



Tajikistan Rural Electrification Project

Environmental and Social Impact Assessment

Khorog-Qozideh 63km 110kV Transmission Line,
Tajikistan

PAMIREENERGY
НҶМБҶ «Памир Энерджи»

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Abbreviations and Acronyms	
BT	Barqi Tojik
CEP	Committee for Environmental Protection
DEP	Department on Environmental Protection
EE	Ecological Expertise
EA	Environmental Assessment
EHS	Environmental, Social, Health and Safety
E&S	Environmental and Social
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental & Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMMP	Environmental and Social Management and Monitoring Plan/Program
FI	Financial Institution
GBAO	Gorno-Badakhshan Autonomous Oblast
GIIP	Good international Industry Practice
GOT	Government of Tajikistan
GRM	Grievance Redress Mechanism
HSE	Health, Safety, Environment and Social
IDA	International Development Association / World Bank
IP	Indigenous Peoples
JPC	Jamoat Project Commission
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
NSIFT	National Social Investment Fund of Tajikistan
O&M	Operations & Maintenance
PAP	Project Affected Person (or Party)
RPF	Resettlement Policy Framework
RAP	Resettlement Action Plan
PCBs	Polychlorinated biphenyls (in power transformer oil)
SEE	State Ecological Expertise
SF6	Sulfur hexafluoride
WB	World Bank

1. Introduction

1.1. Background

The World Bank is considering providing support to the Tajikistan Rural Electrification Project (TREP), whose purpose is to provide electricity access to selected settlements in Khatlon and Gorno-Badakhshan Autonomous Oblast (GBAO) regions of Tajikistan (Figure 1). The total cost of the World Bank project is US\$ 31.7 million. TREP is part of the Risk Mitigation Regime (RMR) that is included in the upcoming World Bank Country Partner Framework for the Republic of Tajikistan for fiscal years 2019-2023.

The TREP is being prepared under the World Bank’s new Environment and Social Framework (ESF),



Figure 1. Location of Gorno-Badashan Autonomous Oblast within Tajikistan

which came into effect on October 1, 2018, replacing the Bank’s Environmental and Social Safeguard Policies. Under the ESF, projects such as TREP must comply with ten Environmental and Social Standards (ESSs) in investment project lending financed by the Bank.

TREP has two components:

- Component 1: Provision of electricity access to target settlements in GBAO region. This component will have the following subcomponents.
 - Sub-component 1.1: Construction of microgrids, and connection of consumers to microgrids and centralized distribution network of Pamir Energy. This subcomponent will finance provision of electricity supply to 61 settlements in GBAO region with an estimated total population of 11,666. The investments will cover (a) construction of electricity generation infrastructure, which will include microgrids comprising solar photovoltaic installations, small hydropower plans, wind generation plants, and battery energy storage systems (BESS); (b) distribution infrastructure, including expansion of 10kV and 0.4kV distribution lines and distribution transformers; and (c) connections and internal wiring for

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- households and public facilities (such as hospitals, schools, kindergartens) to alleviate consumer affordability barriers.
- Sub-component 1.2: Project implementation support to Pamir Energy, technical assistance for additional geological site investigation works for Sebzor Hydropower Project (HPP), and promotion of energy efficiency (through a US\$1.4 million IDA grant).
 - Component 2: Provision of electricity access to target settlements in Khatlon region. This component will have the following subcomponents.
 - Sub-component 2.1: Connection of target settlements to the centralized distribution network of Barqi Tojik (BT). This sub-component will finance connection to the electricity distribution network of up to 74 settlements, bordering Afghanistan, in the Khatlon region. The total population of the target settlements is estimated to be about 31,460 people. The investments will cover the cost of distribution infrastructure, including construction of 35/10/0.4kV distribution lines, installation of additional distribution transformers in existing substations; and connections and internal wiring costs for households and public facilities (e.g. hospitals, schools, kindergartens) to alleviate consumer affordability barriers. For all target settlements, access to energy services will be ensured by connecting the settlements to BT's centralized network because this is the least economic cost solution considering the proximity of the target settlements to the power distribution network. Most of the settlements are located within 0.5-2 kilometers of the distribution system.
 - Sub-component 2.2: Project implementation support to BT. This sub-component will finance the cost of: (a) Project Management Consultant to help BT with preparation of bidding documents for works to connect target settlements to its distribution grid; carrying of tenders for procurement of contractors to connect the settlements to the distribution grid of BT; technical supervision of grid-connection activities; and compliance with environmental and social requirement; and (b) monitoring and evaluation costs related to measuring availability of electricity service, efficiency of citizen engagement and addressing gender gaps under the Project.

It should be noted that KfW and the European Union are expected to finance construction of the Sebzor Hydropower Project (HPP) near the village of Sebzor about 18 kilometers from Khorog in GBAO region. An associated facility, construction and operation of an 18-kilometer (km) 110kV transmission line to evacuate power from the Sebzor HPP to a new substation in Khorog, will be financed by the Swiss State Secretariat for Economic Affairs. In addition, a 63km 110kV transmission line from Khorog to Qozideh, close to the Afghanistan border, will be required for further strengthening of the power transmission grid in GBAO and for exports of energy from Sebzor HPP to Afghanistan. There is no financing secured for this transmission line project as yet.

The World Bank is also providing financing for the environmental and social assessments and other planning documentation needed to meet the requirements of the World Bank's ESF and other requirements related to environmental and social performance. The various assessments will include:

- *Environmental and social impact assessments.* The Sebzor hydropower project and the associated 18km transmission line will be assessed in an Environmental and Social Impact Assessment (ESIA). Final feasibility studies are in preparation, and the environmental and social impacts of the projects have previously been subject to desktop evaluations in a preliminary feasibility study. The 63km transmission line will also be assessed in an ESIA. The off-grid solutions projects will have a preliminary assessment in Environmental and Social Management Frameworks (ESMFs) that will establish criteria for future evaluations of individual electrification projects. Although the project and its potential impacts have not been previously evaluated in a feasibility study, there is sufficient information to allow preparation of this ESIA.
- *Stakeholder Engagement Plans.* Each project component will have a tailored program to engage affected people and other stakeholders, with the Sebzor HPP and the two 110kV transmission lines sharing a single SEP since they are contiguous projects with many common stakeholders.
- *Resettlement Policy Frameworks.* Each project component will require the temporary and permanent use of land that is currently allocated to other people and so will result in physical and/or economic displacement of some households. Each will require one or more separate Resettlement Action Plans in the future, but the principles and objectives of the program will be the same for all components. For that reason, a single RPF has been developed that covers all components.

This report presents the **Environmental and Social Impact Assessment (ESIA)** for the 63km Khorog-to-Qozideh transmission line and Qozideh substation in GBAO. Documents required for each component are identified in Table 1.

Table 1. Environmental and social documentation for TREP and associated projects

	<i>Sebzor HPP & substation</i>	<i>18km Sebzor-to-Khorog 110kV t-line</i>	<i>63km Khorog-to-Qozideh t-line</i>	<i>GBAO off-grid solutions</i>	<i>Khatlon last-mile solutions</i>
ESIA	✓	✓	✓		
ESMF				✓	✓
SEP		✓		✓	✓
RPF			✓		
ESIA: Environmental & Social Impact Assessment ESMF: Environmental and Social Management Framework SEP: Stakeholder Engagement Plan RPF: Resettlement Policy Framework ✓ indicates separate E&S document to be prepared to meet ESF and other applicable requirements ✓ identifies present document					

Pamir Energy will be responsible for all the project components except the Khatlon last-mile solutions. Pamir Energy was formed in 2002 by the Aga Khan Fund for Economic Development (AKFED) in partnership with the Government of Tajikistan and the International Finance Corporation. Under a public-private partnership agreement with the Government of Tajikistan, the company has assumed

the operational management of all power generation, transmission and distribution facilities of GBAO. The Khatlon electrification projects will be implemented by Barqi Tojik, the state-owned company responsible for power generation and transmission in other provinces of Tajikistan.

1.2. Project Description

The element of the overall electrification program assessed in this ESIA is in the southwestern part of GBAO and includes construction and operation of a 63-kilometer transmission line from a substation in Khorog to Qozideh and a new substation near Qozideh, as shown in Figure 2. In the future, it is foreseen the new line will provide electricity supply to neighboring regions of Afghanistan, but that is not part of the present project.

The 110kV line will run through rough and rocky mountain terrain along the Tajik and Afghan state border parallel to and near the Panj River (also spelled “Pyanj” or “Pyandzh” in English). The line will begin at a 35kV/110kV substation in the city of Khorog, pass through Roshtkala district, and end in a new 110/35kV substation near the village of Qozideh in Ishashim district (Figure 2). The line will pass through or near 13 villages between Khorog and Qozideh. These villages have a total population of 5633 persons (798 households). The villages are identified in Figure 3 and Table 2.



Figure 2. Route of proposed transmission line

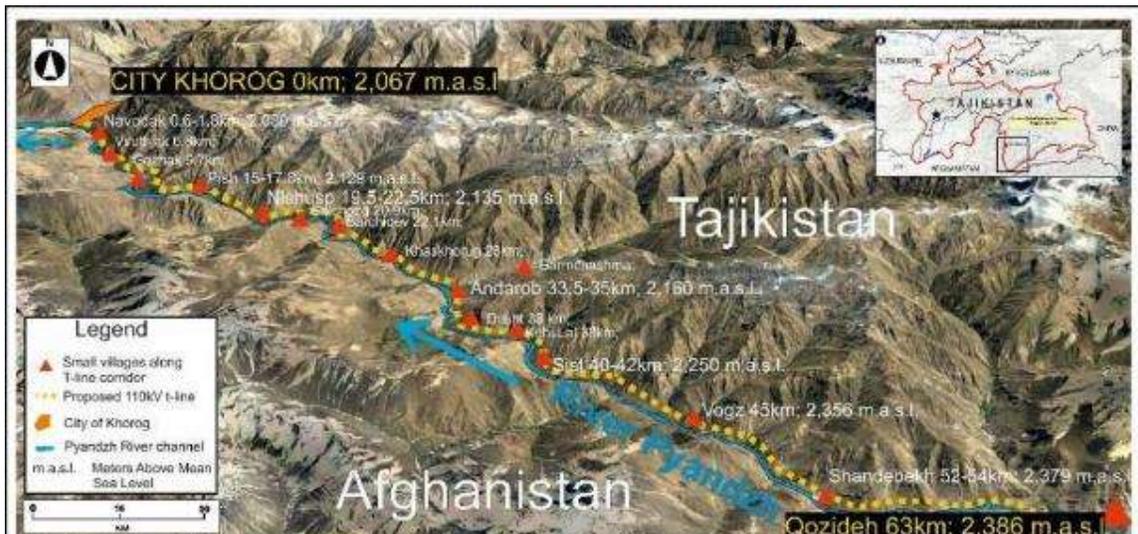


Figure 3. Villages along the transmission line corridor

Table 2. Villages along the transmission line corridor

<i>Distance from Khorog (km)</i>	<i>Name</i>	<i>Number of households</i>	<i>Population</i>
6.8	Viruthjak	11	25
9.7	Gozhak	78	462
14.9	Pish	119	692
19.8	Nishusp	189	1585
20.9	Shichozg	42	235
22.1	Barchidev	31	210
28.3	Khaskhorug	42	283
30.6	Andarob	71	493
31.8	Dasht	22	264
37.5	Kuhi - La'l	39	285
38.7	Sist	46	328
45.3	Vozg	39	337
48	Shanbedeh	69	434
<i>Totals</i>		<i>798</i>	<i>5633</i>

The project is currently in advanced planning. Due to deterioration of the existing 35kV line, the first 10-kilometer section of the line has already been constructed (a total of 37 towers), and another five towers in avalanche areas have also been constructed. In addition to these 42 towers, another 208 towers will be constructed, for a total of about 250. The exact number will be determined during final design, as will their locations. Pamir Energy intends to install the following types of towers, with examples shown on Figure 4.

- Four-legged steel lattice “angle” towers will be anchored in concrete foundations, with the base about 7.5 meters square (thus, with “footprint” of 56.25 square meters) and heights that can range from 15 to 25 meters.
- Smaller four-legged steel lattice “suspension” towers for straight sections will also be anchored in concrete foundations and will be slightly smaller than the angle towers.
- In areas where terrain does not allow installation of four foundations for legs, three lattice steel towers (poles) will each be anchored in concrete foundations and will be about 20 meters high.

The construction period will last for two or three years, depending on the length of the construction season, which typically extends from April through November but will depend on weather. Towers will be provided by an international vendor, although it is likely they will ultimately be purchased and imported from China. One or two contractors, likely to be from Tajikistan, will be appointed to complete the construction. It is anticipated around 160-200 workers will be employed in construction, many or most of them from local communities. Construction activities for the transmission line will involve earthworks, including drilling and possibly limited blasting, concrete works to install foundations for tower legs and poles, transportation/storage of tower parts and insulators, and tower

assembly (erecting) works. For the substation, about 150 workers will be employed in earthworks, concrete works, and installation of electrical equipment.

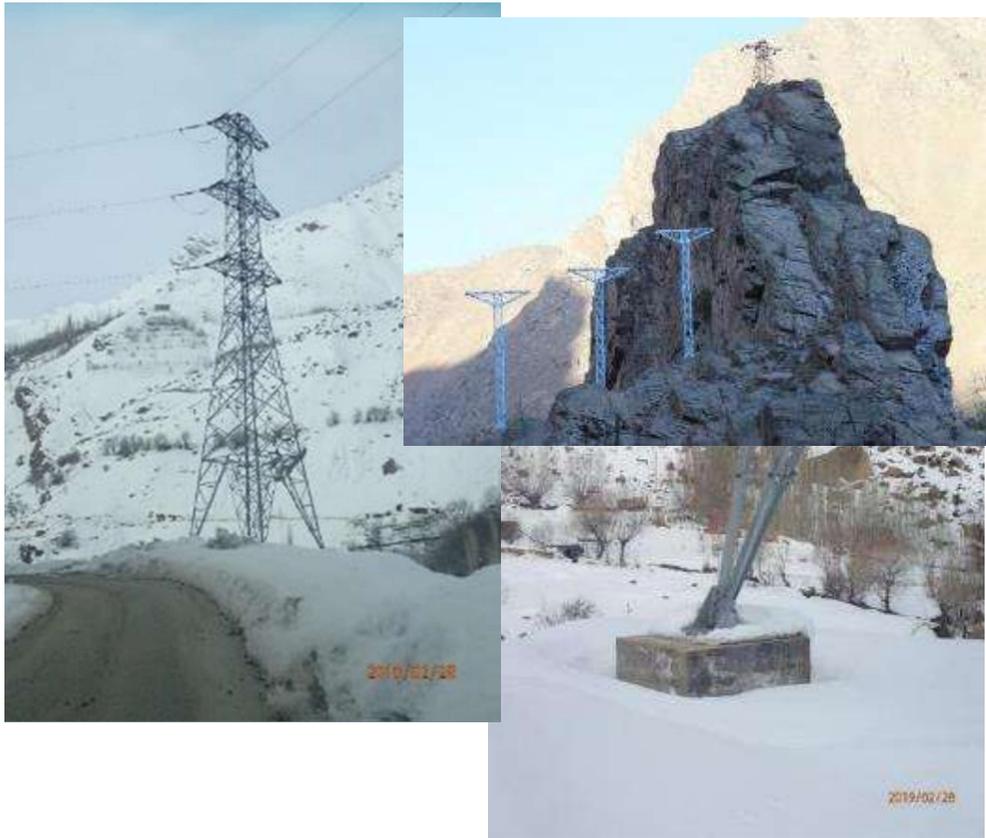


Figure 4. Examples of towers: angle tower at left, three suspension poles on uneven terrain at upper right, and example of foundation at lower right

As noted, the transmission line corridor will run parallel to the Panj River. A two-lane road (designated as road RB 06(12R45)) also runs parallel to the river, and the existing 35kV line runs in part between the river and the road and in part inland of the road, sometimes on hillsides and cliffs several hundred meters higher than the road. One option considered by Pamir Energy is simply to place the new steel towers in the same locations as the existing wooden poles. However, the existing line passes near or through villages and would likely require some resettlement of households. Therefore, it is Pamir Energy's intent that the new towers be placed so the corridor does not pass near any occupied houses or other buildings, and so the corridor avoids orchards and trees as much as possible.

In addition, to reduce the impacts of construction, Pamir Energy will require the contractor to use little or no mechanized equipment other than rock drills and hand tools. Concrete, water, steel parts of the towers, and other materials will be carried by hand from trucks to the tower locations and the towers will be assembled in place. Figure 5 shows examples of the manual construction methods for the towers that have already been installed. At present, the 42 new towers carry 35kV conductors (wires). When towers are in place, 110kV conductors (wires) will be placed on the towers and energized.

1.3. Purpose and objective of ESIA

The purpose of this Environmental and Social Impact Assessment (ESIA) is to provide an environmental and social assessment of the project in order to identify potential environmental and social risks throughout construction and operation. The ESIA will guide Pamir Energy in determining what additional surveys or studies are needed and in determining the requirements that need to be placed in contracts for final design and construction of the transmission line and substation so that environmental and social impacts are managed and mitigated in accordance with World Bank ESF requirements and Tajikistan law.

1.4. Organization of the ESIA

The ESIA is organized as follows:

- Chapter 2 identifies and describes the legal framework that will apply to the project
- Chapter 3 describes the methodology used to prepare the ESIA
- Chapter 4 describes baseline environmental and social conditions in the project area
- Chapter 5 describes potential environmental and social impacts and measures to avoid or reduce impacts
- Chapter 6 is the environmental and social management and monitoring program and also describes supervision, monitoring and reporting
- Chapter 7 describes stakeholder engagement and public consultations
- Chapter 8 is the grievance redress mechanism
- Chapter 9 provides a bibliography of references consulted and/or cited
- Annex 1 is an example grievance form

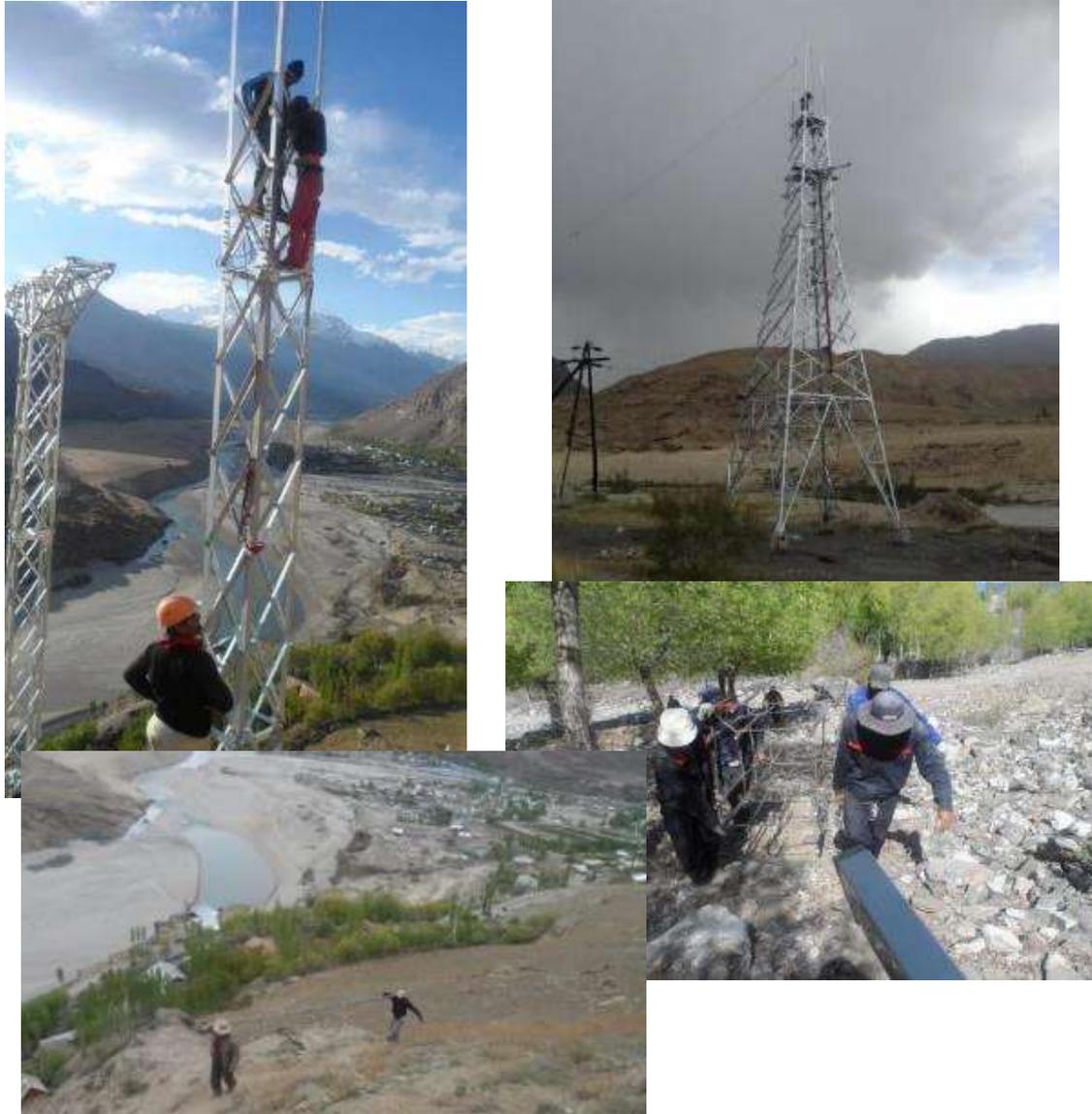


Figure 5. Tower construction process will not use mechanized equipment other than hand tools. The partly assembled tower at top right shows its modular nature, which facilitates hand transport.

2. Applicable Legal Requirements

This chapter describes the national and international legal requirements that will apply to the project.

2.1. National Legal and Regulatory Framework

The “framework environment law” or **Law on Environment Protection** was adopted in 2011 (21 July 2011, № 208). The previous Law on Nature Protection was adopted in 1993 and amended in 1996, 2002, 2004 and 2007, then replaced by this new law in 2011. The new Law stipulates that Tajikistan's environmental policy should give priority to environmental actions based on scientifically proven principles to combine economic and other activities that have an impact on the environment with nature preservation and the sustainable use of resources. The Law defines the applicable legal principles, the protected objects, the competencies and roles of the Government, the State Committee for Environment Protection, local authorities, public organizations, and individuals. The Law stipulates measures to secure public and individual rights to a safe and healthy environment and requires a combined system of ecological expertise and environmental impact assessment of any decision on an activity that could have a negative impact on the environment. The Law also defines environmental emergencies and ecological disasters and prescribes the order of actions in such situations, defines the obligations of officials and enterprises to prevent and eliminate the consequences, and establishes liabilities of the persons or organizations that cause damage to the environment or otherwise violate the Law. The Law establishes several types of controls over compliance with environmental legislation: State control, ministerial control, enterprise control, and public control. State control is affected by the Committee for Environment Protection, the Sanitary Inspectorate of the Ministry of Health, the Inspectorate for Industrial Safety and the Mining Inspectorate. Public control is carried out by public organizations or trade unions and can be exercised with respect to any governmental body, enterprise, entity or individual.

2.1.1. Environmental and social impact assessment in Tajikistan

Two laws establish requirements for impact assessment: the **Law on Environment Protection** introduced above and the **Law on Ecological Expertise**. Chapter V, Articles 35-39 of the Law on Environment Protection introduces the concept of state ecological review (literally, “state ecological expertise” – SEE), the purpose of which is to examine the compliance of proposed activities and projects with the requirements of environmental legislation and standards and with the ecological security of society. These laws emphasize the cross-sectoral nature of SEE, which must be scientifically justified, comprehensive, and objective and which should lead to conclusions in accordance with the law. SEE precedes decision-making about activities that may have a negative impact on the environment. Financing of programs and projects is allowed only after a positive SEE finding has been issued. Among activities and projects subject to state ecological review are construction and reconstruction of various types of facilities irrespective of their ownership.

The laws require that all types of economic and other activities be implemented in accordance with existing environmental standards and norms and have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. Environmental impact studies analyzing the short- and long-term environmental, genetic, economic, and demographic impacts and consequences have to be prepared and evaluated prior to making decisions on the siting, construction, or reconstruction of facilities, irrespective of their ownership.

An Environmental Impact Assessment (EIA) study is a component of the State Ecological Expertise, as set out in the 2011 amendments to the Environmental Protection Law and in the Law on the State Ecological Expertise (2012). The EIA is the responsibility of the project proponent (in this case, Pamir Energy). The State Ecological Expertise for all investment projects is the responsibility of the Committee for Environmental Protection under the Government of Tajikistan (CEP) and its regional offices. Also, the 2012 Law on the State Ecological Expertise requires that all civil works to be assessed for their environmental impacts and the proposed mitigation measures reviewed and monitored by the Committee on Environmental Protection.

The legal and regulatory system for EIAs also includes:

- Procedure of Environmental Impact Assessment, adopted by the Resolution of the Government of the Republic of Tajikistan No. 509 as of 01.08.2014
- Procedure to implement State Ecological Expertise, approved by the Resolution of the Government of the Republic of Tajikistan No. 697 as of December 3, 2012
- Guidelines on the composition and order of development of content and structure of documentation to be submitted for review as part of SEE
- List of objects and types of activity for which preparation of documentation on Environment Impact Assessment is mandatory, adopted by the Resolution of the Government of the Republic of Tajikistan No. 253 as of June 3, 2013.

2.1.2. Other relevant legislation on environmental and social issues

The **Law on Environmental Information** (2011) is underpinned by Article 25 of the Constitution, which states that governmental agencies, social associations, and officials are required to provide each person with the possibility of receiving and becoming acquainted with documents that affect her or his rights and interests, except in cases anticipated by law. The Law defines the legal, organizational, economic, and social bases for providing environmental information and establishes the right of individuals and legal entities to receive complete, reliable, and timely environmental information. Article 4 provides the right of access to environmental information and Article 8 defines the conditions for restricting access to environmental information (none of which should be relevant here).

The **Water Code** (2000, last amended 2012) establishes policies on water management, permitting, dispute resolution, usage planning and cadaster. It promotes rational use and protection of water resources exercised by all beneficiaries and defines the types of water use rights, authority and roles of regional and local governments for water allocations among various users, collection of fees, water use planning, water use rights and dispute resolution. The Code provides Water User Associations with the mandate to operate and maintain on-farm irrigation and drainage infrastructure.

The Constitution of the Republic of Tajikistan establishes exclusive state ownership of land. The **Land Code** (1996, last amended 2016) establishes the rules that control the assignment and termination of the rights to use (or lease) land. Rights to use land can be primary or secondary. Primary use rights include perpetual use, limited or fixed-term use up to 20 years, life-long inheritable tenure. The only secondary use/right is the right to lease, again up to 20 years. The Land Code establishes seven categories of land uses, including agricultural, urban/populated, industrial and other infrastructure, conservation and other protected land, national forest/wood reserves, water reserves, and state land reserves. Of most concern here are the first three, plus water reserves. In GBAO, most issues of land

relations are under the jurisdiction of the region itself. Districts (jamoats) and cities have authority to provide land allotments for agricultural land and to withdraw land for nonagricultural uses (Land Code, Article 7). They are also responsible for protecting users' rights, terminating rights to use land, registering the rights to use land plots, and generally controlling land use and protection. They specifically approve land tenure documents dealing with works of regional importance.

Article 48 of the Land Code outlines the rules for state "confiscation" of land plots for state and public needs. Requirements include assignment of an equivalent land plot ("if desired"), construction of equivalent house and structures, and "full compensation for all other losses, including loss of profits...." These provisions apply only to those who have the legal right to use the land by virtue of possession of a "certificate on the legal right to use the land." The Regulation concerning compensation of land users' losses and losses of agricultural production was approved by Resolution of the Government of the Republic of Tajikistan No. 641 (30 December 2011). It establishes the detailed order of reimbursement of land users' losses. The amount of compensation is determined by an interdepartmental commission established at the district level where the acquisition is to take place (that is, at the GBAO level). If the land user does not agree with the amount or type of compensation for losses and damages, the land user can apply to the court with a request for additional compensation, or may appeal the decision to terminate the rights.

This law is directly relevant since it will control the termination of rights of current users and issuance of certificates of rights to Pamir Energy to use the land for the transmission line project.

The Law on Land Administration (2008, last amended 2016) obliges the authorities to map and monitor the quality of land, including soil contamination, erosion, and water logging.

The **Law on Sanitary and Epidemiological Safety of the Population** (2003, amended in 2011) introduced the concept of sanitary and epidemiological expertise that establishes the compliance of project documentation and economic activities with the state sanitary and epidemiological norms and rules, as well as strengthened provisions on sanitary-hygienic, anti-epidemic, and information measures.

The **Law on Pastures** (2013) defines the basic principles of pasture use, including protection of pastures and the environment, and attraction of investments for more effective use and protection of pastures. The Law specifies the powers of local administrations to control environmental safety and pasture use in accordance with state regulations and standards. The law prohibits the implementation of a number of activities in pastures, such as cutting down trees or bushes, building roads, misuse of grazing land, pollution of the environment with waste, and grazing of livestock beyond the established rate. The law requires users to ensure effective use of pastures, including protection of pastures against degradation and pollution. It provides geobotanical research on pastures to assess the potential productivity of natural forage land.

The **Law on Dekhan Farms** (2016) provides the legislative basis for the establishment and operation of private dekhkan farms. While, according to the Law of 2009, dekhkan farms were subjects of economic activities that carry out activities without the formation of a legal entity, the new Law allows dekhkan farms to obtain the status of legal entities. It also clarifies and fixes the rights of members of dekhkan farms as land users. The law improves the management of dekhkan farms and defines the rights and duties of their members. It allows farmers to legally erect field camps on land as temporary buildings, which makes it possible to significantly improve productivity at the agricultural season. The law

requires dehkan farms to take measures to improve soil fertility and improve the ecological status of lands, make timely payments for water and electricity, and provide statistical information to government agencies.

The **Law on Environmental Information** (2011) is underpinned by Article 25 of the Constitution, which states that governmental agencies, social associations, and officials are required to provide each person with the possibility of receiving and becoming acquainted with documents that affect her or his rights and interests, except in cases anticipated by law. The Law defines the legal, organizational, economic, and social bases for providing environmental information and establishes the right of individuals and legal entities to receive complete, reliable, and timely environmental information. Article 4 provides the right of access to environmental information and Article 8 defines the conditions for restricting access to environmental information (none of which should be relevant here).

The **Forest Code** (2011) regulates forest relations and is aimed at creating conditions for the rational use of forests, including their conservation and protection. The Forest Code requires coordination with the Forestry Agency for construction sites that will affect forests, which are defined as forested areas which have environmental, social and economic interest for the state and that cover at least 0.5 hectares and are at least 10 meters wide. Projects must take measures to protect forests from sewage, waste, emissions, etc. The project is not likely to affect any area large enough to be considered a “forest” within the meaning of the law.

Protection of cultural heritage is grounded in paragraph 44 of the Constitution, which requires all citizens to respect and protect historical and cultural monuments. The **Law about Culture** (1997) establishes rights concerning cultural activities, including non-material cultural heritage, and requires protection, management, and monitoring of historical and cultural monuments. Material heritage is found in archaeological sites, sites of ancient settlement, tumuli, remnants of ancient settlements, castles, industries, channels, roads, ancient burial places, stone sculptures, graven images, antiquity items, and places of ancient settlements. The Ministry of Culture and its local representative offices are primarily responsible for protecting cultural heritage. The **Law of Tajikistan on Regulating Traditions, Celebrations, and Rituals** (2007, last amended 2018) limits expenditures and activities related to religious and family observances and festivities.

The **Labor Code** prohibits forced labor and child labor. Article 8 of the 2016 Labor Code prohibits forced labor. The Labor Code also sets the minimum age at which a child can be employed as well as the conditions under which children can work (Articles 21, 74, and Chapter 15). The minimum employment age is 15; however, in certain cases of vocational training, mild work may be allowed for 14-year-olds (Article 21). In addition, there are some restrictions on what type of work can be done by workers under the age of 18, and what hours of work are permissible. Examples of labor restrictions include that those between 14 and 15 cannot work more than 24 hours per week while those under 18 cannot work more than 35 hours per week; during the academic year, the maximum number of hours is half of this, 12 and 17.5 hours, respectively. The Labor Code also establishes requirements for leave, compensation, dispute resolution, and other aspects of employment. The Code will apply to Pamir Energy and all contractors, including foreign contractors.

Occupational health and safety is also governed by the Labor Code, specifically Section V, Chapters 34-38. The law specifically includes construction and operation of facilities in the types of occupations that are subject to labor protection laws (Articles 349, 352). Among other requirements, the law requires employers to:

- Be responsible for ensuring safe working conditions and safety of work at every workplace (Articles 331, 348) and for informing workers of workplace conditions and the results of labor inspections (Article 332)
- Apply the means to protect workers individually and collectively (including protective clothing and equipment) (Article 335)
- Provide appropriate work and rest regimes (Chapter 7)
- Training workers in their jobs and safe methods of work (Articles 348, 350)
- Provide instructions on labor protection (Article 336)
- Test and verify the knowledge of workers in working safely (Article 348)
- Provide certifications of workplaces at least every five years (Article 348)
- Investigate accidents (Articles 342, 348)
- Provide sanitation and medical services (Article 348)
- Provide access to premises by state officials (Article 348)
- Providing social insurance for accidents and diseases (Article 348).

The law gives workers the right to refuse to undertake work that endangers the employee’s health or life (Articles 335, 337, 345). In addition, workers engaged in hazardous working conditions are entitled to free medical and preventative care (Article 333), additional paid leave (Article 95) and other benefits and compensation (Article 237). In case of disability or death, employers must provide compensation in multiples of average annual earnings as well as other amounts required by law (Article 343).

Under the **Law on Public Associations** (2007, last amended 2019), a public association may be formed in one of the following organizational and legal forms: public organization, public movement, or a body of public initiative. Article 4 of this law establishes the right of citizens to found associations for the protection of common interests and the achievement of common goals. It outlines the voluntary nature of associations and defines citizens’ rights to restrain from joining and withdrawing from an organization. This legislation requires NGOs to notify the Ministry of Justice about all funds received from international sources prior to using the funds and to post financial information on their websites.

The 2014 **Law on Public Meetings, Demonstrations and Rallies** (Article 10) bans persons with a record of administrative offenses (i.e. non-criminal infractions) under Articles 106, 460, 479 and 480 of the Code for Administrative Offences from organizing gatherings. Article 12 of the law establishes that organizers must obtain permission fifteen days prior to organizing a mass gathering.

The **Law on Self-Government Bodies in Towns and Villages** (1994) and the **Law on Local Public Administration** provide the legal basis for local government. The former law assigns to Jamoats a broad range of competencies and the mandate to support community efforts to address local socioeconomic needs. The 2009 amendment aims to strengthen local self-governance and accountability by delegating budget authority to Jamoat councils, and introducing a system of direct election for Jamoat council members. A 2017 amendment allows Jamoat councils to retain non-tax revenues earned through the provision of administrative services and a percentage of local property taxes.

