Draft Environment and Social Compliance Audit

Project Number: 48330
May 2014

AZE: Shah Deniz Gas Condensate Field Stage 2 Project

Prepared by Sustainability Pty Ltd for Shah Deniz Gas Export Project Stage 1 Development in Azerbaijan

SUSTAINABILITY
FUTURE GROWTH

EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT

Independent Environmental and Social Audit
EBRD Additional Financing Shah Deniz Stage 1

May 2014

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1. INTRODUCTION

Sustainability Pty Ltd (Sustainability) was engaged by the European Bank for Reconstruction and Development (the Bank or EBRD) to undertake an independent environment and social audit of the upstream component of the Shah Deniz Gas Export Project Stage 1 Development in Azerbaijan. The EBRD is considering additional financing to Lukoil Overseas Shah Deniz (LSD), a 10% shareholder of the project, for ongoing onshore and offshore development of the Stage 1 Project. The Bank has already provided finance to LSD for the initial Stage 1 development of the project, and the proposed additional financing is planned to support ongoing planned development undertaken within the scope of the Stage 1 Environmental and Social Impact Assessment (ESIA) completed and disclosed by the operator, BP Caspian, in August 2002.

The Stage 1 ESIA, 2002, was prepared in order to gain approval for the project and, as such, was completed in accordance with the legal requirements and policies of Azerbaijan. In addition, the assessment was carried out in a manner that ensured it satisfied relevant international environmental and social guidelines and in accordance with BP's Health, Safety and Environment (HSE) Policy. Approval for the project was received by the Azerbaijan Ministry for Ecology and Natural Resources (MENR) in October 2002. In May 2003 BP provided additional ESIA information in response to the EBRD's review which resulted in the issuing of a "Supplementary Lender Information Pack" (SLIP). The supplementary information included additional information on: changes to the Stage 1 project description since the original ESIA; Project waste management arrangements; Project Health, Safety and Environment Standards; and, additional supporting information to verify compliance with EBRD performance requirements. A number of other documents were produced in parallel to the Supplementary Lender Information Pack which address the ongoing management of SD1 related environmental and socio-economic issues identified in the ESIA and together constitute the Project's environmental and socio-economic management framework. These documents include:

- An Environmental Investment Plan;
- Resettlement Action Plan;
- Community Investment Plan;
- Public Disclosure and Consultation Plan; and
- Environmental and Social Action Plan.

The Shah Deniz Stage 1(SD1) project commenced production of gas and condensate in 2006 with a fixed offshore production facility linked by subsea pipelines to onshore gas processing at the Sangachal Terminal which provides gas for domestic consumption in Azerbaijan and also sells gas internationally through the South Caucasus Pipeline (SCP). Condensate is also treated at Sangachal and sold via the Baku-Tbilisi-Ceyhan (BTC) pipeline. Figure 1, below, provides a location of the key project components for SD1.

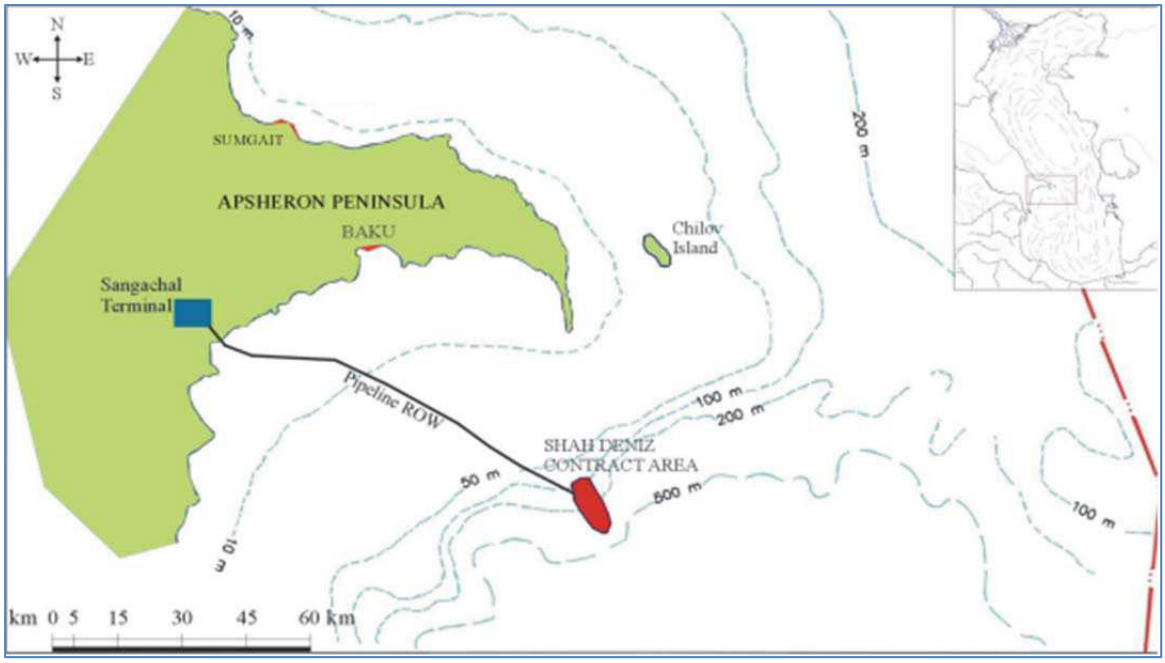

Figure1. Shah Deniz 1 Project Location.

