

OPID 47253

Tajikistan - Qairokkum HPP Climate Resilience Upgrade

**Environmental and Social Appraisal
and Action Plan**



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Acronyms:

EBRD: European Bank for Reconstruction and Development
E&S: Environmental and Social
ESAP: Environmental and Social Action Plan
ESDD: Environmental and Social Due Diligence
HPP: Hydropower Plant

The present document was prepared for GCF and is aimed at providing GCF and the public with relevant information regarding (i) the environmental and social assessment carried out by EBRD and (ii) the resulting environmental and social action plan agreed with Barqi Tojik in the frame of the Qairokkum HPP Climate Resilience Upgrade Project in Tajikistan.

1. BACKGROUND

Project description: The EBRD is considering providing financing for the priority rehabilitation and modernization program at the Qairokkum hydro power plant (the "Qairokkum HPP"), the only power generation facility in the Sugd region of Northern Tajikistan.

The proceeds of the Bank's loan will be used to finance replacement of the remaining four out of six generation units at the Qairokkum HPP and rehabilitation of related infrastructure, following replacement of two units as part of the Qairokkum Hydropower Rehabilitation project. The Project will complete rehabilitation and modernisation of the Qairokkum HPP with resulting improvements in productivity, dam safety and resilience against the projected impacts of climate change of the Qairokkum HPP. The Project fully supports the Bank's Green Economy Transition Approach which fosters scaling up climate financing and resource efficiency activities.

Project Objectives: The Project is expected to:

- increase the installed capacity by 32 MW which, together with the 16 MW increase under the first phase (OPID 41553), will result in an increase of the existing installed capacity from 126MW to 174MW by installing new turbines;
- prevent unnecessary discharge of water through spillways and allow generation of more electricity with the same flow of water;
- raise the safety level of the power plant and the dam;
- strengthen the power plant's resilience to the expected impacts of climate change through continued physical upgrades designed to take into account projected increases in climatic and hydrological variability.

Transition Impact: The Project is expected to have the following transition impact:

- The rehabilitation will increase resource efficiency, preventing unnecessary discharge of water through spillways and allowing generation of more electricity with the same flow of water. The Project will also improve reliability and safety of the Qairokkum HPP, ensuring reliable and uninterrupted service to domestic consumers in the Northern Tajikistan. Implementation of the complex rehabilitation and modernisation of the Qairokkum HPP applying best international practices (in particular, integrating detailed analysis of the projected climate change impacts into the rehabilitation design) will have a replicable impact with the potential to be adopted in future hydropower investments and infrastructure upgrades across the region.
- The Project will enhance the Client's ability to manage climate change related risks to hydropower operations by strengthening the transboundary coordination of hydropower cascade management through institutional capacity development and skills transfer. These improvements will play an important role in dispersing new skills across the industry and across the region.

Client Information: The loan will be on-lent to Open Stock Holding Company "Barqi Tojik" (OSHC Barqi Tojik), an existing client of the Bank, a 100% state-owned vertically integrated power utility accounting for about 80% of domestic power output and responsible for transmission and distribution of electricity almost in the entire Tajikistan.

2. DETAILED PROJECT DESCRIPTION

The existing Qairokkum HPP: The Qairokkum project was conceived as a dual-purpose project for irrigation water management at Syr Darya river and for hydroelectricity. It is one of the many multipurpose dams and reservoirs built in the Soviet time on the Syr Darya river, in Kyrgyzstan, Kazakhstan and Uzbekistan. Upstream of Qairokkum the Toktogul HPP in Kirgizstan is regulating the flow in the Naryn river, which forms together with Kara Darya the Syr Darya in Tajikistan.

Qairokkum HPP with an earthfill dam of about 1,200 m length and a concrete section of 130 m impounds the Qairokkum reservoir with a volume of about 4000 Mio m³. The power house is integrated into the concrete section of the dam. The generating halls are in submerged design and contain the power generating units. 6 gated spillways are located above the generating units.

The power house comprises:

- 6 Trash racks for the turbine intakes
- 6 Intake gates
- 4 draft tube stoplogs which allow to close 2 draft tubes
- 6 Spillway stoplogs
- 6 Kaplan turbines, double regulated, each 21 MW capacity, which are designed to operate between 12.0 m and 24.5 m head
- 6 synchronous generators with 26.3 MVA, 10.5 kV
- 2 single phase transformer banks which transform the generator voltage to 110 kV and 220 kV, the voltages of the transmission lines

The design for construction was in the fifties, the construction activities started in 1953. Qairokkum hydropower plant was commissioned in 1959. The main characteristics of the scheme are described in the following table:

Table 1: Main parameters of existing Qairokkum HPP

Dam		
Type		Concrete and hydraulic fill
Length	m	approx. 1200
Height	m	28 (from foundation)
Foundation elevation	m asl	323.50
Dam crest elevation	m asl	351.50
Reservoir		
Full supply level (FSL)	m asl	347.50
Max. flood retention level	m asl	348.35
Storage capacity at FSL	Mio m ³ Mio m ³	4000 (originally) 3000 (acc. to 2009 survey)
Mean annual flow	m ³ /s	570 (average 2002 – 2005)
Active storage volume	Mio m ³ Mio m ³	2700 (originally) 2300 (acc. to 2009 survey)
Minimum operation level (MOL)	m asl	340.60

Usable water level height	m	6.90
Power house		
Type		submerged
Total installed capacity	MW	126 (6 × 21)
Turbine type		vertical Kaplan turbines
Number of turbine units	Units	6
Turbine discharge	m ³ /s	1062 (6 × 177)
Rated head	m	15.0
Average generation	GWh/yr	Appr. 700
Waterways		
Water Intake level	m asl	347.50
Elevation centreline runner	m asl	324.20
Tailrace water level	m asl	332.50
Spillway		
Spillway type		6 outlets each 12 m wide
Spillway water level	m asl	347.50
Spillway elevation	m asl	337.70
Type of gate		Stop logs operated by crane
Spillway capacity	m ³ /s m ³ /s	approx. 3,960 (6 × 660) 1080 (through turbines)
Transmission lines		
Nominal voltage	kV	220 / 110

Planned Rehabilitation Works: Several scenarios for the rehabilitation of the power plant have been studied during the pre-feasibility phase, including uncertainty regarding climate change effects and including financial feasibility. As a result and following the discussions during the prefeasibility study workshop held on 21 May 2013 in Dushanbe it was decided to implement the scenario based on the replacement of all 6 generating units by new ones with the same runner diameter. No additional turbines will be installed.