Other Tajikistan legislation that may apply to project-related activities are listed in Table 3.

Table 3. Other potentially relevant legislation

Law on Protection of Atmospheric Air (will require permit for emissions)
Law on Hydrometeorological Activity (no specific requirements)
Law on Land Administration
Law on Land Valuation
Law on Environmental Audit (may be required by Committee for Environmental Protection)
Law on Securing Sanitary and Epidemiological Safety of the Population
Law on Radiation Safety
Law on Production and Consumption of Waste (permit will be required)
The Law on Environmental Education
The Law on Environmental Monitoring
The Law on Specially Protected Natural Areas (none could be affected)
Law on Protection of Fauna (will require permission to take fauna)
Law on Protection of Flora (will require permission to cut flora)
Water Codex (permission for water usage required)

In addition, norms that govern the location of high-voltage transmission lines are established in Passage of overhead lines in populated areas (PUE-7).

2.1.3. National Administrative Framework

A number of central government organizations have roles and environmental and social responsibilities, including:

- Ministry of Health: responsible for development and implementation of policy, regulations, and norms related to public health
- Ministry of Labor, Migration, and Employment: responsible for developing and implementing policies relating to employment, labor issues, and migration practices
- Committee of Women and Family Affairs: responsible for gender issues and realization of family-oriented policy
- Architecture and Construction Committee: responsible for technical advice in relation to water supply and sewage systems, including construction and design standards, contract standards and rules, and regulation of project and construction activities
- Agency of Standardization, Metrology, Certification and Trade Inspection: responsible for drinking water quality and other standards
- State Statistical Committee: responsible for collecting, filing and delivering environmental information and drinking water supply and sanitation data
- Committee for Environment Protection (CEP): executive body responsible for environmental protection, sustainable use of resources, forestry and hydrometeorology responsible for decision-making related to environmental issues such as unsustainable

land use, deterioration of soil fertility, excessive use of water for irrigation, flooding problems, and obsolete/banned pesticides. Also responsible for, *inter alia*:

- Defining the main strategies for protection, study, conservation, and sustainable use of natural resources, and mitigation of the effects of climate change
- Drafting laws and other regulatory documents, including environmental standards, instructions and methodologies for the use of resources
- Issuing individual permits for the use of specific resources and withdrawing these if the user violates their terms
- Setting quotas for the hunting and collection of certain species of animals and the importation of ozone-depleting substances
- Carrying out ecological assessments of planned activities
- Defining the system of specially protected territories and maintaining State cadasters of such territories and of forests, factories, water bodies, and hazardous waste
- Regulating the use and protection of waters and the issuance of permits (licenses) for special water usage.

Two levels of local governments also have environmental responsibilities:

- **Khukumat:** municipality or local state administration. A chairperson appointed as a local representative of the President in the implementation national policy and administration of State services and regulations heads each khukumat. This includes what are called Districts in this document (specifically, Roshtkala, Ishkashim, Rushnan khukumats)
- **Jamoat:** local self-government. A jamoat covers a smaller administrative area than a khukumat and may include one or more settlements/villages. The jamoat is responsible for organizing community-based delivery of some basic public services. Jamoats have no budgeting authority and have a very limited independent role. They do have important roles under the Land Code, being responsible for allocating land and also for terminating rights to land and assigning new land.

2.2. International obligations

In addition to national legislation and regulations on environmental issues, Tajikistan is also party to several international treaties focused on environmental issues:

- Vienna Convention for the Protection of the Ozone Layer, 1996, as updated
- UN Convention to Combat Desertification, 1997
- UN Convention on Biological Diversity (CBD), 1997, as updated by Cartagena and Nagoya protocols
- Ramsar Convention (joined 2000)
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (joined 2001), as updated by Bukhara Deer Memorandum, 2002

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- UN Framework Convention on Climate Change, 1998, with related update Kyoto Protocol, accessed on December 29, 2008, and entered into force on March 29, 2009
 - Stockholm Convention on Persistent Organic Pollutants (ratified 2007), as updated
 - Aarhus Convention (UNECE Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters) (joined 2001), as updated by Kiev Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, on May 21, 2003
 - Convention on International Trade in Endangered Species of Wild Fauna and Flora, 2016
 - UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (joined 1992)
 - Rotterdam Convention on Prior Informed Consent (PIC) procedure on September 28, 1998, ratification pending
 - The United Nations Convention to Combat Desertification (1997)
 - Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (2016).

In addition, Tajikistan has ratified a number of core labor standards of the International Labour Organisation, including the following:

- Forced Labor (C029) and Abolition of Forced Labor (C105)
- Minimum Age (C138) and Worst Forms of Child Labour (C182)
- Discrimination (C111)
- Freedom of Association and the Right to Organize (C087)
- Right to Organize and Collective Bargaining (C098)
- Equal Remuneration (C100)

2.3. World Bank Environmental and Social Standards

2.3.1. Environmental and Social Framework

Pamir Energy is seeking financing for the project from the World Bank, which requires that the project meet the Bank's environmental and social standards, as well as relevant Tajikistan legislation if it is more stringent. The World Bank's Environmental and Social Framework (ESF) includes the Environmental and Social Policy for Investment Project Financing, which describes the requirements the Bank must follow for projects it supports through Investment Project Financing. The ESF also includes 10 Environmental and Social Standards (ESSs), which establish requirements for Borrowers and grantees such as Pamir Energy to identify, assess, and control the environmental and social risks and impacts of Bank-supported projects.

Applicable ESSs include:

- ESS1: *Assessment and Management of Environmental and Social Risks and Impacts*: identification, control, and monitoring of risks and impacts, including identification of applicable requirements and monitoring outcomes.

- ESS2: *Labor and Working Conditions*: labor relations, rules of employment, occupational health and safety, workforce protection, worker grievance mechanism, with specific requirements for contractor and subcontractor employees.
- ESS3: *Resource Efficiency and Pollution Prevention and Management*: conservation of resources and control/prevention of wastes and pollution.
- ESS4: *Community Health and Safety*: avoidance and control of risks and impacts on communities from project activities and workers, emergencies, security, and other factors.
- ESS5: *Land Acquisition, Restrictions on Land Use and Involuntary Resettlement*: identification, planning, avoidance/response to the need for physical and/or economic displacement due to project activities, including information disclosure and consultation.
- ESS6: *Biodiversity Conservation and Sustainable Management of Living Natural Resources*: protection and conservation of biodiversity and habitats, protecting and supporting livelihood of local communities.
- ESS8: *Cultural Heritage*: protection of tangible and intangible cultural heritage.
- ESS10: *Stakeholder Engagement and Information Disclosure*: identification and engagement of local and other stakeholders throughout the project life cycle, disclosure of project information, grievance redress mechanism for external stakeholders.

ESS7 (*Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities*) does not apply since no such communities or people could be affected by the project. Similarly, ESS9 (*Financial Intermediaries*) does not apply since Bank funding is not being provided to financial institutions for further on-lending.

The Bank classifies proposed projects into one of four risk categories (Low, Moderate, Substantial, and High), and has classified both environmental and social risks for the Rural Electrification Project as substantial. Environmental risks are considered substantial since the project involves construction of the Sebzor run-of-river hydropower plant in the remote GBAO province and constructing greenfield power transmission lines related to that facility. In addition, the rural electrification component will involve a large number of smaller scale activities taking place in remote areas of GBAO and Khatlon where there may be limited capacity for addressing the relevant Environment and Social Standards by the implementing agencies. Social risks are deemed substantial due to contextual risks -- diverse regions, common fragility, remoteness and extremely difficult access, border vulnerability, absence of sustainable job opportunities and income-generating activities and consequent unemployment and poverty, migration & remittances and associated increased female headed households -- as well as client capacity risks. If the Bank determines that risks are actually higher or lower than substantial, it may change the classification as appropriate.

Table 4 provides a high-level summary of key gaps between the Bank's requirements and Tajikistan's requirements. As noted, the more stringent of the requirements will apply.

2.3.2. World Bank Group environmental, health, and safety guidelines

In addition to the ESS, the World Bank Group has promulgated a number of Environmental, Health, and Safety Guidelines (EHS Guidelines), with the following being applicable to the project:

- General EHS Guidelines (April 30, 2007) includes guidelines for environmental controls during facility operation (air and water emissions, hazardous materials management, noise, contaminated land, etc.) and occupational and community health and safety during operation. This guideline also covers the same topics for construction.
- EHS Guidelines for Electric Power Transmission and Distribution (April 20, 2007) cover many of the same topics (environmental controls, occupational and community health and safety) during construction and operation, with a focus on activities involved in constructing and operating electricity transmission and distribution lines.

Table 4. Summary of World Bank requirements and key gaps with Tajikistan legal requirements

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts		
Scope of application	ESSs apply to Associated Facilities to extent of Borrower's control/influence	Associated facilities not covered by Tajikistan law as such, except to the extent that all activities in Tajikistan are subject to laws
Borrower's E&S Framework	May use Borrower's framework if can meet objectives of ESSs. That is not the case here. World Bank ESSs will apply, together with Tajikistan requirements if they are not conflicting or weaker.	No provision for alternative requirements except that international standards take precedence if agreements are in place
A. E&S Assessment	<ul style="list-style-type: none"> - Conduct E&S assessment, including stakeholder engagement - Retain international expert(s) for high-risk projects - Apply national framework, ESSs, EHSs/GIIP - Apply mitigation hierarchy - Offset significant residual impacts - Differential measures for vulnerable or disadvantaged people - Consider primary suppliers 	<ul style="list-style-type: none"> - ESIA law has much less emphasis on social conditions and impacts, but other laws partly fill gaps, but with less specificity concerning community impacts - No distinction between international and Tajikistan experts - No reference to EHSs or GIIP - No equivalent provision for offsets - No equivalent provisions for vulnerable and disadvantaged people - No coverage of primary suppliers
B. ESCP	ESCP for compliance in a specified time	No provision in permits/approvals for delayed compliance
C. project monitoring & reporting	<ul style="list-style-type: none"> - Monitor proportionate to nature of project, risks and impacts, and compliance requirements - Reports to World Bank 	Monitoring required but less emphasis
D. Stakeholder engagement and information disclosure	Engage stakeholders through life cycle	Generally consistent but no requirement for project-specific stakeholder engagement plan
ESS2: Labor and Working Conditions		
A. Scope of application	ESS2 applies to workers employed by Pamir Energy who work on the project and to contracted workers, primary supply workers, and community workers	<ul style="list-style-type: none"> - Labor Code applies to all workers in Tajikistan, including foreign workers - Requirements apply to employer but do not extend to prime contractor
B. Working conditions and management of labor relations	<ul style="list-style-type: none"> - Written labor management procedures - Terms and conditions of employment - Nondiscrimination and equal opportunity - Worker's organizations 	Generally consistent
C. Protecting the work force	<ul style="list-style-type: none"> - Prohibits child labor except in very specific and regulated community-based circumstances 	<ul style="list-style-type: none"> - Minimum employment age is 14, with other limits consistent with ILO,

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
	(no one under age 18 will be employed on this project) - Forbids Forced labor	but no work that could “cause health or moral damage” if under 18 - Forced labor prohibited
D. Grievance redress mechanism (GRM)	A separate GRM has to be provided for all direct and contracted workers	No specific requirement for grievance mechanism for workers
E. Occupational Health and Safety (OHS)	Measures relating to occupational health and safety will be applied to the project: - Apply World Bank Group General and sector-specific EHS Guidelines - Requirements to protect workers, train workers, document incidents, emergency preparation, addressing issues - Provide safe working environment - Workers allowed to report safety issues and refuse to work under certain circumstances - Provide appropriate facilities (canteens, toilets, etc.) and ensure accommodations meet needs of workers - All employers to collaborate on applying OSH requirements - Monitor OSH performance	- Generally consistent but less detailed - No requirements for accommodations
F. Contracted workers	- Reasonable efforts to verify contractors have labor management procedures to meet requirements of ESS2 (except those that apply to community and primary supply workers) - Procedures for managing and monitoring performance - Access to worker’s GRM	Safety requirements apply to all employers, including contractors, but no obligation for developers to verify compliance
G. Community workers	Requirements for working conditions and OHS applied to community labor	Labor Code applies to employers and employees, not volunteers
H. Primary supply workers	Depending on the level of Pamir Energy/contractor control/influence, requirements to assess risk of child labor, forced labor, and safety issues and require suppliers to address significant risks	- Tajikistan law applies if work is done in Tajikistan - No obligation on employers in other countries - No requirements for prime contractor
<i>ESS3: Resource Efficiency and Pollution Prevention and Management</i>		
<i>Resource Efficiency</i>		
Scope of application	Borrowers must apply feasible resource efficiency and pollution prevention measures in accordance with mitigation hierarchy	Some requirements

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
A. Energy use	Adopt measures in EHSs if project is significant energy use	No specific limits. No significant energy usage.
B. Water use	Assess water use and impacts and communities and adopt mitigation measures as needed	Permits required for water usage
C. Raw material use	Use GIIP to reduce significant resource usage	Resource usage requires permits
<i>Pollution prevention and management</i>		
General requirements	<ul style="list-style-type: none"> - Avoid, minimize, and control release of pollutants, apply the more stringent of EHSs and national law - Historic pollution and non-degradation requirements 	Specific numeric requirements. Project will generate only very minor pollution
A. Management of air pollution	Requires assessment of potential air emissions and implementation of technically and financially feasible and cost-effective options to minimize emissions	Emissions limits. Project will have only minor emissions.
B. Management of hazardous and nonhazardous wastes	<ul style="list-style-type: none"> - Apply mitigation hierarchy to waste management - National and international conventions for hazardous waste management and movement - Verify hazardous waste management contractors are licensed and disposal sites operate to meet standards 	<ul style="list-style-type: none"> - Detailed requirements for hazardous and other wastes - Signatory to international conventions - No requirements to verify haulers/contractors
C. Management of chemicals and hazardous materials	<ul style="list-style-type: none"> - Minimize use of hazardous materials - Avoid use of internationally controlled materials 	<ul style="list-style-type: none"> - Regulations on hazardous materials - Signatory to international conventions
D. Management of pesticides	Requirements for pesticide use	Not applicable to this project: no pesticides will be used
<i>ESS4: Community Health and Safety</i>		
<i>Community health and safety</i>		
A. Community health and safety	<ul style="list-style-type: none"> - Evaluate risks to community health and safety and apply mitigation hierarchy and GIIP to reduce risks - Consider third-party safety risks in designing infrastructure and equipment, with regard to high-risk locations - Ensure safety of services provided to communities - Identify traffic/road risks, assess risks if needed, consider safety in fleet decisions, take measures to protect public 	General requirements to minimize risk, no specific requirements for services, ecosystem services, emergencies, etc.

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
	<ul style="list-style-type: none"> - Assess and avoid impacts on provisioning and regulating ecosystem services as appropriate - Avoid or minimize potential for disease transmission and communication, considering vulnerable groups - Address risks to community of hazardous materials management - Prepare of and respond to emergencies, consider in EIAs, prepare response plans 	
B. Security personnel	<ul style="list-style-type: none"> - Assess and address risks of security arrangements - Apply principles of proportionality, GIIP, and law - Verify contracted workers are not implicated in past abuses and are trained - Investigate incidents, report unlawful acts to authorities 	No specific requirements
Annex 1. Safety of Dams	<ul style="list-style-type: none"> - Design and construction of new dams to be supervised by experienced professionals - Dam safety measures to be adopted and implemented during design, tendering, construction, operation, and maintenance - Dam does not fall into categories of paragraph 2, thus most of this annex does not apply - Safety measures designed by qualified engineers to be adopted in accordance with GIIP (paragraph 5) - Confirmation of no or negligible risks to communities due to failure of dam (footnote 123) 	No equivalent requirements
<i>ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement</i>		
Applicability	<ul style="list-style-type: none"> - Assess need during ESIA process - Applies to permanent and temporary displacement, listing types of infringements - Limitations on applicability - Applies to land users and owners 	<ul style="list-style-type: none"> - All land in state ownership - Rights to use land granted with legal certificates - May be used only as authorized - Legal users may lease land for authorized uses
A. General	<ul style="list-style-type: none"> - Affected people: landowners, users with legal claims, and users with no legal claims - Design project to avoid/minimize displacement 	<ul style="list-style-type: none"> - Only those with legal rights eligible for replacement land or compensation - Replacement land preferred option - No requirement for assistance

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
	<ul style="list-style-type: none"> - Provide replacement cost and assistance, disclose standards, offer land-for-land where possible, pay compensation before displacing people where possible - Engaged with affected communities, including women - Grievance mechanism - Census, cut-off dates, notices; detailed plan and monitoring required; require audit if significant displacement 	<ul style="list-style-type: none"> - Detailed requirements for committee memberships and actions - Compensation based on established rates for trees or other items lost
B. Displacement	<ul style="list-style-type: none"> - Detailed requirements for physical displacement - Detailed requirements for economic displacement, including livelihood restoration 	<ul style="list-style-type: none"> - Replacement with equivalent land and houses preferred over compensation - Compensation for lost profits required, but not livelihood restoration
C. Collaboration with other responsible agencies or subnational jurisdiction	Collaborate with other involved agencies, provide support as needed; include arrangements in Plan	Committee membership and responsibilities defined in Land Code
D. Technical and Financial Assistance	World Bank may provide support to resettlement planning	
Annex 1: Involuntary resettlement instruments	Detailed requirements for resettlement plans, resettlement frameworks, and process frameworks	No detailed requirements
<i>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</i>		
A. General	<ul style="list-style-type: none"> - Consider direct, indirect, & cumulative impacts in impact assessment under ESS1 - Characterize baseline conditions - Manage risks with mitigation hierarchy and GIIP, including adaptive management - Differentiated habitats, ESS applies to all, provides for offsets - ESS applies to modified habitat with significant biodiversity value - Avoid natural habitats unless no feasible alternative; if affected achieve no net loss of biodiversity Critical habitat - Requirements if a project will affect legally protected and international recognized areas of high biodiversity value - Strict conditions on affecting critical habitats, requires BMP 	Requires protection of biodiversity but less detailed requirements

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
	<ul style="list-style-type: none"> - No introduction of spreading of invasive species - Requirements for projects involving primary production and harvesting 	
B. Primary suppliers	Requirements when Borrower purchases natural resource commodities	No equivalent requirements
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities		
	Not applicable for the project	
ESS8: Cultural Heritage		
Application	Covers tangible and intangible (limited) cultural heritage, whether legally protected or not and whether previously identified or not	<ul style="list-style-type: none"> - Law covers non-material (language, customs, ceremonies and celebrations, knowledge and skills, traditional crafts, dancing, music, art, etc.) and material cultural heritage - Some legal limits on weddings, funerals, and other activities
A. General	<ul style="list-style-type: none"> - Assess and avoid impacts on cultural heritage - Follow chance find procedure if a find is encountered - Involve experts and national authorities if needed 	General requirements to protect cultural heritage and not to disturb sites of interest No specific requirement for chance find procedure
B. Stakeholder consultation and identification of cultural heritage	<ul style="list-style-type: none"> - Identify and consult with affected and interested stakeholders - Maintain confidentiality if needed - Allow continued access to affected sites 	No requirement for consultations except with Ministry of Culture representatives Must provide access
C. Legally protected cultural heritage areas	Comply with regulations and plans, consult with sponsors	Generally consistent
D. Provisions for specific types of cultural heritage	<ul style="list-style-type: none"> - Desk-based and expert consultation to identify archaeological sites and specify protections - Mitigate impacts on built heritage, preserve physical and visual context of structures - Identify and protect treasured natural features - Identify and protect movable cultural heritage 	Less detailed requirements but generally consistent
E. Commercial use of cultural heritage	Not relevant for this project	n/a
ESS9: Financial Intermediaries		
	Not applicable for the project	

<i>ESS & Topic</i>	<i>Major requirements</i>	<i>Key requirements/gaps in Tajikistan legal framework</i>
ESS10: Stakeholder Engagement and Information Disclosure		
Requirements	<ul style="list-style-type: none"> - Engage stakeholders throughout project life cycle, determine how they wish to be engaged - Provide stakeholders with information, - Maintain documented record of engagements 	Generally consistent but less detailed
A. Engagement during project preparation	<ul style="list-style-type: none"> - Identify and analyze stakeholders, including disadvantaged or vulnerable - Stakeholder Engagement Plan (SEP) required, with detailed requirements for disclosure, timing of consultations, measures for disadvantaged or vulnerable, etc. - Disclosure of information early to allow consultation on design - Consultation to allow ongoing two-way communication throughout project life cycle 	<ul style="list-style-type: none"> - No requirement to analyze stakeholders - No formal plan required - Early disclosure required
B. Engagement during project implementation and external reporting	Engagement and disclosure of information to continue throughout implementation, following Plan	No specific requirement for continuing engagement
C. Grievance mechanism	<ul style="list-style-type: none"> - Establish and implement prompt, effective, culturally appropriate, and discreet grievance mechanism - No limit on legal remedies 	
D. Organizational capacity and commitment	Define roles & responsibilities, assign personnel to implement stakeholder engagement activities	No specific requirement for assigning roles and responsibilities
Annex 1: Grievance mechanism	Options for managing mechanism: ways of submission, log, advertised procedures, appeals process, mediation	

3. Methodology for ESIA Preparation

This ESIA evaluates potential environmental and social impacts from construction and operation of the proposed 63-kilometer 110kV transmission line between Khorog and Qozideh and the substation near Qozideh. The ESIA establishes the current baseline and evaluates potential risks of impacts based on an assessment of their extent (local, regional, national), duration (short, medium, long-term), and mitigability/reversibility (ability to avoid, reduce, or otherwise reduce impacts to acceptable levels, or reverse them).

The final design is not yet complete, so many details of the infrastructure construction and operation are not known. However, the conceptual design is sufficiently progressed to allow an assessment of potential impacts, and identification of measures to avoid and/or mitigate such impacts. After designs are finalized, this ESIA may be revised and the Environment and Social Management Plan (ESMP) refined as necessary to avoid or reduce impacts. Once a construction contractor is selected, one of their first deliveries will be their Construction ESMP (C-ESMP), which will detail how they plan to comply with the ESIA/ESMP throughout project implementation.

3.1. Methodology for screening and scoping process

The following methodology was used for initial screening and collection of baseline information important for the project:

- Screening of the project was completed by the World Bank for purposes of project categorization and the level of impact assessment needed. This was applied at the level of the Rural Electrification Project, and environmental and social risks were determined to be “substantial”.
- Preliminary screening of key receptors and potential impacts during the feasibility study and associated impact assessment for the nearby Sebzor hydropower project and associated transmission line that was carried out in 2015-2016 by SWECO.
- Detailed scoping was carried out through a series of meetings with governmental and nongovernmental institutions in Dushanbe and Khorog in February 2019 and consultations with local residents in 2018 and 2019.
- More detailed assessment of baseline environmental conditions within and adjacent to the project area conducted in 2019.

3.2. Methodology for Baseline Study

Baseline data were collected by visiting and observing most of the area likely to be significantly affected by the project. The following methods were also used to characterize baseline conditions:

- National and local agencies with an interest and jurisdiction were contacted to collect information and identify sources of information on baseline conditions.
- Local institutes who have surveyed the area for decades were contacted to collect information on local biodiversity.
- Scientific and other literature sources were reviewed and brief visits were conducted to gain an understanding of environmental and social resources in and near the corridor, and of the wider region.

Data sources that were reviewed included scientific literature/publications, open data sources and specific reports such as the “Feasibility Study for Sebzor Hydro Power Plant” (SWECCO 2016), which include a Feasibility-level “Environmental Impact Assessment” of the hydropower project and its associated transmission line.

Relevant information from the baseline studies and surveys were digitized and included in a GIS database to allow the environmental and social project components. Pamir Energy staff have collected information, including consultations with local residents, more or less continuously since planning began in 2016. The ESIA reconnaissance team visited the areas to be occupied or temporarily used by the project in early 2019 and observed environmental features, general environmental sensitivity, social conditions and settlements, and other attributes of the area. The corridor was also evaluated by examining aerial imagery acquired by drone, which gave the opportunity to study other details of the area and more precisely if there were areas of particular concern.

A spatial analysis was conducted in order to characterize potentially affected environmental and social conditions and assess potential impacts. For the analysis, a detailed GIS database was developed with GoogleEarth and drone imagery as the base. Finally, handheld GPS instruments and other geopositioning tools were used during reconnaissance visits.

The thematic layers developed in the GIS database for the corridor included data “layers” for administrative boundaries, topography, land use, and various other categories of social information.

3.3. Methodology for Assessing Potential Environmental and Social Impacts

Chapter 5 identifies the potential environmental and socioeconomic impacts that may result from project construction and operation, determines whether the potential impacts are likely to be significant, and compares the potential impacts for the two alternatives. A number of criteria were used to determine whether or not a potential impact of the project could be considered “significant.” These are outlined with reference to specific environmental and social issues in this ESIA.

Where possible, a quantitative assessment of the impacts was undertaken. In most cases, this was not possible, in which case the assessment was qualitative, based on existing information and experience with other transmission and substation projects. Where relevant, the anticipated impacts were compared to applicable legal requirements and standards. Where no such standards exist, assessment methods included interpretation and the application of professional judgement. The assessment of significance in all cases took into account the changes that would occur to the established baseline conditions, considering the sensitivity of the environment.

For impacts considered to be significant (that is, “moderate” or “major” in Table 5 and Table 7) and for many lesser impacts, the assessment identified a variety of measures that Pamir Energy will have to take in order to avoid, reduce, or otherwise mitigate the impacts, as discussed in Chapters 5 and 6.

3.3.1. Methodology for assessing significance of environmental impacts

A general method for grading the significance of environmental impacts was adopted to ensure consistency in the terminology of significance, whether for a beneficial or an adverse impact. The two principal criteria used to determine significance were the sensitivity of the receptor and the magnitude of the change arising from the scheme, as shown in Table 5.

The table shows that the significance of impacts was classed as major, moderate, minor, or none; and either positive (beneficial) or negative (adverse). This categorization is widely recognized and accepted in the field of environmental impact assessment. Where appropriate, topic-specific assessment methods and criteria for determining significance are described in Chapter 56.

Table 5. Determination of environmental impact significance

<i>Magnitude of change/impact</i>	<i>Sensitivity of receptor</i>		
	High <i>(e.g. international, national protection, rarely found)</i>	Medium <i>(e.g. regional, local protection, uncommonly found)</i>	Low <i>(e.g. no protection, common)</i>
High <i>All or significant proportion affected</i>	Major (H,H)	Major (H, M)	Moderate (H, L)
Medium <i>Substantial amount affected</i>	Major (M, H)	Moderate (M, M)	Minor (M, L)
Low <i>Relatively small proportion affected</i>	Moderate (L, H)	Minor (L, M)	Negligible (L, L)
Very Low <i>Very small amount affected</i>	Minor (VL, H)	Negligible (VL, M)	Negligible (VL, L)
No Change	None (NC, H)	None (NC, M)	None (NC, L)

Another consideration was the duration of the impact -- whether the impact would be temporary or permanent -- and if they were temporary whether short-, medium-, or-long term. It is recognized that defining the duration of the impact can be subjective, depending on the receptor. For instance, following construction, it may then take some time for vegetation to become fully re-established. Although in ecological terms, this period may not be a long time, for the people who use the land for orchards or pasture the period could be significant in relation to their lifetime, and could therefore be considered permanent. Similarly, a person’s initial reaction to the new presence of major infrastructure in a landscape could be very negative, but over time the reaction would be subdued until there was little or no reaction at all. Table 6 sets out how the duration of impact was defined. In general, shorter-term impacts were considered to be less significant and longer-term and permanent ones to be more significant.

Table 6. Duration of impacts

<i>Nature of change</i>	<i>Duration</i>	<i>Definition/ Description</i>
Temporary	Short-term	Impact continues during construction (1-2 years) and up to 1 year following construction
	Medium-term	Impact continues 1-5 years following construction
	Long-term	Impact continues 5-10 years after construction
Permanent	-	Due to the length of time period for human beings, impacts over 15 years defined as permanent.

3.3.2. Methodology for assessing significance of social impacts

The objective of the social impact assessment was to identify major risks to social and economic conditions in the area of the proposed transmission line and substation and to assess the impacts of construction and operation on those conditions. As with environmental impacts, social impacts can be direct and indirect, intended and unintended, positive and negative. For significant impacts, Pamir Energy will be required to implement a variety of mitigation measures, and these are discussed in Chapters 5 and 6 .

Generally, the social impact assessment process involved the following major tasks:

- Identifying types of adverse and beneficial impacts of the proposed transmission line.
- Assessing the level of socioeconomic risks in terms of frequency, duration, and probability and consequences.
- Assessing the acceptability of the risks.
- Introducing mitigation measures to reduce risks to acceptable levels.

The social impact assessment typically addressed the following issues:

- Demographics, including changes in local population size, emigration/immigration in the area, migration of people in search of work, and other issues.
- Economic issues, including supply chain impacts, local sourcing opportunities, potential impacts on local markets for goods and services, employment opportunities for construction, operation and decommissioning phases of the project.
- Health issues, including risks of new diseases to local communities, impacts on health and safety of workers and local communities, impact of local diseases on workers.
- Social infrastructure, including effects on such things as health care and education facilities, transport and roads, power supply, fresh water supply to support project activities and personnel as well as the local communities.
- Resources, including land use changes, increased access to rural or remote areas, and use of natural resources.
- Cultural, including issues associated with sites that have archaeological, historical, religious, cultural, or aesthetic values.

- Social equity, including local social groups who might gain or lose as a result of the project or operation.

As with environmental impacts, a general method for grading the significance of socioeconomic impacts was adopted to ensure consistency in the terminology of significance, whether for a beneficial or adverse impact. The two principal criteria used were the nature of the impact and the magnitude of the change arising from the scheme, as shown in Table 7.

Table 7. Determination of social impact significance

<i>Magnitude of change</i>	<i>Nature of impact</i>		
	<i>Avoidance</i>	<i>Disruption/Habituation</i>	<i>Permanence</i>
Negligible	No avoidance needed	Not noticeable under normal conditions	Not noticeable
Minor	Mitigation or design change prevents impact(s)	Possible initial change on daily life/routine, rapid habituation reduces to below nuisance level	Ephemeral: <1 year
Moderate	Mitigation or design change reduces impact	Definite change to daily life, habituation reduces disruption over time	Temporary: recovery to pre-existing conditions after one or a few years (e.g., after construction)
Major	Mitigation or design change cannot significantly reduce impact(s)	Requires major change to daily life or routine activities	Permanent: >15 years

3.3.3. Environmental and social impact mitigation and enhancement

Where potential impacts could be significant (that is, moderate or major), measures to avoid, reduce, or mitigate the impacts were developed by applying the mitigation hierarchy, as outlined in the text box.

These measures are intended to avoid, reduce, compensate, and/or remediate adverse impacts, or to enhance potentially beneficial impacts. Wherever possible, mitigation is undertaken as part of the project design, so the measures could feed back into impact assessment.

The mitigation and enhancement that should be undertaken as part of the project are set out as an Environmental and Social Management Plan which can then be applied in order to manage different phases of the project. For this project, the plan is presented in Chapter 6.

Table 5 and Table 7 show that impact significance has been classed as major, moderate, minor, or negligible (none). As noted, impacts can be either positive (beneficial) or negative (adverse). Where appropriate, topic-specific assessment methods and criteria for determining significance are described in relevant sections of Chapter 5.

3.3.4. Environmental and social monitoring

The success of most mitigation measures is necessarily uncertain and must be monitored to verify it

is being implemented and is working as planned. Various monitoring results will need to be reported by the contractor to the Supervision Consultant, by the Consultant to Pamir Energy, and by Pamir Energy to Tajikistan authorities, the World Bank, and others. The Environmental and Social Monitoring Plan for this project is presented in Chapter 6.

4. Environmental and Social Baseline

This section describes the baseline conditions at a regional scale and in the Roshtkala and Ishkashim Districts in terms of their biophysical environments as well as socioeconomic conditions. The proposed transmission line will pass through these two districts along the pathway from Khorog to Qozideh.

4.1. Environmental Baseline Conditions

Environmental baseline information was collected from various sources, including government agencies (the Committee for Environmental Protection), the Pamir Biological Institute, the Aga Khan Agency for Habitat, other referenced documents, and the scientific literature. No surveys have been conducted specifically for the project, but several will need to be completed prior to construction in order to better characterize baseline conditions and to identify any further measures that may be needed to reduce or avoid impacts.

4.1.1. Climate

The climate of Tajikistan is characterized by interaction of geographic location and topography, atmospheric circulation, and incoming solar radiation. Due to the country's diverse topography and its location in the heart of Central Asia, the climate in Tajikistan is overall continental and dry. However, some regions of the country are subtropical intracontinental. In the plains around Dushanbe (central and western parts) and Khujand (northern), the climate is more temperate: summers are hot and dry, and winters in Dushanbe have much precipitation; in the north of the country, in Khujand, it snows less in winters. On the other hand, since 93 percent of the territory of the country is above 1,000 meters (3,280 ft), a polar climate dominates in the mountains over 3,000 m (9,483 ft) in winters.

In January, average temperature in Tajikistan ranges between 0 degrees Celsius (32°F) in the plains to minus 20 degrees Celsius (minus 4°F) in the mountains. In July, the average temperature in the plains is 30 degrees Celsius (86°F), and from 0 to 15 degrees Celsius (32 to 59°F) in the mountains, depending on the altitude. The lowest temperature recorded in Tajikistan was minus 63 degrees Celsius (minus 81.4°F) at Lake Bulunkul in GBAO region. The highest temperature recorded was plus 48 degrees Celsius (118.4°F) in the town of Nizhny Panj (Khatlon region).

In winters, it snows heavily in the western part of Tajikistan, which closes mountain passes, such as the Anzob Pass connecting Dushanbe and Khujand.

Climate in the Project Area

The Pamir Mountains have the most extreme climate in Tajikistan. The Pamir Mountains take up a very large area and the elevation ranges between 1,000 and 7,495 meters (3,281 to 24,590 feet), thus weather in the region is extremely variable depending on the elevation and location.

As indicated on Figure 6, the climate of the Pamirs is high mountainous and extremely continental, and polar in more severe places. Winters are long, lasting from October to April. Summers are only in July and August. The average temperature in January is minus 18C (minus 0.4 °F) and in July, the average is plus 20 °C (68 °F). The precipitation rate also differs: in Khorog it is 276 mm a year (10.87 in), 416mm (16.38 in) in Ishkashim, and only 72mm (2.83 in) in Murghab.

