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**BAKU-TBILISI-CEYHAN (BTC)  
Pipeline Project**

**Report of the Post-  
Financial Close  
Independent  
Environmental  
Consultant (IEC)  
Tenth Site Visit,  
June 2008**

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**REPORT OF THE POST-FINANCIAL CLOSE  
INDEPENDENT ENVIRONMENTAL CONSULTANT (IEC)  
BAKU-TBILISI-CEYHAN (BTC) PIPELINE PROJECT  
TENTH SITE VISIT, JUNE 2008**

**EXECUTIVE SUMMARY**

This report presents the results of the tenth post-financial visit of the Independent Environmental Consultant (IEC) to Azerbaijan, Georgia and Turkey, between June 9 - 18, 2008 to monitor compliance with BTC Project Environmental and Social (E&S) commitments. The IEC team conducted the visit as two teams; one focused on Project activities in Turkey and the other in Azerbaijan and Georgia.

This site visit represents the second IEC Operations audit, which is an annual verification that represents the continuation of an ongoing monitoring process initiated during the construction phase. The Operations audits focus on the operations team and ongoing operations activities. The reference documents for the Operations audits are the Operations ESAP and the relevant management plans.

This report identifies the miscellaneous non-compliances as encountered in the field, but also focuses on the commitments made by BTC in the September 20, 2007 meeting held at D'Appolonia's office in Genoa, Italy upon which the Schedule 20 document signed by BTC was based and which also formed the basis for the issuance of Schedule 21 - IEC Completion Environmental Compliance Certificate, which was signed by the IEC on October 6, 2007. The commitments made by BTC associated represent follow-up activities intended to close construction-related issues that by their nature extended into the Operations phase of the BTC Project. This Executive Summary does not summarize the details of the findings on the basis of topics, but focuses on the primary issues on a country-by-country basis.

*Azerbaijan*

The most significant issue for Azerbaijan is the right-of-way access, which relates primarily to the requirement of the Export Pipelines Protection Department (EPPD) of the Azeri Government that the ROW be accessible for security patrols. Vehicular access to the ROW is a major break from the ESAP, which defines the general principle of "*No routine vehicle access on the ROW*". The Project developed a strategy to minimize impacts to the right-of-way based on an environmental and social impact assessment (ESIA) addendum that was reviewed by the IEC in September 2007 and approved by the Azerbaijan Ministry of the Environment and Natural Resources (MENR) in February 2008. The commitments made by BTC as part of the conditions as part of the Schedule 20 and Schedule 21 Completion Certificates were to cease BTC vehicular access to the ROW except under emergency conditions and for EPPD to cease regular driving by the end of 2008. This would allow for the biorestitution of the access track to commence by 1 January 2009. This last commitment will not be achieved, as EPPD still routinely drives along the access track and to date does not plan for interruption of driving by the end of this year. Nevertheless, IEC recognizes that BTC has fulfilled the aspects of their ROW access commitments over which they have control and BTC has actively worked with EPPD to develop solutions for access to the ROW that will not involve vehicles. Progress has been achieved and, at least, EPPD does not

routinely drive in environmentally sensitive areas and technical solutions that will preclude the need for the use of vehicles are being evaluated in cooperation with BTC.

#### *Georgia*

The most critical issue in Georgia for the past several IEC trips has been the management of non-hazardous solid waste. During the 9<sup>th</sup> IEC trip in June 2007, this situation was assigned a Level III non-compliance based on the continued use by BP-GEO of the non-compliant Iagljuda municipal disposal site. Disposal at this location stopped as of June 9, 2008 and BP-GEO is expected to receive a permit for the construction of an EU-compliant landfill (December 08 expected completion date) for its ongoing generation of this waste stream. The Level III non-compliance is considered closed and BP-GEO has fulfilled its commitment to end the use of the Iagljuda site by the end of June 2008. As part of the solid waste solution, BP-GEO has started to use maceration to liquefy food waste with the concept of then treating this waste as a liquid effluent. IEC needs to caution that if a non-compliant municipal treatment is used for the final disposal, the overall disposal process will again be non-compliant; however it is expected that BP-GEO will identify a compliant solution for this new liquid waste stream. Compensation for the non-compliant disposal of all non-hazardous waste since the start of construction by means of offset projects (including to date the acquisition of land for the site of a municipal disposal facility, providing of the conceptual design of this disposal facility to the municipalities, and planning for additional offset measures) has started.

#### *Azerbaijan and Georgia Common Issues*

The most important common issue between Azerbaijan and Georgia has been associated with air emissions. Although stack monitoring has been carried out in both countries the programmes have not been implemented in a manner consistent with the ESAP, nor with the commitments defined in Schedule 21. The emissions measured for NO<sub>x</sub> have exceeded ESAP standards in both Azerbaijan and Georgia. Both Azerbaijan and Georgia have also recorded high CO values, but it is a non-compliance only in Azerbaijan, because of a BTC ESIA standard there. It is understood that BTC expects the situation to improve with increased loads.

#### *Turkey*

In Turkey a number of improvements were evident in response to concerns raised by IEC on previous visits. These improvements include the following:

- Botaş International Ltd (BIL), the designated operator of the Turkish section of the BTC pipeline, is implementing maintenance and management procedures and repairs to ensure pipeline right-of-way (ROW) integrity in a proactive manner;
- reinstatement of the East Anatolian Natural Gas Pipeline (NGPL) where it overlapped with the BTC ROW in Lot B is now concluded;
- BIL has achieved ISO 14001 certification and has improved its organizational and data management capabilities; and
- access road reinstatement issues are being addressed but procedures are still required as to how access roads will be used during Operations.

IEC noted several non-compliances during the June 2008 visit and operational improvement is recommended in the following areas:

- despite the achievement of ISO 14001 certification, the BIL HSE and Community Relations (CR) organization have severe staff shortages that are limiting their effectiveness. This is particularly true for the PCR department where no back-to-back capacity was reported. A Level 1 non-compliance was raised because of concerns about PCR team performance relative to ESAP commitments. BIL management should address these shortages so that ongoing environmental and social performance is maintained consistent with ESAP commitments;
- solid waste management at Pump Stations still makes use of construction camp Central Waste accumulation Areas (CWAAs), many of which are well beyond their operational efficiencies. The project should comply with their commitment to construct permanent CWAAs at each pump station location;
- oil water separator performance needs to be reviewed on a project-wide basis in terms of design, efficiency and compliance to project discharge standards;
- BTC should implement recommendations of the recent review of Waste Water Treatment Plant (WWTP) performance to ensure compliance with ESAP commitments towards waste water discharges.

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.

## **1 INTRODUCTION**

D'Appolonia S.p.A.(D'Appolonia), located in Genoa, Italy, has served since the first field trip in February 2004 as the post-financial close Independent Environmental Consultant (IEC)<sup>1</sup> to the Lender Groups for the Baku-Tbilisi-Ceyhan (BTC) Pipeline Project (BTC Project).<sup>2</sup> The BTC Project is owned by BTC, a company formed by a consortium of the Main Export Pipeline Participants (MEPs)<sup>3</sup>. The BTC Project is constructed through Azerbaijan, Georgia and Turkey and the first shipment of oil from the BTC pipeline took place at the Ceyhan Terminal in Turkey on June 5, 2006, after which the transition to Operations was completed.

The overall role of D'Appolonia within the BTC Project is to assess and report to the Lender Group on the compliance with the environmental and social provisions contained within the project Environmental and Social Action Plan (ESAP), the associated Contractor Control Plans (CCPs), and BTC Management Plans and with HSE management systems. This report summarizes the results of D'Appolonia's tenth field visit held from June 9 to 18, 2008 for the BTC Project.

This IEC trip represents the annual verification of an ongoing monitoring process initiated during the construction phase and continued during Operations and focuses on the operations team and ongoing operations activities. The reference documents for the Operations audits are the Operations ESAP and the relevant management plans. In addition to this aspect of the field visit, the IEC has also focused on commitments made by BTC as part of the terms of the Schedule 21 Completion Certificate signed by the IEC On October 8, 2007. As it was not realistic or practical to fully close all of the construction-related issues in a dynamic process prior to the issuance of Schedule 21, the IEC accepted that certain items not be closed as long as they have well-defined closure plans with associated closure schedules as agreed and defined in a meeting held in the D'Appolonia office in Genoa, Italy on September 20, 2007.

One different aspect planned for the operation of the BTC pipeline that is essentially a cross-country change is with respect to the use of drag reducing agent (DRA) to increase the capacity of the BTC pipeline from 1 to 1.2 millions of barrels of oil per day, expected to start in December 2008. This is a change that was anticipated in the ESAP and the Host Country Agreements and does not require IEC review through an Management Of Change (MOC)

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<sup>1</sup> IEC Team members: Roberto Carpaneto (Team Leader), Giovanni Battista De Franchi (Team Coordinator), Miles Scott-Brown (Team Member), William J. Johnson (Team Member).

<sup>2</sup> 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, in their capacity as the providers of debt financing or political risk insurance for the BTC Project, including, for the avoidance of doubt, the Sponsor Senior Lenders.

<sup>3</sup> 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.



process described in the ESAP. Nevertheless, the IEC was provided with the project description and potential environmental impacts that could be associated with the proposed increased pipeline flow and has reviewed this information.

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. Social and community relations aspects have only been addressed based on documentation review and management interviews, but no field audits and potentially affected community meetings have been held, as the latter are responsibilities of the SRAP Panel, as dictated by the ESAP. Similarly, review of BTC oil spill response plans (OSRPs) and related issues are not included in the IEC scope of work as they form part of the work scope of the OSRP expert (Polaris).

The IEC team conducted the visit as two teams; one focused on Project activities in Turkey and the other in Azerbaijan and Georgia. 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.

## **2 AZERBAIJAN**

The BTC Project in Azerbaijan includes 443 km of pipeline extending from the first pump station (PSA1) in Sangachal Terminal, 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 is followed by the South Caucasus Pipeline (SCP), which transports 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 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 at the Sangachal Terminal is not within the scope of the BTC audit in Azerbaijan.

BP/AIOC First Oil in Azerbaijan was celebrated on May 25, 2005. The entire BTC pipeline became operational on June 5, 2006 with the first shipment from Ceyhan, Turkey. At the time of the visit, the BTC pipeline had transported an average of about 700,000 bpd since June 2007, with flows increasing to somewhat greater than 800,000 bpd in May 2008. As of the end of May 2008, the total throughput has been approximately 392 million net barrels associated with 485 shipments from the Ceyhan Marine Terminal. A significant change in the throughput of the BTC pipeline is expected for December 2008, when the injection of drag reducing agent (DRA) is expected to increase the capacity of the pipeline to 1.2 mmbd. The SCP has also been fully operational since November 2006.

During the construction phase, the BTC Project in Azerbaijan used two prime Contractors, Consolidated Contractors International Company (CCIC) responsible for pipeline construction and valves and Spie-Capag Petrofac Joint Venture (SPJV), responsible for the main AGIs. These Contractors are now demobilized and all of the temporary facilities associated with construction described in previous IEC reports are now closed, reinstated to the satisfaction of the landowners and relinquished to the landowners, except for a portion of Mugan Camp still used by CCIC for storage. It is anticipated that this facility will be fully closed and reinstated by the end of Q3 2008.

This mission represents the first IEC visit fully associated with BTC Operations. Nevertheless, many of the aspects of Operations still relate to completion of the pipeline (e.g., bioremediation) and programs started during construction and which have follow-up during Operations (e.g., erosion and sediment control monitoring along the ROW; ecological monitoring; cultural heritage), as well as topics common to either construction or Operations (waste management, wastewater treatment, and emissions monitoring). One topic specific to Azerbaijan that was an issue for the preparation of the Schedule 21 Completion Certificate and reviewed during this trip is the implementation a ROW access strategy to eliminate routine driving along the ROW, contrary to the requirements of the ESAP.

All activities associated with construction are now fully incorporated within Operations and include the still pending improvements to the facility oil-water separators, completing the construction of a redesigned facility sewage treatment plant and associated infrastructure, as well as construction that may be associated with maintenance activities. These subjects are treated in the other sections of this report.

## **2.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES**

### **2.1.1 Resources and Organization - Observations**

The environmental and social management organization for Operations is complete. The responsibilities for the BTC pipeline fall within the responsibilities of the Azerbaijan Export Pipelines Environment Team, which also has responsibilities for the SCP and Western Route Export Pipeline. The most significant aspect of this organization has been the transition from expat to national staff. Within the environmental organization with a permanent staff of 11, only the positions of Team Leader and Biorestation Specialist were occupied by expats. The Biorestation Specialist position is being discontinued at the end of Q2 2008. A position of Deputy Team Leader is being created for an Azeri national in Q3 2008 with the expectation that this will allow for the Team Leader to be replaced after a suitable transition period. An organization chart was also provided for the Azerbaijan Export Pipelines Health and Safety Team, which shows that this entire department has been transitioned to Azeri nationals. A similar observation can be made with respect to the Social Team, made up of a Team Leader, three Social Officers and three Community Liaison Officers (CLOs), who are all Azerbaijani nationals. These latter two organizations are independent of the Environment Team.

Based on observations made during this field trip, it is apparent that the data available from the construction phase is readily available to Operations; this guarantees that any new activity performed by Operations takes into account specific environmental and social aspects and that new operations do not damage sensitive resources previously identified during construction. This observation is a reflection that the overall transition from construction to Operations has been successful.

A major accomplishment with respect to both environmental, as well as health and safety organizations in Azerbaijan has been the recent (May 2008) ISO 14001 certification.

### **2.1.2 Management of Change (MOC) - Observations**

At the time of the June 2007 field visit, the IEC had reviewed several environmental and social MOC documents prepared by BTC in anticipation of IEC's issuance of a Completion Certificate. These documents were the subject of review and discussion prior to and during the discussions held between the IEC and BTC during the September 2007 meeting in D'Appolonia's office in Genoa, Italy. A listing of the approved MOC documents is provided in the "BTC Project Environmental and Social Annual Report (Operations Phase) 2007 and is not repeated here (note that the annual report for Azerbaijan MOCs does not indicate IEC approvals, but most were indicated as approved in the June 2007 IEC trip report).

A summary of the recent MOC documents for the three countries prepared since the September meetings in Genoa with the IEC responses is summarized in Table 1.

## **2.2 CAMPS, INFRASTRUCTURE AND SERVICES**

With the exception of Mugan Camp, as note above, the camps operated for the construction phase of the project are no longer operational. Where the construction facilities were not returned to the landowners in a greenfield condition, the land was returned to the landowner in a condition reported to be satisfying the landowner. Subsequent to the June 2007 IEC field

trip, those facilities not returned in a greenfield condition have been reviewed by the Azerbaijan Export Pipelines Environment Team and conditions documented to verify that the properties did not have significant environmental or health and safety issues, as documented in MOCs accepted by the IEC in September 2007.

#### **2.2.1 Camps, Infrastructure, and Services - Observations**

One issue remaining from the June 2007 IEC field trip was the verification of the decommissioning of the Central Waste Accumulation Area (CWAA) at Kurdamir camp with respect to possible soil and/or groundwater contamination from the underground storage tank. An environmental assessment was conducted by the Azerbaijan Environment and Technology Centre and presented in a report dated November 2007 that concluded that the BTC activities at the CWAA did not cause soil or groundwater contamination. The IEC considers that issues associated with the old construction camps are now fully closed and it is not anticipated that these facilities will need to be included as a review topic in future IEC field trips.

One change to previous conditions is with respect to the construction and operation of new Camp for Pump Station 2 in Azerbaijan (PSA2 Camp). This facility was under construction at the time of this IEC field trip and the location was not visited. The details with respect to the justification for this facility were presented as a Level II MOC considered acceptable by the IEC.

During the visit potable water quality data and the procedures to manage potable water were reviewed. This is an issue that was assigned a Level I non-compliance based on conditions encountered during the June 2007 field visit. The Azerbaijan Export Pipelines Health and Safety Team has undertaken extensive efforts to implement a Water Quality Improvement Plan including better procedures for management of water dispensers, switching to small, rather than large bottles for drinking water, and improving the chlorination process at the treatment plant at PSA-2. The result of these efforts has been to consistently provide potable water compliant with ESAP standards and the Level I non-compliance is considered rescinded.

The recommendations included with the June 2007 IEC trip report have effectively been followed and the IEC does not have additional recommendations for the subject of camps, infrastructure, and services.

## **2.3 WASTE MANAGEMENT**

#### **2.3.1 Non-Hazardous and Hazardous Waste – Observations**

At the time of the last visit, a dedicated non-compliant BP waste cell with a 48,000 m<sup>3</sup> capacity had been filled at Sumgayit. This cell has been closed with a clay cap and a gas collection system installed. A second identical cell is nearly filled (estimated additional life ~ 2 months) and is planned to be closed in a manner similar to the first cell. These dedicated cells at Sumgayit are not EU compliant, but are considered to represent a safe temporary solution until the construction of a new EU compliant landfill is constructed and available for use. A new EU-compliant non-hazardous waste landfill started in September 2006 is now constructed and a QA review by Enviro Consulting completed. Contractual issues with the local operator Tehlukeli Tullantilar MMC (TTMMC) have thus far prevented it from being available for use.

Hazardous waste continues to be consolidated and stored at the BP-owned Hazardous Waste Management Facility (HWMF) in Serenja. Wastes are also consolidated at the Central Waste Accumulation Area (CWAA) at the Sangachal Terminal. Both of these facilities were visited by the IEC and found to have acceptable operating procedures and safeguards. BP still plans to construct its own dedicated EU-compliant hazardous waste landfill at Sumgayit that will be able to accept all of the BTC legacy waste. The construction schedule for this facility remains uncertain, as contractual issues still need to be resolved before a new landfill is started.

Medical waste continues to be temporarily stored at the Serenja HWMF, but BP expects to establish a contractor for the management and treatment of this waste stream by Q4 2008. The MOC allowing for the continued temporary storage of medical waste at the Serenja HWMF was approved by BP management in June 2008. As noted in previous IEC reports, this temporary storage is considered to be acceptable, as it is a situation consistent with waste management procedures defined in the ESAP.

Another hazardous waste stream continues to be stored at Serenja: oily waste consisting primarily of oily rags, spent filters and other material contaminated with oil (sands, soil and sludges). A contract for these waste streams was awarded at the end of 2007, but the treatment process has not been deployed and so the wastes are stored. As noted in the June 2007 IEC trip report, these two waste streams were the subject of MOCs to allow for their temporary storage at the Serenja HWMF. Again, temporary storage is acceptable under the ESAP and these MOCs were approved by IEC prior to the 2007 trip report. Pigging wax waste is now disposed to a contractor for recycling in its refinery process.