The financing is sought for additional offshore well development, production field improvements, debottlenecking of the onshore processing facilities at the Sangachal Terminal and a flare replacement programme at the terminal. The current offshore facility is producing from 5 existing wells, with the 6th well not producing as it is being subject to side track drilling. The additional Stage 1 development will involve the development of a further 3 wells to be drilled from the existing offshore facility and ongoing work to the current subsea production facilities to improve production performance and ensure well integrity is maintained.

The initial 2002 ESIA for the Stage 1 development of the Shah Deniz gas field included an assessment of the field expansion programme which is subject to the additional funding application. Additional assessments have been completed by the Stage 1 operator since the initial 2002 ESIA which include statutory assessments for offshore and onshore changes. Furthermore, in 2013 the operator completed a detailed ESIA for the Shah Deniz Stage 2 (SD2) development which includes additional offshore facilities and a significant expansion of the Sangachal Terminal.

The objective of this independent environment and social audit of the Shah Deniz Stage 1 project is to provide monitoring of the Project's environmental and social performance, in addition to the Project monitoring and reporting already in place, and to verify if any further due diligence is required in order to provide the financing.

1.1 SCOPE OF WORK

The scope of work for the independent audit was initially provided in the Request for Proposal provided by the EBRD in December 2013. The scope was further defined following initial document reviews and the audit planning undertaken with LSD. The scope of independent audit includes:

- A high level assessment of the Shah Deniz Stage 1 environmental and social performance to date, against the commitments and obligations established in the environmental and social assessment documentation, the EBRD performance requirements and good international practice.
- A review of the proposed activities associated with the additional project financing to verify if the activities have been sufficiently subject to assessment within the initial Stage 1 ESIA and subsequent assessments and to determine if any further due diligence is necessary.

The audit scope was to undertake assessments based on the environmental and social reports provided by the operator as part of the project monitoring and BP's existing public reporting processes. As the financing is being provided to LSD and not the Project operator, a detailed review of operational performance was not appropriate, nor feasible.

2. APPROACH AND METHODOLOGY

The independent audit was conducted by John Miragliotta, Principle Advisor with Sustainability and registered environmental auditor (RABQSA International). The audit included a document review of the primary environmental and social reports relevant to the Shah Deniz Stage 1 Project in order to ascertain the obligations and commitments that apply to the Project, and to determine if the additional financing under consideration is to be used for activities that have been suitably assessed in accordance with the Bank's standards and policies.

Project environment, safety and social documentation was sourced from information provided by LSD to EBRD, data available on the BP Caspian website and data provided by BP and LSD in response to requests made during the site audit (8-10 January). Requested information received by the auditor up to the 12 February 2014 was reviewed for this audit. The documents reviewed are provided in Table 1 below.

Table 1. Audit Document Review List

Document Name	Document Author	Date
Shah Deniz Environmental and Social Impact Assessment	BP	August 2002
Shah Deniz Stage 1 ESIA Supplementary Lender Information Package	BP	30 May 2003
Resettlement Action Planning Overview; Zykh Construction Yard Baku	SOCAL	August 2003; Revised report November 2003 2003.
RAP, Zykh Shipyard, Final Report	Pooley, HAYAT	Feb 2004
BP's Azerbaijan Social Review Commission Reports (Independent Review completed annually from 2007 – 2011)	ASRC	Annually 2007 – 2011.
Shah Deniz Project Environmental and Social Action Plan	SOCAL	August 2003;
Commitments Register, Shah Deniz gas Export Stage 1 Construction Programme 1	BP	June 2003
Contractor Control Plan Pollution Prevention Shah Deniz Gas export Stage 1 Project Construction Programme	Shah Deniz Project	June 2003
BP in Azerbaijan; Sustainability Report 2012	BP	May 2013
Multiple: BP Azerbaijan Sustainability Reports 2003-2011	BP	2002-2012
Community Investment Plan (CIP) 2002-2007	BP	
Sangachal Terminal Extension and offshore Works; RAP Completion Audit Part One: Café-Garage and Fishermen	SRAP Panel	December 2009

Document Name	Document Author	Date
Voluntary Principles Implementation – BP Azerbaijan Evaluation	Group Security	May 2010
Social and Resettlement Action Plan (SRAP) Monitoring Implementation Terms of Reference (covers pipelines: BTC, South Caucasus and ACG phase 1 – includes herders who had used the Sangachal terminal site.)	BP	September 2003
ACG Phase 1 RAP, includes Shah Deniz Stage 1 – Sangachal Terminal Extension and Offshore Works	Planning and Resettlement Solutions	April 2003
Shah Deniz project Annual Environmental and Social Report: 2007 and 2008	Risk Group PLC	September 2009
Shah Deniz Upstream Project Monthly HSE Report – May 2006	Shah Deniz Project	May 2006
Multiple: Shah Deniz Monthly Reports (Operational monthly reports include HSE statistics and provided to Lukoil and other partners)	Shah Deniz Project	Monthly reports for all 2013 were reviewed.
SD1 Flare Project; Environmental Technical Note; Draft.	Shah Deniz Project	July 2012
Letter of approval for Shah Deniz SD1 Flare Project	Ministry for Ecology and Natural Resources	February 2013
Sangachal Terminal Ambient Air Quality Monitoring Station Location Plan	Shah Deniz Project	Undated
Sangachal Terminal Groundwater Monitoring Well Locations and Section Profile	Shah Deniz Project	Undated
Letter from MENR to BP Azerbaijan: acknowledgement of incident reported for potential leakage PFW from holding ponds and request for further information.	MNER	7/12/2009
Letter from BP AGT Region to MENR: Provision of updated information regarding the actions taken by BP to manage PFW holding ponds at Sangachal and to monitor groundwater.	BP AGT Region	10/12/2013
Incident report abstract for PFW pond leakage discussing actions taken and recommended future actions.	BP AGT Region	Undated
Community presentation on ambient noise and air quality monitoring results for nearby settlements of Umid, Sangachal and Azim.	Shah Deniz Project	2011 and 2012