The goal of the project is to improve the hydro power plants reliability, durability and to increase the electricity generation by using the existing civil structure. The turbine output will be increased to the maximum which is possible without cavitation and with minor adaptations only for the concrete weir and power house.

The installation of new turbines with increased rated power makes it mandatory to install new generators as well. Apart from that most of the electro-technical equipment has reached the end of its lifetime and is outdated.

Based on the findings of the consultant on site, the age of the equipment, the requirement for a safe and stable operation as well as the possibility to increase the generation, made it necessary to proceed to the replacement of all components by new and modern equipment.

Great importance was given to a reliable operation of the HPP since the grid in Tajikistan is practically isolated from the neighbouring countries. The new layout is based on a 110/10.5 kV three phase unit transformer for each generator which will be connected to two new step-up transformers with a capacity of 125 MVA each. A new automatic control system will have to be installed and the monitoring and surveillance system, including an alarm system for the embankment dam, will be integrated.



Picture 1 – One of the gates to be replaced



Picture 2 –Partial view of one of the 6 existing generators.

All gates will be rehabilitated and the turbine intake gates will be equipped with automatic drives. To enhance safety under flood conditions, additionally automatic drives will be installed at the spillway gates.

Finally, the ongoing project for the rehabilitation of Qairokkum HPP substation, financed by the Asian Development Bank, will guarantee the capacity of the network to transport the additional energy produced by the rehabilitated Qairokkum HPP.

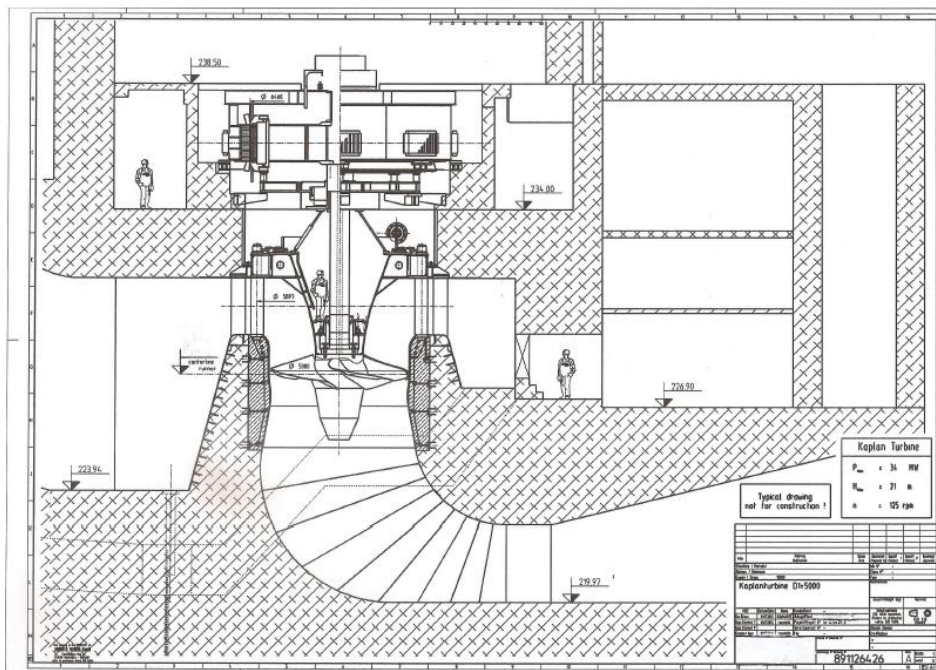


Picture 3 – New switch at the switchyard, financed by ADB.



Picture 4 – This part of the switchyard will be dismantled and will receive the new transformers.

Figure 1: Typical drawing cross section new Kaplan turbine – D=5000 mm



3. SCREENING OF THE PROJECT AND SCOPING OF THE ASSESSMENT

The Project was categorized B by EBRD and therefore was subject to an Environmental and Social Due Diligence (ESDD), but a full Environmental and Social Impact Assessment as defined by EBRD’s Environmental and Social Policy was not required. The environmental and social due diligence was carried out in two stages: a consultant visited the site in 2013 and provided an independent environmental and social (E&S) review to EBRD. On the basis of this review, an Environmental and Social Action Plan (ESAP) covering the first phase of the Qairokkum HPP rehabilitation was prepared and agreed with Barqi Tojik.

The ESDD work carried out in 2013 for the first phase formed the basis for the ESDD of the second phase (i.e. the present Project), that was carried out by EBRD’s environmental and social specialists in 2015. The site was visited with the Client, the operating staff, and the engineers in charge of the design. The second phase ESDD aimed at verifying that the ESAP developed under the first phase was appropriate for the second phase, as well as making any necessary amendment to the ESAP to reflect changes in the Project context. Only minor changes were done – mostly dates adjustments to reflect the rehabilitation of all six production units.

4. EXAMINATION OF ALTERNATIVES

The “no project” alternative would mean sooner or later the end of the production of energy by Qairokkum HPP and is not an envisaged option. It is not further considered.

Several alternatives were considered during the feasibility and due diligence stages. The main options that were discussed in relation to the E&S issues associated with the Project are the following ones:

- **Alternative design** of the production units: the Project is designed so that the production units rehabilitation takes into account (i) climate resilience and (ii) reduced fish mortality.
- **Alternative phasing:** the replacement of spillway gates will be organized and phased so that the reduction of the overflow discharge capacity during works does not affect the dam safety. In practice this means that the spillway gates will be replaced during the low flow season only, and one gate after the other.

5. ENVIRONMENTAL AND SOCIAL ASSESSMENT

Regulatory Requirements: Tajik law differentiates two different items, when it comes to EIA development: (i) the Environmental Impact Assessment (OVOS), and (ii) the State Ecological Expertise (SEE).

OVOS/EIA is implemented by the developer of a specific project, while the SEE is carried out by the authorized state body or by their experts for certain types of infrastructure/activities. The development of an EIA (Environmental Impact Assessment) is not necessary for the Project.

According to the Law of the Republic of Tajikistan on Ecological Expertise with amendments signed by the President of the Republic of Tajikistan dd. 16.04.2012, № 818, the rehabilitation works at the Qairokkum HPP fall under article 14. Copies of past SEEs have been checked by the Consultant during the site visit in May 2013. The Client has also confirmed that intrinsic technical changes at the power plant are being reported regularly to the State Agency via a SEE.