### **2.3.2 Wastewater Management - Observations**

At the time of the IEC mission to Azerbaijan in June 2006, sewage effluent from PSA-2 and IPA1 was being trucked to the Sahil Municipal Plant, although the Project was about to switch to the Mingechevir Municipal Plant, neither of which was compliant with Project required standards. The commitment made by the Project environmental staff at the time of the June 2006 IEC mission was that the entire WWTP system was going to be upgraded with the construction of new sewage treatment plants and reed beds and the non-compliant discharge to the municipal facilities would be stopped. Because of these commitments, the continued use of non-compliant municipal plants was assigned a Level I Non-Compliance, CCP Waste Management Plan, Commitment ID: 553.

The Project has continued to use the Mingechevir Municipal Plant. At the time of the June 2007 IEC field trip, three new treatment plants were under construction at PSA2 and IPA1 and expected to be completed in the near future. Given that there appeared to be tangible progress in arriving at a final solution to the management of sewage effluent, the previous Level I non-compliance assigned during the June 2006 visit was rescinded. Reportedly due to a contractual dispute, none of these facilities was operational at the time of the current IEC site visit and it was reported that the PSA-2 reed bed for tertiary treatment was maintained as a viable system because a local farmer involved in the construction took the time to divert irrigation water to the reeds. It is expected that the PSA-2 plant will be operational in the near future and the construction at IPA-1 (plant and reed bed) can then be completed. It is recognized that the Rotating Biological Contactor (RBC) type sewage treatment units being constructed at PSA2 and IPA1 represent the best available technique (BAT) for managing sewage waste from these facilities.

The Mingechevir municipal treatment system was again visited by the IEC during this mission. As noted in the IEC June 2007 field trip, the Mingechevir facility was a state-of-the-art treatment plant when it was constructed in 1978, but since the end of Soviet occupation, there have been limited resources for maintaining this facility. Test results provided for this plant during this trip show that it does not achieve EU standards. The conditions at the plant observed in June 2008 appear to be effectively the same as observed in June 2007. BP has supported the operations of this facility with some laboratory supplies and PPE, but there is minimal evidence that BP has made any significant positive impact to the operation of this facility. One positive change reported by BP is that the disposal fees paid to this facility have substantially increased since June 2007, but this rate increase does not appear to have affected the plant operations. Plant personnel were replacing pipes and a pump using materials reported to be scavenged from other old industrial facilities in the area at the time of the IEC visit. In 2007 the volume of sewage water generated was reported to be 7,315 m<sup>3</sup> with approximately 500 m<sup>3</sup>/month sent to Mingechevir in 2008 (approximately 2 tanker loads of sewage waste which need to be transported every day). The effluent from the Mingechevir plant is reported by BP to be chlorinated and not expected to contribute to a significant coliform load. This is contradicted by test results for the effluent taken in May 2007, which shows very high coliform values.

An MOC for the continued use of Mingechevir was approved by the Azerbaijan Export Pipelines Management in June 2008. Because this situation has now existed for years, because the construction of compliant treatment plants is far behind what was previously presented to the IEC, and also because efforts to actually improve the performance of the Mingechevir facility is considered minimal by IEC, this situation is assigned a Level II non-compliance with the Operations ESAP, Commitment ID J24 *“If sewage is to be discharged into public facilities, the impact on the facility and its discharge will be assessed in order to meet the project standards.”* It is expected that the use of the Mingechevir facility will cease in the near future as the new sewage treatment plants are commissioned and at that point in time the Level II can be considered to be rescinded.

### **2.3.3 Wastewater Management – Recommendations**

1. BTC should review their past activities at Mingechevir and plan for new assistance that improves the performance of this facility – consider significant support, such as supplying and installing a new pump and associated piping, developing a system for effective chlorination of the effluent, etc.
2. Expedite the completion of the new RBC plants.

## **2.4 POLLUTION PREVENTION**

### **2.4.1 Observations**

As previously noted in the June 2006 and June 2007 trip reports, one issue common to both Georgia and Azerbaijan is the effectiveness of main oil-water separators designed to clean up surface water from the pump stations and IPA1. As previously noted, the situation is not a non-compliance with ESAP commitments, but their performance could potentially be compromised under emergency loadings. These systems were redesigned in 2005, but the modifications have yet to be completed. It was understood in June 2007 that the construction effort at PSA2 would commence after completion of the construction of the RBC plant,

expected at that time for August 2007, but as this plant was not commissioned, the upgrades to the oil-water separators have not taken place. The 2007 IEC trip report also noted that the PSA2 retention pond is the only pond with a complete concrete liner in Azerbaijan and Georgia and that the lack of a liner could be a contaminant pathway where groundwater is shallow and without concrete it is very difficult to clean out bottom sludge. During this field trip, the IEC was not provided with any indication as to whether the presence of shallow groundwater might be a concern at any of the stations where the retention pond is unlined, but it is understood that plans are in place to line the pond at IPA1.

Stack emissions testing was completed at three MOL turbines at PSA2 in October 2007 and at one MOL turbine and the three Diesel Generators at PSA2 and two Diesel Generators at IPA1 in May 2008. Therefore all required stack emissions monitoring has been carried out (with the exception of the PSA2 water bath heater which has not been operational). The generator stack monitoring ports are not ideally located (they are close to elbows in the ducting), but it is understood that plans are in place to relocate these ports.

As reported in the BTC Annual report, the available results (2008 results are not yet available) indicate non-compliance with respect to the ESAP NO<sub>x</sub> emissions standard and also with carbon monoxide (CO). Technical problems have prevented an interpretation of the SO<sub>2</sub> emissions from the MOL turbines. The CO standard is not an ESAP standard, but is a BTC Azerbaijan ESIA requirement approved by Azerbaijan Government (Ministry of Ecology and Natural Resources). An interpretation of the reason for the non-compliant measurements was indicated by BTC to be that the problem was due to the fact that at the time of sampling, the turbines were operating at below the load at which their low emission technology becomes operational.

BTC's MOL turbines in Azerbaijan and Georgia are of a Dry Low Emission (DLE) design and consist of two units; the Gas Producer and the Power Turbine. The Gas Producer burns fuel and produces a stream of high speed exhaust gas. This gas is routed through the Power Turbine, which drives the pump through a mechanical coupling. There is no mechanical link between the Gas Producer and the Power Turbine and they are free to rotate at different speeds. Because of this there is a non-linear relationship between the power output of the Gas Producer and that of the Power Turbine. (Note that the output of the Gas Producer is usually measured in terms of percentage of the maximum design rotational speed and is designated Natural Gas Producer - NGP speed, or simply NGP.)

Fuel can be input into the Gas Producer through two separate injection systems; a conventional injection system and a low emission system known as SoLoNox. When operating in SoLoNox mode the manufacturer guarantees NO<sub>x</sub> emission levels of below 70 mg/m<sup>3</sup>. However the SoLoNox mode can only be operated when the NGP is above 93%. This corresponds to a Power Turbine load of about 70%, although the exact figure depends on other factors which affect turbine efficiency; principally ambient temperature and air pressure (i.e. altitude).

The model of turbines chosen by BTC is based on the power required to operate at 1.2 mmbd at summer temperatures. Therefore at lower pump rates and low ambient temperatures (turbine efficiency increases as temperatures decrease) the power requirement may fall to a level at which the NGP is below 93% and hence SoLoNox ceases to operate. However, even in this non-SoLoNox mode NO<sub>x</sub> emissions are projected to be less than half those of a conventional, non-DLE, turbine.

The ESAP requirements for turbine emissions are based on those in the EU Large Combustion Plant Directive. This specifies standards for gas turbines above 50MW thermal power operating above 70% load. As the BTC turbines are about 28 MW thermal is understood that BTC is considering modifying the ESAP to emissions standards considered to better reflect the actual equipment used at the pump stations.

BTC has assigned a Level I non-compliance as a Corrective Action Report (CAR) for the current situation. IEC also will continue to assign a non-compliance for the stack emissions monitoring *Level I Non-Compliance, Emissions Management Plan - BTC Operations – Azerbaijan & Georgia (Commitment ID 1024)*.

It is recognized that it is unlikely that air emissions represent a significant adverse environmental impact, as ambient air monitoring does not show any anomalies for NO<sub>x</sub>. Nevertheless, ambient air measurements have also been shown to be problematic. Ambient air has been shown to exceed the standard for SO<sub>2</sub> during two sampling rounds at PSA-2 as reported in the BTC Annual Report. Ambient monitoring data for 2008 are not yet available. The explanation for this deviation has been that the sampling may have been too close to the vehicle parking area. Although it is unlikely that the gas-fired turbines contributed to the problem as the gas does not contain significant sulfur, the actual SO<sub>2</sub> stack emissions were not calculated at the time of the visit. Another difficulty could also be with respect to the general placement of the ambient monitoring points. The ESAP requires a minimum of four points to be monitored, one upgradient of the source, two near the source and a fourth located at the nearest receptor. Newly acquired meteorological data indicate that the upgradient location may be different that what was assumed in the emissions model and the location of the nearest receptor was not monitored reportedly because the location is not secure. It is understood that the emissions monitoring points have been relocated, an additional monitoring point has been added, and that data are being acquired on a bi-monthly basis. BTC has assigned a “potential” Level I non-compliance for the high SO<sub>2</sub> in a Corrective Action Report (CAR). It is considered a potential non-compliance by BTC, because the ESAP limit for this parameter is for an annual average and measurements have not been taken over a full year, yet. The IEC considers that the BTC CAR is sufficient definition of the non-compliance, but cautions that the monitoring points should allow for a firm interpretation of the ambient air quality at the nearest receptor.

#### **2.4.2 Pollution Prevention – Recommendations**

1. Accelerate the programs to repair the facility OWS systems. Consider lining the bottom of the retention ponds with concrete, especially where groundwater is shallow. PSA2 could be the model for the retention ponds (repeat recommendation).
2. Increase the frequency of emissions testing and relocate the sampling ports for the diesel generators. The ESAP indicates that thresholds for corrective action are exceedances of emission limit values, as well as “incomplete or late collection or reporting”. Substantial information is still missing to determine what corrective actions might be required, if any-
3. Continue to evaluate the reasons for non-compliant emissions from the MOL turbines and consider actions that could improve their performance.
4. Should BTC choose to modify the emissions standards with an MOC process, the IEC expects that the change would be a Level 3 and that there would be substantial documentations as to the appropriateness of the change.



## **2.5 ROW MANAGEMENT**

### **2.5.1 Observations**

Consistent with the situation encountered in the June 2007 field visit, the Project has made a concerted effort with a survey in the spring of 2008 to identify those areas that will require additional effort to achieve complete reinstatement. These areas are designated as “critical areas” and a total of 63 km of the ROW (~15%) has this designation. Accordingly, 380 km of ROW (~85%) including naturally saline and grazing lands have been considered to be non-critical. This situation is the same as encountered in the June 2007 IEC, but the IEC can confirm that biorestorement is substantially more advanced in the critical areas in June 2008 than was the case in June 2007. The IEC believes that biorestorement is sufficiently advanced such that the ongoing programs can be considered to be sufficient to consider the overall program a success.

The IEC was also able to observe the effectiveness of erosion and sediment control measure undertaken along the ROW. Difficult areas such as the Hasan Su River crossing at KP 397 are showing that the erosion and sediment control measures are effective. Difficulties were observed where the overflow of irrigation channels due to farming activities has caused erosion at areas that would otherwise be stable, in particular at KP 296 – Ganja Chai crossing. The Project actively monitors for the occurrence of erosion and has programs in place to manage this erosion. The one risk to the reinstatement/maintenance program over which the Azerbaijan Export Pipelines Environment Team has limited influence is vehicular traffic.

Vehicular traffic continues to take place along much of the ROW, and has caused damage in critical areas, including the sensitive Gobustan Desert area. This traffic relates primarily to requirements the Export Pipelines Protection Department (EPPD) of the Azeri Government, which requires that the ROW be accessible for security patrols. Following the introduction of the new Access Strategy defined in the ESIA Addendum related to the ROW access, about 380 km of ROW has been maintained accessible to EPPD for security reasons, but probably not all with the same frequency.

The MOC related to the revised access strategy to account for the need for EPPD and BTC/SCP Operations to have increased vehicular access is a major break with principles of the ESAP, which defines the general principle of “No Vehicle Access on the ROW”. An issue with the ROW access at the time of the June 2007 IEC visit was that BTC Operations were also driving along the ROW. As part of the Completion Certificate process, BTC confirmed its commitment not to drive along ROW, except in emergencies and for EPPD related road works, consistent with the ESAP, and also to open a non-compliant condition should BTC Operations use the road, except for purposes mentioned above. BTC has fulfilled their commitment not to use the ROW for routine activities and continues to use horse patrols. The current issue is that the EPPD has continued vehicular access.

The Long Term Access Strategy as associated with the issuance of the Schedule 21 Completion Certificate is for EPPD to cease regular driving by the end of 2008 and biorestorement of the access track to commence by 1 January 2009. This commitment will not be achieved. IEC acknowledges the continuous efforts of BTC to convince EPPD to avoid driving along the ROW and it is apparent that progress is being made. Field observations in the Gobustan Desert area indicate that the EPPD track along the ROW is no longer being used on a routine basis. According to BTC information, EPPD has verbally indicated its

intention to fully transition to daytime horse patrolling and eventually to avoid nighttime driving by using different procedures under evaluation. Based on IEC's understanding of the surveillance technologies being discussed between BP and EPPD, this transition will take months or years to achieve, if an appropriate solution is found.

#### **2.5.2 Recommendations**

1. Continue to offer EPPD field personnel training in terms of their awareness of environmental sensitivities and continue to negotiate a surveillance solution such that the bio restoration of the ROW can be completed.
2. Should it be apparent that driving on the ROW will definitely extend beyond the limit defined by the current MOC (December 2008) a new MOC or an Addendum to the existing MOC should be prepared to specify new commitments.

## **2.6 ECOLOGICAL MANAGEMENT**

#### **2.6.1 Observations**

The two programs initiated at the beginning of construction to manage rare and endangered species and reinstate them along the pipeline ROW are now complete, except for monitoring. Specifically for fauna, a number of spur-thighed tortoises (*Testudo graeca*) and European marsh turtles (*Emys orbicularis*) were collected and relocated in appropriate habitats distant from the pipeline in accordance with the Project requirements. The IEC was not provided information regarding the status of the turtle translocation program, but it can be noted that two examples of *Testudo graeca* were encountered by the IEC in the Gobustan Desert area (~KP 26).

A second program involved the collection of approximately 33,000 individuals of the endangered plant *Iris Acutiloba* from the pipeline ROW and their translocation at a designated desert habitat in the Mardakan Arboretum operated by the Azerbaijan Institute of Botany (IoB). In addition, 8,105 individuals of *Iris* were replanted adjacent to pipeline area. These individuals of *Iris Acutiloba* were replanted primarily in the Gobustan Desert area with the planting program ending on September 30, 2006. As reported in the June 2007 IEC trip report, the available information was that this program had been only partially successful with limited survival rate. Accordingly, one of the conditions associated with the issuance of the Completion Certificate was that BTC undertake a comprehensive survey to prove or disprove the initial observations from May 2007. BTC fulfilled this commitment and the results reported to the IEC that indicate a total 8% survival for iris replanted on the ROW in the Gobustan area and a 50% survival rate for iris that were relocated off of the pipeline ROW. It is recognized that the specimens planted adjacent to the ROW have had two years to adapt to their new surroundings, whereas the plants from the Mardakan Arboretum have had only one year and that some of these plants might be dormant rather than dead. Nevertheless, at this point in time, the overall survival rate appears to be about 20% only.

#### **2.6.2 Recommendations**

1. BTC should consider if enough has been done to compensate for the disturbance to this red-listed species with respect to ESIA commitments.

## **2.7 CULTURAL HERITAGE MANAGEMENT**

The cultural heritage program for the BTC project currently relates to the management of the material encountered during construction, as well as management of situations that could occur along the pipeline route in the future. The governing procedures for the ongoing pipeline management are defined in the Operations Cultural Heritage Management Plan (CHMP) that covers both Azerbaijan and Georgia and was completed May 2007, which focuses on the main issues of cultural heritage that could be faced by Operations:

- damage to heritage resources as a result of earthwork associated with maintenance, inspection, or other common operational activities on the ROW or associated facilities;
- contamination or damage to heritage resources as a result of oil spill and subsequent clean up activities;
- damage to heritage resources as a result of soil erosion; and
- damage to heritage resources as a result of looting.

Work to date for the BTC Project has been in association with the Azerbaijan Institute of Archaeology (AIA) with supervision provided by international experts under contract to BTC.

### **2.7.1 Observations**

Responsibilities for cultural heritage are divided into two independent components. The Azerbaijan Export Pipelines Environment Team is responsible for protection of the BTC pipeline as described above, whereas the follow-up to the construction phase work rests with Communication and External Affairs (CEA) and their responsibilities extend to both Georgia and Azerbaijan. In essence, CEA is responsible for Phase 5 – curation of finds, analysis, display of finds, and publication of information associated with the construction phase. Operations teams are responsible for protection of sites previously excavated and managing any new developments. There have not been any new developments to report with respect to new finds or damages to any existing sites.

A major development since the June 2007 IEC field visit took place on March 17, 2008, when BP on behalf of both the BTC and SCP projects signed a grant agreement with the Smithsonian Institution. The program has two main goals - public outreach and capacity building, targeted for the Gobustan State Historical-Artistic Reserve (GSHAR), the Azerbaijan Institute of Archaeology and the Ethnography and the Georgian National Museum. The total value of this program is just over \$1 million and its duration is two years.

The public outreach component of the program will be implemented via a number of activities. These include:

- completing Phase 5 technical analysis and reporting of the BTC/SCP artifacts. This program to complete Phase 5 for Azerbaijan is being undertaken by the Smithsonian Institution with the support of archaeologists who were responsible for coordinating the excavations during the construction phase, including Landsker Archaeology as reported in the June 2007 IEC trip report, URS experts, as well as from individuals responsible for providing technical assistance in the transition from construction to operations;

- publication of 1000 copies of a catalogue on the cultural heritage program and on the artifacts discovered in the three countries (Azerbaijan, Georgia and Turkey) along the BTC/SCP route. The catalogue will be published in four languages: Azerbaijani, Georgian, Turkish and English;
- creation of a BTC/SCP cultural heritage website as means for public outreach. This website is expected to describe the BTC/SCP Cultural Heritage Program and introduce the artifacts discovered in the three countries along the BTC/SCP pipelines in an interactive way that will be publicly accessible;
- an international conference on topics relating to the interpretation of cultural heritage discoveries along the BTC/SCP pipelines corridor. The conference is expected to give an opportunity for the experts involved in the BTC/SCP archaeological excavation works as well as those from the three countries and around the world to analyze and interpret the BTC/SCP findings in a manner consistent with the international practice. The cross-country conference will also compare analytical procedures and curatorship practices and findings across the three countries. The conference papers will be then published; and

All of the above project activities have been previously recommended by the IEC.