2.1 FIELD AUDIT AND INTERVIEWS

The audit was carried out from 8 - 10 January 2014 and included interviews with relevant operational and support staff in BP's Baku offices and a site visit to the Sangachal Terminal. The field audit was carried out with participation and assistance from Mr Jeff Jeter, EBRD, and Mr Zaur Yusuf-zade, Lukoil. The schedule of audit interviews and personnel is included in Table 2 below.

Table 2. Audit Programme

Day	Audit Activities	Participants
8 January 2013	Meeting with BP Shah Deniz offshore HSE personnel. Discuss offshore operational issues including discussion of additional drilling activities; proposed subsea improvements and expected production rates. Health, safety and environmental performance offshore performance was discussed around monthly report information, reported non-conformances, outcomes of monitoring programmes and environmental approval requirements for offshore changes.	Dimitry Pogorniy, Manager Shah Deniz Commercial Operations and JV Management. Shah Deniz environment and H&S Specialists participated in the meeting. Zaur Yusaf-zade; Lukoil, Economy and finance Senior Specialist Jeff Jeter; EBRD Environment Department. John Miragliotta, Sustainability Auditor.
9 January 2013	Site Visit Sangachal Terminal	Sangachal Terminal Environment staff and communications staff Zaur Yusaf-zade; Lukoil, Economy and finance Senior Specialist Jeff Jeter; EBRD Environment Department. John Miragliotta, Sustainability Auditor.
9 January 2013	Meeting with Sangachal terminal Environment and Communications representatives	Sangachal Terminal Environment staff and communications staff Zaur Yusaf-zade; Lukoil, Economy and finance Senior Specialist Jeff Jeter; EBRD Environment Department. John Miragliotta, Sustainability Auditor.
9 January 2013	Meeting with Sangachal Terminal Manager	Ilgar Gasanov: BP Operations Manager Sangachal Terminal Zaur Yusaf-zade; Lukoil, Economy and finance Senior Specialist Jeff Jeter; EBRD Environment Department. John Miragliotta, Sustainability Auditor.
10 January 2013	Meeting with BP Sustainable Development Team	Kenan Shikhlinsky, BP Sustainable Development Initiate Team Leader.

		Araz Yusubov: BP Transparency and Public Reporting Team Leader. Rene Hesenova: BP Sustainability Development Zaur Yusaf-zade; Lukoil, Economy and finance Senior Specialist John Miragliotta, Sustainability Auditor.

2.2 LIMITATIONS AND ASSUMPTIONS

The scope of this audit recognised that constraints would apply to the level of detail that could be achieved in the audit due to the limited access to project facilities and operational personnel and the time available to review information and records onsite. These constraints exist due to the recipient of the proposed financing, LSD, not being the operator of the Shah Deniz Stage 1 project. BP Azerbaijan, being the operator, was cooperative in providing access to specific personnel for audit discussions (2 hours with SDA production EHS personnel and 2 hours with SD Sustainable Development personnel) and provision of requested information and a half day visit to the Sangachal Terminal. The audit did not include a site visit or inspection of the SDA offshore facility, the Serenja Hazardous waste treatment facility nor the Sumgayit non-hazardous landfill facility.

Most of the information used to assess the performance of the SD1 project was publicly available reports and the monthly operational reports submitted by LSD to the EBRD. As such, and in accordance with EBRD's Request for Proposal stated objectives, the audit identifies material EHS and social risks and liabilities associated with the operations, and compares status of operations relevant to publicly available EHS and social data and reports. The information provided in this report is in summary form whereby key risks and material compliance issues are presented in a discussion format. The audit is not a comprehensive assessment of compliance with EHS and social obligations, commitments and EBRD Performance Requirements. The evidence reviewed during this audit has not been subject to verification or sampling of records that would normally apply in a comprehensive EHS compliance assessment. The information relied upon for this audit as provided from BP Caspian website and from the audit interviews and follow up information requests is assumed to be correct.

3. AUDIT FINDINGS

3.1 REVIEW OF CURRENT AND PLANNED STAGE 1 UPSTREAM PROJECT WORKS AGAINST SCOPE OF ESIA (2002)

The additional finance being considered by the EBRD is for LSD's ongoing contribution to the operational and capital expenditure for upstream Stage 1 Project development which commenced gas and condensate production in 2006. The development activities were recognised within the Stage 1 ESIA with a phased approach of development of the Shah Deniz reservoir over the life of the project. The phased approach included progressive well development up to 4 km south of the Shah Deniz A (SDA) fixed offshore platform. The original ESIA predicted a total of 14 wells to be developed in the field to sustain a rate of gas production at an average of 900 Million standard cubic feet per day (Mmscfd). The SDA is currently operating with 6 wells and producing at 975 Mmscfd with planned further developments expected to increase production rates to 995 MMscfd by the end of 2014 and aim to reach peak production of 1040 Mmscfd in following years. The expected peak production represents a 16% increase in the average production rates expected in the ESIA, but this increase is expected to be achieved with fewer wells and less subsea infrastructure. The planned peak production rate represents a 6.5% increase over current daily production rates. Table 1 below provides the condensate and gas production rates from 2006 commissioning to the end of 2013. The 2013 figures are an estimate based on 3rd Quarter actual figures.