Environmental and Social Impact/Issues: The environmental context of the project area is mostly related to the quality and availability of water, the ecological continuity for aquatic life and climatic conditions. Interactions between the Project and its social environment are limited to the vicinity of the public road which follows the crest of the dam. The hydropower scheme and the associated facilities such as the switchyard are not located close to any inhabited area and therefore the potential impacts of the Project on the public will be limited to interactions with the local traffic. However, the Project is associated to the Qairokkum reservoir which is a public object of national importance for socio-economic and recreational uses. It is important to note that the Qairokkum reservoir operation is not under the responsibility of Barqi Tojik, who only operates the hydropower scheme: the reservoir level regulation is the responsibility of the Ministry in charge of Agriculture, and the Project will not affect the reservoir operation. Consequently, the Project will not affect any of the reservoir uses.

Environmental and Social Management System: Qairokkum HPP is the first hydropower plant in Tajikistan to be operated under a Management System that was certified ISO 9001. In the frame of the Project, Barqi Tojik has committed to extend this management system to an integrated Environmental and Social Management System certified ISO 9001, ISO 14001 and OHSAS 18001. This will ensure an organization of work that seeks continuous improvement of the environmental and health and safety performance of the HPP. Qairokkum HPP will be the second HPP of the Syr Darya cascade with such an integrated and certified management system, after Shardara HPP in Kazakhstan (located downstream, also rehabilitated using EBRD funds).

Transboundary or cumulative impacts: The Qairokkum HPP is located more than 10 km from the closest international border, and therefore the terrestrial activities carried out on site during the rehabilitation works will not have any transboundary impact. The water from Qairokkum reservoir is either conveyed to large irrigation channels (some of which are transboundary) or flows through the HPP towards the border with Uzbekistan (more than 40km downstream): the reservoir operation

rules are established by the Ministry in charge of irrigation in coordination with the neighbouring countries in the framework of the Syr Darya basin dialogue. Under this organization, Qairokkum HPP discharges downstream (through turbines or spillways) the volumes of water it is instructed to release. The rehabilitation of the HPP will not change the water releases instructions Qairokkum HPP receives and will not affect the capacity of the HPP to release the required volumes. The transfer of water to the existing irrigation channels from Qairokkum reservoir will also not be affected. The production of hydropower by downstream users and water availability for downstream users will be unchanged. The Project is therefore considered to be associated with no transboundary impacts or risks and the risk of cumulative impacts in relation to other projects or activities in the Project area or in the downstream Syr Darya reach is considered as nil.

Green House Gas Emissions (GHG): In total the effect of the rehabilitation measures will be very positive in terms of greenhouse gas emissions. The increase of the general plant efficiency will lead to approx. 20% higher power generation from a renewable source, thus improving the GHG emissions of the whole grid. The transformers will be equipped with insulated high-voltage switchgear under a separate Project financed by the Asian Development Bank. This technology is using the greenhouse gas SF₆, which has a very high global warming potential. The technology that is used is expected to result in no to little gas can leak; which will be monitored and reported by Barqi Tojik.

Air quality and noise: Any activity in the frame of the Project will lead to temporary negative impacts on the air quality: exhaust from site vehicles, dust from sand and cement loading and handling cannot be avoided. Respective measures have to be taken: wetting of the dusty roads or dusty to minimize dust, reducing vehicle transport during night hours. The site of the power plant is remote from the next village or settlement, so those local construction-related impacts won't affect settlers.

Seasonal flow regime change: Since the Qairokkum reservoir is depending on the outflow of the above Toktogul reservoir and on regulation decisions made by the Ministry in charge of Agriculture, the project itself will not influence the flow regime, no impacts are to be expected.

Water quality: Refurbishment of the electromechanical equipment will lead to reduction of loss of lubricants and oil. In the year 2006 e.g. a daily loss of 200 l per day of hydraulic oil was reported; this was been repaired in the meantime, however it is only a matter of time, until the leaks will result in heavy pollution again. The suggested repair works shall settle this problem once and for a long period.

Solid waste: Construction activities will lead to mostly metallic waste production, which will be collected and treated (re-cycled) as scrap metal.

Sediment transport & flushing: It is assumed, that the project activity will not change the sediment regime in the project area.

Water pollution from construction activities: Construction activities might lead to accidental pollution in the water. Outflow of oil and other hazardous substances need to be avoided; any spills to be cleaned diligently.

Fish and Aquatic Ecosystems: The fish population in Qairokkum reservoir and in the Syr Darya river has been reducing in the recent years and mitigation measures that could help improving the fish population in the context of the Project were sought, since the presence of the hydropower plant

itself also has some negative impacts on the fish population: on one hand the presence of the dam cuts migration pathways for aquatic species intending to move upstream (this is not specifically a negative impact of the hydropower plant, but rather a consequence of the presence of the dam, which is mostly aimed at irrigation). In addition, fish can be killed when passing the turbines downstream: this is not an issue that affects all fish, but only those which do swim in the deeper layers (the hydropower intakes are several meters under water) and that are small enough to pass through the grids that prevent the intrusion of large debris such as tree trunks. The rehabilitation Project was considered as a clear opportunity to reduce fish mortality and therefore the reduction of fish mortality was included in the Environmental and Social Action Plan. Fish-friendly turbines – with different shapes of the propeller vane, less sharp blades and wider space between the propeller vanes - could reduce the kill of fish passing the turbines by up to 90%.

The construction of a fish pass was discussed, but was finally not considered because (i) the HPP is part of a cascade of HPPs and the restoration of upstream migration would be meaningful only in the context of an all-river multi-national effort to restore ecological continuity from the Northern Aral Sea to the upstream Syr Darya basin (there are currently no discussions in this direction at the regional/basin level), and (ii) because the construction of a fish path would be physically possible on the earth dam only, and the earth dam does not belong to Barqi Tojik.

For information, there are many reasons that affect the fish population, but are totally outside Barqi Tojik's control or responsibility: for example, some of the large water intake structures for the irrigation systems lack protective measures such as fish screens. A recent extrapolation of fishery experts, states that about 19 million fish are being sucked into the irrigation system per year. Another problem for fish are changing water levels (due to operation of the reservoir for irrigation), leading on the one side to partly drying out of spawning grounds, and on the other to partly flooding, which is destroying the eggs: this is also an issue that is outside Barqi Tojik's responsibility, as the reservoir fluctuations result from water management decisions made by the irrigation services.

