTC has decided to fill a new position of Field Environmental Supervisor (2 new expatriates in rotation for one position) in addition to the one already in place. BTC

should also consider increasing the number of EFOs (Environmental Field Officers), to the six currently present in the field.

CCIC

Observations similar to BTC also apply to CCIC with respect to the resources available in the field to monitor and interact with the construction teams, particularly in light of the significant extent of the on going construction activities and length of ROW under construction, well beyond the initial plan. The IEC considers the current organization not sufficient to cover all the activities along the ROW and at camps (three Environmental Engineers, one senior Environmental Officer and four EFOs). The organization is still missing a senior reinstatement specialist.

In addition the construction experience of the E&S field team is limited and additional senior staff is required with significant previous experience in the field of large pipeline construction. The teams in the field were found active and dedicated, but sometimes not sufficiently experienced to focus on the most important aspects related to the ongoing operations (e.g. waste management, water management, data management, noise monitoring, etc. - see other sections) and to fully interact with the construction management.

The technical resources (vehicles, digital cameras, GPS, personal computers) made available to the CCIC environmental staff appear to be limited when compared with the current number of staff.

SPJV

The E&S organization of SPJV is considered sufficiently staffed and competent. An audit program still needs to be implemented by the E&S staff according to the plan (Non-Conformity with the BTC ESMSM anual, Section 4.5.4).

2.2.2 Resources and Organization - Recommendations

BTC

- 1. BTC should strengthen its E&S organization because of the extent of the ongoing ROW construction activities. The new Field Environmental Supervisor position should be filled as soon as practical, as well as additional EFO staff should be appointed.
- 2. The level of effort to control the procedures being followed by the Contractors is not sufficient, particularly for some specific aspects such as waste management and monitoring of water quality (see Sections 2.3 and 2.4); the prompt implementation of specific Contractor audits focusing on implementation of requirements and reviewing technical capabilities is strongly recommended.

CCIC

3. CCIC should significantly strengthen its E&S organization both in terms of personnel (a second Environmental Officer and supporting EFOs are recommended; the reinstatement specialist position should be filled as soon as practical), technical resources (vehicles and field equipment), and experience (senior staff is recommended with significant experience in the field of large pipeline construction and management of environmental aspects relevant to camps). More construction equipment and experienced staff need to be dedicated to the back end of the pipeline construction, including topsoil management, erosion and sediment control, reinstatement and biorestoration.

SPJV

4. The E&S internal audit program should be implemented according to the commitment as soon as practical.

2.2.3 Management of Changes - Observations

The supporting documentation and correspondence among the involved parties dealing with some E&S related changes during Project development was reviewed during the mission. One of the most significant and recent approved change requests was the proposed location of a new camp site at Tovuz, requested by CCIC (Management of Change Notice N.18), to replace two other locations previously identified during the Environmental and Social Impact Assessment (ESIA) phase. According to the plans a dedicated ESIA was prepared by CCIC and the Rev. 0 of this study was submitted for comments and approval to BTC in December 2003. The document was also submitted to the Ministry of Environment and Natural Resources (MENR) on December 25th 2003.

BTC reviewed the ESIA document and requested additional information and document integrations, which resulted in the issuance of three additional revisions, up to rev 2A in January 2004. On February 2, BTC reminded CCIC that they needed to wait for MENR approval and to have archaeologists monitor at site. Any eventual preparatory work (topsoil stripping) that the landowner might decide to undertake in advance of the Contractor occupation of the land should have been monitored as well.

On February 6 MENR expressed its no objection to the construction of the Tovuz Camp at the proposed location, and on February 14 this decision was notified to BTC.

2.2.4 Management of Changes – Comments and Recommendations

IEC acknowledges the effort demonstrated by the BTC team to manage the change request made by CCIC according to Project standards. Specific comments,

recommendations and suggestions were made available to CCIC. Nevertheless it is noted that Rev. 0 of the ESIA was submitted by CCIC to national authorities prior BTC approval at a time when BTC was providing significant comments to the document and when it was generally considered not to comply with Project standards. It is noted, however, that CCIC withdrew the submission to the MENR following a BTC request. Furthermore, as recommended by BTC, the preparatory work to be eventually performed by the landowner should have been managed according to the Project requirements. In this case the overall procedure appears to have been a procedural "shortcut" identified by CCIC to speed up starting construction prior to technical and formal approval.

5. The supporting documents to any request of change should be developed according to Project requirements and standards and be considered satisfactory and technically sound prior to transmittal to authorities, as appropriate.

2.3 CONSTRUCTION CAMPS, INFRASTRUCTURE AND SERVICES

The review of construction camps, infrastructure and services focuses on construction operations that potentially have an impact to surrounding infrastructure, natural resources, and community and household assets, including land, roads, and irrigation systems. In addition, the review of this topic includes camp water supplies and general aspects of camp management.

2.3.1 SPJV - Observations

SPJV operates a small camp at Kurdamir for the intermediate pigging station IPA1 with a capacity of approximately 160 workers and a larger camp at PSA2 with a capacity of about 320. These camps are both temporary, as permanent facilities will be located within the respective facilities. During the visits to IPA1 and PSA2, the following was observed:

• *Water supplies*: At the IPA1 Camp, no water wells have been drilled and water for both construction and for use as potable water are being trucked from Baku with current total consumption of approximately $15 - 20 \text{ m}^3/\text{day}$. Bottled water is used for drinking. At the PSA2 Camp, a water well was drilled, but is not being used because sand clogged the pump. Water for both construction and for use as potable water is being obtained from the Karabakh Canal with a total consumption of approximately $80 \text{ m}^3/\text{day}$. This water quantity is not significant in terms of the water available from the canal and the portion of this water used as potable water for the camp is treated at the camp and testing is being conducted by a laboratory in Baku. Bottled water is used for drinking. Testing of the potable water is being conducted only for basic parameters. Although no problems are reported, the potable water supplies have not been screened for a full suite of baseline parameters consistent with WHO standards. *Level II Non-Compliance, CCP Infrastructure and Services, Commitment ID: 528, 628.*

- *Project footprint*: Land use at both IPA1 and PSA2 has been evaluated on the basis of preconstruction surveys consistent with BTC Project commitments.
- *Road use*: Road use condition and routing studies have been conducted consistent with BTC Project commitments.
- Aggregate: PSA2 is anticipated to have significant needs for aggregate and concrete. The Camp Construction, Environmental Social Management Plan, Section 7.3.5 indicates that approximately 12,000 m³ of soil will be extracted from Borrow Pit 1, located 3 km east of PSA2 and 3,000 m³ of gravel will be extracted from Borrow Pit 2, located 7 km east of PSA2. Government permits have been obtained and road conditions documented, but the Environmental and Social Impact Assessment, presenting pre-construction surveys conducted for these sites, was still to be submitted to BTC at the time of the visit. Local concrete is being procured, but information to indicate if PSA2 is a major or minor user of the local supply sources was not provided. The BTC Project requires that an environmental and social assessment needs to be conducted for sourced aggregates and that environmental issues are considered in the procurement of goods and services. Level I Non-Compliance, CCP Procurement and Supply, Commitment ID 54, 404.
- *General Camp Management*: Both of the camps at IPA1 and PSA2 appear to be clean and well managed. Some specific problems to be resolved in the area of waste management are identified in Section 2.4.

2.3.2 CCIC - Observations

As noted above, CCIC has four work camps located along the pipeline route, Mugan (being discontinued), Kurdamir (occupied), Yevlakh (occupied), and Tovuz (under construction). The Kurdamir Camp has a capacity of approximately 800 workers, while the camp in Yevlakh has a capacity of about 600. During this mission the camps at Kurdamir and Yevlakh were visited with the following observations:

• *Water supplies*: At the Kurdamir Camp, no water wells have been drilled and water for use as potable water is being obtained locally. Test results for potable water indicate that problems were encountered, but the frequency of testing was not increased until the problem was resolved, which means that camp potable water may not have always been fit for consumption.. It is understood that bottled water is used for drinking. At the Yevlakh Camp a water well was drilled, but the required sustainability study of this well was not conducted. *Level I Non-Compliance, CCP Infrastructure and Services, Commitment ID: 52, 276, 278, 280, 831, 833.* Testing of the potable water supplies have not been screened for a full suite of baseline parameters consistent with applicable and

relevant WHO standards and Project specifications. Level II Non-Compliance, CCP Infrastructure and Services, Commitment ID: 528, 628.

- *Project footprint*: Land use at camps at Kurdamir and Yevlakh have been evaluated on the basis of preconstruction surveys consistent with BTC Project commitments. The Kurdamir Camp was previously occupied as a camp for the WREP and a pre-construction survey was provided for the Yevlakh Camp. As also discussed in Section 2.6, documentation for pre-construction surveys is scattered in several documents.
- *Irrigation channels*: Irrigation channels along the pipeline ROW have posed special challenges to construction as hundreds have been crossed where it has been necessary to maintain flow for the local farmers. Based on field observations, interviews with the CCIC Community Liaison Officers (CLOs) and complaints registered on the Grievance Log, CCIC appears to be managing irrigation channels generally within BTC Project commitments.
- *Road Crossings*: Road crossings along the pipeline ROW appear to have been managed within BTC Project commitments.
- Access roads to the ROW: CCIC was not able to demonstrate that preconstruction surveys had been consistently conducted for new access roads or where there was a significant upgrading to an existing road. Level I Non-Compliance, CCP Infrastructure and Service, Commitment ID 54, 404.
- *General Camp Management*: The Kurdamir Camp was found to be very muddy at the time of the visit, to such an extent that the poor surfacing impacted efficient environmental management, as noted in Section 2.5. The Yevlakh Camp appeared to be better managed. Some specific problems to be resolved in the area of waste management for both camps are identified in Section 2.4.

2.3.3 Recommendations

1. During the construction phase, some of the most significant situations with the potential for adverse Project environmental impact are from temporary facilities (camps, storage yards and related facilities). All E&S organizations (BTC and Contractors) need to be better focused on the management of these facilities within Project commitments.

- 2. Potable water testing is insufficient and baseline testing is missing. Where wells have been drilled, technically sound sustainability studies from both environmental and social considerations are needed. BTC should take the lead to make sure that potable water is correctly obtained from sustainable sources, baseline testing is conducted for all sources and standardized procedures are established to monitor the sources. European Union (EU) Drinking Water Directive 98/83/EC and WHO Guidelines are defined as appropriate standards to meet Project specifications, but BP Corporate Standard procedures (Procedure HSE-31) could be also applied, as has been the case in Georgia.
- 3. Documentation for pre-construction surveys is scattered in several documents and in some cases has been found to be incomplete. It is recommended that BTC make sure that the all of the required information is consolidated in a single pre-construction baseline survey document.

CCIC

4. Improve housekeeping, especially at Kurdamir Camp, also considering that this camp will also be used for the SCP Project and is therefore relatively permanent.

SPJV

- 5. E&S organizations (including BTC) should confirm the environmental and social compliance of the source(s) being used for aggregate and concrete, should it be found that SPJV represents the primary consumer of these local products. Verify that these third-party suppliers are not stressing the environment, cooperating with them as needed, without impacting the local supply procurement and work opportunities for local communities.
- 6. The community wells installed by SPJV need to be capped and controlled. Water quality monitoring is being conducted, but it should be reviewed by BTC as well (independent verification testing).

2.4 WASTE MANAGEMENT

2.4.1 Non-Hazardous and Hazardous Waste – Observations

CCIC

Recognizing that waste management is a key area of concern and there is a need for close monitoring, BTC requested a third-party audit of the waste management issues on pipeline construction operations in January 2004. The audit noted improvements in waste management performance of the EPC Contractor, CCIC, especially the implementation of an audit procedure, provision of further training, and use of waste

manifest forms. Nevertheless, persistent issues were noted in terms of waste segregation and labeling, as well as with sewage treatment.

CCIC has contracted AMSCO for waste management. AMSCO collects and transports waste, including some recyclable materials, to a waste management facility located near Baku. Hazardous wastes, mainly waste oil, oily rags and filters, and fuel-contaminated soils, are currently stored on site until a treatment/disposal site compliant with EU regulations is constructed and made available to the Project in Azerbaijan.

The Kurdamir waste incinerator, managed by AMSCO, has been commissioned and began operations in January 2004. However, due to technical problems the incinerator operations were stopped for about a month in January-February. The facility was put again in operation in the second half of February. The incinerator is located in the Central Waste Accumulation Area (CWAA) of the Kurdamir Camp and is being used for the disposal of non-hazardous waste and oily waste collected from CCIC and SPJV construction and camp sites.

During the visit of Kurdamir and Yevlakh camps, the following was observed:

- As already pointed out by the BTC audit conducted in January, the incinerator at the Kurdamir CWAA was again operational, but conditions still appeared to be poorly controlled and monitored, in particular considering that hazardous waste (waste oil, oily rags and filters, and waste caustic solution) and plastics were incinerated. Bottom ash, stored on site, was found to contain significant quantities of unburned waste material, often in coarse pieces, including plastic bottles. The significant amount of unburned organic material is a measure of the poor performance of the facility. It is likely that the incinerator efficiency was impaired by improper waste mix loads, with high percent of wet organic waste (food waste). Stack emission concentrations appeared to be significantly above the Project Specifications for the parameters measured by the Continuous Emissions Monitoring System (i.e., CO, SO₂, HCl). In addition, some parameters listed in the Project Specifications were never measured (e.g., hydrocarbons, PM₁₀, HF, heavy metals, dioxins/furans). Level II Non-Compliance, CCP Waste Management Plan, Commitment ID: 244, 245, 246, 1051, 1110.
- Proper management procedures for the incinerator appeared not to be available and known on site, especially in terms of control, monitoring, and reporting of stack emissions and prompt management of conditions non-compliant with Project emission standards. Operators on site were not fully aware of the specific waste control and stack emission monitoring requirements and precise instructions were not available from either BTC or CCIC. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 970, 1110.*

- Incinerator ash and scrubber liquors (caustic solution) were stored on site at the Kurdamir CWAA, although it was reported that ash is periodically sent to the AMSCO waste management facility in Baku and that caustic solution was incinerated in January. Testing results were not yet available to properly classify these materials and define suitable disposal options. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 1051, 1109.*
- The CWAA at Kurdamir was found to be not fully adequate in terms of stormwater management and proper containment. Secondary containment was insufficient around some hazardous waste container storage areas (including scrubber liquor containers). Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 541, 1110.
- Labeling of waste containers was found to be inadequate at both waste storage areas visited at Kurdamir and Yevlakh and not compliant with the applicable and relevant EU requirements. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 1106.*
- The available figures for waste generation (waste inventory) were not adequate, as they do not allow for the easy tracking of the origin, storage and fate of individual waste streams.

SPJV

An audit of SPJV Waste Management Plan was conducted by BTC at the end of January 2004 at PSA2, IPA1 and related camps. The audit found that roles and responsibilities were well understood and that waste collection, handling and segregation were partly adequate. However, significant delays were observed during the BTC audit in terms of completeness and adequacy of the waste management infrastructure, as well as other areas of concern in terms of a waste tracking system, waste inventory, container labeling and segregation of some waste streams. In February SPJV prepared a remedial action plan to address the issues raised by BTC.

SPJV has an agreement with CCIC to use their incinerating facility in Kurdamir. Recycling of materials that can be donated to Project-affected communities is organized through the Community Liaison Officers (CLOs).

At the time of the visit, the Waste Storage Point (WSP) at IPA1 was complete, whereas the CWAA at the PSA2 site was defined, but not constructed yet (Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 541).

Labeling of waste containers was found to be generally adequate and compliant with Project specifications, both at IPA1 and PSA2 sites.

2.4.2 Non-Hazardous and Hazardous Waste - Recommendations

BTC

- 1. BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. The audit should include a thorough inspection of all the facilities used by the EPC Contractors and their subcontractors to dispose of and recycle different waste streams, in order to ensure that the facilities meet Project Specifications.
- 2. BTC should conduct an in-depth review of the correctness and consistency of the waste inventories prepared by the EPC Contractors to ensure that there are no discrepancies between waste quantities actually stored or disposed and waste quantities reported, and that correct data are available to assess Contractor performance and potential issues.
- 3. BTC is responsible for full compliance of contractors with the ESAP commitments. Therefore, BTC should ensure that CCIC is capable of properly and safely operating the Kurdamir incinerator. BTC should routinely assess if compliant conditions are met during operations [siting with respect to closest receptors and prevailing winds, stack height, waste acceptance criteria (especially in terms of food waste mixing), operator training, availability of management procedures, availability of an accredited laboratory to test stack emission parameters].

CCIC

- 4. Additional training of incinerator operators is needed, such that they can demonstrate that the incinerator is operating in compliance with Project commitments.
- 5. Hazardous waste containers should be stored in bunded areas with appropriate secondary containment. Minimization of their potential contact with stormwater (e.g., using roofs or overpack drums) should be implemented, particularly taking into account that they will have to be stored on site until a suitable disposal option is identified by BTC.
- 6. Waste container labeling needs to be reviewed, improved and made compliant with Project specifications. As a minimum, the container labels should include: details of producer and contact details; what the waste is (description, hazardous components); how much there is (weight, volume, concentration); type of containment, and the number and size of containers; and the time and date of transfer to the CWAA. Training on proper waste handling, storage and labeling is needed.

7. The waste inventory needs to be revised and improved to allow proper tracking of waste amounts generated, recycled and disposed of by CCIC through AMSCO and other approved options.

SPJV

- 8. The construction of the CWAA at PSA2 needs to be completed in compliance with Project Specifications and made operational.
- 9. It is recommended that the food waste segregation and temporary storage points be located farther away from the kitchen.

2.4.3 Wastewater Management - Observations

BTC

Wastewater treatment was found to be inadequate at most facilities visited and contingency plans have therefore been implemented to manage the poor performance of the Sewage Treatment Plants (STPs) installed by both EPC Contractors. BTC pointed out that a technical review has been commissioned by BTC to assist both CCIC and SPJV in resolving the persistent issues relevant to the STPs used at their facilities. Results of this review were not available at the time of the mission.

CCIC

CCIC reported that their Sewage Treatment Plants (STPs) at Kurdemir and Yevlakh camps discharge into the municipal sewers. Recent results from both plants are within the Project standards, with the exception of persistent exceedances for coliforms.

There is neither a field laboratory nor testing equipment available to effectively monitor wastewater effluent quality and STP efficiency on site. Samples are collected monthly and sent to an offsite laboratory in Baku for testing. This arrangement does not allow for a frequent and effective wastewater monitoring. The IEC was informed after the mission that field analysis equipment has been purchased.

Potentially oil-contaminated water collected from the containment basins throughout the CCIC facilities is trucked away and disposed of by a subcontractor. Information provided on collection frequencies, disposal facilities and amounts disposed were insufficient to assess compliance (*Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 395, 396, 397, 398*).

SPJV

The Sewage Treatment Plants at both Yevlakh PSA2 and Kurdemir camps were not operating to the Project standards.

In Yevlakh sewage effluent is discharge into a 330 m³ unlined retention pond, from where it is collected and transported to a BTC approved treatment facility in Baku (Hovsani). The impact of the STP and the retention pond in terms of strong odor was apparent, particularly taking into consideration their location close to some worker accommodations and other living areas of the camp. The use of an unlined retention pond does not prevent infiltration of untreated or insufficiently treated wastewater into the subsoil and potential localized impact on the shallow groundwater. Yevlakh STP effluent testing results on samples analyzed by an external laboratory located in Baku were provided, although the latest results made available in a report dated February 24, 2004 were about two months old (December 2003). Clear evidence was not provided that SPJV was meeting their procedural requirement to test effluent quality every week. The reviewed results show concentrations exceeding Project standards for several parameters, including coliforms, BOD5 and COD, TSS, and total phosphorous. Current arrangement at Yevlakh does not appear to prevent discharge into the environment (Level II Non-Compliance, CCP Waste Management Plan, Commitment ID: 310, 384, 554).

In Kurdemir camp, the STP was operational at the time of the visit, although SPJV reported that approval was still to be granted. Treated effluent was stored in a 35 m³ storage tank, from where effluent was reportedly being trucked daily to the Hosvani treatment facility. At IPA1, sewage is discharged to a septic tank.

As already indicated for CCIC, there is neither a field laboratory, nor testing equipment available to effectively monitor wastewater effluent quality and STP efficiency on site.

2.4.4 Wastewater Management – Recommendations

BTC

- 7. BTC should take the lead in wastewater management as was done in Georgia (see Section 3.4) for retrofitting, operating, and monitoring the plants, as well as providing on-the-job training for the national staff.
- 8. BTC needs to improve the control of the procedures being followed by the Contractors for the monitoring of wastewater effluents, making sure that monitoring plans are technically sound, sampling is performed according to plans, results are made available with quick turn-around times by the laboratories and they are compliant with Project specifications, and practical contingency plans are available.

- 9. The condition of closed drain systems and the fate of oily water need to be verified by the BTC and EPC Contractors, especially CCIC. The review should include:
 - Oil water separator maintenance and discharges;
 - Collection, treatment and fate of oily water, including third-party facilities;
 - Adequacy of containment basins and collection drainage at fuel storage areas and filling stations.

CCIC

- 10. The STPs should be improved to allow effluent disinfection and control coliform concentrations in the discharge. Proper management of influent water, with respect to its characteristics and loads should be carefully evaluated prior to implementing any action.
- 11. Consider installing a field laboratory capable of effectively monitoring basic wastewater quality parameters and mobilizing a trained chemist to start up the laboratory.

SPJV

- 12. The STPs should be improved to treat wastewater and meet Project specifications as soon as practical at both Kurdamir and Yevlakh camps. The retention pond in Yevlakh should be lined, given that the groundwater is very shallow. The control of odors should be improved.
- 13. Consider installing a field laboratory capable of effectively monitoring basic wastewater quality parameters and mobilizing a trained chemist to start up the laboratory.

2.5 POLLUTION PREVENTION

2.5.1 Observations

The Project has adopted a pollution prevention plan aimed at systematically identifying potential impacts from construction activities and implementing avoidance and mitigation measures to minimize the likelihood, extent or duration of their occurrence, and any associated adverse effects. The mitigation measures include: spill prevention and management; management of existing contaminated areas, if any found during construction; groundwater protection; surface water protection; ecological receptor protection; air quality protection and dust mitigation; noise control; soil erosion control and topsoil protection.

Various provisions apply directly to the protection of surface and ground waters, including: permanent fuel and chemical storage, hazardous material storage, vehicle maintenance facilities, wastewater discharges, controlling run-off, and disposal of trench water and groundwater.

It is noted that chemical and fuel storage facilities should be constructed in accordance with UK best practice, which includes the following requirements, amongst others:

- Double skinned oil and fuel storage tanks, or installation of storage tanks in a suitably sized and constructed concrete bund. The bund volume should be no less that 110% of the tank volume;
- Storage tanks should be designed, constructed and tested to an appropriate code;
- Areas for road tanker parking and delivery should be surfaced and drained to a receiver/interceptor; and
- Discharge of rainwater and run-off from the storage and delivery areas should be made to a treatment system designed to meet the project water discharge standards.

The EPC Contractors are also required to develop and implement a hazardous materials management plan (as part of the Pollution Prevention CIPP).

Vehicle maintenance facilities should be established in accordance with UK best practice.

Areas of the facilities that have the potential to contaminate storm water flows should have impermeable slabs collecting and directing storm water runoff to appropriate flow balancing and storm water treatment systems.

The Contractors should also use measures to prevent sediment run-off entering water courses (e.g., installation of sediment fencing, drainage channels & trench barriers).

Air emission, noise and vibration monitoring is to be monitored by the EPC Contractors to ascertain that construction activities do not impact on the environmental and human receptors potentially affected by the Project.

BTC has developed a Hydrogeological Monitoring Program to comply with the relevant commitments (identify groundwater abstraction points in close proximity to the pipeline and develop a hydrogeological program for the Karayazi aquifer along the ROW). BTC reported that installation of monitoring wells for the Karayazi aquifer monitoring has been completed. The first round of sampling has been performed at the time of the visit, but analytical results were not available yet.

CCIC

Maintenance of irrigation drainage and stream flow and erosion and sediment controls throughout the ROW construction are discussed in Section 2.6.