Table 3. Annual Production Rates for Shah Deniz 1 2006-2013

	2006	2007	2008	2009	2010	2011	2012	2013 (based on 3rd quarter figures)
SD1 Production rates of Gas (bscm)	n/a	3.14	7.1	6.2	6.9	6.7	7.7	9.1
SD1 Production rates Condensate (mmbbl)	n/a	7.04	14.95	13.1	14.7	14	16.1	18.2

It is predicted that only an additional 3 wells will be required to achieve the desired production rates as the field permeability is higher than initially expected. The field characteristics defined during operations have also meant that the planned subsea templates for the southern well development predicted in the ESIA is not necessary. These additional wells are planned to be drilled from the SDA rather than using subsea tie-ins.

Further work offshore is ongoing with side tracking of one existing production well and replacement of sub-sea safety valves on two wells. Additional studies are being completed to ensure that the SDA can accommodate the additional loads and infrastructure required for the proposed new wells.

The onshore aspects of current and planned Project developments for Stage 1 include debottlenecking of the gas and condensate treatment process at the Sangachal Terminal to allow for the increased production rates discussed above. The debottlenecking will include increased capacity of separators and upgrade of the filtration system. There are no expected significant increased emissions or discharges that result from the process improvement programme.

Produced formation water (PFW) which is separated from the condensate onshore at Sangachal is being disposed of onsite for evaporation in lined ponds. The PFW management process described in the ESIA included the option for disposal to unused onshore wells. However, well testing found that the wells could not sufficiently accommodate the disposal. The Sangachal Terminal operator has commenced works to allow for the disposal of Shah Deniz PFW to the Azeri-Chirag-Deepwater Gunashli (ACG) offshore oil wells where waste water from the Terminal is already injected to assist in lifting of the oil for production which is treated onshore at Sangachal, adjacent to the Shah Deniz onshore processing facilities.

The additional financing will also be used for the current flare replacement programme for the Shah Deniz onshore processing facilities at the Sangachal Terminal. The construction of a new elevated flare has commenced and will replace the previously used ground flare when complete. The replacement of the flare resulted from ongoing safety concerns with the ground flare. The flare operation will not change from that assessed in the original ESIA in that the flare is only to be used during production bypassing which may occur during maintenance or in case of emergency. The flare replacement was subject to a separate environmental approval completed by the operator and submitted for approval to the regulator – The Ministry for Ecology and Natural Resources (MENR), and was also subject to public disclosure and consultation with potentially impacted communities.

The audit found that the development work associated with Lukoil's extension of funding for Shah Deniz Stage 1 includes activities that are considered ongoing operational requirements which are generally consistent with the Stage 1 project assessed in the 2002 ESIA. Where changes have occurred from the assessed project, additional assessments have been completed and mitigation measures implemented in line with the initial environmental and social management planning commitments and the Environmental and Social Action Plan. The ongoing development work for Stage 1 would not result in any additional environmental or social impacts and would not be expected to increase the significance of impacts as previously assessed in the ESIA.

It was noted that the Shah Deniz Stage 2 ESIA has been completed and submitted to the national regulator following a period of public disclosure. The Stage 2 ESIA includes assessments of additional offshore production wells on new offshore facilities, additional subsea infrastructure, pipelines and a further expansion of the Sangachal Terminal. The Shah Deniz Stage 2 construction and installation works will be undertaken in parallel with the ongoing Stage 1 development activities.

3.2 KEY OPERATIONAL CHANGES IMPLEMENTED OR PLANNED SINCE COMPLETION OF THE 2002 STAGE 1 ESIA

Produced Formation Water Management and Disposal Strategy

The SD1 ESIA assessed the disposal of produced formation water from the SDA offshore facility to onshore disposal wells within the Karasu oil field. In July 2007 there was a series of letters to the MENR concerning a request for approval to store SD produced water in a holding pond at the Sangachal Terminal as a temporary measure, as the use of the Karasu oil field for re-injection was suspended during construction works at that facility. The MENR approved this change by letter dated 2 August 2007 (RSK, 2008). The storage of SD produced formation water at the Sangachal Terminal used existing concrete lined storage facilities. The storage ponds were subsequently lined with a synthetic liner to ensure integrity of containment as seepage was identified from monitoring of groundwater.

Groundwater is monitored in the vicinity of the produced formation water storage ponds through a network of piezometers. The monitoring conducted in 2009 around Pond 1 revealed produced water in two if nine piezometers. Additional studies were undertaken for identification of the source of leakage which was found to be SD1 produced water from section A of Pond 1. The Shah Deniz produced water was pumped out to section B and it was decided to re-line section A with new High Density Polyethylene (HDPE) membrane liner. Installation of the new liner which covers the entire walls on Pond 1 Section A was completed in 2Q, 2013; water from Pond 1 Section B was pumped out into the section A which is now fully operating.

In order to minimize the potential for leakage from Pond 1 Area A the following actions were completed:

- Movable tyres were placed on the entrance of Pond 1 Section A to restrict the truck access to pond area
- A gas venting system was installed under the liner to reduce the build-up of gases, and that will reduce the likelihood of the liner being punctured.
- Integrity inspection was completed once the pond lining completed

The SD1 operators at Sangachal terminal continue to conduct environmental monitoring around both Pond 1 and Pond 2. This monitoring includes monthly groundwater level checks, and biannual monitoring of water quality. Groundwater levels in monitoring wells continue to reduce slowly over time, and no new water has been detected in the piezometers around the pond. Based on results of ground water monitoring the water level is considered stable.