The capacity building component of the program is expected to be implemented by means of a number of activities including internships, training, workshops, and lectures for the staff of Gobustan State Historical-Artistic Reserve, the Azerbaijan Institute of Archaeology and the Ethnography and Georgian National Museum. It is planned that representatives of the beneficiary institutions will be trained on museum management, collection processing, artifact handling, assessment of the damage to the rock art; proper documentation and registering of monuments; storage and protection of materials applying new computer technologies and programs; management of collections of scientific, literary and historical value; exhibitions management; and sustainable tourism development.

In addition to the above activities, significant effort has been expended to train Operations personnel in the procedures that need to be followed to protect cultural heritage along the ROW. This has involved the integration of archaeological site information within the Project GIS and defining procedures to manage cultural sites. Part of the ISO 14001 certification process has been to emphasize awareness of cultural heritage sensitivities among the pipeline technicians such that the potential for damage to archaeological sites during erosion control works, pipeline repair, etc. is minimized. Cultural heritage information is also being incorporated within the Oil Spill Response Plan (OSRP).

## **2.8 ENVIRONMENTAL INVESTMENT PROGRAMME**

During the mission, the IEC did not conduct a detailed review of the Environmental Investment Programme (EIP) in Azerbaijan and the EIP has been reviewed on the basis of limited information provided by BTC.

A major change to the EIP program in Azerbaijan was approved internally by BTC in May 2007. This change was associated with cross-country EIP changes as documented in an MOC classified as a Class II change, which therefore did not require IEC review. In Azerbaijan, the most fundamental change is that the Phase 1 projects have been officially abandoned. These projects were to have been the following:

- NABU: Kura-Araz Lakes System - Conservation of Wetlands Biodiversity in Azerbaijan;

- United Nations Development Programme (UNDP): Desert Conservation Demonstration Project;
- Azerbaijan Society of Geographers: Desertification Prevention Project;
- Azerbaijan Society of Zoologists: Conservation Management of Persian Gazelle *Subgutturosa*;
- Azerbaijan Society for the Protection of Animals (AzSPA): Humane Environmental Education of Children and Youth;
- ECOS - Biodiversity Conservation Awareness Raising Project.

As noted in the June 2007 IEC trip report, BTC was never able to obtain ministerial support for any of these Phase I projects and the focus of the EIP program has moved away from large scale biodiversity projects, implemented by local and international NGOs and requiring MENR support, towards smaller scale, community focused projects addressing local environmental needs (Phase 2 projects). The MOC authorizes the shifting of unspent funds intended for the Phase 1 projects to the Phase 2 projects.

BTC continues to implement Phase 2 (community driven small grants program), which does not require the same level of regulatory support, does not present a significant financial risk, but should result in real and measurable benefits to the environment and the potentially affected communities. Ongoing projects include:

- the *Green Pack* – an environmental education tool. The Green Pack is an educational tool which aims at boosting the environmental knowledge of schoolteachers and students aged 7-14. It contains a teacher's handbook, a textbook for children, a DVD film collection, a CD-ROM and a role-playing dilemma game. With the support of the Organization for Security and Co-operation in Europe (OSCE) Office in Baku, some 1,000 Green Packs have been produced, distributed and are being used in 680 schools and 30 educational centers around the country (in Baku, Ganja, Sumgayit, Lankaran, Yevlakh, Kurdamir and the Nakhchivan Autonomous Republic). As the project is being implemented in partnership with OSCE with an additional leveraging fund of \$113,000, the total budget of the project is now \$227,000;
- the *Green Pack Training of Teachers* – the Green Pack being a complex and multimedia tool required special training to help teachers fully understand the product and build their capacity for professional mastering of the tool. To date, 1114 teachers representing 724 secondary schools in 67 regions participated in 3 stage trainings. The Green Pack had such a deep resonance that universities and institutes requested the product. Currently, trainings are ongoing for the universities teachers in Baku and Ganja. The total value of the project is \$154,470 of which \$118,403 is BTC/SCP contribution and \$36,066 of OSCE.

- the *Support to Energy and Environmental Initiatives (Energy Bus)* – In association with the local NGO, Humanitarian and Social Support Center – UMID, this project has aimed at supporting improved resource/energy management, promoting the use of locally developed alternative energy solutions and reducing environmental degradation in communities primarily along the BTC/SCP Pipelines route. Information is transmitted via a tour bus equipped with educational aids. In addition to awareness raising activities the program has delivered 13 demonstration projects such as the installation of solar panels, biogas units, and safety demonstrations including the restoration of a community bridge (Phase 1 of the project was co-funded by EIP and CIP. The EIP contribution that has been committed is \$279,716. The EIP contribution for Phase 2 is \$368,427);
- *Tugai Forest Rehabilitation project* - This is a joint project involving BP Group, the BP Azerbaijan Business Unit and the BTC/SCP projects. Started in 2002, this project has focused on the threatened Tugai forest habitat, and aims to enhance protection of Tugai Forest. 40000 seedlings of poplar, oleaster, ulmus, acacia, terebinth and ash-tree were planted on a 12-ha area, fully protected from cattle; an irrigation pump has been supplied; irrigation and tree nursery activities have been provided; an additional 150-ha forest land has been fully protected from cattle and provided with regular servicing for natural restoration; and a forest house has been built for the labor and 2 guardians who were hired to protect both 12 ha and 150 ha land plots. BTC/SCP has made a financial contribution of \$230,000 to help enable the implementation phase of this project.

### **3 GEORGIA**

The BTC Project in Georgia encompasses 249 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 shares the same corridor with the SCP pipeline, which is a subsequent separate related project that transports gas from the Shah Deniz field offshore Azerbaijan to the Georgian/Turkish border. The BTC Project includes several permanent Above Ground Installations (AGIs) including two pump stations, PSG-1 located at KP 3.8 and PSG-2 located at KP 88, as well as block and check valves.

The entire BTC pipeline became operational on June 5, 2006 with the first shipment from Ceyhan, Turkey. At the time of the visit, the BTC pipeline had transported an average of about 700,000 bpd since June 2007, with flows increasing to somewhat greater than 800,000 bpd in May 2008. As of the end of May 2008, the total throughput has been approximately 392 million net barrels associated with 485 shipments from the Ceyhan Marine Terminal. A significant change in the throughput of the BTC pipeline is expected for December 2008, when the injection of drag reducing agent (DRA) is expected to increase the capacity of the pipeline to 1.2 mmbd. The SCP has also been fully operational since November 2006. Georgia began receiving the benefits of off take gas from the SCP Project in January 2007.

The BTC Project in Georgia used a single prime Contractor for both pipeline and AGI construction, Spie-Capag Petrofac Joint Venture (SPJV). This Contractor is now demobilized and most of the temporary facilities associated with construction described in previous IEC reports are now closed, reinstated to the satisfaction of the landowners and relinquished to the landowners, unless their use has been required by Operations. The current status of the temporary facilities during construction is as follows:

- of the five camps used during the construction of the BTC Project, only Tsalka camp at KP 123 has been completely handed over to the land users while 90% of Marneuli camp at KP 53 has been reinstated and handed over. The camps at PSG-1 and PSG-2 and the old Akhaltsikhe camp at KP 228 are still being used by Operations;
- all pipe yards and mechanical yards have been reinstated with the exception of two sites (Rustavi and Andeziti) that are still being used by BTC to support ongoing activities.

During this tenth mission, spot checks on the ground were conducted to review the reinstatement of the pipeline from about KP 193 to KP 3. Some of the off-ROW (construction camps, pipe and mechanical yards, access roads, borrow pits, batching plants, and rock disposal sites) were also visited primarily to verify their current condition. The Central Waste Management Area (CWAA) at PSG-1, the site selected for construction of an EU-compliant landfill, the Gardabani municipal wastewater treatment facility considered for possible Project use for sewage disposal, and the construction sites associated with the Kodiana Project were also visited.

All activities associated with construction are now fully incorporated within Operations and include the still pending improvements to the facility oil-water separators, completing the construction of redesigned facility sewage treatment plants and associated infrastructure,

Kodiana Project construction, as well as construction that may be associated with maintenance activities.

### **3.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES**

#### **3.1.1 Resources and Organization - Observations**

The transition from Construction to Operations is complete. The single point of accountability for environmental management in Georgia is the Georgia Asset Environmental Manager, who is supported by teams covering emissions management; ecological management and EIPs; ESMS implementation and compliance; waste management; remediation management; and Projects. The Projects team covers the Kodiana Projects and remaining 'legacy' projects and is managed by a Project Environmental Team Leader, who is supported by a dedicated senior environmental advisor for the Kodiana Projects, as well as two environmental field officers. The most significant aspect of this organization has been the transition from expat to national staff. Within the environmental organization with a permanent staff of 12, only one position, that of Environmental Advisor is occupied by an expat, whose contract will be complete by the end of the year. Organization charts for the Operations Health & Safety and Social teams comprising a total of 28 individuals indicate that these organizations are made up entirely of Georgian nationals. The resources and the personnel dedicated to the management of the E&S system appear sufficient.

From the standpoint of health and safety, this the H&S Team Leader reports to the Georgia Exports Manager. This individual is supported by a Deputy Team Leader, as well as a support staff of 19. The social Team Leader reports to the CE&A Manager. This individual is supported by five community liaison officers (CLOs). Both of these organizations are fully staffed by Georgian nationals and appear to be fully staffed.

The Operations organizations are responsible for monitoring and controlling the local contractors involved in the ongoing Projects, specifically the Kodiana projects (see Section 3.6), the decommissioning of the remaining off-ROW facilities and the final reinstatement of the ROW.

A major accomplishment with respect to both environmental, as well as health and safety organizations in Georgia has been the recent (May 2008) audit where ISO 14001 certification was recommended.

#### **3.1.2 Management of Change - Observations**

At the time of the June 2007 field visit, the IEC had reviewed several environmental and social MOC documents prepared by BTC in anticipation of IEC's issuance of a Completion Certificate. These documents were the subject of review and discussion prior to and during the discussions held between the IEC and BTC during the September 2007 meeting in D'Appolonia's office in Genoa, Italy. A listing of the approved MOC documents is provided in the "BTC Project Environmental and Social Annual Report (Operations Phase) 2007 and is not repeated here.

A summary of the recent MOC documents for the three countries prepared since the September meetings in Genoa with the IEC responses is summarized in Table 1.



## 3.2 CAMPS, INFRASTRUCTURE AND SERVICES

The review of 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, borrow pits and irrigation systems. At this point in time, with the exception of the Kodiana Projects, most of the facilities originally part of the BTC Project are no longer operational, and the IEC visit focused on reinstatement of some of these facilities.

### 3.2.1 Observations

The camps operated for the construction phase of the project are no longer operational. Nevertheless, all but the Tsalka and Marneuli camps are still being used by Operations for various purposes, most notably for the ongoing Kodiana Projects. Most of the pipeyards have been reinstated and returned to the landowners, but two of the pipeyards, Rustavi (Gatchiani) and Andezit (Bakuriani) have been retained by Operations for continued usage. The remaining off-ROW facilities have been reinstated to varying degrees. If a site has been returned to the landowner in other than a fully reinstated condition, it has been to the satisfaction of the landowner. Details of the condition of these off-ROW facilities are as follows:

#### *Camps*

- *PSG1 Camp* – still in place and has changed status to a permanent facility to accommodate the construction of an Oil Spill Response base for the eastern most section of the BTC pipeline. In addition, a logistics base is being constructed on the PSG1 camp space. The camp itself is currently being used for Operations and will support the BTC 1.2 expansion work planned for 2008. BTC plans for the camp to be replaced in 2009 by a permanent camp structure to accommodate Operations, Oil Spill Response, and Logistics base requirements. BTC has renewed the lease with owner until 2012;
- *Marneuli Camp* – Reinstated except for about 10% of area (currently used for the storage of surplus shipping containers) – BTC lease extended to 31 December 2008;
- *PSG2 Camp* – still in place and servicing Operations – will be used to support the BTC 1.2 expansion project this year. Longer term plans for the site would be to eliminate the accommodation requirement by building a larger permanent camp near PSG2 facility and this is being planned for 2009/2010. Ultimately the PSG2 construction camp will be demobilized and the foot print reinstated except for the land needed for the permanent water well located at the camp and required to service PSG2 facilities;
- *Tsalka Camp* – Reinstated and turned over to former owners;
- *Akhalsikhe Camp* – still in place and providing accommodation services to Area 80 and the western section of the pipeline corridor. Plans are in place to construct a permanent camp in 2009 at Area 80 and allow for the Akhalsikhe camp to be demobilized, land reinstated and handed back to the landowners. – Contractor's lease has been extended until 2010.

#### *Pipeyards*

- *Rustavi (Gatchibani) Pipeyard* – still in use as a temporary Oil Spill Response base, Logistics base and pipe storage yard. The Oil Spill and Logistics equipment and

personnel will be moved to PSG1 OSB and Logistics base when complete. Meanwhile, the pipe will continue to be stored at the Rustavi pipe yard, but options are being reviewed such that the pipe could be moved to PSG-1 at some point in the future;

- *Akhaltzikhe, Tetrtskaro, and Tsalka Pipe Yards* – reinstated and returned to the landowner;
- *Marneuli Pipeyard* – reinstatement complete and lease termination agreed with landowners;
- *Andezit Pipeyard / Bakuriani Mechanical Yard* – continued use in association with Kodiana Projects; BTC renewed lease expires in July 2008 and expected to be extended until 2009.

#### *Other Facilities*

- *Tsalka Mechanic Yard* - cleaned up, – reinstated and returned to the landowner;
- *Akhaltzikhe Mechanic Yard* – lease terminated, land cleaned-up and handed back to owner.
- *Rustavi Mechanic Yard* – lease terminated, land cleaned-up and handed back to owner.
- *Akhaltzikhe Batch Plant* – still in operation.
- *PSG-1 Batch Plant* – Reinstated and returned to owner.
- *Andezit (Geo-Tek) Batch Plant* – Project terminated lease and Geo-Tek has taken on the lease and wishes to retain the site as an ongoing business. This facility was visited by the IEC and found to be operated with acceptable environmental controls.
- *PSG2 Batch Plant* – pre-disturbed site, reinstated and returned to the owner.

#### *Aggregate Supplies*

At the time of the June 2007 IEC field visit a third-party operating gravel pit being used by the Project at Kashuri supplying aggregate for the Kodiana Projects was visited and improvements to the operation of this facility provided by the Project were observed, such as PPE and management of sedimentation pond for washwater runoff. The Project was also able to demonstrate that it had audited this facility in the past and found operations to be generally acceptable. The use of this facility was discontinued at the end of 2007 and aggregate has been supplied in 2008 by a similar facility at Agara. The Agara site was visited by the IEC and evidence was found to indicate that the Project had positively influenced operations in terms of pollution prevention systems and waste management procedures. Nevertheless, the site activities were deficient with respect to personnel protective equipment (PPE) and the sedimentation pond was close to breaching into the nearby river. It was understood at the time of the June 2008 visit that the Agara site might be discontinued in favor of a nearby site at Khrtisi. The Khrtisi site was also visited and found to have conditions similar to the Agara site.

The Kodiana projects have a requirement for substantial amounts of aggregate. Although precise quantities were not provided to the IEC, based on production estimates provided at the Agara and Khrtisi sites, it is apparent that BTC will be the prime user of aggregate from either of these facilities during the peak of the Kodiana Projects. The ESAP Local Procurement and Supply Chain Management states: “For contracts involving significant

quantities of aggregates, BTC requirements in terms of environmental impact minimization will be included in the scope of work.”

The IEC also visited borrow pits that were used during construction, but whose use has continued into Operations, such as at KP 153. This and several other similar borrow pits will eventually need to be reinstated.

### **3.2.2 Recommendations**

1. Considering that the aggregate requirements for BTC represent a significant amount for whatever provider is used, increase BTC's influence on these facilities such that their environmental and health & safety conditions improve;
2. Evaluate the actual usage of the construction-period borrow pits and reinstate them as appropriate.

## **3.3 WASTE MANAGEMENT**

### **3.3.1 Non-Hazardous and Hazardous Waste – Observations**

#### *Non Hazardous Waste*

The issue of solid waste disposal has been one of the most significant difficulties for the BTC Project in Georgia. The result of the June 2007 IEC visit was to result in assigning a Level III non-compliance for the ongoing disposal of domestic waste at the non-compliant Iagljuda disposal facility. As part of the Completion Certificate process, BTC committed to cease the use of this facility by the end of June 2008. In addition, BTC agreed to the development of an offset program for their history of non-compliant domestic waste disposal. Disposal of domestic non-hazardous waste at the Iagljuda disposal site was stopped June 9th 2008. This represents the achievement of the commitment taken by BTC to form the basis for their signing Schedule 20 and IEC's signing of Schedule 21. BTC has also initiated an offset program that provides land and support for the development of Georgia's first modern municipal disposal facility. The Level III non-compliance is considered rescinded.

BTC has stopped the use of the Iagljuda facility through a process of maceration of organic wastes and the compaction, baling and temporary storage of the non-organic domestic waste. This solution is acceptable, as long as the disposal of macerated waste is compliant with ESAP commitments. One ultimate disposal possibility being considered by BTC at the time of the IEC visit for the macerated waste was the Gardabani municipal treatment plant. The IEC approved an MOC allowing that the Gardabani site be used for the disposal of sewage sludge, but not for sewage. This facility was visited and found to be operating large volumes of sewage with only mechanical treatment systems. Disposal of sewage at this facility would almost certainly be a non-compliance should it be selected. BTC has indicated that they will identify a different compliant disposal solution.

Compaction, maceration and temporary storage of compacted solid (waiting for the EU compliant landfill) takes place at the premises of local contractor Sanitary Ltd. This facility was visited and found to have generally acceptable operating procedures and pollution prevention systems, although the field observation was made that the maceration area could be improved with better ventilation.

In parallel with working to eliminate the use of the Iagljuga facility, BTC has been in the process of planning to construct a new EU-compliant municipal landfill. This landfill has been sited, investigated with borings and the installation of monitoring wells, designed for a 40-year life, and the EIA document has been submitted to the MOE for approval. Approval is expected and BTC expected to have this facility operational by the end of 2008. The proposed site is located in the Rustavi area and was visited by the IEC. The site is not brownfield, but has low environmental value according to BP. Assuming site conditions are as described in the EIA documentation, the site appears to be acceptable and should represent a major breakthrough to waste disposal in Georgia when it becomes operational. The municipal landfill proposed as an offset measure is planned to be located next to the BP facility.

#### *Hazardous Waste*

The final solution for the disposal of hazardous waste stored at the Central Waste Accumulation Area (CWAA) at PSG-1 is based on international export and final disposal in EU-compliant facilities. A specialized contractor Veolia ES (UK) has been retained to export in the stored hazardous waste in an EU compliant manner and more than 4500 drums and IBCs were exported to compliant European disposal sites in Germany and Holland between February and May 2008. Export is ongoing for some asbestos and will continue for other hazardous waste generated by the Project in the future if alternatives are not available. Used oil generated mainly during pipeline construction was injected into the pipeline and injection continues on an as-needed basis.