At the time of the visit, after several months of construction activities along the ROW and at camps, the environmental monitoring procedure available at camps was still in a draft version. CCIC field environmental staff was not aware of the status of the procedure (*Level I Non-Compliance, ESAP, Section 6.4.3*).

Although this issue was already raised during pre-financial close monitoring, both the fueling stations at Kurdamir and Yevlakh camps were still lacking platforms for containing spills from filling operations. In addition, especially in Kurdamir, the poor surface condition of the camp, with significant mud, could contribute to accidents resulting in fuel (e.g., generator fuel storage tanks) and chemical spills. (Level II Non-Compliance, CCP Pollution Prevention Plan, Commitment ID: 1119).

As already mentioned in Section 2.4.1, the condition of closed drain systems and the fate of oily water collected by the system were not clear and they should be verified jointly by CCIC and BTC personnel.

Noise monitoring is conducted daily at some construction sites (mainly camps). The environmental monitors in charge of this task have not always identified the closest external receptors and monitoring duration has not always allowed for the obtaining of measurements comparable with the Project limits (*Level I Non-Compliance, CCP Pollution Prevention Plan, Commitment ID: 1101, 1102*).

Air emission and vibration monitoring results were not available during the visits. Dust control is accomplished through watering.

Four contaminated land sites were identified by BTC and CCIC during the ROW construction. They were reported in the January 2004 monthly report and appropriate procedures have been implemented by BTC.

SPJV

The refueling points at PSA2 and IPA1 construction sites were both lined, but the one at IPA1 was not bunded (*Level I Non-Compliance, CCP Pollution Prevention Plan, Commitment ID: 421*). Spill kits were available on site.

Noise monitoring results during construction activities at the facility boundaries and some potential external receptors were made available. Monitoring results appear to be within the limits, but, as indicated for CCIC, there is a concern that monitoring duration does not allow for obtaining measurements comparable with the Project limits.

Audits relevant to third-party facilities used by SPJV for providing the significant amount of concrete needed for the PSA1 construction were not available.

2.5.2 Recommendations

- 1. BTC should improve the control of the procedures being followed by the Contractors for the monitoring of environmental components, including water quality and wastewater, noise, vibrations and gaseous effluents. Procedures used by different Contractors should be consistent in terms of selection of monitoring location, parameters, frequencies, reporting.
- 2. BTC should verify the condition of closed drain systems at all camps and temporary facilities and the fate of all oily water (see also Section 2.4).
- 3. CCIC fueling stations should have appropriate platforms, suitable drainage collection for spills and oily water, and oil/water separators.
- 4. The CCIC environmental monitoring procedure should be urgently finalized and made available to the environmental staff at all the construction sites. Field training from experienced environmental professionals should be provided as soon as practical.
- 5. Training should be provided to CCIC staff to make sure that appropriate noise monitoring locations are selected.
- 6. Vibration and air emission monitoring activities should be fully documented by Contractors and results should be readily available to assess compliance with commitments.
- 7. Adequate monitoring of the implementation of the CCIC dust management procedure should be conducted before the coming summer season, especially at sensitive locations.
- 8. As specified in Section 2.4, the retention pond collecting wastewater effluent from the SPJV STP in Yevlakh camp is to be lined to protect the shallow groundwater.
- 9. The SPJV E&S or ganization should evaluate the third-party source for concrete, given that it is likely that the construction activities at PSA2 absorb the majority of the production of this supplier. The Project should make sure the plant operations are conducted within the spirit of the environmental and social commitments for BTC, especially without significantly impacting the local supply procurement and work opportunities for local communities.

10. The community wells installed by SPJV should be properly controlled to prevent the waste of the artesian groundwater resources tapped by these wells. Water quality monitoring was being conducted at the time of the visit, but it should be reviewed by BTC as well through independent verification.

2.6 EROSION CONTROL AND REINSTATEMENT

2.6.1 Observations

The original planned construction sequence indicated these specifications in a 44 meter construction corridor with a 32 m ROW:

- 1. Build BTC pipeline in 32 m ROW; no construction in the additional 12 meters dedicated to SCP pipeline;
- 2. 12 m of permanent reinstatement onto BTC; temporary reinstatement (20 m) including erosion control between construction of BTC and SCP, additional 12 m ready for construction of SCP;
- 3. 32 m ROW for SCP construction;
- 4. Final reinstatement of the 32 m SCP ROW to complement the 12 m corridor of BTC already permanently reinstated (item 2): total of 44 m permanent reinstated corridor.

In addition, the Project is committed to complete reinstatement of the ROW if the SCP is delayed by more than a year following the BTC construction phase. Final reinstatement will include biorestoration (seeding, seedling, tree planting, etc.).

As already highlighted in other sections, the single most important finding in Azerbaijan that represents a significant deviation from the BTC plans is the length of the ongoing pipeline operations. At the time of the visit, the pipeline had been cleared to approximately from KP 0 to KP 284. Final reinstatement had not been achieved for any portion of the pipeline, although approximately 30 km have been partially reinstated by CCIC, but considered not adequate by BTC. At the time of the visit, more than 20 km of the ROW had open trench, which is a non-compliance in terms of BTC commitments (*Level II Non-Compliance, CCP Reinstatement Plan, Commitment ID: 172; Commitment Register: Commitments No. 862 and 45*).

At the time of the visit, discussions were still underway as to how to effectively implement this reinstatement strategy based on the current dual speed of the construction in terms of the significant speed of the front end and delays in the back end for reinstatement and biorestoration. In light of the inadequacy of the partial reinstatement already implemented and in an attempt to manage this critical condition, BTC had just issued a stop work order to CCIC for clearing activities. Also BTC reported that they were involving an internationally-recognized specialized institution, the Desert Research Institute (DRI), to support CCIC in preparing an adequate Reinstatement and Erosion Control Plan and a Biorestoration Plan. In addition, BTC was mobilizing an additional environmental supervisor to support CCIC in the management of reinstatement issues. CCIC reported that they were mobilizing additional equipment to strengthen back-end activities and increase their speed, and that a reinstatement specialist would be recruited soon. CCIC also requested to be allowed to start working on the SCP ROW, but relevant Change Request documentation was not developed at the time of the visit.

It was noted during the visit of the ROW that erosion and sediment controls are limited, particularly at river crossing construction sites and along steep sections in semi-arid environments. Monitoring and documentation of stream conditions upstream and downstream of the crossings were found to be insufficient. Although required in the relevant CCIC method statements, turbidity measurements were not conducted. The intent of these measurements is to document pre-construction conditions, potential water quality impacts downstream and at potential sensitive receptors during construction, and the return to baseline conditions at the end of the construction phase (*Level I Non-Compliance, CCP Reinstatement Plan, Commitments ID: 1304*).

Four major river crossings were visited:

- the Djeyrankechmez River crossing (KP 9+300), where construction was complete, but temporary reinstatement was still to be made. Temporary erosion and sediment control measures appeared to be limited and potential for erosion was significant;
- the Kushkar Chay crossing at KP316, where turbidity impacts were observed downstream of the river crossing due to construction (i.e., construction was on going during heavy rain, when saturated soil conditions existed) and insufficient erosion and sediment controls were in place (i.e., lack of silt fences on land);
- the Ganja Chay crossing at KP295 which was complete, but not reinstated, and where limited temporary erosion control measures (silt fences on land) were found;
- the Shamkir Chay crossing at KP331, where pipe lowering was ongoing, but no environmental staff was present.

Because of the issues described above, it is considered that a systemic non compliance situation is present in terms of environmental management of river crossing activities. Although the potential damages or impacts are not irreversible and clearly identified, this issue needs urgent attention and expeditious corrective actions (both site-specific and systemic actions) (*Level II Non-Compliance, CCP Reinstatement Plan, Commitments ID: 350, 476, 498, 1284, 1300, 1301, 1323, 1324*).

Another significant issue in terms of assessing actual construction impacts is proper monitoring of additional land requests and land use along the ROW. Additional land is considered any land in addition to the ROW corridor (44 meter width; 60 meters at river crossings) which is requested and used by the Contractor, after approval by BTC, for construction needs. Although all the requests appear to be individually assessed and approved or rejected as needed and all the additional land is properly compensated, IEC observed that total additional land is not evaluated with the objective of assessing Contractor commitments to make the maximum effort to minimize Project footprints. Monitoring of new and rehabilitated access roads is also not systematically documented and assessed by both BTC and CCIC. In addition, it was found that the CCIC environmental staff is not involved in the decision process to review and approve the access road selection.

The large number of irrigation channels crossed by the ROW have been generally well maintained, with the installation of flume pipes and culverts, although there have been cases where BTC has issued non-compliances and filed some complaints due to disruption of some irrigation drainage.

During the visit it was observed that topsoil is generally properly stockpiled, although the delays in implementing the reinstatement are of concern in terms of topsoil preservation. A number of incident reports have been opened by CCIC and BTC on topsoil disturbance and misuse, but they are generally minor issues, managed by the Contractor. Topsoil monitoring is specified in the CCIC Environmental Audits and Monitoring Procedure, but its implementation is not fully started. BTC has recently taken the lead in addressing topsoil management and reinstatement issues and, at the time of the visit, a plan was being finalized and soil moisture monitoring equipment procured.

It was reported that CCIC has identified a limited number of existing borrow pits for the disposal of excess subsoil and inert construction waste.

As already observed above, due to the significant length of the ongoing ROW construction, the resources for field environmental supervision of the construction activities along the ROW appear to be insufficient both for CCIC and BTC, particularly to systematically monitor erosion phenomena, stream conditions and topsoil maintenance along all the sections, including river crossings still to be reinstated.

2.6.2 Recommendations

- 1. Additional post-construction erosion and sediment controls are recommended, particularly at the river crossings. The adoption of sediment control and erosion control measures along difficult terrains, such as steep slopes in semi-arid environments and bad lands, should be optimized and reviewed/approved by the Environmental department in detail and in the field prior to the starting of activities. Field implementation of these control measures will need to be carefully monitored.
- 2. River crossings should be fully and expeditiously reinstated as per commitments. Proper silt control measures (i.e., silt fences on land) should be consistently implemented during construction to minimize turbidity impacts.
- 3. BTC should closely monitor and assess additional land acquisitions and access roads used for construction with the objective of minimizing the Project footprints.
- 4. CCIC environmental staff should be involved in the decision process to select and maintain access roads and should develop a tracking system that allows for the systematic monitoring of their status, maintenance and reinstatement, as needed.
- 5. BTC, in cooperation with CCIC, should plan to mitigate the adverse effects of the length of pipeline operations. It is noted, however, that a specific mitigation strategy was reported to be under preparation at the time of the IEC visit. Components of the plan could include stoppage of the advancement of the pipeline until the back end catches up. More resources need to be dedicated to the back end, including topsoil management, erosion and sediment control systems, and final reinstatement. Also, it is recommended that BTC consider adding senior field staff in addition to the planned mobilization of a reinstatement specialist. DRI should be involved with practical implementation oversight of the CCIC Reinstatement and Erosion Control Plan and a Biorestoration Plan.
- 6. CCIC should evaluate the environmental and social aspects relevant to the recovery plan, in terms of mitigating impacts that could occur due to the extended length of time that reinstatement of the 44 meter construction corridor will not be complete (including ecology, topsoil management, erosion and sediment control, land use, cultural heritage monitoring aspects, etc.). It is recommended that BTC should take the lead in this exercise.
- 7. The CCIC resources for field environmental supervision of the construction activities along the ROW should be strengthened. In addition to reinstatement specialists, additional experienced environmental field officers (EFOs) should be mobilized to make sure that sufficient monitoring is performed during

construction activities at sensitive locations and along the significant length of open ROW. As indicated in the relevant method statements, it is stressed that experienced EFOs are expected to be in attendance during key activities, including topsoil strip and pipeline construction at river crossings.

8. The river crossing method statements should include routine monitoring (consistent with commitments) and appropriate documentation of the stream conditions upstream and downstream the crossings, through turbidity measurements and periodic inspections.

2.7 ECOLOGICAL MANAGEMENT

2.7.1 Observations

As highlighted above, the single most significant finding in Azerbaijan that represents a breach to the BTC commitments is the length of the pipeline operations. Final reinstatement has not been achieved for any portion of the pipeline. Uninterrupted pipeline strings are significantly long, which may have effects on land, fauna, agriculture and communities, although it is recognized that the route traverses areas relatively remote from villages.

Pre-construction ecological surveys are generally well managed and completed in accordance with the Project requirements. However, relevant and complete information is sometimes not immediately available, as it is scattered in several documents for both CCIC and SPJV.

A spur-thighed tortoise translocation plan and an *Iris Acutiloba* translocation monitoring program have been completed. Results of the spur-thighed tortoise translocation plan implementation were not available at the time of the visit. Approximately 32,500 individuals of *Iris* have been removed from the pipeline ROW and translocated at a designated desert habitat in the Mardakan Arboretum.

BTC is supporting CCIC in the implementation of ecological commitments.

2.7.2 Recommendations

- 1. The Recovery Plan, prepared to meet construction schedule, needs to be evaluated in terms of potential ecological impacts that could occur due to the extended length of time that reinstatement of the 44 meter construction corridor will not be complete. BTC should take the lead in this exercise.
- 2. It is recommended that all of the required information, including ecological survey and evaluation, collected during pre-construction surveys be consolidated in a single pre-construction baseline survey document.

2.8 CULTURAL HERITAGE MANAGEMENT

Cultural heritage management is predominantly the responsibility of BTC. The governing procedures are defined in the ESAP, Appendix D as *Archaeological Late Finds Protocol*. Each Contractor has also developed *Cultural Heritage Protection Procedures* that define their obligations to report chance finds to BTC. Prior to construction, the ROW was surveyed and more than 150 archaeological potentially significant sites were identified, of which only four were found not practical to avoid. Of these four, three have been excavated (Borsunlu at KP 272; Samukh at KP 316 with excavations still ongoing; and Zayamchay at KP 356); and a fourth is about to start at KP 406.

Field archaeology is conducted by the Azerbaijan Institute of Archaeology (AIA) with supervision provided by two independent experts under contract to BTC. Work has included monitoring of topsoil stripping and excavation work, as well as excavation of the sites identified prior to construction and chance finds. CCIC has identified several chance finds consistent with their obligations and have stopped work on several occasions.

2.8.1 Observations

During the mission, the following observations were made:

- The overall field archaeological program along the ROW appears to be consistent with Project commitments, but the archaeological coverage for associated infrastructure, especially access roads and temporary facilities is not always complete. *Level I Non-Compliance, Commitment Register, Commitment ID 157, 158, 162.*
- A considerable amount of artifacts and data have been obtained by the archaeological teams. AIA is now the primary organization for analysis, interpretation and curation of the artifacts encountered, as well as reporting of the findings.

2.8.2 Recommendations

1. BTC needs to make sure that the archaeological program extends to all areas of the Project where the ground can be impacted, including temporary facilities and access roads.

- 2. At this point BTC will need to take care that the analysis and reporting are consistent with international standards. As stated in WTP62⁶, the support document to the World Bank Operational Note OPN 11.03 Management of Cultural Property in World Bank Financed Projects, "*Excavation is only the first step. Equally important is the classification, analysis, interpretation, and publication of the excavated materials in order to develop or enhance knowledge of the past behaviors of previously unknown predecessors of contemporary societies.*" An important guideline to achieve this goal is to make sure that the same individuals involved with the excavation are the same ones who have responsibility for the artifact analyses, interpretation and reporting.
- 3. BTC should endeavor to work with AIA such that the capacity of AIA to work to international standards is enhanced. In particular, the BTC Project is an important opportunity for the on-the-job training of young professionals and graduate students.

2.9 COMMUNITY LIAISON

Community Liaison Management and public relations processes are responsible for communicating BTC Project information to the general public and the community in areas along the pipeline route, as well as receive and transmit community information to the BTC Project. The overall objective for the community liaison and community relations teams is to build a positive, non-dependent relationship between the BTC Project and the local communities. Specific responsibilities for community liaison include, but are not limited to:

- Providing communities affected by the Project with regular information on the progress of work and the implications for these communities.
- Informing the BTC Project of any community related issues that may impact on construction.
- Monitoring implementation of mitigation measures and the impact of construction via direct monitoring and feedback.
- Managing disputes between the BTC Project and communities.
- Assisting with the implementation of community safety, health and investment programs.

⁶ Goodland, R. and M. Webb, 1987, *The Management of Cultural Property in World Bank-Assisted Projects, Archaeological, Historical, Religious, and Natural Unique Sites*, World Bank Technical Paper Number 62.

• Recruiting workers from affected communities.

Community liaison is managed by a team of dedicated Community Liaison Officers (CLOs) who report to both BTC and the Contractors.

2.9.1 Observations

Based on available records and Contractor's interviews the process of employment is fair and transparent for both Contractors. Training provided by both Contractors is consistent with Project commitments. Also community investment appears to be well managed.

SPJV

Visits were made to the SPJV CLO offices near IPA1 and in the villages of Yaldili and Aran near PSA2. The CLOs appear to be well supported in terms of office space and logistical support provided by SPJV. In all cases the local CLOs were able to provide minutes of community meetings, safety awareness program, grievance registers and response, and recruitment information demonstrating the achievement of local recruitment KPIs.

Tangible results of community investment programs could be observed, including water wells that have been drilled to serve Project affected communities near Yevlakh, although the wells have been drilled into an artesian aquifer with no control to flow at the surface and should be capped and controlled.

The only program yet pending to fulfill Project commitments for community liaison is starting a community health program. It is understood that community health is in the process of being organized by BTC.

CCIC

CCIC has a social and community liaison staff of 34, including 12 local CLOs and a lead CLO and managed by an Interface Manager, based in Baku. Project Information Centers have been opened along the ROW. A community safety awareness program is on going. Approximately 50 formal meetings involving CLOs were held with local communities. A social investment program has been implemented, including a program for refugees and Internally Displaced People (IDP). Actions promoted under the social investment program include road upgrades and support to local schools.

A visit was made to the CCIC CLO office near Kurdamir. The CLO was able to provide minutes of community meetings, grievance registers and response, recruitment information demonstrating the achievement of local recruitment KPIs. Similar to SPJV, a community health program has not been initiated by CCIC, but it is understood that community health is in the process of being organized by BTC.

2.9.2 Recommendations

- 1. BTC needs to initiate the required community health program.
- 2. SPJV should ensure that the community wells are capped and controlled. More generally, it is recommended that health, safety and environmental considerations up to Project standards are verified during the implementation of the social investment programs.

2.10 HEALTH AND SAFETY

2.10.1Observations

BTC

There is an extensive effort made by the BTC organization to properly manage the safety performance of the different parties involved during the Project development. A comprehensive Health and Safety (H&S) Management system is in place and dedicated H&S Plans and Manuals have been developed. The activities performed by the H&S team are extensive and include the significant components of the most advanced safety management systems (training, monitoring, auditing, risk analysis, safety data collection and reporting, etc.). An extensive analysis of safety data and statistics is performed including incident analysis and evaluation of immediate and root causes. Results of these analyses are shared with the field staff to improve Project performance.

CCIC

The significant extent of pipeline construction activities, in addition to environmental aspects, represents a concern with regard to safety, particularly in terms of the high potential for interaction with third parties. As already indicated in Section 2.6, the stretches of the open trench exceed Project commitments, creating increased hazard conditions to third parties. In addition, as observed during the field visit along the ROW, the length of the welded pipeline string reaches several kilometers without interruptions at certain locations.

Access control to the ROW is a typical concern in any pipeline construction. Dedicated community safety awareness campaigns have been performed across the communities affected by the pipeline construction, but efforts to indicate prohibited access in the field have been found to be insufficient. Access prohibited signs at main road crossings are often missing or inadequate, and use of the ROW by unauthorized vehicles was observed.

During the visit at Kurdamir and Yevlakh camps, insufficient housekeeping and poor ground surface maintenance were apparent. Ground surfaces at Kurdamir in particular were very muddy, including at locations critical in terms of safety

management, such as fuel tanks, generators, treatment plants and waste storage areas. Housekeeping is one of the most important factors for creating safe working conditions.

During the visit to the ROW welding operations, the working site appeared to be well organized and the operations were properly monitored by an on-site safety officer. Personnel were found to use appropriate PPE.

SPJV

The visit to the IPA1 and PSA2 camps and worksites did not outline any particular concern with regard to safety related aspects. Personnel were wearing appropriate PPE and safety procedures were properly applied during the different construction operations observed at the time of the visit.

Most of the aggregate and concrete used for the construction of the facilities are purchased from local enterprises. This approach is encouraged as it represents a significant contribution of the Project to the local economy, but where Project needs represent a significant amount of the production of these facilities, a dedicated review of these activities is recommended, as already discussed in sections above.

2.10.2 Recommendations

- 1. CCIC should increase the number and the quality of appropriate warning signs to be deployed along the ROW at critical locations, to discourage third parties from the use of the ROW and to warn about the hazards of the working sites.
- 2. CCIC should review the camp layouts to improve ground surfaces (increased use of gravel and aggregate to reduce muddy conditions); review the location and the proper maintenance of portable fire fighting systems (portable extinguishers); and improve the condition of fueling stations and fuel storage tanks.
- 3. It is EIC opinion that the third-party aggregate and concrete source audits should include health and safety related aspects, in addition to the environmental and social aspects discussed in different sections. Both BTC and SPJV should look to influence that safety standards normally applied by the Project are adopted for significant third-party sources, eventually providing additional resources, training opportunities for workers, and appropriate PPE.

2.11 ENVIRONMENTAL INVESTMENT PROGRAMME

During the mission, the IEC was briefly updated on the status of the Environmental Investment Programme (EIP) in Azerbaijan. No detailed review has been conducted on the 7 priority themes identified in the ESAP.

Following the issuance of a Request for Proposal (RFP) in early 2003 for the priority themes included in the Environmental Investment Programme (EIP), 11 proposals, out of 24 evaluated, have been short-listed according to a selection mechanism that, to guarantee transparency, has involved local and international independent organizations. In January 2004, BTC has requested the Ministry of Ecology and Natural Resources (MENR) of Azerbaijan to provide technical consultation and future partnership in the implementation phase of the EIP. Main objective of the EIP is the delivery of additional actions that are of benefit in the biodiversity promotion and conservation. At the time of the IEC visit, BTC was waiting to receive a response from MENR and to start discussions for joint review of the scopes of work and for the establishment of a Steering Committee.

Because of the significance of the EIP during the BTC construction phase for achieving several objectives, including *inter alia* to demonstrate environmental leadership, to address stakeholder concerns, and to honor commitment and public statements on biodiversity, the IEC intends to perform a thorough review of the program organization and implementation.

3 GEORGIA

The BTC Project in Georgia encompasses 248 km of pipeline extending from Azerbaijan-Georgia border in the Gardabani District and finishing in the Akhaltsikhe District at the Turkish border. The corridor followed by the pipeline is close to the existing Western Route Export Pipeline (WREP) for a short distance from the Georgia – Azerbaijan border until the BTC pipeline deviates towards Turkey at KP 19. The BTC pipeline also follows the corridor that will be subsequently followed by the SCP pipeline, which will transport gas from the Shah Deniz field to the Georgian/Turkish border in a separate, related project. The BTC Project includes several permanent Above Ground Installations (AGIs) including two pump stations, PSG1 located at KP 4 and PSG2 located at KP 88 with associated work camps (Gardabani Camp at PSG1 and Tetriskaro Camp at PSG2), as well as necessary block and check valves.

In addition to the permanent facilities, the pipeline is associated with several temporary facilities, which include:

- Temporary construction camps (Marneuli at KP 53, occupied; Tsalka, open but not occupied; Akhaltsike, ready for occupancy)
- Pipe yards for pipe (Gatchiani; Marneuli; Tetritskaro; Tsalka 2; Tsikhisjarvi; Atskuri; and Akhaltsike)

At the time of the visit, weather constrained the area that could be visited to the eastern half of the pipeline in Georgia.

3.1 CONSTRUCTION STATUS

The BTC Project uses a single EPC Contractor, Spie-Capag Petrofac Joint Venture (SPJV), for both pipeline and AGI construction. Current (March 2004) construction progress is as follows:

- *Facilities* Pump Station PSG1 is reported to have an overall completion of 34%; PSG2 is reported to be at a 23% overall completion.
- *Pipeline* ROW clearing and grading, 168 km; pipe stringing, 142 km; trenching, 52 km; pipe in ground, 40 km; backfilled, 37 km; interim reinstatement, 6 km.