The terminal has capacity within storage tanks as a temporary measure for storage of SD1 produced water and is undertaking trials to dispose of the produced water to offshore wells currently used for re-injection in the Azeri-Chirag-Gunashi (ACG) offshore area. A "management of change" process has been completed for the offshore reinjection of SD produced water to the ACG field. The current storage of SD produced water at the Sangachal Terminal has resulted in odour issues for terminal workers and nearby communities. This issue is likely to continue as the completion of works necessary for reinjection of all SD produced water is likely to take 2-3 years. The approval for onsite storage of SD formation water as a temporary measure expires in 2016.

SD1 Flare Project

The purpose of the SD1 Flare Project is to replace the combined High Pressure (HP) / Low Pressure (LP) ground flare and surrounding enclosure with a new, elevated flare package. The HP section of the ground flare has experienced a range of operational problems since commissioning in October 2006. During a shutdown in September 2009, an inspection revealed that physical damage to flare headers had occurred and the need to replace the existing ground flare was identified. Recent feedback from the community representatives in the terminal vicinity during the SD2 Infrastructure Project ESIA consultation and disclosure and the associated Stakeholder and Socio Economic Survey (SSES) in 2011 has included a number of concerns regarding the existing flares at the terminal, particularly with regard to health effects. While the ongoing ambient air quality and recent odour monitoring has demonstrated no significant changes in air quality at the communities and no odour issues associated with the existing flares, there is potential for impact to community well-being from the construction and operation of three additional flares at the Terminal due to increased stress and anxiety. It was therefore proposed to undertake community engagement activities prior to the construction works associated with the SD1 Flare Project to provide information to residents within Sangachal Town, Umid, Azim Kend and Masiv 3 about the SD1 Flare Project and hence minimise the potential for negative impacts.

4. OPERATIONAL ENVIRONMENTAL AND SOCIAL PERFORMANCE

Performance in Meeting ESAP and ESIA Commitments

The Shah Deniz ESAP (12 August 2003) was produced in relation to SOCAR's application for EBRD finance and it is assumed that Lukoil's commitments and responsibilities are similar to those of SOCAR. The ESAP makes specific reference the Operator (BP) is not part of the financing and has no responsibilities or obligations in respect of the ESAP. The ESAP states that SOCAR will use reasonable endeavours to cause the Operator to fulfil these commitments.

The audit reviewed specific aspects of the Stage1 development and operations to assess performance in meeting ESIA and ESAP commitments. It is recognised that these commitments have been amended over time in response to approved changes to project operations and as the project has moved from a construction phase to an operational project since 2002. It is also recognised that a number of environmental and social obligations from the initial ESIA and ESAP have been amended due to subsequent assessments completed for project changes.

The Shah Deniz 1 Product Sharing Agreement (PSA), Appendix 9 Environmental Standards and Practice, provides a comprehensive set of standards for discharge of wastes and for ambient air and water quality. The PSA environmental standards are the primary statutory requirements and are aligned with the ESIA commitments and obligations.

The audit focused on management and mitigation measures associated with impacts that were assessed as significant. The results of the document review of publicly available data and additional information provided by BP from the interviews with staff indicate that the Shah Deniz environment, health, safety and social commitments and obligations are effectively managed in general compliance with the objectives of the ESIA and ESAP.

The Shah Deniz operations at the Alpha platform and at the Sangachal terminal operate within a comprehensive Environmental Management System (EMS). Both facilities are third party certified to the ISO14001:2004 management system standard. The EMS includes identification and management of environment, health, safety and community compliance aspects from various sources including statutory, ESIA and other commitments. These obligations are managed through BP's Compliance Task Manager (CTM) which is a tool that allocates responsibility and timeframes for compliance actions.

The original ESIA and ESAP compliance actions were modified following project commissioning to reflect the operational status and to remove those construction related compliance actions that were no longer relevant. The environmental standards relevant to the Shah Deniz operations were reviewed in 2009 as it was identified that there was potential for varying standards to apply to the same production processes depending on the applicable ESIA, lender documents and the different production unit and assets that make up the facility. BP completed a process of streamlining the standards in order to adopt a unified approach. The outcomes of the revised standards are now reflected in the CTM system.

In addition, BP 's EMS includes a mature corrective action management process whereby incidents, non-conformances and non-compliances are identified, reported and documented along with appropriate corrective actions and these actions are monitored for effectiveness and completion.

Verification of Effectiveness of Monitoring Programs

The environmental monitoring programs have been developed for the Alpha offshore facility and the Sangachal terminal for direct emissions to air, waste water emissions, surface water run-off, groundwater, biological and biodiversity monitoring, wastes, flaring and chemical usage. The monitoring parameters and frequency have been established to allow verification of operations in accordance with the environmental performance standards established in the ESIA and the PSA. Monitoring results are presented in statutory reports to regulators and some data is presented annually in the publicly available "BP in Azerbaijan Sustainability Report". The reports submitted to regulators are not made publicly available.