Terrestrial Fauna & Vegetation: Since the project is restricted mainly to the dam site, potential impacts on terrestrial wildlife and flora (habitat loss and changes) are negligible. The project area is not known to host special endemic or rare terrestrial fauna and flora which could not move and would be affected thus by the project.

Construction impacts on wildlife are also negligible, a part of times of noise and dust which might drive away terrestrial wildlife for the time of the construction works. Waste and waste water shall be treated in a sustainable way such as not to harm terrestrial fauna or flora.

Socio-economic Impacts - Employment - The construction of the bottom outlet and of the new spillway will employ around 100 local workers. The refurbishment of the electromechanical equipment, incl. dismantling of the old electromechanical equipment, will require further 40 local workers.

The number of workforce needed at the site is small compared to the local population at nearby Khudzhand and City and their presence should therefore not require any special precautions.

Skills & Training - new technical facilities will be built, requiring new skills from operation personal. Training on the new equipment has to be conducted in order to guarantee continued employment opportunities for the operating personnel.

Improved access to electricity: It is expected that the rehabilitation measures of the hydropower plant (new turbines, refurbishment of the electromechanical equipment...) will lead to approximately 20% higher power generation.

Road traffic: Transport of heavy and bulky machinery (e.g. the new transformers) can become a challenge of the transport infrastructure, which is quite narrow (tunnels, narrow roads). The transport possibilities of this equipment parts will have to be checked in advance.

Safety: The most important impacts of the whole rehabilitation works are to increase the safety of operation, the plant safety and the safety of supply.

General plant safety: Reconstruction of the dam and embankments will lead to an important safety increase in the whole area. This is a direct positive influence on the quality of life in the surrounding area of HPP Qairokkum. The equipment is over 50 years old and needs to be refurbished now in order to guarantee safe operation conditions.

Asbestos: there are some asbestos components in the HPP, mainly in the insulator of some parts of the generators. The ESAP includes a requirement to identify all sources of asbestos prior to the rehabilitation works, and to remove and treat asbestos according to good international practices, and following the principles of the EU directive for hazardous wastes.

Worker safety: Several measures will be implemented, in order to reduce the requirement for manual operation of devices, e.g. in case of flood manually operating the gates. Automatic and remote-controlled equipment will increase work safety. During the rehabilitation works, the main risks will be associated with (i) works close to water bodies, (ii) works at height, (iii) works with electric systems, and (iv) heavy parts and equipment movements.

The following pictures illustrate the observations made during the 2015 visit:



Picture 5 – Overall view on the hydropower plant and on the earth dam.



Picture 6 – Mechanical oil storage. Containments (in case of leak) are located under the tanks. The earth dike around the storage is there to be pushed to the bottom of the tanks in case of fire.



Picture 7 – Overall resurfacing is required on the dam crest.



Picture 8 – The crane leaks.



Picture 9 – The concrete dam below the sluice gate will need to be lifted up in order to access and replace the generator and turbines.



Picture 10 – Control rooms, generators, turbines, electrical equipment – all will be replaced.



Picture 11 – Safety instructions and signs are frequent and appropriately distributed.





Picture 12 – There is an obvious effort made to ensure the well-being of workers. Here the control room workers locker room and kitchen.



Picture 13 – resurfacing is needed in several places at the switchyard.

Picture 14 – Eurasian Magpie (*Pica Pica*) nest in the Switchyard.

6. STAKEHOLDER IDENTIFICATION AND ENGAGEMENT

A present Stakeholder Engagement Plan (SEP) was prepared meeting the requirements of EBRD Environmental and Social Policy was prepared for the Project and approved by Barqi Tojik. Based on the EBRD’s Environmental and Social Policy (Performance Requirement 10: Information Disclosure and Stakeholder Engagement), the stakeholder engagement is an ongoing process involving

- the client’s public disclosure of appropriate information to enable a meaningful consultation of stakeholders
- advising of potentially affected parties
- a procedure or policy by which people can make comments or complaints

This process should begin at the earliest stage- the project planning phase and continues throughout the entire project. This Performance Requirement outlines a systematic approach of stakeholder engagement that will

help clients to build and maintain a constructive relationship with their stakeholders, in particular the locally affected communities. The process of stakeholder engagement is an essential component of the appraisal, besides management and monitoring of environmental and social issues.

EBRD requirements for stakeholder engagement: Due to EBRD involvement in the Qairokkum HPP reconstruction, the project must meet the high international standards and their requirements, which are specified in the PR10 of the EBRD Environmental and Social Policy. The EBRD considers stakeholder engagement as an essential part of good business practices and corporate citizenship, and a way of improving the quality of projects. In particular, effective community engagement is essential for a successful management of risks and impacts on communities that are affected by projects. Furthermore the engagement is an useful instrument, which leads also to benefits for the society.

Identification of stakeholders: Several stakeholder groups were identified that may be interested and/or affected by Qairokkum HPP project development and implementation. Identified stakeholders are internal stakeholders, such as Barqi Tojik’s employees and contractors’ workers, as well as external stakeholders, such as governmental authorities, private companies, non-government organizations and local residents:

- a. **Internal Stakeholders:** Barqi Tojik and companies likely to be directly involved in the Project implementation
- b. **Regional and Local Authorities**
- c. **Economic players** interested by the Project without being directly involved in its implementation
- d. **General Public and Non- Governmental Organisations (NGOs)**

The table below provides a matrix for a potential stakeholder engagement program and the intended communication process, which contains the points of providing stakeholders details, communication methods and possible media that will be used for information disclosure.