At the time of the visit, a second spread was being initiated by Punj Lloyd Ltd as a subcontractor to SPJV. Spread 2 will cover KP 196 to KP248.

Georgia has several river crossings (Mtkvari (Kura) East at KP 29; Algeti River at KP 54; Gheti River at KP 73; Beiutchai River at KP 116; Gumbati River at KP 137;
Ktsia River at KP 139; Chil Chil River at KP 174; Borjomula River at KP 182; Kumiska River at KP 184; Oshora River at KP 186; Sakirula River at KP 199; Mtkvari (Kura) West at KP 223; Potskhovi 1 at KP 240; and Potskhovi 2 at KP 245). Only one is proposed for horizontal directional drilling (HDD), the Mtkvari (Kura) East River crossing near Rustavi (KP 29), scheduled to start in April 2004. At the time of the D'Appolonia visit, the Potskhovi 2 crossing and Algeti crossings had just been completed, with the Mtkvari East and West crossings the two major crossing still not completed. D'Appolonia was able to visit the Algeti River crossing and a non-major crossing at the Chiv-Chavi River (KP 85) and a channel/road crossing at KP 11.

3.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES

3.2.1 Resources and Organization - Observations

BTC

The BTC in-country organization, following the significant number of noncompliances found by recent internal audits and third-party reviews, was able to react and has demonstrated a good knowledge and control of the different aspects relevant to the environmental management system. IEC acknowledges that, even if late when compared to the original plan, the environmental management organization has been able to recover and obtain a satisfactory standard in terms of activities performed, procedural framework and Project control. Furthermore, the environmental staff includes senior personnel with previous experience with similar large pipeline construction projects.

As described in the following sections, many of the "chronic" problems (such as those related to sewage treatment plants, waste management and document preparation and organization) raised during past reviews, are now sufficiently managed and in some cases acceptable conditions have been reached following the implementation of effective remedial actions. To this purpose BTC has actively supported the EPC Contractor with specialized technical assistance and resources.

The accelerated construction work program for the coming months includes the deployment of a second Spread, where SPJV has subcontracted the work. This new organization will pose an additional strain and increase the work load for the current BTC organization.

The social management organization of BTC is discussed in Section 3.9.

SPJV

The SPJV E&S organization was originally divided into two teams covering the facilities and the pipeline contracts, respectively. The accelerated construction

program has added a new working spread for the pipeline construction (Spread 2) which has been subcontracted to Punj Lloyd Ltd. SPJV has therefore prepared a new organization chart, including the interface with the E&S organization of the subcontractor. A few positions were still not covered at the time of the visit, although the Spread 2 construction work had started with some activities. The position of a full-time biorestoration specialist was still to be filled, as well as a position of environmental engineer.

It was also reported that the planned E&S organization audits have never been implemented (Non-Conformity with the BTC ESMS Manual, Section 4.5.4).

3.2.2 Resources and Organization - Recommendations

- 1. BTC should review and assess its organization in view of the new conditions relevant to the accelerated construction work program and the management of Spread 2 to avoid any potential deficiency and maintain sufficient field monitoring and control over the Contractor's activities.
- 2. SPJV should urgently fill the organizational vacancies prior to major operations starting in the field along Spread 2. Senior personnel are needed in addition to the team already in place to assure that there is adequate follow up of the remedial actions started by BTC in several fields.
- 3. SPJV should implement the E&S organization audits as soon as practical, as required by the BTC Project procedures.

3.2.3 Management of Changes - Observations

The supporting documentation and correspondence among the involved parties dealing with some E&S related changes during Project development was reviewed during the mission. IEC acknowledges the effort demonstrated by the BTC team to manage the change requests made by SPJV according to Project standards.

A significant Deviation Request, presented by SPJV, is No. BTC004-B210-PL-DVR-00076 dated 10.01.04 referring to the Contractor's request to change the ROW layout and to manage, differently from the original plan, the construction of the parallel SCP pipeline. This request, consisting of an increase of the ROW to 44 meters, was accepted by BTC subject to 14 construction conditions and the preparation of additional construction documentation as stated in the BTC letter AGT002-2002-PM-LET-1098 dated 14.01.04.

3.2.4 Management of Changes – Comments and Recommendations

The interaction between the BTC and SCP construction activities along the entire pipeline portion in Azerbaijan and Georgia has been extensively discussed and

evaluated during the ESIA phase of the Project development. Project commitments can be summarized in the following major points (as presented in the ESIA):

- at any one time the maximum width disturbed should be 32 meters;
- at no one point should the 32 meters ROW ever be disturbed at any one time;
- the standard ROW for the construction of each pipeline (i.e., BTC and SCP) should be 32 meters.

The original proposed construction sequence guaranteed the following specifications in a 44 meter construction corridor with a 32 m ROW:

- build BTC in 32 m ROW; no construction in the additional 12 meters dedicated to SCP;
- temporary reinstatement (20 m) including erosion control between construction of BTC and SCP; 12 m of permanent reinstatement onto BTC, additional 12 meters ready for construction of SCP;
- 12 m permanent reinstatement onto BTC, and 32 m ROW for SCP construction;
- final reinstatement of the 32 m SCP ROW in addition to the permanent reinstated 12 m onto BTC: total of 44 m permanent reinstated corridor.

In addition, the Project is committed to complete reinstatement of the ROW if the SCP is delayed by more than a year following the BTC construction phase.

The acceptance of the Deviation Request does significantly change the expected conditions associated with the construction of the BTC and SCP pipelines. The construction sequences, as described in the ESIA, were the results of an extensive technical and environmental evaluation with the aim at minimizing the impacts and maximizing mitigation during the construction of the two pipelines. Environmental, ecological and social aspects, as well as constructability aspects were considered during the decision process presented in the ESIA. According to the information provided by BTC during the visit, evidence of a similar level of assessment for the proposed change to support its approval has not been presented.

4. IEC does not have sufficient information to evaluate if the approved change, already under implementation, has the potential for any incremental impacts on the environmental, ecological and social aspects of the Project. However, the IEC recommends the Project to complement the current Change Management documentation with an adequate comparative assessment of the potential impacts related to the two options (the original and the new one); and to define

an environmental, social and safety management plan relevant to the new construction strategy.

3.3 CONSTRUCTION CAMPS, INFRASTRUCTURE AND SERVICES

The review of construction camps, infrastructure and services focuses on construction operations that potentially have an impact to surrounding infrastructure, natural resources, and community and household assets, including land, roads, and irrigation systems. In addition, the review of this topic includes camp water supplies and general aspects of camp management.

3.3.1 Observations

As noted above, SPJV has three work camps along the pipeline ROW (Marneuli, occupied; Tsalka, occupied; Akhaltsike, ready for occupancy), as well as two that serve the pump stations (Gardabani Camp at PSG1 and Tetriskaro Camp at PSG2). The two pump station permanent camps have a maximum capacity of approximately 450 workers, each, while the temporary camps have various combined workforces of up to about 750. During this mission the Gardabani Camp at PSG1 and the Marneuli Camp were visited with the following observations:

- *Water supplies*: Georgia is the only country where evidence has been provided to indicate that WHO Guidelines have actually been followed in terms of the screening of groundwater sources prior to their use. Such a procedure is also defined in BP Corporate standard (Procedure HSE-31), which is also being followed. Nevertheless, some camps have multiple sources and the application of these standards has been inconsistent. Inconsistencies in testing and documentation from various sources indicate a *Level I Non-Compliance, as per CCP Construction Camps, Commitment ID: S3.* The following observations relate to the specific visited camps:
 - Marneuli Camp: Potable water is obtained from a municipal spring source (Marneuli Springs) and is treated at the camp. A well intended for use as potable water was drilled, but the well was dry and has not been developed. Baseline testing of Marneuli Springs water was conducted and subsequent monitoring has not shown any non-compliant conditions.
 - PSG1 (Gardabani Camp): A water well was drilled, but quality was unacceptable and it caused the filters of the treatment plant to become clogged and the treatment plant not functional. Potable water is trucked from Tbilisi, although it is not used for drinking and cooking. Available water test results meet WHO guidelines, although data presentations are inconsistent.

Where wells have been used as sources, some well testing has been conducted, but sustainability studies to verify that the wells do not adversely impact the local communities have not been completed (Level I Non-Compliance, CCP Infrastructure and Services, Commitment ID: N13 (P27)).

- *Project footprint*: Land use at camps has been evaluated on the basis of preconstruction surveys consistent with BTC Project commitments. Preconstruction surveys appear to be well done and the data are well organized.
- *Irrigation channels*: Irrigation channels are a significant issue along portions of the pipeline ROW. Based on field observations and the near lack of grievances filed by farmers, SPJV appears to be managing irrigation channels within BTC Project commitments.
- Aggregate: Supply and batch plant operations for concrete from third-party sources appear not to be being properly controlled by SPJV and BTC. Nevertheless, proper procedures appear to be followed in developing borrow pits for BTC Project use. Permits have also been obtained for borrow pit development and usage, but plans for closure of thee facilities appear to be lacking. Two borrow pits were visited near PSG1. At the larger of the facilities near the village of Lemshveniera, the BTC Project appears to represent 100% of the production of this facility. This particular site appeared also to be used for subsoil disposal, although this use is not documented by the Project. Subsoil disposal areas have specific BTC Project requirements for reinstatement.
- *Road Crossings*: Road crossings along the pipeline ROW appear to have been managed within BTC Project commitments.
- *Access roads to the ROW*: Access roads appear to have been managed within BTC Project commitments.
- *General Camp Management*: Gardabani Camp at PSG1 and the Marneuli Camp both appear to be clean and well-managed. Some specific problems to be resolved in the area of waste management for both camps are identified in Section 3.4.

3.3.2 Recommendations

- 1. Potable water is tested in Georgia, but a thorough review of sampling, testing and reporting procedures conducted by experienced professionals is warranted. Consistency should be sought and laboratories used for potable water should be verified by an independent third-party to assess if they are reliable or if running periodic verification testing with an internationally accredited lab is warranted.
- 2. SPJV needs to complete water sustainability studies as needed.

3. It is IEC opinion that third-party sources of cement and concrete should be properly audited by SPJV to verify their compliance with BTC Project safety and environmental standards.

3.4 WASTE MANAGEMENT

3.4.1 Non-Hazardous and Hazardous Waste – Observations

Although waste management is an area of concern in all three countries, it appears that in Georgia there has been a strong reaction of the Project to solve chronic problems (efficiency and operation of the sewage treatment plants and the incinerator) and close the significant non-compliances found during the past two Lender audits and discussed in the relevant monitoring reports. BTC has recently taken the initiative to resolve the most significant problems, particularly the operational issues related to the SPJV incinerator, located at the Central Waste Accumulation Area (CWAA), PSG1, Gardabani Camp, and to the sewage treatment plants (STPs, see Section 3.4.3).

Waste management data made available by SPJV show that non-hazardous waste was incinerated at the CWAA from December 2003 (when a permit to operate was granted by the Ministry of Environment) to February 2004. At the time of the visit, however, operations of this incinerator were stopped by BTC because Project specifications were not being achieved. Operational procedures for the incinerator were still to be finalized and engineers from the manufacturer and a process consultant hired by BTC were working on resolving the technical problems identified by the Project. Remaining issues under assessment include treatment and disposal of the scrubber liquor; and procedures for stack emissions monitoring. BTC is also reviewing the achievability of Dutch standards for air emissions, also taking into consideration that the location of the incinerator is relatively remote and far from potential human and significant environmental receptors. BTC is therefore considering a possible revision to the standards for NO_X, SO_X and PM₁₀.

The Central Waste Accumulation Area (CWAA) for SPJV is located at PSG1. It was found to be adequately sized and generally acceptable in terms of safe handling, segregation and storage of the different waste streams, although some improvements still needed include containment and bunding for the incinerator wastewater (scrubber liquor) containers (*Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: J32*) and a review of the discharge points of the oil/water separators (OWS). The SPJV waste management staff appears to be trained and knowledgeable, although the waste and wastewater management workers were found not to be using project-minimum PPE and additional activity-specific PPE.

In addition to the issues relevant to efficiently starting incinerator operations as quickly as practical, the most significant issue at the CWAA appears to be handling and safe storage of bagged mixed waste, collected from all the SPJV construction and camp facilities, due to the apparent presence of organic waste (food waste) contamination and their temporary storage in shipping containers. This may become a significant issue, if the incinerator does not become quickly operational.

A new Waste Accumulation Area at Marneuli Camp has been recently completed and was found to be a well designed facility, complying with Project specifications and good practice. Oil-contaminated soil was being bioremediated on site.

Significant quantities of non-hazardous waste are reportedly recycled via approved third-party commercial facilities and local communities, including food waste for pig farms, wood waste, and scrap metal. Used oil is stored at the CWAA and recycling/disposal options are still under consideration by SPJV and BTC, including the development of a new BP hazardous waste facility at Sagarejo, compliant with EU standards.

Hazardous waste is currently being stored on site at the CWAA, due to the current lack of Project-approved treatment and disposal facilities in Georgia.

Although the main facilities appear to be well managed in terms of waste handling and accumulation, the visits to some SPJV construction yards allowed for the identification of localized issues relevant to limited housekeeping and waste management (e.g., signs of limited open air burning at Rustavi pipeline storage yard). *Level I Non-Compliance, CCP Construction Camps, Commitment ID: S6 (J19).*

3.4.2 Non-Hazardous and Hazardous Waste - Recommendations

BTC

- 1. BTC should conduct a technical audit of the waste management subcontractors to SPJV. The audit should include a thorough inspection of all the facilities used by the subcontractors to dispose of and/or recycle different waste streams, to ensure that the facilities meet Project Specifications.
- 2. BTC has full responsibility for the operation of incinerator, and should be able to routinely assess if compliant conditions are met prior to operating it and during operations [siting with respect to closest receptors and prevailing winds, stack height, waste acceptance criteria (especially in terms of food waste mixing), operator training, availability of management procedures]. The adoption of different stack emission standards would require implementation of a Change Management process. However, standards should be compliant with the EU Directive 2000/76/EC. An external accredited laboratory to test stack emissions for all the relevant parameters should be identified as soon as practical during the start-up phase of the incinerator.
- 3. Conduct a review of waste management for SPJV ancillary facilities, including pipeline storage yards and other construction yards, to ensure that waste is properly stored and promptly collected.

SPJV

- 4. Hazardous waste containers with incinerator wastewater should be stored in bunded areas, with appropriate secondary containment. Minimization of potential contact of hazardous waste containers and potentially contaminated storage areas with stormwater (e.g., using roofs or overpack drums) should be implemented, particularly taking into account that hazardous waste will have to be stored on site until a suitable disposal option is identified by BTC.
- 5. Used oil recycling and/or disposal option should be identified as soon as practical, in cooperation with BTC.
- 6. Ensure that contamination of non-hazardous waste with organic waste (food waste) is minimized to avoid potential health risk and vector issues, especially at the CWAA.
- 7. Ensure that proper PPE is used by the personnel involved in waste and wastewater management operations.
- 8. Ensure that food waste, when recycled to pig farms, is properly screened to guarantee that there noxious components are not present.

3.4.3 Wastewater Management - Observations

The Sewage Treatment Plants (STPs) installed by SPJV are currently operational. Significant issues relevant to their treatment and inadequacy to meet Project standards were raised up to the beginning of 2004. Nevertheless, their efficiency has recently been improved since BTC has taken the initiative to support SPJV and resolve the chronic problems relevant to their design, inadequate maintenance and operation. Since January 2004, BTC has taken the lead for assessing, retrofitting, operating, and monitoring these plants, as well as providing on-the-job training for the national staff. Two senior process consultants have been mobilized by BTC to assess STP processes and efficiency, develop and implement remedial measures with the aim of bringing the STPs in compliance with Project standards. The STP management has made major improvements in the last month:

- Structural modifications have been implemented to improve the access of operators to different STP units, and to allow a better control of the operations;
- Reed beds have been constructed at PSG1 and PSG2 to allow denitrification, reduction in Suspended Solids/BOD/COD/ to Project standards, reduction in coliforms, temperature control, and protection during plant failure. At the time of the visit, the reed bed area at PSG1 was not fenced and the discharge point was located in a ditch along a public road. The IEC has been subsequently informed that the reed bed area has been fenced;

- A new STP has been ordered to resolve overload problems at PSG2. The wastewater treatment process at PSG1 is monitored to determine whether an additional STP capacity is needed. Measures have been taken at both camps to reduce per capita water consumption;
- A process control laboratory has been installed and put in operation at Marneuli Camp to allow continuous monitoring of the most critical process control parameters for all the SPJV STPs, including effluent quality and sludge volume index. BTC has also appointed a senior chemist to set up the laboratory, organize the laboratory testing, conduct the testing and train national staff.

The test results made available from BTC showed a remarkable improvement of the effluent quality (total suspended solids, COD, BOD), although exceedances of the Project standards were still present. Due to reported difficulties in finding local laboratories capable to meet quality control/quality assurance (QA/QC) requirements, some parameters have not been tested yet (i.e., coliforms, oil and grease, nitrogen, ammonia, total phosphorous, fluorides, phenols, sulfides), although they are included in the Project specifications. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: J16, J20 (S7)*

3.4.4 Wastewater Management – Recommendations

- 1. BTC should continue to monitor STP efficiency and ensure compliance with Project standards. If the Project considers that standards are not reachable, or not fully applicable since effluents are not discharged into natural water courses and impacts to human and natural environment are negligible, the adoption of different effluent limits would require implementation of a Change Management process and proper evaluation of potential impacts, taking also into consideration specific commitments relevant to the use of local infrastructure and third-party facilities (CCP Waste Management Plan, Commitment ID: J18, J21).
- 2. External accredited laboratories should be identified to perform periodic verification testing as soon as practical. Although the involvement of local laboratories is to be encouraged to promote local business and strengthen technical capacity, use of international accredited laboratories for periodic testing for additional parameters consistent with Project specification, should be considered.
- 3. The condition of closed drain systems and the fate of oily water need to be verified by the BTC and SPJV. The review should include:
 - Oil water separator maintenance and discharges;

- Adequacy of containment basins and collection drainage at fuel storage areas and filling stations.
- 4. The reed bed areas should be consistently and appropriately fenced and discharge points should be located in a safe area to avoid direct third-party interaction, and controlled through the use of appropriate diffusers, sprinklers or leach fields to minimize potential localized impacts.

3.5 POLLUTION PREVENTION

3.5.1 Observations

As already described in Section 2.5, the Project has adopted a pollution prevention plan aimed at systematically identifying potential impacts from the construction activities and implementing avoidance and mitigation measures to minimize the likelihood, extent or duration of their occurrence, and any associated adverse effects. The mitigation measures include: spill prevention and management; management of existing contaminated areas, if any found during construction; groundwater protection; surface water protection; ecological receptor protection; air quality protection and dust mitigation; noise control; soil erosion control and topsoil protection.

Various provisions apply directly to the protection of surface and ground waters, including: permanent fuel and chemical storage, hazardous material storage, vehicle maintenance facilities, wastewater discharges, controlling run-off, and disposal of trench water and groundwater.

BTC is preparing specific documentation in response to the 13 conditions indicated by the Georgian government for the Environmental and Social Impact Assessment approval. The documents are not available yet, although a close-out matrix has been provided. Some of the agreed actions fall into the engineering field. The IEC will monitor the implementation of the agreed actions, with respect to the potential effects on the environmental and social commitments. It is noted that at the time of the mission, based on information made available by the Project, agreements on the Environmental Risk Assessment document, as well as on biodiversity issues were expected by March-April 2004. Potential impacts to river morphology at the Kura west crossing were being evaluated. The design of the groundwater monitoring system for the Borjomi and Tsalka areas was planned to be revised to include Government requirements to follow Dutch or EU standards. A strategy for public meetings and information centers to increase community awareness for the restrictions associated with the installed pipelines was under preparation. A specific report was under preparation for the Borjomi area, as well as the draft Oil Spill Response Plan. Plans were to issue the reports by April 2004.

Upon request of the Georgian government, the contaminated land method statement is being updated to include management of potential finds of anthrax contamination.

SPJV

Maintenance of irrigation drainage and stream flow and erosion and sediment controls throughout the ROW construction are discussed in Section 3.6.

Noise monitoring is conducted at construction sites. Vehicle air emission is monitored through periodic inspections. Dust control is achieved through watering.

Vibration monitoring is being conducted at blast sites, particularly due to the several complaints recorded by the Project associated with property damage claims from ground vibrations. However, during the visit, the IEC observed that the Project approach has been mostly reactive and aimed at resolving complaints by performing measurements at selected locations where complaints were received.

The fueling stations at PSG1 and Marneuli Camp are sufficiently controlled and both paved with a concrete platform. Spill kits were generally available on site. However, at the SPJV Maintenance Area near Rustavi a secondary fuel tank was found to be in poor condition, next to the yard fence, and improperly installed. At the fuel storage area some holes in the secondary containment and minor fuel spills were observed on unpaved surfaces (*Level I Non-Compliance, CCP Pollution Prevention Plan, Commitment ID: H42*).

The third-party facilities (batch plants) used by SPJV to produce the significant amount of concrete needed for the PSG1 and PSG2 construction have not been evaluated.

3.5.2 Recommendations

- 1. BTC should verify that the condition of closed drain systems and containment basins at all SPJV camps and temporary facilities (including maintenance yards) and the fate of all oily water (see also Section 3.4) are compliant with Project commitment.
- 2. BTC should verify that noise monitoring is performed at suitable locations (i.e., to ensure protection of closest receptors) for all the construction sites (including maintenance and pipe yards) during operations.
- 3. In view of the next summer season, it is recommended that the dust control actions identified in the SPJV Environmental Procedures for Operational Control are properly monitored, especially at sensitive locations.

- 4. Vibration monitoring should be planned to consistently assess background conditions (pre-blast conditions) and potential impact from blasting and from Project traffic along roads significantly used by the Project. It is important that the Project takes a proactive approach in this matter, taking into consideration the significant amount of complaints received by SPJV and BTC on alleged damages to houses and properties due to blasting and/or heavy traffic.
- 5. The SPJV E&S organization should verify the third-party sources for concrete, given that it is likely that the construction activities at PSG1 and PSG2 absorb the majority of the production of these plants. The Project should make sure the plant operations are conducted within the spirit of the environmental and social commitments for BTC, taking special care that the Project does not adversely impact the supply procurement and work opportunities for local communities.

3.6 EROSION CONTROL AND REINSTATEMENT

3.6.1 Observations

As already observed in Section 2.6 for Azerbaijan, during the IEC mission, the front of the pipeline construction was well in advance of backfilling and temporary reinstatement (about 170 km to topsoil stripping, 40 km backfilling). In addition, the SCP is already being strung in some locations and the entire 44-m corridor for both BTC and SCP pipelines is being cleared and topsoil accumulated, as discussed in detail in Section 3.2 above. The decision to simultaneously construct BTC and SCP is a significant change management, which, although justifiable in terms of optimization of construction activities, requires careful planning and close monitoring of the environmental and social aspects to identify and mitigate potential specific issues. Due to this change, reinstatement is currently restricted to a 10-12 m width of the BTC corridor and final reinstatement across the entire ROW will be undertaken after completion of the SCP pipeline.

It was observed during the visit that topsoil management is adequate, although there were apparent differences along ROW sections in terms of topsoil stockpile slope and compaction and segregation from subsoil. Stockpiles not compliant with the technical specifications stated in the SPJV Reinstatement Plan were observed, especially along the sections where SCP pipe has been strung (*Level I Non-Compliance, CCP Reinstatement Plan, Commitment ID: 139, 142*).

In some of the visited hilly areas (up to KP104) side cuts were observed to be extensive, being a challenge in terms of landscaping and recontouring required for final reinstatement. Areas with rocky substrate and limited topsoil are also frequent and significant blasting is required at these locations. Topsoil preservation and management are challenging and important in these areas to successfully reinstate the corridor.

Topsoil monitoring is specified in the SPJV Environmental Monitoring and Measurement Procedure, but its implementation is not fully started. To ensure that topsoil fertility levels are maintained during storage, topsoil density and moisture content should be monitored to check for the presence of anaerobic conditions.