The audit reviewed the publicly available monitoring data, data presented in the monthly HSE Reports and information provided during the audit interviews and follow up material provided subsequent to those interviews. A number of minor incidents have occurred over the operational period when monitoring has identified non-conformance with established standards, these include:

- An isolated incident where stormwater discharged from Sangachal terminal was in excess of oil in water limits;
- Occasional high contaminant values in groundwater monitoring wells located at Sangachal terminal;
- Occasional breach of ambient air quality standards (SO_x, NO_x and PM_{10}) from monitoring stations located outside of the Sangachal terminal (these were reported to be likely caused from non-terminal related activities);

- Pre-2009 breach of discharge limits for treated sewage from the offshore SDA facility;
- Occasional breach of BP standards from the Sangachal Terminal sewage treatment plant (since rectified with modified plant installed in 2013)

Effectiveness of waste management

SD1 Drill Waste Disposal:

The offshore disposal of water based mud and drill cuttings continues in accordance with the ESIA and Appendix 9 of the PSA. Volumes of water based mud and cuttings discharged to marine environment are measured, calculated & reported daily. Discharge is estimated and reported by weight as part of End of Well Report for each well. It is noted that the ESIA mentions that further environmental assessment will be undertaken for the selected onshore drill cutting treatment and disposal method and committed to further elaboration of BP's waste management strategy and plans for developing waste management systems with the ultimate aim of achieving disposal routes that comply with EU standards.

Improved solid waste treatment and disposal facilities for SD1 drill wastes occurred in 2007 and 2008 and include:

- A dedicated non-hazardous waste landfill cell in Sumgayit, constructed to EU standards replacing BP's cells at the ADES municipal waste site. The ESIA and SLIP refer to use of the Balakhany landfill as a medium term measure only.
- Treatment of synthetic oil-based mud drill cuttings by Indirect Thermal Desorption (ITD) at BP's Serenja Hazardous Waste Treatment Facility was expanded, with a second unit installed in 2008. The recovered base fluid from ITD is re-used and the treated cuttings stored. The ESIA and SLIP discussed the incineration of this material in the cement kilns at the nearby Garadaqh Cement Plant. 1476 tonnes of drill cuttings were processed through the ITD and disposed to landfill from January to end of November 2013.
- The treatment of both brine and produced water solids was also improved in 2008, by passing the solids through the ITD. The solids had previously been stored without further treatment.
- A new separator for oily water was installed in mid-2007 to improve the separation of oil at the Serenja Hazardous Waste Treatment Facility.

The audit found that the current management of SD1 generated wastes solid wastes is improved upon that proposed in the ESIA and SLIP due to improved waste treatment and disposal facilities constructed since commissioning.

SDA Sewage Disposal:

The treatment and offshore disposal of treated sewage effluent is managed in accordance with the ESIA and PSA criteria. The 2009 annual monitoring report to EBRD states: *"There were problems with exceedances of the chlorine and coliform limits, particularly in the first half of 2008, although the latter may have been at least in part due to problems with measurement rather than actual exceedances of the limit. An action plan has been implemented, (including separation of grey water) and the unit showed improved performance in the final quarter of 2008" (RSK, 2009).* Interviews with SDA personnel indicate that there have been no further issues with offshore disposal of treated sewage meeting established criteria.

Waste Water Treatment Sangachal Terminal:

An upgraded sewage treatment facility was commissioned in 2013 providing improved treatment of sewage generated at the terminal and associated worker accommodation. Previously the terminal relied on the Sahil municipal waste water treatment facilities used by local communities. The upgraded waste water treatment plant at Sangachal represents a significant improvement to the ESIA base case treatment systems.

Stormwater Treatment at Sangachal Terminal

The open drain system at the Sangachal terminal was modified since the original ESIA assessed design to include improved storage and treatment prior to release to the environment. Water can be discharged to the environment only from the Open Drain holding tank where oil in water is continuously monitored prior to commencing draining and should not be more than 5 ppm (The PDSA and ESISA criteria is 10 ppm oil in water). If the oil in water concentration exceeds the 5 ppm operational criteria, the water is retreated until results are acceptable for discharge. There was one incident of discharge water from the open drains exceeding the criteria which was found to be due to contamination from windblown oily rags.

Chemical Use

All chemicals that may be discharged to the sea from the SDA drilling or production operations are approved by the MENR in accordance with the requirements of the PSA. Chemicals are approved on the basis of laboratory eco-toxicity testing and use Caspian specific aquatic toxicity criteria. The chemicals, including drill muds, used for drilling activities are reported to the MENR in the "End of Well Report" for each well. No incidences of use of non-approved production chemicals or drill fluids/ muds have been recorded.

Greenhouse Gas Emissions and Energy Efficiency

The SD1 rate of GHG emissions predicted in the ESIA has been improved upon through technological and operational improvements to the production and terminal facilities initiated during construction and since commissioning in 2006. Figure 2 below provides a comparison of the equivalent GHG emissions to November 2013 against the ESIA forecast and BP's 2013 forecast. The SD1 project has far exceeded the efficiencies and GHG reduction targets proposed in the initial ESIA.

