
**BAKU-TBILISI-CEYHAN
Pipeline Project**

**Report of the Post-
Financial Close
Independent
Environmental
Consultant
Fifteenth Site Visit –
September 2013**

BNP Paribas

BAKU-TBILISI-CEYHAN Pipeline Project

Report of the Post- Financial Close Independent Environmental Consultant Fifteenth Site Visit – September 2013

Prepared by	Signature	Date
William Johnson		29 November 2013
Marco Morando		29 November 2013
Controlled by	Signature	Date
Alessandro Casartelli		29 November 2013
Approved by	Signature	Date
Giovanni De Franchi		29 November 2013
Claudio Mordini		29 November 2013
Undersigned by	Signature	Date
Marco Cremonini		29 November 2013

Rev.	Description	Prepared by	Controlled by	Approved by	Undersigned by	Date
0	First Issue	W. Johnson MCM	AEC	CSM / GBD	MGC	29 November 2013

TABLE OF CONTENTS

	<u>Page</u>
GLOSSARY	III
EXECUTIVE SUMMARY	1
1 INTRODUCTION	4
2 AZERBAIJAN	6
2.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES	6
2.1.1 Resources and Organization – Observations	6
2.1.2 Management of Change (MoC) - Observations	7
2.2 HEALTH AND SAFETY	7
2.2.1 Health and Safety – Observations	7
2.3 WASTE MANAGEMENT	7
2.3.1 Non-Hazardous and Hazardous Waste – Observations	7
2.3.2 Wastewater Management – Observations	8
2.4 POLLUTION PREVENTION	8
2.4.1 Observations	8
2.5 ROW MANAGEMENT	10
2.5.1 Observations	10
2.5.1 Recommendation	13
2.6 ECOLOGICAL MANAGEMENT	13
2.6.1 Observations	13
2.6.2 Recommendations	14
2.7 CULTURAL HERITAGE MANAGEMENT	14
2.7.1 Observations	15
3 GEORGIA	16
3.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES	16
3.1.1 Resources and Organization - Observations	16
3.1.2 Management of Change - Observations	16
3.1.3 Health and Safety – Observations	16
3.2 CAMPS, INFRASTRUCTURE AND SERVICES	17
3.3 SECONDARY CONTAINMENTS	18
3.4 WASTE MANAGEMENT	19
3.4.1 Non-Hazardous and Hazardous Waste – Observations	19
3.4.2 Wastewater Treatment – Observations	19
3.5 POLLUTION PREVENTION	20
3.5.1 Observations	20
3.6 ROW MANAGEMENT	22
3.6.1 RoW Reinstatement and General Management - Observations	22
3.6.2 Off-RoW Reinstatement – Observations	23
3.6.3 Recommendation	24
3.7 ECOLOGICAL MANAGEMENT	24
3.8 CULTURAL HERITAGE MANAGEMENT	24

**TABLE OF CONTENTS
(Continuation)**

	<u>Page</u>
3.8.1 Observations	25
4 TURKEY	26
4.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES	26
4.1.1 Management System Observations	26
4.1.2 Management of Change	27
4.2 ENVIRONMENTAL TRACKING AND PERFORMANCE	27
4.2.1 Observations	27
4.3 WORKER CAMPS, INFRASTRUCTURE AND SERVICES	28
4.4 WASTE MANAGEMENT	28
4.4.1 Non-Hazardous and Hazardous Waste – Observations	28
4.4.2 Chemical Storage Facilities at Fixed Facilities	29
4.4.3 Wastewater Management – Observations	29
4.4.4 Oil Water Separator Performance – Observations	31
4.4.5 Wastewater Management – Recommendations	31
4.5 POLLUTION PREVENTION AND ENVIRONMENTAL MONITORING	32
4.5.1 Observations	32
4.5.2 Recommendation	35
4.6 ROW MANAGEMENT, EROSION CONTROL, REINSTATEMENT AND BIORESTORATION	35
4.6.1 Erosion Control, Reinstatement and Bio restoration - Observations	35
4.6.2 Access Roads - Observations	37
4.7 ECOLOGICAL MANAGEMENT	37
4.7.1 Observations	37
4.8 COMMUNITY LIAISON AND SOCIAL RISK MANAGEMENT	38
4.8.1 Observations	38
4.9 ENVIRONMENTAL AND SOCIAL INVESTMENT PROGRAMMES	38
4.9.1 Environmental Investment Programme (EIP)	38
4.9.2 Community Investment Program and Regional Development Initiative (CIP and RDI)	39
4.9.3 Recommendation	39
4.10 CULTURAL HERITAGE MANAGEMENT	39
4.11 HEALTH AND SAFETY	39
4.11.1 Observations	39
4.11.2 Recommendations	40
APPENDIX A: TRIP SUMMARY- 15TH IEC MISSION BY D'APPOLONIA FOR THE BTC PIPELINE PROJECT – SEPTEMBER 2013	
APPENDIX B: NON-COMPLIANCES WITH ESAP	

LIST OF FIGURES

<u>Figure No.</u>	<u>Page</u>
Figure 2.1: Solar Thermal Panels Installation at Bashirli School	9
Figure 2.2: Erosion at Djeyrankechmez River crossing	11
Figure 2.3: Difficult Reinstatement at KP12	12
Figure 2.4: Positive Results of Recent Reinstatement near KP12	12
Figure 2.5: Gabions on River Crossing at KP 419.2	13
Figure 2.6: Rare Species Monitoring 2013	14
Figure 3.1: Construction initiated at PSG2 Accommodations	17
Figure 3.2: Tskhratskaro Secondary Containment Facility	18
Figure 3.3: New Chemical Storage at CWAA	19
Figure 3.4: Tbilisi "Baby House" presentation for last offset project	21
Figure 3.6: Erosion at Kura River crossing (KP 222)	23
Figure 4.1: ECO-CARD Recorded Data up to September 2013	27
Figure 4.2: WWTP Effluent Compliance	30
Figure 4.3: SWP Pond Compliance	30
Figure 4.4: OWS Effluent Compliance	31
Figure 4.5: CMT Air quality Monitoring Locations	33
Figure 4.6: MARPOL under Construction at CMT	34
Figure 4.7: Pipeline Rerouting at KP 383	36

GLOSSARY

ACG	Azeri-Chirag-Gunashli
AGI	Above Ground Installation
AGT	Azerbaijan – Georgia – Turkey
AGTR	Azerbaijan-Georgia-Turkey Region
AIOC	Azerbaijan International Operating Company
BIL	Botaş International Ltd
BTC	Baku-Tbilisi-Ceyhan
BTEX	Benzene, Toluene, Ethyl benzene and Xylenes
BP	British Petroleum
BPEO	Best Practicable Environmental Option
CEA	Communication and External Affairs
CHA	Cultural Heritage Advisor
CHM	Cultural Heritage Monitor
CHMP	Cultural Heritage Management Plan
CIP	Community Investment Program
CLO	Community Liaison Officer
CMT	Ceyhan Marine Terminal
COD	Chemical Oxygen Demand
COFACE	Compagnie Française d'Assurance pour le Commerce Extérieur
COP	Chirag Oil Project
CTU	Crude Topping Unit
CWAA	Central Waste Accumulation Area
DRA	Drag Reducing Agent
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
ECGD	Export Credits Guarantee Department
ECO	Environmental Compliance Observation
EDDF	Emergency Drain Down Facility
EIP	Environmental Investment Programme
EPPD	Export Pipelines Protection Department (Azerbaijan)
ESAP	Environmental and Social Action Plan
ESIA	Environmental And Social Impact Assessment
EU	European Union
GNM	Georgia National Museum
H&S	Health and Safety
HSE	Health, Safety and Environment
HWMF	Hazardous Waste Management Facility
IEC	Independent Environmental Consultant
IFC	International Finance Corporation
ISO	International Standards Organization
JBIC	Japan Bank for International Cooperation
MEP	Main Expert Pipeline Participants

MoC	Management of Change
MoEU	Ministry of Environment and Urbanization
NEXI	Nippon Export and Investment Insurance
NGO	Non Governmental Organization
NGPL	Natural Gas Pipeline
NHL	Non-Hazardous Landfill
NRC	National Response Corporation
NTU	Nephelometric Turbidity Unit
OMS	Operating Management System
OPIC	Overseas Private Investment Corporation
OSR	Oil Spill Response
OSRB	Oil Spill Response Bases
OSRP	Oil Spill Response Plan
OWS	Oil Water Separator
PAC	Provisional Acceptance
PAS	Polaris Applied Sciences
PCR	Public and Community Relations
PCRE	Public and Community Relations Expert
PWHP	Primary Withholding Pond
RBC	Rotating Biological Contactor
RID	Regional Development Initiative
RoW	Right-of-Way
S&OR	Safety and Operational Risk
SACE	Servizi Assicurativi del Commercio Estero
SCP	South Caucasus Pipeline
SCPX	South Caucasus Pipeline Expansion
SOCAR	State Oil Company of Azerbaijan
SVA	Severe Vehicle Accident
SVAR	Severe Vehicle Accident Rate
SWP	Storm Water Pond
TVAR	Total Vehicle Accident Rate
US EXIM	Export-Import Bank of the United States
UV	Ultraviolet
VOC	Volatile Organic Compounds
WBH	Water Bath Heater
WHO	World Health Standard
WMP	Waste Management Plan
WREP	Western Route Export Pipeline
WWTP	Wastewater Treatment Plant

**REPORT OF THE POST-FINANCIAL CLOSE
INDEPENDENT ENVIRONMENTAL CONSULTANT
BAKU-TBILISI-CEYHAN PIPELINE PROJECT
FIFTEENTH SITE VISIT, SEPTEMBER 2013**

EXECUTIVE SUMMARY

This report presents the results of the fifteenth post-financial visit of the Independent Environmental Consultant (IEC) to Azerbaijan, Georgia and Turkey, between September 9 - 19, 2013 to monitor compliance with Baku-Tbilisi-Ceyhan (BTC) Project (the Project) Environmental and Social (E&S) commitments. Social activities in Azerbaijan and Georgia are now effectively part of overall national programs of the British Petroleum (BP) and not related specifically to the BTC Project, whereas in Turkey the BTC Project still has a specific social component. Accordingly, the social aspects of the Project were reviewed only in Turkey.

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

This is the first site visit (since February 2004) where no non-compliances with Project commitments have been identified. The main non-compliance with Project commitments identified over the past two years has been the lack of construction of a slops treatment facility at the Ceyhan Marine Terminal where the Turkish Ministry of the Environment has fined the Project in 2011 and 2012 for not undertaking this work. The facility is now under construction and the issue is considered to be closed.

Azerbaijan

In Azerbaijan, the BTC Project has demonstrated considerable effort to ensure appropriate pipeline route reinstatement and prevent erosion, in particular at sensitive river crossings. Problem areas continue to be the same as previously reported, in particular the sensitive Gobustan Desert area. In the Gobustan Desert the efforts made by the Project towards reinstatement have not been effective due to local adverse soil/climatic conditions and by the Export Pipelines Protection Department (EPPD) of Azerbaijan driving over the Right-of-Way (RoW). Based on our field observations, the status of reinstatement in the Gobustan is not much different from what was observed in 2009. This situation is not considered a non-compliance, because it is evident that the Project is doing whatever they can to reinstate this area. The biggest concern is if the South Caucasus Pipeline (SCP) Expansion (SCPX) project were to decide to follow the BTC – SCP route through the Gobustan Desert. If the SCPX were to cross the Gobustan Desert next to the BTC – SCP route, it would be a setback to years of effort to reinstate this sensitive area and would be an additional cumulative impact not anticipated in the BTC Environmental And Social Impact Assessment (ESIA).