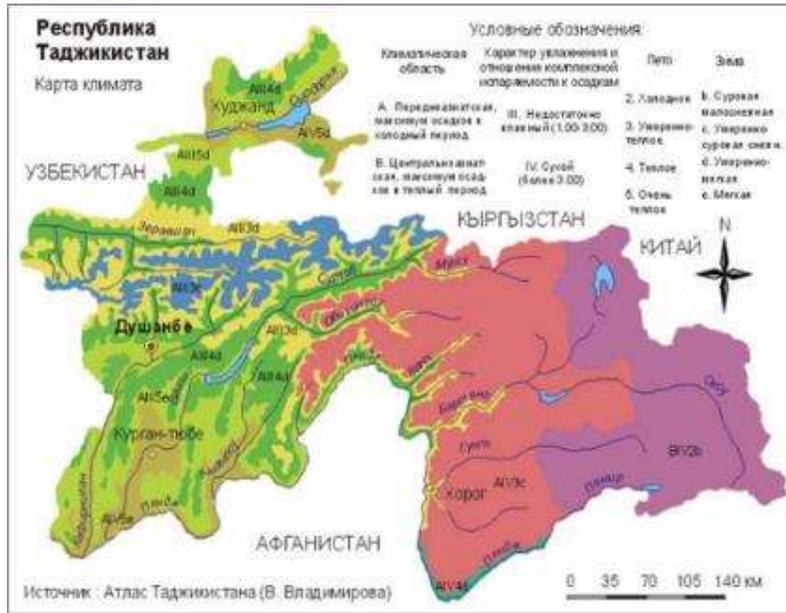


Figure 6. Climatic zones of Tajikistan

(source:.. Atlas of Tajikistan)

Climatic conditions along the transmission line corridor is extremely continental and displays large seasonal variation. Average daily temperatures in Khorog, which is located at 2,000 meters (6,500 feet), range from minus 6°C (21°F) in January to 23°C (73°F) in July and August. The mean annual ambient temperature is 8.9°C. Mean monthly precipitation in Khorog (1981-2010) ranges from 23 to 26.2 mm (280-315 mm average annual total) with typical annual minimums in August-September (2.4 to 2.5 mm) and maximums occurring during February-April (42.7 to 49.6mm):

First snow usually appears in late September-mid-October and lasts in the river valleys until May, while being present all summer long higher in the mountains. The mean annual thickness of snow cover is 40cm. The average number of days with snow cover is 117/annum.

Wind in the Project area is primarily from the west and northwest. The mean annual wind speed is 2.4 m/s and average monthly winds are relatively constant over the year. The strongest winds (between 10-12 m/s) occur during the summer months (July to August), whereas the spring months (April through May) are the calmest time, with the strongest winds ranging between 2 to 4m/s.

The mean annual atmospheric pressure is 596 mmHg and the average relative humidity is 55 percent. Climatic data for the Khorog area are illustrated in Figure 7.

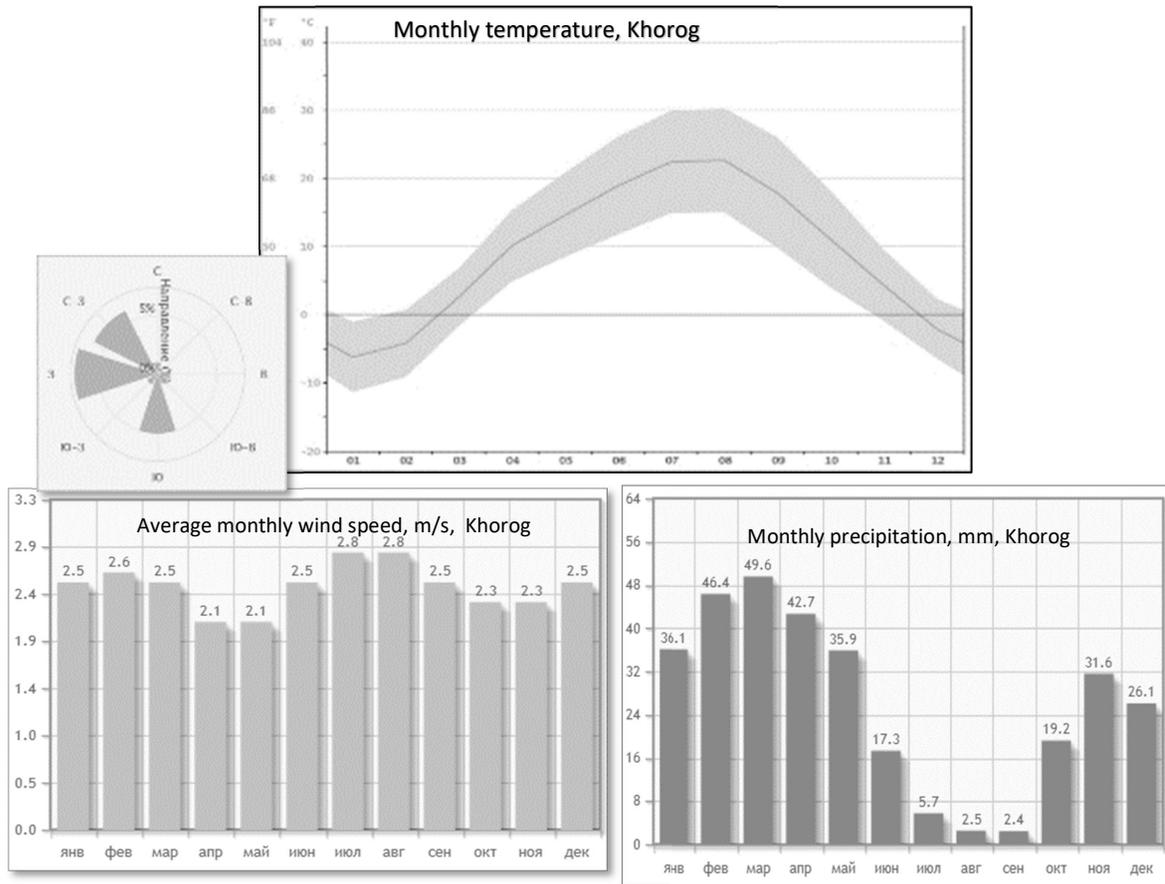


Figure 7. Climatic data for Khorog

Air quality

There are no sources of industrial emissions in the project area. The primary sources of emissions are likely to be vehicle emissions, dust from vehicle passage, and burning wood for heat in winter. In general, emissions are very low in comparison to more densely populated areas of Tajikistan.

Climate Change

According to the *World Bank report (2009)*, Tajikistan is the most climate-vulnerable country in the region and least able to adapt. Thus, climate change may have a considerable impact on both the ecosystem’s condition and the population’s livelihood. Agriculture, power engineering and transport are considered the most vulnerable sectors, but all economic sectors may experience substantial negative impacts. Over the period 1940–2000 (*“Overview of Climate Change Activities for Tajikistan”*,

World Bank, 2013), ground air temperature in most of Tajikistan’s districts and high-altitude zones increased between 0.5 and 1°C, with some districts experiencing an increase above 1°C (Figure 8)¹.

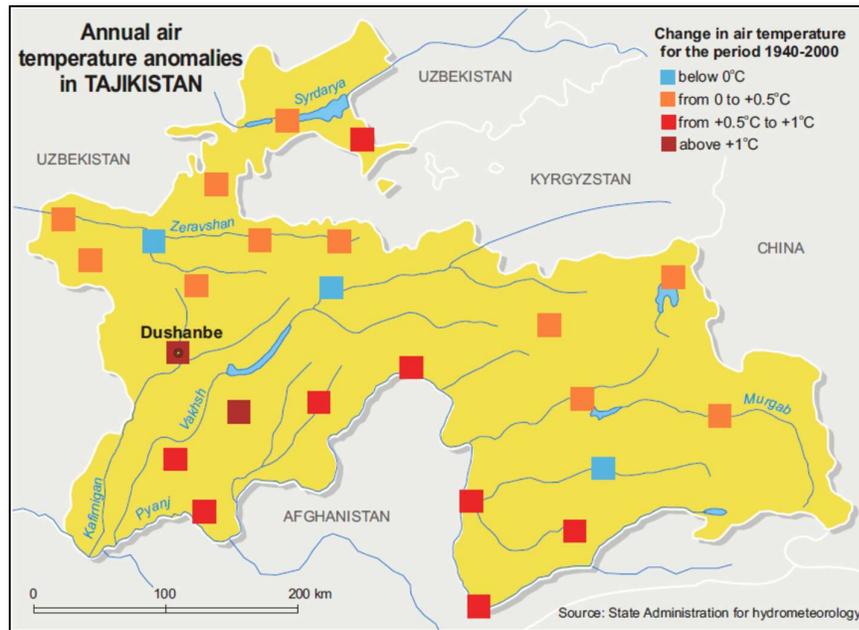


Figure 8. Changes in air temperature in Tajikistan, 1940-2000

Tajikistan is considered the main glacial center of Central Asia, and its glaciers occupy about six percent of the country’s total area (see Figure 9). The glaciers not only retain water, they also regulate river flows and climate, and play an important role in forming the Amudarya River, the biggest water “artery” of the Central Asia and Aral Sea Basin. Together with permafrost, glaciers are the main source

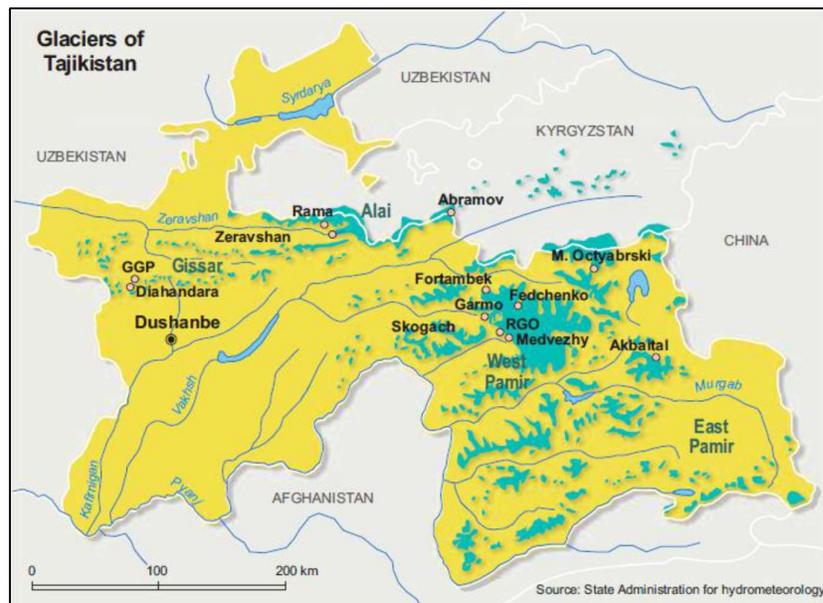


Figure 9. Glaciers in Tajikistan

¹ Second National Communication of Tajikistan to the United Nations Framework Convention for Climate Change (UNFCCC), 2008.

of water replenishing the Aral Sea river basins, and water resources formed in Tajikistan are critical for downstream countries. The snow pack in Tajikistan varies greatly from year to year and on the elevation of the area: from 100 to 135 days with snow cover in the high mountains to 45 days in the Eastern Pamir and 245 days in the Gissar mountain range. Altitudes over 4,000 meters have permanent snow and ice. The current warming rates in the high-altitude areas of Tajikistan are already causing significant changes to glaciers, one of the most vulnerable ecosystems. For instance, remote observations showed that within the period 1966–2000, the Fedchenko Glacier system (in the northwestern Pamir) was reduced by 44 square kilometers, or six percent of its total area.

The intensive melting of glaciers in Tajikistan caused by global warming may result in a catastrophic drop in water content in many Central Asia's rivers. The effect of climate change on water resources is particularly critical in in Tajikistan. In this region, water resources are crucial for a wide range of issues related to national and regional security, as they are consumed by all sectors of the regional economy. Any changes affecting Central Asia's water resources imply a high multiplicative aftereffect on various social and economic aspects of these countries' development. The situation is aggravated by increasing water consumption, which is connected with population growth and intensive development of the regional economies.

Annual precipitation has increased by about 8 percent on average on territory up to 2500 meters and decreased by about 3 percent at higher elevations. The most considerable increase in annual precipitation, by from 37 to 90 percent, has occurred in summer and autumn up to 2500 meters, primarily caused by an increase in precipitation intensity. The increase in the number of days with precipitations from 0 to 5 mm has decreased across much of the country.

Insignificant changes in precipitation patterns are reported for the Khorog area, as can be seen on Figure 10.

Climate Projections for Tajikistan

Tajikistan ranks first among Europe and Central Asia countries in terms of simplified index of vulnerability to climate change and it is particularly sensitive to climate change due to low adaptive capacity. According to the Second National Communication of Tajikistan to the United Nations Framework Convention on Climate Change (UNFCCC), climate change is expected to result in increased air temperature, more variable precipitation and snow cover, increased rate of ice melt, and more extreme and frequent weather events and climate-related hazard have been observed to be occurring. As noted above, all of the above Climate trends and projections for Tajikistan include:

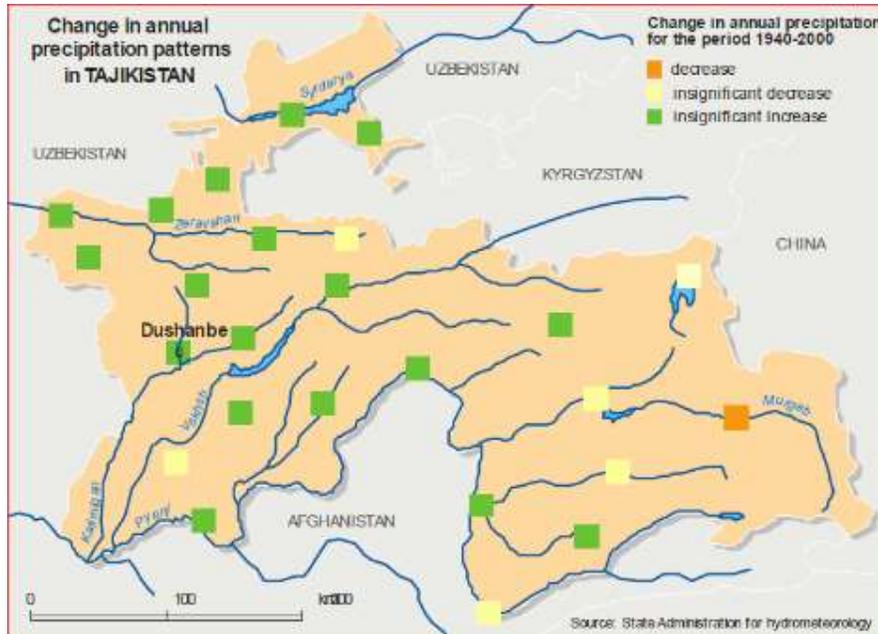


Figure 10. Changes in precipitation patterns in Tajikistan, 1940-2000

An increase in mean annual temperature by 0.2–0.4°C is expected in most areas of Tajikistan by 2030 in comparison with the period 1961–1990. This trend coincides with the tendencies predominant in the country for the last 15–20 years. The maximum increase of temperature is expected in winter, by 2°C and more.

- Projected future rainfall is expected to show large variations in terms of change, intensity, and geographical distribution. While the irregularity and increase in intensity of precipitation is expected to continue in the future, climate models do not reach consensus with regard to future rainfall projections. However, summers are expected to be wetter, while winters are expected to be drier, which could result in both floods and longer droughts.
- Many small glaciers of Tajikistan are expected to completely disappear in 30–40 years if the present rate of glacial degradation continues. The glacial area may be reduced by 15–20 percent compared with the present, resulting in a decrease in water stocks.

4.1.2. Geology and Topography

Tajikistan has an extremely complex geological structure. As a result of intensive demonstration of Caledonian, Hercynian and Alpine phases of diastrophism the principal tectonic structures had repeatedly renewed with the territory, whereby the structure of the territory acquired a mosaic block-folded structure. The rocks that are composing the territory of the country are very diverse in age, composition and structure. There are set of sedimentary- metamorphic rocks that have very ancient Archaic age. The most widely developed geological formations include Phanerozoic age.

The southeast of Tajikistan (Pamir) occupies the extreme southeastern part of mountainous Tajikistan, a total area of 67,000 km². Pamir is bordered on the east by China, on the south and west, with Afghanistan in the northwest, with the Tajik depression, and in the north, with the Alai valley. The

Pamir Mountains are the country’s highest, with some peaks reaching beyond 6,000 and even 7,000: Peak Somoni in the northwestern Pamirs is 7,495 meters and Lenin Peak in the Transalai Range is 7,134 meters.

The Project area lies within the Karakoram fold system, which is separated from the North -Pamir zone by Vanj – Tanimasskiy thrust (Figure 11. Major geologic formations and structures of the project area). The elevation ranges between 2,000 meters near Khorog to almost 2,400 meters near Qozideh.

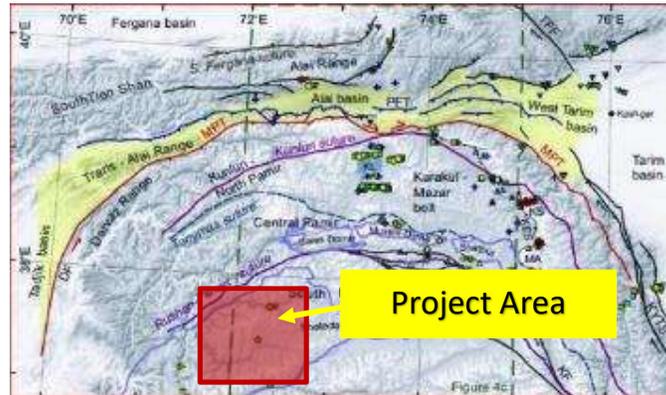
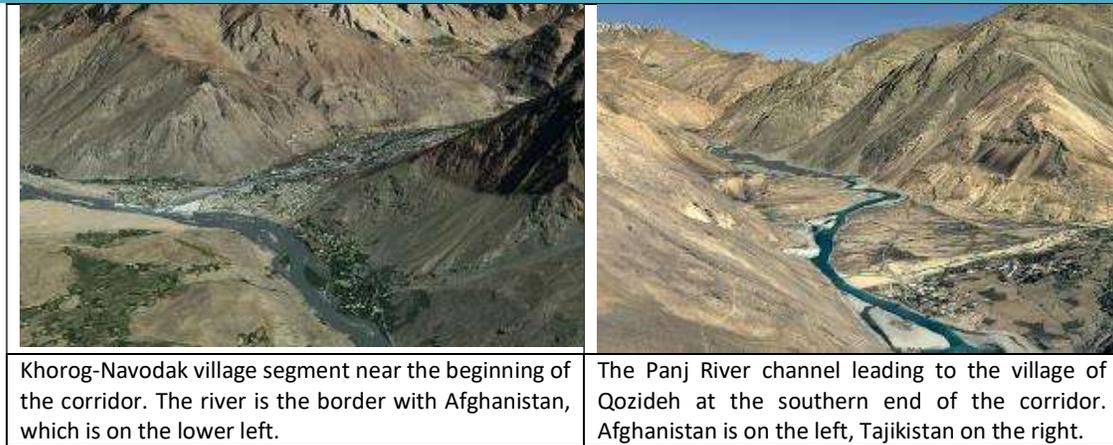


Figure 11. Major geologic formations and structures of the project area

The Rushan-Pshart zone is composed mainly of geosynclinal complex of clastic- carbonate deposits of the Carboniferous - Permian, similar in composition to miogeosynclinal coeval deposits of the area of South - Eastern Pamirs. Upper Permian - Triassic deposits are composed of carbonate- siliceous-volcanogenic (sodic basalts, up to 1500 m) formation. In both zones at the end of the Triassic apparent folding stage, accompanied by the formation in the axial zone of the South- Eastern Pamirs gray-colored and red-colored crude molasses (up to 600 m) and the formation in both areas of high-potassium intrusive masses of granite.

Fluvio-glacial and late Quaternary deposits are clustered in the river valleys, including the valley of the Shokhdara River. The topography of the Project area is presented by a rough, highly dissected mountain terrain. The Panj River is to the west, with the Tajikistan side of the valley generally less than from tens to a few hundred meters wide before giving way to steep hill mountains. The mountains and hills are of mixed material, and show evidence of ancient as well as recent erosion. The 3D images shown on Figure 12 illustrate the roughness and steepness of the terrain within the project area.



Khorog-Navodak village segment near the beginning of the corridor. The river is the border with Afghanistan, which is on the lower left.

The Panj River channel leading to the village of Qozideh at the southern end of the corridor. Afghanistan is on the left, Tajikistan on the right.

Figure 12. GoogleEarth images show the extreme terrain

4.1.3. Seismicity

As shown on the Figure 13, the project area is located in an area where there is a 10 percent probability that an earthquake would occur within 50 years that could cause peak ground acceleration to exceed 4.8 to 6.0m/s²; this is above the threshold considered as being a high risk zone.

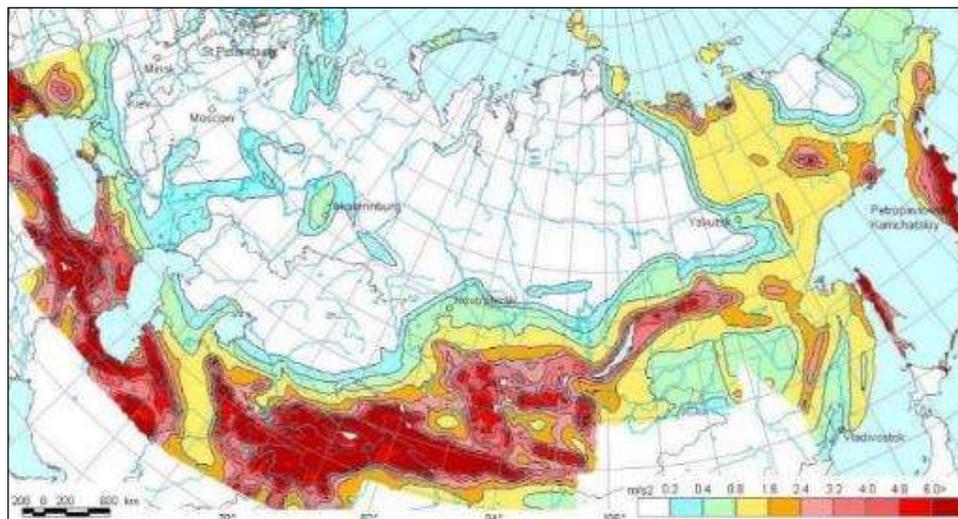


Figure 13. Peak ground acceleration with 10% probability of exceedance in 50 years

(source: U.S. Geological Survey Earthquake Hazard Program 2000).

4.1.4. Geomorphological hazards

The transmission line corridor lies within a zone of high risk for avalanches, rockfalls, and debris flows. A series of avalanche tracks with snow stockpiles and signs of previous rockfalls and mudflow events were evident during a March 2019 visit to the corridor – indeed, avalanches and mudflows have destroyed several old poles and been replaced with new metal towers. Avalanches occur on steep slopes with significant snowfall/snow pack accumulation. Generally, avalanches occur on snow-covered slopes due to slope failure (slip, slide) or snow accumulation by moving snow (“snowball”

effect). Avalanches occur typically near the end of the winter. Sudden avalanches can lead to loss of lives and infrastructure damages. The photographs in Figure 14 demonstrate the traces of avalanches and mudflow along the road.

Rockfalls and mudflows are quite common to this area. Mudflows occur as sudden flows of debris with high content of soil and rock material originating after rainfall. There are three main driving factors that lead to mudflow formation:



Figure 14. Signs of avalanches are evident along the corridor

- Climatic: heavy rainfall, rapid snow melt, glacial lake outburst (GLOF is not a risk to the project).
- Geology and geomorphological features: topography leading to slope failure (source of soils and rocks), lack of vegetative ground cover, earthquakes
- Anthropogenic: deforestation, overgrazing, the consequences of mining operations and others. (It is noted deforestation is not an ongoing risk, but rather was caused by past deforestation.)

The photographs in Figure 15 show two areas along the proposed corridor exhibiting high risks of rockfalls and mudflows.



The steep mountain slopes along the corridor exhibit elevated risks for rockfalls and mudflows	The road from Khorog to Qozideh. Heading south toward Ishkashim
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Figure 15. Risks of rockfall are high along parts of the corridor

Water resources

The Project area is located on the right bank (from upstream to downstream) of the Panj River, whose watershed is shaded in green on Figure 16. Local hydrography is characterized by presence of the large river and its basin and by a few small mountain streams that flow under the road and enter the Panj.

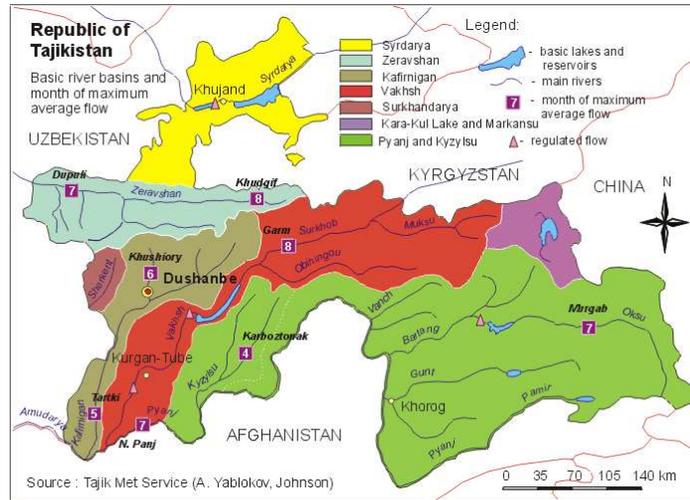


Figure 16. River basins of Tajikistan

Groundwater quality

Groundwater from mountain springs is widely used by local communities, including large cities such as Khorog, as their primary source of drinking water supply. The quality of the groundwater is reported as clean for drinking supply purposes, as shown in Table 8 for Khorog (from *Khorog sanitary inspection*).

Table 8. Groundwater quality in springs serving Khorog

#	Chemical parameters	Maximum allowable concentration (mg/m3)	1 quarter Concentration , mg/m3	2 quarter Concentration , mg/m3	3 quarter Concentration, mg/m3	4 quarter Concentration, mg/m3
1	PH	6-9	6,8	6,5	7,0	6,0
3	transparency		30,0	30,0	30,0	30,0
4	color, gradient	20	transparent	transparent	transparent	transparent
5	sediment		not found	not found	not found	not found
6	alkalinity		2,2	2,0	2,0	2,5
7	chlorides	350	3,0	5,0	6,0	2,0
8	nitrogen	ammonia	0,39	0	0	0,2
		nitrites	10	3,0	5,0	3,0
		nitrites	0,02	0	0	0
9	hardness	7-10	1,0	1,5	1,8	1,2

10	Iron	0,3	0,25	0,05	0,1	0,25
11	Ca		1,8	0,6	2,2	2,0
12	oxidation mg/l		0,24	2,0	1,28	0,8
13	magnesium		0,8	0,9	1,5	0,8

4.1.5. Ecosystems and flora

Figure 17 shows that the project area is within the Mid-Mountain Mesophyllic Forest Ecosystem zone, predominantly characterized by floodplain, small leaf and forms-meadow ecosystem groups (numbers 9 and 11 in the legend).

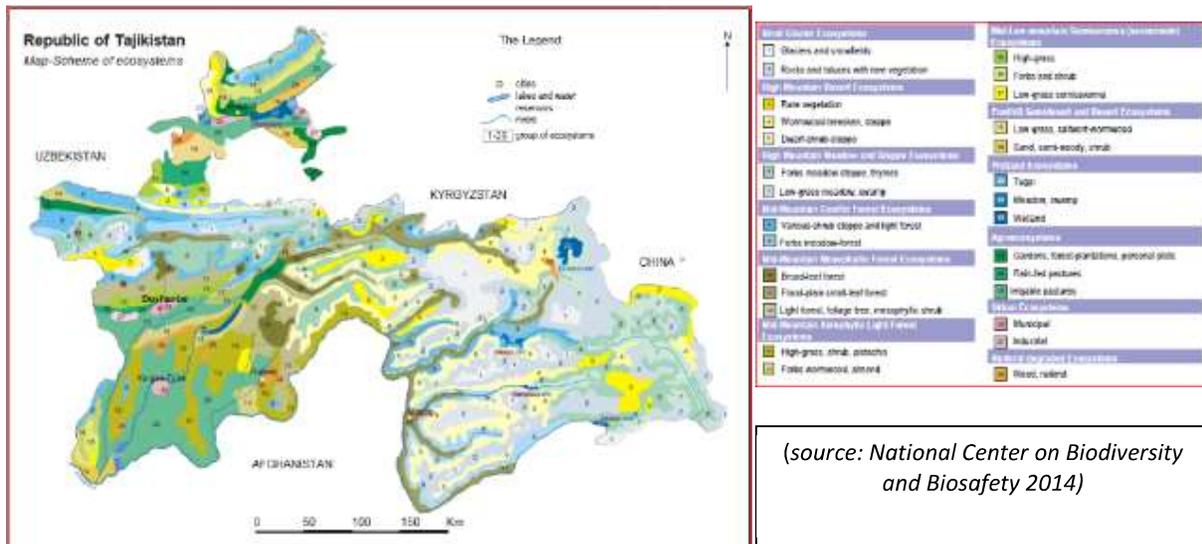


Figure 17. Ecosystems of Tajikistan

The Mid-Mountain Mesophyllic Forest Ecosystem zone is mostly represented by willow-poplar forests with light forest mesophyllic shrubs. These forests contain some number of rare endemic species of animals and plants. However, the area crossed by the corridor has been subject to intense deforestation, to the point that nearly all trees and shrubs are found in small forest fragments in or near village areas, plus a few orchards. Much of the area, including most of the corridor, is now barren rocky ground.

The project area is generally characterized by open steppe and/or Eurasian steppe belt vegetation. The lower open steppe is, or was, dominated by prickly cushion plants such as *Acantholimon* spp., wormwoods (*Artemisia* spp.), and needle grass (*Stipa* spp.). The higher Eurasian steppe supports needle grass and fescue grass (*Festuca* spp.). The highest zone, which is extensive throughout the Pamir, consists of alpine sedge-meadows (*Kobresia* spp. and *Carex* spp.) with many forb species. Perhaps the most common vegetation features along the corridor are fragments of what is known as “Tugai” (or “Tugay” or “Tugainy”) forest, a mix of three or four species of shrubs and trees, as seen on Figure 18. These appear only in small fragments, primarily along the road, and near or in settlements. Many or most trees show signs of being periodically cut for firewood.

The floral composition within the Project area is primarily characterized by the species shown in Table 9.



Figure 18. Fragmented forests along the corridor

4.1.6. Fauna

Baseline information on fauna was acquired from various sources, including governmental agencies (the Committee for Environmental Protection and others), Pamir Biological Institute, and other referenced documents.

Table 9. Flora species found in project area (past and/or present)

#	Species name	Photograph	IUCN Status (if listed)
Medicinal herbs			
1.	Clover (<i>Trifolium Pratense L.</i>)		LC
2.	Mulberry (<i>Morns Alba et morus nigra</i>)		LC
3.	(<i>Rosa huntica Crshan</i>)		NE

#	Species name	Photograph	IUCN Status (if listed)
4.	Wild rue or Syrian rue (<i>Peganum harmala L.</i>)		NE
5.	Wormwoods (<i>Artemisia persica</i>)		NE
6.	Ma huang (<i>Ephedra equisetina Bunge</i>)		LC
7.	Nettle (<i>Urtica dioica</i>)		LC
8.	Chamomile (<i>Matricaria chamemilla</i>)		LC
9.	Licorice (<i>Glycyrrhiza glabra</i>)		LC

#	Species name	Photograph	IUCN Status (if listed)
10.	Dwarf everlasting (<i>Helichrysum arenarium</i>)		NT
11.	Sea buckthorn (<i>Hippophae rhamnoides</i>)		LC
Other species of plants, sedges, grasses, shrubs and trees			
12.	Willow spp. (<i>Salix pycnostachya</i>)		LC
13.	<i>Populus pamirica</i>		NE
14.	Trebizond date (<i>Elaeagnus orientalis</i>)		NE

#	Species name	Photograph	IUCN Status (if listed)
15.	Birch (<i>Betula tianschanica</i>)		DD
16.	English walnut (<i>Juglans regia</i>)		LC
17.	<i>Acantholimon spp</i>		DD
18.	Needle grass (<i>Stipa spp.</i>)		NE
19.	Fescue grass (<i>Festuca spp.</i>)		LC
21.	Sedge (<i>Kobresia spp.</i>)		LC

#	Species name	Photograph	IUCN Status (if listed)
22.	Sedge (<i>Carex spp.</i>)		LC
Fruit trees (in Orchards)			
23.	Pear (<i>Pyrus</i>)		LC
24.	Plum (<i>Prunus</i>)		LC
25.	Cherry plum (<i>Prunus sogdiana</i>)		LC
IUCN Red List (https://www.iucnredlist.org): LC=Least Concerned, NT= Near threatened, VU= Vulnerable, EN= Endangered, CR= Critically Endangered. DD=Data Deficient, NE=Not Evaluated			

Mammals

Faunal communities of the project area are considered part of the steppe and mountain zoogeographical zone and consist of a range of species associated with steppe ecosystems. Table 10 lists mammal species in the area, as identified by the Pamir Biological Institute, whose scientists have been active in documenting flora and fauna in the region for decades.

Table 10. Mammals in the project area

English name	Latin name	IUCN status	
Wolf	<i>Canis lupus</i>	LC	
Fox	<i>Vulpes</i>	LC	
House Mouse	<i>Mus musculus</i> -	LC	
Big-eared cony	<i>Ochotona macrotis</i>	LC	
Long-tailed marmot	<i>Marmota caudata</i>	LC	
Tolai hare	<i>Lepus tolai</i>	LC	
Least weasel	<i>Mustela nivalis</i>	NT	
Stone marten (or Altai weasel)	<i>Mustela altaica</i>	NT	
Eurasian otter (locally known as “Sagi obi”)	<i>Lutra lutra</i>	NT	
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	LC	
Whiskered myotis (bat)	<i>Myotis mystacinus</i>	LC	<div style="border: 1px solid black; padding: 2px; display: inline-block;">River otter</div>
Leatherless nether (Savi’s pipistrelle (bat)	<i>Hypsugo savii</i>	LC	IUCN Status key: LC: Least concern DD: Data deficient NT: Near threatened
White-bellied Strelukha	<i>Otonycteris leucophaea</i>	DD	

Birds

The area is relatively rich in avifauna, with over 120 species and subspecies recorded. Table 11 identifies those of conservation concern.

Table 11. Bird species of conservation concern

English name	Latin name	Status
Himalayan griffon	<i>Gyps himalayensis</i>	RL, IUCN NT
Cinereous vulture	<i>Aegypius monachus</i>	RL, IUCN NT
Bearded vulture	<i>Gypaetus barbatus</i>	RL, IUCN NT
Osprey	<i>Pandion haliaetus</i>	RL
Carrion vulture	<i>Neophron spp.</i>	RL
Golden eagle	<i>Aquila chrysaetos</i>	RL
Sparrow hawk	<i>Accipiter nisus</i>	RL
Barbary falcon	<i>Falco pelegrinoides</i>	RL
Ibis-bill	<i>Ibidorhyncha)</i>	RL
Whistling thrush	<i>Myophonus</i>	RL
Little forktail	<i>Enicurus scouleri</i>	RL
Plumbeous water redstart	<i>Phoenicurus fuliginosus</i>	RL
White-crowned robin	<i>Cossyphaal bicapilla</i>	RL
Babbler	<i>Timaliidae spp.</i>	RL
Chiffchaff	<i>Phylloscopus collybitus</i>	RL
Paddyfield Warbler.	<i>Acrocephalus agricola</i>	RL

English name	Latin name	Status
Common pochard	<i>Aythya ferina</i>	IUCN VU
Key: RL: Listed in Tajikistan Red Book IUCN NT: Near-threatened by IUCN IUCN VU: Vulnerable by IUCN		

Fish

The following fish species were reported to be present in the Pyanj River and its tributaries. The Pamir Biological Institute reported that no other known species are known to inhabit the Panj River.