In terms of construction impact mitigation at river crossings, good temporary erosion measures were observed at Algeti and Chiv Chavi River crossings. It is understood that following an incident relevant to an increased turbidity and sedimentation impact during the Gumbati river crossing, lessons learned were applied to subsequent crossings and construction method statements have been revised and operation control improved. Monitoring and documentation of stream conditions upstream and downstream the crossings were found to be adequate. Turbidity measurements were taken by environmental monitors.

Temporary erosion control measures and maintenance of minor stream / channel / irrigation drainage flow are well established and field implementation of the protection measures appears to be satisfactory.

As indicated for Azerbaijan (Section 2.6), another significant issue in terms of assessment of actual impacts of the construction phase is proper monitoring of additional land requests and use along the ROW. Additional land is considered any land in addition to the ROW corridor (44 meter width; 60 meters at river crossings) which is requested and used by the Contractor, after approval by BTC, for construction needs. Although all the requests appear to be individually assessed and approved or rejected as needed and all the additional land is properly compensated, IEC observed that total additional land is not evaluated with the objective of assessing Contractor commitments to make the maximum effort to minimize Project footprints. The Project has recently started a specific survey of the additional land use.

New and rehabilitated access roads are documented and assessed by both BTC and SPJV. Pre-construction surveys appear to be professionally conducted and documented.

During the visit of PSG1, a borrow pit at Lemshveniera, where the Project is basically the single operator, was visited. Documentation relevant to the environmental and social assessment was made available by the Project.

As already observed above, due to the significant length of the on going ROW construction and the recent decision to open a second spread in the western end of the ROW, subcontracted to Punj Lloyd Ltd., the SPJV resources for field environmental supervision of the construction activities may be undersized, particularly to systematically monitor erosion phenomena, stream conditions and topsoil conditions along all the sections, including river crossings, still to be reinstated.

3.6.2 Recommendations

- 1. Topsoil stockpile procedures need to be strengthened, especially considering that final reinstatement will not take place until installation of the SCP. Issues include seeding, mulching, monitoring of anaerobic conditions, shaping and compacting pile surfaces and establishing runoff controls.
- 2. In hilly areas where side cuts are planned by the construction management, it is recommended that environmental and reinstatement specialists are involved in the construction design review to ensure that proper consideration of reinstatement needs and level of effort are included in the construction techniques.
- 3. River crossings should be fully and expeditiously reinstated consistent with commitments.
- 4. BTC should closely monitor and assess additional land acquisition and management of access roads used for construction, with the objective of minimizing the Project footprints.
- 5. Where the Project is basically the single operator of a borrow pit, such in the case of Lemshveniera, the site should be considered for reinstatement.
- 6. SPJV field environmental and reinstatement personnel should be increased in view of the extension of the construction site, the criticalities of the operations and the addition of Spread 2. Senior reinstatement and biorestoration specialists are recommended to be recruited as soon as practical.

3.7 ECOLOGICAL MANAGEMENT

3.7.1 Observations

As discussed above and also highlighted for Azerbaijan, the front of the pipeline is well in advance of interim reinstatement. In addition, the SCP is already being strung in some locations and the 44-m ROW has been cleared. Final restoration has not been achieved for any portion of the pipeline, because it will not be undertaken until completion of the SCP. A 10-12 m wide corridor over the BTC pipeline is currently being restored.

Pre-construction ecological surveys are generally well managed and completed in accordance with the Project requirements. Relevant and complete documentation was found to be sufficient and readily available, although approvals appear to have been sometimes late with respect to the mobilization and start of construction at the relevant sites.

Some outstanding issues related to the conditions for approval of the ESIA by the Government of Georgia are relevant to biodiversity, including *inter alia* agreement on the basis of the biodiversity monitoring for flora and fauna, list of species to be propagated, list of sensitive areas, reforestation, assistance for the management planning of protected areas. The Biodiversity Monitoring Programme, which included BTC's plan for monitoring flora and fauna, list of sensitive areas, etc. was submitted to the Government of Georgia in October 2003, as was a strategy for Ktsia-Tabatskuri management planning. At the time of the visit, a workshop was planned to agree and close out the outstanding issues. BTC also drafted a strategy and draft Memorandum of Understanding for discussion with the State Forest Department regarding the eco-compensation plan, when the Government was changed and the State Forest Department disbanded. BTC has reported that it is now seeking clarification from the new Ministry of Environment as to appropriate counterpart.

Additional ESIA studies and surveys, as per Section 3.1.2 of the ESAP, also present some outstanding issues. Specifically, pre-clearance bird surveys and pre-clearance reptile surveys programs have been changed. Following an internal discussion, BTC has decided to discount the need of the pre-construction bird survey; experts discounted the need for the pre-construction surveys based on the existence of detailed baseline data obtained during the ESIA and the biodiversity monitoring program. Based on consultation of experts during the development of the Biodiversity Monitoring Programme, BTC also decided that pre-construction survey of snake-eyed lizard was unnecessary. A baseline survey of this species would be undertaken in April/May 2004 depending on weather.

IEC intends to review the documentation available to the Project team to support the decision to postpone the two surveys and will update on this particular aspect during the coming missions.

The Biodiversity Monitoring Program was made available, specifying selected plots and species, methods, personnel, reporting and schedules.

Rare floral species management and biodiversity monitoring activities are on-going. In October 2003, pre-clearance faunal surveys for mammal species were conducted. Pre-clearance bear surveys were conducted in November 2003 in Tetritskaro area and in Tskhratskaro – Tiseli zone.

In January 2004, a level II non-conformance was internally raised by the SPJV environmental department on the design, clearance and location of four bear crossing points along the ROW from KP 83+800 to KP 93 + 800. Corrective actions were identified, but their implementation was not reviewed by the IEC.

3.7.2 Recommendations

- 1. BTC should fully address and discuss potential issues related to the decision to postpone some pre-clearance surveys, especially for birds and reptiles to ensure that there is no significant loss of baseline data, and that the program results and recommended actions are not negatively impacted. IEC intends to review the documentation supporting the decision to postpone the two surveys, during the coming missions.
- 2. The Project should provide evidences that the corrective actions implemented for the four bear crossing points are effective and that no potential impacts are expected from the identified non-conformances.

3.8 CULTURAL HERITAGE MANAGEMENT

Cultural heritage management is predominantly the responsibility of BTC. The governing procedures are defined in the ESAP, Appendix D as *Archaeological Late Finds Protocol*. The definition of significance and actual excavation of sites is the responsibility of the Centre for Archaeological Studies (CAS), the Georgian government's cultural properties review and compliance agency, as specified in the *Georgian Law on Cultural Protection*. SPJV is responsible for reporting chance finds and stopping work until the BTC Cultural Heritage Field Officers (CHFOs) can evaluate the situation in association with CAS and provide appropriate guidance.

Cultural heritage was an important factor in defining the current ROW as part of the EIA process and numerous reroutes resulted from consideration of archaeology and historic monuments. The result of the Phase I studies identified ~ 45 potential archaeological sites within or near the pipeline ROW. Of these ~ 45, 15 were identified as requiring more detailed Phase II investigations. Of these sites, eight were identified as being of high priority at locations where it was not practical to reroute the pipeline and Phase III excavations were undertaken. These investigations are now complete and a Phase III report is about to be issued.

Current activity has related to the management of late finds. The BTC Cultural Heritage Field Team conducts "look ahead" surveys and monitors clearing, soil stripping, grading, trenching and other construction activities. They are also responsible for writing daily and weekly reports, identifying non-compliances, updating databases and coordinating with CAS and BTC and SPJV management. At the time of the visit, 86 potential late finds had been identified, of which 22 were considered to be significant and requiring excavation. One of the significant sites resulted in a minor reroute. The remaining sites have been subject to mitigation through excavations, which are ongoing.

3.8.1 Observations

During the mission, the following observations were made:

- The overall field archaeological program along the ROW and associated access roads, additional land acquisitions and AGIs appears to be consistent with Project commitments. Where finds have been encountered in the ROW, evidence has been observed of fundamental protective procedures, including ROW reduction and rerouting.
- Some of the late finds, in particular those at KP 74 and KP 165+400, are major discoveries. Rerouting might have been preferable, had the full extent of these sites been known at the time they were first identified.
- A considerable amount of artifacts and data have been obtained by the archaeological teams. CAS is now the primary organization for analysis, interpretation and curation of the artifacts encountered, as well as reporting of the findings. Although CAS as a government agency is not within the scope of IEC review, it was understood that CAS is working on repairing their equipment to be able to conduct C^{14} dating. C^{14} dating is not being conducted on BTC Project samples because it is prohibited to remove archaeological samples from Georgia.

3.8.2 Recommendations

- 1. Although it is understood that it is often difficult to realize the extent of a late find when construction is pending, large sites discovered during construction represent the potential for causing construction delays and placing undue pressure on the archaeological team. Work procedures to identify the extent of these sites need to be reviewed to see if they as efficient as they could be. Construction staff need to consider reroute options early in the evaluation process.
- 2. At this point BTC will need to take care that the analysis and reporting are consistent with international standards. As stated in WTP62, the support document to the World Bank Operational Note OPN 11.03 Management of Cultural Property in World Bank Financed Projects, "*Excavation is only the first step. Equally important is the classification, analysis, interpretation, and publication of the excavated materials in order to develop or enhance knowledge of the past behaviors of previously unknown predecessors of contemporary societies.*" An important guideline to achieve this goal is to make sure that the same individuals involved with the excavation are the same ones who have responsibility for the artifact analyses, interpretation and reporting.
- 3. BTC should endeavor to work with CAS such that the capacity of CAS to work to international standards is enhanced. Legal responsibility may rest with CAS, but the BTC Project will be viewed by the outside world as the responsible party. The lack of C^{14} dates is of concern. In reality, there are few laboratories

in the world where confident C^{14} age dating analyses can be obtained and it is not realistic to assume that CAS will be able to develop their own capabilities without international verification at a minimum. A peer review of the entire process being followed for analysis and interpretation is recommended such that any deficiencies can be identified and the BTC Project can support CAS in building its capacity for this effort.

3.9 COMMUNITY LIAISON

The Community Liaison Teams of BTC and the JV are responsible for communicating BTC Project information to the general public and the community in areas along the pipeline route, as well as receive and transmit community information to the BTC Project. The overall objective for the community liaison is to build a positive, non-dependent relationship between the BTC Project and the local communities. Specific responsibilities for community liaison include, but are not limited to:

- Providing communities affected by the Project with regular information on the progress of work and the implications for these communities.
- Informing the BTC Project of any community related issues that may impact on construction.
- Monitoring implementation of mitigation measures and the impact of construction via direct monitoring and feedback.
- Managing disputes between the BTC Project and communities.
- Assisting with the implementation of community safety, health and investment programs.
- Recruiting workers from affected communities.

BTC CL is managed by two field social supervisors who report to the field E&S Manager for day-to-day business and to the social assurance manager for assurance purposes. JV CLOs on pipeline and facilities report to respective Community Relations Managers.

3.9.1 Observations

The environment for community liaisons in Georgia is very difficult. During this visit, IEC team members did meet CLOs in the camps but did not accompany CLOs to the communities (beyond IEC scope of work – covered by SRAP panel) and therefore observations are based primarily on documents presented to the IEC, internal reporting observations and limited discussions with lead CLOs.

- CLO staffing for both BTC and SPJV is limited and, as recognized by BTC, their activities have been mostly reactive, rather than proactive in dealing with local communities. A recent decision has been taken to reorganize CLO activities: BTC CLOs should be more involved in building community relationships, whereas SPJV CLOs should be mostly devoted to resolve individual cases, including grievances. It is understood that more expatriate coordinators and CLOs are being recruited.
- SPJV CLOs are based at the construction camps and there are not open community liaison offices in the affected communities. This is a situation different from what was observed in Azerbaijan, where CLOs have offices in affected communities. Although social managers have indicated that they do not perceive any problem, and this situation does not represent a non-compliance condition, the IEC is concerned that the current arrangement is not the most effective. However, BTC is planning to open two Project Information Centers in the near future (Akhaltsikhe and Bakuriani).
- The process of employment by SPJV is reported to be fair and transparent.
- CLOs were able to provide minutes of community meetings oriented at making communities aware of upcoming pipeline activities and community safety, although meetings have admittedly not been enough, taking into consideration the social issues in Georgia and the high community expectations. BTC CLOs are directly involved in the community safety awareness program to strengthen the SPJV social team. Grievance registers and responses are also well documented.
- As observed in Azerbaijan, the only program yet pending to fulfill BTC Project commitments for community liaison is starting a community health program. It is understood that this program is in the process of being organized by BTC.
- An issue identified in the past has been the lack of social training for workers and especially the line management. Steps are being taken to improve this training, but the training process is not yet complete.
- Aside from the issue of orphaned land, most recent grievances have related to claims of construction noise and damage to houses caused by vibrations from blasting and trucks, situations which have sometimes provoked work blockages. Little evidence was observed to indicate that the BTC Project in general was functioning in anything other than a reactive mode to these complaints.

• Procurement market surveys were conducted last summer and announcements made for interested suppliers. Only 18 were recorded, but all were rejected since not relevant to the Project needs. A single event was organized by BTC in Tbilisi at the beginning of the construction phase to advertise opportunities. Local and national procurement is low (1% local – 3% country-wide). The Project has reported that two problems have been encountered with local procurement: little is produced locally and many potential suppliers in local communities are not properly registered. The social teams from BTC and SPJV are not involved in auditing procurement.

3.9.2 Recommendations

- 1. Staffing and training of CLOs needs to be completed, and a careful review of the social management organization is needed for Spread 2, where SPJV has subcontracted activities to Punj Lloyd Ltd.
- 2. IEC recommends considering to relocate SPJV CLO offices into the affected communities.
- 3. BTC needs to initiate the required community health program scheduled in April 2004.
- 4. BTC and SPJV both need to make sure that social and community awareness training for staff is undertaken appropriately.
- 5. Blasting and truck vibrations: CLOs need to work with the construction and environmental staff to make sure that pre-condition surveys of potentially affected homes are conducted and that blast monitoring is conducted. Similar surveys should be conducted in areas where homes might be susceptible to truck vibrations, based on monitoring of truck vibrations such that good procedures can be defined. In the case of trucks, it might be necessary to limit speed beyond BTC Project standards at certain critical locations.
- 6. Procurement: Appropriate data are not available to be able to show the level of local participation for supplies in detail. BTC and SPJV should stimulate their subcontractors to improve the use of local supplies and provide some direct benefits to the villages of the Project affected communities.

3.10 HEALTH AND SAFETY

3.10.10bservations

BTC

There is an extensive and remarkable effort made by BTC organization to properly manage the safety performance of the different parties involved during the Project development. A comprehensive Health and Safety (H&S) Management system is in place.

During the visit IEC had the opportunity to review the "Contractor's Managers Incentive Program for H&S and E&S Performance – 2004". The goals of the Program are to recognize selected JV Managers and Supervisors who embrace the H&S and E&S concepts set forth by BTC, thereby improving performance trends. The program establishes an Award System to recognize outstanding efforts and initiatives being made throughout all elements of construction while retaining current ongoing programs. The IEC believes that it is extremely important that Managers and Supervisors be recognized for efforts made to provide a safe working environment and recommends that such concepts be extended to workers correctly implementing the instructions from their officers.

The observations made in the field by IEC visiting facilities, camps and construction sites along the ROW, are briefly discussed in the following section. BTC needs to focus on specific aspects relevant to the field implementation of required safety standards. These minor observations need to be fixed as soon as practical throughout specific dedicated review/inspection/audit campaigns to be jointly performed by BTC and Contractor organizations.

On Wednesday February 25th a two-person Georgian working crew erecting metal warning "goal posts" at PSG2 accidentally contacted a power line. One of the workers suffered a fatal electric shock. There were many immediate actions by BTC and SPJV to investigate on the root causes of this fatality. The internal investigation concluded, among other more specific reasons, that there was inadequate work planning, an inadequate training effort, and an inadequate work control (identification of hazard, working procedure, Job Safety Analysis). The IEC recognizes the effort and the attitude of BTC to investigate and to identify root causes and critical conditions that may have contributed to the accident and recommends SPJV and BTC, following the investigation phase, to focus on the implementation of the identified corrective actions.

SPJV

During the mission, the IEC team had the opportunity to visit the PSG1 (work site and camp), the Rustovi Pipe Yard, the Rustovi Maintenance Area, some working sites along the ROW, Marnueli camp, and a pipe and maintenance yard close to PSG2 location. Interviews with some safety officers in the field found some lack of safety training and measures: in some cases emergency procedures (what to do in case of emergency) were not sufficiently known; first aid kits were not available and a means for dedicated Project communication limited or not available in remote sites. In some cases portable fire extinguishers inside the camps and work areas were found to be exhausted. At PSG1 the use of PPE was observed to be insufficient (workers were not using coveralls, including at critical locations, such as waste management and STP areas) or not appropriately related to the tasks performed by the personnel on site.

The extent of the simultaneous construction activities along the ROW is significant from the border with Azerbaijan to the Turkish border. In addition to the social and environmental aspects which are discussed in different sections of this report, this condition adds additional concerns with regard to access control along the ROW and the relevant safety aspects. Differently from what has been observed in Turkey and Azerbaijan, in Georgia SPJV has more systematically adopted the use of warning signs, alerting third parties about the hazards of the working sites along the ROW and to discouraging the use of the ROW by non-Project-related vehicles. These signs are appropriately placed and clear and only few exceptions were observed. Field delivery of food along the ROW appears to be safe, using appropriate containers with temperature control.

As observed in the other two countries, most of the aggregate and concrete used for the construction of the pump stations is purchased from local pre-existing enterprises. This approach is encouraged by IEC as it represents a significant contribution of the Project to the local economy. Nevertheless, in particular for those cases when Project needs represent a significant amount of the production of these facilities, a dedicated H&S review of these activities is recommended.

3.10.2 Recommendations

- 1. The concept of an H&S Award System should be extended to workers correctly implementing the instructions from the H&S Officers and their supervisors/foremen.
- 2. Periodic field reviews/inspections/audits dedicated to specific H&S issues (e.g., fire fighting systems; appropriate use of PPE; loading/unloading; load transportation, etc.) should be started and jointly performed by BTC and SPJV H&S organizations. The BTC safety team should focus, together with the SPJV organization, on the field implementation of the proper safety measures and preventive actions during any construction activity. Safety reviews and inspections should be improved, developing specific campaigns aimed at reviewing and monitoring specific work tasks and therefore avoiding the common pitfall that "general" reviews/inspections are not sufficiently incisive. To maximize the effectiveness of the inspections and reviews, the H&S officers in charge of these activities should rotate among the different field locations.
- 3. The IEC recommends that the SPJV safety team review and monitor more closely field activities and concentrate on the implementation of the required safety measures and preventive actions during construction. A more proactive approach is required to identify critical conditions and correct potentially unsafe practices in the field.

4. Audits of third-party facilities providing services/goods to the Project (i.e., aggregate and concrete sources) should include health and safety related aspects. The Project, through BTC and SPJV, should encourage local enterprises for the adoption of Project safety standards, eventually providing additional resources, training opportunities for workers, and appropriate PPE.

3.11 ENVIRONMENTAL INVESTMENT PROGRAMME

During the mission, the IEC was briefly updated on the status of the Environmental Investment Programme (EIP) in Georgia. No detailed review by IEC has been conducted on the 10 priority themes identified in the ESAP.

Because of the EIP significance during the BTC construction phase for achieving several objectives, including *inter alia* to demonstrate environmental leadership, to address stakeholder concerns, and to honor commitment and public statements on biodiversity, the IEC intends to perform a thorough review of the program organization and implementation.

4 TURKEY

The BTC Project in Turkey encompasses 1,076 km of pipeline extending from the Georgia -Turkey border in the Posof District (Turkgozu border gate) to the marine terminal being constructed at Ceyhan. From the Georgian border, the pipeline ROW crosses the provinces of Ardahan, Kars, Erzurum, Erzincan, Gumushane, Sivas, Kayseri, Kahramanmaras, Osmaniye and Adana, ending up at Ceyhan. The BTC Project runs parallel to the recently completed (2001) East Anatolian Natural Gas Pipeline (NGP) for about 40% of its length, between the cities of Erzurum and Sivas. The SCP Pipeline is parallel to the BTC pipeline at the Georgian border, but diverges until it terminates in Erzerum.

The BTC Project in Turkey is broken down into three Lots from the Georgian border to Ceyhan: Lot A (278 km), Lot B (465 km) and Lot C (340 km). Each Lot effectively operates as a separate construction project with the following characteristics:

Lot A: KP 0 – 278

Contractor: TEPE – Nacap JV (TNJV) Spreads: 2, plus another small spread Block valves: 15 Major crossings: 3 rivers, 6 roads, 3 railways Camps: 1 main (Kars at KP 115), 2 spread camps Pump station PT1 at KP 21.3 and pigging station IPT2 at KP 108 (Contractor TEPE)

Lot B: KP 278 – 744

Contractor: Gunsyil-Haustadt & Timmerman-Max Streicher-Alarko JV (STA) Spreads: 2 (a third spread should be opened according to the Contractor recovery plan) Block valves: 24 Major crossings: 9 rivers, 13 roads, 3 railways Camps: 1 main (Kova at KP 527 in Spread 1), 3 spread camps (Iliça and Tercan in Spread 1; Koyunkaya in Spread 2) Pump station PT2 at KP 278 and PT3 at KP 442 (Contractor TEPE)

Lot C: KP 744 - 1076

Contractor: Punj Lloyd - Limak JV (PLL) Spreads: 2 Block valves: 13 Major crossings: 10 rivers, 6 roads, 1 railway Camps: 1 main (Azizli at KP 1037), 3 spread camps Pump station PT4 at KP 744 and IPT1 at KP 944 (Contractor TEPE) The BTC Project ends at the Ceyhan Marine Terminal (CMT), with a 2.6 km long jetty and includes seven one-million barrel storage tanks, a central control building, housing compounds and administration, and a fiscal metering system (TEKFEN is the Contractor). The BTC Project in Turkey is also associated with numerous dump yards for the storage of pipe.

At the time of the visit, weather constrained the area that could be visited to Lots B and C. Areas that were visited are indicated in Appendix A.

4.1 CONSTRUCTION STATUS

The different Lots in Turkey exhibited different degrees of construction progress due mainly to the influence of winter weather. In particular, little work was done in the winter at PT1 and PT3 and along the ROW in Lot A. Current (March 2004) construction progress is as follows:

• Facilities

Pump Station PT1: excavation 77% complete, concrete 19%
Pump Station PT2: excavation 81% complete, concrete 25%
Pump Station PT3: excavation 99% complete, concrete 15%
Pump Station PT4: excavation 84% complete, concrete 35%
Pump Station Camps: about 90% complete as a whole and partially occupied
Pigging Stations: information on construction progress not provided
Ceyhan Terminal Onshore: All seven tanks are under varying degrees of construction; with respect to the new buildings, foundations are complete and superstructure construction has started – total progress approximately 48%
Ceyhan Terminal Offshore: More than 40% of the piles for the causeway have been driven, concrete of jetty cross beams has started and the core of the causeway is complete – total progress approximately 29%.

• Pipeline

Lot A: ROW clearing -125 km; stringing -48 km; welding -32 km; trenching -1 km; backfilling -0 km; reinstatement -0 km.

Lot B: ROW clearing – 178 km; stringing – 151 km; welding – 142 km; trenching – 51 km; backfilling – 36 km; reinstatement – 1 km (temporary).

Lot C: ROW clearing – 121 km; stringing – 108 km; welding – 97 km; trenching – 70 km; backfilling – 65 km; reinstatement – 32 km (temporary).

Construction recovery plans have been recently prepared, and opening of additional spreads and mobilization of additional staff and equipment for the three Lots are planned from April 2004.

4.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES

4.2.1 Resources and Organization - Observations

Differently from the organization of the Project in Azerbaijan and Georgia, the Project in Turkey is organized in a three level structure: an overall lump sum agreement was signed by BTC with BOTAŞ who awarded EPC Contractors to actually implement the required work. Following this contractual organization, BTC has an assurance role on both BOTAŞ and the Contractors.