The NO_x offset projects are now constructed whereby solar heating systems have been constructed at the Bashirli Secondary School, Gurbanzade School, and the Samukh District Kindergarten. This offset is considered to be complete. The scope of the *Iris acutiloba* offset project was defined at the time of the July 2012 site visit, but the planting of red listed trees expected to start at the first intermediate pigging station IPA1 and the second pump

station PSA2 between September and November 2012 is still in the process of contractor procurement. This delay is somewhat tempered by actual success in replanting *Iris Acutiloba* obtained from the Garadag Cement Plant.

Georgia

There is significant progress to report for Georgia. NOx offset projects were complete at the time of the last IEC audit and are proving successful. A major accomplishment is that the Georgian Government has accepted the Emergency Drain Down Facility (EDDF) and secondary containment facilities as complete. These projects represent an unprecedented level of spill control even when compared to worldwide best practice. Pipeline surveillance and maintenance has been excellent – significant effort has been undertaken for erosion and sediment control at river crossings.

Decommissioning of the Crude Topping Units (CTUs) at pump stations PSG1 & PSG2 is a major accomplishment that positively affects air emissions. The access road at PSG2 is now complete and undertaken with appropriate environmental and cultural heritage surveys completed and the new housing at pump station PSG2 is finally being constructed. An unfortunate situation with respect to the loss of the BTC – SCP archaeological museum at the Akhaltsikhe Castle has been rectified with the construction of a new museum where cultural heritage artefacts are back on display.

A cautionary note is with respect to biodiversity management. The rare floral species management program has not yet had success with three species, of which two have significance: Fritillary and Gentian. Seedlings are planned for reintroduction in fall 2013. An alternative program should be considered if this new effort is not successful.

Turkey

Over the past year, the BTC Project operations in Turkey undertaken through Botaş International Ltd (BIL) and the BTC Project have shown the greatest improvement among the three countries in terms of implementing their Health, Safety and Environment (HSE) programs. Major accomplishments over the past year include:

- The Slops and Bilge Water Reception and Treatment Facility at the Ceyhan Marine Terminal (CMT), also known as the MARPOL Facility, is under construction expected to be complete by March 2014. In November 2012 the Project was fined by the Turkish Ministry of Environment and Urbanization (MoEU) a second time for not building this facility and the situation was assigned as a Level II non-compliance in our report for the July 2012 site visit, so starting construction of this facility is a major accomplishment and the non-compliance is rescinded.
- Botaş construction phase legacy chemicals have finally been removed from the pump stations.
- Pipeline re-routing at Kilometre Point (KP) 383 is complete and well done; the re-route at KP 1007 ongoing. Although a significant effort, these projects were not large enough to trigger the need for a Class III Management of Change (MoC) under the definitions of the Operations ESAP and were assigned a Class II.
- Landslide maintenance projects at KP 387, KP 388, and KP 1010 are finally complete. Their success will be based on comprehensive geotechnical monitoring.
- Numerous small RoW maintenance projects, in particular 23 river crossing stabilization projects, have been completed.

- A new Central Waste Accumulation Area (CWAA) has been constructed at the pump station PT1 – others are scheduled for completion at the other pump stations.
- Effective enhancements have been made to the pump stations PT-2 and PT-4 Wastewater Treatment Plants (WWTPs), the Oil-Water Separators (OWSs), and Storm Water Ponds (SWPs) at all of the pump stations.

Although there has been significant improvements made to the WWTPs in operation, there is still room for improvement. Recommendations for some minor improvements to systems and operational procedures were communicated to responsible individuals in the field.

Turkey is the only country where social teams are dedicated exclusively to the BTC Project. In general, the overall social performance has been excellent, although BIL was cautioned to make sure that their Public and Community Relations Experts (PCREs) have the logistical resources they need to do their job. Employee rights standardization, especially for subcontractors, to maintain the transfer of rights was identified as something that still needs to be addressed. A recommendation was also made for BIL to update and publish their Social Management Plans.

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)¹ to the Lender Groups for the Baku-Tbilisi-Ceyhan (BTC) Pipeline Project (BTC Project).² The BTC Project is owned by BTC, a company formed by a consortium of the Main Export Pipeline Participants (MEPs)³. 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 BTC pipeline currently carries Azeri-Chirag-Gunashli (ACG) oil and Shah Deniz condensate from Azerbaijan; the BTC pipeline also transports some crude oil from Turkmenistan and from the State Oil Company of Azerbaijan (SOCAR). Since 4 June 2006 up to the end of the first quarter of 2013, 2,140 tankers have been loaded at Ceyhan with a total of about 1,648 million barrels (220 million tons) of crude oil transported via BTC pipeline and sent to world markets.

Current throughput of the pipeline is slightly less than 700,000 barrels per day (b/d) through the end of August in 2013, but the capacity of the BTC pipeline is approximately 1.2 million b/d with the use of Drag Reducing Agents for which the Project is equipped. The development of the new Chirag Oil Project (COP) is expected to increase oil production and recovery of an additional 360 million barrels of oil from the ACG field through a new offshore facility to be installed between Deepwater Gunashli and Chirag platforms by the end of 2013. The BTC pipeline is expected to function at or near its capacity with the completion of the COP. 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) and associated Management Plans and with HSE management systems. This report summarizes the results of D'Appolonia's fifteenth field visit held September 9 - 19, 2013 for the BTC Project.

This IEC trip represents the seventh annual verification of BTC Operations focusing on the operations team and ongoing operations activities and represents a continuation of a monitoring process initiated during the construction phase. 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,

¹ IEC Team members: William J. Johnson (Team Leader); Marco Morando (Team Member).

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

³ Also termed the "BTC Sponsors", the BTC Co. shareholders are: BP (30.1%); AzBTC (25.00%); Chevron (8.90%); StatoilHydro (8.71%); TPAO (6.53%); ENI (5.00%); Total (5.00%); Itochu (3.40%); INPEX (2.50%), ConocoPhillips (2.50%) and Hess (2.36%).

2007. The commitments made by BTC associated with the Schedule 21 represented follow-up activities intended to close construction-related issues that by their nature extended into the Operations phase of the BTC Project. Six years later, these construction-related issues are now resolved and this report focuses primarily on operations.

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 been addressed only in Turkey, as it is no longer practical to relate the social programs undertaken in Georgia and Azerbaijan as being related specifically to the BTC Project. The review of the social programs in Turkey was based on documentation review and management interviews and no field audits and potentially affected community meetings were held. Similarly, the review of BTC Oil Spill Response Plans (OSRPs) and related issues is not included in the IEC scope of work as this forms part of the work scope of the OSRP expert (Polaris) which provided the updated OSR Audit in August 2013.

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, and approximately 10 million barrels of oil were required to fill the line that became operational on June 5, 2006. BTC has the capability to increase its capacity for throughput to 1.2 mmb/d with the injection of drag reducing agent (DRA), but as the pipeline is still within its design capacity its use has not been required. During the first quarter of 2013, BTC exported 59.6 million barrels (7.9 million tons) of crude oil loaded on 79 tankers at Ceyhan.

This mission represents the sixth IEC visit fully associated with BTC Operations (although this is the seventh Operations audit, the first Operations audit was combined with the last Construction audit). Nevertheless, some of the aspects of Operations still relate to completion of the pipeline (e.g., bioremediation) and there are programs started during Construction and which have follow-up during Operations (e.g., erosion and sediment transport 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).

2.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES

2.1.1 Resources and Organization – Observations

The Environmental, Health & Safety and Social Organizations are fully developed and capable of functioning within their respective scopes of work. A change that has been made within BTC that is the result of a change in the BP Corporate policy is the development of an Upstream Health, Safety and Environment organization. This new organization includes the majority of the HSE, Environmental Regulatory Compliance and Crisis Management team members who provide support to the operating functions. The intent of this new organization is to identify, assess and manage operating risks and then assure that there are robust action plans in place to control or mitigate them allowing for the optimization of the corporate operating management system (OMS). This new organization is expected to strengthen and simplify the Upstream business and promote clarity of accountability around the running of day to day operations through OMS.

This latest reorganization is not expected to affect BTC Corp's ability to manage the compliance issues that are the subject of IEC review, as the staffing and organization are now mature and there are no gaps with respect to environmental, social or H&S management. Details of the organizations will not be further reviewed unless a change takes place such that there is a significant gap in terms of management capability that could affect compliance.

In May and October 2012, an International Standards Organization (ISO) 14001 audit was held for Azerbaijan and Georgia Export Pipelines with the outcome that a new 3-year ISO 14001 certificate was issued in January 2013 covering BP operations in Azerbaijan and Georgia.

2.1.2 Management of Change (MoC) - Observations

There have been no Class I, II or III changes in Azerbaijan since the July 2012 IEC field visit.

2.2 HEALTH AND SAFETY

2.2.1 Health and Safety – Observations

The BTC organization continues to place emphasis on properly managing the safety performance of the different parties involved during the Project development. A comprehensive Health and Safety (H&S) Management system is in place and dedicated H&S Plans and Manuals are routinely followed. The activities performed by the H&S team are extensive and include the significant components of the most advanced safety management systems (training, monitoring, auditing, risk analysis, safety data collection and reporting, etc.). An extensive analysis of safety data and statistics is performed including incident analysis and evaluation of immediate and root causes.

During the Operations phase, the most serious risk in Azerbaijan has been found to be associated with vehicular accidents and this has been a focus of BP Operations in Azerbaijan associated with the Export Pipelines. This effort appears to be showing positive results, as in 2013 through September 2013 there was no recorded SVA (Severe Vehicle Accident) in Azerbaijan. Recordable injuries were not associated with the BTC Project during 2013 through September. In general, the total recordable injury rate for all of BTC is within industry good practice.

In 2011, the most significant potential hazards to the pipeline in Azerbaijan proved to be grass fires. This also appears to be the case in 2013, where two grass fires were reported just in September at KP 129+300 and KP 354+250.

2.3 WASTE MANAGEMENT

2.3.1 Non-Hazardous and Hazardous Waste – Observations

Since the July 2012 IEC visit, waste management practices have been maintained within BP's overall waste management program in Azerbaijan that also includes the offshore facilities and other export pipelines. An AGT (Azerbaijan – Georgia – Turkey) Region Waste Manual has been developed and implemented to enhance waste management practices at all facilities and BTC continues efforts to minimize waste generation through awareness sessions, toolbox talks and similar efforts.

The BTC Project in Azerbaijan continues to use an EU-compliant non-hazardous waste landfill at Sumgayit. Landfill expansion work at this facility is complete and the expanded landfill is currently operational. The BP-owned ISO 14001 certified Hazardous Waste Management Facility (HWMF) in Serenja and the Central Waste Accumulation Area (CWAA) at the Sangachal Terminal is still being used. Other acceptable disposal solutions continue to be identified, and implemented. About a third of all of the non-hazardous waste generated is recycled by third parties.

2.3.2 Wastewater Management – Observations

BTC Azerbaijan's effluent discharges continue to be comprised by treated sewage from PSA 2, the PSA 2 camp and IPA 1. Sewage treatment systems at PSA 2, PSA 2 camp and IPA 1 have the same design and undergo the same 3 stages of treatment: biological treatment, ultra violet sterilization, and final polishing in reed beds.

The treatment system at PSA 2 camp was not able to treat all waste water due to capacity limitations and required transport untreated sewage from PSA2 to the Hovsan Municipal Treatment Facility plant near Baku. An additional Rotating Biological Contactor (RBC) unit was installed in 2013 to work in parallel with the existing RBC located at PSA 2. The hand-over process between the Project team and Operations team is now complete. Effluent monitoring has included monthly measurements of effluent parameters at the internal environmental laboratory and these results are verified by a third-party laboratory on a quarterly basis. Since the July 2012 IEC field visit the test results from the PSA 2 reed bed have complied with the ESAP standards with the occasional small excursion of coliform bacteria and ammonia NH_4 .