False Osman (*Schizopygopsis stoliczkai Steindachner*) is a cyprinid fish (carp family) that averages 30-40 centimeters but can reach a maximum length of 80-95 centimeters. The species spawns at an age of 2-3 years. Spawning



False Osman

occurs in tributaries of the Panj, with fish migrating upstream from the Panj in spring and returning to the main river in late spring or summer, with young following in the autumn. The spawning period begins from April and continues throughout June. Spawning occurs once per year and the spawning eggs adhere to the substrate. Individuals can live for 25-35 years, with males living longer than females. The main nutrition in the Panj River is provided by algae and microphytes. There is some local fishing, but fish is not a key part of diets and there is no known commercial fishing. The species has not been evaluated by IUCN (characterized as “data deficient”).

Marinka (*Schizothorax* spp. (*intermedius?*)) are widespread cyprinids in the Pamirs and the region. The length can reach 60 centimeters and they can weigh up to about 1.5 kilograms. The color of its body varies depending on environmental conditions. Male Marinkas can spawn at 2-3 years, while females begin ovulation at about 3-4 years. One unusual feature of the Marinka is that the number of males is higher than the number of females. Spawning starts from May and continues into June, with a life history similar to the False Osman—that is, they migrate into tributaries to spawn, with adults returning to the Panj



Marinka

in late spring or early summer and young fish in the autumn. Marinka are found in lower numbers than the False Osman. Like the other species, they are also caught for food, but much less than the False Osman. The fish is not of conservation concern.



Tibetan stone loach

Tibetan stone loach (*Nemacheilus stoliczkai*) can be found in the western and eastern parts of the Pamir at altitudes up to 4,000 meters above sea level. The length is typically about 10-12 centimeters but can reach 16 centimeters. Ovulation and spawning occur when temperatures reach 8-10°C, which occurs from early March into early April. Nutrition consists of algae. The number of Tibetan stone loach is not large and it is not widely used as a source of food. The species has not been evaluated by

IUCN.

The **Turkestan catfish** (*Glyptosternum* sp) is found in the Shokhdara River and other tributaries of the Panj and may be present in the Panj itself. It grows to about 18-24 centimeters and is generally not a food source for people. It has not been evaluated by IUCN.



Turkestan catfish

Reptiles

According to the Committee on Environmental Protection, reptiles in the area include Blunt-nosed viper (*Vipera lebetina*—IUCN Least Concern), various aspids (*Cerastes* spp.—all species are LC), various racers (*Coluber* spp.—all LC or Data Deficient), and water snakes (*Natrix* spp. -- all reported to be LC). No reptile species are reported to be listed in the Tajikistan Red Book.

Other fauna

There have been few or no studies to identify or characterize amphibians, insects, or macroinvertebrates in the area.

4.1.7. Habitat

There is no undisturbed habitat along the corridor. While there are few or no introduced species, the remaining habitat is not considered to support viable assemblages of native species although there are some remnant fauna that survive in rocky areas and in remaining forest fragments, and even in orchards. Between villages, in areas that are less disturbed, relatively few trees and other vegetation remain other than remnant shrubs and grass species that grow in rocky terrain. Even here, there is evidence of grazing by goats and other livestock that can tolerate steep slopes. It is also important to note that, at no point will the final corridor be more than 100 to 300 meters from the road. Perhaps the least disturbed areas will be those with extreme slopes immediately inland of the road, where towers will be placed on rocky outcrops. Many of these areas are also crossed by the existing line.

None of the habitat could be considered natural other than the sheer cliffs that would never have supported significant vegetation. All other habitat would have to be characterized as modified, in all or nearly all cases heavily modified. The only potentially valuable habitat would be the forest fragments that survive, and even these are heavily exploited for firewood.

4.2. Protected Areas

The proposed transmission line corridor does not cross, intersect, or pass near any naturally protected areas. The nearest protected area is Tajik National Park (no. 18 on Figure 19), which is in the northern part of GBAO.

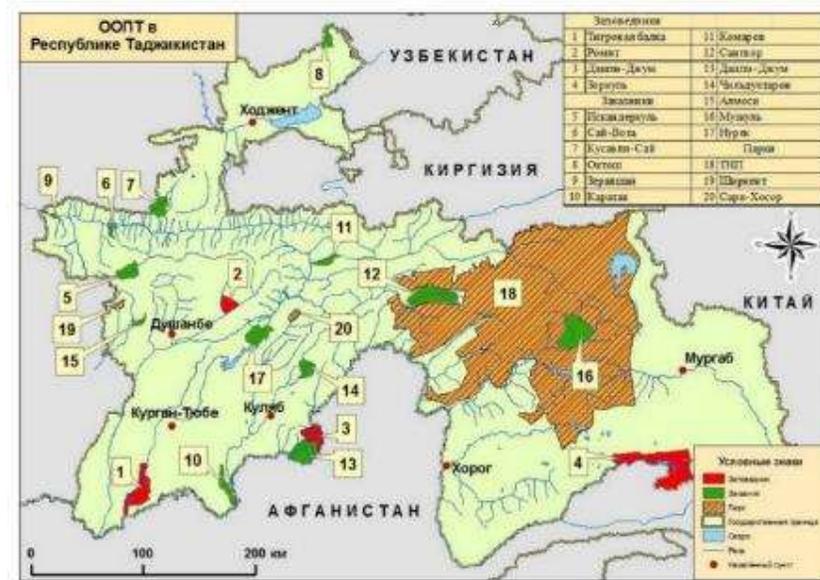


Figure 19. Natural protected areas of Tajikistan

4.2.1. Soils and Land Use

Soil cover

The area along the proposed transmission line corridor is presented by alpine/sub-alpine landscapes. Hillsides are rocky with only relict soil, but moderate slopes nearer the river and along small tributaries may have the following primary types of soils:

- *Alluvial meadow soils* are typical for stream floodplains. The topsoil horizon of such soil is the most developed and these soils are typically used for grazing and/or as arable lands for growing different types of crops (e.g. wheat, potatoes and others). Vegetation cover on these soil cover is presented by meadow grasses, shrubs and so-called Tugai forests, which are predominantly represented by osiers, sand thorn, poplars and other small shrubs, as described above.
- *Mountain and high-mountain, peaty/or meadow-marshy soils.* These types of soil cover are situated in small areas on the mountain slopes, typically near mountain springs. These soils are characterized by the presence of an upper peaty horizon of brown, dark brown color.

Soils along the transmission line corridor have typically poorly developed profiles with thin topsoil layer. Where the upper profile is developed to 30-50 centimeters, it is susceptible to erosion in this highly deforested area. The Pamir Biological Institute reports that past deforestation was much more intense than at present, since most people now have electricity for heating. However, except along roads and near villages, there are very few meadows, orchards, or areas with trees. Trees were observed to be heavily cut back for firewood and other household uses.

Land Use

The transmission line corridor is mostly barren land with only sporadic vegetation cover between villages. Some land in and near villages is used for garden plots and grass (for hay), and there are highly fragmented forests in and near villages—as noted, these “forests” are heavily cut back for wood. Agriculture comprises small-scale farming and gardening, hayfields, and orchards. Typical annual crops are potatoes, tomatoes, wheat. Some land is devoted to orchards, mostly pears, apricots, plums and other fruit. Some small areas are covered either with shrubs, pastures, or fragmented forest, all significantly impacted by human activities. This remaining forest, which is only sparsely covered in trees, is exploited for wood and for berries and wild fruit, although this is not an important source of nutrition.

4.2.2. Noise

There are few noise sources along the corridor but from vehicles passing, water flowing over rocks, and human activity in villages. As seen in Table 12, noise monitoring was consistent with this, with the maximum 70+dB measured nearby the Panj River and/or when cars were passing by. There are no industries or other types of industrial activities along the corridor which would produce noise.

Table 12. Noise levels along the corridor

Period	Noise level measured		
	L ₁	L ₂	L _{max}
Single measurements at multiple locations	45	52	70

4.3. Social and Economic Baseline Conditions

Socioeconomic baseline data was acquired from government statistics, village records, household surveys conducted among residents of rural villages along the corridor of transmission line, and from data collected by the Aga Khan Agency for Habitat in their hazard mapping of all GBAO settlements.

Demography

As described previously, the transmission line corridor will pass through rough and rocky mountain terrain along the Tajik and Afghan state border parallel to and immediately adjacent to the Panj River. As shown by Table 13, the line will pass through the territories of 18 villages with a total population of 5633, of whom 50.4 percent were male.²

Table 13. Population characteristics of villages along the corridor and nearby

Distance from Khorog (km)	Name	Households	Population	Sex		Age			Disabled	Widowed
				M	F	<12	12-60	>60		
Villages along the corridor										
6.8	Viruthjak	11	25	10	15	12	8	5	0	1
9.7	Gozhak	78	462	220	242	73	361	28	7	4

² Population and demographic data are not from Government sources, but rather based on a full house-to-house census by the Aga Khan Agency for Habitat as part of a program of hazard mapping.

Distance from Khorog (km)	Name	House-holds	Popu-lation	Sex		Age			Disabled	Widowed
				M	F	<12	12-60	>60		
14.9	Pish	119	692	359	333	153	480	59	9	56
19.8	Nishusp	189	1585	806	779	287	1098	200	17	14
20.9	Shicho zg	42	235	117	118	43	178	14	2	1
22.1	Barchidev	31	210	102	108	8	192	10	4	2
28.3	Khaskhorug	42	283	154	129	66	203	14	3	0
30.6	Andarob	71	493	255	238	96	359	38	1	4
31.8	Dasht	22	264	112	152	78	166	20	4	0
37.5	Kuhi - La'l	39	285	147	138	21	264	0	5	0
38.7	Sist	46	328	158	170	31	278	19	5	2
45.3	Vozg	39	337	169	168	69	234	34	13	0
48	Shanbedeh	69	434	228	206	95	295	44	10	0
<i>Totals</i>		<i>798</i>	<i>5633</i>	<i>2837</i>	<i>2796</i>	<i>1032</i>	<i>4116</i>	<i>485</i>	<i>80</i>	<i>84</i>
Oher nearby villages										
62.8	Qozideh	72	519	250	269	128	318	73	18	0
6.8	Garm Chashma									
5.2	Devlokh	10	171	91	80	36	124	11	1	0
4.8	Snib	108	609	307	302	129	424	56	10	0
5	Bagush	70	371	189	182	87	241	43	15	0

As can be seen, households are large, averaging seven persons per household. Just over 12 percent of the population would be considered vulnerable, including elderly (over 60 years), disabled, and/or widowed. Although it is widely reported that a substantial percentage of men are economic migrants to urban centers in central Asia, and in particular to the Russian Federation, there are slightly more males than females in the overall population. Data on education levels and income are not available for GBAO or smaller units.

The predominant occupation is subsistence and small-market farming. There is relatively little employment outside the home except in education and other public institutions. Nearly all agriculture is manual, with little mechanized machinery in use, and production is based in garden plots rather than large farms. Similarly, fewer than five percent of households have a car or truck. Perhaps 50 percent of agricultural produce, and somewhat more meat, is produced for local markets, and a substantial amount of foodstuffs (up to 60-70 percent) are purchased from local markets rather than grown. Primary agricultural products are potatoes, wheat, barley, peas, tomatoes, cucumbers, peppers, cabbage, etc. Cattle, goats, and poultry are the animal products.

Data on education and employment are available for most but not all villages. Available data show that adults are relatively well-educated, with about 55 percent of both men and women having secondary education (high school) and another 25 percent with some higher-level education as well. Local employment is relatively low, with over 50 percent of those who are employed have to go

beyond the immediate area. Of local employment, about 25-30 percent are teachers or otherwise involved in education and about the same number in agriculture. Smaller numbers are military, engineers, doctors, and involved in business (sex-disaggregated employment data are not available).

4.4. Cultural heritage and tourism

The area is known as a popular area for tourists, both foreigners and Tajik nationals. The most popular tourist attraction, which also has cultural value, is a thermal spa at Garm Chasma between Khorog and Qozideh. Besides baths, the resort has hotels and restaurants. The spa is located approximately five kilometers east of the main road, well away from the transmission line corridor.

In addition to Garm, there is a mineral spring about 20 kilometers south of Khorog that is considered by local people to have health benefits. This spring serves both local people and passersby. This spring belongs to the government, which has built a small building to protect the spring. It is located immediately beside the road (less than four meters distant), with a short path leading to the water.

In the village of Nishusp, there is a stone with Arabic inscription which has ethnographic meaning to the local population. In addition, most of the sizable villages have cemeteries that are maintained by the local people, and some are crossed by the existing 35kV line.

5. Potential Environmental and Social Impacts and Proposed Mitigation Measures

This chapter summarizes the impacts (both positive and negative) that could occur as a result of construction and operation of the 63km 110kV transmission line between Khorog and Qozideh and the substation at Qozideh. The impacts have been screened, analyzed and summarized based on consideration of the information presented in baseline characterization. For all adverse impacts considered to be moderate or major, and for some minor impacts, measures are identified to avoid or reduce the impacts. It is also important to note that the ESIA requires a number of further studies that are intended in order to provide more information on baseline conditions and allow a determination of whether additional or refined mitigation measures are needed.

5.1. Summary of project activities that could result in adverse impacts

The project will involve a variety of different activities, many of which could affect environmental resources and people if they are not carefully designed and implemented. The activities that are considered to cause the most significant impacts include:

- Construction of each of the approximately 250 towers has occupied (in the case of the 42 towers already constructed) or will occupy an area of about 56 square meters (7.5m x 7.5m). Users will lose the right to use this land. Construction of the substation will require an area of about 0.6 hectares. Approximately equal areas will be used temporarily during construction.
- When the towers are constructed and the conductors have been placed and energized, there will be a protection zone or safety zone beneath the 63-kilometer corridor. The protection zone will be 45 meters wide: five meters between the energized conductors and 20 meters on each side of the conductors. Houses and auxiliary buildings in the protection zone will be demolished and people with rights to those household plots will have to move.
- Trees in orchards, forests, and other areas that are within the protection zone will be cut back if they could grow to within six meters of the conductors. Trees will not be cut to the ground, but to a height of 1-4 meters.
- Workers will establish footpaths to travel from the road to the tower locations, in most cases, these will be a few 10s of meters, but in some cases could be up to a kilometer. This could affect crops or grass.
- Conductoring (placing wires between towers) the entire line. This would involve unrolling conductor wire, raising it to towers and stringing the wires between the towers on either side of the two rail lines. There will be some disturbance of the land between the towers.
- Construction will take two or three years, but construction-related disturbance at any single tower location would last for a maximum of two to four weeks. During that time, construction activities could generate noise, dust, and other nuisances when the towers are located near settlements.
- During the construction period, there will be increased construction traffic locally at the places where construction is ongoing at the time.

- Routine maintenance of the vegetation control zone will require trees and other plants to be cut back every 6-8 years, as needed to maintain clearance from the line
- Construction and maintenance of the new substation near Qozideh will require about 0.24 hectares. It will require the demolition of any buildings and clearance of any vegetation.

5.2. Assessment of Potential Impacts

Potential impacts were assessed for the environmental and social baseline conditions listed in Table 14.

Table 14. Assessment of environmental and social conditions

<i>Environmental conditions</i>	<i>Socio-economic conditions</i>
Climate and meteorology	Demography
Landscape and land use	Economy
Geology and geomorphology	Employment and income
Hydrogeology	Vulnerability of population
Hydrology	Tourism and cultural heritage
Soils	
Flora and fauna	

5.2.1. Impacts on physical conditions

Impacts on views and landscapes.

Direct impacts on views of the landscape could occur through obstruction of views or intrusion of new elements into views of receptors. In most cases, conductors will be visible from only a short distance and so are of limited concern. However, towers would extend above the landscape, including the tallest surrounding trees. Taking into consideration the lattice framework of the towers, their height, their relative height compared to the landscape, and the extreme terrain, it is unlikely that viewers would be able to see the towers or conductors from a distance greater than one or two kilometers at most.

Potential visual receptors in the region would include local residents, travelers, visitors, and tourists. The most important impact could be expected to be on tourists and others who come to visit the Pamir mountains, especially during the summer season. Their exposure would be limited in duration, and they currently see the existing 35kV line, even in unpopulated areas. People who live near the transmission line would experience a change in their customary views, and those who live in houses nearer the corridor would be most affected. Although towers could be seen in the distance up to about 1-2 kilometers away, the more significant views would be within about 500 meters, with the line much less noticeable at longer distances. Residents are already exposed to views of the existing 35kV transmission line and of distribution lines. In addition, they would quickly become acclimated to the view. The overall significance of the potential impact on landscape and views is considered to be minor or even negligible. No mitigation is necessary, even if it were possible.

Impacts on land use.

The effects of the project on the existing land use pattern could be temporary or permanent, direct or indirect. Land in household plots that have buildings or houses within the 45-meter-wide corridor

would be impacted directly and permanently since buildings will be demolished. Land uses where towers will be located will also be affected since they will be occupied by concrete foundations and steel towers, and uses of land where the Qozideh substation will be located will be changed as well. Since locations are not yet known, the precise impacts on land uses cannot be quantified at this time. Land uses that will be affected, and Pamir Energy's intent, include:

- *Household plot/buildings*: although several such plots and buildings are within 45 meters of the existing 35kV line, Pamir Energy will require the design contractor for the new line to avoid any such plots so that no houses or buildings are located in the corridor. Thus, no temporary or permanent direct impacts are expected on household plots or buildings. (It is noted that Pamir Energy was successful in achieving this goal for the first 10 kilometers of the line and fully expects to continue this success with the remainder of the line.)
- *River*: some towers may be placed on rocky outcrops high above the river. Except for the area occupied by concrete foundations, grazing could continue if the land supports sufficient vegetation (if so, it will be replanted after disturbance—see below). Thus, there will be no effect on riparian land uses.
- *Arable land, grassland (hayfields)*: Pamir Energy will require the design to avoid such lands where possible. Even in locations where such land cannot be avoided, the only land directly and permanently affected would be the small areas where concrete foundations are located. Temporary effects would be felt on the footpaths to the tower locations and under the towers; these areas would revert to the original land use. In addition, Pamir Energy will schedule construction works on these lands so they occur before the planting/growing season and/or after harvest so as to minimize the impact on agricultural production.
- *Grazing land*: same as arable land, except that some grazing land, especially for goats, is nearly barren and such areas will not be avoided. Where land will support grass, disturbed areas will be revegetated as much as possible (seeded with native grasses)
- *Orchards*: same as for arable land, plus if trees could reach within six meters of an energized conductor, they will be cut to a height of under four meters. Such cutting will be repeated every 6-8 years as needed to maintain a six-meter clearance between trees and conductors.
- *Trees/shrubs (private or state)*: same as orchards
- *Rocky land*: as needed, land will be restored to its original conditions, or more stable condition if possible.
- *Other*: if used for economic purposes, any other land will be avoided where possible.

It is important to note that, except for residences and buildings and tall trees, land within the protection zone can continue to be used as before: crops and grass can be planted and grown, and grazing can continue as before, under the line and even between the foundations under the towers. Pamir Energy will restrict the use of tall equipment, but the actual impacts on land uses are expected to be relatively minor.

Impacts on soils

Project activities with the greatest potential to affect soils include land-clearing and vegetation removal where necessary, and excavations for tower foundations and the substation(s). If not

managed carefully, land clearing and vegetation removal may cause erosion and topsoil loss (where there is erodible material and/or topsoil). The risk is much higher on steeper slopes, although many such slopes have little or no topsoil to erode. In addition, some areas could become more susceptible to landslides and mudslides, and valuable topsoil could be lost and this in turn could affect the success of the reinstatement program, whose aim will be to restore vegetation wherever possible.

Wherever there is soil and subsoil material, it will be removed and stored before excavations are made for foundations. When construction is complete, the subsoil and soil will be replaced and the surface will be replanted with seeds or seedling plants. If there is excess material, it will be removed to a location where it will remain stable and not erode, and it will be seeded. If there is excess fertile topsoil, local households will be given the opportunity to take it for use on garden plots or orchards. If revegetation of disturbed areas has to take place near the end of the growing season or when it is too dry for vegetation to thrive, the contractor will pay one or more local households to tend the site until vegetation is self-sustaining and the ground surface is stable. Pamir Energy will require the contractor to prepare and implement a detailed Land Management and Erosion Control Plan to ensure these and other measures are undertaken to protect and preserve soil and land stability.

Besides erosion, soil and the ground surface can be contaminated by spills of fuel, paint, or other hazardous materials. To avoid this, all such materials will be stored in areas with impermeable surfaces and the ability to contain at least 110 percent of stored material. Fueling and vehicle maintenance will take place only over impermeable surfaces or drip trays. Containers will be disposed so they cannot contaminate land or water and in places authorized by Tajikistan law. These requirements and others will be specified in a Materials and Waste Management Plan that will be prepared by the contractor for approval by Pamir Energy.

Impacts on air quality.

The primary impacts on air quality are expected to result from dust generated by the movement of vehicles and equipment on unpaved roads, during earthworks, during blasting (if blasting is necessary), and by emissions from fuel combustion in vehicles and other equipment. In addition, open piles of topsoil and spoil can generate dust in dry and windy conditions. Construction machinery will generate exhaust gases that contain air pollutants, including particulates, sulfur dioxide, nitrogen oxides, and volatile organic compounds. Since there will not be new access roads, most dust generation would be from the main road. If it is determined that project traffic is causing excessive dust in villages, Pamir Energy will require the contractor to use a bowser or other means to dampen roads to reduce such dust. As for emissions, the contractor will be required to take out of service any vehicle or other equipment that is emitting black smoke.

Besides these construction impacts, the corona effect can cause small amounts of ozone and nitrogen oxides to be generated by transmission lines during operation, especially during humid weather. This is a more important issue for lines with much higher voltage than this line. These pollutants can be harmful to health at high concentrations, but not at concentrations generated by the transmission line, which will be very low, much lower than Tajik standards.

In summary, impacts on air quality due to dust or vehicle emissions could be minor or moderate if not mitigated, but are expected to be negligible with proper dust and emissions control and low with even partial controls.

Impacts due to noise

Noise can be defined as unwanted sound. The sound pressure level emitted from any activity that can be heard by a receiver depends on a number of factors. The impact of the noise depends not only on the sound pressure level but on such things as the frequency spectrum, the duration of the noise, the time of day, the activity causing the noise, and the attitude of the receiver. All these aspects must be taken into account in assessing the impact of noise.

Noise levels in the project area are generally low, generally in the range of 30-50 decibels or even lower. Levels are higher near the river, where the water makes noise flowing over rocks, and along the road when vehicles pass. There are no major noise sources in the immediate vicinity other than from normal human activities.

Table 15 provides examples of common noises and the average subjective response. These levels have been used to interpret the noise levels discussed in this assessment and in establishing criteria for the assessment of impact significance.

Table 15. Typical sound pressure levels associated with common noise sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 25m	
130	Threshold of pain	Jet aircraft during take-off at a distance of 100m	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 300m	Inside propeller plane
100	Very Loud	Power mower, motorcycle at 8m, car horn at 3m, crowd noise at football game	
90		Propeller plane flyover at 300m, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately Loud	Diesel truck (65kph) at 16m	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	Jet aircraft cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 5m, near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Adapted from Egan 1988 and from Ramsey and Sleeper, 1994.

Various standards exist for noise; this assessment uses those in Table 16, which were developed by the World Health Organization (WHO) and have been adopted by Tajikistan.

Table 16. Noise level guidelines

Location	General effect	Noise level, LAeq [dB] Time base [hours]	
		Daytime (0700-2200)	Night (2200-0700)
Residential	Annoyance when outdoors	55	45
Industrial, commercial	Interference with hearing	70	70
Source: WHO 1999 and World Bank Group EHS General Guidelines 2007. Tajikistan limits match WHO: Sanitary Rules of the Republic of Tajikistan CH 2.2.4/2.1.8.562-96.			

The sensitivity of the receptor depends on the type of receptor and proximity to the noise. It is not expected that any houses will be within 40-50 meters of any construction site, so noise impacts will be limited.

The primary sources of noise will include:

- Machinery and equipment used during construction
- Vehicles moving along roads
- Workforce activities (voices, movement, etc.) at construction and maintenance sites during construction and maintenance
- Energized transmission line, especially in wet or humid weather (the corona effect can cause a low humming noise)
- Operating electrical equipment at the substation
- Workforce activities during occasional maintenance activities along the corridor and at the substation.

Since very little mechanized equipment will be used, the loudest noises will be from vehicles and equipment on roads and at a construction camp and from workforce activities. During tower assembly, there could be periodic loud banging noises as towers are transported, erected, and assembled. If there is blasting at a few tower locations, that would also generate noise.

Distance reduces the sound level that can be heard, with an average reduction of about six decibels (dB) with each doubling of distance. Thus, noise levels of 78dB at 15 meters would be reduced to 72dB at 30 meters, 66db at 60 meters, 60db at 120 meters, and 54dB at 240 meters. Except for the nearest houses, this noise level would generally not exceed the 55dB standard at any time during daytime hours, even if there were no intervening trees or obstructions and no other noises, such as the flowing river.

To ensure that impacts from noise are minor or negligible, the following mitigation measures will be implemented:

- The contractor will mobilize to work sites only between the hours of 0700 and 1900.
- If any residence is within 0.5 kilometers of the corridor, the contractor will notify occupants before initiating construction works.
- If blasting is to take place, the contractor will notify nearby residents and post signs at least six hours prior to the time of blasting.
- If residents complain of noise, the contractor or Pamir Energy will monitor noise at the location of concern and implement mitigation measures if noise levels exceed the standards in Table 10.
- Ensure that sound mufflers and dampeners on vehicles and equipment are working properly, and remove from service any vehicles and equipment that emit excessive noise until noise levels are reduced.

In summary, noise will not be a problem if proper mitigation measures are implemented.

Impacts on surface and groundwater.

Direct impacts on groundwater are not likely to occur due to the small-scale nature of the project at individual locations. In addition, the corridor does not cross wetlands or important lakes or reservoirs. The risk to surface water, however, is more of a concern since the corridor and roads will be passing along the Panj River channel. Localized contamination of surface water is possible during the construction phase due to spillages of lubricating hydraulic oil and fuel onto the nearby ground surface or even into the river channel.

As noted above, fueling and handling of hazardous materials will be controlled by a Management Plan approved by Pamir Energy. In addition, the contractor will be prohibited from vehicle or fueling within 25 meters of the river, and always on the side of the road away from the river.

Impacts of the project on climate change or of climate change on the project

The project will have no effect on climate. It will not result in significant emissions of greenhouse gases, only very small amounts from vehicle fuel combustion, from the corona effect of the operating line, and from leaks of sulfur hexafluoride (SF₆) gas if substation equipment uses this as an insulator. Nevertheless, if SF₆ insulating gases will be used in substation equipment, Pamir Energy will be required to install and use only equipment with low leakage rate (>99% control), ensure equipment is properly labelled/marked, train staff in proper inspection and maintenance to prevent leakage, and manage decommissioning to minimize SF₆ leakage.

Climate change should also have little or no effect on the project. Although avalanche and mudflow hazards could be exacerbated by climate change, Pamir Energy is requiring the design to be more resilient than the previous line. Where possible, towers will be placed on elevated rocky outcrops so the line itself can pass over avalanche chutes and mudflow routes. In other locations, where towers must be in locations that could be subject to hazard, the design will include the placement of diversion barriers just uphill so that moving material can pass around the tower. All towers will be sufficiently high above the Panj River so even severe floods should have no effect on the line, and the line will not be impeded floodwaters.

5.2.2. Impacts on biological conditions

Impacts on flora and fauna

It is expected that the final corridor will cross land that has limited biodiversity value. Most or all of the land has been significantly affected by human activities, either by past deforestation or by ongoing agriculture, animal husbandry, and/or wood collecting. As noted previously, most land crossed by the current line are scree and other rocky slopes, agricultural land, grassland/grazing land, and sections of severely fragmented forests. Some rocky land is used for grazing, but it would support very little vegetation and few or no animals.

The only activity with a direct effect on flora would be at tower foundations, where vegetation would be cleared. To the extent possible, such areas will be avoided during design, and since there is abundant unvegetated land that should be available in most cases. Pamir Energy will be required to plant at least 10 saplings of the same species of all trees that have to be cut, and to pay local people to tend to the trees until they are mature.

The primary impact on fauna will be disturbance due to construction. Only very small amounts of land will be taken for tower foundations, and this should have an effect on only a few individual organisms, and not on populations. Construction disturbance will be very short-term, only a few days or weeks at any one location except the powerhouse and camp, where disturbance would last several months. Mobile fauna can generally tolerate such disturbance by moving short distances away during the day, so there should be limited or no effect on mammals or other fauna.

One possible exception could be birds. Large birds in particular are susceptible to injury or death due to collision with transmission lines while flying, especially during migration, and to electrocution when they touch an energized conductor and a ground. The line is parallel to the river, which would be the migration route of choice, so collision should not be a concern except possibly where the line crosses small valleys that have tributary streams. In addition, there are a number of bird species of conservation concern in the area, as was shown Table 11. Any of these species that use the corridor for nesting or feeding would be capable of moving short distances to other territories and should not be affected.

Because data on species and assemblages of species in specific locations is limited, Pamir Energy will be required to commission surveys by qualified experts of flora and fauna (plants, mammals, reptiles, amphibians, insects, and birds) along the corridor. The surveys will determine whether any species of conservation concern are present along the corridor, and whether the project could present a risk to individuals or populations of such species. Surveys will be completed prior to construction. If it is determined there are species of conservation concern that could potentially be adversely affected, Pamir Energy will be required to develop a Biodiversity Management Plan that will aim to avoid such effects or to identify measures that can be implemented to ensure there is no net loss of biodiversity. (It is noted that this is considered to be unlikely, but is a conservative approach that is appropriate given current data limitations.)

For birds, the surveys should also include spring and autumn migration seasons to determine the customary path that migrating birds follow, which in turn can allow a better assessment of whether the line could present a risk to large birds. If it is determined there is any such risk to common species, Pamir Energy will be required to install bird diverters on the line in locations of concern. If the line could present a risk to species of conservation concern, Pamir Energy will prepare a Biodiversity

Management Plan that identifies measures to avoid such impacts or to ensure no net loss, and to verify effectiveness.

For bats, the surveys will identify if trees or buildings that support hibernation, roosting, or breeding/nesting could be affected. If such locations are affected, Pamir Energy will install at least two “bat boxes” (small structures suitable for roosting or even nesting) for every bat estimated to use a lost site; locations and designs will be selected by qualified experts.

Impacts on habitat

As noted in Chapter 4, the entire corridor has been affected by human activity in the past and/or at the present time. The World Bank classifies habitats into one of three categories, as shown in Table 17. As described in the Table, the project will not affect critical habitats or natural habitats, and no modified habitat of particular biodiversity value.

Table 17. World Bank habitat categories

<i>World Bank Definition</i>	<i>Applicability</i>
Critical habitat (ESS6, paragraph 23) is defined as areas with high biodiversity importance or value including:	
(a) Habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species of equivalent national approaches	The project will not affect any habitat of significant importance to species that are considered threatened, endangered, or critically endangered by IUCN or the Tajikistan Red Book.
(b) Habitat of significant importance to endemic or restricted-range species	The project will not affect habitat of significant importance to endemic or restricted-range species.
(c) Habitat supporting globally or nationally significant concentrations of migratory or congregatory species	Affected habitats do not support significant concentrations of migratory or congregatory species.
(d) Highly threatened or unique ecosystems;	Habitats are extensively modified and are neither threatened nor unique.
(e) Ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d).	The corridor does not support these biodiversity values.
Natural habitats (ESS6, paragraph 21) are areas composed of viable assemblages of plant and/or animal species of largely native origin and/or where human activity has not essentially modified an area’s primary ecology function and species composition.	The entire area has been subject to deforestation, particularly prior to electrification of settlements, and does not support assemblages that fulfill the area’s primary ecological function.
Modified habitats (ESS 6, paragraph 19) are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area’s primary ecological functions and species composition... The ESS applies to those areas of modified habitat that includes significant biodiversity value.	The habitats to be affected do not include areas of significant biodiversity value.

5.2.3. Impacts on protected areas

The transmission line corridor and substation will not affect national parks, reserves, or other areas that are protected or recognized for reasons of biodiversity or other value.

5.3. Potential impacts on socioeconomic conditions

This section identifies and assesses the potential impacts the project could have on socioeconomic conditions – that is, on people and the economy. As is also true for environment impacts, socioeconomic impacts can occur during construction and/or operation, and can be both positive and negative. These impacts will vary by location, size, duration, distance to communities, land ownership and other factors. This section is organized as follows:

- Section 5.3.1 examines potential impacts on demographics
- Section 5.3.2 examines potential impacts on community health and safety
- Section 5.3.3 summarizes potential impacts of physical and economic displacement.
- Section 5.3.4 examines potential impacts on worker health, safety, and welfare
- Section 5.3.5 examines potential impacts on economic conditions in the region
- Section 5.3.6 examines potential impacts on cultural heritage.

5.3.1. Potential impacts on demographics

Population

The project is unlikely to have any effect on population in the short term, but it could cause a minor increase in future population if it fosters further development of the region and people consider this a more attractive place to live.

Immigration and emigration

The project could reduce economic migration, especially by men who travel to urban areas and especially the Russian Federation to seek employment. While this could last the length of the project, it is unlikely to have any significant effect in the longer term unless the line fosters further development and thus in turn provides employment opportunities.

5.3.2. Potential impacts on community health and safety

A number of actions that will be carried out by Pamir Energy, its contractors, and project workers may affect community health and safety. In general, the potential for impacts of construction and operation on communities and community members is related to the distance that people live from the transmission line. Although the exact location of the line is not yet known, it is unlikely there will be any houses within 50 to 100 metres of the line, and probably only a few within 500 metres. This is because Pamir Energy will require the contractor to avoid settlements, and that will be achieved primarily by moving the corridor up onto the hills behind the villages compared to the existing 35kV corridor.

The primary risks, and actions to be taken to reduce or avoid the risks, are described below.

Impacts that result from labor Influx

As noted previously, the project will employ 120 or more workers for construction of the transmission line and somewhat fewer for the substation. Most labor will come from local communities, but managers and supervisors are likely to come from elsewhere in GBAO or Tajikistan, and there may be some specialists and engineers from other countries.