Problems and inconsistencies were found in the collection of raw data (performed by EPC Contractors), analysis and processing of those data (mostly performed by BOTAŞ), and presentation of summary indicators of the Project performances (e.g., data provided in monthly reports). In addition, even if some documents prepared by BOTAŞ and/or Contractors and subsequently approved according to the required QA/QC procedures were found to be formally in compliance, the content of those documents was found in some cases to be technically insufficient (an example is discussed in the Section 4.2.3 dedicated to change management).

BTC

The BTC License to Operate (LTO) organization is fully in place as was observed during the pre-financial close audit in October 2003. The focus of the IEC this time has been to assess, based on documentation reviews, interviews with BTC personnel and observations in the field, the effectiveness of the assurance role and the reliability of reporting the results of this activity. The BTC assurance organization, through their programs of auditing, inspection and monitoring, was observed to focus mainly on formal compliance of documents and activities completed by BOTAŞ, rather than in the assurance of the technical reliability of documents, data and field implementation of the commitments. The details to support this statement are presented in the following sections dedicated to Turkey and refer to several different aspects related to the E&S management of the Project implementation in Turkey. This may be due to insufficient BTC resources in the field, which may become even more critical during the implementation of the Contractor recovery plans throughout the Lots. Two experienced BTC E&S Advisors are in place for Lot A and B and for Lot C and Terminal, respectively, supported by two BTC License to Operate (LTO) officers per pipeline construction Lot to follow both environmental and social management aspects. However, it appears that BTC field officers are not sufficient to fully cover all the several formal and technical aspects related to the assurance of the Project environmental and social commitments.

BOTAŞ

The visit in Turkey coincided with the launching of a new Project organization for BOTAŞ. Based on the information available to IEC, the need for a new,

strengthened organization was recognized by BOTAŞ, recommended by BTC and suggested in the pre-financial close E&S construction monitoring report prepared in October 2003. It is the intention of the IEC team to monitor the implementation and the performance of the new organization in the field during the next missions. During this visit, the lack of experience of some of the personnel in charge of monitoring and supervising the Contractors was apparent at some specific locations (e.g. Lot B), although the general willingness of the BOTAŞ staff to implement an E&S system according to commitments is recognized.

TEPE - Facilities

The organization and staff of TEPE at PT2, the facility visited by IEC, appear to be improved from what has previously been reported, with three new environmental engineers on site. The Environmental Manager is still missing in the field, being on leave since the end of the past year. This particular issue was raised as a Non Compliance condition by the BOTAŞ organization onsite.

STA – Lot B

In the following sections dedicated to the description of the observations made by the IEC in the field, the current situation at Lot B is defined as critical. In addition to the difficult working conditions in this portion of the pipeline, particularly during winter, the situation may also be the consequence of weaknesses and deficiencies of the E&S organization, consisting of junior personnel. STA E&S staff was found to be willing to learn, but their inexperience is a factor that has contributed to the current critical condition, in addition to other organizational and managerial issues. The Environmental Manager resigned a few months ago and STA had still to fill the position at the time of the visit.

Improvements are also needed in the tracking of data. Raw data do not appear to be correctly used and methods for data management are missing. This brings to question the KPI reporting system and finally the Monthly Reports used by all parties involved for summary indicators of the Project development.

PLL – Lot C

The current situation does not significantly differ from that recorded during the previous monitoring visit in October 2003. The resources appear to be sufficient, but some field positions still need to be filled for reinstatement and biorestoration. The gap is partially filled by the significant and positive effort made by BOTAŞ personnel in this field, as described in Section 4.6.

TEKFEN – Ceyhan Marine Terminal

The situation at the Ceyhan Marine Terminal is different from any other Project location in Turkey. The terminal is constructed within the boundary of an existing

facility. Both BOTAŞ and TEKFEN organizations appear to be adequately staffed and organized. During the interviews and from the review of documentation, the adequate control and monitoring of the activities at the terminal were apparent. The only significant finding was the importance of third-party facilities providing aggregate and disposal sites for the construction waste. Even if not an ESAP requirement and there is not a contractual mechanism to impose monitoring in accordance to Project standards, IEC observed that these facilities did not undergo the same level of E&S scrutiny applied to the construction work internal to the organization despite their potential significant utilization by the Project..

4.2.2 Resources and Organization - Recommendations

- 1. It is recommended that the BTC LTO organization concentrate more on the actual performances of the overall E&S management system rather than on the formal compliances of the commitments. The role of the BTC LTO organization should be extended as far as practical, taking into consideration the current contractual arrangement, to provide an effective support to the new BOTAŞ organization, providing support and additional field resources, especially in view of the construction recovery plan in Turkey. Personnel in the field should be strengthened both in number and in field technical experience to fulfill the BTC obligations to assure formal and technical compliance, as well as to provide practical support to the other parties involved in Project development.
- 2. It is recommended that the new organization of BOTAŞ is fully and immediately mobilized and adequately strengthened with experienced E&S personnel in charge of monitoring and supervising the Contractors, especially in Lot B.
- 3. The position of the Environmental Manager for STA should be filled as soon as possible. This person should demonstrate strong background and experience in similar large pipeline construction projects and have sufficient capability and experience to function as a mentor for the rest of the existing E&S organization. Additional field personnel, with some previous exposure to the environmental and social aspects of major construction are also needed in view of the coming accelerated construction program. A specific effort is required to focus on the monitoring and management of environmental issues relevant to construction camps and waste storage facilities, as described in the following sections. Improvements are also needed in data tracking and management systems.
- 4. PLL resources appear to be sufficient, excepting their need for personnel in the fields of reinstatement and biorestoration. The gap should be filled as soon as practical, taking into consideration the status and progress of construction work.
- 5. It is recommended that monitoring and supervision of the E&S aspects managed by the TEKFEN organization are extended beyond the boundary of

the facility to outside- the-gate locations and the third-party enterprises significantly involved in important activities related to the construction of the terminal (e.g., provision of aggregates, dumping pits, etc.), with some potential for environmental and social impacts.

4.2.3 Management of Changes

Differently from the other two in-country organizations, the BTC LTO organization in Ankara is usually not directly involved in the management of changes, including reroutes, as a consequence of the turn-key agreement with BOTAŞ. The BOTAŞ organization in Ankara relies to a large degree on their field supervisors for the assessment and approval of the change requests, although information is regularly passed to Ankara for their overall management.

Several minor and two major reroutes have been approved by BOTAŞ and E&S documentation supporting the change requests was provided to the IEC during the mission. The IEC has focused on the review of E&S documents supporting Deviation Requests relevant to two major rerouting of the pipeline route following significant archaeological findings in Lot C (a late finding at Hamdilli site, and a Phase III planned excavation at Gökdere-Yüceören site). As discussed in Section 4.8, the cultural heritage management system has properly been applied and important archaeological excavations were performed. Reroutes were the preferred option according to commitments. This section presents the results of the IEC review of the E&S documents supporting this decision, aside from the evaluation of the archaeological significance of the discovered sites.

Two documents presenting proposed reroutes of the BTC pipeline in Turkey near Ceyhan were reviewed: the Environmental and Social Assessment of the Proposed Reroute from Chainage 1060+202 to 1062+184, Rev. 0, January 16, 2004 (Document No. PLL-REP-ENS-PLC-020); and the Environmental and Social Assessment of the Proposed Reroute from Chainage 1067+442 to 1072+398, Rev. 0, January 26, 2004 (Document No. PLL-REP-ENS-PLC-021).

Both planned reroutes are outside the "Preferred Route Corridor" (500m or \pm 250m from the centerline of the original construction corridor). BTC considers both route changes to be Class II, based on their position that the changes would not meet any of the five criteria defined in the ESAP for a Class III Change. The ESAP specifies significant differences between Class II and Class III in terms of reporting and approval procedures, the latter requiring approval of the Lenders.

From the IEC's standpoint, the Class II classifications and the conclusion of the reports could be endorsed if the environmental and social assessments provided by the Project are technically adequate. Both reports were approved by the Ministry of Environment and BOTAŞ and construction work at the reroutes were underway at the time of the visit. As indicated above, there is no question on the decision taken to reroute the pipeline to avoid significant archaeological finds. Nevertheless, the IEC

considers it appropriate to raise the following significant comments on the technical adequacy of the approved documents, mainly in the light of potential future evaluation of environmentally and socially significant change requests:

- The documents do not include readable scaled maps depicting all significant features and, in particular, potential receptors for the evaluation and depicting the existing and planned routes. The new routes were not clearly designated on aerial photography.
- The description of the proposed route was not presented in the context of differences from the original route for each component of the evaluation such that any differences in environmental impact from one route to the other could be easily understood.
- The main potential impact in both cases appears to be to agricultural land, but this topic was not treated thoroughly in terms of a specific land use component of the reports.
- The reports indicated that the public meetings took place in April May 2003, presumably for the description of the original routes, and indicated that they represent sufficient public involvement for the reroutes. Demonstration was not provided that this rerouting has been properly presented to the local population.
- The reports did not address if there might be differences in the two routes from a potential oil spill (groundwater vulnerability, location of streams, irrigation channels).

Finally, the overall process for the approval of the two reroutes appears to be unclear. Apparently the Government of Turkey first approved the reroute and then approval to proceed was granted by BOTAŞ to PLL. It is not clear if all the appropriate steps were followed during the process by the Project organizations prior to submittal to the Government.

It is recommended, beyond this specific case, that procedures are clarified between BTC and BOTAŞ in dealing with change management in line with ESAP requirements.

4.3 CONSTRUCTION CAMPS, INFRASTRUCTURE AND SERVICES

The review of construction camps, infrastructure and services focuses on construction operations that potentially have an impact to surrounding infrastructure, natural resources, and community and household assets, including land, roads, and irrigation systems. In addition, the review of this topic includes camp water supplies and general aspects of camp management.

4.3.1 Observations

Visits to construction camps in Turkey were limited by access and available time. Visits were made to the TEPE PT2 Camp at the border between Lots A and B; the Iliça Camp, a fly camp located operated by STA at the northern end of Lot B (KP 318); the main Lot C camp, the Azizli Camp at KP 1037 operated by PLL; and the Ceyhan Marine Terminal (CMT) Camp operated by TEKFEN.

The pump station permanent camp at PT2 has a maximum capacity of approximately 450 workers, but at the time of the visit the camp was not completely constructed and only about 200 workers were just mobilized to reside there, with the remainder still living in Erzerum. The maximum capacity of the Iliça Camp was about 350, but at the time of the visit there were about 150 workers in the camp and it was understood that the camp is about to be closed. The Azizli Camp was fully occupied with approximately 600 workers at the time of the visit. The CMT will employ up to 2,000 workers, but the camp facilities are for a relatively small number as most workers are bussed in from local housing. The following observations have been made from the visits to these four camps:

- *Water supplies*: Where wells have been drilled or a camp uses an existing well as in the case of Iliça Camp, documentation of the sustainability of these wells was provided, although document quality is sometimes questionable or limited, especially in terms of social impact assessment. In Turkey potable water is required to be treated to comply with WHO Guidelines and Turkish Standard TS266 *Water Intended for Human Consumption*. Water quality testing is done inconsistently and not always for the same parameters. WHO/TS266 procedures for testing have not been uniformly followed and baseline analyses are missing for all water sources within Lots B and C and the CMT. Specific observations include:
 - Lot B: when non-compliant water quality problems are encountered, the Project does not respond with additional testing and procedures to immediately solve the problem (Koyunkaya Camp).
 - Azizli Camp: monitoring procedures are good, but many samples do not pass for coliforms. Corrective action requests have been produced by BOTAŞ.
 - > *CMT*: except for the lack of baseline testing, potable water quality monitoring appears to be within Project commitments.

The inconsistent testing is largely due to a lack of attention and limited procedures developed by both the various Contractors and BOTAŞ. *Level II Non-Compliance, BOTAŞ Environmental and Social Management Plans, Commitment ID: CH9E3, CH4E41.*

- *Project footprint*: Land use at camps and for ROW reroutes has been evaluated on the basis of preconstruction surveys consistent with BTC Project commitments, but in several examples the approved documentation provided to the IEC was weak. For example, where a detailed review was conducted of two pre-construction survey documents for two major reroutes in Lot C (*Reroutes from KP 1060.2 to 1062.2 and KP 1067.4 to 1072.4*), although they have been approved for construction, several deficiencies in the surveys were identified, as discussed in Section 4.2.3 above. Although this example was taken from Lot C, the documentation provided by Lot C in general was better presented than in Lot B.
- *Irrigation channels*: Irrigation channels are a significant issue along portions of the pipeline ROW. Based on field observations and the fact that few grievances have been filed by farmers, both STA and PLL appear to be managing irrigation channels within BTC Project commitments. Nevertheless, an example of a blocked irrigation drain was noted when visiting the ROW in Lot B at KP 336, as further noted in Section 4.6.1, although it is recognized that the channel was not being used given the season of the year.
- *Blasting*: The Project has apparently made improvements to the blasting procedures following an incident where an electric line was broken by blast debris in Lot C.
- *Road Crossings*: Road crossings along the pipeline ROW appear to have been managed within BTC Project commitments.
- *Access roads to the ROW*: appear to have been managed within BTC Project commitments.
- Aggregates: Turkey is the only country where BTC/BOTAŞ have developed a specific CCP for aggregates. The CMT has been the greatest project consumer of aggregate, an estimated 350,000 tons. Impacts from third-party installations, i.e., licensed existing privately owned and operated quarry/borrow pit sites are outside the scope of Contractor responsibility, but a Contractor is not permitted to use any privately owned and operated quarry or borrow pit that does not have the appropriate license and permits required under the Turkish *Quarries Regulation*. Due diligence inspections of licensed facilities are required to verify the environmental standard of the facility with respect to environmental receptors and impacts. The IEC findings are that these procedures have been generally followed, but documentation is weak.

• *General Camp Management*: The only camp with significant management problems was Iliça Camp, also likely due to the fact that the area of the camp was smaller than required for operation. Specific safety and environmental problems with this camp are outlined in Sections 4.4, 4.5 and 4.10. The other camps were found to be generally clean and well managed, although some specific problems to be resolved in the area of waste management for all of the camps are identified in Section 4.4.

4.3.2 Recommendations

- 1. WHO Guidelines and EU standards need to be carefully followed for the control of potable water quality. These procedures define the need for baseline testing, which has not been done, as well as the parameters that need to be tested and the frequency of those tests. Potable water is tested in Turkey, but a thorough review of sampling, testing and reporting procedures conducted by experienced professionals is warranted. Consistency should be sought and laboratories used for potable water should be verified by an independent third-party to assess if they are reliable.
- 2. The technical content of pre-construction surveys needs to be reviewed at a managerial level to verify that sufficient data are presented such that BTC Project commitments are being met.
- 3. It will be necessary for both the E&S and H&S staffs to verify that aggregate and concrete sources are being developed and managed within Project commitments, given that it is likely that much of the production of some sources could be dedicated to Project use. This recommendation applies to TEPE at the fixed facilities, and to TEKFEN at the CMT, where large quantities of aggregate are being used.
- 4. In Lot B, considerable attention needs to be placed on camp housekeeping.

4.4 WASTE MANAGEMENT

4.4.1 Non-Hazardous and Hazardous Waste – Observations

Waste management in Turkey is a key area of concern, based on field observations of waste tracking, inventory, handling and storage, and labeling. However, there are significant differences among the EPC Contractors in terms of capacity and compliance with Project specifications.

The Project hazardous wastes are transported to the Izaydaş waste management center in the Izmit region (northwest Turkey), although BTC and BOTAŞ both reported that the center is still due to upgrade its wastewater treatment facility to bring it in compliance with EU requirements.

In terms of data management, the reliability of information collected by BOTAŞ from the EPC Contractors was found to be insufficiently verified (e.g., waste inventories, STP test results and contingencies). In some cases figures relevant to waste generation have been found to be questionable or partially significant. Data QA/QC, especially in terms of field verification and interpretation, appears to be limited. This situation creates a data management issue in light of reporting requirements (e.g., monthly reports to BTC) and definition of remedial actions. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: CH15E40, APC1E69.*

EPC Contractors have identified waste management options and most third-party facilities have been audited and subsequently approved by BOTAŞ.

TEPE (PT2)

TEPE has identified third-party recyclers for plastic, paper, metal and glass wastes. Non-reusable / non-recyclable non-hazardous waste, hazardous waste and medical waste are collected and sent to the Izaydaş waste management center. Organic wastes are treated on site by grinding and disposal at the Wastewater Treatment Plant (WWTP).

Significant waste management non-compliances were found in October 2003 during a formal Quality, Health & Safety, Environmental and Community Relations (QHSER) review performed by BOTAŞ, as well as in January 2004 during an audit of PT2 management and facilities for the implementation of the environmental and social commitments. Some progress appears to have been recently made. A partial waste register, recording transportation of sewage, plastic, metal and paper waste to third-party facilities, was made available on site, although a precise and reliable inventory has yet to be developed to track generation of different waste streams and allow proper assessment of on-site waste management. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: CH15E40, APC1E69, APC3E70*

The Central Waste Accumulation Area is being used, although it needs significant improvement. The collection system for storm water was found to be inadequate to segregate potentially contaminated storm water from clean run off. Storm water passes directly to a poorly maintained OWS located outside the CWAA fence. The area was not locked and the fence surrounding the facility was poorly maintained. Labeling of waste containers was found to be inadequate and not complying with Project specifications. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: APC3E34, APC3E45*

Several sites have been identified by TEPE for disposal of excess subsoil from PT2 (approximately 200,000 m³). The relevant Environmental and Social Impact Assessment (ESIA) for four proposed sites was approved for construction in November 2003 and made available during the site visit. To minimize landscape and visual impacts, TEPE plans to fully reinstate the sites and return them to agricultural

use, also using biorestoration techniques if needed, based on monitoring of natural revegetation and indications of potential erosion. A cultural heritage assessment was made and no archaeological findings were discovered.

STA (Lot B)

STA has identified third-party recyclers for plastic, paper, metal and glass wastes. Non-reusable / non-recyclable non-hazardous waste, hazardous waste and medical waste are collected and sent to the Izaydaş waste management center. Organic wastes are sent to a pig farm in Erzincan.

As already discussed for PT2, the current waste tracking system and the waste inventory do not appear to be fully developed. Significant inconsistencies were found between the raw data recorded in the STA waste register and the figures reported in recent BTC/BOTAŞ monthly reports summarizing generated and disposed waste amounts. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: CH15E40, APC1E69, APC3E70*

The Central Waste Accumulation Area at Iliça Camp was found to be inadequate and not in compliance with Project specifications. The area appears to be insufficient in size; housekeeping was poor; the waste was poorly segregated and labeling was inadequate or missing; secondary containment for safe storage of hazardous waste containers was not present, except for some absorbent booms that were deployed around some unlabeled containers. Signs of spills were detected on the ground surface and in the standing water inside and outside the shelter. Developer and fixer liquids were stored at an improper location, which was not paved or bunded. *Level II Non-Compliance, CCP Waste Management Plan, Commitment ID: APC3E34, APC3E45, APC3E46*

The current organization in Lot B appeared not to be sufficiently trained and capable of managing waste issues according to the Project requirements. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: APC3E38, APC3E56*

PLL (Lot C)

PLL has identified third-party recyclers for plastic, paper, wood, metal and glass wastes. Non-reusable / non-recyclable non-hazardous waste, hazardous waste and medical waste are collected and sent to the Izaydaş waste management center. Organic wastes are treated at the composting facility built by PLL, which hired two workers from the local community to operate the site.

The waste storage area at Azizli Camp is a relatively small facility. The area is properly paved and fenced, and different waste streams are segregated, although some non-compliances were observed in terms of proper waste management: missing labeling of bagged hazardous waste and, more generally, inadequate labeling (*Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: APC3E34*);

storage of medical waste container together with other waste containers (*Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: APC3E23*); combined drainage system from the hazardous and non-hazardous waste areas; inadequate PPE used by the waste management workers.

TEKFEN (Ceyhan Marine Terminal – CMT)

TEKFEN has identified third-party recyclers for plastic, paper, metal and glass wastes. Non-reusable / non-recyclable non-hazardous waste, hazardous waste and medical waste are collected and sent to the Izaydaş waste management center. Organic wastes are treated on site by grinding and disposal at a Wastewater Treatment Plant (WWTP).

Inert wastes are partially reused for construction activities (fill material) and also sent to a dump site identified in the vicinity of the CMT, for which a permit has been granted to TEKFEN by the local Municipality. Although the environmental and the health and safety staff reported that the site has been inspected and assessed, no documentation was found to ascertain that Project requirements in terms of health, safety and environmental protection are met for the site. *Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: APC3E65, APC3E77*

The Central Waste Accumulation Area is a relatively small facility, properly paved and fenced. The different waste streams appear to be segregated, although the labeling and storage of hazardous waste were found to be not fully adequate and requiring improvement.

4.4.2 Non-Hazardous and Hazardous Waste - Recommendations

- 1. BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved.
- 2. The overall impression is that there is a need for on-the-job training for the field environmental staff of BOTAŞ and EPC Contractors in the field of waste management. The environmental and waste management organizations, especially in Lot B, should be trained on-the-job by experienced professionals, and strengthened to be able to ensure appropriate waste management and compliance with Project standards.
- 3. Waste container labeling was found not to be compliant with EU requirements and good practice. Labeling should be improved to allow immediate identification of relevant waste data and to minimize potential risks of exposure and mixing. Labeling should be made consistent throughout the EPC Contractors.
- 4. The arrangement of the CWAAs (particularly at Lot B Iliça Camp and PT2) needs to be consistently reviewed and improved with respect to proper fencing and securing of the areas, drainage collection systems for potentially contaminated storm water and spills, proper housekeeping and segregation of waste streams, effectiveness of the secondary containments for hazardous waste storage.
- 5. Use of proper PPE for waste management operators should be reviewed and enforced. It is recommended that hygiene of the composting facility be reviewed by medical staff and that periodic disinfection against vermin and proper PPE at the organic waste composting facility be provided.
- 6. The compliance of disposal methods and sites (including outside-the-gate sites) for waste (including inert waste) with Project standards (e.g. safety of operation, environmental issues, third-party interaction), particularly for pump stations and CMT construction sites should be verified and properly documented (CCP Waste Management Plan, Commitment ID: APC3E35, APC3E57, APC3E64, APC3E65, APC3E77).

4.4.3 Wastewater Management - Observations

Wastewater management has been another issue of concern for both BTC and BOTAŞ since the beginning of the construction phase. At the time of the visit, an independent assessment of the operability and effectiveness of the several wastewater treatment plants (WWTPs) installed at the construction sites was ongoing.

TEPE (PT2)

The installation of the WWTP was completed, but still not operational at the time of the visit. The PT2 camp was being mobilized and TEPE was planning to put the WWTP in operation in the short-term. Prior to operation of the WWTP and in case of its malfunction, TEPE has entered into an agreement with the Erzincan WWTP, which is considered acceptable by the Project, in order to dispose of sewage generated at the site.

The PT2 WWTP is installed inside a closed metal shed. Discharge of treated water is to the closest surface water body and partially reused for irrigation during the summer season. A contingency plan to deal with WWTP malfunctioning and management of partially treated or untreated wastewater was made available.

STA (Lot B)

The WWTP at Iliça Camp was not operational at the time of the visit. Untreated sewage was collected in an underground storage tank, which was located near the camp fence along the main public road. Wastewater was trucked to the Erzincan WWTP. It was also found that STA was installing two additional above-ground

storage tanks which are located outside the fence and which were to be connected to the wastewater treatment plant by a hanging plastic pipe.

At Koyunkaya Camp, when wastewater quality problems were encountered in terms of non-compliant coliform concentrations, the Project did not respond with additional testing and procedures to solve the problem. Effluent discharge to the receptor surface water body (Kizirlimak River) was not discontinued, although the impact appears to be limited due to the high concentrations of coliforms already present in the river water. Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: CH4E53; Level I Non-Compliance, CCP Environmental Management Plan, Commitment ID: APC1E34

Effluent monitoring is performed approximately every 7 to 10 days. Available results are relevant to a reduced number of parameters (BOD, suspended solids, chlorine, and coliforms). Infrequent measurements of COD and pH were also reported. Significant inconsistencies both in terms of parameters tested and in terms of sampling frequencies were found in the monitoring plans implemented at different water and wastewater treatment facilities managed by STA. *Level I Non-Compliance, CCP Environmental Management Plan, Commitment ID: APC1E8, APC1E66.* BTC and Botas recognized this deficiency and implemented a Third Party Environmental Audit. The IEC will review the results of this audit during the next mission.