No.	Category of Stakeholder	Information relevant to the respective Category	Communication method & media
1.) Internal Stakeholders			
1	Employees	<ul style="list-style-type: none"> - General information about the project implementation and timeline (in the form of a non-technical summary) - Impact of the project on the employee’s work - Opportunities for new positions - Information about work safety - Instructions on environmental protection, occupational health and work safety 	<ul style="list-style-type: none"> - Personal communication - Bulletin board - Work safety and environment: regular training - Intranet - Other?
2	Construction workers, subcontractors, suppliers, consultants...	<ul style="list-style-type: none"> - General information about the project implementation and timeline (in the form of a non-technical summary) - Instructions on environmental protection, occupational health and work safety - Business opportunities (tenders, procurement...) 	<ul style="list-style-type: none"> - Personal communication - Information contained in the contracts - Call for proposals advertised on Barqi Tojik website
2.) Regional and local authorities:			

No.	Category of Stakeholder	Information relevant to the respective Category	Communication method & media
1	Administration of Qairokkum City	<ul style="list-style-type: none"> - The purpose of the nature and scale of the project - The duration of proposed project activities - Information about all envisaged consultation process, if any, and opportunities and ways in which the public can participate 	<ul style="list-style-type: none"> - Personal communication - Special public meetings / hearings to inform the public?
2	The Ministry of Agriculture of the Republic of Tajikistan	<ul style="list-style-type: none"> - See above 	<ul style="list-style-type: none"> - Invitation to the Public Hearing / Meeting, if planned
3	The Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan (responsible for irrigation of lands)	<ul style="list-style-type: none"> - See above 	<ul style="list-style-type: none"> - Invitation to the Public Hearing / Meeting, if planned
4	Department of Environmental Protection of Qairokkum City of the Environmental Protection Committee under Government of Tajikistan	<ul style="list-style-type: none"> - Any risks to and potential impacts with regard to environment, worker health and safety, public health and safety and other social impacts on communities, and proposed mitigation plans 	<ul style="list-style-type: none"> - Personal communication - Invitation to the Public Hearing / Meeting, if planned - Any information necessary under the reporting needs (including Ecological Passport, State Ecological Expertise)
3.) Economic Players:			
1	Company Sughd Mohi (engaged in fish industry)	<ul style="list-style-type: none"> - The purpose of the nature and scale of the project - The duration of proposed project activities - Information about all envisaged consultation process, if any, and opportunities and ways in which the public can participate 	<ul style="list-style-type: none"> - Website - Invitation to the Public Hearing / Meeting, if planned
4.) General public & Non-Government Organizations (NGOs):			
1	Citizens of Qairokkum and neighboring cities	<ul style="list-style-type: none"> - The purpose of the nature and scale of the project - The duration of proposed project activities - Information about all envisaged consultation process, if any, and opportunities and ways in which the public can participate - Any risks to and potential impacts with regard to environment, worker health and safety, public health and safety and other social impacts on communities, and proposed mitigation plans 	<ul style="list-style-type: none"> - Communal bulletin board - Website - Invitation to the Public Hearing / Meeting, if planned
2	NGOs	<ul style="list-style-type: none"> - The purpose of the nature and scale of the project - The duration of proposed project activities - Information about all envisaged consultation process, if any, and opportunities and ways in which the public can participate - Any risks to and potential impacts with regard to environment, worker health and safety, public health and safety and other social impacts on communities, and proposed mitigation plans 	<ul style="list-style-type: none"> - Website, mailing - Personal communication - Invitation to the Public Hearing / Meeting, if planned
3	All stakeholders	<ul style="list-style-type: none"> - In application of Aarhus convention and EU Water Framework Directive objectives, share with the public environmental data monitored at the dam site (for example outflow, water quality, water level, meteorology...) 	<ul style="list-style-type: none"> - Share monitored parameters automatically on Barqi Tojik's website

Tab. 1: Matrix for the Stakeholder Engagement Program for the rehabilitation of the Qairokkum HPP

Qairokkum HPP is reporting on a regular basis a set of environmental data - see for instance the “Ecological Passport” (Паспорти экологи / Экологический паспорт)” and the “Report on Standards of Maximum Permissible Emission into the atmosphere by the Kayrakkum HPP (State Environmental Expertise (Лоихаи меъёрҳои ҳадди имконпазири партов (ХИП) ба ҳавои атмосфера барои Неругоҳи барқи обии Кайроққум). Barqi Tojik will publish these data on its website (<http://www.barqitojik.tj/en/>) environmental data for the Qairokkum HPP on a dedicated webpage, together with the following parameters: water level, water flow, eventually meteorological parameters.

Vulnerabilities: In the course of the development of the Environmental and Social Appraisal no special vulnerable groups, that would be affected by the rehabilitation (e.g. ethnic minorities, refugees, “informal users”) have been identified.

7. GRIEVANCE MECHANISM

A Grievance Mechanism was prepared for the Project together with the Stakeholder Engagement Plan. It is open to all stakeholders. The objective of the grievance procedure is to ensure that all comments and complaints from any project stakeholder, including local/regional authorities, residents of nearby residential areas, Barqi Tojik employees, Barqi Tojik contractors’ staff and other interested parties, are considered and addressed in an appropriate and timely manner. All grievances will be acknowledged and responded to within a reasonable timeframe.

Examples of Grievance issues may include items such as:

- Noise, dust and truck traffic during dam rehabilitation works
- Impact on fishery industry during rehabilitation works at the dam and/or powerhouse
- Lack of timely response to input given during the project.

Barqi Tojik has a department for registering complaints and proposals from the public on the power supply issues and other activities of the company’s responsibility. Complaints and proposals are recording in special journal log and transferred to the responsible departments to resolve the issues. Subsequent to the results of reviewing the issue, the person who sent a complaint will receive an official response. Also there is a telephone hotline, which is published on press and television, any citizen of Republic of Tajikistan can contact with this phone number with his complaint and it will be investigated.

All grievances will be registered and acknowledged within 5 days and responded to within 20 working days. Barqi Tojik will keep a grievance log and report on grievance management, as part of annual project progress reports, available at the Barqi Tojik website and on request at the Barqi Tojik office in Dushanbee.

Individuals who submit their comments or grievances have the right to request that their name has to be kept confidential.

During rehabilitation works of the HPP, grievances in relation to rehabilitation activities will be managed by the Barqi Tojik and the construction contractor. Residents will be informed about the contractors contact information before construction begins, through the local media (listed in the table above) and announcements in public places. A separate grievance mechanism is available for workers, both employees of HEP and the contractors.