Poor behavior by workers from outside the region (that is, outside the Pamirs) could lead to disruption of local community cohesion, especially smaller communities. This can occur through unaccustomed or violent behavior, including gender-based violence, and/or an increase in communicable diseases. This will be controlled by requiring workers to abide by a Worker Code of Conduct that will prescribe certain behaviors and require other behaviors; the contractor will be required to enforce the Code for its own and its subcontractors' employees, with penalties leading up to dismissal. In addition, Pamir Energy and the contractor will consult with local authorities and community leaders, which will ensure they (that is, project managers) are aware of incidents and can take appropriate action if issues arise. Finally, Pamir Energy and the contractor will establish communications with law enforcement authorities so they are aware of the influx of workers, including where they will be working and where they will reside, and can take appropriate precautions. The risk of gender-based violence (GBV) under this project is assessed to be low given the small size of workers' teams and the lack of precedents that indicate such risks in Tajikistan. Nevertheless, a number of mitigation measures will be taken to prevent GBV-associated risks, including sensitization for project employees and communities and adoption and monitoring of Codes of Conduct for all project workers.

Increased demand on community services, such as medical and law enforcement, due to use of the services by project workers from outside the region could leave fewer services for community members. The relatively low number of workers and the requirement for the contractor to consult and coordinate with community leaders and law enforcement will ensure that added demand for community services will not cause significant reductions in services available to the community. The fact that most workers are likely to be from the local communities will further reduce the potential impacts.

Increase in HIV/AIDS and/or other communicable diseases could occur due to the increase of male construction workers into rural communities and an increase in prostitutes or other sex workers who come to serve them. The relatively low numbers of nonlocal workers (likely to be fewer than 100), the fact that most work will be primarily in rural areas away from settlements, and the fact that much of the workers' spare time would be spent in Khorog or other large towns, would be expected to make this risk not significant. If ongoing engagement with community leaders or others suggests there may be problems of this sort, Pamir Energy and the contractor will enhance training on the Code of Conduct, monitor and enforce worker behaviour more closely, and dismiss offending workers.

Other activities and impacts

Inappropriate actions and responses by security personnel could injure or harm community members. The contractor will probably appoint a subcontractor to provide security. If security guards are hired or provided by Pamir Energy or the contractor, they will not be armed. Only licensed security providers will be used, and Pamir Energy will take steps to verify that security subcontractor(s) and their personnel have not been involved in past abuses. They will also have to ensure security personnel are trained in the appropriate use of force.

Project traffic could interfere with normal public traffic and could cause an increase in accidents involving pedestrians and vehicles. The contractor will be required to develop and implement a Traffic Management Plan that provides for driver training, vehicle safety, route planning to avoid sensitive areas, and coordination with local traffic authorities.

Accidents and emergencies caused by the project could affect communities. The most likely impacts during construction would be from fires and traffic accidents since there will be only limited use of hazardous or flammable chemicals. Workers will be trained in fire prevention, and implementation of a Traffic Management Plan will reduce the potential for accidents. In addition, the contractor will be required to develop and implement an Emergency Preparedness and Response Plan or procedure. During operation, the most likely emergency would be from traffic accidents or fires or electrical emergencies caused by sparking or other problems with lines. Proper maintenance will reduce the likelihood of such failures.

Nuisances such as noise and dust during construction could disturb nearby residents and other community members. Given the distance between most construction activities and settled areas, this is not likely to be an issue except very locally and for very short periods. Pamir Energy will require the contractor to maintain vehicles and equipment to minimize noise, and to consider the timing of construction activities so they can avoid periods when specific areas would be most sensitive (see above in section 5.2.1). In addition, the contractor will be required to control dust from unpaved roads and construction sites during dry periods.

Nuisance noise during operation could be generated by the transmission line and could disturb nearby residents in wet and humid weather. During operation, low buzzing, crackling, or hissing sounds could be audible directly under the line and possibly for short distances away from the line. These sounds are produced as a result of corona discharge from humid air contact with conductors, from damaged or dirty insulators, or from wind blowing through conductors and tower latticework. The noise is usually louder during wet and foggy weather, when the relative humidity of ambient air is over 80 percent, and in windy conditions. The noise level also increases with voltage. According to various literature sources, during relatively dry and calm conditions, the noise level from high-voltage lines of about 400kv-500kv lines can reach 50-60dBA in wet and windy weather but would decrease rapidly away from the corridor, becoming inaudible in no more than 20-30 meters. For this 110kv line, any coronal noise should be inaudible for more than a few meters from the conductors. . Other than occasional maintenance workers, the only people who will spend any time in the corridor will be agricultural workers and they would spend only short periods on a few days of the year. Overall, corona noise is unlikely to be even a minor nuisance, although it could possibly affect a few people for short periods of time.

Uncontrolled or poorly controlled access to work sites could expose members of the public to extreme hazards, including areas near excavations (at tower foundation sites and substation), around heavy equipment (at the substation and along the road) and vehicles (along the road), under lifting operations or overhead work (at the substation, if then), and other such limited situations. To control access, all construction areas near communities and at the substation will be marked with barriers or safety tape and there will be only one or a few access points. Excavations will have physical barriers or intact safety tape placed on all sides of the excavation at any time there is no active work at the excavation site. Any lifting operations at the substation will have one or more flagmen on duty who can warn people away (lifting at towers will be manual).

Towers will present fall and electrocution hazards to anyone who climbs the tower once the towers are in place and then when the line energized. This is particularly a hazard to young children and teenagers. When towers are in place, there will be signs on all four sides to warn of danger and prohibit climbing, with signs in the Tajik and Russian languages (and any other language known to spoken by nearby residents) and with graphic danger symbols that warn of the dangers of falls and of electrocution.

Coming into contact with energized conductors could electrocute children or others. This could happen if people, especially children, climb towers or if they come into contact with energized conductors that have fallen due to heavy snow, high winds, or tower failure. In addition, tall machinery being used under the lines could come into contact with the energized line and electrocute the driver/operator. Pamir Energy will provide information on such risks and precautionary measures to local schools to help prevent such accidents. In addition, Pamir Energy will ensure that each tower has signs, in Tajik and Russian, that warn trespassers of the risk of electrocution, falls, and other dangers. The signs will have a 24-hour telephone number to which emergency calls can be made.

Electromagnetic fields. Due to the complexity of this issue and the high level of interest in potential impacts that has been shown at other similar projects, this topic is discussed in some detail.

An electromagnetic field (EMF) is emitted by any electrical device, including power lines. The electric field (EF) is produced by the difference of potential between two points (that is, the voltage) and is measured in kV per meter. The magnetic field (MF) is produced by electric current and is measured in microteslas (μ T) or nanoteslas (nT)—one tesla (T) is equal to 10,000 Gauss. Unlike electric fields, magnetic fields pass through most materials and are difficult to shield. Both electric and magnetic fields decrease inversely to the square of the distance, therefore reduction in voltage takes place quickly over very short distances, as is illustrated in Figure 20. Directly under a high-voltage line, EMF can reach levels of 100 μ T or more, but after 25 meters can be as low as 1 μ T, although typically 10-20 μ T.

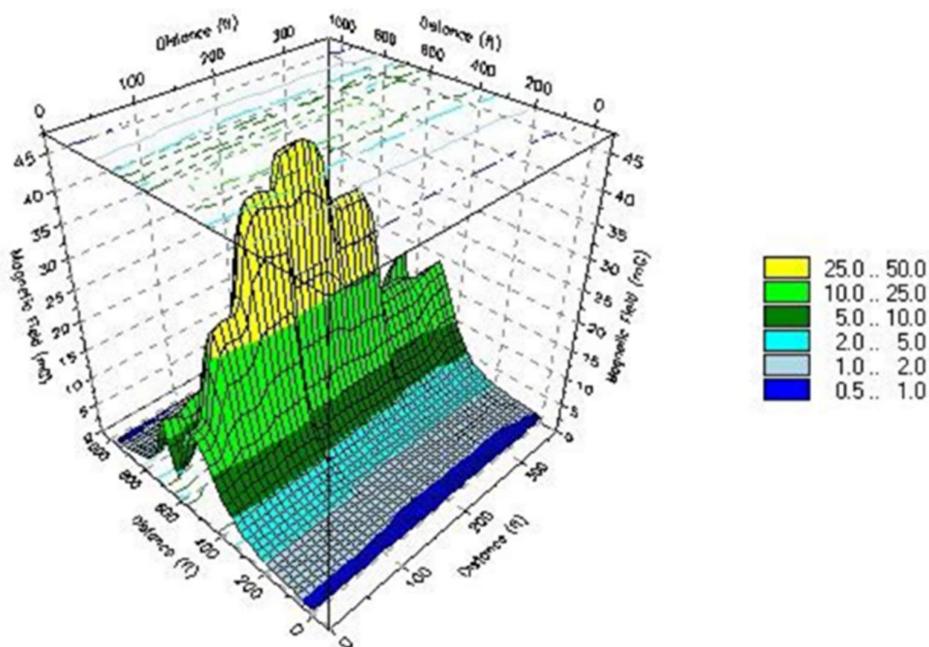


Figure 20. Decrease in electromagnetic field strength with distance from 500kV circuit (horizontal axis is in feet (0.331m), vertical axis is mG (see scale))

Over the last 30 years, extensive research has been conducted in the European Union, the United States, and around the world to examine whether exposure to EMF has adverse health or environmental effects. In general, exposure to EMF is affected by the types of electrical sources, the distance from these sources, and the amount of time spent near these sources. Scientific research has focused on magnetic fields, since objects such as trees and walls act as physical barriers that easily block and shield electric fields.

Since the intensity of magnetic fields diminishes quickly with distance from the source, few homes are close enough to transmission lines for the lines to have an impact on the magnetic field level within the home. Rather, the major sources of residential magnetic field levels are electrical appliances within the home. To provide some context, in many homes the background alternating current magnetic field levels average about 0.1 to 10 μT , and are the result of electricity passing through wiring within the home and appliances, and through power lines outside the home. The average daily exposure is the composite of instantaneous, higher exposures (such as driving under a power line) and long-term, low exposures (such as wiring within a home).

Most countries do not have limits on exposure to occupational or public exposure to EMF. Many countries, including the United Kingdom, however, adopt the positions of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), which has several times reviewed the epidemiological and experimental evidence and concluded that there was insufficient evidence to warrant the development of standards limiting long-term exposure to EMF. Rather, the guidelines put forth in its 1998 and 2010 documents set limits at much higher field levels to protect against direct short-term health effects (for example, stimulation of nerves and muscles, a shock-like effect) that are known to occur at very high exposure levels. The ICNIRP in 1998 recommended a residential exposure limit of 833 mG (or 83.3 μT) and an occupational exposure limit of 4,200 mG (ICNIRP, 1998). Also, the International Committee on Electromagnetic Safety (ICES) recommends that exposures of the general public be limited to 9,040 mG (ICES, 2002). Both standards are designed to provide a very large margin of safety.

The exposures of workers and persons living in close proximity to the proposed project transmission lines should be well below these guidelines. Based on EMF exposure levels cited in the U.S. National Institute of Environmental Health Sciences June 2002 report titled “EMF, Electric and Magnetic Fields Associated with the Use of Electric Power” (NIEHS, 2002), an electrical worker has an average EMF exposure of 9.6 mG, and typical EMF levels 20 meters from a 500kV power transmission line is 29.4 mG, decreasing to 12.6 mG at 30 meters. Based on these data, the EMF field levels within and at the edges of the 74.5-meter wide corridor of the proposed project, will be well below the levels recommended by the ICNIRP and the ICES—on the order of a 12.6 mG exposure compared to ICNIRP recommendation of 833 mG. In general, EMF levels outside the corridor will be extremely low, much lower than research has shown to present a hazard to human health.

In the corridor, extended exposures over a long period of time could lead to some risk, although even in such cases scientists do not agree on the degree of hazard. Short-term exposures such as would occur for agricultural workers would present no risk.

Research on EMF in residential settings and health was prompted by a 1979 epidemiology study of children exposed to EMF, mostly from neighborhood transmission lines. A weak statistical association has been reported in some studies between childhood leukemia or other health problems and average exposure to magnetic fields greater than 3 - 4 mG. Hundreds of studies have subsequently addressed

almost all issues that have been raised about EMF and health. These later studies have not found convincing or consistent evidence to suggest that EMF exposure was higher or more frequent in children with leukemia. Since there is very little support in other areas important for evaluating causation (for example, similar findings in animal studies and a plausible biological mechanism), the scientific consensus is that these findings are insufficient to establish a cause-and-effect relationship between residential EMF exposure and childhood leukemia or other disease. Rather, most researchers agree that where associations exist in epidemiology studies, they are likely the result of study design issues such as bias or confounding. The World Health Organization (WHO) concluded in their June 2007 review of EMF and health (WHO, 2007) that no consistent adverse health effects including cancer, were reported in animals even after exposure to high levels of electric and magnetic fields. Overall, the research does not establish that EMF exposure causes or contributes to any disease or illness.

Using a weight-of-evidence approach to evaluate this large body of research, the scientific consensus of numerous organizations is that no cause-and-effect relationship between EMF from any source and ill health has been established at the levels typically found in residential environments, even near to transmission lines. As a result, no scientific organizations have recommended standards to prevent long-term health effects (such as cancer), nor are there any standards in the U.S. or most other countries for limiting exposure to the levels of EMF typically encountered in people's everyday lives.

Overall, no potential impacts are expected to occur when humans, animals, and plants are exposed to EMF. However, mitigation is called for in order to comply with the Tajikistan norms and ICNIRP guidelines. As described above, the primary mitigation is that no one may live in the protection zone, which means no one will live within 20 meters of the energized conductors of the transmission line. In addition, any person who lives within 75 meters of the line may request that electromagnetic fields be measured in their house. If monitoring shows that EMF levels exceed 0.5kV/m or 10uT, Pamir Energy will shield or otherwise reduce levels to below that standard or will relocate the people in accordance with the RCAP. In addition, consultations with communities following disclosure of this ESIA and other documentation will specifically include presentations by Pamir Energy on EMF levels, potential risks, and mitigations. If community concern remains high, Pamir Energy will hold special consultation sessions specifically to discuss EMF issues.

If there is sufficient interest, the Stakeholder Engagement Plan will include specific requirements for including EMF discussions in consultations with leaders and community members. If interest justifies this, Pamir Energy will also develop and post a page on its website that discusses levels and risks that result from high-voltage transmission lines (and from other sources such as cellular telephones).

Summary of impacts on community health and safety

Potential impacts on community health and safety are briefly noted in the paragraphs above. With proper implementation of mitigation measures, there should be limited or no impacts. With proper implementation of mitigation measures, potential impacts should be no more than minor and will be negligible in most cases.

5.3.3. Potential Impacts due to physical or economic displacement

As noted in Chapter 2, Tajikistan norms require that 110kV transmission lines have a protection or safety zone on each side of the conductors: the zone is 45 meters wide, including five meters between conductors and 20 meters on each side. No occupied dwelling or auxiliary building may be located

within this safety zone. If people do live in the proposed corridor, they will be required to move—this is called “physical displacement” or “resettlement”. In addition, the economic losses (that is, the loss of income or the value of property) that people may suffer is called “economic displacement”, and can result from such things as loss of land used for crops, pastures, or other purposes; from damages to property or animals; or from other project-related causes. As noted in Chapter 2, Tajikistan law and World Bank standards both include requirements for dealing with physical and economic displacement.

Activities that could cause physical or economic displacement

Physical or economic displacement can result from any or all of the following causes.

- *Termination of rights to use household plots or other land* due to reallocation of land to Pamir Energy can cause physical displacement if houses or other buildings are located in the protection zone or on the substation site.
- *Acquisition by Pamir Energy of houses and property* in the transmission line protection zone and at the substation site can result in physical displacement if households have to relocate away from the protection zone. It can cause economic displacement if land is currently used for agriculture, grazing, orchards, or other economic purposes and can no longer be used for that purpose.
- *Damage to crops, animals, or other property* can cause economic displacement when vehicles and equipment cross and damage croplands or grasslands or collide with animals or other property.
- *Cutting trees or other vegetation* in the 45-meter protection zone of forests and orchards could cause economic displacement both to those who own the trees and to those who may exploit the trees that belong to the community or to others.
- *Restricting the use of land* can lead to economic displacement if owners are prevented from undertaking economic activities.

It is noted that displacement can occur to people without legal rights to use the land that is affected, or if they are using the land in ways that are not authorized. This is a World Bank requirement, even though Tajikistan law does not require compensation or other measures for people who do not have legal rights.

Pamir Energy has prepared a Resettlement Policy Framework to guide resettlement and compensation due to physical and/or economic displacement. To help avoid or minimize potential economic and physical displacement, the Framework will require Pamir Energy to:

- Require the design contractor to place towers so that no occupied houses are within the corridor and to avoid arable lands and plots with buildings or other economic activities to the extent possible. This will prevent any physical displacement and most economic displacement.
- Require the contractor to restore land that is not acquired for permanent use to its former use as soon as possible after construction is complete. This would be on land the contractor or Pamir Energy leases for construction storage and staging. Restoration would be agreed with the owner and could include de-compacting agricultural land where vehicles and equipment have driven, parked, or worked; and/or re-vegetation with native

or grass species. If grazing lands or other lands are revegetated with native species, the contractor will monitor during the following growing season to verify that grasses or other vegetation are successfully established.

- Require the contractor to undertake, wherever possible, as much of the construction on arable lands between the autumn harvest and spring planting in order to minimize disruption of agriculture (and thus minimize required compensation for damages).
- Prepare a Resettlement Action Plan when the design contractor selects final locations of towers and substation and the construction contractors select their construction sites. This Plan will be reviewed and approved by the World Bank and the Government of Tajikistan. The Plan will be based on the current Resettlement Policy Framework. The Plan will identify the land that will be needed, owners and persons to be resettled (if any) and compensated, the methods by which compensation amounts will be determined, the rates of compensation for various losses and land uses, and the amounts. It is noted that some information may be withheld from disclosure from public disclosure in order to protect privacy.

The RAP will identify and make special provisions for affected people who are considered vulnerable or disadvantaged, and thus more likely to be adversely affected and/or less able to participate in the consultation process. These will include elderly households, women-headed households, and extremely poor households. Available data suggest these vulnerable groups make up about 12.1 percent of the population (with elderly being about 9.3 percent, disabled 1.7 percent, and widows 1.1 percent). The RAP will provide special provisions such as higher rates of compensation, special funds, and/or other assistance and support as needed to ensure their living conditions and livelihoods are improved, or at least restored to their condition prior to the project. Once the final design is complete, affected people can be identified with certainty in the RAP, including those who are actually vulnerable and who may require assistance or special attention.

- Require the contractor to consult with communities where trees are to be cut so that wood from these trees is donated to local people, with preference to those who lose land and those who currently exploit timber resources for personal use.
- Not authorize the contractor to begin construction until all compensation for physical and economic displacement has been paid (except compensation for damages that may occur during construction).

Collectively, these measures will ensure the project has only minor adverse effects on affected people, and that those effects will be overcome with compensation measures as required by the Resettlement Policy Framework and the future RAP.

5.3.4. Potential impacts on worker health, safety, and welfare

Protection of workers is recognized as being extremely important, as witnessed by the 2009 Law on Occupational Safety, and also is receiving increased emphasis by the World Bank with the adoption in 2018 of Environmental and Social Standard 2, “Labor and Working Conditions”. Actions that could cause potential impacts on worker health, welfare, and safety could include:

Poor labor management practices by Pamir Energy, contractors and/or subcontractors could lead to situations where workers are exploited or taken advantage of. This could happen if they did not have

written labor management procedures or did not to enter into written contracts that inform workers of compensation, work hours and leave, and other information required by Tajikistan law. This can lead to problems between workers and employers, which in turn can put work and schedules at risk, not to mention the effects on the workers. Pamir Energy has a Human Resources program that fully complies with Tajikistan law and is consistent with World Bank standards as well. In addition, Pamir Energy has developed a Labor Management Procedure (LMP), which sets out the general principles that will govern the management of project workers by the contractors and subcontractors. The procedure is based on Tajikistan law and World Bank's ESS2, including written employment contracts. It also requires contractors to include equivalent provisions in subcontracts and to enforce compliance. Pamir Energy will monitor contractors' working hours to ensure that daily and weekly hours do not exceed legal limits, and also do not place fatigued workers in high-risk situations near the end of their workdays and workweeks. The need to limit working hours, especially when completing high-risk tasks, will also be emphasized in induction training and toolbox talks.

Unsafe working conditions could place workers at risk of injury or death. Such conditions could be caused by vehicles and equipment that do not meet safety standards (seat belts, horns, lights, tires, etc.), unprotected access to dangerous locations (unmarked excavations), poor practices and equipment for lifting operations (during conducting and substation construction), poor electrical safety (untrained workers, inadequate tools, etc.), inadequate safeguards on tools and equipment (unprotected saws, etc.), and other poor practices. Workers will also be exposed to danger when traveling on foot between the road and tower locations, in particular when traversing steep terrain or areas of treacherous footing. In addition, contractors could fail to provide, free of charge to the workers, adequate personal protective equipment, including head, hand, hearing, eye, and foot protection, and could provide insufficient training to workers in the risks of their jobs and how to perform their work safely. To ensure workers are provided with a safe working environment, each contractor will be required to develop and implement, and to train all workers in the requirements of, an Occupational Health and Safety Plan that includes requirements that meet Tajikistan law, the World Bank Group EHS Guidelines, and good international industry practice; key components of bidders' safety programs will need to be submitted with their proposals and will be considered by Pamir Energy in the selection of contractors. The Plans will have to be approved by Pamir Energy or a qualified consultant before the contractors are allowed to mobilize and begin any works or investigations. In addition, contractors will have to require subcontractors to comply with this Plan or to develop equivalent Plans. Finally, contractors will report, on a monthly basis, key safety statistics to Pamir Energy.

Not giving workers to opportunity to express concerns can lead to worker dissatisfaction and affect productivity, and equally importantly it can lead to missed opportunities to identify unsafe conditions that workers are in the best position to recognize. When workers are allowed to freely express opinions and to make their grievances known to management, with the knowledge that management will take action as needed, it can lead to more efficient and safer working conditions and also increase worker satisfaction. Pamir Energy will develop a written mechanism by which workers can submit, including anonymously, their opinions and grievances, and by which the company will take action in response to all such submissions. Pamir Energy will require contractors to develop their own mechanisms or alternatively may extend its own grievance mechanism to contractor employees. The contractor will make the mechanism available to subcontract employees, and ensure their grievance are addressed. Further, the contractor will be required to include in their monthly reports to the Supervision Consultant a summary of grievances, and how they were resolved.

Substandard accommodations, if they are provided, can lead to illness or disease among workers, which in turn can result in increased turnover as well as reduced productivity. At present, it is not known if the contractors will provide accommodations for workers, but if they do, they will be required to comply with good international industry practice for accommodations, as recorded in the IFC/EBRD Guidance Note on “Workers' Accommodation: Processes and Standards”.

Inadequate water and/or sanitation can affect workers' health, contaminate soil and surface water, and lead to worker illness or disease. Contractors will be required to provide workers with potable water, at no cost to the workers. Contractors will also have to provide sanitary facilities, including portable toilets in remote areas, and to enforce the Code of Conduct's prohibition on using the bush.

Gender equality will also be given attention. Construction has historically been the province of men, as have electrical works. Special attention will be given to this issue. Taking into account the nature of the project, the number of women workers who are employed for construction and operation of high voltage transmission lines is very low in Tajikistan and in most or all other countries. There are many reasons for this, including the historic absence of women from employment in general and hard labor in particular. It is not expected that many women would be employed on construction crews, although there could be some involved in engineering designs and in technical teams. They will not be automatically prohibited from employment, however, so long as they can have the strength and stamina to do the work. In addition, women would be more likely to fill support roles at offices and camps. During selection of contractors, Pamir Energy will consider their labor management policies, including gender nondiscrimination policies and programs that go beyond simply nondiscrimination policies, and will require contractors to establish realistic (and binding) goals for hiring women in different positions.

5.3.5. Impacts on social and economic conditions

Impacts on local income. The loss of income due to land acquisition and the loss of use of agricultural and forest lands is addressed in sections 5.3.3 above, and will be overcome by compensation provided under the RAP. Other than those impacts, the project can affect local income in two ways: by employing local people and by purchasing materials and supplies from local suppliers. More direct impacts can be felt by the improvement to the regional and local electrical supply, which in turn can help development of economic potential.

As noted above, construction of the transmission line will require up to 200 workers and the substation will employ approximately half or more of this number, with the actual number of workers to be determined by the contractors. At present, it is not known if the contractor will be a local or Tajikistan firm or will come from another country; based on Pamir Energy's previous experience with 110kV lines, it is considered likely the design contractors will be foreign and the transmission line construction contractor will be Tajikistan company. Pamir Energy will encourage the construction contractors to hire local subcontractors and local workers. It is expected that a minimum of 40 percent of the workers will be locals and probably up to 60-70 percent, preferably from nearby villages. It is also expected that support staff working in camps, auxiliary infrastructure and other support facilities will be mostly of local population. This will definitely have some positive impact on the project image on the local level and will smooth the project implementation process. Unemployment and lack of the work opportunities is one of the main problems in local communities. Overall, the impact on local incomes will be significant but temporary, lasting only two or three years and spread over the villages along the 63 kilometers of the line. Most of this income will be earned by the largely male workforce,

but the contractors will be encouraged to hire as many women as possible, especially including heads of households.

There will be some increase in demand from local suppliers of foodstuffs and household goods, which could benefit women and others who could develop small household production centers. This is not likely to be important on a regional basis but could be critical to households. Pamir Energy will set (nonbinding) goals for purchasing supplies from local providers.

The overall impact of increased income locally is expected to be important for the two or three years that construction will last but insignificant over the longer term. Similarly, the impact on local economies from local sourcing of materials and supplies will not be more than very minor given the scale of the project and thus the relatively limited materials and supplies that will be required.

Potential impacts on power supply. A reliable power transmission system is essential to continued economic development in Tajikistan and GBAO, and also in neighboring Afghanistan. As mentioned previously, the project will strengthen the power transmission capacity and reliability in southeast GBAO and thus contribute to long-term economic development. It could also help electrify areas of Afghanistan, providing the same benefits there and also helping stabilize the region.

Potential impacts on agriculture sector. Perhaps 90 percent of people along the corridor are engaged in subsistence or small-market agriculture. The area of affected agricultural land will be very small, especially in comparison to other agricultural land. Even if all 250 towers were on arable land, that would affect less than 14 hectares; as noted, Pamir Energy will require the design contractor to avoid arable land whenever possible, so it is likely that less than 10-20 percent of towers will be on arable land, in which case the total direct effect would be felt on less than three hectares. Lost production from these lands will be fully compensated and replacement land will be provided, so there will be no effect on long-term production. During some additional arable land will be affected by construction activities, but this land will be restored and can resume production after construction ends; as with land that is permanently affected, any losses will be fully compensated.

Potential impacts on tourism. As noted, tourists would be exposed to changes in the landscape due to the presence of metal towers. The increased reliability of the power supply could increase the attractiveness of local resorts and increase tourism.

Potential impacts on cultural heritage. Pamir Energy will require the design contractor to avoid having tower locations be placed so they would not affect cultural sites such as a stone with Arabic writing in Nishusp and cemeteries (although the line will be allowed to pass over cemeteries, as this is an accepted practice in the area). In addition, Pamir Energy will appoint a qualified expert to conduct a detailed survey of the corridor to identify any currently unknown sites that may have significance to local people or be of historical or prehistorical interest, and will require the design contractor to avoid placing towers so they would affect such sites.

Potential Impacts on vulnerable people and groups. As described above, project implementation will require land acquisition in the project corridor as well as some vegetation clearance, which could then cause impacts on those who own or use land and its assets and products. Some of these impacts would necessarily be felt by vulnerable groups. The avoidance of houses and, to the extent possible, of arable land, should minimize and possibly avoid such impacts.

Even minor impacts can have added significance to vulnerable people, especially the poor. For that reason, The Resettlement Policy Framework and the future RAP require that Pamir Energy provide additional compensation for permanent and temporary loss of land, buildings, or other assets when vulnerable people are affected. Pamir Energy will provide special assistance as needed to ensure these people will not suffer any reduction in their standard of living or income.

Potential Impacts on Infrastructure. The only infrastructure at risk would be the existing 35kV transmission line and the road. It is not expected that the new construction would affect the existing line, but any damage would be repaired by Pamir Energy (which already owns and operates the line, which will remain in place as a backup to the new 110kV line). The road is significantly deteriorated. If the project causes significant damage to the road, Pamir Energy will require the contractor to consult with road authorities to determine what repairs are needed so the road is not in worse condition at the end of construction as it is at the beginning.

Potential impacts on traffic. As noted above, project traffic could interfere with traffic on the public road, especially where project vehicles and equipment use roadside areas for staging and preparation areas, and from where workers will travel on foot to tower locations. To avoid such impacts, Pamir Energy will require the contractor to consult with road authorities to identify the places on roadsides where it is safest to conduct work. In addition, Pamir Energy will prepare, or require the contractors to prepare, a Traffic management plan that establishes operating and safety requirements for drivers, vehicles, and other project activities in urban, rural, and remote areas. The Plan will require flagpersons or other signals to be used when vehicles and heavy equipment could disrupt normal traffic, including when they are parked on roadsides and not visible for at least 500 meters in each direction.

5.4. Summary and significance of potential impacts

Table 18 summarizes the potential impacts of the project on environmental and socioeconomic resources. Many or most potential impacts of construction and operation of the transmission line and substation are considered to be generally insignificant or of minor importance and would not typically require specific measures to avoid or mitigate the impact other than the implementation of routine good international industry practices. However, there are a few potentially moderate to major adverse impacts associated with this project that will require specific measures to avoid, reduce, or otherwise mitigate impacts. These are primarily associated with physical and economic displacement, with potential impacts on communities and people, and uncertainty regarding potential impacts on biodiversity (flora and fauna). The moderate and major potential impacts, and many of the minor or even negligible ones, include the following:

- Construction and ongoing operation of the transmission line will create a minor adverse impact on aesthetics and views for tourists and some residents, perhaps more on tourists since they may have come to the area to enjoy the natural environment. This cannot be completely avoided, except possibly by adjusting some locations so that hilly terrain will hide some towers from specific high-use areas, if there are any.
- The construction of towers and future maintenance activities will have an adverse impact on flora in some forest fragments due to destruction of individual plants and habitat modification. At the time of final design (that is, final selection of exact locations of towers, construction areas, and corridor), Pamir Energy will appoint a qualified biologist to conduct a detailed botanical survey of tower locations and corridor. The purpose will

be to identify, mark, and count all tree and shrub specimens and populations. Wherever feasible, the contractor will “micro-locate” towers and the corridor (that is, will move towers by a few meters in one direction or another) to minimize the number of trees and shrubs that must be cut. For each tree that has to be cut, at least two trees or shrubs of the same species will be planted at the outer edges of the 45-meter corridor or other suitable location, and monitored until they are self-sustaining. Prior to undertaking the surveys, the biologist will prepare for review and approval by Pamir Energy a “Flora, Fauna, and Habitats Survey Plan.” If the surveys determine the project could affect individuals or populations of species of conservation concern, and avoidance is not feasible, Pamir Energy or the contractor will prepare a “Biodiversity Management Plan” that describes the results of the surveys and tower selection, maps the specimens and populations that will need to be cut or removed, designs and describes the planting program, and specifies other ways in which further potential impacts will be reduced or avoided in order to achieve no net loss of biodiversity.

- The establishment and continued presence of the transmission lines is unlikely to, but could, have a minor to moderate impact on migratory birds and bats due to collisions with the conductors, especially in areas where the transmission line crosses the valleys of Panj River tributaries. Throughout the two- or three-year construction period, Pamir Energy will appoint one or more experts to monitor these areas during the spring and autumn migration periods to determine if migrating birds cross the corridor, and if so whether they are likely to be at an altitude that could lead to collisions in the future, and also whether bats pass the corridor in migration or in normal feeding patterns. If, in the opinion of the expert, there is a significant risk of future mortality due to collisions, Pamir Energy will install so-called “bird diverters” at intervals on transmission lines at valley crossings to discourage perching and loafing, and to discourage birds from approaching the line. In addition, if birds of conservation concern are considered to be at significant risk, Pamir Energy will prepare a “Biodiversity Management Plan” that identifies measures that must be taken to achieve no net loss of biodiversity. If bats are determined to be at risk, Pamir Energy will take measures recommended by the expert to reduce bat collisions. (It is noted that all bats known to occur in the area are not species of conservation concern, unlike in Europe and many other countries.)

The presence of the energized transmission lines could have a minor to moderate impact if large birds (primarily raptors and cranes) land on them and are electrocuted. For the entire line, the contractor’s design will require that conductors (lines) and insulators be spaced so as to prevent electrocution by the bird with the largest wingspan that is likely to be present (approximately 2.5 meters for the Himalayan vulture).

- Cutting mature trees could have a minor to moderate adverse impact on bats that may hibernate in tree hollows and on bats and owls that roost and/or nest in hollows, and other raptors that nest in the trees. As noted above, the final locations of towers will make every effort to avoid or minimize the need to cut trees. If it cannot be completely avoided, however, the surveys described above will include identification and documentation of mature trees that have active or previously used hollows and nests in and near tower locations and also those that need to be cut back. If trees that have active nests are found within 0.5 kilometer of the corridor, construction and other activities within 200 meters of nests will be delayed until at least 30 days after young birds and bats fledge and leave the nest. If an old nest is found, another survey will be completed immediately before

construction to determine if the nest has become active; if it has, the same delay will be required. For every tree with a hollow where bats are found, or where there is evidence of past presence, at least two “bat boxes” or “bat houses” suitable for bat roosting and nesting will be installed at locations recommended by a qualified expert, if possible within 50 meters of the tree that was cut. These requirements will be recorded in the report that is prepared following implementation of the “Flora, Fauna, and Habitat Survey Plan” noted above.

- Construction of towers, access roads, and ongoing maintenance activities could have a minor adverse impact on fauna in due to disturbance of individual animals as well as possible (but unlikely) destruction of dens, nests, and foraging habitat. The surveys describe above will include a qualified expert to identify whether fauna could be adversely affected, and if so the report summarizing the surveys will include feasible measures to reduce the impacts. If breeding bird species of conservation concern are determined to be at risk, construction will be delayed until after young birds have fledged and additional surveys will be conducted to verify the absence of risk before construction continues.
- Construction workers would be exposed to significant health and safety risks, as are all construction workers. Employers will be required to provide equipment and materials that are sufficient to provide a safe working environment, and to provide, at no cost to workers, personal protective equipment. In addition, workers will be trained in the risks of their jobs and how to protect themselves from injury or death. Requirements will be recorded in materials that will be submitted with bidders’ proposals that outline the bidders’ safety procedures so that Pamir Energy will be able to consider bidders’ commitment to safety in evaluating proposals. Following contract award, the contractor(s) will prepare a Worker Health and Safety Plan, which will be finalized before construction begins and updated as needed throughout construction. In addition, Pamir Energy is required to update its own safety procedures, including supervision of construction contractors, and to review its Human Resources program to verify it meets the requirements of World Bank Environmental and Social Standard 2 and Tajikistan law.
- As noted, Pamir Energy will require the design contractor to place towers so the corridor avoids household plots with occupied houses and to the extent possible avoids other buildings and arable land. For other land where current users (with or without legal rights) will lose the right to use the land, Pamir Energy will consult with households in accordance with Tajikistan law and the Resettlement Policy Framework (and ultimately with a future Resettlement and Compensation Action Plan), with compensation and/or land agreed to by the user. Overall, the RAP will require that no people who are affected by the project be worse off financially/economically due to construction and operation of the line and substation. If compensation or replacement land is necessary, it will be complete before construction begins.
- Construction and/or future maintenance activities could damage crops, herds, or other property and thus have a minor to major impact on subsistence farmers and herders. This will be avoided or reduced by adherence to best management practices and required mitigation measures for vehicle movements and tower construction activities, and further mitigated by prompt compensation in accordance with the future RAP. As required by the RAP, vulnerable households will receive additional assistance and compensation to overcome any disproportionate impacts.