PLL (Lot C)

Camp WWTPs have two treatment units. At Azizli Camp a pre-treatment unit has been recently added to treat laundry wastewater and reduce the load for the two main units as part of the actions to limit risk of upset conditions for the plant. A 15 hrs capacity holding tank is also available downstream from the WWTP to collect partially treated or untreated wastewater in case of plant malfunctioning. The WWTP discharges into a receiving surface water body, which has been reported to be used by third parties for crop irrigation. Effluent is sampled twice a week.

Available effluent quality results for the Azizli and Andirin WWTPs appear to be generally below or at Project standards for pH, total suspended solids, BOD, COD, coliforms and free chlorine. Tests are also performed to check water quality of the receiving water body upstream and downstream of the discharge point and results show no significant changes in water quality.

TEKFEN (CMT)

Both CMT WWTPs (800 and 300 unit) were found not to discharge into the environment and wastewater is trucked to the main BOTAŞ District Management (BDM) plant for treatment. A new stabilization tank for the 800 WWTP was installed to increase the capacity of the plant. The most recent available results made available by TEKFEN (up to February 2004) show that the 800 WWTP effluent

samples did not meet Project standards for BOD₅, COD, TSS and total coliforms in several sampling episodes. The 300 WWTP does not consistently meet Project standards for total coliforms and, although infrequently, for TSS. BTC and Botas recognized this deficiency and implemented a Third Party Environmental Audit. The IEC will review the results of this audit during the next mission.

Documentation was provided on effluent quality from the BDM WWTP, showing that the plant is meeting Project standards for pH, BOD₅, COD, and TSS.

4.4.4 Wastewater Management – Recommendations

- 1. Proper ventilation should be provided for the shed where the TP2 WWTP is installed to minimize occupational health risks.
- 2. Lot B and CMT WWTP design and arrangements should be reviewed by experienced process engineers to assess treatment effectiveness and reliability such that they can meet Project requirements.
- 3. The condition of closed drain systems and the fate of oily water and potentially contaminated storm water (see also Section 4.4.1 above) should be verified by the BTC, BOTAŞ and EPC Contractors environmental staffs throughout the construction camps and facilities. The review should include:
 - Oil water separator maintenance and discharges
 - Collection and treatment of oily water, particularly when third parties are involved
 - Adequacy of containment basins and collection drainage at fuel storage areas and filling station.
- 4. The conditions of the liquid discharges from the batching plants directly operated by the Project and/or by third parties, especially when the Project is the most significant, if not the exclusive, user of these facilities, should meet Project requirements. Samples were taken and recommendation to treat effluent was made before discharge. Their compliance should be verified by the Project.
- 5. BTC and BOTAŞ should ensure that the water and wastewater monitoring plans developed and implemented by the EPC Contractors allow for an adequate compliance verification of Project commitments. It is recommended that a thorough technical review be conducted of the consistency and adequacy of the plans, in terms of monitoring frequencies and parameters. Accreditation and QA/QC procedures of the external laboratories used by the Project (BTC, BOTAŞ and EPC Contractors) should also be assessed by experienced chemists to verify that they are complying with EU requirements.

6. BOTAŞ and EPC Contractors should consider installing field laboratories to allow for more frequent and controlled testing of basic wastewater process and effluent quality parameters.

4.5 POLLUTION PREVENTION

4.5.1 Observations

As already described in Section 2.5, the Project has adopted a pollution prevention plan aimed at systematically identifying potential impacts from construction activities and implementing avoidance and mitigation measures to minimize the likelihood, extent or duration of their occurrence, and any associated adverse effects. The mitigation measures include: spill prevention and management; management of existing contaminated areas, if any are found during construction; groundwater protection; surface water protection; ecological receptor protection; air quality protection and dust mitigation; noise control; soil erosion control and topsoil protection.

Various provisions apply directly to the protection of surface and ground waters, including permanent fuel and chemical storage, hazardous materials storage, vehicle maintenance facilities, wastewater discharges, run-off controls, and disposal of trench water and groundwater.

Maintenance of irrigation drainage and stream flow and erosion and sediment controls along the ROW construction are discussed in Section 4.6.

TEPE (PT2)

Noise monitoring is conducted daily and properly documented at site, although there are reportedly no receptors within a 2 km radius from PT2. No limit exceedances were reported. An air emission monitoring program was prepared and is being implemented by TEPE for both vehicle emissions and large emission sources (generators), although the first round of air emission results were still not available at PT2 during the visit.

The setting of the fueling station and the arrangement for refueling of the generators were found to need improvements to allow vehicles to approach safely and to provide proper bunding and containment of potential spills (*Level I Non-Compliance, CCP Pollution Prevention Plan, Commitment ID: APC4E17, APC4E22*).

The third-party facilities (aggregate sources and batch plants) used by TEPE to produce the significant amount of aggregate and concrete needed for the construction of four pump stations were found not to be fully evaluated in terms of adherence to basic and applicable environmental and social commitments (*Level I Non-Compliance, CCP Aggregates Management Plan, Commitment ID: APC10E1*).

STA (Lot B)

Noise monitoring is conducted, although monitoring intervals do not appear to be regular and locations are not consistently assessed. Results made available show several exceedances, but reporting does not allow for the assessment of compliance with applicable and relevant Project standards (*Level I Non-Compliance, CCP Pollution Prevention Plan, Commitment ID: APC1E76, APC1E77*).

Emission control records for vehicles were not available at the time of the visit, although it has been reported that arrangements have been made to implement this monitoring component.

PLL (Lot C)

Noise monitoring appears to be conducted at sensitive locations along the ROW. Documentation provided for specific locations appears to be appropriate. Short-term exceedances related to specific operations along the ROW were reported to local communities.

An air emission monitoring program is being implemented for vehicle emissions control and generator emissions.

TEKFEN (CMT)

Noise monitoring was found to be conducted twice a week at seven selected locations, including internal areas and closest villages (Karatepe and Gölovasi), and properly documented at site. No limit exceedances were reported.

An underwater noise monitoring report was also prepared as committed in the EIA report and approved by BOTAŞ. Monitoring was performed during pile driving activities. The results of long wave noise level measurements during pile driving were slightly higher (190 dB ref. 1- μ Pa for hydrophone located 2 meters below sea surface and 3 meters horizontally away from the pile) than the value of 180 dB ref. 1- μ Pa, which is the threshold where fish behavioral changes are reported to be noticeable. It was, however, concluded that the impact of this activity is minor, short-term and localized.

An air quality survey was also conducted in December 2003 – January 2004 in compliance with Project commitments. Measured pollutants included suspended particulate matters (SPM), volatile organic compounds (VOCs), NO_X and SO₂. The campaign will serve as baseline data for the site prior to operations. Sampling points included 10 locations, among which there are potential receptors internal to the industrial site and closest external receptors, such as the villages of Kurtkulagi, Gölovasi and Karatepe. All the PM₁₀, NO_X and SO₂ measurements were reported to be below Project standards. Benzene, toluene, ethylbenzene and xylenes (BTEX)

were measured for VOCs and benzene concentrations appear to be relatively significant, although generally slightly below the EU standard (5 μ g/m³).

A sediment quality survey at 12 seabed locations was conducted in June 2003. The results of the survey are available and appear to represent a sound baseline assessment of the conditions in the vicinity of the CMT and the new jetty location. They showed no significant impact in terms of petroleum hydrocarbons and moderate concentrations of some metals (especially iron and chromium).

The third-party facilities (aggregate sources) used by TEKFEN to produce the significant amount of aggregate needed for the CMT construction were found to be evaluated in terms of potential effects related to their Project involvement and of adherence to basic and applicable environmental commitments. However it is noted that the environmental due diligence audit performed for a new third-party basalt quarry, apparently used mostly for the Project, identified that a post-quarry plan is not available. The audit has only indicated that the site could be used to dispose of excess soil from CMT construction activities, but affirmed that alternative uses could be decided by the owner.

A batch plant is operational on site for the concrete used for the CMT construction. A test was performed on its discharge to assess water quality, but a nearby stormwater drainage pond was observed to possibly receive water from the plant, although separation ponds are in concrete.

4.5.2 Recommendations

- 1. The condition of the fuel station and the arrangement and setup for refueling the generators at TP2 need to be reviewed and corrections made to allow for containment of potential spills and to provide good surfaces for vehicles approaching the locations. A review of this aspect is recommended for all the pump station construction sites. As already indicated (Section 4.4.4), BTC and BOTAŞ should verify that the condition of closed drain systems and containment basins at TEPE facilities and the fate of all oily water is compliant with Project commitments.
- 2. BTC and BOTAŞ should verify that noise monitoring is performed by STA at suitable locations (i.e., to ensure protection of closest receptors) for all the construction sites during operations.
- 3. In consideration of the upcoming summer season, BOTAŞ should ensure that the dust control actions are properly identified and monitored by all the EPC Contractors, especially at sensitive locations. A consistent approach should be followed.

- 4. BOTAŞ should ensure that vibration monitoring is consistently conducted by the pipeline Contractors to assess background conditions (pre-blast conditions) and potential impact from blasting, as well as from Project traffic along roads with significant Project use.
- 5. TEPE and TEKFEN E&S organizations should verify the third-party sources for aggregate and concrete, given that it is likely that the construction activities at pump stations and CMT absorb the majority of the production of these plants. BOTAŞ should make sure that plant operations are conducted within the spirit of the Project environmental and social commitments, especially without significantly impacting the local supply procurement and work opportunities for local communities. Where the Project is clearly the most important user, if not the exclusive one, of a quarry or a borrow pit, a site closure and reinstatement plan should be identified, promoted and agreed with the land owner.
- 6. Based on the results obtained from the air quality monitoring campaign conducted at the CMT construction site and surrounding receptors, showing relatively significant concentrations of benzene, it is recommended that verification testing be conducted during the next planned campaign, using stainless steel canisters for the collection of VOCs.
- 7. TEKFEN should verify that runoff from the batch plant operated for the CMT construction does not interact with the nearby stormwater drainage pond.

4.6 EROSION CONTROL AND REINSTATEMENT

4.6.1 Observations

As already observed in Section 2.6 for Azerbaijan and Section 3.6 for Georgia, the length of the ROW under construction is extensive, creating potential impacts on environment and strain on the BTC, BOTAŞ and pipeline Contractors' organizations, especially considering the BOTAŞ recovery plans to improve production and being implemented by the Contractors (for instance, a third spread is expected to be opened in Lot B). Final reinstatement had not been achieved for any portion of the pipeline at the time of the visit, although good examples of interim reinstatement were observed in Lot C.

BOTAŞ has reported that a reinstatement team of environmental specialists is being provided by an independent Turkish consulting firm to support EPC Contractors. PLL, the pipeline Contractor for Lot C, was still working to develop a biorestoration team.

Special Area Reinstatement Method Statements (SARMS) have been developed for the Ecological Sensitive Areas (ESAs) identified during the EIA phase. BTC has drafted a Reinstatement Guide for the ESAs aimed at complementing and updating the Vegetation Mapping Survey Report issued in January 2003. The implementation of ad-hoc topsoil management measures was observed at ESA 47 and 48 in Lot C. Construction issues were found at ESA 13 in Lot B (see Section 4.7).

Generally good topsoil management and ROW reinstatement practices (water breaks, jute matting) were observed in Lot C. Special attention is given to topsoil management in difficult terrains where topsoil is reduced and slopes are steep. Topsoil stockpiling, in terms of compaction, slope, layout, designation with signs and special preservation measures, is adequate and in line with Project standards and objectives.

Topsoil management in Lot B appears to be significantly less adequate, with cases of mixing with subsoil and not fully adequate compaction, although reinstatement was still at an early stage due to the winterization program. Only 1 km of reinstatement was accepted by BTC at ESA 51 and other five ESAs still to be reinstated, although construction was completed several months ago, notwithstanding time constraints stated in SARMS, and a non-compliance on construction work duration at ESAs raised by BTC to BOTAŞ (*Level II Non-Compliance, CCP Reinstatement Plan, Commitment ID: APC2E26, CH12E2, CH12E4, CH12E10, 411)*. At the time of the visit, a training program for clearing was planned to be implemented in Lot B.

Topsoil monitoring is specified in the relevant Reinstatement Plans, but its implementation has not fully started. To ensure that topsoil fertility levels are maintained during storage, topsoil density and moisture content should be monitored to check for the presence of anaerobic conditions. However, it is noted that the level of control for topsoil preservation adopted by Lot C organization appears to be adequate and in line with the Project standards and commitments.

With respect to additional land acquisition, total amounts were found not to be sufficiently tracked and analyzed, particularly by the BTC and BOTAŞ environmental and social staffs in Ankara, and especially for Lot B (*Level I Non-Compliance, CCP Reinstatement Plan, Commitment ID: 2*). However, it was noted that the Lot C Contractor, PLL, has developed a basic extra land register that should allow for the tracking of relevant information and for analyzing this issue, as well as reinstatement. PLL has also developed an access roads register that appears adequate to track relevant information, especially reinstatement actions to be implemented at the end of construction activities. STA has also developed an access roads register.

Small stream / channel / irrigation drainage flow is generally maintained through the use of flume pipes. Although the implementation of such measures is consistent through the Lots visited, it was observed during the visit that is the flume pipes are sometimes inadequate and undersized, especially in Lot B, where for instance an irrigation channel having a relatively significant hydraulic section, located at KP 336, was found to be blocked with inadequate flume pipes plugged downstream by debris (*Level I Non-Compliance, CCP Reinstatement Plan, Commitment ID: 2, 631*).

None of the four river crossings visited in Lot C have been fully reinstated. The Mersin (Karacay) River crossing was not well done during construction, in particular with respect to the erosion and sediment control system, and at the time of the visit temporary erosion and sediment control measures were lacking although the river banks were still to be stabilized (*Level II Non-Compliance, CCP Reinstatement Plan, Commitment ID: APC2E26, APC2E95, APC2E96, APC2E97)*. However, other river crossings visited were found to be better stabilized. Appropriate systems for erosion and sediment control were in place for the Altigoz River crossing during construction. The small crossing of the Taslik River at KP 1034 appeared to be close to completion with appropriate rip-rap. Turbidity measurements were found to be consistently taken at river crossings.

At the time of the visit, the facility Contractor, TEPE, was waiting for the report of a specialist hired to address long-term preservation of topsoil at the pump station sites.

4.6.2 Recommendations

- 1. The Project should ensure that the front of the pipeline construction does not get too far in front of the back of the construction. Immediate actions should be taken to ensure that experienced reinstatement and biorestoration specialists support the Lot B organization. More generally, care needs to be taken that reinstatement can keep up with the anticipated accelerated production of the recovery plans.
- 2. A review of all the temporary irrigation channel crossings in Lot B should be conducted by BOTAŞ and BTC. STA should ensure that adequately sized flume pipes or culverts are put in place, taking into account hydraulic sections and expected flow. Adequate training should be provided to the ROW crews to prevent topsoil loss and land damage caused by heavy equipment outside ROW.
- 3. Sufficient resources need to be dedicated by Contractors to implement sufficient sediment and erosion control measures and quickly reinstate river and stream crossings, consistent with Project commitments. BTC and BOTAŞ should assure that the commitments are met.
- 4. Topsoil management procedures need to be improved in Lot B, especially considering the delays in reinstating ESAs. Issues include seeding, mulching, monitoring of anaerobic conditions, shaping and compacting of pile surfaces, and establishing runoff controls.
- 5. BTC and BOTAŞ should monitor additional land acquisition and management of access roads following the requirement to minimize the Project footprints. Comparisons and analyses between the spreads along the three Lots should be developed.

4.7 ECOLOGICAL MANAGEMENT

4.7.1 Observations

As discussed above and also highlighted for Azerbaijan and Georgia, the front of the pipeline is well in advance of reinstatement for both the visited Lot B and C. As already indicated in Section 4.6, final reinstatement had not been achieved for any portion of the pipeline at the time of the visit, although good examples of interim reinstatement were observed in Lot C.

Pre-construction ecological surveys are generally conducted in accordance with the Project requirements. Relevant documentation was found to be sufficient, but often scattered in several documents.

55 Ecologically Sensitive Areas (ESAs) have been identified during the EIA studies, as corridor stretches which were considered to be the habitats for several threatened and endangered floral species. ESAs were identified in two phases, which included a habitat survey in the 500 meter corridor. In Lots B and C there are 24 and 19 ESAs, respectively. As part of the pre-construction survey, detailed vegetation mapping studies were undertaken to study the 28-meter ROW, with the objective to ascertain the presence of the species identified during the EIA studies and any other important species, if any. Based on these additional detailed studies, Special Area Reinstatement Method Statements (SARMS) have been developed by BOTAS and the EPC Contractor for each ESA, and Areas of Important Plants (AIPs) identified. The lengths of the AIPs where special management and reinstatement techniques are applied are usually significantly shorter than the ESA lengths defined in the EIA studies. For example, a 600 meter AIP is defined for ESA 47 (length of 3.45 km in the EIA studies); a two stretches of 100 meters and 10 meters are the AIP defined for ESA 48 (length of 2 km in the EIA studies); a 3.72 km AIP is defined for ESA 24 (length of 24.09 km in the EIA studies).

The implementation of ad-hoc, special topsoil management measures was observed at the AIPs identified for ESA 47 and 48 in Lot C.

To support and ensure an adequate ecological management and mitigation of the construction activities, BTC has recently drafted (March 2004) a Reinstatement Guide for the ESAs, which, as noted in Section 4.6, is aimed at complementing and updating the Vegetation Mapping Survey Report, issued in January 2003. A workshop on SARMS was held in August – September 2003 for all of the pipeline Contractors and an Ecological Field Assistance Report was distributed in October 2003.

During the mission ESA 13 (length of 1.37 km in the Erzurum Plain) in Lot B was also visited. At this location construction issues were found, which may impact future reinstatement activities. Specifically, construction did not proceed as recommended in the EIA. Construction work had been stopped and the pipeline was

welded, but not trenched along the ESA. A new Construction Method Statement was still under preparation by the Contractor at the time of the visit to manage new seasonal conditions. At the time of the visit, BTC management was found to be only partially informed about the current situation.

The issues observed may be the results of a combination of several factors:

- BTC and BOTAŞ field personnel were only partially informed on the ESA 13 requirements, prior and during construction.
- Construction alignment sheets did not provide sufficient information to the construction team about applicable limitations, concrete coating requirements and restrictions in that area.
- Minutes of meeting among parties related to the need to apply concrete coating instead of sandbags at ESA 13 were not transmitted to the construction team in time.
- The BTC/BOTAŞ agreement to use sandbags instead of concrete coating in Erzurum Plain wetland crossings was misunderstood and considered applicable to the ESA 13 crossing, where mechanical protection is required in addition to buoyancy avoidance, dictating the need for concrete coating.
- The proposed length of construction was changed by the EPC Contractor from 3 weeks, consistent with Project specifications (CCP Ecological Management Plan, Commitment ID: APC1E103), to a period of 12 weeks at ESA 13, and this proposed change has apparently not been judged by BTC / BOTAŞ as a potential risk factor.
- Weather conditions impacted on the construction method and timing. Wetland areas were supposed to be crossed in winter during frozen conditions, but unexpectedly warm weather conditions thawed the soil along the ROW preventing the continuation of the BTC-approved construction method developed by the EPC Contractor and BOTAŞ.

During the mission, BTC anticipated that construction work would not proceed until the end of the environmentally sensitive period from April to July and could resume after August 2004.

It is not practical to define a non-compliance level, within the ESAP classification due to the lack of a detailed analysis of impacts potentially caused by the ESA 13 construction procedures. It is however stressed that the observed situation is critical and requires a careful, technically sound assessment and appropriate monitoring and mitigation.

As already indicated in Section 4.6, only 1 km of reinstatement has been accepted by BTC at ESA 51 in Lot B. The other five ESAs still need to be reinstated, although construction was completed several months ago, notwithstanding time constraints stated in SARMS. A non-compliance on construction work duration at ESAs has been raised by BTC to BOTAŞ (CCP Ecological Management Plan, Commitment ID: APC1E103).

It is highlighted that the CCP Ecological Management Plan recommends that special measures to minimize potential adverse effects on species of ecological interest are to be formalized into working method statements, including the Special Area Reinstatement Method Statements, applicable to ESAs, 60 days prior to construction commencing. It is also emphasized that experienced ecological advisors are to be appointed and be present on each spread during construction activities and in particular at ESAs. The current situation at ESA 13 and the open non-compliance raised by BTC on ESA construction work duration appear to be due to shortcomings in relation to the Management of Change, involving all parties (*Level II Non-Compliance, CCP Ecological Management Plan, Commitment ID: CH6E40*).

The IEC was also informed on two proposed changes to the approved route (a reroute and variations to the approved ROW width) and construction arrangements (change to the seasonal constraint) in the Posof Wildlife Protection Area (WPA), which is part of the ESA 1 in Lot A. At the time of the visit, BTC was completing its evaluation of the proposed changes with the support of an external ecological consultant. No construction work was ongoing, pending BTC decision and agreement with BOTAŞ, although it was reported that the proposed changes were approved by the Ministry of Environment.

4.7.2 Recommendations

- 1. The Project should adequately monitor, assess and document that the potential environmental effects relevant to inadequate management of construction work at ESA 13 are short-term and reversible.
- 2. A revised SARMS and a revised Work Method Statement should be developed for ESA 13 as soon as practical, including a recovery plan to address potential effects of the present situation. Constraints should include seasonal conditions and duration of activities from clearing to reinstatement.

- 3. Although there appears to be compliance with commitments at ESA 47 and 48, as specified in the relevant SARMS, BTC and BOTAŞ should continue to focus on implementation of commitments in the ESAs and systematically monitor and ensure that the spirit of the EIA studies is fully applied in these areas, as well as in other sensitive locations (e.g., river crossings, see Section 4.6). The development of a specific Turkey monitoring plan for the ESAs is strongly recommended, also in light of the issues raised by BTC field personnel in terms of non-compliant work duration at some locations. BTC and BOTAŞ should consider strengthening their respective field staff with experienced environmental and ecological specialists to monitor ecological commitment implementation (i.e., special topsoil management, plant translocation, seed collection, etc.), also taking into account construction recovery plans developed for the three Lots to meet construction deadlines.
- 4. BOTAŞ should fully address and ensure through proper monitoring during the implementation phase that potential issues related to the duration of construction at several ESAs exceeding the recommended duration indicated in the EIA studies and in the ESAP are negligible. Issues to be investigated and addressed include the nature of potential impacts and mitigation measures adopted. The quality and results of the monitoring should be fully evaluated in the field by BTC.
- 5. It is recommended that the information collected during pre-construction surveys, including ecological survey and evaluation, be consolidated in a single pre-construction baseline survey document.

4.8 CULTURAL HERITAGE MANAGEMENT

Cultural heritage management is predominantly the responsibility of BOTAŞ. The governing procedures are defined in the ESAP, Appendix E as a *Procedure, Cultural Heritage Management Plan.* This document provides the basic procedures for all phases of the cultural heritage management process, including archaeological late finds protocol found as independent documents in the ESAP for Azerbaijan and Georgia. The construction contractors also have responsibilities for archaeological monitoring during pre-construction survey work and have developed their own *Cultural Heritage Management Procedures*. BOTAŞ has its own archaeological staff, but field work has been placed primarily with the Archaeological Environment Properties Research Centre at Gazi University. All excavations are managed by the Archaeological Work Teams in association with the Ministry of Culture and Tourism, Directorate of Monuments and Museums (Museums Directorate), who has legal responsibility for excavation.

BTC Co. has assumed a position of quality assurance with respect to archaeology. BTC Co. has retained the services of the British Institute of Archaeology at Ankara (BIAA) a UK based charitable NGO for audits of field activities. The services of Oxford Archaeology, the largest independent archaeological practice in the U.K., have also been contracted for additional review services, in particular the review of the work done at the Tasmasor and Sazpegler sites further discussed in Section 4.8.3.