During the mission the CWAA was visited and efforts to continue to improve this facility are evident. Housekeeping has improved with less quantities of waste and waste is better segregated. IEC still recommends putting a roof over the hazardous liquid storage platform, the construction of which is still pending. Another significant change to the CWAA is that a contractor for the recycling of plastic waste accumulated since the beginning of construction has been identified, representing a solution for approximately 100 tons of waste. The plastic waste (mainly used water bottles) is being sent to the recycler over a long period of time so as not to overwhelm their capacity for processing this material.

#### *Wastewater Treatment*

The Project has continued sewage treatment at Operations sites through the camp wastewater treatment plants (WWTPs) with discharges through reed beds. In general, these plants are functioning in compliance with ESAP commitments, although there have been some excursions to which the Project has shown a reaction. For example, in August and September 2007 the PSG2 camp the level of coliform bacteria was tested to be as high as 16,000 MPN. The problem proved to be a failure of the UV disinfectant lamp and the problem was resolved. Elevated coliform bacteria values were also recorded for May 2008 at PSG-2 camp, indicating that special efforts are required to continue the good management of effluent at that location.

PSG1 and PSG2 both have WWTPs that are not designed to treat the volumes of sewage produced at site, similar to the pump stations in Azerbaijan, which have identical problems. Control is based on sampling and manual management (transfer and treatment at camps) of sewage effluent and waste sludge. The current plan is for the PSG1 and PSG2 facility WWTPs to be replaced with new rotating biological contactor (RBC) units identical to the unit nearly completed in Azerbaijan at PSA-2 such that they are operational in 2009. It is understood that the new RBC treatment plants will have a different UV lamp setup, such that

it is much easier to verify the functioning of the lamp and resolve problems if it is found not to work. One operational RBC unit is present at the Kodiana Security Base and appears to be a significant improvement in terms of operation and maintenance compared to the existing WWTPs.

The spent sewage sludge from the PSG1 and PSG2 facility WWTPs are being sent to the Gardabani municipal WWTP for final disposal. This solution was the subject of an MOC approved by the IEC in September 2007. During this trip the Gardabani facility was visited. As noted above, this facility would probably be non-compliant for the disposal of sewage, but the facility does appear to adequately manage the disposal of sludge.

### **3.3.2 Non-Hazardous and Hazardous Waste - Recommendations**

1. The disposal of the macerated food waste has not yet taken place. Care should be taken that the final disposal of this material is compliant with ESAP commitments.
2. Construct a roof over the hazardous liquids storage platform at the CWAA.

## **3.4 POLLUTION PREVENTION**

### **3.4.1 Observations**

As the BTC pipeline is now operational, pollution prevention issues relate primarily to erosion and sediment control along the pipeline ROW and these are discussed in Section 3.5. Furthermore, as most of the camps are decommissioned, the pollution prevention systems at these locations were not a focus of this IEC mission. The situation encountered during the June 2007 IEC trip at the PSG-1 camp, where an OWS associated with the vehicle maintenance area next to the WWTPs was not cleaned up was not visited, but the IEC was provided with evidence that this area was cleaned up and the Level I non-compliance is considered rescinded.

As previously noted in the June 2006 and June 2007 trip reports, one issue common to both Georgia and Azerbaijan is the effectiveness of the main oil-water separators designed to clean up surface water from the pump stations. As previously noted, the situation is not a non-compliance with ESAP commitments, but their performance could potentially be compromised under emergency loadings. These systems were redesigned in 2005, but the modifications have yet to be completed. The actual schedule for constructing the improvements to the OWS system was not provided to the IEC, but it is understood that a schedule is being established. It is understood that the retention ponds at PSG1 and PSG2 are not fully lined as PSA2 in Azerbaijan is the only retention pond with a complete concrete liner in Azerbaijan and Georgia. The lack of a liner could be a contaminant pathway where groundwater is shallow and without concrete it is very difficult to clean out bottom sludge. During this field trip, the IEC was not provided with any indication as to whether the presence of shallow groundwater might be a concern at any of the stations where the retention pond is unlined.

Stack emissions testing was completed at three MOL turbines at PSG-1 and PSG-2 in November 2007. A round of tests for BTC generators was programmed to take place a few days after the IEC visit. Testing of the diesel generator stacks had previously not taken place, because of the improper positioning of the sample ports. As reported in the BTC Annual report, the available results of MOL Turbines stack emissions monitoring indicate non-

compliance with respect to the ESAP NO<sub>x</sub> emissions standard. A specific CAR was raised both in Azerbaijan and Georgia to set up actions to resolve the issue. The CO levels are high, but CO is not an ESAP non-compliance in Georgia. Reported SO<sub>2</sub> values are within ESAP limits.

The reason for the non-compliant NO<sub>x</sub> levels are the same as in Azerbaijan. At the time of sampling the NGP speed was about 90%. This is below the 93% threshold at which the turbine's low emission SoLoNox technology becomes operational, as discussed in greater detail in Section 2.4. As also noted in Section 2.4, ESAP requirements for turbine emissions are based on those in the EU Large Combustion Plant Directive. This specifies standards for gas turbines above 50MW thermal power operating above 70% load. Considering that the BTC turbines are about 28 MW thermal, the EU standard is conservative and it is understood that BTC is considering modifying the ESAP to emissions standards considered to better reflect the actual equipment used at the pump stations.

IEC will continue to assign non-compliance for the stack emissions monitoring - *Level I Non-Compliance, Emissions Management Plan - BTC Operations – Azerbaijan & Georgia (Commitment ID 1024)*. This non-compliance reflects the non-compliance of the MOL Turbines for NO<sub>x</sub>.

It is recognized that it is unlikely that air emissions represent a significant adverse environmental impact, as ambient air monitoring does not show any anomalies for NO<sub>x</sub>. Nevertheless, ambient air measurements have also been shown to be problematic. Measurements were taken at five locations around PSG1 and PSG2. There were four rounds of monitoring (January, March, June and October), but it is understood that the vendor company provided the results of only three rounds and SO<sub>x</sub> results were reported only for October 2007. The limited results indicate exceedance for SO<sub>x</sub> at two locations. Ambient monitoring data for 2008 are not yet available. The explanation for this deviation has been that the sampling may have been too close to the diesel generators. Similar to the situation in Azerbaijan, there have been some difficulties in properly locating the ambient monitoring points to achieve ESAP requirements, but it is understood that points have been relocated and measurements are ongoing. BTC has assigned a potential Level I non-compliance for the high SO<sub>2</sub> in a Corrective Action Report (CAR). It is considered a potential non-compliance by BTC, because the ESAP limit for this parameter is for an annual average and measurements have not been taken over a full year, yet. The IEC considers that the BTC CAR is sufficient definition of the non-compliance, but cautions that the monitoring points should allow for a firm interpretation of the ambient air quality at the nearest receptor.

## 3.5 ROW MANAGEMENT

### 3.5.1 ROW Reinstatement - Observations

Much of the time spent by the IEC team in the field was dedicated to the spot-checking of conditions along the ROW from KP 193 – KP 3. The primary scope of the survey was to observe final reinstatement across the combined BTC/SCP corridor.

A fundamental observation is that the erosion and sediment control efforts appear to have been generally successful over the past winter season. Erosion events were not observed by the IEC and not reported by BTC, even at locations where the vegetative cover is still not fully developed. Vegetation has advance substantially since the June 2007 visit, but there are still areas that have not properly revegetated, in particular at some high lands portion of the

RoW (for example at KP 193). Another example is the steep slopes at KP 166. Vegetation is starting to appear and overall conditions are much better than observed in June 2007, but further attention is still required. It is worth noting that the steep slope at KP 176.5, which has been one of the most difficult of all of the segments of the pipeline route, did not experience erosion over the winter and the seeding efforts observed to be taking place during the June 2007 IEC visit have been effective, as vegetation of this area is well underway. These and other areas have been identified by BTC and are listed for special attention and further bio restoration efforts. For those areas having revegetation problems, replanting and hydroseeding is just starting. The hydroseed mix has been the subject of extensive discussions with the Georgia MOE, but has been approved for use.

A significant new development with respect to the bio restoration of the pipeline is with respect to the re-planting of endangered plant species. Fourteen endangered species that were originally translocated from the pipeline to the Bakuriani Alpine Botanical Garden (BABG) and the Tbilisi Department of Plant Conservation (TDPC) are now being re-planted along the pipeline route. The BABG was visited during this mission and many plants were observed to be ready for re-planting along the ROW, an activity actually taking place at the time of the IEC visit at KP 193. The IEC will monitor the success of this program during future visits.

Another component of the bio restoration process has been the planting of trees and shrubs, which took place in 2007 along forested portions of the ROW as per the planting scheme outlined in the Pipeline Reinstatement Specification-Georgia. The percentage survival of these plants is currently unknown and is expected to be assessed in 2008 and 2009. A total of 175,000 saplings selected from 40 species of trees and shrubs were planted during this initial phase of bio restoration. A number of tree planting sites have performed poorly and replanting (or live-staking) is required in a number of locations. A number of important habitat and landscape sites on the ROW (particularly Mt Taukvetili and Tkhratskaro Pass) have not yet been planted with any woody species and large numbers of plants will be required to replant these areas to the extent proposed in the ESIA. Where observed by the IEC, the apparent survival rate has been variable. For example, in the general area of KP 190, the pine trees planted required staking to keep them upright, as winter snows had pressed many to the ground, but the other types of trees and shrubs appeared to be doing well. The IEC will also monitor the success of this program during future visits.

A concern to the reinstatement process identified during the June 2007 visit was the presence of motorized vehicles along the ROW. This is an issue that has been flagged by the environmental management in Georgia when evaluating aspects and impacts associated with the development of an ISO 14001 program. Additional information on this issue was not provided during this IEC mission, but it is noted that much of the ROW in Georgia is not passable with motorized vehicles as is the case in Azerbaijan and as the vegetation continues to return along the ROW it becomes less attractive as a road.

### **3.5.2 Off-ROW Reinstatement – Observations**

As noted in Section 3.2, all pipe yards and mechanical yards have been reinstated with the exception of two sites (Rustavi and Andeziti) that are still being used by BTC to support ongoing activities. The reinstatement of Tsalka and Marneuli camps is effectively complete, except for approximately 10% of the Marneuli site where containers are still stored.

The reinstatement of pipeline construction phase borrow pits is complete, except for borrow pits that are still being used for operations. These borrow pits have been identified by BTC and are designated as still requiring reinstatement. Locations include KP 107, KP 153 and

KP 162. Landscaping will be required to reinstate these sites when their use is no longer required.

The disposal of excess rock and spoil from pipeline construction was complete at the time of the June 2007 IEC visit. There are still some disposal locations actively being used in association with the construction of the GC14 access road, GB15 and GB16 that will require reinstatement. BTC reports that plans are in place to also reinstate these areas when they are no longer being used.

With respect to access roads, the main observation is that as long as the Kodiana Projects continue, access roads will continue to be required. The IEC approved in September 2007 an MOC for the upgrading and continued use of a Kodiana access road and construction of a bypass, the details of which are provided in the BTC Annual Report. BTC reports the completion of construction of 21 of 27 permanent access roads and repairs to 22 community roads in 2007. This effort was stopped due to winter weather, but started up again in May 2008.

### **3.6 KODIANA PROJECTS IN THE BORJOMI AREA**

#### **3.6.1 Observations**

The Borjomi Work Region extends from about KP 176 to KP 196. This area is one of the most significant parts of Georgia in terms of environmental, economic, cultural and aesthetic considerations. The area is part of the catchment of Borjomi Mineral Water, which is one of the most significant private developments in Georgia. Communities in this area are hopeful that tourism will be redeveloped and are concerned that the Project will adversely impact the landscape and their prospects for tourism.

The Kodiana area is where the Government of Georgia has requested that BTC implement special protective measures, including: temporary secondary containment, permanent secondary containment, a drain down tank, and construction of a security base for a patrolling security crew (the “Kodiana Project”). Critical issues include landscape alteration and aesthetics, potential impacts from altering the local hydrology, construction impacts taking also into account the presence of an archaeological site at one location, potential social consequences (especially from the stationing of about 200 soldiers at the security base), management issues during operation (e.g. waste management, pollution prevention requirements), access control (especially the Tori site location), ecology, and identification of relevant mitigation measures.

The Project has committed to strictly following best practices with multiple lines of protection and redundancy in design and operations on the pipeline to achieve as close to “zero risk” of an oil spill or leak as practical. At the time of the October 2006 IEC mission, the construction for all of the Kodiana Projects was scheduled to be complete by October 2007. As of June 2007, the completion of all projects was anticipated to be by the end of 2007, except for one of the secondary containments, expected to be completed in 2008. At the time of this trip the estimate was that the projects would be complete by the end of 2008.

According to the information provided during the visit and field observations, the status of the Kodiana Projects construction works is as follows:



- *Secondary Containment Sites*: four of the secondary containment sites were under construction at the time of the IEC visit, except for the Tori location, which still requires completion of the access road construction;
- *Emergency Drain Down Facility (EDDF)/G18*: construction is advanced and expected to be completed by the end of 2008;
- *Temporary Bypass Road (KP 181-184)*: This is still an operational road;
- *Security Base*: more than half of the facility is complete and has been turned over to the security patrols; completion is forecasted for the end of 2008.

The EDDF and the four active secondary containment sites was visited by the IEC and the maintenance of good sediment control and topsoil management as encountered in June 2007 continued to be observed at the these facilities and the environmental aspects of the construction appear to be well managed. Where topsoil stripping was taking place, an archaeologist was present to manage any late finds. The construction of the Tori access road was also visited. This access road project is one of the most significant footprints associated with the Kodiana Projects and will require substantial care to prevent adverse environmental impact.

### 3.7 ECOLOGICAL MANAGEMENT

BTC Ecological Management Plan Commitment F16/D6 defines the Project's responsibility to "...*Promote and undertake a wildlife monitoring programme in forest areas and wetlands to promote the conservation of endangered species...*" The Project has fulfilled commitment F16/D6 through the development and implementation of a Biodiversity Monitoring Programme approved by the Government of Georgia in May 2004.

The Biodiversity Monitoring Programme consists of five years of monitoring selected floral and faunal species of concern, the first of which was conducted in 2004. The floral component of the Biodiversity Monitoring Programme focuses on four habitats (wetlands, forests, high mountain meadows, and *Rhododendron* scrub), as well as on individual species of high conservation value. For the faunal component, multi-taxa monitoring is conducted with emphasis on IUCN and Georgia Red-listed species that occur in the vicinity of the ROW (as determined by the ESIA and as confirmed by the pre-clearance surveys).

During the current visit to Georgia, the IEC did not specifically review the ecological management programs in the field, but was provided with the 2007 biodiversity monitoring reports for both floral and faunal components.

#### 3.7.1 Biodiversity Monitoring

In previous reports the IEC recommended that the Project prepare a separate document that includes justifications for all indices, site selection, sampling protocols, and statistical tests (specific to the populations in question); citations for methods; all available baseline data in a concise format so that an independent reviewer will be able to verify the results; separate figures that clearly show the monitoring design at the different sites; and, clear explanations of why a particular method was chosen (supported with citations, when necessary). This information was made available for this IEC trip.

## ***Faunal Monitoring***

### ***Amphibian Monitoring***

Reproductive Syrian spadefoot toads (*Pelodytes syriacus* [IUCN Near Threatened and Georgia Red List]) were identified at one of the monitoring sites (KP 11) in 2005, but no individuals were located at the KP 40 monitoring site. In 2006 adult toads were recorded in early April in the channel at KP 40 and tadpoles were encountered in 2007, which leads to the conclusion that at that location the population is stable. KP 11 evidence has still not been found for the presence of the toads, although this might be due to the presence of predatory carp. Regarding the Caucasian mud-diver (*Pelodytes caucasicus* [IUCN Data Deficient/Georgia Red List]), consistent with IEC recommendations, new habitats (two compensatory ponds) for mud-divers have been found and are currently being monitored. The 2006 monitoring survey indicated the rapid recovery of this species after destruction of several breeding pools along the ROW between KP 181-185. The 2007 monitoring surveys show that almost all suitable breeding sites located in forest (even by roadsides) have been colonized by mud-divers. The conclusion of the 2007 Annual Report is that the negative impact of the pipeline construction activities on the Caucasian mud-diver has been successfully mitigated and it is not anticipated that project activities are likely to further impact the species subpopulation. Consequently, this report suggests that the monitoring of the Caucasian Mud-diver could be completed at this stage. It is understood that BTC agrees with this suggestion and intends to submit an MoC to this effect, possibly as part of an MoC covering a revision to the ESAP.

### ***Reptile Monitoring***

Three species of concern were included – the snake-eyed lizard (*Ophisops elegans*), the European marsh turtle (*Emys orbicularis*), and the Caspian terrapin (*Mauremis caspica*). In response to IEC concerns, BTC has endeavored to demonstrate some improvement to the means by which the snake-eyed lizard has been monitored. In 2007 the lizard abundance was lower than in previous years (possibly due to the unusually hard winter), but no clear trend in the abundance of the snake-eyed lizards throughout the study area has been documented in the entire monitoring from 2003-2007. No significant differences in lizard abundance have been recorded between the monitoring and control sites in any year and the Annual Report again suggests that the removal of this species from the program of further monitoring should be considered. It is understood that BTC agrees with this suggestion and intends to include the Snake-eyed lizard in the MoC mentioned above.

Monitoring of the European marsh turtle and the Caspian terrapin took place in two monitoring locations and two “control” sites, one of the monitoring locations being the stream at KP 11 (also used for monitoring of the spadefoot toad). According to the 2007 surveys, a decline in the numbers of European marsh turtles was observed. This could be attributed to the unusually cold spring, lack of water in side canals or periodic population fluctuations reflecting the species complex population dynamics. Further surveys and studies are needed to clarify whether it is a decline or a fluctuation. A corresponding negative trend in the abundance of *Emys orbicularis* was observed between 2004 and 2007, but this trend was not significant across the survey sites, and more surveys are required to verify the trend. The Annual Report recommends continuing the monitoring of only the European marsh turtle taking into consideration that monitoring of Caspian terrapin has not shown any trends that could be associated with the pipeline project activities. The IEC supports these recommendations.

### *Avian Monitoring*

The project's avian monitoring efforts continue to be extensive including the monitoring of wintering waterfowl, resident waterfowl, nesting populations, breeding pairs, and the Caucasian black grouse (*Tetrao mlokosiewiczii* [IUCN Data Deficient]). Following IEC recommendations, the monitoring has improved in terms of stated goals and means of analysis. Similar to the results from the 2006 monitoring program, the end result of this monitoring and analysis at the end of 2007 continues to be somewhat ambiguous based on a variety of different parameters (e.g. lakes chemical composition, food base supply, habitat fragmentation due to human factors, etc) deemed to be building a clear picture of species' vital activities considering improvement in their respective populations' stability, i.e. referring on the positive trend. Although some species have apparently increased, others have decreased. At this point there is no reason to believe that pipeline activities have had a significant negative impact to any of the species, the Annual Report indicates that more monitoring is necessary for all avian species and the IEC concurs with that recommendation.