As noted above, most adverse impacts that are minor or negligible will be reduced or avoided altogether by the use of good international industry practices and required mitigation measures. The more serious potential impacts described above will be avoided or reduced to acceptable levels by implementation of the mitigation measures. Avoidance strategies, mitigation measures, and best management practices are presented as part of the Management and Monitoring Program in Chapter 6.

Table 18. Summary of potential impacts and significance

Receptor	Sensitivity of Receptor	Potential Impact	Description of impact	
			Magnitude & duration of impact	Significance
Landscapes and visual				
Residents	Medium	Disturbance to current landscape views due to construction, vegetation corridor in forests, and presence of towers and conductors	Low permanent	Minor adverse
Residents near substation	Low	Disturbance to current views of agricultural land due to construction, towers, conductors, and substation	Low permanent	Negligible adverse
Tourists	Medium-High	Disturbance of natural views due to construction and transmission line	Low permanent (temporary for individuals)	Minor adverse
Travelers along road	Low	Disturbance of natural views due to construction, vegetation corridor and transmission line	Very low temporary	Negligible Adverse
Land use				
Residential areas	High	Relocation and demolition of houses and buildings in 45-meter protection zone	No change	None
Fragmented forest areas & Orchards	Medium-High	Land clearing at towers and substation, vegetation cut to <4m under line, vegetation cleared at tower locationsites and substation	Medium permanent	Moderate adverse
Arable land used for annual crops and grass/hay	Medium	Loss of land at tower locations and substation	Minor permanent	Minor adverse
	Medium	Damage and crop loss during construction and maintenance	Minor permanent	Minor adverse
Grazing land (vegetated)	Low	Loss of land at tower locations and substation, no other restrictions on use	Low permanent	Negligible adverse
Barren rocky land	Low	Loss of and at tower locations and substation	Low permanent	Negligible adverse
Other land (developed)	Low	Loss of land at tower locations and substation	Very low permanent	Negligible adverse
Soils and geomorphology				
Ground surface (rock & soil) at towers on steep and moderate slopes with soil	Medium-high	Potential significant erosion of soil, impaired ability to support vegetation, increased landslides and mudflows	Medium temporary or permanent	Moderate to Major adverse
Ground surface on slight slopes and flat land with soil	Low-Medium	Slight to moderate erosion of topsoil, impaired ability to support vegetation	Medium temporary or permanent	Moderate adverse

Receptor	Sensitivity of Receptor	Potential Impact	Description of impact	
			Magnitude & duration of impact	Significance
Air quality				
Residents and visitors	Medium-High	Fugitive dust generation during construction and maintenance	Low temporary	Minor adverse
		Vehicle emissions during construction and maintenance	Very low temporary	Negligible adverse
		SF6 emissions during operation of substation	Very low permanent	Negligible adverse
		Ozone and NOx emissions during operation of transmission line	Very low permanent	Negligible adverse
Noise				
Residents and visitors along corridor	High	Line & road construction noise	Low temporary	Moderate adverse
Residents and visitors near substation	Medium to Low	Construction and transformer/switchgear/line noise	Very low temporary	Negligible adverse
Water resources				
Panj River	Medium to High	Sedimentation of streams from erosion due to compaction and soil disturbance	Very low temporary	Negligible adverse
		Contamination from spills	Very low temporary	Negligible adverse
		Contamination from herbicide use	No change	None (n/a)
Small streams and drainageways	High	Sedimentation of streams from erosion due to compaction, soil disturbance, rutting, road crossing	Medium temporary	Minor adverse
		Disruption of flood flows	Low temporary or permanent	Negligible adverse
		Contamination from spills	Low to Medium temporary	Minor adverse
		Contamination from herbicide use (none will be used)	No change	None (n/a)
Groundwater	High	Reduced recharge due to compaction of soil	Very low temporary	Minor adverse
		Contamination from spills	Very low permanent	Minor adverse
		Reduced availability due to withdrawals (there will be none)	No change	None (n/a)
Climate				
Climate	Low-Medium	Increased greenhouse gas emissions (CO2, SF6)	Very low permanent	Negligible adverse

Receptor	Sensitivity of Receptor	Potential Impact	Description of impact	
			Magnitude & duration of impact	Significance
Flora				
Common trees and shrubs species	Medium	All trees and vegetation cleared at towers and substation, cut back to <4m under line	Low to very low permanent	Minor adverse
Fruit & nut trees (orchards)	High	All trees cut at towers, construction zones, access roads, substation Trees >1-4m cut in corridor	Low permanent	Minor adverse
Habitat				
Critical habitat	High	Loss of critical habitat	No change	None
Natural habitat	Medium	Loss of natural habitat	No change	None
Modified habitat (high-value for biodiversity)	Medium	Loss of modified habitat of high value to biodiversity	No change	None
Modified habitat (limited biodiversity value)	Low	Loss of modified habitat of limited value to biodiversity	Low permanent or temporary	Negligible adverse
Fauna				
Common species of terrestrial fauna	Medium-low	Animal death due to crushing or direct impact	Very low permanent	Negligible adverse
		Abandonment of home territories due to construction disturbance	Low temporary	Minor adverse
		Nest abandonment/disruption of breeding animals due to construction disturbance	Low temporary	Minor adverse
		Change in species composition due to change from tall trees to lower vegetation	Very low permanent	Negligible adverse
		Worker interference with animals or nests	Low temporary	Minor adverse
Terrestrial fauna of conservation concern	High	Death of animals of conservation concern	No change	None
Owls and bats	High	Loss of hibernating and nesting places in mature trees or buildings	Low permanent	Moderate adverse
Migratory birds (raptors, waterfowl), bats	Low-medium	Death or injury due to collision with line	Very low permanent	Minor adverse
Large birds (raptors, etc.)	Medium	Death due to electrocution	Low permanent	Minor adverse
Community health and safety				
Community	Medium	Worker influx: community disruption, crime, etc.	Low temporary	Minor adverse
		Direct impacts: pressure on services, emergencies, etc.	Very low temporary	Negligible adverse

Receptor	Sensitivity of Receptor	Potential Impact	Description of impact	
			Magnitude & duration of impact	Significance
Community members (individuals)	High	Disease	Very low temporary	Minor adverse
		Violent behavior (including GBV)	Low temporary	Moderate adverse
		Nuisance and safety: noise, dust, etc.	Low temporary	Moderate adverse
		Accidents, emergencies	Low temporary	Moderate adverse
		EMF	Very low permanent	Minor adverse
Physical and economic displacement				
Households in protection zone and at substation	High	Physical displacement / relocation	No change	None
Land users (with or without rights)s	Medium-high	Permanent loss of land at tower locations and substation	Medium permanent	Moderate adverse
		Temporary loss of land for construction purposes (paths, storage, etc.)	Low temporary	Minor adverse
		Restriction on land use under line	Very low permanent	Negligible adverse
Private wood users	Medium	Loss of wood resource	Low permanent	Minor adverse
		Wood from cut trees donated for personal use	Low temporary	Minor positive
Property owners	Medium	Loss of property, assets, animals due to construction or maintenance accidents	Low temporary	Minor adverse
Worker health, safety, and welfare				
Workers (contractors and subcontractors)	High	Poor labor management practices	Medium temporary	Moderate to major adverse
		Unsafe working conditions (failure to implement Safety Plan)	High permanent or temporary	Major adverse
		Inability to express concerns	Medium temporary	Moderate adverse
		Substandard accommodations (If required)	Medium temporary	Moderate adverse
		Unsanitary conditions (illness, disease, etc.)	Medium temporary	Moderate adverse
Economic conditions				
Income	Low	National and regional income due to increased employment	Very low temporary	Negligible positive
	Medium	Local income due to increased employment	Low temporary	Minor positive
	Medium	Increased income by local suppliers	Low temporary	Minor positive

Receptor	Sensitivity of Receptor	Potential Impact	Description of impact	
			Magnitude & duration of impact	Significance
Key economic sectors	Low-high	More reliable power supply	High permanent	Moderate positive
		Reduced agricultural output	Very low temporary	Negligible adverse
		Reduced tourism	Very low temporary	Negligible adverse
Infrastructure	Low-medium	Damaged public roads	Low temporary	Minor adverse
Cultural heritage				
Items of cultural importance	High	Worker disruption	Very low temporary	Minor adverse
		Direct impacts	Very low permanent	Minor adverse
Chance finds	High	Damage or destruction of an archaeological site or individual artifacts	Very low permanent	Minor adverse
			Very low permanent	Minor adverse

6. Environmental and Social Management and Monitoring Program

Table 19 describes and outlines the Environmental and Social Management Program/Plan (ESMP) for the project. It has been developed to clearly identify measures that must be implemented to avoid, reduce, or otherwise mitigate potential impacts of moderate or major significance (see Table 18). It also identifies best management practices (BMPs) and other mitigation measures that will minimize, reduce, or eliminate many of the impacts of minor or even negligible significance which could escalate to become more important if they are not handled properly.

It is expected that mitigation measures will be sufficient to reduce all risks to acceptable levels. In many cases, the ESMP requires development of detailed plans to manage specific risks and hazards and includes an overview of the relevant requirements of those plans. Primary responsibility for implementing mitigation measures during construction will rest with the contractors, although Pamir Energy will have responsibility for some of the actions and for supervising the contractors. Pamir Energy may oversee contractor performance, in which case they would have immediate responsibility for approving plans and supervising construction, or they may elect to appoint a Supervision Consultant (variously known as the Engineer, Consultant, Consulting Engineer, Owner's Engineer, or other names) to approve the contractor's environmental and social management plans and oversee environmental and social performance of construction contractor(s)

It is important to note that Pamir Energy, in part through its contractors, will also be responsible for complying with relevant requirements of Tajikistan laws, the World Bank Environmental and Social Framework, the World Bank Group's General Environmental, Health, and Safety (EHS) Guidelines, and the EHS Guidelines for Electric Power Transmission and Distribution, which may have more detailed requirements than the Plan presented here.

The ESMP table is organized as follows:

- Section 1.0 includes measures for the procurement phase (that is, the process by which Pamir Energy will select the contractors).
- Section 2.0 includes measures to be implemented during the project preparation stage, between the time the design contractor is appointed, and the time that construction contractors mobilize to the field. This will include employing workers and specialists, developing detailed plans, conducting surveys, selecting final sites for the construction areas, substation, corridor, and towers, and then establishing initial access roads, construction storage and preparation areas, and camps.
- Section 3.0 includes measures during construction, which for the transmission line will include installation of foundations, erection of towers, vegetation clearing, and conductoring; and for the substation will include excavation, concrete works, and installation of breakers, transformers, and possibly a control room (yet to be determined).
- Section 4.0 includes measures to be implemented during demobilization by the contractor, either at the end of each construction season or at the end of construction.
- Section 5.0 includes measures to be implemented by Pamir Energy during operation and maintenance of the line and substations.
- Section 6.0 includes measures that must be implemented during all phases of all activities that could have an impact on environmental or social resources.

Following this table of mitigation measures, 0 provides the Environmental and Social Monitoring Plan (or Program). This Plan is necessary to ensure there is close scrutiny over actual environmental and social performance so that prompt action can be taken if mitigation measures are not being implemented or if the measures are not adequately mitigating actual impacts. The objectives of the monitoring program are to:

- Meet Tajikistan legal, World Bank, Pamir Energy and community obligations
- Identify project impacts during preconstruction, construction, demobilization, and operation
- Verify that mitigation measures are being implemented as required
- Evaluate the effectiveness of mitigation measures and identify any shortcomings
- Allow refinement and enhancement of mitigation measures if needed to further reduce impacts
- Allow development of mitigation measures to deal with unforeseen issues or changes in operations
- Allow Pamir Energy, Government authorities, and the World Bank to verify that their respective requirements are being met.

The total cost for implementation of the measures called for in the Environmental and Social Monitoring Plan/Program in Table 19 is \$214,000, with most costs during the construction phase.

Pamir Energy and/or a Supervision Consultant will oversee the two (or more) design and construction contractors to ensure these companies, their subcontractors, and all workers are fully implementing the proper mitigation measures during the preconstruction, construction, and demobilization phases. These measures include training workers so they are familiar with their own responsibilities as well as their employer's. The first level of monitoring during construction will be conducted by the contractor in routine management of ongoing activities. This will be supplemented by nearly continuous monitoring by Pamir Energy project management (or a Supervision Consultant) and somewhat less frequent monitoring by Pamir Energy corporate management and by the World Bank. In addition, there will be at least one third-party audit during construction and another before the contractor has completed demobilization. During operations, there will be many fewer activities that could result in significant impacts, so monitoring will be less intense, with monitoring conducted by Pamir Energy or various Government agencies, with periodic reviews by the World Bank.

The total cost of the Environmental and Social Monitoring Plan in Table 20 is estimated to be about \$37,500 over the life of the project, with most costs during construction.

Table 19. Environmental and social management plan for the Khorog to Qozideh transmission line and Qozideh substation

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
1.0 Procurement Phase						
1.1	Preparation of bidding documents for design of transmission line	Failure to optimize design to avoid impacts on people and environment	As required by World Bank Standard Procurement Documents, include relevant documentation (ESIA, RPF, SEP, ESCP) in procurement documents. Include the following in work requirements: <ul style="list-style-type: none"> – Avoid household plots with occupied houses or buildings – Where feasible, avoid placing towers on arable land used for crops, hay, and orchards – Spacing to avoid electrocution of large birds (>2.5m spacing) – Where feasible, align corridor to avoid the need to cut back trees, including orchards 	<ul style="list-style-type: none"> – Designer understands need to minimize impacts – No physical displacement and minimal economic displacement 	Pamir Energy World Bank (approval)	\$1000
1.2	Preparation of bidding/ procurement documents for transmission line construction	Failure of bidders to recognize E&S requirements, to plan for E&S management, and to incorporate E&S requirements in proposals and planning	As required by World Bank Standard Procurement Documents, include relevant documentation (ESIA, RPF, SEP, ESCP) in procurement documents, for construction contracts and require proposals to include the following plans as part of Management Strategies and Implementation Plan: <ul style="list-style-type: none"> – Occupational health and safety plan – Land management and erosion control plan – Worker Code of Conduct and Grievance Redress Mechanism Define key personnel to include, for the project (that is, not corporate-level): <ul style="list-style-type: none"> – E&S manager – Safety manager – Biodiversity specialist (as required) – Community liaison/social specialist – HR manager 	<ul style="list-style-type: none"> – Bidders understand E&S requirements and prepare responsive proposals – Higher E&S capacity by bidders – Realistic proposals 	Pamir Energy World Bank (approval)	\$1000
1.3	Preparation of bidding/ procurement	Failure of bidders to recognize E&S requirements, to plan for E&S	As required by World Bank Standard Procurement Documents, include relevant documentation ESIA RPF, SEP, ESCP) in procurement documents, and	<ul style="list-style-type: none"> – Bidders understand E&S requirements and prepare responsive proposals 	Pamir Energy	\$1000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
	documents for substation construction	management, and to consider E&S requirements in cost proposal	require proposals to include the following plans as part of Management Strategies and Implementation Plan: <ul style="list-style-type: none"> – Community health and safety plan – Occupational health and safety plan – Worker Code of Conduct and Grievance Redress Mechanism Define key personnel to include, for the project (that is, not corporate-level):: <ul style="list-style-type: none"> – E&S manager – Safety manager – Community liaison/social specialist – HR manager 	<ul style="list-style-type: none"> – Higher E&S capacity by bidders – Realistic proposals 	World Bank (approval)	
1.4	Review and evaluation of proposals	Failure to consider bidders' E&S qualifications and experience in scoring proposals	<ul style="list-style-type: none"> – Inclusion of E&S specialist(s) in proposal review team, with sufficient time provided for evaluation – Awareness by entire evaluation team of key E&S requirements – Scoring includes corporate E&S experience and qualifications, E&S staff experience and qualifications and evaluation of management plans in MSIP – Recognition of unqualified bidders 	<ul style="list-style-type: none"> – Bidders' E&S qualifications and experience receive full consideration in evaluations – Bidders disqualified for poor safety record, inadequate E&S qualifications and experience, or inadequate MSIP (that is, inadequate understanding of requirements) 	Pamir Energy	\$500
1.5	Selection of contractors	Selection of contractor unqualified and/or unprepared to implement ESMP full C-ESMP	<ul style="list-style-type: none"> – MSIP plans sufficient to avoid or control impacts – Key staff qualified and available – Award only to contractors with E&S qualifications and experience that meet specific criteria 	<ul style="list-style-type: none"> – Award to contractor able to implement this ESMP – Contractor ultimately implements ESMP satisfactorily – Fewer delays in project preparation and construction 	Pamir Energy World Bank (approval)	Nominal
2.0 Project preparation						
2.1	Implementation of Stakeholder Engagement Plan (SEP)	<ul style="list-style-type: none"> – Uninformed local people and other stakeholders – Unrealistic expectations by local people and others 	<ul style="list-style-type: none"> – Outreach to identified stakeholders – Realistic information on employment opportunities – Meetings with community leaders and citizens as appropriate – Implementation of Grievance Redress Mechanism 	<ul style="list-style-type: none"> – Well-informed supportive community – Realistic expectations 	Pamir Energy manages overall program and deals with	\$2000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
		<ul style="list-style-type: none"> – Long-term distrust of contractors and Pamir Energy – Protests or other disruptions – Vandalism 	<ul style="list-style-type: none"> – Train project personnel (Pamir Energy, contractors, etc.) in relevant requirements of SEP, including receiving and reporting grievances 	<ul style="list-style-type: none"> – Trust of contractor and Pamir Energy to resolve issues – Timely resolution of grievances 	<p>high-level grievances</p> <p>Contractor implements on day-to-day basis during construction</p>	
2.2	Management of E&S issues	<ul style="list-style-type: none"> – Failure to hire qualified specialists with sufficient time to manage issues – Excessive E&S impacts due to mismanagement or failure to manage E&S issues 	<ul style="list-style-type: none"> – Assign key E&S personnel defined in items 1.2 (transmission line) and 1.3 (substation) and provide sufficient time to perform duties – Employ and train sufficient safety officers: at least one per work crew and overall ratio of at least 1 per 50 workers – Train managers and supervisors/foremen in key requirements for E&S mitigation (i.e., this ESMP and monitoring plan) – Develop checklists for use by E&S staff to record findings – Develop templates for monthly E&S reports to Supervisions Consultant – Develop templates for investigating and addressing root cause of serious incidents /injuries/accidents – Develop registers for recording grievances from external stakeholders and from workers 	<p>Qualified staff in sufficient numbers to implement/oversee C-ESMP</p>	Contractor	\$5000
2.3	<p>Complete Contractors' Construction ESMP (C-ESMP) by preparing/ updating;</p> <ul style="list-style-type: none"> – Materials and Waste Management Plan – Land Management and Erosion Control – Community Health and Safety Plan – Labor Management Procedure. 	<ul style="list-style-type: none"> – Contractor begins works without programs to avoid or minimize impacts on human and environmental resources: – Unsafe vehicles, accidents – Damage to protected flora – Subcontractor E&S performance not managed – Noise disturbances to communities – Community disruption, violence, crime, disease due to worker influx 	<ul style="list-style-type: none"> – Plans prepared by qualified E&S specialists and project managers – Supervision Consultant to review and approve all C-ESMP plans and procedures, including C-MSIP plans that had been submitted in contractor's proposal – All plans reviewed and ultimately approved by qualified experts – Awareness-raising sessions on GBV conducted for all workers – Code of Conduct adopted, acknowledged and signed by all workers on site (Contractor, Sub-Contractors, Supervisor, as applicable) 	<ul style="list-style-type: none"> – No activities undertaken without underlying procedure or plan to protect E&S – Comprehensive contractor program for avoiding and minimizing impacts – Subcontractor compliance with plans – All activities in accordance with C-ESMP – No unacceptable or unpredictable impacts 	<ul style="list-style-type: none"> – Contractor (prepare) – Supervision Consultant (approve) – Pamir Energy to review 	\$12000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
	<ul style="list-style-type: none"> - Refueling and Spill Prevention Plan - Worker Occupational Health and Safety Plan (finalize MSIP draft) - HR Manual (finalize MSIP draft) - Worker Code of Conduct (finalize MSIP draft) - Chance find procedure Develop detailed method statements on: <ul style="list-style-type: none"> - Traffic management - Emergency response; - Flora, fauna, and habitat survey required for finalization of design; - Working in or near surface water bodies; - Explosives and blasting (if explosives are to be used) - Worker accommodation and work camp management 	<ul style="list-style-type: none"> - Unsafe and/or unsanitary accommodations 				
2.4	Conduct detailed geotechnical study to identify high-risk locations	<ul style="list-style-type: none"> - Foundations placed on unstable ground - Tower collapse - Landslides and/or severe erosion 	Implement geological study to identify measure to avoid or overcome unsafe/unstable locations results and recommendations to avoid high-risk locations	Stable towers on stable ground	Design contractor	\$10000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
2.5	Prepare and implement biodiversity and cultural heritage survey plans	Unplanned impacts on biodiversity or cultural resources	<p>Appoint qualified consultants to prepare and implement survey plans. Biodiversity survey plan to require, for entire corridor and substation site:</p> <ul style="list-style-type: none"> - Qualified expert to prepare and implement, during spring or summer - Identification of trees that will need to be cut down or cut back. Location for replacement trees - Identification of trees and buildings with bat roosts, hibernation sites, breeding pairs - Identification of trees with owl or raptor nests - Presence of birds or other fauna of conservation concern and assessment of likelihood of adverse impact - Identification of nesting and breeding birds and other fauna - Plan for planting 2+ trees for every one cut, for placing bat boxes for every bat location affected - Requirement to delay or change activities so there will be no impact on species of conservation concern, including delays to avoid breeding seasons if necessary - Detailed recommendations for the these and other appropriate mitigations as needed - Timeframe for implementation of mitigations <p>Cultural heritage survey plan for entire corridor and substation site, to include:</p> <ul style="list-style-type: none"> - Qualified expert to prepare and implement - Consultations with village leaders and residents and with regional/national experts to identify locations/items of value to communities or of historic/prehistoric interest - Survey to verify consultations and identify artifacts and historic/prehistoric heritage - Program to avoid impacts on locations with cultural value 	<ul style="list-style-type: none"> - Minimal impacts on biodiversity, no impact on species of conservation concern - No impacts on cultural heritage 	Pamir Energy	<p>Prepare: \$2000</p> <p>Implement: see 3.2</p>
2.6	Develop and implement Resettlement Action Plan (RAP) based on	- All Project Affected Persons (PAPs) not identified	- Appoint qualified consultant to develop RACP	- Physical and economic displacement compensated	Pamir Energy	\$25000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
	Resettlement Policy Framework (RPF)	<ul style="list-style-type: none"> – All physical and economic displacement not compensated or replaced – Inadequate compensation – Violations of Tajikistan law and/or World Bank ESS5 for land take and compensation – Hardships for PAPs prior to compensation – Degradation of PAP livelihoods or living standards – Loss of community support 	<ul style="list-style-type: none"> – Based on final design/locations, identify PAPs and impacts, identify vulnerable people, land ownership, land use, valuations, etc. – Consult with PAPs – Consult with authorities on valuation and compensation – Acquire rights to land for towers and substation, provide compensation or like-for-like replacement for physical and/or economic displacement prior to displacement occurring 	<ul style="list-style-type: none"> – at replacement cost or more, or like-for-like compensation – RAP implementation meets requirements of ESS5 – Affected people are fully compensated for losses at replacement value or land-for-land – Compensation paid to all PAPs prior to issuing authorization to proceed to contractor – Participation by authorities and PAPs in process – Community support 	World Bank (RAP approval)	
2.7	Recruit and employ workers and subcontractors	<ul style="list-style-type: none"> – Unqualified workers and/or subcontractors – Poor labor practices (substandard pay, uninformed workers, unsafe conditions, etc.) – Excessive staff turnover 	<ul style="list-style-type: none"> – Implement Contractor’s Labor Management Plan (LMP) – Preference for local hiring, with PAPs given preference (50% local) – No employees under age 18 – Written contracts with workers, per LMP and Tajik law – Other provisions per Labor Code of Tajikistan – Subcontracts include and require compliance with contractor’s LMP and law – Subcontracts include and require compliance with C-ESMP – Workers receive full induction training 	<ul style="list-style-type: none"> – Maximum hiring of PAPs and other locals.; At least 50% of workforce from local population – Workers employed in compliance with law (nondiscrimination, equal opportunity, income, etc.) – Low staff turnover 	Contractor	\$1000
2.8	Establishment of construction camps/laydown areas, storage areas, footpaths, quarries/borrow areas, etc. and other land contractor may need for temporary use/possession	<ul style="list-style-type: none"> – Contractor trespasses on land – Placement of construction zones in inappropriate locations (excess tree-cutting, too close to residents, etc.) – Impacts outside boundary of designated area – Unrecorded damage to biodiversity 	<ul style="list-style-type: none"> – No ground disturbance until C-ESMP approved – Implement C-ESMP requirements for noise, fuel and hazardous materials, noise, worker safety, and community safety, etc., including worker training – Reach written agreements with land users prior to undertaking activities on their lands – Implement recommendations from biodiversity and cultural heritage surveys – Train/warn workers to remain within boundaries and penalize for violations 	<ul style="list-style-type: none"> – Compliance with approved C-ESMP – No unexpected or unacceptable impacts – All work within marked boundaries – Minimal disruption to breeding fauna – Minimal disruption to bats and owls 	Contractor	Included in 3.2

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
		<ul style="list-style-type: none"> - Excess damage to topsoil/subsoil, vegetation cover, erosion, spills and soil/water contamination, impacts on communities 	<ul style="list-style-type: none"> - Maximize use of existing paths and disturbed areas - Consult with roads authority concerning Traffic Management Plan and damages to public roads - Prevent/minimize movement of vehicles and equipment on unpaved roads in wet conditions - Plant 2+ trees for every one cut, place bat boxes for bat roosts disturbed, avoid disturbance of breeding/nesting fauna and birds of conservation concern - Minimize cutting of mature trees and trees of conservation concern: maintain log of all trees cut - Maintain photographic and written log of plants of conservation concern that are cut <p>Implement Land Management and Erosion Plan, including at a minimum:</p> <ul style="list-style-type: none"> - To extent possible, avoid landslide-prone areas and areas with severe erosion potential - Establish and mark boundaries of construction zone - Keep all activities inside boundaries - Strip and store topsoil within boundaries, protect from erosion - Store excavated subsoil separately, protect from erosion - Install drainage control as needed to control erosion that would affect off-site - Place gabions, walls, silt fences or other measures as necessary to prevent erosion from leaving construction areas 	<ul style="list-style-type: none"> - Minimal disruption to fauna and flora of conservation concern - Minimal disruption to traffic - Wood and flammable debris material removed before it becomes a fire hazard - 		
2.9	Establishment of accommodations, kitchens, sanitary facilities	<ul style="list-style-type: none"> - Worker illness or death - Worker dissatisfaction and lower productivity - Contamination of land and water 	<ul style="list-style-type: none"> - If accommodations are to be provided, comply with ESS2/IFC/EBRD guidance "Workers' Accommodation: Processes and Standards" - Develop and use operating and maintenance checklists for operation of canteens/kitchens - Appoint persons to be responsible for cleanliness of accommodations, kitchens, canteens, break areas, etc. 	<ul style="list-style-type: none"> - Sanitary and compliant facilities and amenities - Healthy workers - Toilets in place where needed 	Contractor	\$2500

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
			<ul style="list-style-type: none"> – Provide toilets at or near all work locations, establish and enforce rules prohibiting workers from using the bush 			
2.10	Identify risks to migratory birds and large birds	<ul style="list-style-type: none"> – No knowledge of potential risks to birds from collisions – Bird mortality due to collisions 	<ul style="list-style-type: none"> – Appoint expert to develop program to monitor passage of raptors and waterbirds in Panj and tributary valleys – Appoint consultant(s) to implement monitoring program during at least two spring and autumn migration periods, beginning in 2019 – Based on results, expert to prepare summary report that includes recommendations on (a) if bird diverters (spinners, flashers, etc.) should be installed at valley crossings to reduce significant risk of collisions and (b) if additional monitoring is needed before final recommendations can be made. – Require “electrocution-resistant” towers, with minimum distance between energized conductors and ground of at least 2.5 meters 	<ul style="list-style-type: none"> – Expert appointed and monitoring program developed – Consultants appointed and program implemented – Results reviewed and recommendations developed – Recommendations implemented (no action, continue monitoring, or install diverters) – No electrocution of large birds 	Pamir Energy	\$12000
3.0 Construction phase						
3.1	All activities, beginning with fieldwork during preparation phase	<ul style="list-style-type: none"> – Worker injury or death – Damage to vegetation, land, property outside construction zone 	<p>Implement Occupational health and Safety Plan, including:</p> <ul style="list-style-type: none"> – Medical clearance for workers to perform their tasks – Assessment of risks and identification of mitigation measures for all tasks, with PPE as last resort – Design tasks for maximum safe operations – Workers provided with proper equipment and tools, and PPE, to accomplish tasks safely – Only trained workers allowed to complete tasks – Safety Officers oversee all works (minimum 1 per crew and 1:50 workers overall) – Sufficient First Aiders to provide first-level medical care as needed – Fully supplied first aid kits in all vehicles and equipment and at all workplaces 	<ul style="list-style-type: none"> – Tasks completed with no worker injuries or deaths – Tasks completed with no damage to vegetation, land or property outside construction zone 	Contractor	\$10000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
			<ul style="list-style-type: none"> - Communications established with nearest medical facilities and personnel regarding works to be completed, arrange for support as appropriate - Record safety statistics (work hours, near misses, minor & incidents and accidents, fatalities) - Worker transport (passenger vehicles only, no riding on heavy equipment, wear safety belts, etc.) - Work within boundaries, penalize supervisors and workers for violations - Install physical barriers at deep excavations to prevent accidents Implement Traffic Management Plan, to include: <ul style="list-style-type: none"> - Drivers/operators licensed for vehicles and equipment - Driver trained as needed and tested - Vehicles properly licensed/registered - Vehicles/equipment checked for safety daily by drivers/operators (horns, tires, fire extinguisher, headlights and taillights, safety belts, intact glass, etc.) - Speed limits established and enforced - Require special precautions for sensitive areas (hospitals, schools, etc.) - Keys never left in vehicle/equipment when driver/operator not present - Consultations with roads authorities concerning use of public roads (timing, locations, etc.) - Trained flaggers and/or signs/signals placed on public roads to control traffic at locations where roadside work not visible for 0.5km Mark boundaries of construction zone before operations			
3.2	Implement other relevant C-ESMP plans as part of all activities (see 2.3)	Excessive impacts on people and environmental resources	Management of activities as planned to avoid or minimize potential impacts on people and environment	<ul style="list-style-type: none"> - Implementation of mitigation measures - Adaptive management for unexpected impacts 	Contractor	\$105000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
				– Compliance with law and ESSs		
3.3	Manage contractor(s)	– In adequate or incomplete implementation of E&S requirements	– Include evaluation of E&S performance in decisions on payment of invoices for work completion=	Full implementation of E&S requirements	Pamir Energy	\$2500
			– Pay 100% of milestone completion invoices when E&S requirements have been implemented as required, reduce payment if requirements are not implemented			
3.4	Manage subcontractors	– Subcontractors not aware of E&S requirements – Poor labor practices and poorly trained workers – Failure to implement C-ESMP – Poor E&S performance, including safety, leading to environmental impacts, impacts on local communities, and worker injury or death	– Include relevant portions of C-ESMP in procurement documents and subcontracts – Require compliance with contractor’s LMP safety, and other requirements, or equivalent requirements approved by contractor – Supervision of C-ESMP implementation by contractor and Pamir Energy (or Supervision Consultant) – Structure milestone payments to include C-ESMP implementation and withhold payments for failure to comply	– Subcontractor implementation of C-ESMP – No unacceptable E&S impacts	Contractor	\$2500
3.5	Land clearing at tower locations, construction zones (tree & vegetation cutting, land clearing, excavations, earthworks in some places, equipment/building placement, etc.)	– Worker injury or death – Excess damage to surrounding areas, including biodiversity and private land and property – Excessive erosion – Landslides	– Implement chance find procedure if artifacts or heritage discovered – Train workers and implement Occupational Health and Safety Plan, including requirements for working with machinery and tools, working on steep slopes, animal/plant hazards, working in hot or cold environments, etc. – Agree with communities how debris/wood will be managed, with preference for donation to PAPs – To extent possible, micro-locate construction boundaries to minimize cutting/clearing flora of conservation concern Implement Land Management and Erosion Control Plan including at a minimum: – Mark and stay within boundaries of construction zones and paths – Train/warn workers to remain within boundaries, penalize supervisors and workers for violations	– Minimum biodiversity damage due to land clearing – No damage outside boundaries – Limited damage to ground surface and root zone – Survey completed, trees and shrubs marked – Bat box placement and tree/shrub plantings completed as required	Contractor	Included in 3.2

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
			<ul style="list-style-type: none"> - Strip and store topsoil and subsoil/spoil in separate piles within construction boundaries, protect from erosion - Install drainage control as needed to control erosion that would affect off-site areas - Restore disturbed areas per Plan Implement recommendations from biodiversity surveys, including <ul style="list-style-type: none"> - If surveys detect hibernating bats or nesting owls, bats, or raptors in mature trees, delay construction/clearing activities within 150m until after bats have left roost and/or young bats, raptors, and/or species of conservation concern have left nests - If surveys identify breeding or nesting fauna of conservation concern in or within 100m of construction zone, postpone disturbance within 100m until young have left the nests - Maintain photographic and written log of plants of conservation concern that are cut - Place 2+ bat boxes for every mature tree with evidence of bat hibernation/roosting/ nesting, within 50m of tree that was cut - Plant 2+ trees of same species for every tree that is cut - Do not cut trees to the ground but leave as much of the trunk as possible, at least 1-4mm - Do not cut shrubs if they are less than 4m high 			
3.6	Vegetation clearance under line	<ul style="list-style-type: none"> - Excessive impact on biodiversity (flora, fauna, habitats) - Excessive erosion - Landslides 	<ul style="list-style-type: none"> - Implement recommendations from biodiversity surveys (as above) - Cut as little of trees as necessary to maintain clearance through maintenance period - Agree with communities or owners (as appropriate) as to disposition of wood, with preference for giving to PAPs - No use of herbicides 	<ul style="list-style-type: none"> - Minimal impact on biodiversity, no excess vegetation cleared - No direct impacts off-site - Minimal erosion, no landslides - Restored land 	Contractor	Included in 3.2