Prior to construction, the ROW was surveyed following Phase I and II procedures and 179 potentially significant archaeological sites were identified within a 2-km corridor. After pipeline reroutes approximately 12 were selected for Phase III excavations. In some cases major reroutes were defined after significant excavation had taken place, including the Hamdilli site (KP 1060.2 to 1062.2) and Gökdere-Yüceören site (KP 1067.4 to 1072.4). In other cases excavation was adopted for mitigation, including the Tasmasor site (KP 298.1 – 298.7) and Sazpegler site (KP 36.8), discussed in Section 4.8.3.

Current cultural heritage activities have related to the management of late finds. Field archaeologists actively monitor topsoil stripping and excavation work. When late finds are encountered, topsoil stripping/excavation must be stopped until the representative Museum Directorate evaluates the significance of the find. BOTAŞ has tabulated fourteen of these significant late finds where seven reroutes have already been implemented and four are being evaluated.

4.8.1 Observations

During the mission, the following observations were made:

- The overall field archaeological program along the ROW and associated access roads, additional land acquisitions and AGIs appears to be consistent with Project commitments. It is significant that archaeological sites have caused reroutes to take place and that considerable efforts have been made to excavate sites such that the pipeline route will not cause a loss of cultural heritage.
- Some of the "late" finds are considered late only because they were encountered after the Phase I and II surveys presented in the EIA. In particular those at KP 1060.2 to 1062.2 (Hamdilli site) and KP 1067.4 to 1072.4 (Gökdere-Yüceören site) were discovered in early 2003, well before construction. These sites were found to be extensive and important and the ROW has been rerouted to avoid them. An observation from the Hamdilli site is that the excavated rockcut tombs are beginning to deteriorate due to exposure to the atmosphere and to vandalism.
- The Cultural Heritage Management Plan provides little guidance for cases where burials encountered are not old enough to be of archaeological interest. It is understood that some graves have been encountered that were not of interest to archaeologists, yet were not able to be associated with a modern community. The IEC has no reason to believe that proper procedures were not followed for the exhumation and re-burial of these human remains, but notes that BTC Project documents provide little guidance for this effort.

4.8.2 Recommendations

- 1. Although it is understood that the final conservation of sites is a responsibility of the Ministry of Culture, considering that the sites would not have been excavated had the pipeline not been constructed, it is recommended that efforts be made to assure that excavated sites (e.g., Hamdilli site) are not allowed to deteriorate.
- 2. The Project needs to be careful that appropriate procedures are followed when non-archaeological graves are encountered. This is a "gray area" when interpreting the Cultural Heritage Management Plan.

4.8.3 Tasmasor and Sazpegler Sites

The Tasmasor and Sazpegler archaeological sites have caused considerable controversy and have been the source of dispute between BOTAŞ and BTC. The dispute can be effectively summarized that BTC believes that BOTAŞ should have avoided these sites, whereas BOTAŞ believes that reroutes were impractical and that they have followed proper mitigation procedures through salvage archaeology. For the review of these two sites, BTC contracted the services of Oxford Archaeology.⁷ Based on conversations with BOTAŞ personnel, it is understood that the Sazpegler site will be avoided. Avoidance of the excavations is being planned on the basis of a horizontal deviation of the route. Assuming that this information is correct, the heart of the controversy is with the Tasmasor site and only the Tasmasor site is reviewed in detail. An abbreviated chronology of events is as follows:

- Tasmasor is a site identified through Phase II studies completed in October 2002 to be important enough to require re-routing or salvage excavations.
- On November 27, 2002 BOTAŞ submitted a letter to BTC indicating reasons why they preferred not to re-route the pipeline.
- Prior to May 2003 Gazi University provides a scope of work to excavate Tasmasor.
- July 3, 2003 Excavations start at Tasmasor (120 workers and 15 archaeologists).

⁷ Ox ford Archaeology, February 2004, *Review of the Cultural Heritage Mitigation Strategy for Tasmasor, Ezerum and Sazpegler, Ardahan, Turkey*, Final Report on Behalf of BTC Co.

- August 4, 2003 BTC recommends a reroute for this specific site, in a letter dedicated to the several Phase III Archaeological Salvage Excavations across the Project. BTC has reported that, at that time, excavation was only one month into a planned 4 month period.
- November 20, 2003 the Ministry of Culture and Tourism (MTC) approves passage of the BTC pipeline through Tasmasor (a decision confirmed by MENR, MTC, and MOEF on December 17).
- January 22 25, 2004 Trenching of about 2/3 of the Tasmasor site was undertaken after BTC requested that the work stop. Construction activities are now stopped with about 1/3 of the site yet to be trenched.

Based on the information provided and the above chronology the IEC makes the following observations:

- Given the horizontal and vertical extent of the site and the apparent significance of the site, avoidance should have been the preferred treatment option. Without conducting its own routing study, however, it is not practical for the IEC to comment on the feasibility of a reroute.
- There is no evidence that BOTAŞ considered a reroute, but they did provide reasons why they felt that salvage excavation was the best option, i.e.: according to their view routing to the south was not practical because of the presence of terrain slopes, the NGP, a highway, and settlements; routing to the north not practical because the Tasmasor site borders an Important Bird Area (IBA Erzerum Plains) where environmental impacts would increase. They also indicated that there would still be a likelihood of encountering other archaeological sites.
- The official communication from BTC to BOTAŞ (letter dated August 4, 2003) calling for a reroute was transmitted more than eight months after the communication from BOTAŞ (letter dated November 27, 2002) indicating reasons why they preferred not to re-route the pipeline. In compliance with the Cultural Heritage Management Plan, BTC waited for the beginning of the Phase III excavation at site (started on July 3, 2003) to respond. No excavations could be undertaken during the winter months. It is the opinion of IEC that the response was late and not sufficiently emphasized taking into consideration the likely significance of the site which was recognized by all parties. Although it is understood that the concept of rerouting was verbally made clear to BOTAŞ on numerous occasions, it is opinion of IEC that BTC should have made a formal request in writing for rerouting much earlier than August 4 to emphasize and strengthen its position.
- BOTAŞ put significant effort in to archaeological excavation, considered "...*at a very high standard*..." by Oxford Archaeology.

- There is no evidence that there was irrevocable damage caused by excavating the trench to its current extent.
- World Bank policy (OPN 11.03) regarding cultural properties is to assist in their preservation and to seek to avoid their elimination. The policy notes that "...in some cases, the project is best relocated..." and "...often, scientific study, selective salvage and museum preservation before destruction is all that is necessary..." Salvage archaeology is acceptable practice.
- World Bank policy also notes that "...the management of cultural property ...is the responsibility of the government..." The Turkish Government has made their position clear.
- Continuing the current route through the Tasmasor site "...is likely to be the lowest risk option..." according to Oxford Archaeology.

The IEC has also reviewed documentation provided by BOTAS in terms of the level of effort that was undertaken to characterize the 1/3 of the site that has yet to be trenched. Consistent with the opinion provided by Oxford Archaeology, it is noted that the sample size of the portion of the site not excavated under research conditions is very small (< 2%) and "does not supply the level of confidence required to eliminate the risk of finding significant archaeological remains during the construction processes. Furthermore, the geophysical surveying was poorly done and does not help to screen the site for yet undiscovered cultural resources. The geophysical surveys were conducted at three locations using the technique of magnetic gradiometry. It is unclear why the entire Tasmasor site ROW was not surveyed as data are rapidly obtained with this technique. The variation in magnetic response indicates that such surveys are capable of obtaining useful information at this site, but the presentations included in the Gazi University report⁸ cannot be interpreted. It is not practical to determine if the problems with their surveys stem from improper data acquisition or with data processing, but they are not useful in determining if additional cultural resources may be present along the ROW not yet excavated.

The overall situation based on the information provided to the IEC is one of a *Level II non-compliance*. The trenching does not represent a Level III because there is no evidence of irrevocable damage to a cultural resource. The situation has the potential to turn into a Level III if the trench is continued and significant cultural resources are irrevocably lost. At this point in time, the IEC concurs with Oxford Archaeology and recommends that continuing the trench along the ROW is the option with the least amount of risk. Before this is done, however, additional work is recommended:

⁸ Gazi University, undated, *Geophysical Report of Tasmasor Salvage Excavation*.

- Screen the entire remaining Tasmasor site ROW with properly conducted geophysical surveys. A magnetic survey where both the total field and magnetic gradient are obtained offers the best possibility for success. Soil resistance measurements should also be obtained with at least two electrode spacings (e.g., 0.5 and 1 m).
- Anomalies identified by the geophysical surveys should be followed-up with excavation and some additional excavation should also be conducted in areas where the geophysical data are not anomalous.

A fundamental observation from the entire process is that BTC and BOTAŞ need to improve communications such that situations like Tasmasor do not develop in the future.

4.9 COMMUNITY LIAISON

Community Liaison Management and public relations processes are responsible for communicating BTC Project information to the general public and the community in areas along the pipeline route, as well as receive and transmit community information to the BTC Project. The overall objective for the community liaison and community relations teams is to build a positive, non-dependent relationship between the BTC Project and the local communities. Specific responsibilities for community liaison include, but are not limited to:

- Providing communities affected by the Project with regular information on the progress of work and the implications for these communities.
- Informing the BTC Project of any community related issues that may impact on construction.
- Monitoring implementation of mitigation measures and the impact of construction via direct monitoring and feedback.
- Managing disputes between the BTC Project and communities.
- Assisting with the implementation of community safety, health and investment programs.
- Recruiting workers from affected communities.

Community liaison is managed by a team of dedicated Community Relations Supervisors (CRSs) who report to both BOTAŞ and the individual contractors.

4.9.1 Observations

The review of community liaison in Turkey was limited by access and available time to the PT2, Lot B, Lot C and CMT organizations. BOTAŞ provides one Lead Community Relations Supervisor (CRS) per Lot / AGI, and one CRS per spread who work closely with Contractor CRSs. BTC also complies with its assurance role, providing LTO officers that cooperate with BOTAŞ and Contractor staff. The BOTAŞ team appears to be capable and committed to their responsibilities. To support its staff, therefore, social management from BOTAŞ in Ankara spends considerable time in the field and also contributes to the resolution of social situations. Comments relate to the specific areas and Contractors visited.

- *PT2 Camp* (TEPE): The TEPE social manager operates from PT2 and is supported by four local CRSs who operate from PT1, PT3, PT4 and IPT1. Two additional CRSs are in the process of being mobilized by BOTAŞ for the pump station organizations. Employment audits are conducted by a third-party university under contract with BOTAŞ. The social organization exhibited by TEPE appears performing well and was found to be focused on its obligations. CRSs were able to provide minutes of community meetings oriented at making communities aware of construction activities, employment opportunities and community safety. Grievance registers and responses are also sufficiently documented. Local procurement of goods is reportedly very low. TEPE has been able to fulfill their social KPIs.
- Lot B (STA): Payment of employees and subcontractors has caused the greatest amount of difficulty with the social management team. This is a reported issue with several NCRs. STA stated that payment issues are being rapidly resolved. It is understood that subcontractor procurement and contracting monitoring has been weak, financial issues are still being resolved, and that an initiative has recently been started by BOTAS and BTC to monitor compliance with Project requirements in this field. BOTAS has recently strengthened the Lot B management, mobilizing a senior manager. The local CRSs along Lot B also have to work with communities skeptical of pipeline operations because of reported bad experiences with the NGP construction and management organizations in terms of management of employment, compensation and reinstatement issues. CRSs were able to provide minutes of community meetings oriented at making communities aware of upcoming pipeline activities and community safety. Grievance registers and responses are also sufficiently documented. Employment of local workers has been problematic in Lot B. Under the subject of procurement and supply management, the figures of overall values of materials and services purchased locally do not provide sufficient information to assess the compliance with commitments. In general, the STA social staff is dedicated, but relatively insufficient, with limited resources (3 vehicles) and inexperienced (5 junior CRSs), particularly in the light of the difficult conditions along the route and skepticism of local communities, as well as the construction recovery plan.

- Lot C (PLL): CRSs were able to provide minutes of community meetings oriented at making communities aware of upcoming pipeline activities and community safety. Grievance registers and responses are also sufficiently documented. A community health program with participation of the camp medical staffs has started. Under the subject of procurement and supply management, PLL has developed procedures for market surveillance that demonstrate an effort to comply with BTC Project commitments for procurement and use of local supplies. The procedures for market research could serve as an example for the other Contractors in Turkey, and also in the other countries, but documentation of the implementation phase was found to be insufficient for the results demonstrated. Employment KPIs for local workers are being met. The staffing of the PLL social organization appears adequate, yet relatively small (a Lead CRS and three local CRSs), and it may need to be strengthened to cope with accelerated production under the Contractor recovery plan.
- Ceyhan Marine Terminal (TEKFEN): CRSs have offices in local communities and to a large degree have had major responsibilities regarding recruitment (9,200 job applications have been received with approximately 750 jobs obtained). In spite of this effort, a social problem at the Ceyhan Terminal has been the percentage of local workers actually hired. Another social problem has been worker payments, although the CRSs believe that the payment issue has been resolved. The CRSs were able to provide minutes of community meetings oriented primarily at community safety related to truck traffic. Grievance registers and responses are also well documented. A community health program has not started, but is scheduled to begin in the near future. The staffing of the TEKFEN social organization appears sufficient.

4.9.2 Recommendations

- 1. Staffing and training of CRSs for STA at Lot B need to be strengthened. BOTAŞ should also consider strengthening their social organization at Lot B in light of the need to build better relationships with the local communities, as well as implementation of the construction recovery plan.
- 2. BTC and BOTAŞ should strengthen their field activities to monitor subcontracting procedures and ensure that all subcontractors are qualified, trained and comply with Project specifications.
- 3. The CRS organization at CMT will need to closely monitor local employment and worker payment and continue to work to meet employment KPIs.
- 4. Procurement and local supply statistics need to be developed such that real indicators are presented for the success or lack of success of the BTC Project in this field. The statistics of total expenditures provided in the BTC Monthly

Report is difficult to relate to performance, but it is acknowledged that PLL is making some efforts to ensure that the local communities are involved in the procurement process, as they have documented with a Market Research Study. BOTAŞ and the Contractors need to stimulate their subcontractors to improve the use of local supplies.

4.10 HEALTH AND SAFETY

4.10.10bservations

Consistent with other aspects described in this chapter dedicated to Turkey, the main IEC observations with regard to safety is that, in spite of a sufficiently defined safety management system, the appropriate implementation in the field is sometimes limited and in few cases inadequate. In some cases it appears that the Safety Officers in the field have limited influence on the development of the construction activities and on the decisions and procedures adopted by the construction teams. However, the IEC recognizes the effort recently made by BTC and BOTAŞ central offices in Ankara to strengthen the H&S organization and improve the safety management system.

During the field visit the following main observations were made:

- At PT2 the layout of the camp was found not to be optimal in terms of the location of the equipment that needs to be refueled: relevant unloading fueling platforms are often missing and fuel trucks cannot safely approach them, including at the main fueling station. Some fire extinguishers were found not to be properly maintained. The access control in some areas was also found deficient, such as where fences at certain locations were found poorly maintained or insufficient.
- Lot B Iliça camp is clearly inadequate taking into consideration Project specifications and needs, although it is understood that the camp is about to be closed. At the time of the visit, the layout of the camp did not provide sufficient guarantees for a safe and environmentally sound operation, to a certain degree because of the limited space available. Housekeeping was found poor and hazardous areas were found not fenced and easily accessible to the camp community.
- Lot B During the visit the IEC team had the opportunity to visit some pipeline dump yards and the ROW. The pipe dump yards visited in the field were found to be inadequate. In particular, third-party access was not sufficiently controlled and general working arrangement was not appropriate. Fencing is missing or inadequate and locations visited were inadequate to allow access control and minimize safety risks. Safety officers were not available at these sites during loading/unloading operations. Access control along the ROW was also observed to be insufficient, with very few warning signs, particularly at

the main road crossings or in the proximity of communities. Along the ROW during construction, the use of PPE was observed to be extensive with some minor exceptions. In some cases the Safety advisor was not present at site as required and first aid kits or dedicated Project communication means were not available in remote areas. Field delivery of food in Lot B was observed to be performed under poor conditions. The quantity and quality of food was claimed to be substandard by workers during field interviews.

- Lot C The overall condition of the Azizli camp is good. A remarkable standard for the housekeeping is maintained in the camp and the working conditions in the camp appear to be adequate and generally compliant with the Project standards. Along the ROW the access control is limited or insufficient and non-Project vehicles have been observed along the ROW on several occasions. Medical facilities and kitchens were observed to be of high quality and the field delivery of food in Lot C appears to be safe, using proper containment and temperature controls.
- *Ceyhan Marine Terminal* No significant observations of unsafe behavior were made during the visit at the camp and construction site. As indicated for the other countries, it is unclear the level of H&S control for third-party "outside-the-gate" activities which are significant in terms of potential safety risks to operators and local communities.

4.10.2 Recommendations

- 1. The Project should evaluate the need for further H&S resources in the field, also taking into account the extent of the pipeline construction and the acceleration of activities being planned under the Recovery Program (mainly BOTAŞ and pipeline Contractors).
- 2. BTC and BOTAŞ should continue to develop ad-hoc monitoring/review campaigns focusing on specific issues that have been chronic past problems associated with construction.
- 3. IEC recommends BOTAŞ and the Contractors to rotate the Safety Officers among the different working locations to maximize the effect of the monitoring ("*fresh eyes*").
- 4. PT2 camp layout should be reviewed to optimize the location of equipment that needs to be refueled. Fuel unloading platforms should be constructed and fuel trucks should be able to safely approach them, including at the main fueling station. Maintenance and adequacy of fire fighting equipment should be reviewed. The access control, including fencing, in hazard areas should be also improved.

- 5. Lot B camp layouts should be thoroughly reviewed to provide sufficient guarantees for a safe and environmentally sound arrangement. Housekeeping should be improved and segregation of hazardous areas should be consistently implemented.
- 6. Lot B pipe yard locations and operations should be thoroughly reviewed to prevent unsafe conditions due to third-party interaction and intrusion, and to ensure that all the safety controls are in place. Access control and warning signs along the ROW should be significantly improved, particularly at the main road crossings and in the proximity of communities. First aid kits and the means for dedicated Project communications should always be available in remote areas. Food delivery in the field should be managed in a safer way, using appropriate food handling, preservation, temperature controls and delivery techniques.
- 7. Access control and warning signs along the ROW at Lot C should be significantly improved, particularly at the main road crossings, in intensive agricultural areas, and in the proximity of communities.
- 8. The Project should concentrate the efforts of the safety teams on the control of "outside-the-gate" activities conducted by third parties, especially at the CMT and pump station construction sites. This is particularly important for aggregate sources, cement plants and dump sites, in order that they are being developed and managed within Project commitments, given that it is likely that much of their activities are dedicated to the Project.

4.11 ENVIRONMENTAL INVESTMENT PROGRAMME

During the mission, the IEC was briefly updated on the status of the Environmental Investment Programme (EIP) in Turkey. No detailed review has been conducted on the 10 priority themes identified in the ESAP. At the time of the mission the EIP had started with six programs (Important Bird Areas, Caucasian Black Grouse, Mediterranean Monk Seal, Important Plant Areas, Sea Turtles, Lesser Caucasus Forest Gap Analysis) with a seventh one on Small Grants Programme about to start. A second Request for Proposals (RFP) is planned to be launched in early May 2004 for three additional key themes. The Environmental Coordinator for BTC appears to be doing a good job.

Because of the EIP significance during the BTC construction phase for achieving several objectives, including *inter alia* to demonstrate environmental leadership, to address stakeholder concerns, and to honor commitment and public statements on biodiversity, the IEC intends to perform a thorough review of the program organization and implementation.

5 CONCLUSIONS

After about one year from the start of the construction activities, the E&S management system is still on a learning curve, which might be expected, given the complex nature of the Project in terms of engineering goals and managerial structure. Nevertheless, a sufficient level of performance is not being achieved and a significant gap still exists between the stringent Project standards and the status of their actual field implementation in all three countries. Nevertheless, the remarkable turnaround being achieved in Georgia after findings of their own internal performance audits must be recognized. It is now the turn of the other two BTC in-country organizations to react. Their E&S management systems are developed, but need to demonstrate improved field performance. More generally, the E&S management organizations (including BOTAŞ) needs more resources and senior staff, especially in the field of topsoil management, ROW reinstatement and waste management, to strengthen the current organizations, especially considering the length of construction along the ROW and that accelerated construction programs have been approved in the three countries.

The IEC recognizes that most of the numerous non-compliant conditions observed in the field and described in this report were minor. Nevertheless, they indicate shortcomings in the implementation of the E&S management system developed by the Project and the commitments defined in the ESAP. The Project now needs to act to strengthen its E&S management organization and improve field performance.

Appendix A

Trip Summary- 1st IEC Mission by D'Appolonia – February-March 2004

February 29 – Azerbaijan. Arrive in Baku early morning; in the afternoon review SRAP Panel findings with a member of the panel.

March 1 – Azerbaijan. Meetings with management of BTC Core Management Team (CMT) and with E&S and H&S staff of the Azerbaijan In-Country Organization of BTC in Baku.

March 2 – Azerbaijan. Meetings with management and E&S and H&S staff of the two contractors SPJV and CCIC at their head offices in Baku.

March 3 – Azerbaijan. Travel from Baku to Kurdemir – observations made with respect to the status of partial reinstatement of the ROW; the E&S program at IPA1 reviewed with SPJV field staff and a tour of IPA1 conducted. SPJV CLO offices near IPA1 also visited.

March 4 – Azerbaijan. Meeting with CCIC at Kurdemir Camp followed by a tour of the camp. In the afternoon CCIC's local CLO office visited and the group traveled to Yevlakh with a stop to observe the horizontal directional drilling (HDD) program underway at the village of Garabork.

March 5 – Azerbaijan. Meetings held with CCIC E&S and H&S staff at the Yevlak Camp and a tour made of the camp; meetings held with SPJV E&S and H&S staff at PSA2 followed by a tour of the facility. SPJV CLO offices near PSA2 were also visited. In the afternoon the group traveled to Ganja with stops along the ROW.

March 6 – Azerbaijan. After a visit to the Samukh archaeological site and at river crossing construction at KP 316, the group split to visit the Zayamchay archaeological site at KP 356 and to visit the main Ganja Chay and Shamkir Chay river crossings at KP295 and KP 331, respectively. The group reunited in Ganja and returned back to Baku. A wrap-up meeting for Azerbaijan was held on the train with the E&S Manager for the BTC Azerbaijan In-Country Organization.

March 7 – Travel to Ankara, Turkey.

March 8 – Turkey. Meetings with BTC E&S and H&S staffs held in the morning and with BOTAS E&S staffs in the afternoon at their respective offices in Ankara.

March 9 - Turkey. Further meetings held with BTC and BOTAŞ E&S and H&S staffs at their offices in Ankara in the morning; in the afternoon travel to Erzerum, Turkey.

March 10 – Turkey. Meeting with pump station EPC Contractor Tepe and BTC and BOTAŞ E&S field staff at PT2 followed by tours of PT2 Camp and PT2 construction activities; in afternoon traveled to Iliça Camp operated by the Lot B pipeline contractor Max Streicher – Haustadt & Timmerman – Gunsayil – Alarko JV (STA); briefing provided by BTC construction and LTO field staff.

March 11 – Turkey. Travel to Erzinçan, Turkey and attend meetings with Lot B BTC organization, BOTAŞ E&S field staff, and STA E&S and H&S staff at their main office in Erzinçan.

March 12 – Turkey. Visit ROW along Lot B and Pipe Yards No. 7 and No. 3 with a stop at Environmental Sensitive Area (ESA) 13 at \sim KP 302; travel to Adana, Turkey.

March 13 – Turkey. In the morning H&S induction with Lot C pipeline contractor Punj Lloyd – Limak JV (PLL), BTC organization, and BOTAŞ E&S field staff at Azizli Camp; visit the archaeological site at KP 1072 and the pipeline stringing operations at the reroute around this site; visit the PLL composting facility; visit the Mercin River crossing at KP 1054; in the afternoon visit the Altigoz River crossing at KP 1045, the Taslik River crossing at KP 1034, ESA 48 and the Ceyhan River crossing (KP 1036).

March 14 – Turkey. In the morning visit the Lot C ROW in the area of ESA 47 at KP 993 - 995; in the afternoon visit ROW restoration at KP 1020.

March 15 – Turkey. Meeting with Lot C BTC organization, BOTAŞ E&S field staff, and PLL E&S and H&S staffs at Azizli Camp followed by a tour of the camp.