### *Mammalian Monitoring*

A number of bat species, Brandt's hamster (*Mesocricetus brandti*), and the common otter (*Lutra lutra* [IUCN Near Threatened]) were included for the mammalian monitoring effort. The most significant find is the continued decline of the bat population. The Annual Report concludes that after the completion of the construction of the pipeline, the major limiting factor for bats along the ROW has been the destruction of mature trees and forest patches. In addition, increased noise, vibration and road dust might affect the distribution of bats. This report recommends that mitigation measures to protect bats should be taken at the following sections of the pipeline: KP 179-182, KP 186-189, and KP 194-201. These mitigation measures should be a combination of forest protection and construction of up to 400 artificial bat roosts. The report also recommends continuing the bat monitoring surveys to further define trends in bat numbers and diversity and identify variables accounting for the trends and the IEC concurs with these recommendations. It is understood that the additional surveys will be on a smaller scale than proposed in the faunal monitoring report. They will focus on assessing the effectiveness of the artificial bat roost project by measuring percentage of roosts colonized, shelter sustainability, anthropogenic pressure, etc. The Brandt's hamster also showed a decline, but the common otter has made a reappearance. In both cases, the Annual Report recommends additional monitoring with which the IEC concurs.

### *Aquatic Monitoring*

Dragonflies and damselflies (two suborders within the order Odonata) continue to exclusively being used as indicator taxa. The results of the 2007 surveys indicate that cold spring delayed dragonfly egg hatching by 3-4 weeks. At all sites the ratio of one-week-old and younger dragonflies was high and dragonfly numbers were reduced at sites located at higher elevations. Statistical tests suggest no negative impact of the pipeline operations on dragonfly abundance and species diversity, as there have been no significant differences between the monitoring and control sites. Nevertheless, it is recognized that impact may be delayed and the Annual Report recommends continuing with monitoring.

Regarding the ichthyology component, BTC provided a separate report entitled Biodiversity Monitoring Programme – Ichthyological Component, dated 2007. The watercourses crossed by BTC and SCP pipeline were assessed for in-stream water quality, macro-invertebrate communities and habitat. The monitoring was conducted during early autumn of 2007 by joint team of LSG Applied Technologies LTD and the Institute of Zoology, Tbilisi. This report does not arrive at conclusions, but indicates that additional monitoring will be required

to evaluate the healthiness or vulnerability of fish stocks in the rivers crossed by the pipeline. The IEC encourages these studies, but notes that in the case of fish species it will probably be impractical to identify pipeline impact at this point in time. Provided that there are no abnormal incidents (e.g. oil spills), it is not expected that the pipeline will have any impact on fish populations, but the quantitative and qualitative data gathered over the 2007-2009 period should establish a baseline for future potential industrial footprint/s (if any).

With respect to mountain wetlands, in 2007 the IEC was informed that a three year scope for high mountain wetland communities' botanical inventory/eco-compensation study was agreed with Georgian government in May 2007 with a scope of work consisting of three stages: in 2007 a literature review on environmental conditions and flora and vegetation of the study area, as well as an initial field reconnaissance; in 2008 - 2009 detailed botanical surveys applying phytosociological methods and identification of high conservation value sites based on floristic quality index and other qualitative and quantitative characteristics. During this mission, the results of the initial survey were presented to the IEC. The initial results are not encouraging in the sense that essentially all of the mountain wetlands surveyed show some adverse anthropological effects ranging from eutrophication of waters to draining of the wetlands for agricultural purposes. A full evaluation of the condition of these wetlands should prove to be of high scientific interest, meriting of publication.

### ***Floral Monitoring***

Based on IEC review, of the Annual Biodiversity Monitoring Program – Floral Component for 2007, the floral biodiversity monitoring continues to represent a significant achievement of the Project. One concern consistent with previous reviews is with respect to invasive species, specifically Common Ragweed (*Ambrosia artemisiifolia*) now encountered in the ROW section between KP 90 and 91 and a potentially invasive plant, Reed Canary-grass *Digraphis arundinacea* that has been encountered in the vicinity of Lake Alygyol (KP 127-128) since 2006. The Annual Report recommends conducting short-term scientific research to identify the measures of efficient control and eradication of Common Ragweed populations and also separate survey is required to study the dispersal mechanism of Reed Canary-grass and its invasion potential. The IEC concurs with these recommendations.

In 2007, significant negative changes in some parameters of target plant populations were recorded, specifically with respect to the Frog Orchid (*Coeloglossum viride*), Snowdrop (*Galanthus alpinus* var. *alpinus*) and Globe-daisy (*Globularia trichosantha*). The distress to these plants appears to be caused by an intensification of grazing in the vicinity of relevant sections of the ROW (KP 151-152 and 191-192, Mt. Tavkvetili shoulder and Kodiana pass, respectively). The 2007 year survey also revealed the absence of 4 individuals of Gentian from a plot on the Tskhratskharo descent (KP 176 - 177), which may simply be due to inter-annual fluctuations in population numbers. Potentially more serious problems have been observed in the forest test plots, of which eight plots were found with obvious signs tree cutting and four of these plots were lost due to removal of all canopy trees and the forest vegetation has been transformed into a treeless secondary meadow. Unsanctioned forest cutting is continuing in Georgia and the 2007 survey indicates that the most intense logging continues to take place in the Tsikhisjvari-Tiseli area (KPS 187 – 204).

A positive note to the biodiversity monitoring is that the control plots for scrub plants and meadows have not experienced measurable changes and do not appear to have been impacted by construction activities. It should be noted that where significant impacts are occurring, they do not appear to be related to pipeline activities.

Recommendations within the Annual Report include: with respect to forest land, re-create forest habitats similar to those lost in 2005 as a part of Forest Ecocompensation Programme; with respect to meadows, grow 100 individuals of Fritillary (*Fritillaria ophioglossifolia*) and reintroduce them in their original habitat on the shoulder of Mt. Tavkvetili; collect 80,000 cuttings in areas covered with dense Rhododendron thickets and transplant them directly onto the RoW during the re-instatement in the area of on the shoulder of Mt. Tavkvetili; and conduct brief hydrological studies of wetland ecosystems and fluctuations of hydrological regimes at specified sites located near Lake Bedeni, KP 100 – 101; Lake Alygyol, S of village Santa, KP 127 – 128; and SW of village Khando, KP 149 – 150. The IEC concurs with these recommendations.

### 3.7.2 Recommendation

1. The annual biodiversity monitoring reports contain several recommendations with which the IEC is in agreement: continue monitoring, especially in areas where the results are inconclusive; compensate for damaged habitats (e.g., bat roosts in the Tskhratskaro-Kodiana area; further evaluate current conditions of the channel at KP 11 and develop mitigation measures, if necessary; and carefully monitor invasive plant species and develop a mitigation plan, if appropriate (repeat recommendation).

## 3.8 OFFSET MITIGATION AND ENVIRONMENTAL INVESTMENT PROGRAMS

During the mission, the IEC was updated on the status of the Offset Mitigation Measures and the Environmental Investment Programme (EIP) in Georgia. Implementation of the EIP projects committed in 2006/2007 has continued into the Operations phase, except where modifications were made on the basis of a Level II cross-country MOC where the EIP programs were modified in May 2007. In Georgia, the most significant change was the elimination of the Sustainable Forest Pilot Project, with a re-allocation of funds to support further stages of projects undertaken under other key priority themes. The EIP programs still ongoing in 2008 have the following titles:

- Caucasian Black Grouse (CBG) Research, Monitoring and Conservation Management;
- Small Grants Programme for NGO Capacity Building – Phase II;
- Management Planning for Ktsia Tabatskuri Managed Reserve.

Based on a presentation provided to the IEC it is understood that the Caucasian Black Grouse program will be extended through 2008. With respect to the Small Grants Programme, first round grants were disbursed to a total of 14 national NGOs from Kvemo Kartli and Samtskhe-Javakheti regions. With respect to the Management Plan for Ktsia-Tabatskuri Managed Reserve, a draft management plan has been developed and comments are being received from key stakeholders and the public consultations and awareness timeframe extended to the end of October 2008. It is expected that stakeholders' endorsement will lead to Management Plan implementation in 2009.

In terms of offset compensation, several changes were incorporated into the program in May 2007 as part of a Level II MOC process:

- expansion of species incorporated into the Rare Floral Species Programme (population enhancement element) and revised re-introduction timing;

- extended timetable for Management Planning for Ktsia Tabatskuri Managed Reserve as noted within the discussion of the EIP programs;
- definition of the Borjomi Kharagauli National Park Support Zone Programme - Environmentally Sound Livestock Farming (ELF) Project; and
- early stages of implementation of the Forest Ecocompensation Programme.

Except for those programs associated with the EIP, the IEC has not received information to update their status, except to note that the scopes of some programs are still under negotiation with the Georgian MoE, especially with respect to the Forest Ecocompensation Programme. The MoE has also indicated to the IEC that they recommend that the Caucasian Black Grouse program and the ELF Project to be closed and that they would like to see the initiation of a project to develop to establish a nursery facility.

### 3.9 CULTURAL HERITAGE MANAGEMENT

Cultural heritage management for the specific aspects of the BTC Project in Georgia under Operations is predominantly the responsibility of BP-GEO, whose responsibilities also includes the SCP and other projects managed by BP in Georgia. The governing procedures are now defined in the Operations Cultural Heritage Management Plan (CHMP) that covers both Azerbaijan and Georgia, completed May 2007, which focuses on the main issues of cultural heritage that could be faced by Operations:

- damage to heritage resources as a result of earthwork associated with maintenance, inspection, or other common operational activities on the ROW or associated facilities;
- contamination or damage to heritage resources as a result of oil spill and subsequent clean up activities;
- damage to heritage resources as a result of soil erosion; and
- damage to heritage resources as a result of looting.

Work to date for the BTC Project has been with the Otar Lordkipanidze Centre for Archaeological Studies (CAS), an organization within the Academy of Science of Georgia. The Georgian government's cultural properties review and compliance agency, as specified in the *Georgian Law on Cultural Protection*. In May 2007, the structure of the cultural heritage authorities in Georgia changed with a new *Georgian Law on Cultural Heritage* (June, 2007). The CAS is no longer a legal authority and the Center of Archaeology(CA)is now part of the Georgia National Museum (GNM).

#### 3.9.1 Observations

The BP-GEO is responsible for protection of the BTC pipeline as described above, whereas the follow-up to the construction phase work rests with Communication and External Affairs (C&EA) and their responsibilities extend to both Georgia and Azerbaijan. In essence, C&EA is responsible for Phase 4 – curation of finds, analysis, display of finds, and publication of information associated with the construction phase. C&EA in Georgia is responsible for protection of sites previously excavated and managing any new developments in the Operations Phase as well.

In Georgia, the BP GEO Cultural Heritage Team still has responsibility for field investigations. The ongoing construction activities associated with the Kodiana Projects requires monitoring to protect archaeological materials that could appear as chance finds during topsoil stripping. The IEC observed monitoring of topsoil stripping by an archaeologist at the active construction zone of the Kodiana Projects during this field trip. Also, archaeological excavations of two sites damaged during the construction phase are anticipated for June-July 2008. Excavation of a possible Bronze Age possible burial site along the Tetrtskaro–Tsalka main road, Tetrtskaro District is scheduled to start in late June. Excavation of a Bronze Age settlement at Darakow Borrow pit, Tsalka District is scheduled to start in late July. BTC GEO reports that most of the compensation for sites damaged during the construction phase is covered under an “Archaeology Claims Agreement” signed by BTC/SCP and the GNM, which states that damaged sites along the ROW are effectively preserved in situ and the direct compensatory funding for damages should be directed toward additional laboratory investigations. This agreement is consistent with recommendations made by the IEC in previous reports that compensation be associated with improving the capability of the local Georgian authorities to curate, interpret, and report the findings from the main archaeological sites identified during construction, rather than initiating new excavations. Of the several sites considered for compensation, only two have been selected for additional excavations due to their high vulnerability to additional damage.

Within the framework of “Archaeology Claims Agreement” a series of lectures and workshops is planned on Survey/Landscape Archaeology and Modern Archaeological Studies. Two lecturers from the U.S. (Christopher Ratte, New York University, Professor of Classics and Fine Arts and Reid Ferring, University of Texas, Center of Environmental Archaeology) have been invited by GNM management and the lectures and workshops should start in late June. Also, under the framework of this agreement upgrading of storage and display facilities is now taking place. This includes the upgrade, renovation and exhibition at the GNM’s Akhaltsikhe Museum of archaeological materials discovered during the BTC/SCP pipelines construction in Borjomi and Akhaltsikhe Districts. This is being done in close collaboration with BP GEO Cultural Heritage Team. The third activity which takes place under the “Archaeology Claims Agreement” is the bilingual publication of archaeological scientific articles related to the BTC/SCP construction projects. The Editorial Board of the Centre of Archaeology, in close collaboration with BP GEO Cultural Heritage Team, is preparing a draft of this book.

A major development since the June 2007 IEC field visit took place on March 8, 2008, when BP on behalf of both the BTC and SCP projects signed a grant agreement with the Smithsonian Institution. The program has two main goals - public outreach and capacity building, targeted for the Gobustan State Historical-Artistic Reserve (GSHAR), the Azerbaijan Institute of Archaeology and the Ethnography and the Georgia National Museum. The total value of this program is just over \$1 million and its duration is two years.

The public outreach component of the program will be implemented via a number of activities. These include:

- publication of 1000 copies of a catalogue on the cultural heritage program and on the artifacts discovered in the three countries (Azerbaijan, Georgia and Turkey) along the BTC/SCP route. The catalogue will be published in four languages: Azerbaijani, Georgian, Turkish and English;

- creation of a BTC/SCP cultural heritage website as means for public outreach. This website is expected to describe the BTC/SCP Cultural Heritage Program and introduce the archaeological sites and artifacts discovered in the three countries along the BTC/SCP pipelines in an interactive way that will be publicly accessible;
- preparation of an international conference on topics relating to the interpretation of cultural heritage discoveries along the BTC/SCP pipelines corridor. The conference, which will be held in Georgia, is expected give an opportunity for the experts involved in the BTC/SCP archaeological excavation works, as well as those from the three countries and around the world, to analyze and interpret the BTC/SCP findings in a manner consistent with the international practice. The cross-country conference will also compare analytical procedures and curatorship practices and findings across the three countries. The conference papers will be then published; and

All of the above programs have been previously recommended by the IEC.

The capacity building component of the program is expected to be implemented by means of a number of activities including internships, training, workshops, and lectures for the staff of Gobustan State Historical-Artistic Reserve, the Azerbaijan Institute of Archaeology and the Ethnography and GNM. It is planned that representatives of the beneficiary institutions will be trained on museum management, collection processing, artifact handling, assessment of the damage to the rock art; proper documentation and registering of monuments; storage and protection of materials applying new computer technologies and programs; management of collections of scientific, literary and historical value; exhibitions management; and sustainable tourism development.

In addition to the above activities, significant effort has been expended to train Operations personnel in the procedures that need to be followed to protect cultural heritage along the ROW. This has involved the integration of archaeological site information within the Project GIS and defining procedures to manage cultural sites. Part of the ISO 14001 certification process has been to emphasize awareness of cultural heritage sensitivities among the pipeline technicians such that the potential for damage to archaeological sites during erosion control works, pipeline repair, etc. is minimized. Cultural heritage information is also being incorporated within the Oil Spill Response Plan (OSRP).

### **3.9.2 Recommendations**

2. Make sure that the Smithsonian Institution is supported by the archaeologists who actually were in the field for the construction phase excavations, especially for the program in Georgia, as it appears that the archaeologists that worked during the construction phase in Azerbaijan are already involved.

## **3.10 MEETING WITH GOVERNMENTAL OFFICIALS**

A meeting was held between the IEC and representatives from the Georgian Ministry of Environmental Protection and National Resources (MoE) and the Georgian International Oil Corporation (GIOC) on June 14, following a request by MoE to BTC. This was the sixth meeting held between the IEC and the MoE/GIOC, and MoE/GIOC was able to voice their concern and priorities about several environmental and social issues associated with the BTC project.



- Reinstatement, including: soil reinstatement; erosion control; landscape monitoring; the Biorestoration Specification Plan and Method Statements; monitoring the results of nurseries; rare floral species management; and monitoring of invasive species;
- Biodiversity Monitoring Program (Biodiversity Monitoring Report – Floral and Faunal Component - 2006);
- Forestry - Eco-compensation Programme;
- Environmental Management Plans for Operations, specifically the Ecological Management and Monitoring Plan;
- Environmental Investment Plan (EIP), including the following topics: Caucasian Black Grouse; Brown bear; management planning for the Ktsia-Tabatskuri Managed Reserve; Sustainable Forest Management Pilot Project, the Borjomi-Kharagauli National Park/Support Zone; Enhancement of Environmental Education Project; Environmentally Sound Livestock Farming Project; and the Management of Small Grants Programme;
- Compensation damage for Ichthyofauna;
- BTC Oil Spill Response Plan Approval Conditions; and
- Waste management.

Although communications are reported by both the MoE and BP GEO to have substantially improved, there still appears to be room for improvement. The IEC suggested to MoE that informal communications be supplemented with formal, regular meetings where meeting notes agreed by both sides are prepared. This suggestion was also given to BP GEO during the site visit.

## **4 TURKEY**

The BTC Project in Turkey encompasses 1,076 km of pipeline extending from the Georgia - Turkey border in the Posof District to the Ceyhan Marine Terminal (CMT) on the Mediterranean Sea. From the Georgian border, the pipeline Right-of-Way (ROW) crosses the provinces of Ardahan, Kars, Erzurum, Erzincan, Gumushane, Sivas, Kayseri, Kahramanmaraş, Osmaniye and Adana, terminating at Ceyhan. The BTC Project runs approximately parallel to the existing East Anatolian Natural Gas Pipeline (NGPL, completed in 2001) for about 30% of its length (approximately 330 km), between the cities of Erzurum and Sivas (Lot B). The BOTAS Gas Pipeline is parallel to the BTC pipeline at the Georgian border, where it connects to the South Caucasus Pipeline (SCP), but diverges until it terminates in Horasan. The BTC pipeline terminates at the Ceyhan Marine Terminal (CMT), which includes a 2.6 km long jetty and offshore loading facility, seven one-million barrel storage tanks, a central control building, housing compounds and administration, and a fiscal metering system.

Linefill of the BTC pipeline with oil began from the Sangachal Terminal near Baku on 18th May 2005, and crossed the Georgian Turkish border on 18th November 2005. Oil reached the Ceyhan Marine Terminal (CMT) on 28th May 2006. The first shipment of oil sailed from Ceyhan on 4th June 2006.