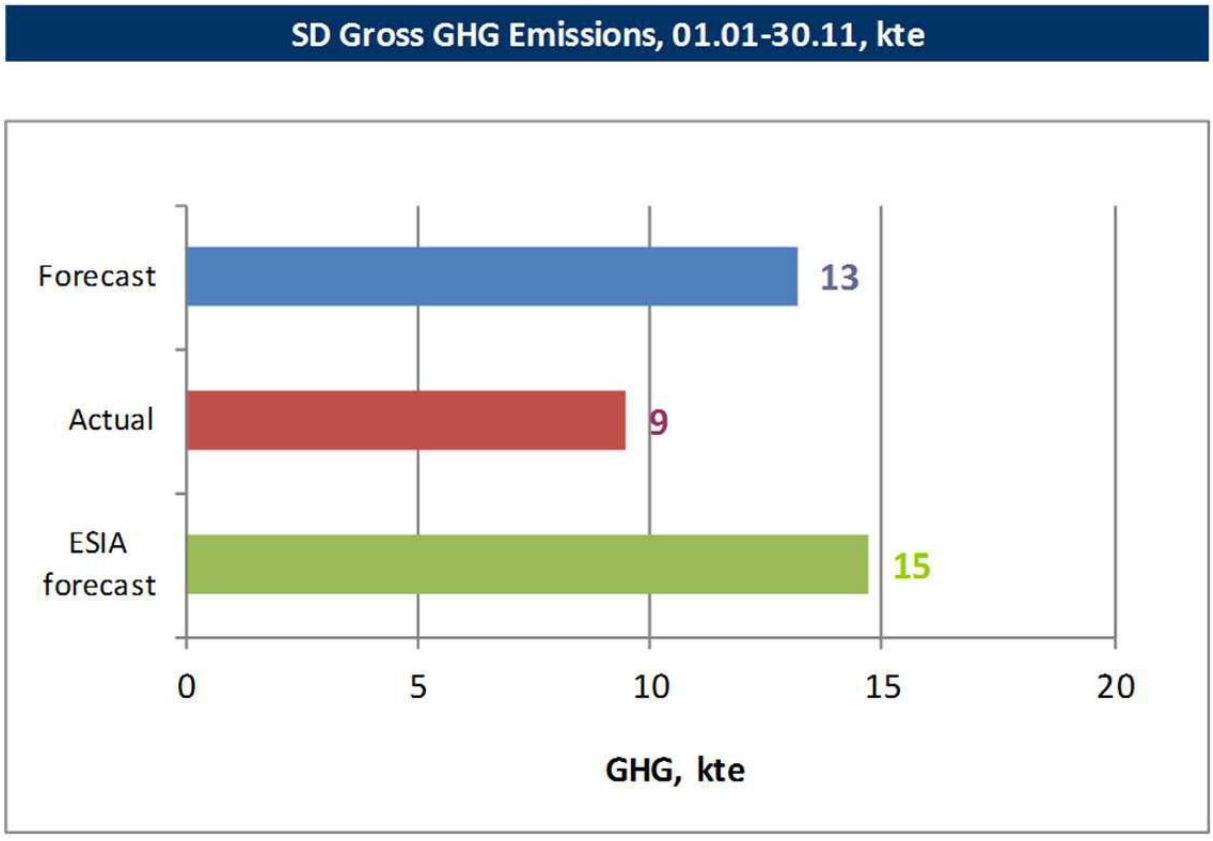

Figure_: 2013 GHG emission data from 1 January to 30 November 2013.

An overview of the annual GHG emissions for SD1 from the SDA offshore facility and the Sangachal Terminal are provided in Table 4 below. The 2013 emission figures are a projection based on 3rd quarter data provided on the BP Caspian website. The data in the table shows how SD1 has been able to reduce GHG emissions per unit production, from 2011 to 2012 SD1 experienced a 15% increase in production yet GHG emissions from the terminal only increased by 7% over that period. The overall trend from start of production has resulted in a significant reduction in emissions (almost 50% reduction from 2007 to 2012).

Table 4. SD1 GHG emission estimate comparisons against annual production rates

	2006	2007	2008	2009	2010	2011	2012	2013 (based on 3rd quarter figures)
GHG emissions SD1 Offshore Operations (kte)	11.4	14.7	3.2	2.3	2.1	1.9	2.1	
GHG emissions SD1 Sangachal terminal (kte)	n/a	67.1	48.7	44.3	46.2	41.8	44.8	
SD1 Production rates of Gas (bscm)	n/a	3.14	7.1	6.2	6.9	6.7	7.7	9.1
SD1 Production rates Condensate (mmbbl)	n/a	7.04	14.95	13.1	14.7	14	16.1	18.2

(Data sourced from the BP Azerbaijan Annual Sustainability Reports and the SD1 Monthly HSE reports).

The 2003 ESIA predicted total CO_2 emissions over the life of project as approximately 3.7 million tonnes over 30 years. This was revised in 2010 to 4.3 million tonnes over life of project (2010 BP Caspian Regional Review). The energy efficiency design initiatives for SD1 production facilities at the Sangachal terminal include heat recovery, expanders and flare gas recovery with further efficiency improvements gained since the 2006 commissioning period. BP Caspian's Regional review of 2010 sates "Energy efficiency benchmarking indicates that the Shah Deniz project is best in class...".

Resettlement

The audit reviewed the status of post resettlement monitoring and evaluation to determine if commitments contained in the SLIP and The Resettlement Action Plans have been fulfilled in regards to ensuring the effectiveness of livelihood support programmes. The SD1 project ESIA and RAP included resettlement and livelihood support programmes for four separate resettlement initiatives: the Sangachal herder/ pastoralist families, a café/garage business which was relocated; fishermen whose livelihoods were to be impacted by near shore and offshore activities, and; the Internally Displaced Persons (IDP) community that was located at the Zykh Shipyard which was used for project construction.

The post resettlement monitoring programmes reviewed included close out and verification that commitments had been completed for the herder/ pastoralist resettlement, fishermen and the café/garage. However, there was no available information on the post resettlement monitoring and livelihood support evaluation as specified in the RAP. The SD1 operator advised that the Zykh shipyard belongs to SOCAR and responsibility for the resettlement process rests with SOCAR. Resettlement plan and implementation activities have been funded and coordinated on SOCAR's behalf by the Technip Maritime Overseas Ltd (Technip), which was developing the Zykh site. Technip commissioned a national NGO named HAYAT to carry out resettlement tasks on its behalf. The Resettlement plan for the Zykh Shipyard community began in July 2003 and culminated in the physical relocation of affected households in January 2004. BP Caspian does not have full details of the reports associated with this resettlement project.

