



“Darial Energy” LLC

Dariali Hydro Power Plant Construction and Operation Project

Environmental and Social Action Plan, Dariali HPP

Tbilisi 2014

“Dariali Energy” JSC, the “Sponsor”, is planning construction and operation of a 108 MW HPP (Dariali HPP, the “Project”) on the river Tergi, Stepantsminda municipality. The European Bank for Reconstruction and Development and (EBRD) is considering entering into a financing agreement with Dariali to part finance the project.

According to the project design, the HPP is of diversion type, with no regulation, operating on natural flow. Components of the plant are:

- Water intake;
- Sand Basin;
- Diversion pipeline;
- Inlet portal of the tunnel with idle spillway;
- Headrace tunnel;
- Surge tunnel;
- Underground pressure shaft;
- Underground power plant;
- Tailrace tunnel;
- Access tunnel; and
- Open distribution substation.

The Dariali HPP shall connect with power supply by 110 kV transmission line (Stepantsminda-Vladikavkaz towns), which connects Georgia and Russia energy systems. A new 220 or 500kV capacity line is being considered by Georgian State Electro system and in case of project implementation the line will be used to deliver energy from Dariali HPP.

Water intake structures include low-threshold dam, lateral water intake and headrace channel, which connects with regularly washed settler.

Project considers arrangement of 6 m high dam. Given height and construction of the dam excess water and full amount of solid sediment will be freely released into the tailrace during floods.

The water from the water intake will drain into the sand basin will be arranged 326 m away from the water intake, on the right slope of the riv. Tergi. Water will be transferred to the sand basin via 4 m long diversion pipeline. The three-section sand basin will arrest solid sediments with a diameter of up to 0,2 mm.

The sand basin is followed by the diversion pipeline. The pipeline will be located underground. After construction works the surface will be recultivated. Boring of Headrace tunnel is planned by the “Robbins” tunnel boring machine. Diameter of the tunnel will be 5,5 m and the length – 5040 m. Upstream portal of the headrace tunnel will be located on 1705 m elevation and the downstream portal on elevation of 1361 m. Vertical pressure shaft will be arranged at the end of the leveling shaft. Horizontal section of the shaft will be shifted into the turbine pipeline. The storage for disk valves will be also arranged. The power unit includes underground power house, cable tunnel, access tunnel, tailrace tunnel and channel and open substation.

According to the project HPP building shall be located underground – in artificially arranged area. Here shall be installed bridge crane, three hydraulic units, management facilities and auxiliary electric facilities. Arrangement of ventilation system for HPP underground building is also considered.

110/10 kV open substation will be arranged near the exit of the tunnel, on the right bank of Tergi River. 3 units of power transformers will be installed in the substation area.

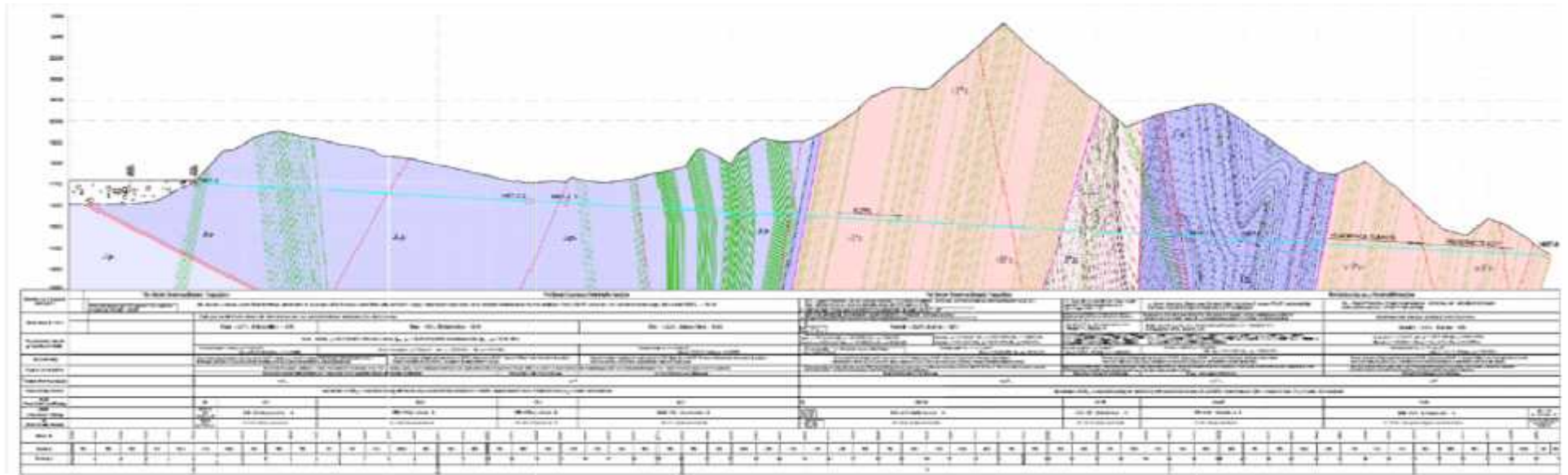
In the table below basic specification of Dariali HPP is presented:

Headrace Location	m	∇1725
Tailrace Location	m	∇1333
HPP design discharge rate	m ³ /s	33.0
Design head (net)	m	370-380
HPP installed capacity	MW	108.0
Electricity production for 50% provision	mln. kW-hr	510.0

Figure 2.1. Situational scheme of Dariali HPP location



Figure 2.2. Cross section of the diversion system



Dariali has prepared and disclosed an Environmental and Social Impact Assessment (ESIA). This ESIA described the project and the natural and human resources that could be affected, and evaluated the potential impacts the project could have on those resources. The ESIA also described a series of actions that will need to be taken to prevent, control, or otherwise mitigate potential impacts and comply with Georgian Law and the Lender's environmental and social performance requirements and standards.

Those requirements are described in this Environmental and Social Action Plan (ESAP). The ESAP in the table below will be included in Dariali's financing agreements with the EBRD. Performance of the required actions will be reported to the EBRD by Dariali and will be audited or otherwise evaluated by the EBRD during construction and operation of the project.

Implementation of the actions is the ultimate responsibility of Dariali. When other companies perform work under contract, Dariali will be responsible for their compliance with the requirements of the ESAP, even if direct oversight of the work is by a contractor. This is expected to be accomplished by inclusion of requirements in contracts and subcontracts, and by direct oversight and supervision by Dariali and/or its oversight contractor.

As agreed between the EBRD and Dariali, this ESAP may be revised from time to time during project performance. No changes will allow violations of Georgia law or of the EBRD's requirements for environmental and social performance, which are found in EBRD E&S Policy (2008) and associated Performance Requirements.

No	Action	Source of requirement	Implementation schedule	Target For Successful Implementation / Reporting Requirement
Performance Requirement 1: Environmental and Social Appraisal and Management				
1.1	Appoint an E&S manager at Dariali Energy HQ to take responsibility for E&S management, implementation of this ESAP and liaison with the Lenders.	EBRD PR1	By end of Q2 2014	Appointment of suitably qualified and experienced EHS manager and stakeholder liaison officer.
1.2	Report to Lenders on the status of each ESAP requirement and compliance with Performance Requirements.	EBRD PRs	<ul style="list-style-type: none"> - By-annually throughout construction and commissioning - Annually during operation 	Submission of reports in format to be agreed with EBRD.
1.3	<p>Develop and implementan integrated ESHS Management System aligned with ISO14001 and OHSAS18001 standards, certification is recommended but not required.</p> <p>The management system will include a contractor management plan and be implemented at site level for all project participants and works.</p> <p>Environmental and Social Management Plans (ESMPs) developed to date and those identified as being required in the ESIA will be cross referenced and</p>	EBRD PR1 Best Practice ISO14001 OHSAS18001	Prior to commencement of next stage of construction works (head works, diversion channel, sediment basin etc.).	<ul style="list-style-type: none"> - Finalised ESHS with all aspects included. - Lender approval of monitoring program - Monitoring of environmental and mitigation.

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	consistent with the ESMS.			
1.4	Comply with all required permits and authorisations	Georgian law EBRD PRs	Prior to beginning any activities that require permits or authorisations	<ul style="list-style-type: none"> - Permits & authorisations received - Reports submitted to authorities as required
1.5	<p>Develop outstanding management plans required and implement existing and new ESMPs accordingly, as per ESIA and supplementary reports, including:</p> <ul style="list-style-type: none"> • OHS Management Plan • Soil and Erosion Management Plan • Terrestrial and Aquatic Biodiversity Management Plans • Water Quality Management Plan • Stakeholder Engagement Plan • Social Management and Monitoring Plan • Chance Finds Management Plan • Cultural Property Management Plan 	EBRD PRs 1-10 Best practice	Development and implementation by end of Q2 2014 and throughout construction and operation	<ul style="list-style-type: none"> - ESMP and all plans implemented - ESHS impacts avoided, minimised, mitigated or compensated
1.6	Require all contractors to submit a CESMP (construction environment and social management plan) aligned with the Dariali Energy HQ OHS plan, detailed above. The contractor plan will describe all the measures planned by the contractor to limit its E&S impacts, including, but not limited to:	EBRD PRs 1-10	<p>For existing contractors: during Q1 2014 and prior to headworks construction</p> <p>For new contractors: As</p>	<ul style="list-style-type: none"> - - CESMP in place for all contractors - - CESMP reviewed and approved by Dariali Energy HQ - - CESMP implementation