With linefill, the transition from Construction to Operations was initiated. BOTAS assumed responsibility for the operation of the pipeline until Provisional Acceptance (PAC) on 28<sup>th</sup> July 2006. From 29<sup>th</sup> July 2006 onwards, BOTAS International Ltd (BIL), the Designated Operator of the BTC pipeline in Turkey, assumed responsibility with BTC Co. continuing to maintain an overall assurance role.

The June 2008 audit in Turkey consisted of a site visit of selected sections of the pipeline right-of-way (ROW) between Erzincan and the Turkey-Georgia border and a visit to the Ceyhan terminal. The field visits were complemented by a review of documentation pertaining to project environmental, social and health and safety management as provided to IEC by BTC.

Specific comments relating to the data are provided in each of the relevant sections that follow.

### **4.1 PROJECT STATUS**

BTC provided the following summary of project status, relative to IEC's scope of work, as of June 2008. In addition to pipeline operations, IEC was provided information regarding three additional project components; Expansion 1.2; MARPOL compliance, and Enhancement projects.

- provisional acceptance was signed on 29<sup>th</sup> July 2006. BIL is the Designated Operator of the BTC pipeline in Turkey, with BTC assuming an assurance role. The warranty period terminated in July 2007;
- according to BTC, the outstanding items to be completed include 6 on-RoW PAC, 35 Warranty, 34 off-RoW items which are to be completed in 2008. BTC has hired a contractor, Gencsari-Dolphin, to undertake reinstatement related to warranty items.

- BTC is planning expansion of export capacity beyond the one million barrel per day design capacity of the pipeline. BTCX 1.2 will expand export capacity to 1.2 million barrels per day (currently in the execute phase);
- BTCX 1.2 will employ a chemical drag reducing agent (DRA) to increase pipeline capacity to 1.2 MM bpd. In Turkey, five injection points will be used; one at each of the four pump stations (PT1-PT4) and one at BVT 50. Pre-winter 2007-2008 civil works were almost completed at all pump stations. Commissioning is planned to begin in September 2008 and it is intended that operations will commence by the December 2008. TEKFEN is the appointed construction contractor;
- the Marpol project is to treat ship's oily water slops<sup>4</sup> at Ceyhan and is intended be operational in early 2010. It is currently understood that the project will include the following components:
  - 2.6 km 12 or 16 inch pipeline from the jetty to onshore,
  - 2 x booster pumps onshore to transfer slops into one of two 4000 m<sup>3</sup> storage tanks,
  - slops pumps (50 m<sup>3</sup>/hr) to pump slops through the separation facilities,
  - flocculant and demulsification injection,
  - Separation using a Corrugated Plate Interceptor,
  - dissolved Air Floatation Unit,
  - sludge collection and disposal (sludge tank),
  - storage of recovered oil prior to re-injection into export loading lines,
  - storage of treated water prior to discharge,
  - marine Outfall for discharge of treated water, and
  - one way access roads;
- there are two sets of BTC enhancement projects envisaged; one BIL managed and the other BTC managed. The BIL environmental projects include the following:
  - installation of chlorine storage cabinet at CMT WWTP (completed),
  - completion of bund in CMT pigging area (completed),
  - installation of fire bends in PT1 oily-water separator (as incoming line installed at wrong elevation and oil and water is passing above separator),
  - construction of treated waste water discharge by-pass lines around the storm water lines at PTs and CMT,
  - installation of UV lamps and sand filters at all WWTPs,
  - bunding of foam storage area at CMT,
  - installation of water meters on incoming potable water lines,

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<sup>4</sup> "Slops" is a generic industry term for oily mixtures arising from crude oil cargo tank draining and tank washing activities, and other oily residues from the sludge of engine fuel treatment, oily wastes from engine room maintenance and waste from and bilge water tanks; all of which will contain a significant percentage of fine solids.

- installation of valve on PTs and CMT stormwater discharge lines (completed), and
- Installation of valve on PTs and CMT primary withholding pond discharge lines (which feed to stormwater ponds).

The BTC environmental projects for 2008/2009 include the following:

- IPT1 Waste Water Treatment Plant Installation;
- extension of water heater stacks to meet H&S requirements;
- installation of buoys at CMT to delineate the exclusion zones;
- installation of a spare jetty volatile organic compound (VOC) blower and cross-over to provide back-ups in case the VOC blower system is down;
- installation of pig-cleaning areas at PTs and CMT;
- landscaping of the ceremony area at Ceyhan;
- installation of chemical storage areas at all facilities; and
- installation of a settling tank for the WWTP at Ceyhan.

## **4.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES**

### **4.2.1 Observations**

In Turkey, a turnkey contract was signed between BTC and BOTAŞ who subsequently awarded EPC contractors the construction work in each of the three Lots, the Pump Stations, and at the CMT. BTC maintains an assurance role over both BOTAŞ and the EPC contractors through to final acceptance by BIL.

BTC also maintains an assurance role over BIL in fulfillment of Operations ESAP commitments in Turkey.

#### ***BTC***

As of June 2008, the BTC E&S organization has been restructured to reflect changes necessary for E&S assurance during operations. The BTC E&S organization is now structured into three departments; environmental assurance, corporate social responsibility (CSR) which includes community relations and the Community Investment Program (CIP), Regional Development Initiative (RDI) and projects assurance:

- the environmental assurance group includes an environmental assurance manager, pipeline environmental assurance coordinator, facilities environmental assurance coordinator, CSO Capacity Building Programme partner, reinstatement supervisor and environmental consultancy contractors;
- the corporate social responsibility group includes a corporate social responsibility manager, a social coordinator, a CIP coordinator, CSO Capacity Building Programme partner, and social consultancy contractors; and

- the projects assurance group includes a projects assurance manager, an E&S projects assurance manager, an E&S projects assurance coordinator, 5 x HSE field assurance staff, and environmental consultancy contractors.

IEC observes that the BTC assurance resources are adequate, but personnel undergo significant travel from the Ankara office.

### ***BOTAŞ***

As of June 2008, Botas Project Directorate (established for the construction of BTC) no longer has any E&S personnel on staff.

### ***BIL***

The BIL Health Safety and Environment Directorate has three departments: environment, emergency response, and health and safety.

#### **Environment Department**

An environmental manager reports to the HSE Director, and oversees the following:

- an environmental supervisor, (vacant) and two environmental engineers at the CMT;
- an environmental supervisor, (vacant) and eight pipeline HSE engineers (of which two are vacant at PT4) for pipeline;
- an environmental supervisor – office (vacant), an EMS engineer and a compliance engineer (vacant); and
- two consultancy companies are employed; Springtime Consultancy (ISO 14001) and Dokay (environmental).

In addition, BIL has established a Pipeline Technical Management Department (Patrolling and Reinstatement Organization) to manage ROW issues. The organization has a manager, a ROW supervisor, a reinstatement expert, one GIS chief and two GIS experts, six ROW patrol teams (5 ROW, one CMT) and two reinstatement teams. In addition, an expatriate advisor provides technical assistance to the Patrolling and Reinstatement teams.

#### **Public and Community Relations (PCR) Team**

As of June 2008, a Public and Community Relations (PCR) chief, reports to the Human Resource (HR) Director and heads the PCR team. The PCR chief oversees a PCR Supervisor, a land supervisor and five PCR experts (one for Area 1: km 0-164 and PT-1, one for Area 2: km 164-373, PT2 and PT3, one for km 373-575 and PT4 and one for Area 4 and 5: km 575-940 and two staff for Area 6: km 940-1076, including the CMT).

As noted by IEC and the SRAP Panel in 2007, the PCR organization of BIL continues to be insufficient to handle the significant amount of work needed to maintain good community relations across the length of the BTC ROW in Turkey. In June 2008, IEC observed that the BIL PCR organization has adequate coverage geographically in the field, but no back-to-back capacity; PCR staff effectively only work 2 weeks per month.

IEC is concerned about the lack of PCR overall resources and no back-up for rotational leave time of PCR personnel. As this issue was raised by both IEC and SRAP in 2007, and there has been no apparent response from BIL since that time, a *Level 1 non-compliance, Social Management Plan, Turkey (Commitment ID CH7 S2)* is assigned for failure to implement adequate PCR program since June 2007.

In June 2008, IEC was informed that previous concerns about lack of mobility and vehicles have been resolved. PCR staff now has dedicated vehicles.

#### **4.2.2 E&S Management Organization and Resources - Recommendations**

1. The BIL E&S team is fully operational but is limited by a number of key vacancies. BIL should resolve personnel shortages in a timely manner to staff the BIL HSE and PCR organizations at a level representative of their functional organization and ISO commitments.
2. IEC recommends that the Project, and in particular BIL should address concerns about lack of full-time presence of PCR personnel in the field. Back to back coverage of PCR personnel in the field should be provided.
3. Although BTC has mobilized additional Health and Safety (HS) advisors into BIL, IEC has concerns about HS staffing, capacity and capability given Project cutbacks.
4. IEC recommends that BIL consider establishing a CSR department embodying CR, governance, HR and other functions and moving from a reactive response to PCR issues to a proactive response.

### **4.3 ENVIRONMENTAL TRACKING AND PERFORMANCE**

#### **4.3.1 Observations**

As part of ISO 14001 certification in May 2008, BIL has developed a component of the BIMS information management system to the collection, storage and analysis of environmental data. IEC was informed of the data management process as follows:

- Dokay (environmental consultant to BIL) undertakes sample measurements on site;
- When data is generated (e.g. stack emissions monitoring), it is sent to BIL as a report in pdf format. The aqueous discharges monitoring data are sent to BIL in pdf format at the end of each month (sampling carried out at the beginning of each month). This data is uploaded into the BIL Intranet to ensure there is access from all sites; and
- BIL then fills out an Excel file to BTC (Ops-GHGENV\_200\*(live).xls) and sends the data to BTC. Both BIL and BTC use this file that it is updated on a monthly basis and sent until the 7<sup>th</sup> day of each month.

BTC also informed IEC of the following:

- BTC conducts annual compliance audits and do regular site visits of all facilities. During the visits, non-compliances and recommendations resulting in corrective actions are identified and logged in an action tracking database (Ops Environmental Action Tracker\_Facilities.xls) which is then shared with BIL for their internal use and action;
- BIL QA/QC department has developed a separate action tracking database (BIL ATS) which records the actions from the audits (not all have been recorded yet since the system is still being developed), Management of Change (MOC), Preventive and Corrective Action Requests (PCAR), incidents, contained spills and Safety Observation Conversation (SOC)/STOP cards; and

- during the ISO 14001 certification audit, BSI observed a non-compliance with regard to the aspect/impact register in that some wastes types were not categorized to reflect specific environmental risks they may pose;
- in June 2007, IEC noted that there were a number of inconsistencies with BIL's aspects and impacts register and recommended improvement as part of ISO 14001 certification. Clear identification of responsibilities and sign off procedures were recommended to confirm implementation of any corrective actions. During the June 2008 visit, IEC was pleased to note a significant improvement of BIL's registers for the pump stations and CMT and was informed that similar standards apply to key BIL contractors.

#### **4.3.2 Environmental Aspects and Impacts Register – Recommendations**

IEC noted a significant improvement in the management of environmental data associated with BIL operations. However, the file provided to IEC as part of the June 2008 visit was not up to date for a number of parameters, and a number of data sets in recent months were missing. It is recommended that reporting measures be improved and that environmental data entry into the BIMS are regularly entered to ensure that monitoring data is recorded on a current and consistent basis.

## **4.4 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 potable water supplies and general aspects of camp management.

In June 2008, it was not possible to view all former construction camps to verify if they have been reinstated according to ESAP commitments, or transferred to third parties. BTC provided two due diligence checklists for Hanak and Kars Camps. A site visit to Kars Camp was undertaken during the June 2008 field visit.

According to BTC, there are no status reports for Kars and Hanak camps. Lot B reports have been prepared by BOTAS and are currently under BTC Co's review. The Lot C report is under BTC Co. review and is not likely to be finalized before September 2008. Documentation on handover for Kars and Hanak camps was made available during the June 2008 visit.

#### **4.4.1 Construction Camps – Current Conditions**

According to information provided to IEC by BTC, Kars Camp and Hanak Camp were transferred to the Governorships of Kars and Ardahan on 28 March and 27 March, 2008, respectively. In both cases, according to the release documents *"officials of the Entity (Governorship of Ardahan) and BOTAS have performed status assessment on the date when the protocol hereby was signed. As result, it has been detected that there is no damage, soil pollution, waste water, chemical waste, trash and similar adverse element on the land."*

During the June 2008 visit IEC undertook a site walk-around in the Kars Camp and noted the following:

- CWAA clean, but garbage noted outside;

- presence of garbage was noted throughout the camp; evidence of burning;
- pipe, scrap metal and equipment scattered throughout the site; and
- some buildings partially dismantled, representing safety concerns.

IEC also visited the site of the Protegol spill which is further discussed in Section 1.5.3 of this report.

The Hanak Camp was locked and it was not possible to enter the site. However it appeared to be clean and free of concerns, in contrast to Kars Camp.

IEC was informed that Kova Camp had been decommissioned, but that no status reports were available as of June 2008. In an Off RoW Outstanding Work List, dated 8 January 2008, IEC notes the following concerns:

- General: *BOTAS should ensure that all necessary groundwater and soil sampling is undertaken at all camps where this has not been satisfactorily completed, and that remedial action is taken in all cases where the acceptance criteria are not met;*
- Kova Camp: *141 drums of potentially hazardous material stored on site without mitigation. These drums are stored on a concrete pad, but there is no secondary containment and no warnings or pollution response materials/equipments are evident. There is a significant hydrocarbon spill resulting in contaminated soil as a result of hydrocarbons being stored on a concrete pad with no secondary containment;*
- Limited or no groundwater, surface water or soil sampling at Koprokoy, Cardikaya, Koyunkaya, Sivritepe, Orensehir, Yesilkent, Andirin and Azizli camps; and
- Failure to provide adequate waste transfer records.

#### **4.4.2 Construction Camps – Recommendations**

1. One year after IEC raised concerns in June 2007 about camp due diligence and reinstatement, the final status of construction camps across the Project remains unknown. Only due diligence checklists were provided to IEC for Hanak and Kars Camps. At the time of the June 2008 visit, IEC was informed by BTC that the Lot B reports were going to be available soon; similarly, the Lot C report is under BTC Co. review and is not likely to be finalized before September 2008. IEC recommends that BTC conclude this issue as soon as possible, and provide proper due diligence reports to ensure that all identified liability issues have been adequately closed out.
2. An MOC regarding the ongoing operation of construction camps at fixed facilities, until at least 2011, has been approved, and IEC notes that BTC has committed additional funds for camp upgrades. As noted in June 2007, IEC reiterates that this should consider the following:
  - plans and procedures for compliance to project standards with respect to operation of camp potable water supplies and WWTPs (CMT currently only in operation). CWAAs are being addressed as part of project enhancements;
  - control of erosion and implementation of reinstatement plans for construction camps at pump stations and the CMT as part of the MOC for continued use; and
  - establishment of formal decommissioning plans, including a final date and a due diligence procedure for site closure.



3. Although, Kars Camp has been transferred from the Project to the Governorship of Ardahan and that there may have been non-Project use after conclusion of BTC usage, IEC remains concerned about the discrepancies regarding damage, soil pollution, waste water, chemical waste, and trash. IEC requests further clarification and due diligence assessment beyond the checklist provided.

#### **4.4.3 Aggregate and Excess Material Management - Observations**

IEC was informed that a few reinstatement issues regarding borrow pits, quarries and stockyards remain; several sites were visited in June 2008:

- Gulluce Quarry – near KP457+500 – some rill erosion noted; BTC remediation contractor to install jute mat and rock stabilization;
- Yeniyol Dump site (KP 484) – the area behind the school and Jandarma station was reinstated, although the contractor (STA) denied any project use.

IEC also visited the excess material dump sites at PT3 (DS1, DS4 and DS5). IEC recognizes the efforts of the Project to reinstate these three sites and observed the following:

- DS1: revegetation was not extensive throughout the site; further monitoring is required to assess reinstatement success. The access road to the site remains open;
- DS4: well revegetated and successfully reinstated; and
- DS5: well vegetated and no problems were observed.

#### **4.4.4 Aggregate and Excess Material Management - Recommendations**

1. Monitoring of reinstatement success should continue at the PT3 dumpsites, in particular DS1, taking into consideration that the sites are located in or next to an environmentally sensitive area (ESA 19), as designated in the Environmental Impact Assessment. As noted in June 2007, the Project should confirm the final status of the access road to DS1, which should be reinstated, unless of evident need as expressed by the local community.

## **4.5 WASTE MANAGEMENT**

#### **4.5.1 Non-Hazardous and Hazardous Waste – Observations**

In June 2008, IEC visited the newly constructed operations CWAA at the CMT and construction-phase CWAA's at the CMT, PT3 and PT1. The following observations were noted as part of site visits:

- the construction phase CWAA at the CMT continues to operate for the Project until the new Operations CWAA is operational. Although the site is not a permanent facility, conditions at the site were found to be remarkably improved with proper waste segregation and housekeeping in place;
- the new Operations CWAA, located approximately 200-250 m from the BIL administrative complex was completed in March 2008, and contains a variety of state-of-the-art waste disposal equipment. However, it is not yet operational and permitting is not expected to be completed until September 2008;

- overall, good housekeeping and waste management procedures were noted at all the construction CWAA's visited;
- permanent CWAA's at each Pump Station in Turkey are still not implemented and are not currently included in the BTC list of enhancement projects for 2009; and
- IEC observes that no definitive timetable for construction and implementation of Operations CWAAs at the fixed facilities have been finalized at present.

IEC reviewed the waste and emission monitoring registers provided by BIL during the June 2008 visit. They are now included as part of the BIMS information management system. The Level I non-compliance assigned during the June 2007 visit is considered rescinded.

As already observed during the June 2007 visit, the Project informed the IEC that it has established a 6-month time limit for the storage of hazardous waste at CWAAs. However, it is important to note that there is commitment to minimize storage time for waste in the BTC facilities: *"The time period in which wastes are stored will be kept to a minimum. This is both good housekeeping and, in the case of hazardous wastes, reduces the risks associated with the storage of large quantities of hazardous material"* (BIL Waste Management Plan).

IEC was again informed that the Izaydas waste facility continues to accept hazardous and non-hazardous waste from the Project. Non-hazardous waste shipments continue to be sent to Izaydas approximately every four weeks. BTC is analyzing a number of options for EU alternative waste disposal sites, including Erzurum and Antakya. BTC has initiated a project as part of the Regional Development Initiative on a cost shared basis with the local municipality of Antakya to fund improvements to over a two-year period to achieve EU compliance in three areas:

- design improvements to EU standards, including leachate collection, flare system, additional drainage, improvements to medical waste storage etc.;
- development of operation waste management plans; and
- training in waste management for facility personnel.

IEC was informed that the Antakya Municipality, in conjunction with their RDI Implementing Partner, ISTAC, has developed a tender document to finalize gaps in landfill design and construction. No bids were received; consequently the Municipality has now decided to combine construction and operation into a new tender package.