Corporate Social Responsibility Programmes

The Shah Deniz operations have evolved the community and enterprise development programmes since the ESIA and SLIP in response to changing community needs and to reflect the outcomes of the post construction phase community initiatives. The more recent programmes have expanded to include a broader regional focus for community and enterprise development as much of the local development programmes has achieved substantial success since the construction project was completed in 2006. The broader regional approach also reflects BP's expansion assets and infrastructure in the Caspian region. Key aspects of the current regional programmes include:

- Micro level loan programme to small enterprises (in cooperation with EBRD) aimed at enterprise development in affected communities.
- Business development enabling project with IFC.
- Training programmes aimed at Technical and Vocational Education and expansion of apprenticeship programmes to more local communities with the SD2 project expansion underway.

Reporting, Consultation and Grievance processes

The audit sought to verify that the operation has continued to liaise with communities and other stakeholders and those changes to operations are subject to formal consultations, including a continuation of grievance process.

Reporting of compliance related issues is completed through the Shah Deniz Operational Monthly Reports provided to JV partners. The review of the reports indicates that compliance related issues are reported relevant to spills but not for other compliance related issues such as breach of project emission standards or breach of statutory obligation. BP advise that complete environment monitoring data, including specific details of any breach of agreed standards and/or limits, is included in reports to the statutory authority, MNER, on a quarterly and annual frequency.

Consultation with local communities near the Sangachal terminal has increased over the past 12 months with substantial public consultation occurring with the Shah Deniz stage 2 ESIA which was made publicly available at the end of 2012. Community information centres are established in each local community to provide a focal point for information dissemination and consultation efforts.

The Shah Deniz operator, BP, has entered into a cooperative agreement with other Caspian oil and gas producers and international NGO's to establish a web based Caspian Environment Information Centre which aims to provide a platform for sharing regional environmental data and encourage public participation in environment assessment and monitoring programmes.

Shah Deniz operators advised that there were six community grievances formally received for the period of 2010 – 2013. All of them have been positively resolved. One was a "damage to property" complaint regarding land that was subject to the resettlement; four were in regards to employment opportunities for local community members and one was in regards to health concerns from the flaring at Sangachal terminal.

Worker safety

The annual BP Caspian Sustainability reports and the monthly HSE reports provided to joint venture partners provide details of worker safety statistics and performance for the SD1 operations. The safety management for both onshore and offshore SD1 activities is impressive with no lost time injuries reported since 2008 and no medical treatment injuries reported for 2013. Information provided by the operator indicates that the SD1 operations safety management programmes and performance are benchmarked against industry peers and have exceeded the performance worker health and safety targets over recent years.

5. RECOMENDATIONS

The audit recommendations are provided to EBRD as suggested actions that may be implemented through its arrangements with Lukoil. Although the audit makes findings in regards to the operational aspects of the Shah Deniz Stage 1 operations, it is acknowledges that these recommendations can only be implemented through Lukoil's participation as a minority JV partner. As such, these recommendations are aimed at actions or requests that Lukoil can take to the Shah Deniz Stage 1 operations in its capacity as a JV partner.

Reporting of non-conformances and non-compliance

The Shah Deniz Operational Monthly Reports provided to JV partners provide statistical information in regards to safety and environmental non-conformances. The data is specific to safety incident frequency rates and environmental incidents related to spills of hydrocarbon. The reports do not appear to provide a summary of environmental incidents that are recorded due to a breach of project environment standard or statutory limit; and do not provide specific information on incidents that may have been reported to regulators. It is recommended that Lukoil request that specific information is provided in the monthly reports, or other reporting mechanism, that summarises any incident of breach of operational environmental standard or regulatory limits including direct and indirect discharges at the terminal and the offshore facility. This additional information should also ensure that Lukoil are advised of any environment or safety incidents that are reported to regulatory authorities or that become subject to regulatory action. The recommended reporting would allow Lukoil to notify EBRD in accordance with existing commitments.

Assessment of SD1 Produced Water Disposal Options

The audit findings in regards to the management of produced water from the SD1 operations at Sangachal indicates a lack of assessment of environmental impacts associated with produced water management and disposal options. The initial ESIA disposal option for onshore well injection was abandoned in 2007. Since then, the SD1 operators have obtained temporary approval for storage at the Sangachal terminal. The suitability of storage facilities was found to be inadequate following detection of seepage from storage ponds at the terminal which has since been rectified. However, odour concerns to local communities and workers exist due to the nature of the produced water being stored.

The auditor was not made aware of any comprehensive environmental assessment of produced water disposal to offshore wells although there appears to be advanced plans to progress the engineering for this to occur. It is recommended that a comprehensive environmental assessment of SD1 produced water management and disposal options be undertaken, unless already in progress or complete, to ensure the high standards of waste management are maintained for the project. This assessment should include measures to address the odour issues at the produced water storage ponds. It is noted that the SD2 ESIA includes three options for produced water management and disposal at Sangachal, which include: disposal to the ACG field offshore produced water system which is co-located at Sangachal; disposal offsite to a third party wastewater treatment facility for treatment and disposal, and; the third option of storage onsite at Sangachal. The SD2 ESIA recognises that odour issues would need to be addressed for the third option to be accepted.