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	<ul style="list-style-type: none"> • Liquid and solid waste management • Noise, air quality and dust management • Erosion prevention and control • OHS risks and associated safety rules • PPE • Emergency response • OHS and E&S training 		part of contractor tender / procurement	monitored by Dariali Energy HQ
1.7	Use best efforts and influence to ensure ESIA for connection to the new 220 / 500kv grid transmission line is completed in accordance with EBRD performance requirements and that required mitigation measures are fully implemented.	Best Practice	Throughout development of ESIA and construction/ operation of line	<ul style="list-style-type: none"> - Transmission line ESIA meets international standards - Construction and operation in accordance with agreed mitigation
Performance Requirement 2: Labour and Working Conditions				
2.1	Develop/update HR policy and procedures/manual to fully comply with national law and EBRD requirements, provide communication and access to HR policies and manuals to all staff	EBRD 2 Georgian Law	Q2 2014 and prior to recruitment of further staff	<ul style="list-style-type: none"> - HR policies - HR manuals
2.2	In accordance with point 1.3 and 1.5 above, develop an OHS plan to be specific to various components of the Project and ensure that the procedures and HSE manuals referred within it are an integral part of health safety and environmental management on site.	EBRD PR2 Best Practice OHSAS18001	As soon as possible and not later than prior to next phase of construction	<ul style="list-style-type: none"> - OHS plan further developed, adopted, and implemented - Minimise lost time incidents and fatalities

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2.3	Develop and implement a Labor Grievance Mechanism, made available to all Dariali and contractor workers	EBRD PR2	Development and implementation by end of Q2 2014 and throughout construction and operation	<ul style="list-style-type: none"> - Plan implemented, mechanism made available. - Timely resolution of all grievances
2.4	Periodically review working accommodation against the requirements of IFC/EBRD Guidelines of Worker Accommodation and develop a plan for improvement where necessary	EBRD PR2 Best practice guidelines	Annually	<ul style="list-style-type: none"> - Annual inspection reports - Improvements plan, where necessary
Performance Requirement 3: Pollution Prevention and Abatement				
3.1	<p>In collaboration with all contractors based on site, and in accordance with item 1.5, develop and implement all relevant management plans relating to Pollution Prevention and Abatement including:</p> <ul style="list-style-type: none"> • Soil and Erosion Management Plan • Spill Prevision and Spill Response Management Plans • Hazardous and Non-Hazardous Management Plans • Air Emissions (including dust) Management Plan <p>Implementation, supervision and monitoring of above plans for all site activities, including that carried out by the contractors.</p>	EBRD PR3 Best practice	Development and implementation by end of Q2 2014 and throughout construction and operation	<ul style="list-style-type: none"> - Management Plans of acceptable quality in place - Monitoring audits to confirm that plans are being implemented.

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3.2	Engage within local authorities to identify specific solutions with regards to the need for management of domestic waste presently on site at appropriately engineered / licensed landfill, or other suitable site, and to discontinue domestic waste tipping within the vicinity of the head works construction site.	EBRD PR3 Georgian Law Best Practice	Prior to commencement of construction in headworks area	<ul style="list-style-type: none"> - Solutions identified and alternative waste disposal site established - Authorities engaged with
3.3	Develop a plan and carry out remediation of the area of informal domestic waste tipping in vicinity of head works and ensure appropriate disposal of removed wastes to an engineered / licensed facility.	EBRD PR3 Georgian Law Best Practice	Prior to commencement of construction in headworks area	<ul style="list-style-type: none"> - Confirmation of remediated area
3.4	Undertake a follow up audit of surface water quality control mechanisms and develop a plan to ensure untreated grey / black, sediment, fuels and / or construction waters are not being discharged to the river Tergi in an uncontrolled manner.	EBRD PR3 Georgian Law Best Practice	Undertake an audit by Q2 2014 and develop a plan for implementation thereafter.	<ul style="list-style-type: none"> - Audit by Q2 2014 - Action Plan by Q2 2014 - Close out of all actions by Q3 2014
Performance Requirement 4: Community Health, Safety and Security				
4.1	Identify and evaluate risks to community health and safety from construction and operation of the project, develop and implement commensurate preventive measures including an emergency response and communication plan.	EBRD PR4	Prior to creation of potential risks	<ul style="list-style-type: none"> - Community H&S risk assessment for all project stages - Mitigation/prevention measures developed and implemented - ESMP monitoring and reporting