Responsibilities: Stakeholder Liaison Officer at Barqi Tojik will have the overall responsibility for handling the consultation and information disclosure process, including organization of consultation process, communication with identified stakeholder groups, collecting and processing comments/complaints, and responding to any such comments and complaints. Depending on the nature of a comment/complaint, some comments or complaints will be provided to the appropriate person in the company for a response within 10 calendar days. Barqi Tojik will keep a record of all complaints and answers provided:

Comments and concerns regarding the project can be submitted in writing in the following ways:

1. In electronic form on BT website: <http://www.barkitojik.tj/index.php/en/>
2. Via email: barki_tojik@tajnet.com
3. Via post: 734026 г. Душанбе, ул. Исмоили Сомони, 64;
4. Via fax: (+99237) 235-86-92;
5. Via phone: (+99237) 235-86-68;

Comments and Complaints Sample Form:

Comments and Complaints Sample Form					
FORM FOR COMMENTS, COMPLAINTS AND REPORTS OF INDIVIDUALS					
Reference No:					
Full Name					
Contact Information and Preferred method of communication	By Post: Please provide mailing address:				
Please mark how you wish to be contacted (mail, telephone, e-mail).	By Telephone:				
	By E-Mail:				
Description of Incident or Grievance:					
	What happened? Where did it happen? Who did it happen to? What is the result of the problem?				
	Source and duration of the problem?				
Date of Incident/Grievance					
	One time incident/grievance (date _____)				
	Happened more than once (how many times? _____)				
	On-going (currently experiencing problem)				
What would you like to see happen to resolve the problem?					
Signature:					
Date:					

8. ENVIRONMENTAL AND SOCIAL ACTION PLAN

Environmental and Social Action Plan
Qairokkum HPP Rehabilitation Phases 1 & 2, Tajikistan

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
0	Prepare and submit reports on the status of the implementation of the ESAP and environmental, social and occupational health and safety performance of the project as well as other relevant agreed activities.	EBRD PR 1	<ul style="list-style-type: none"> - During construction each six months - During operation annually 	Submission of reports on the implementation of the ESAP and the Project's environmental, social, and occupational health and safety performance in form and substance satisfactory to EBRD. The Report Format is to be provided by EBRD.
1	PR 1: Environmental and Social Appraisal and Management			
1.1	<p>Develop and implement environmental, social, and occupational health and safety management systems equivalent to those under ISO 9001, ISO 14001, OHSAS 18001 (see also item 2.3) for all relevant departments and services of Qairokkum HPP. A three steps process is thus suggested:</p> <p>Step 1. Barqi Tojik to make resources (staff, budget, training and/or external consultant...) available for the E&S management systems set-up: year when the loan becomes effective (probably 2014)</p> <p>Step 2. Develop the Environmental and Safety Management Systems</p> <p>Step 3. Certification (Q1 2016) and implementation (loan duration)</p>	Best international practice; EBRD PR 1, 2	<ul style="list-style-type: none"> - Step 1: 2016 - Step 2: first full year (2017) - Step 3: 2018 and throughout loan duration - Maintain system throughout operation phase 	<ul style="list-style-type: none"> - Systems developed by qualified person, staff trained, systems implemented. - Status reported in respective reports to EBRD

¹ Items required to be reported to the Bank will be presented in the semi-annual or annual reports required under item 0, unless noted otherwise.

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation¹
1.2	Appoint responsible manager(s) at Qairokkum HPP for (i) overseeing occupational health and safety issues, (ii) implementing environmental, social, and occupational health and safety management systems as per action 1.1 and (iii) following-up and reporting on the implementation of the ESAP as per Action 0. The person(s) shall report directly to the site manager and subsequently to Barqi Tojik management.	Best international practice; EBRD PR 2	- 2016 and ongoing	<ul style="list-style-type: none"> - Appointment of qualified person - Qualifications submitted with first report under item 0 - Responsible person maintained at all times
1.3	Train foremen, relevant staff and (sub-)contractors on each construction team and operational shift in the relevant requirements of this ESAP.	Best international practice; EBRD PR 1	<ul style="list-style-type: none"> - Before construction starts (internal staff) - Before a new (sub)-contract starts (external staff) 	<ul style="list-style-type: none"> - Documentation of regular training for foremen, staff and other personnel (number and percentage of staff trained to be reported) - Include updates of training within regular reports to EBRD

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
1.4	<p>Establish and implement corporate policy and procedures for oversight of (sub-)contractors in respect to environmental, occupational health and safety, and social performance during construction. This includes three different items:</p> <p>Item 1: Inclusion of appropriate ESAP and other legal requirements in contracts/subcontracts, including requirement for staff/management training.</p> <p>Step A. Barqi Tojik includes in bidding documents for contractors a requirement for a CESMP (Construction E&S Management Plan) to be submitted with the technical proposals and separately quoted in the financial proposals. The CESMP should at least address all issues raised in the E&S appraisal (noise, dust and air quality, waste management, spill prevention and management, water-bodies protection...) and standard OHS requirements (risks review and prevention plan, OHS organization and management, PPEs, Emergency procedures).</p> <p>Step B. The CESMP is then to be reviewed by Barqi Tojik at the bid evaluation stage and agreed at the contract negotiation , with a provision for modifications based on a continuous improvement approach during the execution of works</p> <p>Item 2. Assignment of clear responsibilities within Barqi Tojik on contractor oversight and performance monitoring.</p> <p>Item 3. Contractor reports on performance sufficient to allow inclusion of data in reports to the Bank, and to allow Barqi Tojik to determine if corrective actions are needed.</p> <p>See also item 2.3 (Occupational Health and Safety), as well as item 3.1 (Waste Management Plan), and item 4.1(Public Health & Safety).</p>	Best international practice EBRD PR 1	<ul style="list-style-type: none"> - Upon entry into contracts/subcontracts - Prior to contractor actions 	<p>Include in reports to Bank, for each contract passed under the Project:</p> <ul style="list-style-type: none"> (i) contract title and short description, (ii) confirmation that CESMP was required within bidding documents, (iii) confirmation that CESMP was proposed by the selected contractor and was reviewed for approval by Barqi Tojik; (iv) Highlights of contractor's EHS performance based on contractor's report; (v) Training: topics and number of people trained.