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
3.7	Excavations of tower foundations and substation footings	<ul style="list-style-type: none"> - Worker injury or death - Excessive soil and spoil removed 	<ul style="list-style-type: none"> - Train workers and supervisors in Occupational Health and Safety Plan (as above), in particular: <ul style="list-style-type: none"> - Working in/near excavations/ confined spaces - Workers trained in use of all tools and equipment - Use of harnesses on towers and extremely steep slopes - Implement relevant provisions of Land Management and Erosion Control Plan, including: <ul style="list-style-type: none"> - Disturb as small an area as possible - Remove and store topsoil and spoil separately on construction site, protect from erosion - Mark and work within boundaries - Replace topsoil, ensure area is stable when complete - Establish/restore vegetative cover - Provide physical barriers around excavations if no active ongoing work 	<p>Works completed safely No damage outside boundaries Safe and efficient operations</p>	Contractor	Included in 3.2
3.8	Excavations and cuts on steep and moderate slopes	<ul style="list-style-type: none"> - Worker injury or death - Loss or damage to equipment - Excessive land affected - Landslides - Erosion 	<ul style="list-style-type: none"> - Train workers and supervisors on Occupational Health and Safety Plan (see above): <ul style="list-style-type: none"> - Harnesses, handrails as needed: - Working in steep terrain - Working around heavy equipment - Implement Land Management and Erosion Plan: <ul style="list-style-type: none"> - Mark construction zone boundaries - Strip and store topsoil (if any) and spoil on site, allowing none escape downhill - Grade surfaces, install gabions, walls, silt fences, etc., as necessary to prevent landslides, slope failure, mass erosion and stabilize slopes - Clear site of all debris and waste when works are complete - Restore land (stable contour, replace topsoil if possible, restore/establish vegetative cover with native species) 	<ul style="list-style-type: none"> - Works completed safely - No works or damage outside construction zone boundaries - No landslides and no severe erosion - Land restored and stabilized after works completed 	Contractor	Included in 3.2

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
3.9	Blasting at tower locations and/or substation (if required)	<ul style="list-style-type: none"> – Worker injury or death – Off-site damage from fly rock or vibration – Theft of explosives 	<ul style="list-style-type: none"> – Implementation of Explosives and Blasting Management Plan (if blasting is required): – Licensed subcontractor with proper permits from authorities – Transport and storage per Tajik law, storage at distance from other works – Licensed blaster – Notice to communities – Pre- and post-blast surveys of buildings within 500m – Compensation per RAP 	<ul style="list-style-type: none"> – Explosives transported and used safely – Minimal off-site damage – Off-site damaged identified and compensated per RAP, as necessary 	Contractor	Included in 3.2
3.10	Erection of towers	<p>Worker injury or death Damage outside construction zone</p>	<ul style="list-style-type: none"> – Train workers and supervisors in Occupational Health and Safety Plan: lifting, working at heights, electrical safety, general works, steep slopes – Mark and work within boundaries of construction zone, penalize supervisors and workers for violations – Remove all construction debris, restore sites when complete, including restoration of vegetative cover 	<ul style="list-style-type: none"> – Works completed safely – No damage outside boundaries 	Contractor	Included in 3.2
3.11	Restoration of land at construction sites (towers, construction zones/areas, temporary paths, all damaged lands)	<ul style="list-style-type: none"> – Post-construction against future erosion, landslides – Failure to restore/establish vegetative cover – Reduced production from cropland and grasslands 	<ul style="list-style-type: none"> – Restore all disturbed areas per Land Management and Erosion Control Plan (see items above): – Remove all waste and debris – Establish stable contours – Spread spoil and topsoil (except on rocky barren terrain) – Remove excess spoil/soil for use elsewhere. Donate excess fertile topsoil to PAPs – Plant native species of grasses and shrubs. – On land used by contractor for construction zones: restore land as above unless landowner requests modification (for example, no planting on cropland, etc.) 	Land returned to productive use	Contractor	Included in 3.2
3.12	Protection of camps, storage areas, equipment, property, substation, etc. (security)	<ul style="list-style-type: none"> – Abuse of local population or workers, including injury or death – Loss of community support, possibly active opposition 	<ul style="list-style-type: none"> – Prepare and implement Security Plan: <ul style="list-style-type: none"> - No armed security - Subcontractor and guards checked for licenses, past abuses - Guards trained in appropriate use of force 	No vandalism, theft, or incidents involving security	Contractor Pamir Energy to approve	Included in 3.2

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
		– Liability for contractor and Pamir Energy	- Consultations with local law enforcement authorities			
3.13	Placing conductors (stringing wires)	– Worker injury or death – Excess damage to land, crops, and forest	<ul style="list-style-type: none"> – Train workers and supervisors in Occupational Health and Safety Plan - Work within corridor boundaries - Place notice boards or otherwise notify landowners of upcoming activities - Consult with road/traffic authorities before placing conductors over highways and public roads - Train and place flaggers to control traffic on public roads/highways while conductors are being placed overhead and when work on roadside is in places with limited visibility – Repair damage to land surface immediately after operations are complete at that location – As recommended by the avian expert, install bird diverters on conductors at specific valley crossings 	<ul style="list-style-type: none"> – Works completed safely – Minimal damage to land, crops, etc., within corridor – No damage outside corridor – Losses due to damages compensated per RAP 	Contractor	Included in 3.2
3.14	Protect workers employed by primary suppliers	Child labor, forced labor, and/or serious safety issues at primary suppliers	If Pamir Energy or contractor has significant control or influence over primary suppliers (specifically, tower and conductor suppliers, contractor to monitor supplier and require improvement in labor safety practices or remedies in case of child or forced labor	No child labor or forced labor or serious safety issues at primary suppliers	Contractor (supported by Pamir Energy)	\$2500
3.15	Payment of invoices for completion of milestones	Failure to implement E-CSMP in completion of construction milestones: erosion damage, works/damage outside construction zone boundaries, poor soil/spoil management, poor safety practices, risks to community, etc.	<ul style="list-style-type: none"> – Consider relevant E&S management requirements to be an integral part of each construction milestone – Penalize initial failures to implement mitigations by withholding partial payment until mitigations are properly implemented – Penalize repeated failures to implement mitigations by considering milestones incomplete and reducing payments permanently 	<ul style="list-style-type: none"> – Proper implementation of C-ESMP – Minimal impacts on biodiversity, people, and property 	<p>Pamir Energy for contractor invoices</p> <p>Contractor for subcontractor invoices</p>	\$2000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
4.0 Demobilization						
4.1	Closure of construction areas, camps, accommodations, etc.	<ul style="list-style-type: none"> Contaminated soil , waters remain after contactor departs Liability for Pamir Energy 	Implementation of Land Management and Erosion Control Plan prior to departure (site restoration, revegetation, etc.): <ul style="list-style-type: none"> Removal of all equipment, storage units/tanks, debris, wastes, etc. Removal of contaminated soil Establish stable contours to eliminate standing water and match surrounding terrain as much as possible Spread spoil and replace topsoil Plant native species or take final action as requested by private landowners. Monitor plantings until established and self-sustaining 	<ul style="list-style-type: none"> Areas used for construction operations restored to pre-construction uses or as agreed with land users No residual liability or damages 	Contractor	Included in 3.2
4.2	Payment of final invoice	Demobilization incomplete, with residual damage, unrestored land, improper drainage, etc.	<ul style="list-style-type: none"> Withhold payment until Pamir Energy confirms demobilization is complete from E&S perspective Appoint third party to complete restoration activities if contractor fails, at contractor's expense 	<ul style="list-style-type: none"> No continuing or residual damages or contamination Land restored to former use as required 	Pamir Energy	\$0
5.0 Operation and maintenance						
5.1	Energizing transmission line and substation	<ul style="list-style-type: none"> Electrocution of workers or others Damage to towers, conductors, substation 	<ul style="list-style-type: none"> Consult with communities before energizing Workers trained per Occupational Health and Safety Plan: electrical safety, working at heights, lifting Follow Pamir Energy technical protocols/ procedures for energizing lines/components Keep bystanders/observers away from corridor and substation during procedure Inspect entire corridor in case of malfunction 	<ul style="list-style-type: none"> Works completed safely Communities consulted 	Contractor and Pamir Energy	\$500
5.2	Updates of Labor Management Plan and Occupational Health and Safety Plans	<ul style="list-style-type: none"> Lack of compliance with safety law Worker injuries and deaths Poor labor relations 	<ul style="list-style-type: none"> Pamir Energy Safety Manual updated per World Bank Group EHS General Guidelines and guidelines for Transmission Lines LMP updated to reflect World Bank ESS2 requirements 	<ul style="list-style-type: none"> Updated management programs Safe working environment Good labor relations 	Pamir Energy	\$1000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
5.3	Routine maintenance and security patrols	<ul style="list-style-type: none"> – Worker injury or death – Damage to ground surface and cover vegetation, soil erosion – Traffic accident – Damage to private property (trees, crops, etc.) 	<ul style="list-style-type: none"> – Workers trained in requirements of Pamir Energy Safety Manual specific to their jobs – Workers trained in requirement of Traffic Management Plan – Compensation per RAP 	<ul style="list-style-type: none"> – Works completed safely – Damages compensated promptly per RAP 	Pamir Energy	\$500
5.4	Tower repairs or replacement	<ul style="list-style-type: none"> – Worker injury or death – Excess damage to ground surface, vegetation, drainage, leading to erosion – Longer power outages 	<ul style="list-style-type: none"> – Same as tower construction above 	<ul style="list-style-type: none"> – Works completed safely – Minimal damage in immediate vicinity of tower, no damage outside that area – Damages to land repaired and land restored to previous use – Compensation paid promptly per RAP 	Pamir Energy	Nominal
5.5	Replacement of conductors	<ul style="list-style-type: none"> – Worker death or injury – Damage to land from equipment and vehicles – Longer power outages 	<ul style="list-style-type: none"> – Implement Safety Manual – Restore damages to land immediately upon completion (grading, revegetation per Land Management and Erosion Control Plan) – Compensate promptly for losses due to damages to vegetation, crops, property 	<ul style="list-style-type: none"> – Work completed safely – Damages to land repaired and land restored to previous use – Compensation paid per RAP 	Pamir Energy	\$2000
5.6	Vegetation control in corridor/under line	<ul style="list-style-type: none"> – Worker death or injury – Trees cut too close to ground – Excess cutting of trees – Excess compensation paid 	<ul style="list-style-type: none"> – Workers trained in risks and mitigations of tasks per Pamir Energy Safety Manual – Workers provided proper and safe equipment and tools – Workers knowledgeable of boundaries of vegetation control zone and remain within zone – Wood distributed as agreed with communities/owners – No use of herbicides or pesticides 	<ul style="list-style-type: none"> – Work completed safely – Minimal disturbance to ground surface and tree/plant roots – All works within vegetation control zone – Debris removed before becoming a fire hazard 	Pamir Energy	\$1000
6.0 All phases						
6.1	Oversight of E&S performance of project	<ul style="list-style-type: none"> – Lack of timely knowledge about contractor E&S performance – Unnecessary E&S impacts – Minor issues become major problems 	<ul style="list-style-type: none"> – Appoint qualified professionals to oversee E&S performance on the project – If Pamir Energy supervises, project management to communicate with corporate management on E&S management on weekly basis, written reports on monthly basis 	<ul style="list-style-type: none"> – Pamir Energy project HSE staff and corporate HSE Department knowledgeable and up to date on E&S performance 	Pamir Energy (and Supervision Consultant if appropriate)	\$5000

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
			<ul style="list-style-type: none"> - If Supervision Consultant supervises, Consultant to communicate with to Pamir Energy on weekly basis, writeup reports on monthly basis - Monthly progress meetings involving contractor, Pamir Energy, and (if appropriate) supervision Consultant - Pamir Energy corporate staff to visit site unannounced at least quarterly - Project management to provide data for website updates - Pamir Energy HSE Department (corporate) to: <ul style="list-style-type: none"> - Schedule and participate in consultation meetings and informal interviews - Periodically consult with municipal and village authorities - Review grievance logs periodically - Maintain communications with important NGOs - Maintain communications with Committee for Environmental Protection 	<ul style="list-style-type: none"> - Pamir Energy management well-informed of issues before they become problems 		
6.2	Operating passenger and heavy vehicles	<ul style="list-style-type: none"> - Traffic accidents - Injury or death to drivers or passengers - Damage to pedestrians, other drivers and passengers, property - Liability to contractor and project 	Implement Traffic Management Plan <ul style="list-style-type: none"> - Trained and licensed drivers - Speed limits - Daily safety checklist - Passengers only in seats designed for persons (safety belts, etc.), no standing or riding in back of trucks or on equipment - No giving rides to public - No vehicle/equipment movements off construction zones and roads unless authorized by site supervisor 	<ul style="list-style-type: none"> - Vehicles and equipment operated by authorized personnel - No traffic accidents - No injuries to drivers or passengers, no damage to property 	Owner/ Operator of vehicle: Contractor, Supervision Consultant, Pamir Energy	\$1000
6.3	All construction works	Damage to vegetation, land surface, property outside construction zone boundaries	<ul style="list-style-type: none"> - Implement relevant elements of Land Management and Erosion Control Plan (see 2.9 above): - Implement relevant elements of Occupational Health and Safety Plan (see 3.1 above) - Control dust from soil/spoil piles and construction sites by covering or vegetating, from roads by dampening 	<ul style="list-style-type: none"> - All work within construction zone boundaries - Minimal damages, compensation per RAP - Work completed safety 	Contractor Pamir Energy (OHS)	Included in 3.2

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
			<ul style="list-style-type: none"> Control noise by maintaining equipment and vehicles, training workers 			
6.4	Stakeholder engagement	<ul style="list-style-type: none"> Uninformed stakeholders Distrust of Pamir Energy Increased vandalism 	<ul style="list-style-type: none"> Implement Stakeholder Engagement Plan Notify local authorities of ongoing maintenance and repair operations Implement Grievance Redress Mechanism: receive and respond to comments and complaints 	<ul style="list-style-type: none"> Informed stakeholders Public support 	Pamir Energy (manage throughout, implement during operation) Contractor (day-to-day) during construction	<p>Construction: included in 3.2</p> <p>Operation: \$2500</p>
6.5	Hazardous and nonhazardous waste and materials management	<ul style="list-style-type: none"> Spills and contamination of soil and surface water Extra cost due to wastage 	<p>Implement Materials and Wastes Management Plan, including</p> <ul style="list-style-type: none"> Minimize use of hazardous materials, using nonhazardous substitutes wherever possible Store hazardous materials (including fuels) in secure area over impermeable surface Material Data Safety Sheets to be kept at all locations where hazardous materials (including fuels, paints, lubricants) are stored or used Allow only authorized and trained personnel to work with hazardous materials Segregate used materials/wastes in categories to maximize ability to restore, reuse, recycle and minimize disposal Dispose wastes in licensed disposal area or hire licensed hauler to take wastes to a licensed area (verified by contractor) For hazardous wastes taken away by hauler, verify hauler's license and verify that final disposal/recycling location is properly permitted 	<ul style="list-style-type: none"> Minimal spills and contamination, rapid and proper cleanup as needed Proper and safe waste management, including third-party management 	Contractor	<p>Construction: included in 3.2</p> <p>Operation: nominal</p>
6.6	Vehicle and equipment fueling and maintenance	<ul style="list-style-type: none"> Spills and contaminated soil or water Fire 	<ul style="list-style-type: none"> Vehicle and equipment fueling and maintenance only over impermeable surfaces. Use drip trays needed when not over paved surface. Fire extinguisher with proper chemicals in all vehicles/equipment and at all fueling locations 	<ul style="list-style-type: none"> No contamination from incidents involving fueling Vehicles maintained as required 	Contractor	<p>Construction: included in 3.2</p> <p>Operation: nominal</p>

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
			<ul style="list-style-type: none"> – Spill cleanup kits at all locations where fuel and hazardous chemicals are stored and in all vehicles and mobile equipment – Vehicles maintained per manufacturers' recommendations: mufflers, safety equipment, engine and fuel burning (no black smoke), etc. 			
6.7	All activities within 20m of Panj River or other perennial and seasonal streams	<ul style="list-style-type: none"> – Spills of fuel or other materials into water – Damage to streams and water bodies – Erosion into streams and water bodies 	<ul style="list-style-type: none"> – Implement procedure for working in or near surface water – Barriers between work zones and water if within 25m of water – No fueling within 25m of surface water or ephemeral drainageway – Vehicle/equipment crossings of drainageways or small streams only at designated locations – Apply gravel or otherwise prepare surface at places of frequent crossings to minimize damage to streambeds of small streams – Minimize crossings during wet weather – Repair rutting and other damage to stream banks and streambeds immediately when works are completed in that area (grade, revegetate) 	<ul style="list-style-type: none"> – No water contamination – Minimal damage to streams and drainageways 	Contractor	<p>Construction: included in 3.2</p> <p>Operation: nominal</p>
6.8	Responding to emergencies	<ul style="list-style-type: none"> – Worker injury or death – Community member injury or death – Excess damage to property or people 	<p>Implement Emergency Preparedness and Response Plan, which is to include:</p> <ul style="list-style-type: none"> – Appointment of emergency response team – Train workers in their responsibilities in case of emergencies and in responding – Identify possible emergencies and possible consequences (fire, accidents, injuries or deaths, earthquake or weather event, civil unrest, spills) – Develop and use checklists to verify readiness for emergencies – Place and maintain emergency response equipment (fire extinguishers, first aid kits, radios/communication devices, etc.) – Conduct investigations/reviews to identify causes and avoidance measures following emergencies, including accidents 	<ul style="list-style-type: none"> – Emergencies avoided – Emergency equipment in place and ready if needed – Quick and effective responses to emergencies 	Contractor and Pamir Energy	<p>Construction: included in 3.2</p> <p>Operation: \$1000</p>

No.	Activities	Potential Adverse Impact	Mitigation Measures/ Best Management Practice	Target outcome of mitigation	Responsible body	Cost (USD)
6.9	Protect undiscovered cultural heritage	Damage or destruction of artifacts or archaeological remains	Implement chance find procedure, to include <ul style="list-style-type: none"> - Stop work upon discovery - Notify Ministry - Consult with Ministry on steps to commence work - Protect site while awaiting work re-start - Begin work when authorized by Ministry - Train workers and supervisors in procedure 	<ul style="list-style-type: none"> - Qualified personnel make judgments about possible finds - Cultural heritage protected 	Contractor	Construction: included in 3.2 Operation: nominal
Total cost						\$214000

Table 20. Environmental and social monitoring plan for the Khorog to Qozideh transmission line and Qozideh substation

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
All construction works	Technical progress and implementation of mitigation measures, compliance with Tajikistan E&S law, World Bank ESF, and C-ESMP	Selected past and all current work areas	<ul style="list-style-type: none"> - Observations during normal activities - Inspections - Monthly reports and incident reports 	Continuous or as necessary	Verify implementation of mitigation measures	Pamir Energy (or Supervision Consultant)	Minor/nominal
			E&S monitoring audit	First year of construction, one further time during last year	<ul style="list-style-type: none"> - Verify implementation of C-ESMP - Identify needed modifications to C-ESMP 	Third-party consultant appointed by Pamir Energy	\$15000
	Working conditions, biodiversity management, and erosion control	All active work areas	Observations	During daily rounds (continuous)	Verify implementation of OHS Plan	Contractor safety manager	Minor/nominal
			Inspections	At least weekly			
		Active and recent tree cutting areas, active sites on steep slopes, active construction sites	Observations	During daily rounds	Verify relevant aspects of C-ESMP are being implemented	Contractor E&S manager and/or specialist(s)	
			Inspections	At least weekly			

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
		New construction sites	Inspections	Before construction begins	Verify supervisors are aware of requirements, construction boundaries are marked, etc.		\$1000
	Working conditions (equipment, tools, etc.) and workers (PPE)	All active work areas	Observations	During daily rounds (continuous)	<ul style="list-style-type: none"> – Verify safety of working conditions and workers – Provide guidance to supervisors and workers 	Safety Officers	Minor/nominal
			Inspections	At least weekly		Contractor safety manager	
	Worker and supervisor safety training	All active work areas	Records checks & interviews	Daily or as needed before beginning new work	Ensure workers are trained to work safely	Supervisor (foreman)	\$2000
Spot checks (at least once every site monthly)				Contractor safety manager			
Progress reports/meeting	Technical progress and status of C-ESMP implementation: <ul style="list-style-type: none"> – Safety – Biodiversity survey and restoration activities – Erosion control & site stabilization – Site restoration – Grievance management 	Recently and currently active sites	<ul style="list-style-type: none"> – Interviews with contractor E&S & technical staff – Review monthly contractor and Supervision Consultant E&S reports – Review worker & stakeholder grievance registers – Site visits 	Monthly	Verify technical progress and E&S protection	Mandatory attendees: <ul style="list-style-type: none"> – Contractor E&S personnel – Supervision Consultant (if any) – Pamir Energy project E&S specialists and HSE Department representative 	Minor/nominal
Drivers and vehicle safety	Driver qualifications	Office	<ul style="list-style-type: none"> – Verify valid driver’s license and operator’s permit as required – Check with traffic police if needed – Skills test as needed 	<ul style="list-style-type: none"> – Before allowed to vehicles/equipment – Annually 	Trained drivers	Contractor PM & safety manager	Minor/nominal
	Mobile plant/ vehicle safety (horns, backup)	All mobile plant in use	Inspect and complete checklist	Daily before first use		Driver/operator	\$1000

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
	alarms, lights, tires, safety belts, fire extinguisher, cleanup kit, first aid kit, etc.)		Review checklists and vehicles	Spot checks: at least monthly for each vehicle	Minimize traffic accidents, protect workers and other drivers/pedestrians	Contractor safety manager	
Marking boundaries of work areas	Boundary is clearly marked	All active work areas	Observations and photographs	<ul style="list-style-type: none"> - The day before work is to begin - At least once during each stage of construction works 	<ul style="list-style-type: none"> - Limit areas of impacts - Verify no off-site damage 	Contractor supervisors & E&S personnel	\$2000
Air quality	<ul style="list-style-type: none"> - Visible dust - Dust coating leaves on nearby vegetation 	Unpaved roads & other construction areas	Observations	Continuous during daily rounds	Determine need for damping roads to suppress dust	All contractor managers, supervisors, E&S personnel,	Minor/nominal
	Black smoke from vehicles, equipment, other engines	All engines			Determine need to remove engine from service until repaired		
Flora and fauna surveys (design team and preconstruction surveys)	<ul style="list-style-type: none"> - Mature trees (and buildings) with hibernating/ nesting bats & birds logged, photographed, & marked - Trees to be cut marked - Fauna present and/or at risk identified, including birds of conservation concern (if any) 	Selected areas being surveyed, while surveys are ongoing	<ul style="list-style-type: none"> - Visits to ongoing surveys - Spot checks of specimens marked after surveys - Debriefs by survey team(s) 	<ul style="list-style-type: none"> - Visits and spot checks: at least one site daily during surveys - Debriefs: daily verbal or email/written 	Verify surveys are identifying species of concern, mature trees, natural habitat	Contractor E&S manager & specialists	\$500

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
Land clearing activities (roads, towers, substation, & construction areas)	Compliance with Land Management and Erosion Control Plan, including: – Boundary marking before construction begins – Working within boundaries – Topsoil storage and spoil storage – Drainage control to prevent erosion	All areas being cleared	– Visits/inspections – Reports from supervisors to E&S manager	– Before clearing – Daily during clearing – After clearing and before construction	– Limit extent of clearing – Verify topsoil salvaged – Verify drainage controlled and erosion avoided –	– Contractor E&S personnel – Contractor PM (spot checks)	Minor/nominal
	Condition of land/vegetation at boundary	All areas under construction	Inspections	At least weekly	Verify implementation of LC&EC Plan	Contractor E&S personnel	
	Site restoration	Construction sites	Observations and photography	Before clearing begins	Allow verification of working within boundaries	Contractor E&S personnel	
			Inspections	When and immediately after construction ends at that site	To verify restoration	Contractor E&S personnel	
Excavations and cuts	Areas of excavations marked, edges of excavations marked (tape, rock barriers, etc.)	Foundation locations, cuts on steep slopes	Before ground broken	Before excavations	Limit area of disturbance	Contractor E&S personnel	Minor/nominal
	Works are within boundaries	Tower locations, substation location	Observation, photographs	Daily during works	Limit area of disturbance	Contractor E&S personnel & supervisors	
	Soil salvaged and stored separately from subsoil/spoil	All excavations	Observations and photographs	At least once during works at each site	Topsoil conserved and protected from erosion	Contractor E&S personnel	
	Workers received relevant training	Work sites and records	Interviews, records review	Prior to work at excavation sites	Verify workers can work safely	Contractor safety manager	

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
	Barriers (tape, rocks, etc.) placed to prevent falls	Perimeter of excavations >1m deep	Observation	When excavation is complete	Protect workers and others against falls	Supervisor	
				Spot checks (including when no active work is ongoing, such as weekend)		Contractor E&S personnel	
Vegetation cutting	Implementation of Flora and Fauna Survey Plan <ul style="list-style-type: none"> – Trees to be cut marked – If flora species of concern identified: logged, photographed, & marked – Mature trees with bats/birds logged, photographed, & marked – Fauna signs and presence documented, risks identified 	Areas where trees and shrubs are to be cut	Observation	Immediately prior to cutting/clearing and during ongoing cutting/clearing	Verify species and specimens of concern are identified	Contractor E&S manager	\$1000
Tree and shrub plantings	2+ trees and shrubs of same species planted per tree cut/removed	In location suitable for growth selected by qualified biologist	Observation and photography	During spring following cutting	Verify plantings	Botanist appointed by contractor	\$500
	Survival of 2+ plantings per tree/shrub cut			Prior to demobilization	Verify success to allow final payment		
				Annually for 5 years after planting	Verify success or identify need for replanting	Botanist appointed by Pamir Energy	
Bat box placement	2+ bat boxes placed per bat-supporting		Observation	Within one month of tree cutting	Verify placement		\$500

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
	tree cut or building removed	In location selected by qualified expert		One year after original placement	Verify in place	Contractor- or Pamir Energy-appointed biodiversity expert	
Land restoration	Implementation of Land Management and Erosion Control Plan <ul style="list-style-type: none"> – Stable contours after construction – Placement of topsoil (if any) on bare ground – Planting native species (seeds or plants) 	All areas where land was disturbed that will support vegetation	Observation and photography	Within one month of end of activities at that site	Identify need for repairs or verify restoration	Contractor E&S personnel	Minor/nominal
	Establishment of self-sustaining vegetation cover	All restored areas except slopes not capable of supporting vegetation cover	Observation & photography	Each month (spring, summer, fall) until vegetation cover determined to be self-sustaining and one year after that	Verify vegetation is established & determine if further action or repairs needed	Botanist appointed by contractor (and Pamir Energy after construction ends)	\$500
Identify need for bird diverters on line	Migration of raptors and waterbirds across transmission line corridor, passage of bats across corridor	Main river valleys for birds, near forests for bats	Observations (monitoring plan to be developed under 2.10 in Table 19)	Spring and autumn migration seasons (as recommended by expert) for two seasons	<ul style="list-style-type: none"> – Identify if bird diverters are needed to avoid collisions – Identify if measures are needed to prevent bat mortality 	Pamir Energy (by appointment of a consultant)	See 2.10 in Table 19
Noise generation	Noise levels	Workplaces	Noise meters	Monthly at typical work sites	Verify noise is within standard or identify need for mitigation	Contractor E&S personnel	Minor/nominal
		Off-site locations		Within 24 hours of request or noise complaint by worker or external party			
		At nearest residence when		While work is ongoing within 0.5km of village			

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
		works are within 0.5km					
Blasting	Slope slippage (landslide potential)	Within 200m of blasts	Observation	Same work shift as blast	Determine risk of landslide and need for corrective action	Personnel assigned by blast master	\$1000
	Pre-blast condition	Buildings within 0.5m of blast	Inspection and photography	Prior to blast	Establish pre-blast condition	Personnel assigned by blast master & Contractor PM	
	Post-blast condition: cracks, settling, flyrock damage, etc.			Within 24 hours after blast	Identify blast damage		
	Blasting contractor compliance with legal requirements for transport, storage, use	Magazine and blasting sites	Inspection	Monthly	Verify compliance, ensure safety	Contractor E&S manager	
Ensuring adequate hygiene	Sanitation, water, etc.	Kitchens, break areas, toilets, accommodations	Inspections	Weekly	Verify adequacy of amenities/accommodation	Contractor E&S manager	Minor/nominal
	Toilets & potable water	Work locations	Observations	Daily during rounds	<ul style="list-style-type: none"> - Verify workers have potable water - Verify toilet facilities are available 	Safety Officers and/or E&S specialists, supervisors, managers	
			Inspections	At least weekly		Contractor E&S specialist and/ or safety officer	
Worker grievance resolution	Worker grievance register	Work sites and Contractor records office	Review of register	Weekly	Verify grievances are being recorded and resolved	Contractor HR manager and PM	Minor/nominal
	Grievance handling and resolution		Interviews with managers responsible for resolution and with complaining workers	Before monthly progress meeting	Verify grievances are being addressed properly	Contractor HR manager, supervisors	
External stakeholder	Stakeholder grievance register	Contractor records office	Review of register	Weekly	Verify grievances are being recorded and resolved	Contractor HR manager and PM	

Activity	What	Where	How	When	Why	Who	Cost (USD)
	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Is the parameter to be monitored?)	(Define the frequency / or continuous?)	(Is the parameter being monitored?)	(Is responsible for monitoring?)	
Grievance resolution	Grievance handling and resolution	Community	Interviews of selected stakeholders who submitted grievances and with persons responsible for addressing	Before monthly progress meetings	Verify grievances are being addressed properly	Contractor E&S manager, social specialist/CLP	Minor/nominal
Stakeholder engagement	Worker behavior in communities	Community	<ul style="list-style-type: none"> - Reviews of grievance log - Interviews with community leaders 	Quarterly	Determine need for training/dismissals/ etc.	Contractor HR manager, PM, social specialist/CLO	Minor/nominal
	Community satisfaction with project	Community	<ul style="list-style-type: none"> - Reviews of grievance log - Interviews with community leaders and local residents 	Quarterly	Identify community issues	Social specialist, CLO	
Resettlement and compensation	Compliance with RAP	As specified in RAP					\$10000
Erosion control, land stability	Effectiveness of erosion control and land restoration	Tower locations and substation	Observations during routine maintenance patrols	Semi-annually during operation	Identify need for further land stabilization and erosion control	Pamir Energy	Minor/nominal
Total cost of monitoring program							≈\$37500

7. Stakeholder Engagement and Public Consultations

Pamir Energy has been engaging with local stakeholders since 2015. Engagement activities have not been specifically for the 63-kilometer transmission line from Khorog to Qozideh but for the combined Sebzor HPP and transmission lines.

7.1. Purpose of stakeholder engagement within ESIA

Stakeholder engagement is an integral part of project development and implementation, and should begin as early in project development as possible and continue through the project's full life cycle. The purpose of stakeholder consultation during the international ESIA process is to ensure that the views, interests and concerns of project stakeholders are taken into account in the following decisions:

- Decisions taken during the planning, design, and implementation of the project
- Decisions regarding planning of the ESIA scope, assessment of the potential impacts, and identification of appropriate management measures
- Decisions by the state environmental agency (CEP) to approve successive steps leading to completion and approval of the local OVOS
- Decisions by development financiers on the funding of the project and corresponding loan conditions.

7.2. Stakeholder engagement and consultation process for Sebzor HPP

An overview of the ESIA stakeholder consultation process for the transmission line between Khorog and Qozideh is presented in Table 21.

Table 21. Overview of the stakeholder engagement process during the transmission line project

<i>Steps</i>	<i>Objectives</i>	<i>Stakeholders involved</i>	<i>Activities</i>	<i>Main documents to be produced</i>
SCOPING Corresponds with the scoping phase of the ESIA	- Identify regulatory authorities and other stakeholders who should be involved in the ESIA process. - Notify stakeholders of the ESIA process and give them the necessary procedural and substantive information to facilitate their input to the process. - Engage stakeholders – listen to them and record issues raised (concerns,	All	Stakeholder identification and analysis (desktop social scan)	List of potential stakeholders
			Planning stakeholder consultation and disclosure	SEP
			Notification of stakeholders of ESIA process and the proposed project	Background information document for stakeholders
			Engagement of stakeholders	- Records of meetings. - Updated stakeholder database and issues record.

<i>Steps</i>	<i>Objectives</i>	<i>Stakeholders involved</i>	<i>Activities</i>	<i>Main documents to be produced</i>
	comments and questions).			
DISCLOSURE AND CONSULTATIONS ESIA and RPF stakeholders	Disclose ESIA and RPF	Local communities, and regulatory authorities, NGOs and other stakeholders as required	Meetings with stakeholders, as per the procedure described in SEP	<ul style="list-style-type: none"> - Records of meetings. - Specific information-sharing documents.
FEEDBACK RESPONSE on the results of the ESIA	<ul style="list-style-type: none"> - Provide relevant stakeholders with an update on progress with project planning, expected impacts and proposed mitigation. - Acknowledge issues raised by stakeholders and tell them how the project proponent (Pamir Energy) proposes to address these. - Engage stakeholders – listen to them and record additional issues raised. 	All stakeholders that have shown an interest in the project	Notification of stakeholders	<ul style="list-style-type: none"> - Issue specific feedback documentation as necessary - Non-technical summary of the ESIA.
			Engagement of stakeholders	<ul style="list-style-type: none"> - Records of meetings. - Updated issues record.
			<ul style="list-style-type: none"> - Pamir Energy advertises public hearing “Asia Plus” and “Badakhshan” newspapers - Delivering public meeting information through Pamir Energy electrical inspectors 	<ul style="list-style-type: none"> - Advertisements - Notices for distribution by electricity inspectors
			Public hearing within 30 days of public notice	A record of the hearing(s) and meetings

7.2.1. Previous Stakeholder Engagement and Consultations

Pamir Energy began planning for the Sebzor HPP and transmission lines as early as 2015, and since that time has engaged with its current customers on its development plans. Local people are perhaps most concerned about employment opportunities, since unemployment is a major concern in the entire region and especially in these rural communities.

7.2.2. Scoping Consultations for international ESIA

In 2019, prior to and during preparation of this ESIA, Pamir Energy conducted interviews with community members in Khorog and also in villages in the first 10 kilometers of the line and in avalanche areas, where the current line was replaced with towers that will be suitable for the 11kV

conductors when the remainder of the line is completed. Pamir Energy then organized more community meetings in April and May 2019 in a number of other communities around the project affected area.

All community members who have been consulted expressed positive opinions about the proposed transmission line construction project and about the full World Bank Rural Electrification Project. All respondents support the rural electrification project due to its high social and economic value to local communities. Everyone interviewed had knowledge of Pamir Energy and its activities, since most or all are current customers. Nearly everyone noted that the most significant social and economic problems in the region are high unemployment rates and low income. A number of stakeholders interviewed specified that the best communication method with village residents and community members would be through Pamir Energy electricity inspectors, who they see on a regular basis (once a week or so) when inspectors visit households to read electricity consumption meters. Most interviewee expressed interest in participating in further meetings, consultations, and public hearings for the proposed project.