The RBC unit operating at IPA1 has been generally performing well since installation. The most recent results from June through August 2013 show generally compliant results from the reed bed, with the exception of a single slight excursion of faecal coliforms in June and a slight excursion of COD, also in June.

An observation previously made by Project environmental staff applicable to the PSA2 and IPA1 facilities is that exceedances of total coliforms from the reed beds tend to take place after heavy rains and it is speculated that the rains wash in bird droppings from the reeds. Field test results of effluent entering the reed beds is commonly better than the discharge from the reed beds after heavy rains.

2.4 POLLUTION PREVENTION

2.4.1 Observations

Since June 2006, 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 and noise, and protecting surface water and groundwater.

Environmental incidents continue to be identified and tracked. In 2013, the largest reported BTC incident in Azerbaijan was at Block Valve AB16, where there was a one litre release of Main Diesel Generator coolant to containment area, which was entirely recovered.

Stack emissions testing has continued at the MOL turbines and generators at PSA2 and the IPA1 generators with the last tests for which results are available undertaken in February 2013. All of the generators have compliant emissions. At the PSA2 turbines NO_x levels continue to be above the standard of 75 mg/m^3 limit at Turbines 2, 3 and 4. Ambient air measurements obtained around PSA2 and IPA1 are all within Project standards.

The exceedance of NO_x has been addressed by the Class III MoC discussed in the report from the July 2012 IEC field visit. During this visit, the three schools and the kindergarten where the solar thermal panels have been installed as the NO_x offset program were visited. In the Bashirli Secondary school of Goranboy district, 12 panels have been installed (Figure 2.1), as well as 22 new radiators and hot water storage, water makeup treatment and

additional gas boiler. The cost of the investment was about 42,000 EUR. The system is not yet operational pending a control from the governmental Energy Department.



Figure 2.1: Solar Thermal Panels Installation at Bashirli School

In the Gurbanzade School of Goranboy district, 22 panels have been installed, as well as 32 new radiators and hot water storage, water makeup treatment and additional gas boiler. The cost of the investment was about 46,000 EUR. The system is not yet operational pending a control from the governmental Energy Department.

In the Sigirli School of Kurdamir district, 20 panels have been installed, as well as 70 new radiators and hot water storage, water makeup treatment and additional gas boiler. The cost of the investment was about 52,000 EUR. The system is not yet operational pending a control from the governmental Energy Department.

In the Chobanabdali Kindergarten of Samukh district, 16 panels have been installed, as well as 24 new radiators and hot water storage, water makeup treatment and additional gas boiler. The cost of the investment was about 29,000 EUR. The system is operational and during last winter it provided 50 – 60°C hot water without gas boiler use, according to information provided by the Kindergarten Director.

The IEC is favourably impressed with the results of the NO_x offset program. The installation of the solar water heating systems was worth the effort.

The BTC Environmental Team continues to conduct noise monitoring. The most recent monitoring results from the December 2012 and August 2013 campaign indicate full compliance with the Project noise standard. No exceedance was recorded during these measurement campaigns.

Surface and groundwater monitoring continues to be undertaken. Groundwater samples were taken from five monitoring wells at the Karayazi aquifer, with the observation that two of the wells were vandalized in 2012, which required their re-drilling in January 2013. Ground water monitoring is reportedly being conducted twice a year in May and November. According to data provided, 2012 results indicate no significant deterioration from pre-project baseline conditions. A concern for potential contamination was with respect to releases of water from the retention ponds, but, test results at the PSA2 and IPA1 retention ponds did not indicate any exceedances of Project effluent standards, except for a single small excursion of oil and grease from the PSA2 pond in June 2012, such water is pumped out by vacuum truck and sent to disposal. Again, according to data provided, no more recent pond monitoring has been performed since 2012.

2.5 ROW MANAGEMENT

2.5.1 Observations

Since the completion of construction, bio restoration monitoring has been conducted by BTC terms of percentage cover values and species-diversity data. Available results have shown a consistent increase in vegetative cover and biodiversity. Nevertheless, the monitoring results also show some transects where vegetation cover is either slow or is less than 70% of the off-RoW cover, essentially confined to three zones: the Gobustan Desert near Sangachal (KP 0 to KP 9), the Gobustan semidesert (KP 23 to KP 79), and Kurdamir lowlands (KP 143 to KP 208). The most difficult area has proven to be the Gobustan Desert near Sangachal and the beginning of the Gobustan semidesert area. The efforts made by the Project towards reinstatement have not been effective due to local adverse soil/climatic conditions and by EPPD driving over the RoW. Based on our field observations, the status of reinstatement in the Gobustan is not much different from what was observed in 2009. This situation is not considered a non-compliance, because it is evident that BTC is doing whatever they can to reinstate this area. In addition to naturally difficult conditions, some significant external factors have affected the overall ecological balance in the Gobustan area that can be grouped under the category of “cumulative effects” in addition to EPPD including the following:

- New prison;
- New water pipeline;
- New transmission lines;
- New roads associated with the Gobustan museum;
- Increased tourism and visitors in general;
- Increased agriculture;
- Projected Sangachal Expansion.

The biggest concern is if the South Caucasus Pipeline Expansion (SCPX) project were to decide to follow the BTC – SCP route through the Gobustan Desert. If the SCPX were to cross the Gobustan Desert next to the BTC/SCP route, it would be a setback to years of effort to reinstate this sensitive area and would be an additional cumulative impact not anticipated in the BTC ESIA.

During this field visit one of the most difficult areas for river erosion, the Djeyrankechmez River crossing at KP 9, was visited (Figure 2.2). An intervention to repair the river's slopes and fix the deep erosion channels is again required. This is an area of dynamic river movements where monitoring and maintenance will always be required. The difficulties

related to the biorestorement in the Gobustan region were visible also at KP 12, as shown on the photograph on Figure (2.3). Some limited success in this area is shown on Figure 2.4.

The BTC project is doing a good job in terms of managing erosion and sediment control at the river and stream crossings. During this field visit several river crossings with important remedial construction were visited, including:

- River crossing at KP 331 at Shamkir Chai, major construction of weirs to prevent what was a serious erosion of the riverbed with potential for exposing the BTC pipe is now complete;
- River crossing on the Jail river at KP343, where gabions have been installed to prevent erosion of the banks;
- River crossing at Zayam Chai at KP 356.6, where rocks have been placed on the banks to prevent bank erosion;
- Small river crossing at KP 419.2, where gabions were being installed to prevent erosion of the river bed (see Figure 2.5);
- River crossing at KP 422 on Kurudara River near to block valve AB-21, where works on the bed of the river (installation of terraces gabions) have been made to prevent its erosion.



Figure 2.2: Erosion at Djeyrankechmez River crossing



Figure 2.3: Difficult Reinstatement at KP12



Figure 2.4: Positive Results of Recent Reinstatement near KP12



Figure 2.5: Gabions on River Crossing at KP 419.2

2.5.1 Recommendation

It is understood that any decision to construct the SCPX project through the Gobustan region may rest with SOCAR and Ministry of Environment and Natural Resources.. BP is encouraged to exert whatever influence it can to have SCPX avoid the Gobustan area.

2.6 ECOLOGICAL MANAGEMENT

2.6.1 Observations

The scope of the *Iris acutiloba* offset project was defined at the time of the July 2012 site visit, but the planting of red listed trees expected to start at IPA1 and PSA2 between September and November 2012 is still in the process of contractor procurement. This delay is somewhat tempered by actual success in replanting *Iris Acutiloba* obtained from the Garadag Cement Plant.

The original plants taken from the RoW, maintained at the Mardakan Arboretum and trans-located back to the RoW have continued to show poor success. The plants trans-located in 2010 from the Garadagh Cement Plant redevelopment area with improved management have shown much better survival percentages, as also shown on Figure 2.6:

- 39.8% in 2011;
- 55% in 2012,
- 33% in 2013.

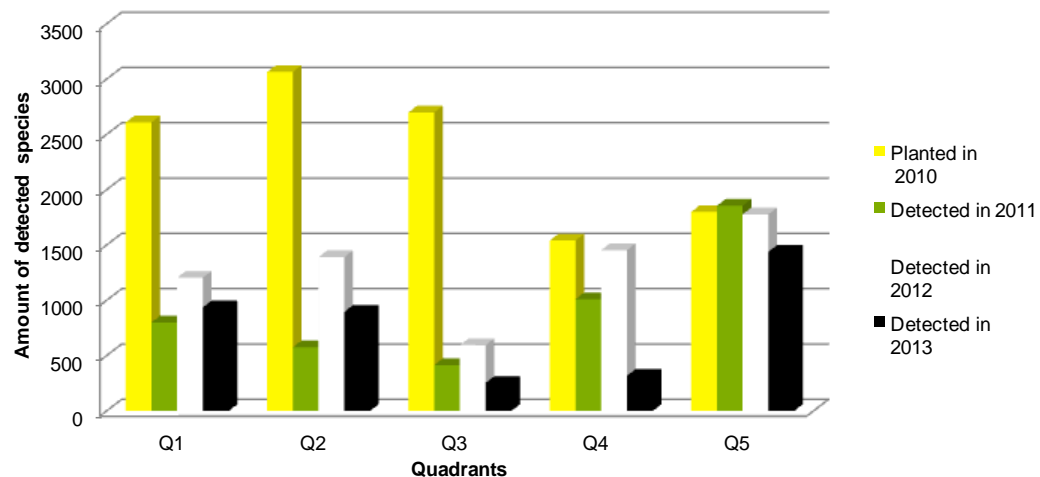


Figure 2.6: Rare Species Monitoring 2013

The reversal of the population decline is mainly due to a translocation technique adopted by the Project, whereby roots are better protected with surrounding soil. This process that falls in the category of “lesson learned” to be applied with future development.

2.6.2 Recommendations

1. Start the plantings that comprise the *Iris Acutiloba* offset. This program is late. . The reason for being late in planting of red book listed trees to compensate not survived *Iris Acutiloba* plants was high cost proposal made by contractor company (650 K- 700K which is not reasonable and acceptable cost for this project. That’s why then it has been decided to plant 32000 *Iris* Plants on RoW which will not be deteriorated by EPPD. Negotiation with contractor has already started)
2. Continue with the program of reinstatement the *Iris acutiloba* with their original soil. Some last attempts (2012 – 2013) seem to have produced better results than in the past with this technique, as visible in a recent reinstatement areas near to KP12. Even considering some success in re-planting this red listed plant, at this stage it cannot be considered a replacement for the offset. As mentioned above the company has decided to plant back 32,000 plants instead of planting of trees. The cost for planting trees is not acceptable and reasonable.

2.7 CULTURAL HERITAGE MANAGEMENT

The cultural heritage program for the BTC project currently relates to the management of cultural heritage material encountered during construction, as well as management of situations that could occur along the pipeline route in the future. Operations have not faced any issues related to damage to cultural heritage due to new construction or third-party damage to identified sites. The main activities have been associated with the management of archaeological materials identified during the construction phase of the BTC and SCP Projects. This effort continues to be undertaken by BP AGTR Communication and External Affairs (CEA) department based in Baku for both Azerbaijan and Georgia.

2.7.1 Observations

The activities associated with the management of cultural heritage from the construction phase of the BTC Project in Azerbaijan are complete as previously reported. There have been no chance finds associated with the BTC Project that are not associated with the field work underway to prepare for construction of the South Caucasus Pipeline Expansion (SCPX) Project, which will follow much of the BTC route.

3 GEORGIA

The BTC Project in Georgia, inaugurated in October 2005, 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.