March 16 – Turkey. Meeting with BTC, BOTAŞ E&S and H&S staffs, and Tekfen E&S and H&S staffs at Ceyhan Marine Terminal with a tour of the facility.

March 17 – Turkey. Travel from Adana to Ankara; attend wrap-up meetings with BTC and BOTAŞ management and E&S and H&S staffs at their respective offices in Ankara; travel to Tbilisi, Georgia.

March 18 – Georgia. Arrive in Tbilisi in the early morning; attend H&S induction by BTC In-Country Organization in afternoon.

March 19 – Georgia. Meetings with BTC management and E&S and H&S staffs at BTC office in Tbilisi.

March 20 – Georgia. Attend meeting with E&S and H&S staffs of the pipeline and facilities contractor SPJV at PSG1 and tour the facility; in the afternoon tour borrow pits near PSG1 and travel along the ROW with stops at a channel/road crossing at KP 11 and the planned HDD area at the Mtkvari (Kura) River near Rustavi at KP 28.7; also visit the Rustavi Pipe Storage Yard and the Rustavi Maintenance Area of SPJV.

March 21 – Georgia. In Tbilisi, day spent reviewing documentation and preparing close-out meetings.

March 22 – Georgia. Visit SPJV Marneuli Camp and then travel along ROW with stops at archaeological sites at KP 53/54, KP 73, and KP 83+600, as well as at the Algeti and Chiv Chav River crossings.

March 23 – Georgia. Attend meeting with SPJV E&S and H&S staffs in their office in Tbilisi; in afternoon present wrap-up meeting to the BTC In-Country Organization and SPJV management and E&S staff for Georgia, followed by a more general close-out meeting to BTC management in Azerbaijan, Georgia and Turkey (also with BOTAŞ E&S management) covering all three countries.

March 24 – Depart Tbilisi after completion of field mission.

Appendix B
Table B-1: Non-Compliances with ESAP – Azerbaijan

Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
2.2.1	Open ROW is significantly longer than the relevant commitments.	Contractor must have no more than 10 km of continuous or 15 km total trench open at any one time. <i>Commitment Register,</i> <i>Commitments No.</i> 862 and 45.	II	BTC should strengthen its E&S organization because of the extent of the ongoing ROW construction activities.
2.3.1	Potable water supplies for SPJV have not been screened for a full suite of baseline parameters consistent with WHO standards.	WHO and EU potable water testing procedures are Project requirements. CCP Infrastructure and Services, Commitment ID: 528, 628	11	BTC should take the lead to make sure that baseline testing is conducted for all sources and standardized procedures are established to monitor the sources.
2.3.1	Environmental and Social Impact Assessment, presenting pre-construction surveys conducted for sourced aggregates at PSA2, was still to be submitted by SPJV to BTC at the time of the visit.	The BTC Project requires that an environmental and social assessment needs to be conducted for sourced aggregates and that environmental issues are considered in the procurement of goods and services. CCP Procurement and Supply, Commitment ID 54, 404.	1	Submit the ESIA as required. E&S organizations (including BTC) should confirm the environmental and social compliance of the source(s) being used for aggregate and concrete, should it be found that SPJV represents the primary consumer of these local products.
2.3.2	At the CCIC Yevlakh Camp a water well was drilled, but the required sustainability study of this well was not conducted.	CCP Infrastructure and Services, Commitment ID: 52, 276, 278, 280, 831, 833.	I	Where wells have been drilled, technically sound sustainability studies from both environmental and social considerations are needed. BTC should take the lead to make sure that potable water is correctly obtained from sustainable sources
2.3.2	Potable water supplies have not been screened for a full suite of baseline parameters consistent with applicable and relevant WHO standards and Project specifications.	CCP Infrastructure and Services, Commitment ID: 528, 628.	11	BTC should take the lead to make sure that baseline testing is conducted for all sources and standardized procedures are established to monitor the sources.
2.3.2	CCIC was not able to demonstrate that pre- construction surveys had been consistently conducted for new access roads or where	CCP Infrastructure and Service, Commitment ID 54, 404.	1	Consistently conduct technically sound pre- construction survey. BTC to support as needed.

Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
2.4.1	there was a significant upgrading to an existing road. The indinerator at the CCIC Kurdamir CWAA was found to be poorly controlled and monitored	CCP Waste Management Plan, Commitment ID: 244, 245, 246, 1051, 1110.	11	BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. BTC should ensure that CCIC is capable of properly and safely operating the Kurdamir incinerator. BTC should routinely assess if compliant conditions are met during operations. CCIC should provide additional training of incinerator operators.
2.4.1	Proper management procedures for the CCIC incinerator appeared not to be available and known on site. Operators on site were not fully aware of the specific waste control and stack emission monitoring requirements and precise instructions were not available from either BTC or CCIC.	CCP Waste Management Plan, Commitment ID: 970, 1110.	I	BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. BTC should ensure that CCIC is capable of properly and safely operating the Kurdamir incinerator. BTC should routinely assess if compliant conditions are met during operations. CCIC should provide additional training of incinerator operators.
2.4.1	Incinerator ash and scrubber liquors (caustic solution) testing results were not yet available in CCIC to properly dassify these materials and define suitable disposal options.	CCP Waste Management Plan, Commitment ID: 1051, 1109.	I	BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. BTC should ensure that CCIC is capable of properly and safely operating the Kurdamir incinerator. BTC should routinely assess if compliant conditions are met during operations
2.4.1	The CCIC CWAA at Kurdamir was found to be not fully adequate in terms of stormwater management and proper containment. Secondary containment was insufficient around some hazardous waste container storage areas (induding scrubber liquor containers)	CCP Waste Management Plan, Commitment ID: 541, 1110	T	BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. Hazardous waste containers should be stored in bunded areas with appropriate secondary containment. Minimization of their potential contact with stormwater (e.g., using roofs or overpack drums) should be implemented.

Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
2.4.1	Labeling of waste containers was found to be inadequate at both CCIC waste storage areas visited at Kurdamir and Yevlakh and not compliant with the applicable and relevant EU requirements.	CCP Waste Management Plan, Commitment ID: 1106.	I	BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. Waste container labeling needs to be reviewed, improved and made compliant with Project specifications.
2.4.1	The SPJV CWAA at the PSA2 site was defined, but not constructed yet	CCP Waste Management Plan, Commitment ID: 541.	I	BTC should conduct a technical audit of the waste management subcontractors of CCIC and SPJV. The construction of the CWAA at PSA2 needs to be completed in compliance with Project Specifications and made operational.
2.4.3	Potentially oil-contaminated water collected from the containment basins throughout the CCIC facilities is trucked away and disposed of by a subcontractor. Information provided on collection frequencies, disposal facilities and amounts disposed were insufficient to assess compliance	CCP Waste Management Plan, Commitment ID: 395, 396, 397, 398	I	BTC needs to improve the control of the procedures being followed by the Contractors for the monitoring of wastewater effluents. The condition of dosed drain systems and the fate of oily water need to be verified by the BTC and EPC Contractors, especially CCIC.
2.4.3	In Yevlakh sewage effluent is discharge into a 330 m ³ unlined retention pond. The use of an unlined retention pond does not prevent infiltration of untreated or insufficiently treated wastewater into the subsoil and potential localized impact on the shallow groundwater. Clear evidence was not provided that SPJV was meeting their procedural requirement to test effluent quality every week. The reviewed results show concentrations exceeding Project standards for several parameters. Current arrangement at Yevlakh does not appear to prevent discharge into the environment.	CCP Waste Management Plan, Commitment ID: 310, 384, 554	11	BTC needs to improve the control of the procedures being followed by the Contractors for the monitoring of wastewater effluents. The STPs should be improved to treat wastewater and meet Project specifications as soon as practical at both Kurdamir and Yevlakh camps. The retention pond in Yevlakh should be lined, given that the groundwater is very shallow. The control of odors should be improved
2.5.1	The environmental monitoring procedure	ESAP, Section 6.4.3	I	BTC should improve the control of the

Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
	available at CCIC camps was still in a draft version. CCIC field environmental staff was not aware of the status of the procedure			procedures being followed by the Contractors for the monitoring of environmental components. The CCIC environmental monitoring procedure should be urgently finalized and made available to the environmental staff at all the construction sites. Field training from experienced environmental professionals should be provided as soon as practical.
2.5.1	Both the CCIC fueling stations at Kurdamir and Yevlakh camps were lacking platforms for containing spills from filling operations. In addition, especially in Kurdamir, the poor surface condition of the camp could contribute to accidents resulting in fuel (e.g., generator fuel storage tanks) and chemical spills.	CCP Pollution Prevention Plan, Commitment ID: 1119	11	CCIC fueling stations should have appropriate platforms, suitable drainage collection for spills and oily water, and oil/water separators
2.5.1	The CCIC environmental monitors in charge of noise monitoring task have not always identified the closest external receptors and monitoring duration has not always allowed for the obtaining of measurements comparable with the Project limits	CCP Pollution Prevention Plan, Commitment ID: 1101, 1102	I	BTC should improve the control of the procedures being followed by the Contractors for the monitoring of environmental components. Field training from experienced environmental professionals should be provided as soon as practical.
2.5.1	The refueling points at SPJV PSA2 and IPA1 construction sites were both lined, but the one at IPA1 was not bunded	CCP Pollution Prevention Plan, Commitment ID: 421	I	The refueling point at SPJV IPA1 construction site should be bunded
2.5.1	Audits relevant to third-party facilities used by SPJV for providing the significant amount of concrete needed for the PSA1 construction were not available	CCP Pollution Prevention Plan, Commitment ID: 1129; CCP Infrastructure and Services, Commitment ID: 29, 30; CCP Procurement and Supply, Commitment ID: 786.	Ι	BTC should improve the control of the procedures being followed by the Contractors for the monitoring of environmental components.
2.6.1	More than 20 km of the ROW had open trench	CCP Reinstatement Plan, Commitment ID: 172; Commitment Register: Commitments No. 862 and 45.	II	A management plan should be prepared by BTC, in cooperation with CCIC, to mitigate the adverse effects of the length of pipeline operations.

Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
2.6.1	Monitoring and documentation of stream conditions upstream and downstream of the river crossings were found to be insufficient. Turbidity measurements were not conducted by CCIC	CCP Reinstatement Plan, Commitments ID: 1304		The CCIC resources for field environmental supervision of the construction activities along the ROW should be strengthened. The river crossing method statements should indude routine monitoring and appropriate documentation of the stream conditions upstream and downstream the crossings, through turbidity measurements and periodic inspections
2.6.1	A systemic non compliance situation was found to be present in terms of environmental management of river crossing activities: lack of environmental supervision and monitoring, lack of turbidity measurements, lack or insufficient silt control measures, especially on land	CCP Reinstatement Plan, Commitments ID: 350, 476, 498, 1284, 1300, 1301, 1323, 1324	11	River crossings should be fully and expeditiously reinstated as per commitments. Proper silt control measures (i.e., silt fences on land) should be consistently implemented during construction to minimize turbidity impacts. The CCIC resources for field environmental supervision of the construction activities along the ROW should be strengthened. The river crossing method statements should include routine monitoring and appropriate documentation of the stream conditions upstream and downstream the crossings, through turbidity measurements and periodic inspections.
2.8.1	The archaeological coverage for associated infrastructure, especially access roads and temporary facilities is not always complete.	Commitment Register, Commitment ID 157, 158, 162.	I	BTC needs to make sure that the archaeological program extends to all areas of the Project where the ground can be impacted, including temporary facilities and access roads.

Appendix B Table B-2: Non-Compliances with ESAP – Georgia

Section Ref	Observation	Non-Complianœ	Level	Comments / Recommendations
3.3.1	Some camps have multiple water sources and inconsistencies in testing and documentation from various sources were found	CCP Construction Camps, Commitment ID: S3.	I	A thorough review of sampling, testing and reporting procedures conducted by experienced professionals is warranted. Consistency should be sought and laboratories used for potable water should be verified.
3.3.1	Sustainability studies to verify that the wells do not adversely impact the local communities have not been completed	CCP Infrastructure and Services, Commitment ID: N13 (P27)	I	Conduct water sustainability studies as needed
3.4.1	Containment and bunding for the indinerator wastewater (scrubber liquor) containers at the Central Waste Accumulation Area (CWAA) at PSG1 are lacking	CCP Waste Management Plan, Commitment ID: J32	I	Hazardous waste containers with incinerator wastewater should be stored in bunded areas, with appropriate secondary containment.
3.4.1	The visits to some SPJV construction yards allowed for the identification of localized issues relevant to limited housekeeping and waste management (e.g., signs of limited open air burning at Rustavi pipeline storage yard)	CCP Construction Camps, Commitment ID: S6 (J19).	I	BTC should conduct a review of waste management for SPJV ancillary facilities, including pipeline storage yards and other construction yards, to ensure that waste is properly stored and promptly collected
3.4.3	Some parameters have not been tested yet (i.e., coliforms, oil and grease, nitrogen, ammonia, total phosphorous, fluorides, phenols, sulfides), although they are included in the Project specifications.	CCP Waste Management Plan, Commitment ID: J16, J20 (S7)	I	External accredited laboratories should be identified to perform periodic verification testing as soon as practical. Use of international accredited laboratories for periodic testing for additional parameters consistent with Project specification, should be considered
3.5.1	At the SPJV Maintenance Area near Rustavi a secondary fuel tank was found to be in poor condition, next to the yard fence, and improperly installed. At the fuel storage area	CCP Pollution Prevention Plan, Commitment ID: H42	I	Fuel storage and containment should be fixed by SPJV as soon as practical. BTC should verify that the condition of dosed drain systems and containment basins at all SPJV

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Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
	some holes in the secondary containment and minor fuel spills were observed on unpaved surfaces			camps and temporary facilities (including maintenance yards) and the fate of all oily water are compliant with Project commitment
3.6.1	Topsoil stockpiles not compliant with the technical specifications stated in the SPJV Reinstatement Plan were observed, especially along the sections where SCP pipe has been strung	CCP Reinstatement Plan, Commitment ID: 139, 142	Ι	Topsoil stockpile procedures need to be strengthened, especially considering that final reinstatement will not take place until installation of the SCP. Issues include seeding, mulching, monitoring of anaerobic conditions, shaping and compacting pile surfaces and establishing runoff controls

Appendix B Table B-3: Non-Compliances with ESAP – Turkey

Section Ref	Observation	Non-Complianœ	Level	Comments / Recommendations
4.3.1	Inconsistent potable water sampling and testing proœdures were found, largely due to a lack of attention and limited proœdures developed by both the various Contractors and BOTAŞ	BOTAŞ Environmental and Social Management Plans, Commitment ID: CH9E3, CH4E41	II	WHO Guidelines and EU standards need to be carefully followed for the control of potable water quality. A thorough review of sampling, testing and reporting procedures conducted by experienced professionals is warranted. Consistency should be sought and laboratories used for potable water should be verified by an independent third-party to assess if they are reliable.
4.4.1	The reliability of waste information collected by BOTAŞ from the EPC Contractors was found to be insufficiently verified (e.g., waste inventories, STP test results and contingencies). In some cases figures relevant to waste generation have been found to be questionable or partially significant. Data QA/QC, especially in terms of field verification and interpretation, appears to be limited.	CCP Waste Management Plan, Commitment ID: CH15E40, APC1E69	Ι	This situation creates a data management issue in light of reporting requirements (e.g., monthly reports to BTC) and definition of remedial actions.
4.4.1	A precise and reliable waste inventory has yet to be developed by Tepe	CCP Waste Management Plan, Commitment ID: CH15E40, APC1E69, APC3E70	I	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program.
4.4.1	The Central Waste Accumulation Area at PT2 needs significant improvement. The collection system for storm water was found to be inadequate to segregate potentially contaminated storm water from dean run off. Storm water passes directly to a poorly	CCP Waste Management Plan, Commitment ID: APC3E34, APC3E45	I	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program. Labeling should be improved and made

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Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
	maintained OWS located outside the CWAA fence. The area was not locked and the fence surrounding the facility was poorly maintained. Labeling of waste containers was found to be inadequate and not complying with Project specifications.			consistent throughout the EPC Contractors. The arrangement of the CWAAs needs to be consistently reviewed and improved.
4.4.1	The current waste tracking system and the waste inventory for Lot B do not appear to be fully developed. Significant inconsistencies were found between the raw data recorded in the STA waste register and the figures reported in recent BTC/BOTAŞ monthly reports summarizing generated and disposed waste amounts.	CCP Waste Management Plan, Commitment ID: CH15E40, APC1E69, APC3E70	I	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program.
4.4.1	The Central Waste Accumulation Area at Iliça Camp in Lot B was found to be inadequate and not in compliance with Project specifications.	CCP Waste Management Plan, Commitment ID: APC3E34, APC3E45, APC3E46	11	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program. Labeling should be improved and made consistent throughout the EPC Contractors. The arrangement of the CWAAs needs to be consistently reviewed and improved.
4.4.1	The current organization in Lot B appeared not to be sufficiently trained and capable of managing waste issues according to the Project requirements.	CCP Waste Management Plan, Commitment ID: APC3E38, APC3E56	I	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program.
4.4.1	Missing labeling of bagged hazardous waste and, more generally, inadequate labeling were observed at Azizli Camp waste accumulation area (Lot C)	CCP Waste Management Plan, Commitment ID: APC3E34	Ι	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program.
Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
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				Labeling should be improved and made consistent throughout the EPC Contractors.
4.4.1	Storage of medical waste container together with other waste containers was observed at Azizli Camp waste accumulation area (Lot C)	CCP Waste Management Plan, Commitment ID: APC3E23	I	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. Implement an adequate training program. The arrangement of the CWAAs needs to be consistently reviewed and improved.
4.4.1	No documentation was found to ascertain that Project requirements in terms of health, safety and environmental protection are met for the inert waste dump site identified in the vicinity of the CMT, for which a permit has been granted to TEKFEN by the local Municipality.	CCP Waste Management Plan, Commitment ID: APC3E65, APC3E77	T	BTC and BOTAŞ QA/QC control and field verification on correctness and completeness of documentation and data relevant to waste management need to be improved. The compliance of disposal methods and sites (including outside-the-gate sites) for waste (including inert waste) with Project standards, particularly for pump stations and CMT construction sites should be verified and properly documented
4.4.3	At Koyunkaya Camp (Lot B), when wastewater quality problems were encountered in terms of non-compliant coliform concentrations, the Project did not respond with additional testing and procedures to solve the problem. Effluent discharge to the receptor surface water body (Kizirlimak River) was not discontinued, although the impact appears to be limited due to the high concentrations of coliforms already present in the river water.	CCP Waste Management Plan, Commitment ID: CH4E53; CCP Environmental Management Plan, Commitment ID:APC1E34	T	Lot B WWTP design and arrangements should be reviewed by experienced process engineers to assess treatment effectiveness and reliability such that they can meet Project requirements. BTC and BOTAŞ should ensure that the water and wastewater monitoring plans allow for an adequate compliance verification of Project commitments.
4.4.3	Significant inconsistencies both in terms of parameters tested and in terms of sampling frequencies were found in the monitoring	CCP Environmental Management Plan, Commitment ID: APC1E8, APC1E66	I	BTC and BOTAŞ should ensure that the water and wastewater monitoring plans allow for an adequate compliance verification of Project

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Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
	plans implemented at different water and wastewater treatment facilities managed by STA.			commitments.
4.5.1	The setting of the PT2 fueling station and the arrangement for refueling of the generators were found not to guarantee vehicles to approach safely, and not to provide proper bunding and containment of potential spills	CCP Pollution Prevention Plan, Commitment ID: APC4E17, APC4E22	I	The condition of the fuel station and the arrangement and setup for refueling the generators at TP2 need to be reviewed and corrections made to allow for containment of potential spills and to provide good surfaces for vehicles approaching the locations.
4.5.1	The third-party facilities (aggregate sources and batch plants) used by Contractors to produce the significant amount of aggregate and concrete needed for the construction of pump stations and terminal were found not to be fully evaluated in terms of adherence to basic and applicable environmental and social commitments	CCP Aggregates Management Plan, Commitment ID: APC10E1	1	The BTC Project is committed to ensuring that the mining of aggregates for the project is undertaken in a manner that minimises environmental risks and which is open to managerial and technical scrutiny. TEPE and TEKFEN E&S organizations should verify the third-party sources for aggregate and concrete. BOTAŞ should make sure that plant operations are conducted within the spirit of the Project environmental and social commitments, especially without significantly impacting the local supply procurement and work opportunities for local communities.
4.5.1	Noise monitoring results made available by STA show several exceedances, but reporting does not allow for the assessment of compliance with applicable and relevant Project standards	CCP Pollution Prevention Plan, Commitment ID: APC1E76, APC1E77	I	BTC and BOTAŞ should verify that noise monitoring is performed by STA at suitable locations for all the construction sites during operations
4.6.1	Only 1 km of reinstatement was accepted by BTC at ESA 51 and other five ESAs still to be reinstated by STA, although construction was completed several months ago, notwithstanding time constraints stated in SARMS, and a non-compliance on	CCP Reinstatement Plan, Commitment ID: APC2E26, CH12E2, CH12E4, CH12E10, 411.	II	The Project should ensure that the front of the pipeline construction does not get too far in front of the back of the construction. Immediate actions should be taken to ensure that experienced reinstatement and biorestoration specialists support the Lot B

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Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
	construction work duration at ESAs raised by BTC to BOTAŞ			organization. More generally, care needs to be taken that reinstatement can keep up with the anticipated accelerated production of the recovery plans
4.6.1	With respect to additional land acquisition, total amounts were found not to be sufficiently tracked and analyzed, particularly by the BTC and BOTAŞ environmental and social staffs in Ankara, and especially for Lot B	CCP Reinstatement Plan, Commitment ID: 2.	I	BTC and BOTAŞ should monitor additional land acquisition and management of access roads following the requirement to minimize the Project footprints
4.6.1	The flume pipes are sometimes inadequate and undersized, especially in Lot B, where for instance an irrigation channel having a relatively significant hydraulic section, located at KP 336, was found to be blocked with inadequate flume pipes plugged downstream by debris	CCP Reinstatement Plan, Commitment ID: 2, 631.	I	A review of all the temporary irrigation channel crossings in Lot B should be conducted by BOTAŞ and BTC. STA should ensure that adequately sized flume pipes or culverts are put in place, taking into account hydraulic sections and expected flow.
4.6.1	None of the four river crossings visited in Lot C have been fully reinstated. The Mersin (Karacay) River crossing was not well done during construction, in particular with respect to the erosion and sediment control system, and at the time of the visit temporary erosion and sediment control measures were lacking although the river banks were still to be stabilized	CCP Reinstatement Plan, Commitment ID: APC2E26, APC2E95, APC2E96, APC2E97	11	Sufficient resources need to be dedicated by Contractors to implement sufficient sediment and erosion control measures and quickly reinstate river and stream crossings, consistent with Project commitments. BTC and BOTAŞ should assure that the commitments are met
4.7.1	The current situation at ESA 13 in Lot B and the open non-compliance raised by BTC on ESA construction work duration appear to be due to shortcomings in terms of implementation of Management of Change, involving all parties	CCP Ecological Management Plan, Commitment ID: CH6E40	11	The Project should adequately monitor, assess and document that the potential environmental effects relevant to inadequate management of construction work at ESA 13 are short-term and reversible. A specific Management and Recovery Plan with a new Method Statement and a revised alignment sheet should be developed for ESA 13. BTC

Section Ref.	Observation	Non-Complianœ	Level	Comments / Recommendations
				and BOTAŞ should continue to focus on implementation of commitments in the ESAs and systematically monitor and ensure that the spirit of the EIA studies is fully applied in these areas, as well as in other sensitive locations
4.8.1	Tasmasor archaeological site management was found to be non-compliant	Cultural Heritage Management Proœdures	II	The trenching does not represent a Level III because there is no evidence of irrevocable damage to a cultural resource. The situation has the potential to turn into a Level III if the trench is continued and significant cultural resources are irrevocably lost. Screen the entire remaining Tasmasor site ROW with properly conducted geophysical surveys is recommended. Anomalies identified by the geophysical surveys should be followed-up with excavation. BTC and BOTAŞ need to improve communications such that situations like Tasmasor do not develop in the future.