Pamir Energy also organized and carried out a series of scoping meetings and consultations with institutional stakeholders in early 2019.³ The scoping consultation process involved identification of key project stakeholders in Dushanbe and GBAO, meetings with state and local authorities in Dushanbe and Khorog, meetings with regional NGOs and academic research institutes and universities in Dushanbe and Khorog (e.g., University of Central Asia, Pamir Biological Institute, and Aga Khan Agency for Habitat in Khorog). The main objectives of the consultations included:

- To identify and verify interests of project stakeholders and to establish working dialogues between Pamir Energy and the stakeholders
- To disclose information about the proposed project
- To understand stakeholders' expectations about the project and their respective levels of interest in continued communication and participation in future Pamir Energy activities associated with the proposed project.
- To receive feedback, comments, and concerns from stakeholders about the project and on prospective regional electricity supply schemes in general
- To obtain feedback on major environmental, social and economic problems in local areas and overall across GBAO.

7.2.3. Stakeholder Engagement Plan

Pamir Energy has prepared and disclosed for public review a Stakeholder Engagement Plan (SEP) that outlines how stakeholder engagement will be practiced throughout the course of the project and which methods will be used as part of the process. The SEP covers the Sebzor HPP, the 18-kilometer transmission line that will carry its power from the HPP to Khorog, and this 63-kilometer line to Qozideh. It outlines the responsibilities of Pamir Energy and contractors in the implementation of stakeholder engagement activities. Details on the ESIA stakeholder consultation are presented in the SEP. The SEP is considered to be a live document that will be updated throughout the ESIA process

³ Consultations and discussions dealt with the full World Bank Rural Electrification Project, which includes the Sebzor hydropower plant, 18km connecting transmission line, off-grid connections in GBAO and Khatlon, and this 63km transmission line.

and will continue to evolve as the project proceeds through the construction, operation and decommissioning phases.

Stakeholder engagement activities have been targeted at project affected persons (people affected by land acquisition, people residing in project areas and Jamoats), as well as at other interested parties (Ministries and government agencies, NGOs, business and workers' organizations, press and media, general public, tourists, jobseekers, academic institutions, among others). The SEP outlines special considerations that will be given to ensure outreach to and engagement of disadvantaged and vulnerable groups. SEP activities include establishment and management of a project-wide grievance redress mechanism, public meetings, trainings and workshops, media and social media communication, disclosure of written materials, municipal information desks, involvement of project community liaison officers at the municipal level, as well as a survey among affected persons to gauge satisfaction with the quality of citizen engagement and share additional concerns.

7.3. Public disclosure of and consultations for the ESIA and associated documents

This ESIA was prepared to meet requirements of the World Bank and also the requirements of Tajik laws on Environmental Protection and Law on Environmental Expertise. The ESIA documentation includes this ESIA, the Stakeholder Engagement Plan (SEP), and a Resettlement Policy Framework (RPF). In addition, the ESIA for the Sebzor HPP and the 18-kilometer line to Khorog and the RPF were prepared and disclosed at the same time. In April 2019, at the time the draft ESIA and other documents were published, it was announced in the regional/state newspaper ("Asia Plus") and local newspaper "Badakhshon". It was also announced on the Pamir Energy website (<http://www.pamirenergy.com/en/presscenter/public.php>). The announcements included the date and times of consultation meetings.

Besides the draft disclosure documents (ESIA, Stakeholder Engagement Plan, and Resettlement Policy Framework), a project brochure was posted. In the future, the site will provide details about the Grievance Redress Mechanism (see Chapter 8) and contact details of the Community Liaison Officer. Pamir Energy will update and maintain the website regularly, at least quarterly.

Paper copies of all ESIA documentation have been placed in Jamoats and advertisements placed on notice boards in the villages. Electronic copies are available at the website above. Addresses where the ESIA documents may be reviewed include the following:

- Pamir Energy Company, 75 Gulmamadova Street, 736000 Khorog, GBAO, Tajikistan
- Administration (Khoukumat) of GBAO in Khorog, address: city Khorog, Lenin street 47, Tajikistan
- Administration (Khoukumat) of Roshtqala district in Roshtqala, at address: Khorog, Committee for Environmental Protection (CEP), Lenin street, 46, Tajikistan

Following disclosure of the draft ESIA and other documents, Pamir Energy announced and held consultation meetings in Andarob (on 29 April) and Qozideh (on 30 April). At the meetings, Pamir Energy asked people to sign in and handed out brochures that described the project and announced the meeting.

At the meetings (Figure 21 and Figure 22, Pamir Energy asked people to sign in and handed out brochures that described the project and announced the meeting. A total of 48 people from five villages attended the meetings and actively participated in the discussion.

Pamir Energy described the project and the analyses that had been completed, and explained that there would be international financing, and as a result the project would have to meet international standards as well as those required by Tajikistan. Attendees were then invited to make comments and ask questions.

The discussion began with Mr. Khasanov Mehrobsho, the Leader of the Jamaat, expressing his gratitude to the representative of Pamir Energy for the meeting with the local community and mentioned that the community is glad that PE started implementing the project and expressed his and his community's willingness to assist in the timely implementation of the project.

Questions included the implementation period of the project, with Pamir Energy responding that it would be about 2.5 years. There were many questions about employment, and Pamier Energy noted that many or most of the workers will be from local communities, both hired by contractors during construction and by Pamir Energy during operation, with selections based on qualifications and technical knowledge. .



Figure 21. Disclosure consultation meeting in Andarob



Figure 22. Consultation meeting in Qozideh

7.4. Stakeholder engagement during project implementation

Engagement will continue through the life of the project. The SEP provides details of the program that will be used to present information to stakeholders and to receive information and opinions from stakeholders. In summary, there will be:

- Public / community meetings
- Mass/social media communication
- Distribution of information materials
- Grievance redress mechanism
- Project tours for media, civil society, and local representatives
- Information desks at each municipality
- Citizen perceptions surveys
- Trainings and workshops to raise awareness on key topics of interest such as EMF, impacts on land and compensations, code of conduct for project staff, grievance redress mechanism, or other topics of interest to citizens.

7.5. Pamir Energy Point of Contact

The point of contact for stakeholder engagement is Pamir Energy’s Senior Environmental and Social Officer. During implementation, there may be other Community Liaison Officers to assist.

<i>Description</i>	<i>Contact details</i>
Name	Asligul Mamadatoeva
Address:	75 Gulmamadova Street 736000 Khorog, GBAO, Tajikistan
E-mail:	mavluda.mamadatoeva@pamirenergy.com
Telephone:	+992 35 222 23 10

Information on the Project and future stakeholder engagement programs will also be available on the Project’s website and will be posted on information boards in the villages crossed by the line. Information can also be obtained from Pamir Energy in Khorog.

Six-monthly reports that document the implementation of the ESMP and the Stakeholder Engagement Plan (SEP) will be disclosed on the Project website and made available in the Jamoats or at the village heads’ houses.

8. Grievance Redress Mechanism

Project-affected-people and any other stakeholder may submit comments or complaints at any time by using the project's Grievance Redress Mechanism (GRM). The overall objectives of the GRM are to:

- Provide a transparent process for timely identification and resolution of issues affecting the project and people, including issues related to the resettlement and compensation program.
- Strengthen accountability to beneficiaries, including project affected people.

The GRM will be accessible to all external project stakeholders, including affected people, community members, civil society, media, and other interested parties. External stakeholders can use the GRM to submit complaints, feedback, queries, suggestions, or even compliments related to the overall management and implementation of the project, including the resettlement and compensation program. The GRM is intended to address issues and complaints in an efficient, timely, and cost-effective manner. A separate mechanism will be available to Pamir Energy and contractor employees, who are internal stakeholders.

Pamir Energy will be responsible for managing the stakeholder GRM, but many or most grievances during construction are likely to result from actions of the construction contractors and so will need to be resolved by the contractors themselves, with Pamir Energy oversight. Typical grievances for transmission line projects could include issues related to:

- Land acquisition and compensation
- Construction damages to property, crops, or animals
- Traffic
- Environmental impacts such as erosion
- Nuisances such as dust or noise
- Worker misbehavior.

The GRM will be in place and operational well before Pamir Energy begins construction activities and will function until the completion of all construction activities and beyond, until the contractor's defect liability period ends. Initial compensation, for land and property needed for the project, will be completed before construction begins. People who reside near the line and others who may be affected will be informed, in meetings and with brochures, of the GRM's purpose, functions, procedures, timelines and contact persons. Additional measures will be taken to inform those who are eligible for compensation.

The project GRM will include three successive tiers of extra-judicial grievance review and resolution:

- The first tier will be the Pamir Energy E&S team, including the Community Liaison Officer. They will deal quickly with issues that can be quickly resolved, and would always initiate direct communication with the person(s) who submitted the grievance.
- The second tier will be a Grievance Resolution Committee (GRC1) that includes representatives of Pamir Energy and of the complainant's village and Jamoat. The GRC1 will deal with issues that could not be resolved in the first tier.

- The third tier will be a Grievance Redress Commission (GRC2) that includes one or more senior Pamir Energy managers and one or more Jamoat and/or village leaders. GRC2 will resolve issues that could not be resolved by GRC1.

Grievances would be handled as described in the following subsection.

8.1. Grievance resolution process

Information about the GRM has been publicized as part of the initial disclosure consultations in the participating Jamoats and villages. Brochures will be distributed during consultations and public meetings, and posters will be displayed in public places such as in government offices, project offices, village notice boards, community centers, etc. Information about the GRM will also be posted online on the Pamir Energy website (<http://www.pamirenergy.com/en/presscenter/public.php>).

The overall process for the GRM include six steps, as shown on Figure 23 and described below. This builds on the way grievances are typically managed, which is illustrated in Figure 24.

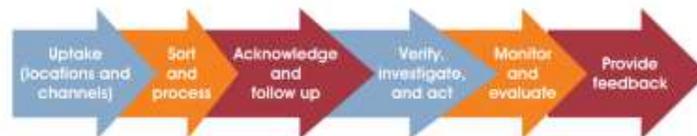


Figure 23: Feedback and GRM Process

Source: Agarwal, Sanjay and David Post. 2009. Feedback Matters: Designing Effective Grievance Redress Mechanisms for Bank-Financed Projects – Part I. SDV. World Bank.

- **Step 1: Uptake.** Project stakeholders will be able to provide feedback and report complaints through several channels: in person at offices (village/mahalla, jamoat, project, and Pamir Energy offices) and at project sites, and by mail, telephone, and email.
- **Step 2: Sorting and processing.** Complaints and feedback will be compiled by the Community Liaison Officer and recorded in a register. Submissions related to the resettlement and compensation program will be referred to the HSE Department for processing and resolution. The Department will assign one individual to be responsible for dealing with each complaint, including following through within Pamir Energy and with the complainant to arrive at a resolution, with the goal to resolve complaints within 15 days of receipt.

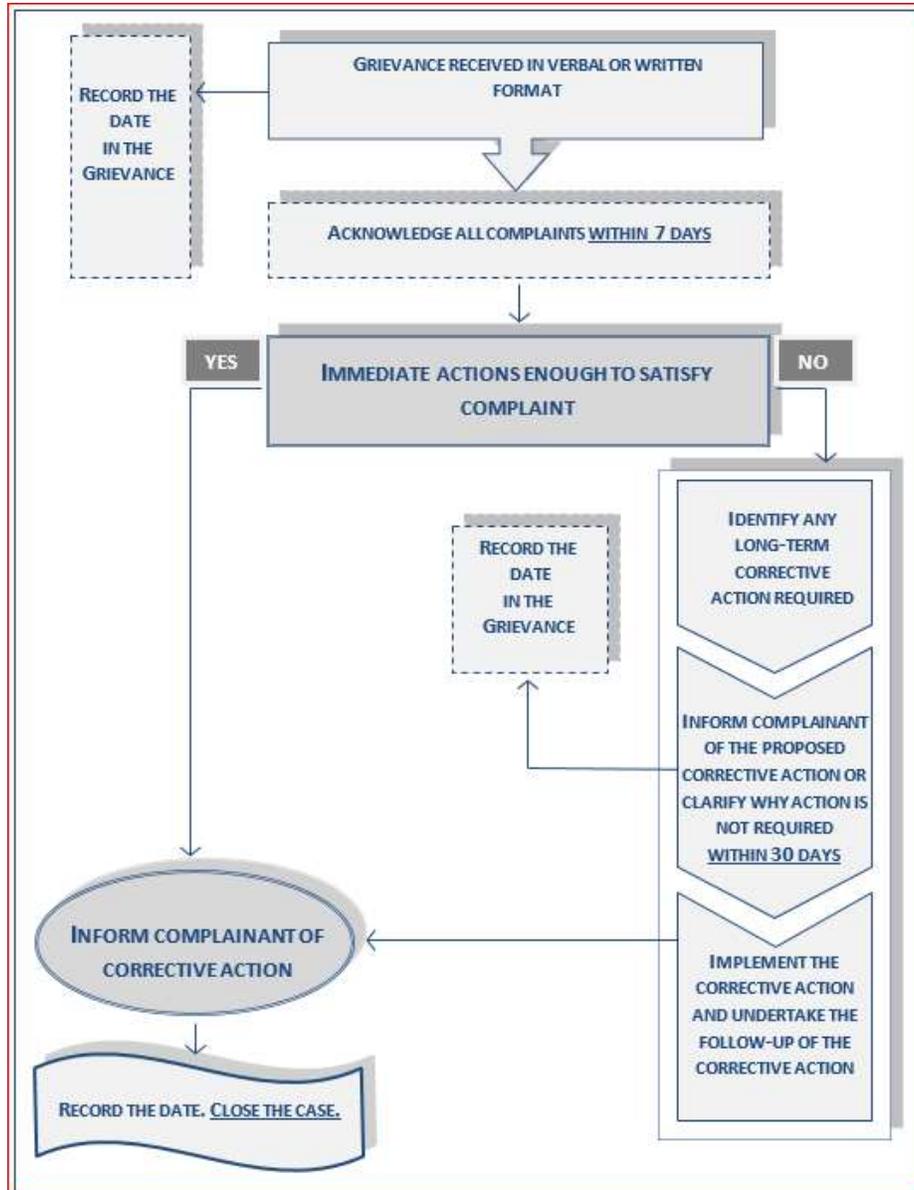


Figure 24: Typical grievance resolution process

- **Step 3: Acknowledgement and followup.** Within seven (7) days of the date a complaint is submitted, the responsible person will communicate with the complainant and provide information on the likely course of action and the anticipated timeframe for resolution of the complaint. If complaints are not resolved within 15 days, the responsible person will provide an update about the status of the complaint/question to the complainant and again provide an estimate of how long it will take to resolve the issue. In addition, the HSE Department will report to the General Director every two weeks on grievances that have remained unresolved for 30 days or more.
- **Step 4: Verification, investigation and action.** This step involves gathering information about the grievance to determine the facts surrounding the issue and verifying the complainant's validity, and then developing a proposed resolution, which could include

changes of decisions concerning eligibility for compensation, additional compensation or assistance, changes in the program itself, other actions, or no actions. Depending on the nature of the complaint, the process can include site visits, document reviews, a meeting with the complainant (if known and willing to engage), and meetings with others (both those associated with the project and outside) who may have knowledge or can otherwise help resolve the issue. It is expected that many or most grievances would be resolved at this stage. All activities taken during this and the other steps will be fully documented, and any resolution logged in the register.

- **Step 5: Monitoring and evaluation.** Monitoring refers to the process of tracking grievances and assessing the progress that has been toward resolution. The HSE Department will be responsible for consolidating, monitoring, and reporting on complaints, enquiries and other feedback that have been received, resolved, or pending. This will be accomplished by maintaining the grievance register and records of all steps taken to resolve grievances or otherwise respond to feedback and questions.
- **Step 6: Providing Feedback.** This step involves informing those to submit complaints, feedback, and questions about how issues were resolved, or providing answers to questions. Whenever possible, complainants should be informed of the proposed resolution in person. If the complainant is not satisfied with the resolution, he or she will be informed of further options, which would include pursuing remedies through the World Bank, as described below, or through avenues afforded by the Tajikistan legal system. On a monthly basis, the HSE Department will report to the General Director on grievances resolved since the previous report and on grievances that remain unresolved, with an explanation as to steps to be taken to resolve grievances that remain unresolved after 30 days. Data on grievances and/or original grievance logs will be made available to World Bank missions on request, and summaries of grievances and resolutions will be included in periodic reports to the World Bank.

Pamir Energy will be responsible for carrying grievances through all six steps. Step 4 (Verify, Investigate, and Act) could involve interviews of the aggrieved party, workers, or other stakeholders; review of records; consultation with authorities; and/or other fact-finding activities. If the grievance cannot be resolved to the satisfaction of all parties, it will be referred to GRC1, who would retrace Step 4 as needed. The steps following the initial investigation and proposed solution would proceed as follows:

- Determination of proposed resolution or referral to second tier:
 - If resolution is proposed: referral to E&S manager for review and approval (including refinements). Once approved, the CLO person would communicate the resolution to complainant and refer to corporate management for implementation.
 - If referred to second tier, GRC1 would consider facts determined by initial review and conduct such other fact-finding as needed, including interviews of complainant and others if necessary.
- GRC1 recommends resolution or refers to GRC2:
 - If resolution is proposed: referral to Pamir Energy for implementation, including communication to complainant.

- If referred to third tier, GRC2 to meet and discuss facts as determined by initial tiers and make determination of proposed resolution.
- GRC2-recommended resolution: referred to Pamir Energy for communication to complainant and implementation of recommended actions (if any)
- Complainant would be asked to acknowledge acceptance (or rejection) of the resolution.
- Pamir Energy would then implement actions that are part of the resolution (if any).

If a person who submits a grievance is not satisfied with the resolution at the first or second tiers, he or she may request it be elevated to the next tier. If they are not satisfied with the ultimate resolution, they may pursue legal remedies in court or pursue other avenues as described above. Throughout the entire process, Pamir Energy will maintain detailed records of all deliberations, investigations, findings, and actions, and will maintain a summary log that tracks the overall process.

8.2. Grievance processing

Anyone who believes they are eligible for compensation can submit a grievance:

- By completing a written grievance form that will be available (a) in the Jamoat and in the villages crossed by the line, (b) at Pamir Energy’s offices in Khorog and on their website, and (c) from CLOs or other members of the HSE Department. An example of a grievance registration form is provided in Annex 1.
- By contacting the Pamir Energy Community Liaison Officer or other member of the Pamir Energy HSE Department team, either by telephone or in person. In addition, grievances may be communicated to contractor supervisors or to Pamir Energy electrical inspectors, who will be briefed on receiving and reporting complaints. Grievances received verbally will be recorded by the Community Liaison Officer on a grievance registration form and logged into the Grievance Register. A copy of the logged grievance will be given to the complainant, giving them the opportunity to alert Pamir Energy if the grievance has not been noted down correctly.

Pamir Energy will explain to local communities the possibilities and ways to raise a grievance during consultation meetings organized in each village when this draft SEP and other draft documents are disclosed and then at quarterly meetings thereafter. The GRM procedures will be disclosed through the project’s website and will also be described in a brochure or pamphlet made available in Jamoat administration buildings.

The Pamir Energy Community Liaison Officer team will be responsible for logging and tracking grievances. As noted above, one person will be assigned responsibility for investigating and recommending resolution to each grievance, or to recommend referral to GRC1.

Information to be recorded in the grievance log will include name and contact details of the complainant and a summary of the grievance and how and when it was submitted, acknowledged, responded to and closed out. All grievances will be acknowledged within 7 days and resolved as quickly as possible. If there has been no resolution within 30 days, the person assigned responsibility for the grievance will contact the complainant to explain the reason for the delay. On at least a monthly basis, a summary of grievances and resolutions will be provided to the Pamir Energy General Director. A generic flow chart for registering and processing grievances is shown in Figure 9 above. The status,

number, and trends of grievances will be discussed between the project team and Pamir Energy senior management during meetings held at least monthly and more frequently as needed.

A grievance will be considered “resolved” or “closed” when a resolution satisfactory to both parties has been reached, and after any required corrective measures have been successfully implemented. When a proposed solution is agreed by the complainant, the time needed to implement it will depend on the nature of the solution. Once the solution is being implemented or is implemented to the satisfaction of the complainant, the complaint will be closed out and acknowledged in writing by both the complainant and Pamir Energy.

In certain situations, it may not be possible to reach a satisfactory resolution. This could occur if a complaint cannot be substantiated or is proved to be speculative or fraudulent. In such situations, Pamir Energy’s efforts to investigate the grievance and to arrive at a conclusion will be well documented and the complainant advised of the situation. It is also possible that a complainant will not be satisfied with the proposed resolution. In such cases, if Pamir Energy cannot do more, the complainant will be asked to acknowledge refusal of the proposed resolution in writing. Pamir Energy will then decide whether to implement the resolution without the agreement of the complainant and the complainant will decide whether to pursue legal remedies.

8.3. Grievance Logs

As noted previously, the HSE Department will maintain a grievance log. This log will include at least the following information:

- Individual reference number
- Name of the person submitting the complaint, question, or other feedback, address and/or contact information (unless the complaint has been submitted anonymously)
- Details of the complaint, feedback, or question/her location and details of his / her complaint
- Date of the complaint
- Name of person assigned to deal with the complaint (acknowledge to the complainant, investigate, propose resolutions, etc.)
- Details of proposed resolution, including person(s) who will be responsible for authorizing and implementing any corrective actions that are part of the proposed resolution
- Date when proposed resolution was communicated to the complainant (unless anonymous)
- Date when the complainant acknowledged, in writing if possible, being informed of the proposed resolution
- Details of whether the complainant was satisfied with the resolution, and whether the complaint can be closed out
- If necessary, details of GRC1 and GRC2 referrals, activities, and decisions
- Date when the resolution is implemented (if any).

8.4. Monitoring and reporting on grievances

Details of monitoring and reporting are described above. Day-to-day implementation of the GRM and reporting to the World Bank will be the responsibility of the HSE Department. To ensure management oversight of grievance handling, the Internal Audit Unit will be responsible for monitoring the overall process, including verification that agreed resolutions are actually implemented.

8.5. Pamir Energy Point of Contact

The point of contact for the grievance redress mechanism is identified here:

<i>Description</i>	<i>Contact details</i>
Name	Asligul Mamadatoeva
Address:	75 Gulmamadova Street 736000 Khorog, GBAO, Tajikistan
E-mail:	mavluda.mamadatoeva@pamirenergy.com
Telephone:	+992 35 222 23 10

Information on the Project and future stakeholder engagement programs will be available on the Project's website and will be posted on information boards in the villages crossed by the line. Information can also be obtained from Pamir Energy in Khorog.

8.6. World Bank Grievance Redress System

Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may also complain directly to the Bank through the Bank's Grievance Redress Service (GRS) (<http://projects-beta.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>). A complaint may be submitted in English, Russian, Tajik, or Shugne, although additional processing time will be needed for complaints that are not in English.

A complaint can be submitted to the Bank GRS through the following channels:

- By email: grievances@worldbank.org
- By fax: +1.202.614.7313
- By mail: The World Bank, Grievance Redress Service, MSN MC10-1018, 1818 H Street Northwest, Washington, DC 20433, USA
- Through the World Bank Tajikistan Country Office in Dushanbe: 48 Ayni Street, Business Center "Sozidanie", 3rd floor, Dushanbe, Tajikistan; Tel: +992 48 701-5810.

The complaint must clearly state the adverse impact(s) allegedly caused or likely to be caused by the Bank-supported project. This should be supported by available documentation and correspondence to the extent possible. The complainant may also indicate the desired outcome of the complaint. Finally, the complaint should identify the complainant(s) or assigned representative/s, and provide contact details. Complaints submitted via the GRS are promptly reviewed to allow quick attention to project-related concerns.

In addition, project-affected communities and individuals may submit complaints to the World Bank’s independent Inspection Panel, which will then determine whether harm occurred, or could occur, as a result of the World Bank’s non-compliance with its policies and procedures. Complaints may be submitted to the Inspection Panel at any time after concerns have been brought directly to the World Bank’s attention, and after Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

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Annex 1: Example Grievance Form

Grievance Form			
Grievance reference number (to be completed by Pamir Energy):			
Contact details (may be submitted anonymously)	Name (s):		
	Address:		
	Telephone:		
	Email:		
How would you prefer to be contacted (check one)	By mail/post: <input type="checkbox"/>	By phone: <input type="checkbox"/>	By email <input type="checkbox"/>
Preferred language	<input type="checkbox"/> Tajik	<input type="checkbox"/> Russian	<input type="checkbox"/> English
Provide details of your grievance. Please describe the problem, who it happened to, when and where it happened, how many times, etc. Describe in as much detail as possible.			
What is your suggested resolution for the grievance, if you have one? Is there something you would like Pamir Energy or another party/person to do to solve the problem?			
How have you submitted this form to the project?	Website <input type="checkbox"/>	email <input type="checkbox"/>	By hand <input type="checkbox"/>
	In person <input type="checkbox"/>	By telephone <input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Who filled out this form (If not the person named above)?	Name and contact details:		
Signature			
Name of Pamir Energy person assigned responsibility			
Resolved or referred to GRC1?	<input type="checkbox"/> Resolved	<input type="checkbox"/> Referred	If referred, date:
Resolved referred to GRC2?	<input type="checkbox"/> Resolved	<input type="checkbox"/> Referred	If referred, date:
Completion			
Final resolution (briefly describe)			
	Short description	Accepted? (Y/N)	Acknowledgement signature
1 st proposed solution			
2 nd proposed solution			
3 rd proposed solution			

Annex 2. Minutes of Consultation Meetings on Khorog-Qozideh 110kV Transmission line in Andarob and Qozideh Villages (Ishkashim District, GBAO)

MINUTES OF MEETING

PROJECT NAME

Figure 1. Tajikistan Rural Electrification Project

VENUE	DATE OF MEETING
Andarob and Qozideh villages of Ishkashim district, Viloyati Mukhtori Kuhistoni Dadakhshon (VMKB)	29&30/04/2019
PRESENT	
A.Mamadatoeva – Senior Environmental Officer, Pamir Energy Mirzo Gulomaseynov – Head of the Territorial Energy Complex (TEC) of Pamir Energy G. Mamadambarova – Call Center Operator, Pamir Energy D.Bakhtibekov – BDU Engineer Pamir Energy N. Shoskandarov – GIS specialist Pamir Energy R.Khushqadamov- PR Specialist, Pamir Energy R.Ustoboeva- Report Officer of Pamir Energy The community members [the list of participants is attached]	

1. Summary

For the consultative meeting (on TREP construction and operation of a 63-kilometer (km) 110kV transmission line between Khorog substation and a new substation near Qozideh, particularly E&S documentation) all village residents were invited and about 48 community members gathered and participated in the meeting. The first day meeting was held in Andarob village and members from four villages (Sist, Kuhi- La’l, Khaskhorug and Andarob) have participated. The second day meeting was held in Qozideh village and participants form remaining 4 villages (Shanbedeh, Vozg, Barshor, Qozideh) have participated. They received information and details about the planned project implementation as well as related environmental and social impacts that were identified in recent assessments. Andarob and Qozideh villagers very much welcome the project’s implementation. They expressed no objection or concern related to the project and its impacts as they are generally very hopeful that it will contribute to positive developments for their village. Primarily, employment opportunities and compensation (in-kind) for potential loss of land were the main point of community interest an discussion.

2. Welcome and Introduction

An introductory speech was made by the chairman of Qozideh Jamoat, Mr Sayfov Amonullo, who welcomed the representatives of Pamir Energy Company (PE) and expressed his opinion and the opinion of the local community about how pleased they are that the company had launched rural electrification project in VMKB and how they are going to benefit from it.

Mr. Mirzo Gulomaseynov, the Head of TE, a representative of PE, presented the Tajikistan Rural Electrification Project that was developed as part of the Government of Tajikistan and PE initiative on electrification of the transmission line population in VMKB and Khatlon regions in cooperation with the World Bank (WB). He mentioned that although within 16 years of operation, the company has significantly increased energy availability for 218,000 people (96% of the population) in Eastern Tajikistan, there are still 12,286 people, residing in 61 villages of VMKB, without electricity. Therefore, the given project aims at electrification of these people through the construction of hydropower plants, through the construction of transmission lines. The project will be financed by the WB. Along with the requirements of the legislation of the Republic of Tajikistan, as a precondition for financing, the WB also requires several activities including the environmental and social assessment, according to Mr. Mirzo.

As to the environmental and social impacts of the project components; the Sebzor hydropower plant and the associated 18 km transmission line as well as the 63km transmission line will be assessed in an Environmental and Social Impact Assessment (ESIA), which was presented to participants by Pamir Energy's Senior Environmental Officer Ms. Mamadatoeva. The purpose of this Environmental and Social Impact Assessment (ESIA) is to provide an environmental and social assessment of the project in order to identify potential environmental and social risks throughout construction and operation. It was further explained that the ESIA will guide Pamir Energy in determining what additional surveys or studies are needed and in determining the requirements that need to be placed in contracts for final design and construction of the transmission line and substation so that environmental and social impacts are managed and mitigated in accordance with World Bank ESF requirements and Tajikistan law.

Community member were informed that the environmental and social assessment helps to determine the potential environmental and social effects of the project and as Ms. Asligul Mamadatoeva noted also identifies if additional research/assessment will be needed and conducted on individual project components or aspects, which are listed in the brochures which will be distributed at the end of the presentation. For instance, as a common practice, while implementing such projects, a plan for resettlement and compensation is developed. An example of the socio-economic aspect would be not only electrification of the targeted areas, but also employment opportunities for the local population.

Ms. Mamadatoeva also highlighted that Pamir Energy will design the transmission and distribution lines in a way that it will not result in any displacement. However, when towers are built on agricultural or other productive lands, it will take measures that people who are currently using the small plots of land are compensated for taking off their lands for towers. In-kind compensation is the preferred means of compensation that Pamir Energy generally aims to use in its projects, according to Ms Mamadatoeva.

According to the representative of Pamir Energy Mr. D.Bakhtibekov. In 2013, with the support of foreign donor 'Norway' project Ishkashim 1 invested in the 110kV transmission infrastructure with local company Badakhshan TADES from Khorog to Gojak. So far, in the area of Andarob, due to a variety of hazards in winter this building has suffered much damage. Since then the year changed the transmission line with the machining facilities. In this building the number of local residents reached 40 years in high quality in the past six months.

In the current year, the World Bank decided to export electricity to an amount of 8,429617 US dollars from Andarob to Hosseinii. The 110 kV power line is created from 63km, with a capacity of 110/35 kV.

This construction is mainly focused on the Afghan population. The construction consists of mechanical bases that will last for 2,5 years, and during the construction work, there will be need for a lot of staff from 120 to 150 people.

Detailed information on the project as well as the developed documents on environmental and social aspects of the projects are available on the PE website, the brochures and newspapers (developed by PE) that are distributed by Gulnor Mamadambarova, as well as on the regional newspaper – “Badakhshon” and messages sent to consumers via phones.

The link to the website is provided in the PE newspapers that were distributed during the meeting. The dates for consultative meetings with the local communities for each targeted village under the project are indicated in the newspaper. That is why we are here today – emphasized Mr D.Bakhtibekov, to present the project’s objectives and activities as well as to know the communities’ opinions as stakeholders and to answer their queries.

3. Questions and Answers

Mr. Khasanov Mehrobsho, the Leader of the Jamaat expressed his gratitude to the representative of Pamir Energy company for the meeting with the local community and mentioned that as electricity is the basic need for human beings, the community is glad that PE started implementing the project and expressed his as well as community’s willingness to assist in the timely implementation of the project. He further queried the implementation period of the project.

Mr. Bakhtibekov responded that the project implementation period. The construction consists of mechanical bases that last for 2,5 years, and during the construction work, we need a lot of staff from 120 to 150 people as he mention above

The community also queried the staff –who will be working during the operational stage at the HPP?

Ms. Mamadatoeva replied that the PE staff as well as local residents, who will be selected based on the required qualifications i.e. with relevant technical knowledge and education

4. Closing Remarks

At the end of the meeting, brochures and regional and Pamir Energy’s newspapers were distributed to all the participants. The pictures of the meeting and the list of participants with their signatures are attached.

Signatures of PE representatives:

/s/ A Mamadatoeva

/s/ G.Mamadambarova

/s/ N.Shoskandarov

/s/ R.Khushqadamov

/s/ R.Ustoboeva

Participants in Consultation Meetings in Andarob and Qozideh		
<i>Full Name</i>	<i>Position</i>	<i>Location</i>
Shodmamadov Ikrombek	Unemployed	Qozideh village.
Mazamov Musamir	Policeman	Qozideh village
Zamirov Islombek	Landstore	Andarob village
Khudoyorov Olimjon	Teacher	Andarob village
Sobirov Khudonazar	Teacher	Andarob village
Mastibekov Mamadrahim	Teacher	Khaskhorog
Surobov Sharob	Teacher	Khaskhorog
Zanjirbekov Khanjar	Unemployed	Khaskhorog
Odilbekov Intizor	Unemployed	Dasht village
Anoyatbekov Khanjarbek	Unemployed	Anderob village
Muzofirbekov Qudratbek	Unemployed	Anderob village
Palavonbekov Noyob	Pensioner	Dasht village
Utalbekov Azam	Unemployed	Dasht village
Rajabov Usmon	Unemployed	Dasht village
Sarvarov Shokir	Unemployed	Sizd village
Ibrohimov Rashid	Unemployed	Sizd village
Shirinbekov Anvar	Unemployed	Kuhi lal village
Ismoilbekov Bakhtali	Unemployed	Andarob village
Poyandaev Aydimamad	School Director	Kuhi lal village
Jumakhonov Qahramon	Unemployed	Andarob village
Khudoyorov Bahrom	Teacher	Andarob village
Shirinbekova Jonamo	Unemployed	Qozideh village
Rakhmondodova Inobat	Unemployed	Andarob village
Davlatmamadova Lutfiya	Unemployed	Qozideh village
Odinaev Umed	Unemployed	Kuhi Lal village
Safarov Abdul	Unemployed	Kuhi Lal village
Qurbonbekov Khanjar	Unemployed	Qozideh village
Odilbekov Oshurbek	Unemployed	Dasht village
Masaylov Salmon	Unemployed	Dasht village
Safoev Khushqadam	Unemployed	Andarob village
Odilbekov Khudoyor	Unemployed	Dasht village
Shirinbekov Bakhtali	Teacher	Dasht village
Nazarov Amirkhon	Unemployed	Kuhi Lal village
Poyandaev Sojiddkhon	Unemployed	Kuhi Lal village
Aslamov Zokir	Unemployed	Andarob village
Shosafobekov Sharaf	Unemployed	Andarob village

Shodmonov Iftikhor	Unemployed	Andarob vilalge
Chorshanbiev Payshanbe	Teacher	Andarob village
Shosafobekov Alimamad	Unemployed	Andarob village
Odinaev Davlatyor	Unemployed	Andarob village
Mastibekov Roziq	Unemployed	Khaskhorog village
Ismatulloev Mamed	Unemployed	Qozideh village
Palavonbekova Ashrafmo	Unemployed	Andarob village
Abdurahimov Jurabek	Teacher	Qozideh village