This mission represents the sixth IEC visit fully associated with BTC Operations (although this is the seventh Operations audit, the first Operations audit was combined with the last Construction audit). Nevertheless, some of the aspects of Operations still relate to completion of the pipeline (e.g., bioremediation) and there are programs started during Construction and which have follow-up during Operations (e.g., erosion and sediment transport 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).

3.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES

3.1.1 Resources and Organization - Observations

The BTC environmental and social management organizations continue to be organized within the AGT Region whose operational activities cover Azerbaijan, Georgia and Turkey. As noted in Section 2.1.1, Georgia is also part of an Upstream Safety and Operational Risk (S&OR) organization that includes the majority of the HSE, Environmental Regulatory Compliance and Crisis Management team members who provide support to the operating functions. As is also the case with Azerbaijan, this latest reorganization is not expected to affect BTC Corp's ability to manage the compliance issues that are the subject of IEC review, as the staffing and organization are now mature and there are no gaps with respect to environmental, social or H&S management. Details of the organizations will not be further reviewed unless a change takes place such that there is a significant gap in terms of management capability that could affect compliance.

3.1.2 Management of Change - Observations

There have been no Class I, II or III changes in Georgia since the July 2012 IEC field visit.

3.1.3 Health and Safety – Observations

The BTC organization continues to place emphasis on properly managing the safety performance of the different parties involved during the Project development. In 2013 through September, there was only one recorded injury in Georgia associated with an injured ankle and two first aid injuries, one a finger injury sustained by a slammed door and another minor injury associated with a preparing construction formwork. BP Georgia has focused on identifying near-misses to better characterize where H&S stewardship needs to be especially

implemented. One area of concern is driving safety, in particular with accidents due to third-party vehicle violations. Defensive driving is now being emphasized. In 2013 there was only one minor traffic accident with a Project Toyota pickup truck and a third-party vehicle. From the point of view of safety statistics, BP Georgia exhibits performance consistent with good practice.

3.2 CAMPS, INFRASTRUCTURE AND SERVICES

With the acceptance of the Kodiana Projects by the Georgian Government, the construction phase of the BTC Project in Georgia is complete. Most of the temporary facilities associated with construction described in previous IEC reports were closed by 2012, reinstated to the satisfaction of the landowners and relinquished to the landowners, unless their use has been required by Operations. The eventual fate of these facilities also depends on whether they could be reutilized by the South Caucasus Pipeline Expansion (SCPX) Project. The current status of the temporary construction facilities, based on the information provided by BTC, is as follows:

- *PSG1 Camp* – still in place as permanent facility;
- *PSG2 Camp* – still in place and servicing Operations (will be reinstated when the now under-construction PSG2 Accommodation Addition – 39 bedrooms with 2 people per room - will become operational);



Figure 3.1: Construction initiated at PSG2 Accommodations

- *Rustavi (Gatchiani) Pipeyard* – still in use as logistics base and pipe storage yard (will be reinstated when all material is moved to PSG1 Warehouse at end of 2013); planned to be turned over to landowners in 2014;

As indicated above, Operations is in the process of planning or has started construction of additional infrastructure. Specifically, at PSG1 the Accommodation Expansion is being constructed and includes the development of additional accommodations, warehouses, new access road, and helipad with planned completion in 2014 (see Figure 3.1).

Construction of PSG1 accommodation camp, warehouse, new access road and helipad (design was changed due to SCPX changes) is planned to commence in 2014.

3.3 SECONDARY CONTAINMENTS

A major accomplishment of the BTC Corp. since the last IEC field visit is that the Georgian Government has accepted the Emergency Drain Down Facility (EDDF) and secondary containment facilities as complete. These projects represent an unprecedented level of spill control even when compared to worldwide best practice. The IEC Team visited the Secondary Containments of Tskhratskaro, Oshora 1, Kumiska 1 & 2, and Tori during this field visit.



Figure 3.2: Tskhratskaro Secondary Containment Facility

3.4 WASTE MANAGEMENT

3.4.1 Non-Hazardous and Hazardous Waste – Observations

Non Hazardous Waste

BP Georgia has a non-hazardous waste management program that was fully developed by the time of the July 2012 IEC visit. The EU-standard non-hazardous waste landfill in Georgia that began operations in 2009 is still being used and it has an estimated lifetime of 40 years. Recyclable waste such as metal, plastic waste and bottles, paper and cardboard is recycled through the local companies. For other non-hazardous waste BP Georgia continues to try to identify new recycling solutions. Non-recyclable waste, after compaction, is sent to landfill for final disposal on a monthly basis. Non-hazardous waste management is well done in association with the BTC Project in Georgia.

Hazardous Waste

The final solution for the disposal of hazardous waste stored at the Central Waste Accumulation Area (CWAA) at PSG-1 continues to be based on international export and final disposal in EU-compliant facilities. Used oil continues to be injected into the BTC pipeline on an as-needed basis. A new chemical storage at CWAA which is now operational (Figure 3.3).



Figure 3.3: New Chemical Storage at CWAA

A coolant distillation/recycling unit is under construction. After the installation of this unit, more than 250 m³ of stored liquid hazardous waste (coolants) will be neutralized and disposed as inert water.

3.4.2 Wastewater Treatment – Observations

Wastewater treatment infrastructure continues to improve. As of July 2012, the PSG1 rotating biological contactor (RBC) WWTP (installed in 2010) had been bypassed due to damage at the discharge pipe. Now it is repaired and re-commissioned.

The only pending improvement is the replacement of the WWTP at the EDDF and the installation of the reed bed. The new plant is now installed and the reed bed construction is in progress. The results indicated general compliance with the Project-specified standards, with the exception of the PSG 2 site WWTP, which showed an exceedance of coliform bacteria in one reading, apparently caused by damage to the ultraviolet sterilization system, a problem that has been resolved. Water quality in the retention ponds is also tested whereby a single exceedance of Chemical Oxygen Demand (COD) was noted in another reading, a situation that could not be investigated as the monitoring results were received two months late. This exceedance did not represent discharge to surface water.

Ground and surface water is monitored semi-annually at all locations. Full compliance in 2012 and 2013 spring rounds was accomplished.

NHL underground water was monitored in two quarterly rounds (Q1 and Q2) in 2012 and one quarterly round (Q1) in 2013 (subject to water availability in the water wells). General compliance with the background geochemistry was monitored, with some trendy fluctuations within several parameters, such as electrical conductivity, sulphate, chloride, sodium and boron.

Concerning Effluent Discharge:

- Retention ponds are monitored monthly at both locations. General compliance with specified standards with the exception of one COD reading at PSG 2 RP was accomplished;
- Oil Water Separators are monitored monthly at PSG 1 and PSG 2 via RPs and directly from OWSs at PSG 1 camp, PSG 2 camp, Tsalka and Borjomi OSRBs and EDDF. Full compliance was achieved.

3.5 POLLUTION PREVENTION

3.5.1 Observations

Since June 2006, 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 and noise, and protecting surface water and groundwater.

BTC Georgia continues to track environmental incidents, the most serious in August 2013 being a spill of 380 litres of oily water around the junction of a PIG receiver storm water drain line, of which 90 litres were recovered. In the field, structural improvements and additional spill control facilities in this area were observed.

The last annual round of stack emissions monitoring was conducted in November and December 2012 for most equipment, with the exception of PSG 1 MOL Turbine 5 and the Water Bath Heater (WBH), as this equipment was down for maintenance. A significant accomplishment in terms of reducing emissions from the pump stations is that the Crude Topping Units (CTUs) have been decommissioned and they have therefore been removed from the monitoring program.

The Stack Emissions Monitoring shows general compliance except for PSG 1 Generator 3 for CO (ESAP standard applicable in Georgia, but not in Azerbaijan) and PSG 2 MOL Turbine 3 for NO_x (MoE standard). As discussed extensively in past reports, BTC has recognized that it is not practical to fully comply with the stack emissions standards and this formed the basis for the development of an offset program involving the installation of solar

water heaters in schools similar to the program in Azerbaijan. This program is discussed in the IEC report for the July 2012 field visit and is not repeated here. One change since July 2012 is that the third project, Borjomi Micro Hydro Power Plant (intended to produce renewable clean electricity to be used by Borjomi Park) was not practical to undertake for a variety of reasons and was replaced by another solar thermal system project at “Baby House” in Tbilisi. This facility seeks to improve sanitary norms for baby care (158 infants) and their living conditions. The project has also included installing energy saving measures such as insulation of the attics, replacement of old wooden windows and doors with double glazed equivalents in PVC frames, and replacement of incandescent light bulbs with energy saving bulbs. The project has been successfully completed and replacing the Borjomi project with this new solar heating project is considered acceptable to the IEC and we consider the offset to now be complete.



Figure 3.4: Tbilisi “Baby House” presentation for last offset project

Noise monitoring takes place on an annual basis and the last round was conducted at the end of 2012, at locations around PSG 1, PSG 1 camp, PSG 2, PSG 2 camp, Tsalka and Borjomi Oil Spill Response Bases (OSRB) and the EDDF. Full compliance with ESAP standards is reported.

Surface and groundwater monitoring continues to be undertaken along the pipeline and around the AGIs, as well as the non-hazardous landfill. Two rounds of sampling have taken place since the last IEC visit in July 2012. Results do not show any evidence of Project-related contamination and water quality is within ESAP standards. Water quality around the landfill does exhibit variation with respect to electrical conductivity, sulphate (SO₄), chloride (Cl), sodium (Na) and boron (B), but these parameters typically fluctuate seasonally and are not interpreted to relate to the landfill.

An unusual monitoring issue has been resolved in the sensitive Tsalka area, where the Government of Georgia had made the requirement of undertaking special leak detection surveys. Based on comparative testing, “sniffer dogs” were found to be more effective in

detecting leaks than the expensive, specialized equipment previously requested by the Government. The Government has approved the use of these dogs, which facilitates the survey process. Leaks have not been detected by the dogs in the Tsalka area.

3.6 ROW MANAGEMENT

3.6.1 RoW Reinstatement and General Management - Observations

Vegetation cover regrowth trends and erosion risk potential along the RoW have been monitored annually since 2005 using both ground-based and satellite data. All transects have shown an increasing trend of vegetation cover over the past seven years of monitoring. Biorestoration targets have been achieved in nearly all habitats – 65% of the RoW transects have vegetation cover equal to or greater than adjacent, undisturbed areas.



Figure 3.5: *Gentiana angulosa* (Gentian) planned for second re-introduction on pipeline RoW

A component of the pipeline RoW reinstatement has been the re-introduction of rare floral species with the objective of re-establishing a minimum of 75% of the original population within the areas designated for translocation. This indicator has been achieved with 8 species out of 11, of which two species are considered significant, *Gentiana angulosa* (Gentian) and *Fritillaria lutea* (Fritillary). These species were originally present in the Tskhratskaro (KP 176) and Kodiana (KP 193) passes, but were found to be absent after surveys in 2009. In particular, approximately two thousands of Gentian individuals were planted in these areas, but did not survive. Since 2009, seeds and bulbs of these species have been cultivated such that they can be again introduced, but with what is expected to be an improved approach for their re-introduction, currently planned for September 2013⁴. Monitoring will be then performed in summer 2014.

The most significant invasive species encountered along the RoW and other Project infrastructure is *Ambrosia artemisifolia*, otherwise known as Common Ragweed. A program

⁴ The target plants were grown from seeds collected in the wild populations of the target species and seedlings/young plants were reintroduced back to the original habitats immediately adjacent to the AGT ROW in September, 2013.

specifically oriented towards this weed has been developed on the basis of optimizing the time of year for mechanical removal. This program is ongoing and monitoring takes place on the basis of walkover surveys.