In the meantime, ISTAC (implementing partner) has started to develop some of the necessary management plans together with the Antakya municipality. Due to a delay in the tendering process, staff training has not proceeded at this time.

#### **4.5.2 CMT Narlik Inert Material Disposal Site – Observations**

In June 2007, IEC requested further clarification over waste materials disposed of at the Narlik Inert Material Disposal site that were characterized as "grit". IEC requested that BTC should confirm the characteristics of the "grit" disposed at the Narlik site and that its categorization as an inert material complies with Turkish regulations and EU Landfill Directive 1999/31/EEC.

In June 2007, IEC produced a memo stating that the grit is a sand blasting material and was sent to Izaydas in October 2004 for analysis to confirm that it is inert waste. The memo confirmed laboratory analysis that the material was sand and characterized it as inert waste.

#### 4.5.3 Final disposal of Protegol Spill material, Kars Camp

IEC reviewed a CINAR report detailing an evaluation of a spill of Protegol (coating material) at Kars Camp. Approximately 22 barrels (340 kg each) were illegally buried at Kars Camp, in an area outside the current camp boundaries. During excavation, 8 of these barrels were ruptured. No volume of the amount spilled is given in the report, but it could be assumed that this represents a minimum volume of approximately 1,200-1,250 liters. The estimated volume of contaminated soil was 6000 m<sup>3</sup>. IEC was asked by the Lenders if this spill incident had been satisfactorily closed.

In reviewing the information provided the following recommendations were made to BTC in October 2007:

- based on the information contained in the report, IEC could not satisfactorily determine if there is sufficient evidence to close the contaminant issue. Additional supporting reference documents should be provided;
- confirmation should be provided that the 6000 m<sup>3</sup> of contaminated soil was disposed of at Izaydas, or another approved location;
- a thorough review of the waste register with respect to waste produced, stored and disposed of in Izaydas should be conducted by BTC to ensure that no discrepancies exist;
- BOTAS and CINAR should provide evidence that there are no other potential burial or spill sites at Kars Camp that could be additional contaminant sources. Geophysical surveys such as with a magnetometer or an electromagnetic instrument (e.g. Geonics EM31) if ground conditions permit, should be considered to rule out this option;
- BTC should independently collect duplicate soil and water samples to be analyzed for PAHs by an internationally certified laboratory specialized in organic and persistent organic pollutant testing. The samples should be collected both from reasonably non impacted sampling locations (baseline) and from the area of potential concern;
- BTC should provide an assurance review of the above and supporting information provided by BOTAS/CINAR; and
- all documents and verifications should be provided to the Lenders Group within a reasonable time span.

IEC visited the spill location nearby the Kars Camp and was informed that the contaminated material had been disposed of at a location within a nearby industrial area, approximately 1 km southwest of the Kars Camp which was also visited. BTC also provided Report CNR-REP-ENM-PLA-014 entitled "Close-out Report of the Kars Camp Soil Contamination Study.

Review of that report indicates the following:

- the volume of contaminated material was 6000 m<sup>3</sup>;
- two additional groundwater monitoring wells were installed at the spill location at Kars camp;
- PAH analysis classified the contaminated material as non-hazardous according to European Waste Catalogue standards and Turkish regulations;

- remedial alternatives were discussed with BOTAS and governmental authorities and landfilling was considered to be the best alternative, according to CINAR in consideration *of the climate of Kars and suitability of biological processes and time constraints*;
- BOTAS prepared a Pre-EIA report to submission to the Ministry of Environment and Forestry for use of the landfill for disposal of contaminated soil;
- the contaminated material was disposed at a privately owned location, a former quarry located about 1 km southwest of the spill site. The remediation contractor who performed the work is the owner of the land. According to CINAR the final use of the site is for storage of concrete pipe. At the time of the visit, the material was completely buried and final grading works were ongoing; and
- the landfill was lined with a 3 mm HDPE liner on top of a 20 cm clay layer. According to CINAR, *the contaminated soil was excavated to 10m in depth from the area on 27 May 2007 and carried to the burial site by truck. The contaminated soil was spread over the geomembrane layer and compacted by mechanical compression. All site preparation and excavation works were conducted under the supervision of BOTAS while DEGOL, the subcontractor of CINAR was present at the site as consultant. The site has been capped with a 20cm layer of compacted clay and top soil.*

#### **4.5.4 Non-Hazardous and Hazardous Waste – Recommendations**

1. The CMT permanent CWAA is an impressive facility with state-of-the-art waste handling and disposal equipment. IEC is concerned that the facility is not yet operational despite being fully completed in March 2008. IEC recommends that permitting issues regarding its operation be rectified as soon as possible and that the facility be made fully operational.
2. Operating standards at construction camp CWAA's are being maintained in accordance with Project standards, but many sites are beginning to show their age and the fact that they were not intended to be used on a long term basis. IEC notes that with the exception of the CMT (although not operational), construction of permanent CWAA and chemical storage sites is still not in place. IEC also notes that construction of permanent CWAA's is not included in the 2008/2009 enhancement list, while chemical storage facilities are. BTC informed IEC that there is no immediate or short term risk from the continued use of the temporary CWAA's. IEC notes the continued good operations of temporary CWAA's across the Project but recommends that BTC consider including permanent CWAA's as part of the 2009/2010 enhancement list.
3. Based on the response provided by BTC confirming that the grit material disposed at the Narlik disposal site is classified as inert waste, IEC now considers this issue closed.
4. Removal of the Protegol contaminated soil was completed in May 2007, but no mention of the work was made during the June 2007 IEC visit. Despite requests by IEC for additional information on the remedial works, the initial draft of the CINAR report was completed in June 2007 and not released until April 2008. IEC has received sufficient information from BOTAS concerning the closeout of the Protegol spill at Kars Camp and confirmed visually that material was disposed at a nearby location during the June 2008 visit. In order to fully close this issue, IEC requests BTC to provide the following, as requested in October 2007:

- documentation, or manifests, confirming removal and transport of material from the Kars Camp to the final disposal location;
- a response to provide evidence that there are no other potential burial or spill sites at Kars Camp that could be additional contaminant sources; and
- BTC's assurance review of the remedial works and landfill project.

#### 4.5.5 Wastewater Management – Observations

IEC reviewed data and documentation provided by BTC regarding waste water treatment plant performance and noted the following:

- across the project, WWTP's are consistently non-compliant. According to BTC, non-compliance of WWTP discharges ranges from 50-70% of the time. However, no discharges are released to the environment but rather trucked to Project approved Municipal WWTP's. While technically not a non-compliance with the Operations ESAP, IEC reiterates Commitment ID CH4E53 of the Environmental Emission Management Plan (EEMP) ESAP that specifies operational commitments to WWTP performance as follows: *The sewage treatment plant will treat all black and gray water arising on the AGI. The plant will be a self-contained activated sludge package unit and will discharge via the stormwater pond. Treated effluent will meet the requirements of World Bank guidelines and Turkish regulations;*
- a WWTP will be installed at IPT1 as part of BTC environmental enhancements;
- BIL is implementing enhancement projects to segregate WWTP discharges from other discharges in 2009; and
- BTC has undertaken a project wide review of WWTP performance and has recommendations for short, medium and long term ranging from improved operator performance, installation of reed beds and replacement of WWTPs.

#### 4.5.6 Oily Water Separator Performance - Observations

In June 2007, IEC recommended that BTC should undertake a complete analysis of OWS performance, including testing of parameters not yet tested and implementation of technically adequate techniques to measure all OWS discharge points. Review of the data provided during the June 2008 visit, shows that OWS discharges are non-compliant across all Pump stations and the CMT. However, as per non-compliant WWTP discharges, the OWS discharges are trucked to Project approved Municipal WWTPs. While this practice is technically not a non-compliance with the Operations ESAP, IEC reiterates Commitment IDs CH4E52 and CH5E55 of the Environmental Emission Management Plan (EEMP) ESAP that specifies operational commitments to OWS performance as follows: *The oily water treatment plant will treat all material from the closed drains oil water sewer system and closed storm water sewer. All liquid effluent leaving the AGI site will be discharged via the stormwater pond and then through a single discharge location. All effluents will meet the requirements of World Bank guidelines and Turkish regulations.*

#### 4.5.7 Wastewater Management – Recommendations

1. IEC notes that Project WWTP discharges are consistently non-compliant and that BTC has recently undertaken a project-wide review of WWTP performance. Although sewage

discharges are being transported to approved municipal WWTPs for disposal, hauling and fuel costs are significant to the project. IEC recommends that BTC provide a plan, based on the recent WWTP performance review, as to how WWTP compliance with ESAP standards will be achieved on a timely and ongoing basis.

2. BTC should undertake a project-wide analysis of OWS performance, including a review of technological options to allow for conformance to World Bank (10 mg/L) and Turkish regulations.

## **4.6 POLLUTION PREVENTION AND ENVIRONMENTAL MONITORING**

### **4.6.1 Observations**

As previously noted in the June 2006 and June 2007 visit reports, the Project has adopted a pollution prevention plan aimed at systematically identifying potential impacts from operations activities and implementing avoidance and mitigation measures to minimize potential adverse effects on the environment. The mitigation measures are aimed at preventing oil/chemicals spills and their management, monitoring air emissions, managing waste production and disposal, and protecting surface water and groundwater.

An Environmental Action Tracker is in place which includes the records of environmental incidents and spills incurred, including their location, size information, and clean-up actions undertaken, the Preventive and Corrective Action Requests (PCAR), Audit/inspection actions, MOCs and a list of enhancement actions.

An Oil Spill Clean-up and Remediation Plan has been developed by BTC and is currently implemented by BIL with clean-up and remediation guidance for the Project. The current plan includes site-specific oil spill clean-up techniques, identification of endpoints for clean-up, procedures for personnel and equipment management under emergency situations. BIL is in the process of developing their own Plans that will respond to the requirements included in the BTC document. These plans will be updated taking into account the planned production increase to 1.2 million bpd.

With reference to the ongoing Operations phase, BIL has initiated an environmental monitoring program and contracted DOKAY to conduct all environmental monitoring activities at pipeline facilities as dictated by the Operations ESAP Environmental Emissions Monitoring Plan (EEMP) and Ecological Monitoring and Management Plan (EMMP).

At the time of the last visit, IEC noted the following (waste and wastewater monitoring has been discussed in the previous sections):

- ambient air quality monitoring at the CMT had started as outlined in the EEMP: the 2007 monitoring data were included in the BTC annual report as well as the results of January 2008. Monitoring data were compliant with relevant Project standards;
- during the June 2007 visit, exceedances in the air quality monitoring data for BTEX were observed, particularly for benzene at some sampling locations near the CMT. The data from the 2007 BTC annual report and from the January 2008 monitoring program were compliant with project standards. IEC now considers this issue closed;

- as part of ISO 14001, BIL has developed the BIMS information management system to collect, analyze, and manage environmental data. An environmental emissions register is maintained and stack emissions at the CMT and Pump Stations are now monitored consistently by DOKAY. During the June 2007 field visit, a Level I non-compliance was assigned due to inconsistent data reporting. As verified during the June 2008 visit, a full set of emissions monitoring is now available and data management appears to have been resolved sufficiently to rescind the non-compliance;
- stack emissions have been monitored by DOKAY as per ESAP requirements. Non-compliant values were reported in the 2007 BTC Annual Report at PT1, PT4, IPT2, and CMT, and were related to maintenance operations. Stack emissions testing were completed at all pump station locations in April 2008 and the results provided to IEC are compliant with relevant standards. A legal issue with the Ministry of Environment and Forestry relating to some stack heights (generators, fire pumps and wax handling boilers) is ongoing. IEC was informed that further clarification on the legal requirements (i.e. stack heights, stack exit velocity) is currently under discussion between BTC, BIL and Ministry of Environment and Forests to define the compliance status of the air emission sources at AGI facilities.
- groundwater monitoring is not started yet. First monitoring is planned for September 2008. According to the information included in the 2007 annual report, “BTC has developed a Groundwater Monitoring Strategy on behalf of BIL and is implementing it in conjunction with BIL”. During the June 2007 visit a “Groundwater Sustainability Report for the CMT-Phase II” developed by DOKAY was provided to IEC. Through a new hydrogeological investigation, the report assesses the groundwater sustainability of the well site at Ceyhan Yanıkdeğirmen following the increase in water demand foreseen at the CMT. The status of groundwater quality monitoring is not fully known; and;
- the EEMP, as modified according to a proposed MOC, has defined a management procedure for ballast water at the CMT. BTC has completed a Ballast Water Risk Assessment (BWRA) to determine the degree of risk presented by the source ports of tankers visiting the CMT. A number of ports within the highest, high and medium risk group were identified which will require ballast water management while exemptions would apply to ballast water from the low and lowest risk ports. With completion of the Marpol project, BTC plans to receive and treat oil contaminated slops as required by Marpol and Turkish Regulations. According to the information provided, the slops reception and treatment facility is currently under design and scheduled for completion by 2009. Meanwhile, the current risk assessment will be updated to take into account any additional source ports used by tankers in 2007/2008. The concern raised by IEC during the June 2007 visit about the visual monitoring of the ballast water discharge is maintained, being that this procedure is still in place at the jetty.

#### **4.6.2 Pollution Prevention and Environmental Monitoring – Recommendations**

1. Although the results of stack emission monitoring are compliant with the Operations ESAP EEMP and no adverse environmental impact is expected, BTC and BIL should clarify the legal issue relating to some stack heights. From what was discussed during the 2008 field visit, the concern of the Ministry of Environment and Forests is more related to potential pollution within plant boundaries (occupational safety issue) rather than to a potential public issue. This can likely be solved through a proper ambient air monitoring campaign within the facilities boundaries. Negotiations are currently ongoing between the

project and the Ministry, operations will continue, the legal requirements regarding the issue will be clarified, agreed and a permit extension application will be made. IEC does not view this as a compliance issue relevant to the ESAP, as long as compliance to project standards is maintained;

2. While it is recognized that no benzene exceedances in ambient air measurements at the CMT have been detected in 2007 and the first quarter of 2008, IEC recommends to continue proper maintenance and leak tests for tanks at the CMT, particularly in relation to the planned BTCX 1.2 Expansion Project;
3. While ground and surface water is routinely monitored by the State Hydraulic Works (DSI) and data are revised and used by BIL to understand trends in surface and ground water quality, the groundwater monitoring plan implemented by the Project across all PT's and the CMT is still not consistent, particularly in relation to groundwater quality. Section 5.3.6 of the EEMP ESAP addresses this concern in that "*if existing wells of DSI are not within the vicinity of PT's or CMT, BIL will consider installing additional monitoring as appropriate*". Although no evidence of groundwater contamination is apparent, groundwater quality monitoring should be considered as soon as practical to address project risk/liability issues and contamination from off-site sources.

## 4.7 BTC EXPANSION

### 4.7.1 Observations

BTC is planning to increase export capacity of the current 1 million bpd flow rate to 1.2 million bpd using a chemical, DRA. A Level II MOC was prepared. The expansion is expected to be fully operational by December 2008.

Although no lender approval is needed for chemical export capacity expansion, BTC informed IEC by providing an advanced copy of the Level II MOC in relation to pipeline expansion to 1.2 million bpd. IEC provided comments to BTC on 23 April, 2008.

The main potential impacts from the use of DRA to increase pipeline flow are as follows:

- increased throughput and increase in road traffic for delivery of DRA at injection point locations. IEC was informed that DRA would be transported by road to proposed injection points on the pipeline from bulk storage sites located at Trabzon in Turkey and at Bretling's yard in Azerbaijan (DRA will be transported by rail from Poti in Georgia to the Bretling yard and then by truck to the injections points in Azerbaijan and Georgia). A Transport Risk Assessment is being conducted. However, the truck traffic volumes expected will be low, approximately one truck every one to two weeks;
- DRA storage facilities at BVT50, extra land will be required (approximately 190 m<sup>2</sup>). A village is located within 500 m of BVT50;
- increased volumes in the event of an onshore oil spill – BTC estimates that there could be an approximate 3.1% increase in amount of spillage due to increased flow rate (DRA reduces turbulent energy losses in the pipeline and the reduced energy loss manifests itself as a reduction in the pipeline's pressure drop and hence enables increase of the flowrate). However, spill risk assessments have determined that current oil spill response capabilities are more than sufficient to cover any spills under BTCX 1.2;



- increased VOC emissions at the CMT – air modeling dispersion studies indicate that any impact from VOC emissions would be small and within local air quality limits. Monitoring was recommended to ensure that the adoption of EU standards for VOC emissions is put in place and that system improvements be considered as appropriate; and
- increased shipping traffic at the CMT – IEC recommended that current procedures be revised to account for increased shipping traffic.

#### **4.7.2 BTCX 1.2 – Recommendations**

1. IEC received a MSDS for DRA which will be used, under the trade name of LP™ Arctic Grade Flow Improver (Conoco Phillips). IEC noted that this chemical is irritating to eyes and skin and recommends that BIL widely circulate the MSDS to areas where DRA will be employed and provide adequate PPE (nitrile gloves and eye protection) as required.

## **4.8 ROW MANAGEMENT, EROSION CONTROL, REINSTATEMENT AND BIORESTORATION**

### **4.8.1 Erosion Control, Reinstatement and Bio restoration - Observations**

#### ***Reinstatement Progress and ROW Maintenance***

In June 2007, IEC noted continued good progress in reinstatement of the pipeline ROW in Turkey, but identified several outstanding issues relative to erosion control, reinstatement and bio restoration at the completion phase as follows:

- maintenance of permanent erosion control measures;
- final agreement on punch list items and required repairs;
- confirmation of the warranty period, contractor responsibility and its conclusion prior to handover to BIL;
- supervision of NGPL reinstatement; and
- measurement of revegetation success against new Project commitments.

In June 2008, IEC observed significant progress and effort of the Project to address these issues including:

- closure of many outstanding punchlist issues;
- the hiring of a dedicated reinstatement contractor by BTC (Gencsari Dolphin) to deal with all outstanding punchlist issues (except for few items that requires field monitoring and verification in 2008) by end of construction season within 2008 (approximately October); and
- the establishment of a dedicated BIL ROW patrolling and reinstatement organization to address ROW maintenance and repair issues.

As part of this proactive response to ensuring adequate ROW patrolling and maintenance, BIL has developed the following procedures:

- right of Way Maintenance and Reinstatement Procedure;
- reinstatement and Patrolling Action Plan; and

- reinstatement schedule.

The ROW patrolling strategy involves the following:

- division of the ROW into five zones, approximately 200 km in length;
- each zone will be patrolled by two ROW teams covering 10 km/day per team; and
- problem areas will be identified and reinstatement teams will follow-up to initial repair and corrective action.

The BIL ROW Patrolling and Reinstatement Organization is creating a database of 91 “critical areas” identified by BTC satellite surveillance. BIL reinstatement crews will undertake necessary repairs.