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
1.5	Acquire and comply with all required permits and authorizations from respective Tajik ministries and authorities, including requirements from the State Ecological Expertise (SEE) as per the State environmental expert review N°735-15 dated 29/08/2013.	Tajik laws and requirements EBRD PR 1	Prior to beginning any activities that require permits or authorizations and during the whole loan duration. To be documented in annual reports.	<ul style="list-style-type: none"> - All permits and authorizations received - Reports submitted to authorities as required - Compliance status reported to EBRD
1.6	<p>Barqi Tojik and its contractors shall monitor:</p> <ul style="list-style-type: none"> - if works requiring significant movement of materials (more than 1000 tons per day) are undertaken: <ul style="list-style-type: none"> a) air emissions (air quality) from Trucks and machinery exhausts, using exhaust measurement devices; - if works requiring significant traffic on public roads (more than 50 vehicles passing per day) are undertaken: <ul style="list-style-type: none"> b) noise (near settlements, if applicable), using portable sound level meters; - if works presenting a risk of spill/discharge of solid or liquid products to water bodies are undertaken: <ul style="list-style-type: none"> c) Permanent visual monitoring during the activity with immediate stop of the works when a spill/discharge is about to occur or occurs. 	EBRD PRs, and international best practice	During construction	Report to EBRD on highlights of implementation
1.7	<p>Develop emergency response plan to cover at least flood response, fire, spills, severe injuries or fatalities, or other events that could reasonably be expected to occur within the lifetime of the power plant.</p> <p>This action has to be aligned with the Tajik legislation, where emergency plans are under the responsibility of the ministry of emergency situations. The ERP should therefore include:</p> <ul style="list-style-type: none"> (i) inundation maps to be shared with the authority in charge of emergency situations (ii) a set of operational procedures for the staff to manage the emergency (who to call, what to do...). The legal possibility for Qairokkum management to inform directly downstream structures (Farkhad and Shardara) is to be checked and would be a plus. 	Best practice	Emergency response plan ready by end 2017	<ul style="list-style-type: none"> - Hire a consultant to prepare the emergency response plan - Barqi Tojik to review and approve the plan in consultation with responsible authorities and communities - Report to EBRD on status of planning and any updates - Report to EBRD immediately after emergency response actions are taken

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
1.8	<p>Low fish mortality to be included in the detailed design and procurement stages.</p> <p>The "low fish mortality" assessment should be based on the following:</p> <ul style="list-style-type: none"> - review of the size and species of exposed fishes: present mortality rate of fish approaching the turbine intake taking into account the existing protections (grids, intake depth, etc...) and risks (cuts by turbine blades, rapid pressure variations) - definition of a target mortality rate for fish approaching the turbine intake associated with technical measures to be included in the Project: low mortality turbines, physical protections... 	International Best Practise	During specification of procurement requirements	<ul style="list-style-type: none"> - "low fish mortality" assessment report shared with EBRD - Implementation of the required measures included in regular reporting to EBRD
2	PR 2: Labor and Working Conditions			
2.1	Develop / update HR Policy and Procedures to fully comply with national law and EBRD requirements; Make this policy and Procedures available to employees in their language.	Tajik laws and requirements EBRD PR 2	Continuously	<ul style="list-style-type: none"> - Submission of HR Policy and Procedures to the EBRD for review - Include in report to Bank data on workers, including dismissals and new hires, collective bargaining developments, status of medical checks, etc. - Report to EBRD the numbers of workers in various categories (management – skilled – unskilled, local – non-local – expatriate, women – men) - Availability of policy and procedures for workers
2.2	Develop a formal grievance mechanism for employees and contractors and disseminate information about its uses to the workforce, in the language(s) of the workers	EBRD PR 2	From start of construction throughout operation phase	<ul style="list-style-type: none"> - Submission to EBRD of grievance procedure for review and approval - Thereafter, report to EBRD to include all worker grievances and resolutions

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
2.3	<p>As far as allowed by the Tajikistan legislation, support local labor force by:</p> <ul style="list-style-type: none"> - Employing local workers where possible: establish and meet goals for local hires, consider training for permanent positions - Emphasis is laid on the need for legal employment only (no hiring without contract, even if for one day). This applies also for recruitment done by contractors. - Providing realistic information on employment opportunities, with transparent hiring practices - Advertise for all open positions - Paying wages at least average for the area for comparable positions 	Tajik Law; EBRD PR 2; Best international practice	Prior to workforce selection	<ul style="list-style-type: none"> - Local announcements when hiring - Training for local workers - Wages comparable to regional averages
3	PR 3: Pollution Prevention and Abatement			

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
3.1	<p>Develop and/or maintain a comprehensive waste management plan for the Qairokkum HPP for all wastes, including chemicals, fuel, oil, construction debris, domestic/household solid wastes. Ensure all off-site management is by licensed companies and in licensed places. The plan should include at least:</p> <ul style="list-style-type: none"> - Procedures for proper handling of all waste generated at the HPP and construction sites, including especially bentonite and concrete slurry - Methods to verify proper off-site management of Barqi Tojik-related wastes by contract waste managers - Measures to minimize waste generation and maximize reuse and recycling at the HPP. <p>We suggest to utilize this waste management plan not only for the work period, but for practical reasons for all relevant Qairokkum HPP activities; thus it should be included in the procedures that will be prepared under future ISO 14001 preparation (see also item 1,4).</p>	<p>Law of the Republic of Tajikistan on Ecological Expertise with amendments signed by the President of the Republic of Tajikistan dd. 16.04.2012, № 818 rehabilitation works at the Qairokkum HPP fall under article 14</p> <p>Best international practices; EBRD PR 1 & 3</p>	<p>Prior to construction activities. Collection of different types of wastes separately (i.e. hazardous wastes, dyes, domestic wastes etc.) will be supplied by the project developer or subcontractor.</p>	<p>Development of the plan:</p> <ul style="list-style-type: none"> - Review and/or approval of plan by authorities, if required - Require compliance in all contracts - Report to EBRD on status of plan and approval <p>Implementation:</p> <ul style="list-style-type: none"> - All wastes managed in accordance with approved plan - Reports to authorities as required in permits - Reports to Barqi Tojik by all contractors on amounts, types, and management of all solid wastes - Reports to EBRD on amounts, types, and management of all solid wastes (by Barqi Tojik and all contractors) - Immediate report to EBRD and relevant authorities of significant incidents and response actions