Another aspect of RoW management is preventing erosion where the pipeline could be damaged, especially at river crossings. The IEC visited the Kura River crossing at KP 222 where a rock pier intended to mitigate against the river meandering and eroding sediment over the pipeline had already been constructed, but where additional remediation was still required. The Project is well aware of the situation and currently is planning additional remedial works. The overall maintenance program for the pipeline in Georgia is well implemented



Figure 3.6: Erosion at Kura River crossing (KP 222)

3.6.2 Off-RoW Reinstatement – Observations

As reported in the IEC report for the July 2012 field visit, survival rates for trees and shrubs planted at PSG-1 and PSG-2, as well as the Secondary Containment Facility (SCF) and Emergency Drain Down Facility (EDDF) sites have had poor to mixed success. In September 2012, this situation was evaluated by a third-party consultancy and various factors affecting the survival rate were identified and approximately 2,000 saplings were planted to replace unsuccessful trees and shrubs, this time with improved fertilizers (phosphorous and potassium) to enhance growth. In 2013, improved survival was documented and new trend-based procedures developed that will hopefully improve the survivability prospects. Additional planting is planned for spring 2014 to meet initial

landscaping/biorestation targets and reconstruct future maintenance range. According to the 2013 fall survivability results necessity for additional case sensitive planting will be considered for spring 2014. .

3.6.3 Recommendation

The introduction of rare floral species along the pipeline RoW has not been successful for Fritillary and Gentian and the time involved to re-establish these species is becoming excessive. If the program to reintroduce these species a second time in fall 2013 is not successful, an offset program should be considered.

3.7 ECOLOGICAL MANAGEMENT

Off RoW biodiversity monitoring consisting of faunal and floral (including habitats) components is currently a five year program (2011 – 2015) based on an agreement with the Georgian Ministry of the Environment (MoE). With this program and previous monitoring, biodiversity monitoring has taken place over a nine year period., excluding year 2010, when the 5-year monitoring trend-based data has been analysed leading to the compilation of the revised scope for 2011-2015 time-period. . Overall results indicate stable biodiversity indices in the floral monitored plots, but with a decrease in numbers of focal faunal species populations, attributed mainly to the substantial increase of anthropogenic pressure at all monitoring sites. This is as has previously been reported. Additional details may be found in the BTC Annual Report for 2012.

As part of oil spill response training, a first regional initiative for simulated emergency involving the need for wildlife rescue and emergency treatment has been developed assuming a Tier 3 incident at KP 11+709 involving nearby Jandari Lake. This simulation has involved the oil spill response contractor with personnel from all of the three oil spill response bases in Georgia, along with BP management, local communities and various governmental institutions. This simulation was conducted as a desk study in August 2013 with the actual exercise planned for the end of September 2013⁵.

3.8 CULTURAL HERITAGE MANAGEMENT

The cultural heritage program for the BTC project currently relates to the management of cultural heritage related material encountered during construction, as well as management of situations that could occur along the pipeline route in the future. Operations has not faced any issues related to damage to cultural heritage due to new construction or third-party damage to identified sites and the main activities have been associated with the management of archaeological materials identified during the construction phase of the BTC and SCP Projects. This effort is undertaken by BP's CEA department based in Baku for both Azerbaijan and Georgia.

⁵ The in situ exercise was conducted on 27th of September 2013, level 3 wildlife response report has been issued and communicated with parties involved with respective improvement action plan in place

3.8.1 Observations

In Georgia, the Cultural Heritage Team is part of the Social Responsibility team within the External Affairs department and is responsible for implementing the Ops Cultural Heritage Management Plan (CHMP) and Cultural Heritage Procedure. The team includes a Cultural Heritage Advisor (CHA) and Cultural Heritage Monitors (CHMs.) on a third party contract.

At the time of the July 2012 field visit, the IEC was disappointed to learn that the Akhaltsikhe museum displaying artefacts from the BTC/SCP excavations had been dismantled. Losing the museum was a significant setback to the original goals of the archaeological program envisioned during the construction phase. For this visit we are pleased to report that a new museum where BTC/SCP artefacts can be observed has been re-established in a different location in Akhaltsikhe. The Georgia National Museum (GNM) is still in the process of finalizing the displays and identifying the artefacts within the context of the BTC/SCP projects, but progress is being made. Space for new storage facility has been selected by GNM and refurbishment of the room is ongoing. The archaeological materials will be relocated to new storage soon.

At the time of the July 2012 field visit, the cultural heritage findings made along the BTC/SCP pipelines for Azerbaijan and Turkey were available from a Smithsonian Institute web page at <http://agt.si.edu/>, but the significant discoveries from Georgia had not been posted. This situation has changed and the Georgian site descriptions, as well as descriptions of the artefacts are available online at <http://museum.ge/>.

New archaeological work was reported in terms of the monitoring of ground disturbance activities associated with the new camp construction at PSG2, known to be a sensitive area for cultural heritage. Significant cultural heritage was not encountered in these areas.

Another responsibility for cultural heritage management is to make sure that the sites identified along the pipeline route are protected. This effort continues to be undertaken mainly in association with the South Caucasus Pipeline Expansion (SCPX) Project that will follow about 56 kilometres of the BTC route and include an expansion of the PSG1 footprint to accommodate a new compressor station. Most of the archaeological work undertaken by BP Georgia is currently being done in association with the SCPX Project. Where BTC/SCP sites will be impacted by the new project, they are being managed appropriately.

One other cultural heritage issue that has extended from the construction phase for the BTC Project is the protection of the Atskuri Castle. Government authorities were concerned that the road next to the castle represented a concern for overall stability of this ancient structure. After undertaking a stability evaluation including a risk assessment, consultation with Geo heritage authorities, and geoseismic studies, the castle was protected by widening the road towards the Mktvari (Kura) River to the satisfaction of the responsible authorities.

4 TURKEY

The BTC Project in Turkey encompasses 1,074 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 Botaş 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 May 18, 2005, and crossed the Georgian Turkish border on November 18, 2005. Oil reached the Ceyhan Marine Terminal (CMT) on 28th May 2006. The first shipment of oil sailed from Ceyhan on June 4, 2006.

With linefill, the transition from construction to operations was initiated. BOTAŞ assumed responsibility for the operation of the pipeline until Provisional Acceptance (PAC) on 28th July 2006. From 29th July 2006 onwards, Botaş International Ltd (BIL), the Designated Operator of the BTC pipeline in Turkey, assumed responsibility with BTC continuing to maintain an overall assurance role.

The September 2013 audit in Turkey consisted of a site visit to selected sections of the pipeline right-of-way (RoW), site visits to Pump Stations PT1 and PT2 and a visit to the Ceyhan Marine 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 BIL and BTC.

Since the September 2011 site visit, the Project has confirmed that in Turkey it has reached the stage where the construction-related issues are essentially complete. The shift to the appropriate routine pipeline operations and maintenance phase was completed in 2011 and currently the Project is fully within the operations and maintenance phase.

4.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION AND RESOURCES

4.1.1 Management System Observations

Environmental and Social management and resources are now well defined and a stable part of operations. In Turkey, BIL obtained ISO 14001 certification in 2008 from the British Standards Institution. A surveillance audit was carried out by the British Standards Institution in October 2012 that has confirmed their certification. The next audit is scheduled for December 2013.

The framework by which BTC Corp. defines the Environmental and Social requirements for BTC Co. contractors continues to evolve which is based on ESAP (E&S Management Plans of BIL) and ESIA and which captures the lessons being learned from Operations and

Maintenance. The last version of the document “Statement of Environmental and Social Requirements” has reached Revision 6 as of April 2013.

The overall management framework between BTC and BIL has not significantly changed since the last IEC visit in July 2012 and both internal and external ISO audits have not found any significant gaps in the BIL management system.

A significant reorganization took place in August 2012 with respect to oil spill response (OSR) when BIL and BTC Corp. agreed on a Protocol for OSR management. Since September 2012 BTC has engaged National Response Corporation (NRC - formerly Seacor) to be the OSR Contractor who works under the supervision of BIL. As noted in the audit report prepared by Polaris Applied Sciences, Inc. (PAS) for the independent OSR audit undertaken in May 2013, “The re-instated response capability provided through the NRC contract (personnel and facilities) provides BTC and BIL with a superior response capability.” BIL OSR capability was flagged as a management gap in the last two IEC reports, but this gap is now closed.

4.1.2 Management of Change

Since the July 2012 field visit there has been one Management of Change (MoC) with an Environmental and Social component such that it was ranked a Class II change, being the pipeline re-routing away from the unstable slope at KP 383. This did not warrant being classified as a Class III, as the re-route took place within a kilometre of the original RoW, and BTC Corp. undertook the necessary additional field surveys, and appropriate mitigations to assure compliance with the ESIA.

4.2 ENVIRONMENTAL TRACKING AND PERFORMANCE

4.2.1 Observations

Environmental tracking and performance is now a routine part of environmental and social management in Turkey, as reported in past IEC reports. One component of this system that we believe is exceptional, as we do not commonly see this system on major development projects, is the Environmental Compliance Observation (ECO) system where employees and visitors are encouraged to make environmental observations that can be reported to management by filling out a card (ECO-CARD). This relatively new system supports environmental management by identifying areas where improvements can be focused (see Figure 4.1).

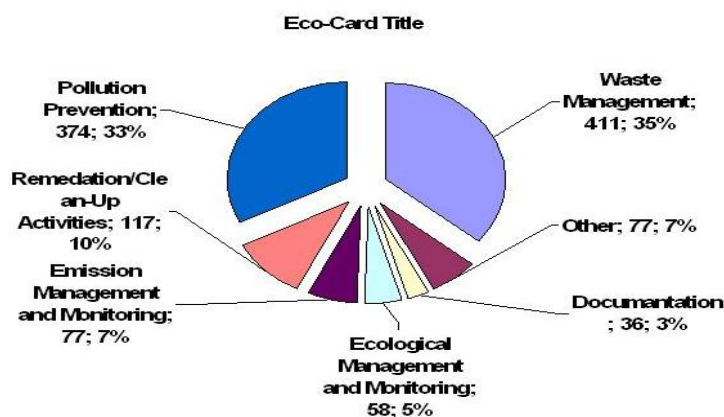


Figure 4.1: ECO-CARD Recorded Data up to September 2013

4.3 WORKER CAMPS, INFRASTRUCTURE AND SERVICES

Based on the Class II MoC enacted in June 2012, the old AGI camps associated with the construction phase will continue to be used until BTC Corp. constructs new facilities with construction expected to start in 2017. This is the last time the IEC will report on the status of these camps.

4.4 WASTE MANAGEMENT

4.4.1 Non-Hazardous and Hazardous Waste – Observations

Turkey has had the advantage, when compared to Georgia and Azerbaijan, in that EU-compliant waste disposal facilities have always been available and waste management was prefaced with the use of these facilities. During the construction phase, the İzaydaş facility near İzmit in western Turkey was available for both hazardous and non-hazardous waste disposal. The problem with the use of this facility for the BTC project is the road transport safety risks stemming from long distances, exhaust emissions from long distance transportation of wastes and the large transportation costs, especially for the disposal of non-hazardous waste. Since the end of construction, the BTC Project has been able to take advantage of improvements in Turkey's waste management infrastructure. Beginning in late 2010, non-hazardous waste has been disposed at the Antakya Landfill instead of the İzaydaş facility after a comprehensive review process (Waste management Best Practicable Environmental Option – BPEO – study) to verify its acceptability with ESAP commitments. Construction at a number of sanitary landfills intended to achieve EU standards is currently ongoing near PTs, IPTs and CMT, and they are anticipated to be ready in the near to mid-term. The Project will continue to explore new opportunities for compliant waste disposal.