#### ***Reinstatement of the NGPL***

During the June 2008 visit, IEC did not have an opportunity to review the success of reinstatement of the NGPL, but was provided with documentation and photos of the BTC NGPL reinstatement close out report – rev A (20.11.2007). As reported by IEC in 2007, Tekimas was contracted by BTC under a LSTKA amendment to complete reinstatement of the NGPL. The work was initiated in May 2007 and concluded in September 2007. As noted by BTC, the success of the project was due to *the selection of a Contractor (Tekimaş) who was committed to excellence in project delivery. The level of this commitment is manifest in the absence of any NCRs or complaints during the work which was undertaken over two operating pipelines.*

Based on a review of this information, IEC considers this issue closed and acknowledges project efforts to ensure adequate NGPL reinstatement as per ESAP commitments.

#### ***Landscaping and Erosion Control at Construction Camp Locations***

On previous occasions, IEC has noted that while landscaping of disturbed areas of the CMT and pump station locations is underway, no work had been initiated for landscaping and erosion control at the construction camp locations, especially at locations where a visual impact is apparent (e.g., PT3 camp). The CCP Reinstatement Turkey (p. 17) commits the Project to full reinstatement, using species appropriate to the surrounding habitat or land use, of all areas of non-permanent land take, such as the temporary construction camp. In June 2007, a Level 1 Non-Compliance was raised due to the lack of measurable progress for landscaping at camp locations, relative to the MOC action to maintain camps at fixed facility locations until 2011 (*BOTAS Reinstatement Plan; Commitment ID: APC2E145*).

As stated in the BTC E&S Annual Report (Operations Phase) 2007, BTC considers this issue closed *as management of all reinstatement work at the camps will form part of normal operations activity.* Although during the June 2008 visit IEC did not observed significant response to initiate landscaping and erosion control measures at the camp facilities and at PT3, IEC was informed by BTC that in May 2007 an audit was undertaken to identify any erosion issues at camp locations and communicated to BIL/BOTAS as a warranty item.

#### **4.8.2 Erosion Control, Reinstatement and Biorestoration – Recommendations**

1. IEC notes that significant progress has been made by BIL to address outstanding ROW maintenance issues addressed in previous visits. In particular, IEC observes a significant level of coordination between BIL maintenance and reinstatement efforts and the satellite based biorestoration monitoring work being undertaken by BTC. IEC recommends that

- BIL and BTC coordinate a unified response to reinstatement priorities, particularly in response to the 91 critical areas identified by BTC satellite data;
2. IEC notes the efforts of BOTAS and BTC to close all outstanding ROW reinstatement issues post construction that do not fall under the responsibility of BIL. A dedicated reinstatement contractor has been hired for this purpose and IEC recommends that BTC coordinate these activities with the routine ROW maintenance and reinstatement efforts of BIL;
  3. Based on review of the documents provided by the project, IEC has closed all issues regarding reinstatement of the NGPL. In previous missions, IEC has recommended that BOTAS, in conjunction with BTC, implement a systematic assessment of topsoil fertility, particularly focused on problematic high elevation areas with fragile and thin topsoil in Lot B. IEC continues to recommend that BIL to address topsoil fertility as well as all other factors as part of their erosion and vegetation cover monitoring, reporting and maintenance actions in high elevation locations of Lot B;
  4. In June 2007, IEC noted that in several locations (e.g. KP 983), animal feeding and use of the ROW had impacted biorestore efforts. The CCP Reinstatement Turkey discusses this concern and Commitment ID: APC2E12 2 states ..... *“Where necessary, contractor will provide appropriate fencing to prevent access by grazing animals and vehicles. Fences will be fitted with signs in Turkish indicating the purpose, i.e., the enclosure is a BTC biorestore project area and fencing is required for protection.”* BIL should consider the need for more diverse and effective temporary control measures in ecologically sensitive areas where animals could affect the future success of biorestore, as required through ongoing monitoring and patrol of the pipeline ROW;
  5. IEC requests that BTC explain their intent towards implementation of landscaping and temporary erosion control for those construction camps that will continue to be used during Operations, or transferred to other contractors. In particular clarification of the response to the Level 1 non-compliance is requested as identified in the 2007 E&S Annual Report that *management of all reinstatement work at the camps will form part of normal operations activity.*

#### 4.8.3 Access Roads - Observations

In past visits, IEC has recommended that the Project establish clear commitments and procedures for the reinstatement of Project access roads as indicated in the ESAP and as part of efforts to minimize Project footprints. In June 2006, IEC reviewed the access road registers provided by the Project and found them to be deficient in regard to reinstatement status. In June 2007, IEC noted that the final status of many project access roads was uncertain, particularly at high elevation locations in Lot B. As a result of lack of clarity with regards to final reinstatement of project access roads in compliance with ESAP commitments a Level II non-compliance was raised at that time (*Reinstatement CCP, Commitment ID: 2*).

In response, BTC provided Report BTC-REP-ESM-GEN-003 Created Access Roads, Stockyards, Borrow Pits and Quarries dated 17.12.2007. The report outlines actions that BTC is taking to close access road issues. BTC has mobilized a reinstatement contractor to deal with access roads by the end of August 2008.

In June 2008, evidence of initial access road reinstatement was observed in the field as follows:

- KP 480+594 – good reinstatement of access roads on side slopes and steep slopes;
- KP 189 – restriction of access to a watercourse where an access road had been created to recover machinery.

#### **4.8.4 Access Roads – Recommendations**

1. IEC recognizes the efforts of BTC to deal with the access road and notes progress is being made to concluding this issue. IEC recommends that a report be developed in conjunction with the reinstatement contractor to document closure and reinstatement of access roads in relation to the final punch-list access road register, particularly at high elevation locations. IEC will review the status of the open non-compliance regarding access roads during the next site visit in 2009.
2. IEC also recommends that BIL and BTC coordinate a procedure as to how access roads will be used during the operations phase in the form of an Operational Access Road Strategy and Plan. The plan should consider the following:
  - existing access roads used during Construction and no longer during Operations;
  - existing access roads used during Operations;
  - closed or reinstated access roads reopened during Operations (if any); and
  - new access roads opened during Operations.

## **4.9 ECOLOGICAL MANAGEMENT**

### **4.9.1 Observations**

Biorestation monitoring is designed and implemented to assess cover, species diversity, tree/shrub survival and translocated rare species along the ROW in Turkey. A BTC MOC procedure is currently in place for biorestation monitoring; the procedures involve analysis of satellite data to assess the trend in revegetation success, coupled with ground truthing procedures. BTC has implemented an Access Database and GIS/RS tools that have shown to be a useful analytical tool for biorestation monitoring. In addition to analysis of satellite data, BTC is also conducting ground-based species diversity and tree and shrub survival monitoring programs.

In June 2008, BTC reported that a Vegetation Cover and Potential Erosion Performance analyses is ongoing through satellite image processing (2005, 2006 and 2007 images) and that these results are communicated to BIL.

BIL personnel informed IEC that the ROW maintenance and reinstatement has identified 91 “critical areas” as derived from BTC satellite based analyses. BIL reinstatement crews will carry out site assessments in order to define necessary actions for these 91 critical areas and then undertake necessary repairs of these sites, where required.

IEC notes a significant improvement in the coordination of biorestation monitoring between BTC and BIL.

#### **4.9.2 Recommendations**

1. Recommends that BIL and BTC coordinate a single unified response to reinstatement priorities and clarify that these 91 critical areas are required for priority intervention.
2. IEC recognizes Project efforts to be proactive in regards to ROW maintenance and will monitor response as per ESAP commitments in future audits.

### **4.10 COMMUNITY LIAISON**

#### **4.10.1 Observations**

Community liaison and dialogue with affected stakeholders is a major concern of the Project. Processes are well established for communicating Project information to the general public and communities along the pipeline route, as well as to receive and transmit community concerns to the Project. The overall objective for the Community Liaison and Community Relations teams is to build a positive, non-dependent relationship between the Project and local communities. At the close of the construction period, the Project was committed to a transparent and effective land exit process to maintain this goodwill through to BIL Operations.

BIL has established a Public and Community Relations department that reports to the Human Resources Director. The organization has also established guiding principles for community relations department with the aim of maintaining the link between construction-transition-operations. The BIL PCR department also recognizes the importance of communication with other BIL departments and has begun a series of training programs in the following areas:

- CR Department Organization and responsibilities;
- Complaint & Compensation System;
- Employment & Procurement Commitments;
- Community Safety (Traffic and Pipeline);
- Land use restrictions;
- Worker code of conduct;
- Internal & external audit; and
- Responding to Media.

While in principle, the structure, organization and intent of the BIL PCR department is commendable, both IEC and SRAP have commented on the lack of resources for effective delivery of this message in the field. Until recently, the lack of vehicles has restricted the effectiveness of PCR staff to reach more remote areas in each of the five areas and this is particularly true in Area 1. While there is a good and established process for recording complaints, public meetings and employment statistics, review of the data does not necessarily reflect this, as it appears that the greater coverage in southern portions of the ROW, particularly the CMT, provides higher statistics than the more northerly and remoter portions of the pipeline. These discrepancies are likely more due to the lack of coverage due to past inability to have access to vehicles and the ongoing shortage of PCR personnel on a full-time basis. As mentioned in Section 1.2 of this report, a Level 1 non-compliance was

assessed for a failure of the BIL organization to adequately address these known resource shortages.

#### **4.10.2 Observations**

1. As noted earlier in this report, BIL should immediately rectify the apparent shortage of PCR personnel in the field so that there is full-time coverage and response to local communities and issues.
2. IEC also recommends that BIL consider broadening the scope of the PCR department to include a corporate social responsibility approach. This would assist in optimizing corporate commitments and inter-departmental relationships towards the functions of health, safety, environment and community.

### **4.11 ENVIRONMENTAL INVESTMENT PROGRAM (EIP)**

BTC informed IEC that as of June 2008, 9 projects have been completed as part of the EIP, including the following:

- Important Bird Areas Project;
- Important Plant Areas Project;
- Improving the Conservation Status of the Caucasian Black Grouse in Turkey;
- Lesser Caucasus Gap Analysis Project;
- Sea Turtle Expedition project;
- Research on the Mediterranean Monk Seal;
- Awareness raising Materials on Biodiversity and Natural Resources along the BTC Pipeline;
- Developing Yumurtalik Lagoons Wetland Management Plan and Identifying Erzurum Marshes Conservation Zones (Phase I); and
- SIF-I.

According to the information provided during the visit, the total amount spent to date is US\$4.3 million.

Plans are moving ahead for EIP-RFP3 as a continuation of the programme but with a lesser budget and greater emphasis on securing more contributing partners. Major themes of EIP-RFP3 have been identified as follows:

- Integrated Conservation and Development;
- Wildlife Rehabilitation;
- Capacity Support for Government Environmental Management; and
- Technical Assistance for Improving Environmental Infrastructure and Services.

A Request for Proposals for EIP-RFP3 is currently under development and will be made available in September 2008. The estimated current budget for the program is about US\$800,000 per year.

## **4.12 CULTURAL HERITAGE MANAGEMENT**

IEC was informed that the second phase of cultural publications is underway, but no further details are available at this time. BIL has undertaken an important component in meeting Project cultural heritage commitments by ensuring that ROW maintenance teams are trained accordingly to protect cultural resources.

## **4.13 HEALTH AND SAFETY**

### **4.13.1 Observations**

In past audit reports, IEC has commented on aspects of health and safety during the construction phase, particularly as they related to concerns about community safety issues. Now that the Project has moved to the operational phase, there is much less work-related activity, although travel still represents the highest safety risk.

Project safety statistics for 2007 are reported in the 2007 BTC Annual Report for both construction and operations phases. No fatalities or DAFWC were reported in both cases. For Operations in 2007, few safety indexes (recordable incident frequency, high potential incident frequency and traffic vehicle accident rate) were reported higher than Project targets. During the June 2008 visit new raw data relevant to the first quarter of 2008 were available and they will be processed and presented by BTC in the new 2008 yearly report.

### **4.13.2 Recommendations**

1. As noted in section 4.2 although BTC has mobilized additional Health and Safety (HS) advisors into BIL, IEC has concerns about HS staffing, capacity and capability given Project cutbacks. BTC and BIL should work together to ensure that adequate resources are available such that sufficient safety oversight, supervision and training be provided for both fixed facility and pipeline operations.

**Table 1**  
**Summary of Recent MOC Documents for the Three Countries**

Proposed MoC description	Date	Class
<b>Cross-Country</b>		
Expansion of existing BTC pipeline throughput from 1 million barrels a day (mmbd) to 1.2 mmbd through the use of DRA.	To start December 2008	II
<b>Azerbaijan</b>		
ROW Access Strategy	Sept 2007	III
Construction and operation of new Camp for Pump Station 2 in Azerbaijan (PSA2 Camp).	January 2008	II
Amendment to RoW Landscape Monitoring Frequency	June 2008	II
Extension of storage of medical waste at the Serenja Waste Management Facility previously approved by IEC	June 2008	III
Continuation of removal of raw sewage waste from sewage treatment plants by vacuum tanker and transportation to external municipal wastewater treatment facility previously approved by IEC	June 2008	III
Continuation of use of ADES Sumqayit Municipal Landfill site BP dedicated cells for disposal of non hazardous waste previously approved by IEC.	June 2008	III
<b>Georgia</b>		
No new MOCs		
<b>Turkey</b>		
Continued use of Ceyhan temporary harbor	II	II
Marpol slops handling	II	II
Manning of IPT1 and 2	II	II
Continue to use the temporary AGI camp facilities (PT1, PT2, PT3, PT4, IPT1 and CMT)	II	II
Waste Management Plan (WMP)	III	III
Environmental and Emissions Management Plan (EEMP)	II	II
Cultural Heritage Management Plan (CHMP)	II	II
Ecological Management and Monitoring Plan (EMMP)	II	II



**APPENDIX A**

**TRIP SUMMARY- 10TH IEC MISSION BY D'APPOLONIA FOR THE BTC  
PIPELINE PROJECT – JUNE 2007**

## **APPENDIX A**

### **Trip Summary- 10thth IEC Mission by D'Appolonia for the BTC Pipeline Project – June 2007**

For this mission, two members of the team toured Turkey while another two visited Azerbaijan and Georgia. The trip summaries of the two groups are presented separately.

#### ***Turkey Team***

*June 9* – Team arrives in Ankara by air.

*June 10* – Meetings in Ankara, team departs to Adana in the afternoon.

*June 11* – Visit the CMT and operations facility. Return to Ankara and overnight.

*June 12* – Travel day to Erzincan.

*June 13* – Erzincan to PT3 through high elevation areas in former Lot B, visit KP 484, 464, 462, 457, 455, DS1,4, and 5. Site walk around at PT3

*June 14* – PT3 to Sarikamis stopping at Karasu River crossing, KP 410, 408, Cadirkaya camp reinstatement, KP 301, 216, 209, 190, 173.5, 171-173 (various stops), ESA 8, KP 171, 167 and 166+871.

*June 15* – Sarikamis to PT1 – Kars Camp, protegol spill site, KP 60, 56, 53, Hanak Camp and site walk around and interviews at PT2

*June 16* – PT1 – Posof – Drive to KP 11 in ESA 1, KP 12, Posof River crossing, KP 17 and KP 20. Return to PT1 and transfer to Kars for flight to Ankara. IEC completes closeout in afternoon in Ankara.

*June 17* - Turkey team departs.

#### ***Azerbaijan/Georgia Team***

*June 8* – Azerbaijan. Team arrives in Baku by air.

*June 9* – Azerbaijan. Kick-off meetings held with Azerbaijan Export Pipelines Environment Team and Azerbaijan Export Pipelines Asset Manager in Baku.

*June 10* – Azerbaijan. Visit the ROW in the Gobustan Desert area; visit the Sangachal CWAA and the Serenja Hazardous Waste Storage Site.

*June 11* – Azerbaijan. Travel by train to Yevlakh; visit PSA-2; spend night in Ganja

*June 12* – Azerbaijan. Visit Mingechevir municipal WWTP; toured ROW and several river crossings between approximately KP 253 and KP 357.

*June 13* – Azerbaijan. Tour the ROW from KP 379 to the Kura River crossing at KP 412 with a stop at the Hasan Su crossing at KP 398 and then drive to Tbilisi.

*June 14* – Georgia. Attend meeting with representatives from the Georgian Ministry of Environmental Protection and National Resources (MoE) and the Georgian International Oil Corporation (GIOG) at BP GEO offices; attend kick-off meetings at BP GEO offices throughout the remainder of the day.

*June 15* – Georgia. Drive to Bakuriani; tour EDDF and Security Base sites; visit ROW at KP 193 to observe reinstatement and ongoing re-planting of rare species plants; tour general ROW back to the construction sites associated with the Secondary Containment facilities; return to Bakuriani.

*June 16* – Georgia. Tour Agara and Khurtsisi gravel pits; visit the Bakuriani Botanical Garden; walk up the Tori access road to observe construction; evaluate reinstatement at the steep slope at KP 176; and return to Bakuriani.

*June 17* – Georgia. Toured ROW and adjacent borrow pits from KP 176 to KP 60 and then continued to Tbilisi.

*June 18* – Georgia. Conducted closeout meeting covering both Georgia and Azerbaijan.

*June 19* – Georgia. Entire team departs.

**APPENDIX B**  
**NON-COMPLIANCES WITH ESAP**

**APPENDIX B**  
**Table B-1: Non-Compliances with ESAP – Azerbaijan**

Section Ref.	Observation	Non-Compliance	Level	Comments / Recommendations
2.3.2	Ongoing use of the Mingechevir (and previously the Sahil) non-compliant facilities for the disposal of sewage.	Operations ESAP, Commitment ID J24	II	Because this situation has now existed for years, because the construction of compliant treatment plants is far behind what was previously presented to the IEC, and also because efforts to actually improve the performance of the Mingechevir facility have been minimal, this situation is assigned a Level II.
2.4.1	Stack emissions for NOx and CO non-compliant with ESAP	Emissions Management Plan - BTC Operations – Azerbaijan & Georgia (Commitment ID 1024)	I	The difficulties with the stack emissions monitoring to a large degree are associated with the commitments of management, rather than the environmental staff, as physical modifications to allow for these tests do not appear to have been a priority

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

Section Ref.	Observation	Non-Compliance	Level	Comments / Recommendations
3.4.1	Stack emissions for NOx non-compliant with ESAP commitments	Emissions Management Plan - BTC Operations – Azerbaijan & Georgia (Commitment ID 1024)	I	Same as for Azerbaijan

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

<b>Section Ref.</b>	<b>Observation</b>	<b>Non-Compliance</b>	<b>Level</b>	<b>Comments / Recommendations</b>
4.2.1	Failure to implement an adequate PCR program during the Operations Phase	Social Management Plan, Commitment ID CH7 S2	I	Ensure that the Project, and in particular BIL should address concerns about lack of full-time presence of PCR personnel in the field. Back to back coverage of PCR personnel should be provided.