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
3.2	<p>Develop and implement plan for transport, storage and management of excavated material from the earth-fill dam, concrete dam and other excavations. This shall include as a minimum:</p> <ul style="list-style-type: none"> - Temporary on-site storage kept to a minimum and in secure location - Maximize beneficial use as fill, or otherwise as approved - Dispose in secure and authorized locations <p>No excavation spoils or quarries should be left uncovered after the project is implemented. Therefore, seeding or re-vegetation has to be implemented on the surfaces that would otherwise be left to erosion after the works are completed. If temporary only spoil dumps are to be used, then temporary covers are to be provided.</p>	Best international practices; EBRD PR 3	Prior to excavation	<ul style="list-style-type: none"> - Review and approval by authorities of management plan - Report to EBRD on plan approval and implementation, including amount of material handled and managed, methods, etc. - Report to authorities as required by permits
3.3	<p>Barqi Tojik and its contractor(s) shall implement air quality management practices to control construction dust and vehicle emissions, including (at a minimum):</p> <ul style="list-style-type: none"> - Periodic observation monitoring for visible dust near construction/ traffic areas - Implement dust suppression as needed in dry/dusty conditions (water, gravel, etc.) - Maintain vehicles/equipment in good running condition - Cover loads as needed to prevent dust 	Tajik Law; EBRD PR 3; Best practice 1. Dust: WHO) Air Quality Guidelines & Directive 2008/50/EC Ambient Air Quality and Cleaner Air for Europe; 2. General EHS Guidelines: Environmental Noise Management of IFC	Develop: prior to construction; Implement: throughout construction	Report to Bank on monitoring results and highlights of dust control/ suppression activities

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
3.4	<p>Barqi Tojik and its contractor(s) shall implement measures to prevent / reduce / control impacts to groundwater and surface water as a result of spills of fuel, lubricants and other chemicals:</p> <ul style="list-style-type: none"> - Store fuels and oils away from water in bonded containers with sufficient capacity - Ensure drip-trays are in place where fuels or oils are stored or used. - Identify a designated bonded refueling location - Train drivers and equipment operators in proper fuel management. 	Best international practices; EBRD PR 3	Throughout construction	<ul style="list-style-type: none"> - Mitigated adverse impacts on local groundwater and surface water - Report to EBRD immediately in case of major incident - Report minor spills in regular reports to EBRD
3.5	<p>Barqi Tojik and its contractor(s) shall be prepared for cleanup of small spills (fuel, etc.), including (but not limited to):</p> <ul style="list-style-type: none"> - Spill control measures provided in all vehicles and equipment and at all sites at all times - Training in cleanup for drivers and equipment operators, and others who use fuel, oil, other hazardous materials - Inspections of vehicles and equipment for leaks before use near or in water. - Collection of waste water in pump sump and cleaning in waste water recycling plant prior to release back into the river 	Best international practices; EBRD PR 3	Throughout construction	<ul style="list-style-type: none"> - All spills cleaned up promptly - Include in regular report to EBRD information on spills and cleanup - Include information about performance of waste water recycling plant
3.6	Barqi Tojik and its contractor shall implement a wastewater management plan	Tajik Law and international requirements Best Practice (General EHS Guidelines: Wastewater and Ambient Water Quality of IFC)	Before construction	<ul style="list-style-type: none"> - Target: Maintaining of Syr Darya River Water Quality - Positive results of monitoring reports regarding the implementation of Wastewater Management Plan

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
3.7	<p>Asbestos: identify (location and volumes) asbestos containing material and include their removal in the Project.</p> <p>Include in the terms of reference of the contractor in charge of asbestos removal the following requirements::</p> <ul style="list-style-type: none"> • Asbestos removal to be done by trained workers, with relevant protection equipment ; • Procedure for transport and landfilling to be prepared and submitted to Barqi Tojik. Transport and landfilling of asbestos material in compliance with the Tajik regulation and in line with the objectives of the EU Directive 1999/31. <p>The procedure must be included in the requirements of the company with an objective to limit the dispersion in the environment and the exposure of workers and public to the asbestos fibres in compliance with the European legislation of dangerous waste (Directive 1999/31)</p>	Best international practices; EBRD PR 3	During the tender documents preparation and during rehabilitation works	<ul style="list-style-type: none"> - Indication of the location of asbestos containing material :Barqi Tojik - Inclusion of relevant requirement in the tender documentation: design engineer - Removal: Contractor
4	PR 4: Community Health & Safety and Security			

No.	Action	Source of Requirement	Date required	Target and Evaluation Criteria For Successful Implementation ¹
4.1	<p>Require contractors to implement -- procedures to protect public health and safety (see also item 1.4), which will include:</p> <ul style="list-style-type: none"> - Traffic management plan for all drivers and equipment operators (speed limits, training, routes to follow, avoidance of sensitive areas) - Public notice of construction operations near areas open to the public - Security as needed to prevent unauthorized access to project locations, with appropriate training for guards - Notice to local authorities and nearby residents before major activities and traffic - Hazard notices/signs/barriers to prevent access to energized components and other dangerous areas - Make best effort to minimize disruption and closures of public roads 	Best international practices EBRD PR 4	<ul style="list-style-type: none"> - Develop procedures: prior to commencement of major works - Implement: throughout construction 	<ul style="list-style-type: none"> - Consultations with local authorities on traffic, notices, etc. - Consultations with traffic authorities on traffic plan - Submission of plans to EBRD with first report under item 0 - Report to Bank on traffic management, security, other activities, including any incidents/ accidents involving the public
10	PR 10: Information Disclosure and Stakeholder Engagement			
10.1	<p>Implement Stakeholder Engagement Plan to inform the public, receive comments and input on the project impacts, including stakeholder grievance mechanism and notice to authorities and residents of major construction events as well as to inform the public.</p> <p>This includes the disclosure on a dedicated page of Barqi Tojik's website of E&S information. In particular, the environmental parameters (water flow, water level and optionally meteorological parameters) that will be monitored in the frame of the new monitoring system should be disclosed on Barqi Tojik's website.</p>	Best international practices; EBRD PR 10	Throughout construction and operation	<ul style="list-style-type: none"> - Include in regular report to EBRD on consultation activities, including notices given - Include in regular report to EBRD on all grievances received and how addressed/ resolved - Dedicated webpage ready in 2015, with water flow/level data disclosed on real time as soon as the monitoring system is set-up.
10.2	Report on a regular basis to the impacted communities about project progress status and about progress of this ESAP implementation	Best international practices; EBRD PR 10	Throughout construction and operation	<ul style="list-style-type: none"> - Include in regular report to EBRD on consultation activities - Report to communities on status

9. ESAP ENFORCEMENT AND MONITORING

The ESAP that was prepared for the Project and agreed with Barqi Tojik forms part of the financial agreement signed between EBRD and Barqi Tojik for the Project.

The implementation of the ESAP will be monitored by EBRD through Annual Environmental and Social Reports provided by Barqi Tojik, and through specific monitoring visits at key development stages or if specific issues arise.