The BPEO study on hazardous waste has been directed towards the evaluation of the suitability of disposing specific hazardous waste streams generated along the BTC pipeline as additional fuel in cement factories (Kayseri and Mersin factories that are close to the pipeline) and as an alternative to landfill or incineration at İzaydaş. These cement factories were found to be compliant with the emission standards specified in the national regulation and European Union (EU) Directives. Specifically for medical waste, four suitable sterilization facilities have been found for the disposal of this hazardous waste stream. The remaining BPEO studies for recyclable and reusable wastes are being carried out by BIL.

In September 2013, IEC visited the Central Waste Accumulation Areas (CWAAs) at PT1, PT2, and CMT. Few minor observations were shared with site management, but these facilities are models for waste management. The CMT Operations CWAA has been fully operational since 2010, but development of similar facilities at the other pump stations has been much slower. Construction of permanent CWAA's at each Pump Station to fulfil ESAP requirements was recommended. The high level specifications were included in the Waste Management Plan (WMP). The new CWAA has been completed at PT1. Actions are expected for the other PTs. Pre-tender works are ongoing for IPT2, but the actual construction schedule for the remaining facilities is still to be defined and may be linked the permanent accommodation projects which might start in 2017.

At the time of the 2012 field visit, hazardous and non-hazardous materials left from the construction phase, including unused hazardous chemicals and construction material from Botaş, were still present at PT2 and PT3 and stored into one hangar at the PT3 workers camp. This situation has finally been resolved. Expired chemical materials have been sent to disposal from all facilities. Other remaining materials (e.g. scrap metals, furniture,

isolation materials, etc.) are non-hazardous and are in the process of donating, disposing, or selling this material.

4.4.2 Chemical Storage Facilities at Fixed Facilities

During the July 2012 visit, the IEC observed that at PT2, it was possible to observe chemical materials not stored within proper containment. During the 2013 visit, it was observed that the containment area is established, the floor of the containment area was coated with epoxy paint and the chemicals arranged according to compatibility requirements. All of the chemical storage areas are now well-designed and operational and it is not expected that there will be any need to further track the progress of operating these facilities.

4.4.3 Wastewater Management – Observations

Our basic observation from July 2012 was still the same as previous years: the wide review of all WWTP systems that started in 2007 was almost complete, but still ongoing. Upgrading consisted of a combination of building new WWTPs or enhancing existing ones, improving the existing OWSs, improving the Storm Water ponds (SWPs) and the Primary Withholding Ponds (PWHPs) and reviewing all connection pipes systems by adding valves that allow for diverting the different flows in case of plant failures or overflows. In 2013, the situation has improved.

Waste Water Treatment Plant (WWTP)

WWTPs at PT1 and PT3 had been replaced with new ones by the time of the July 2012 field visit. Work was still needed at the WWTPs at PT2 and PT4. This work was completed before the end of 2012, including RBC disk replacement, RBC interconnecting piping, final settlement tank improvements, sand filters, chlorine dosing and contact tank, sampling point improvements, etc. As previously suggested by IEC, on-site monitoring kits were purchased for all facilities for pH, turbidity, dissolved oxygen and residual chlorine and relevant trainings were provided to BIL staff in 2012 and April 2013.

A general problem with the WWTPs at all of the PTs over the past year and earlier has been the presence of coliform bacteria or an exceedance of chlorine. As chlorination is not always effective in killing coliform bacteria, an ultraviolet (UV) treatment step was added at one location (IPT1), which is effective, except when there is a power outage. Action to have more reliable power at IPT1 was taken in 2012 to resolve the treatment problems there.

As a result of recent efforts there has been significant improvement in the performance of the WWTPs (Figure 4.2). In the few cases where effluent does not meet Project standards, it can either be recycled or trucked to Project-approved Municipal WWTP for further treatment. Effluents have generally been compliant since June 2013 except for IPT1 (had two excursions in 2013). Effluent not meeting standards is not discharged to the environment.

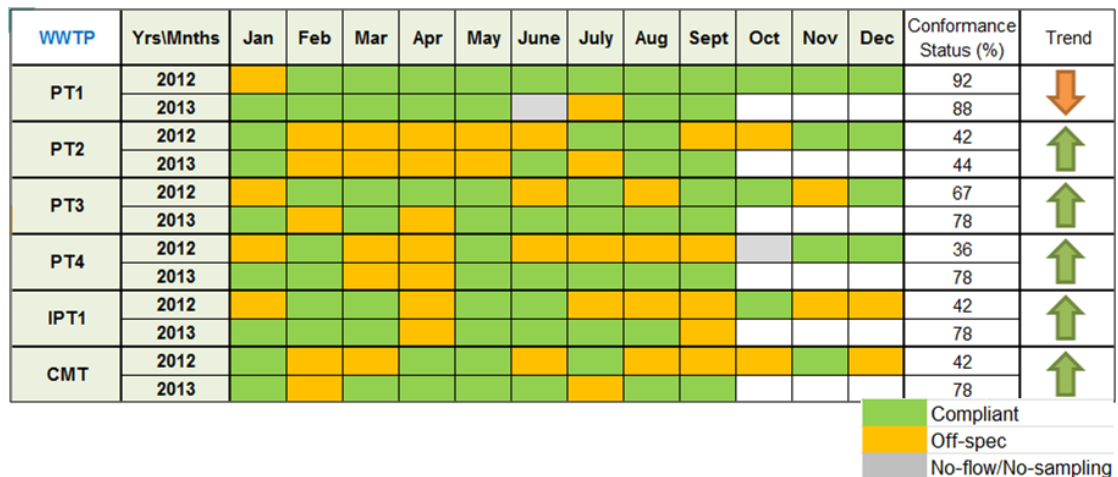


Figure 4.2: WWTP Effluent Compliance

Storm Water Pond (SWP) and Primary Withholding Pond (PWHP)

Most of the improvements planned for the SWP and PWHP systems discussed previous IEC reports were completed in 2013. WWTP effluent no longer has to go to an SWP if it is a compliant discharge, as appropriate bypass valves and pipes have been installed. The PWHPs receive OWS effluents that are then sent to a SWP; sliding gate valves between the PWHPs and SWPs are now installed to avoid SWP contamination in case of oil spill or PWHP non-compliance in general. The SWPs now have submersible pumps. Direct discharge lines and valves for PWHPs are currently being considered for cases when these ponds are capable of compliant discharge. All of these changes are significant improvements in terms of managing spills and effluents, but there is still room for improvement, especially at CMT (Figure 4.3).

The leak from the bottom of the PWHP at PT3, which was already identified in 2011, is not fixed yet, but increased groundwater testing does not indicate that groundwater is being contaminated. The solution to this problem is being evaluated and may be tied into a general MoC to line all of the retention ponds with concrete

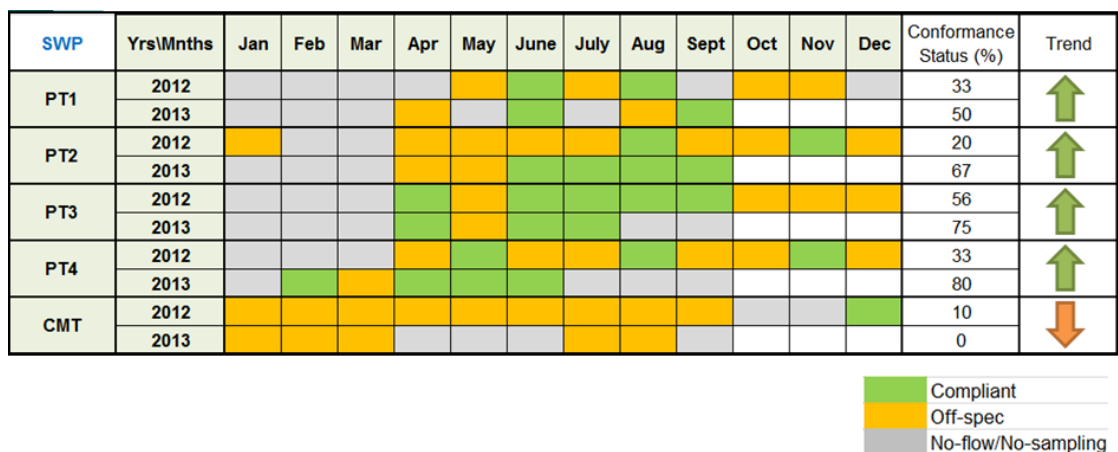


Figure 4.3: SWP Pond Compliance

4.4.4 Oil Water Separator Performance – Observations

Several difficulties with operating the oil water separators (OWSs) have been reported in previous IEC reports, in particular difficult access to conduct routine maintenance. Since the last IEC visit significant improvements have been made:

- OWSs at all Pump Stations and OWSs 1, 2, 3 and 5 have improved access (including a ladder and a platform inside) and a lighter cover to enable easier access for cleaning operations; a safety system that enables oil to be pumped to the slop tank or to barrels through a filtering system and a valve on the bypass line from the OWS to PWHF is still under evaluation;
- IPT1 and IPT2 Pig Receiving Stations, and Pressure Reduction at one location only, will be provided with a system that enables oil to be pumped to the slop tank or to barrels through a filtering system.

OWS effluent compliance is generally good (Figure 4.4). Again, it is emphasized that off-spec effluent is not released to the environment.

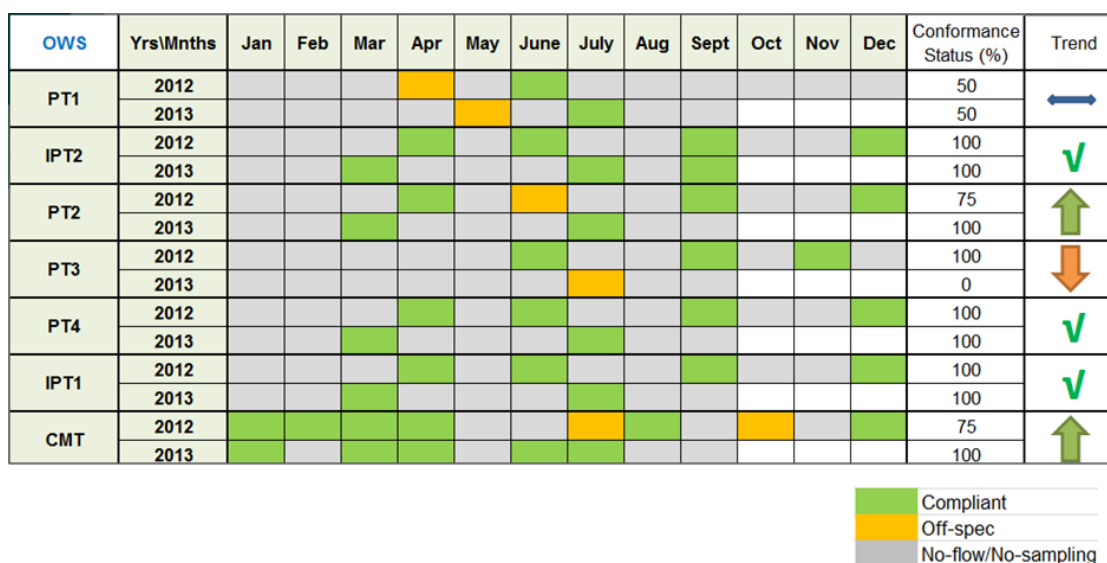


Figure 4.4: OWS Effluent Compliance

4.4.5 Wastewater Management – Recommendations

1. Consider adding aeration systems to SWPs to improve water quality and increase the time that discharges can be allowed. This type of simple system could reduce or eliminate the need for difficult and expensive off-site treatment.
2. Care needs to be made that field technicians and the HSE engineers above them have the complete training to understand the significance of field test results and react to the results to improve effluent quality – consider cross-pollination of experience
3. PT-1 has a three-valve discharge system whereby the operator can decide whether it is appropriate to discharge effluent to the environment, discharge to a pond or recycle the effluent through the plant. This setup should be evaluated for application at other PTs.