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4.2	Develop and enforce a Code of Conduct for Security Personnel and Worker Code of Conduct including interactions with local communities	EBRD PR4 Best practice UN Voluntary Principles	Prior to commencement of next phase of construction	- Code of Conduct developed and enforced
Performance Requirement 5				
5.1	Engage with local communities to assess the degree to which the land on the right hand bank of the River Tergi, which will be subject to temporary restricted access, is used for harvesting, foraging and grazing and the extent to which this is used as a source of income	EBRD PR5	- Prior to commencement of construction works associated with head works and channel and sediment basin.	- Appropriate stakeholder engagement
5.2	Depending on the outcome of the additional engagement and survey in 5.1 develop methods to minimise temporary loss of access and ensure full access (and safety, security) following completion of construction.		- As above	- As above
Performance Requirement 6				
6.1	Re-establish flow monitoring stations upstream and in stream of the project area for continuous monitoring that will be disclosed publically.	EBRD PR6	- Q1 2014	- Functioning, real time flow monitoring station. - Flow data made available to the public on the company website
6.2	Implementation of recommendations by the expert for river biodiversity conservation with regard to:	EBRD PR6	- Commencement immediately and	- Third party confirmation that mitigation measures and

No	Action	Source of requirement	Implementation schedule	Target For Successful Implementation / Reporting Requirement
	<ul style="list-style-type: none"> • Maintenance of minimum environmental flow calculated prior to commissioning • Install grids to prevent fish from being caught at the intake to the penstock/turbines • Undertake further biodiversity surveys to confirm baseline data obtained to date and sensitivity of river biodiversity • Undertake detailed geomorphological monitoring (focused on immediate channel continuity, fine sediment flushes, geomorphological response to the altered regime and extent of freezing) to inform adaptive management and ecological monitoring; • Development of an adaptive management plan including recalculation of minimum environmental flow conditions • Adopt a monitoring programme to establish the effectiveness of the adaptive management plan • Develop a plan to engage with the operator of the downstream Larsi HPP to review impact of the two HPPs in cumulation and effectiveness of fish ladders / passes at both sites. 		implementation throughout the lifespan on the project	adaptive management plans are effectual.
6.3	Implementation of recommendations by the expert for terrestrial biodiversity conservation with regard to:	EBRD PR6	- Commencement immediately and implementation	- Third party confirmation that mitigation measures and management plans are

No	Action	Source of requirement	Implementation schedule	Target For Successful Implementation / Reporting Requirement
	<ul style="list-style-type: none"> • Mapping and delineation of sensitive areas that will be considered “no-go zones” for construction traffic • Development of a biodiversity action plan in accordance with the findings of the expert opinion. • Development of a monitoring plan to be adopted during and post construction. 		throughout the lifespan on the project	effectual.
6.4	<p>Engage, in collaboration with EBRD, with national parks authorities and Ministry of Environment to review the possibility of implementing a reforestation scheme in the vicinity of the head works with a view to:</p> <ul style="list-style-type: none"> • implementation of slope stabilisation programme • development of a carbon neutral project • rehabilitation of indigenous biodiversity to the national park • local employment creation 	EBRD PR6 Best practice	<ul style="list-style-type: none"> - Engagement by Q3 2014 - Development of strategy and plan by year end 2014 	- Development of reforestation plan
Performance Requirement 8				
8.1	<p>Conduct additional surveys to determine presence of areas of cultural heritage associated with the River Tergi that could be impacted during project development and operation.</p> <p>Develop a mitigation plan, including minimisation of visual impacts, where necessary.</p>	EBRD PR8	<ul style="list-style-type: none"> - Survey of area: prior to disturbance of the area and reduced flow regime - Consultation with communities and project stakeholders to 	<ul style="list-style-type: none"> - Surveys conducted - Consultations held and actions agreed

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			minimise impact: prior to works and commissioning	
8.2	Develop a Chance Finds Procedure, to call for archaeologist to be on site as needed to verify archaeological finds, provide advice to a nominated Dariali representative, and liaise with relevant authorities.	Georgian law EBRD PR8	Prior to construction	- Chance Finds Procedure
Performance Requirement 10				
10.1	Implement Stakeholder Engagement Plan and community grievance mechanism.	EBRD PR10	- Throughout construction and operation	- SEP implemented
10.2	Evaluate and update SEP to improve/ refine stakeholder list, communication methods, media, etc.	EBRD PR10	- Evaluation and update: annually during construction, biennially thereafter	- SEP evaluated and updated if needed