4. Go forward with the plan to line the bottoms SWPs and PWHs. The difficulties of maintaining these ponds with gravel bottoms was recognized in Azerbaijan and Georgia and concrete lining was the solution there.

4.5 POLLUTION PREVENTION AND ENVIRONMENTAL MONITORING

4.5.1 Observations

Since June 2006, 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, maintaining track of waste production and disposal at each facility, and protecting surface water and groundwater. The monitoring and reporting procedures are the same as previously reported and are not repeated here.

A key aspect of pollution prevention is oil spill response. This has been an issue in Turkey as discussed in the previous two IEC reports, but as noted in Section 4.1.1, this is a situation that is now resolved. Since September 2012 BTC has engaged National Response Corporation (NRC - formerly Seacor) to be the OSR Contractor who works under the supervision of BIL. Polaris Applied Sciences, Inc. (PAS) completed their independent OSR audit in May 2013 and found that appropriate systems and management is in place for oil spill response.

Bioremediation of contaminated soil from hot-taps has been a long-term activity in Turkey, but the last hot tap took place in June 2011 and the bioremediated soil will be sent to the Antakya Landfill Area as non-hazardous waste as per regulations. During repair work at BVT 24, approximately 6 m³ of oil contaminated soil (which originated from the spill in 2009) was excavated from the site and eventually sent to CMT for bioremediation in 2011. This material with other smaller amounts of contaminated soil is still not ready for disposal as a non-hazardous waste and the next testing of this material is planned for January 2014.

Air Quality Monitoring and Stack Emissions

Ambient air quality monitoring is undertaken only at the CMT and takes place at 8 locations four times a year. NO_x, SO₂, and Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) parameters are monitored. Although some BTEX excursions were recorded in 2010 and 2011 ambient air quality has never been an issue. All of the readings for spring 2013 have been lower than the project specifications standards and Turkish regulations, with the exception of the monitored value of toluene concentration at CMT8, which was measured in 84.98 µg/m³ versus a Turkish regulation limit of 75 µg/m³. It should be noted that monitoring point CMT-8 is intensively affected by the adjacent Botaş facility. There were no excursions of any of the ambient air parameters in all of 2012.

Stack emissions testing has not been conducted since the time of the last IEC audit. The explanation given for this is that new restrictions from a health and safety standpoint have been identified based on a recent risk assessment. These restrictions have forced revisiting the sampling protocols and type of man-lift equipment used. Sampling is currently pending the acquisition of new man-lift equipment.

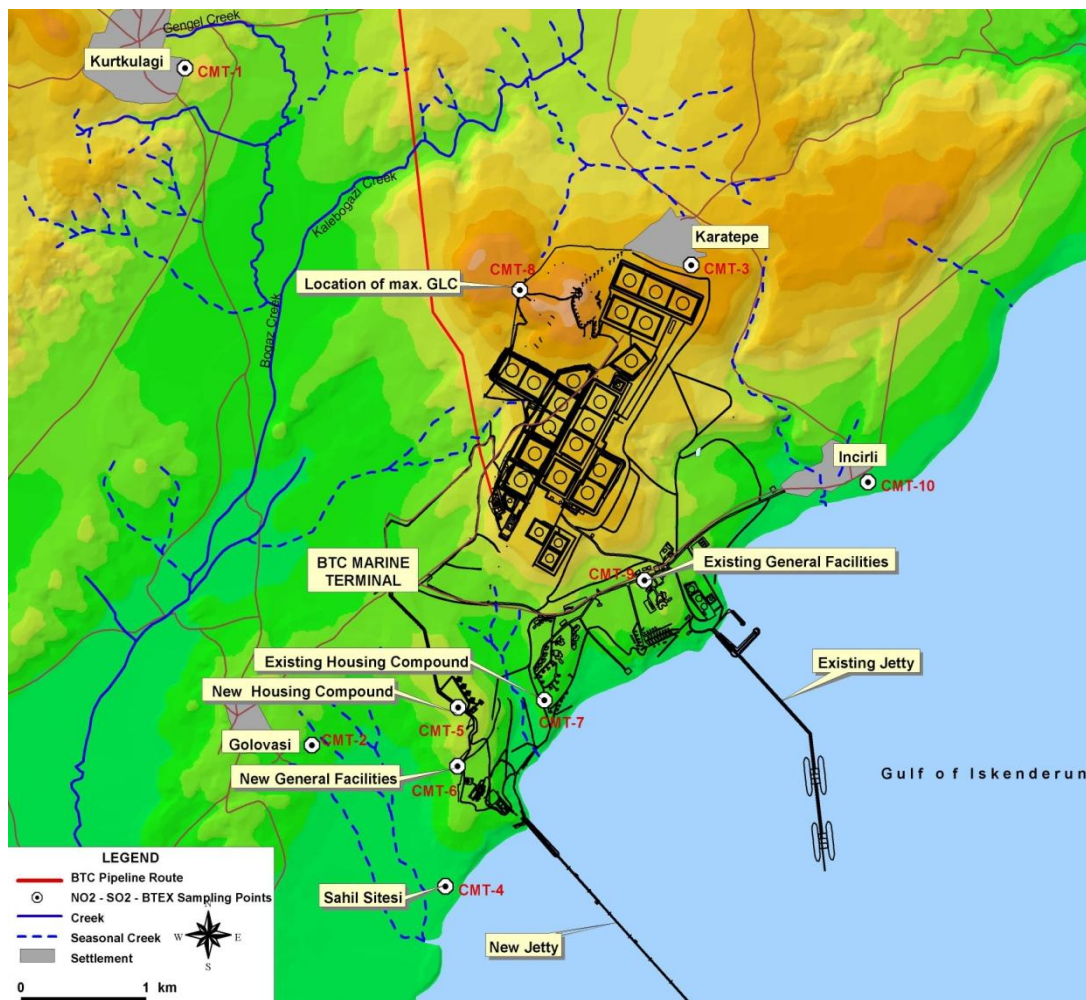


Figure 4.5: CMT Air quality Monitoring Locations

Noise

Noise continues to be a non-issue. Internal workspace noise monitoring measurements were completed over 2009 at all Project facilities to assess workers exposure did not identify major risk for exposed operators. Ambient noise monitoring at community receptors is not undertaken as modelling has demonstrated that there is no need (the nearest receptor from any facility is 1.5 km).

Groundwater Monitoring

Groundwater Quality monitoring was conducted in May 2013 at the CMT and Pump Stations (PT1, PT2, PT3, and PT4). The parameters analyzed were: pH, turbidity, salinity, dissolved oxygen, oxygen saturation, total dissolved solids, temperature, total coliforms, conductivity, ammonia, nitrate, nitrite, TOC, and TPH. In addition an arsenic analysis was conducted at the station wells at PT2 and PT3. The report for the 2013 groundwater monitoring sampling is not yet available, but the raw test results indicate that most of analyzed parameters were generally below the Project's limits. Exceptions are turbidity, for which the WHO limit of 0.1 NTU was exceeded at all PTs and the CMT (1.0 NTU). Other significant raw test results are as follows: TOC was reported as 7.7 mg/l at PT3). Bacterial growth was measured as 52,000 KOB/100ml at PT4 . As the interpretive report was not available, the IEC is not

aware if the groundwater test results have been interpreted in the context of whether non-compliant values are natural or a result of the BTC Project.

Treatment of Slops and Bilge Water at the CMT

The Slops and Bilge Water Reception and Treatment Facility at the Ceyhan Marine Terminal (CMT), also known as the MARPOL Facility, is under construction expected to be complete by March 2014 (Figure 4.6). In November 2012 the Project was fined by the Turkish Ministry of Environment and Urbanization (MoEU) a second time for not building this facility and the situation was assigned as a Level II non-compliance in our report for the July 2012 site visit, so starting construction of this facility is a major accomplishment and the non-compliance is rescinded. Construction is currently ongoing (estimated 20% progress). The works have a dedicated WWTP and SWP.



Figure 4.6: MARPOL under Construction at CMT

The MARPOL facility will include:

- 3km 16" transfer pipeline from Berths to MARPOL Facility
- Booster Pump Station
- 3 x 4000m³ Oily Slops Tanks
- 2 x 125m³ Bilge Water tanks
- 2 x 125m³ Recovered Oil Tanks
- 2 x 50m³ Sludge Tanks
- 1 x 125m³ Waste Oil Tank
- Mechanical Separation Package
- Chemical Treatment Plant
- Air Compressor
- Steam Generating Plant
- Ancillary process piping and equipment
- Utilities including water supply, power supply, drainage system, street lighting
- Excavation and Civil / Structural / Road works for the above
- Communications to the Central Control Building and Jetty Control Building

4.5.2 Recommendation

Interpret the groundwater monitoring results. The Project should determine, based on year-to-year comparisons, if there are deviations from standards as a result of project related activities, or whether the results appear to represent normal, natural conditions.

4.6 ROW MANAGEMENT, EROSION CONTROL, REINSTATEMENT AND BIORESTORATION

4.6.1 Erosion Control, Reinstatement and Bio restoration - Observations

As stated in previous IEC reports, the reinstatement of the pipeline has reached the stage where the process is now effectively maintenance checks and reacting as appropriate and this is being done. BTC and BIL continue to work together on the RoW maintenance and the management system appears to be coordinated satisfactorily. Other activities include the patrolling of the RoW, a process which has not changed over the several years and the compilation of data on the basis of a GIS system, another process that has not recently changed. Maintenance is the main activity.

During this visit, RoW maintenance, erosion control and reinstatement activities were observed between KP 1 and KP 388. Work is well done. In particular some of the major geotechnical stabilization efforts such as at KP 388 are complete and what remains is monitoring to evaluate if the work has been successful. Some other significant maintenance was observed at KP380, where a gabion system has been installed to prevent erosion near the pipeline at a river crossing. Small efforts, such as improved drainage at KP 354 are often not recognized, but at this area the effort had allowed for the reinstatement of a difficult slope. The cumulative benefits of these small interventions cannot be overstated.

The most important area for pipeline maintenance identified during this visit was the pipeline re-route at KP 383. The rationale for this effort is discussed in detail in the IEC report for

the July 2012 trip, but suffices it to say slope movements perpendicular to the pipeline had deviated the pipe on the order of about two meters. The problem was first identified by intelligent pigging and subsequent studies confirmed that the slope was creeping and deviating the pipeline. At the time of the field visit, the reinstatement efforts for this area had taken place only about two weeks previously, but had been well done (Figure 4.7). The redundant section of pipeline has been left in the ground, after appropriate cleaning and sealing. As noted in Section 4.1.2 this effort was the subject of a Class II MoC whereby an environmental and social risk assessment was undertaken and appropriate mitigations defined. This is another area where the success of the intervention will require careful monitoring.

Maintenance is an ongoing process and there is always more work to do. Another re-routing project is currently under consideration at KP 1007. If sanctioned in 2013, the project is expected to be completed in March 2015. 23 river crossing projects are complete, but four more are ongoing and expected to be complete by the end of the year and more are planned for 2014. Eight ground investigation projects are planned for 2014. These efforts are considered a normal part of routine pipeline maintenance.

Although significant effort has been expended, the Project has not been able to control slope movements at KP1007 and plans are being made to reroute the pipeline at these sections. Another problematic area was at BVT 50, where flood control structures are needed.



Figure 4.7: Pipeline Rerouting at KP 383

Pipeline third party crossing (telecommunication cables, power transmission lines, water pipes and aqueducts, irrigation channels, roads, railroads, etc.) continue to be an important issue for the RoW management as the number of crossing applications has progressively increased. For shortening this approval process, pipeline technical management developed an electronic approval system. By using this electronic system all approval stages are completed on this web based platform without any formal correspondences. As of September 2013 207 crossings undertaken with BIL supervision have been completed, up from 185 in July 2012 and 164 in September 2011.

RoW Patrols are now trained to carry out the Physical Monitoring scope for Environment Team (Continuous site monitoring by Patrol team rather than annual monitoring by Contractor). This has greatly increased the efficient of flagging problems to management

4.6.2 Access Roads - Observations

All issues related to access roads were complete at the time of the September 2011 visit. Specifically during the July 2012 visit, BTC reported that the Access Roads Procedure preparation was still ongoing and close to being complete (Document No. BIL-PRO-PLT-GEN-00X Rev.000). The document was completed and has been implemented since May 2013. It identifies the processes and responsibilities for identifying and recording of direct, nearby and alternative access roads to the BTC pipeline route, open the most appropriate and the safest new roads that vehicles can easily access on the BTC pipeline route where required and maintenance and repair works of access roads. IEC's long-standing recommendation to define an operational access road strategy has been removed as it is no longer relevant.

4.7 ECOLOGICAL MANAGEMENT

4.7.1 Observations

The last Ecological Monitoring Report for 2011 basically confirmed progress with respect to vegetation cover and diversity, as previously reported. Vegetation Cover monitoring is annual and last survey was completed in July 2013. The results of this monitoring are still pending. In the field some difficult areas for reinstatement were observed at KP 363 and KP 372. BIL reported another difficult area at KP 983 that was not visited. Difficult soils, steep slopes and grazing by domestic animals make bio restoration difficult in places, but for the most part it is difficult to see where the pipeline is buried, even when you are standing over the top of it. BTC/BIL are well aware of where more work is needed to complete reinstatement and have ongoing programs to continue the effort.

The biannual marine ecology survey was last conducted in July 2011 and the 2013 monitoring was conducted on 2-4 August 2013. Details of the surveys are not yet available. Initial results from turtle surveying near the CMT still underway are that nearly 150 nests have been identified and five adult turtles have been marked.

Coastal Process Monitoring has been undertaken on a bi-annual basis. The next survey will take place in December 2013.

4.8 COMMUNITY LIAISON AND SOCIAL RISK MANAGEMENT

4.8.1 Observations

The main responsibility of the Public and Community Relations (PCR) staff is associated with community awareness programs to prevent inappropriate third-party encroachments on the pipeline RoW and to support the RoW Monitoring and Maintenance Team in managing RoW third party crossings. With respect to third party crossings, 215 projects have been received from 2006 through September 2013 (water systems, telecom, road, electricity, etc.), seven of which have been rejected and 18 are still being assessed. BIL reports that regular awareness meetings are needed to make land users aware of land use restrictions on the RoW, in particular in the Southern Turkey area where agriculture is largely diffuse and land users frequently change. Since 2012 the Awareness Campaign has extended to 276 villages, 78 public institutions, 86 meetings with gendarmerie, 22, 000 students at 220 schools. As a result of this intensive campaign the number of land use violations has been reduced by approximately 50% since 2011. Additional PCR accomplishments include the following for 2013:

- Stakeholder Engagement: 506 meetings with regional/national, 347 community meetings held in 2013;
- Complaint Management: 972 Complaints received (10 in 2013), 95 complaints are open-66.3% reinstatement related;
- Local employment: 85% of unskilled from villages, 88% semi-skilled from affected provinces, 50% of skilled from provinces along the pipeline route.
- Local Procurement: %76 of all goods, services provided from Turkey and 24% from abroad.
- Capacity of BIL CLOs and contractor staff: Workshop and trainings are provided. Social Guideline was prepared for construction teams.
- Security & Human Rights: New Human Rights Policy launched in 2013. Human Resources expert attended the AGT Social Forum held in Istanbul. Additional training is planned.

One action still pending is that the ESAP and BIL Social management plans still need to be updated and published.

Based on discussions with individuals responsible for social management, there is a general acknowledgement that the social programs have been well implemented, but that BIL needs to take care that the Public and Community Relations Experts (PCREs) have the logistical resources they need to do their job – vehicles computers, etc. In terms of work that still need to be undertaken, in addition to finalizing the management system documents, effort is needed to achieve employee rights standardization, especially for subcontractors, to maintain their transfer of rights when changing employment.

4.9 ENVIRONMENTAL AND SOCIAL INVESTMENT PROGRAMMES

4.9.1 Environmental Investment Programme (EIP)

The EIP in Turkey has contributed positively to corporate reputations of both BP and BTC, and has strengthened institutional capacity of biodiversity conservation NGOs in Turkey. The EIP gathers and makes available a pool of experts on many environment-related subjects for BTC to tap into in case of an urgent need such as wildlife rehabilitation in oil spills,

bio restoration and waste management challenges etc. The EIP ensures that key and priority components of the environment (biodiversity) are conserved while offering communities within the BTC region sustainable livelihood opportunities for improving their development efforts.

Since EIP initiation in 2003, BTC has funded 21 projects and spent \$7.8 million USD, while involving 12 local authorities, 17 government entities, 15 universities, and 25 NGOs. The EIP efforts in 2013 planned to extend through 2015 include: (1) Wildlife Rehabilitation (Terrestrial and Marine), (2) Technical Assistance for Improving Infrastructure (Erzurum Municipality Landfill), (3) Integrated Conservation and Development (Forests and Wetlands). The 2012 BTC Environmental and Social Annual Report summarizes the details of these key EIP ongoing project achievements for 2012 and into 2013 and they are not repeated here.

4.9.2 Community Investment Program and Regional Development Initiative (CIP and RDI)

For the past 10 years BTC has had a Sustainable Development Initiative implemented. The Initiative is a framework for all projects along the pipeline and includes two programs: the Community Development Initiative (formerly the Community Investment Program) and the Effective Governance and Enterprise Development Programme (formerly Regional Development Initiative). The Sustainable Development Initiative incorporates a variety of projects which are described in detail in the BTC Annual Reports, and are not repeated here. Reportedly, technical reports including data on key performance indicators within a comprehensive monitoring and evaluation regime have been developed which outline the effectiveness of these projects as part of the Community Development Initiative. In addition to this, booklets, videos and e-bulletins have been released that provide information on outcomes and lessons learnt. While this information is available, an overall evaluation at a critical junction in the Project initiative (10 years) would assist in determining whether communities are better off, worse off or have experienced little to no change over this time period..

4.9.3 Recommendation

The BTC Project should provide an overall assessment of the outcomes over the past 10 years of the Sustainable Development Initiative implemented through Community Investment. This should be accomplished in association with an independent specialist.

4.10 CULTURAL HERITAGE MANAGEMENT

Cultural heritage management requirements associated with the construction phase of the BTC Project are completed. For the Operations phase, the archaeological sites on RoW are covered in the scope of RoW patrolling activities. Archaeological responsibilities are also addressed through environmental refreshment training. So far, there are no archaeological issues to report from RoW patrolling and construction activities along the pipeline.

4.11 HEALTH AND SAFETY

4.11.1 Observations

Health and Safety issues continue to be a major focus of the Project in Turkey. In 2013 through September no fatalities occurred, but two recordable injuries have been recorded in Turkey. During this period, 29 near miss accidents were reported. Moreover, travel

continues to represent an important personal safety risk. BIL reports 13 vehicle accidents through 2013, one of which was a Severe Vehicle Accident (SVA). The Total Vehicle Accident Rate (TVAR) for BIL is 3.65 per million kilometres driven, whereas the Severe Vehicle Accident Rate (SVAR) is 0.28 (slightly more than 3.5 million kilometres were driven). Both of these numbers are significantly higher than the rest of the BTC Project including Azerbaijan and Georgia and highlights the need for BIL to reinforce its driver safety programs.

One issue previously flagged by the IEC was ambient air in the workplace, in particular with respect to BTEX at the CMT. VOC measurements have been recently done via diffusion tubes at different locations. The results show negligible VOC contamination with respect to the Turkish Regulation on Control of Air Pollution Resourced from Industry (e.g., measured value of benzene is $0.5 \mu\text{g}/\text{m}^3$ where limit value is $75 \mu\text{g}/\text{m}^3$ at in the Process Area workplace close to the Tank Farm Offices).

4.11.2 Recommendations

1. BIL should review its program for driver's safety and reinforce it as appropriate.

MCM/AEC/CSM/GBD/MGC:mcs

APPENDIX A
TRIP SUMMARY- 15TH IEC MISSION BY D'APPOLONIA FOR THE BTC
PIPELINE PROJECT – SEPTEMBER 2013

APPENDIX A
TRIP SUMMARY- 15TH IEC MISSION BY D'APPOLONIA FOR THE BTC
PIPELINE PROJECT – SEPTEMBER 2013

For this mission, a two people team toured Turkey, Azerbaijan and Georgia. The team was composed by William J. Johnson and Marco Morando. The trip summaries are presented below.

September 8 – Team arrives in Baku by air.

September 9 – Kick-off meetings and document review at offices, presentation on project status from last visit, visit to the Gobustan desert;

September 10 – Departure from Baku to Yevlakh, visit to either Goranboy district or Samukh district to see implementation of NOx offset program, arrival to Ganja and overnight in Ganja (Ramada).

September 11 – Trip to Samkirchay, trip to BTC Jair, Zayam rivers and Tovuz city, Trip to RoW inspection, including Kura West river (KP411), KP414-420 Bio-restoration of RoW, now became into agricultural land and BV21 and Gurudere river (KP420). Departure to Georgia border.

September 12 – Kick-off, presentations, discussion in Tbilisi, Field Visit.

September 13 – Travel from Tbilisi to Bakuriani, EDDF, SCF, Kodiana, reinstatement. Overnight in Bakuriani.

September 14 – Visit to Sakire, Borjomi OSRB, RoW, Crossing of Turkish Border. Site Visit at KP 20, KP 16 (Meri Castle, Posof River), KP 11, KP 3 and KP 0. Overnight stay in PT1.

September 15 – Kick-off meeting, documentation collection, PT1 audit. Overnight stay in PT1.

September 16 – Trip from PT1 to Hanak Camp, Site Visit of KP58, KP64, BVT 11, KP171, KP222, trip from KP222 to PT2. PT2 Audit Kick-off and Audit, Document Review. PT2 Close-out Meeting. Overnight stay in PT2.

September 17 – Trip from PT2 to Erzurum. Site Visit at KP388, KP387, KP383, KP380, KP372, KP371, KP370, KP362, KP354, KP301. Trip from KP301 to Erzurum Airport and flight from Erzurum to Adana. Overnight stay in Adana Hilton Hotel.

September 18 – Trip from Adana to CMT. CMT Audit Kick-off, CMT Site visit & Interviews, Cross Country Close-out Meeting (AGT), Turkish Close-out with BTC and BIL staff. Trip from CMT to Adana. Overnight stay in Adana Hilton Hotel.

September 19 – Departure from Adana.

APPENDIX B

TABLE B-1: NON-COMPLIANCES WITH ESAP

APPENDIX B

Table B-1: Non-Compliances with ESAP – Turkey

Section Ref.	Observation	Non-Compliance	Level	Comments / Recommendations
4.5.1	Failure of building the marine slops treatment facilities at CMT reached a level of attention such that the Project has been fined twice (about 45,000 and 100,000 USD) by the Turkish MoE.	MARPOL 73/78 Convention and also Turkish Environment Law No 2872 – situation is a non-compliance with Section 5.2 of the ESAP, whereby the Project commits to follow applicable laws and regulations	Closed	The MARPOL construction has started and should be completed by April 2014.