Juru Energy

Sarimay-Dzhankeldy Transmission

Environmental & Social Impact Assessment (ESIA):

Volume I - Non-Technical Summary

CLIENT: NEGU

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List of Abbreviations

Acronym	Definition
AOI	Area of influence
CC	Civil Code
CHS	Community Health and Safety
EBRD	European Bank for Reconstruction and Development
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic fields
EPC	Engineering, procurement, and construction
E&S	Environmental and social
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environment and social management plan
ESMS	Environmental and Social Management System
ESP	Environmental and Social Policy
GBVH	Gender-based Violence and Harassment
GIP	Good International Practice
GM	Grievance Mechanism
ILO	International Labor Organisation
JE	Juru Energy
LARF	Land acquisition and livelihood restoration framework
LC	Land Code
LILO	Line-in Line out
NEGU	National Electric Grid of Uzbekistan
NTS	Non-Technical Summary
O&M	Operations and Maintenance
OHS	Occupational Health and Safety
OHTL	Overhead transmission line
PIT	Project Implementation Team
PR	Performance Requirement
ROW	Right of Way
SanPiN	Sanitary Regulations and Norms of Uzbekistan
SCEEP	State Committee for Ecology and Environmental Protection of the Republic of Uzbekistan
S-D	Sarimay-Dzhankeldy
SEFG	Southern even-fingered Gecko
SEP	Stakeholder Engagement Plan
SS	Substation

PREFACE

The European Bank for Reconstruction and Development (the "EBRD" or the "Bank") is considering providing a loan to finance the construction of the Sarimay- Dzhankeldy overhead transmission line (S-D OHTL) Project (the "Project").

EBRD has appointed Juru Energy Ltd. (JE) to perform an Environmental and Social Impact Assessment (ESIA) for the Project following the EBRD Environmental and Social Policy 2019 (ESP 2019) and supporting Performance Requirements (PRs) and Good International Practice (GIP).

This document provides a Non-Technical Summary (NTS) of the ESIA process. This NTS aims to present clearly and simply the draft findings and conclusions of the environmental and social (E&S) impact assessment process.

EBRD has categorised this Project as Category A. Category A projects require a comprehensive ESIA and associated documents. The ESIA is organised as follows:

- Volume I: Non-technical summary (NTS) (this document)
- Volume II: Environmental and social impact assessment (ESIA)
- Volume III: Technical appendices
- Volume IV: Environment and social management plan (ESMP)
- Volume V: Stakeholder engagement plan (SEP) including grievance mechanisms
- Volume VI: Land acquisition and livelihood restoration framework (LARF)

Information disclosure on the draft of ESIA was completed between January 10 and 13, 2022. The public meetings were arranged with responsible organisations, land users as well as people from the nearest communities to the Project to communicate the findings of the ESIA.

A full summary of this consultation is provided in the SEP. Feedback from stakeholders during the public meetings has been integrated into the ESIA. Public disclosure on the EBRD website of key documents for a minimum of 120 days is scheduled to occur between March 2022 to June 2022. ESIA documents Volume I to VI will be disclosed via the online locations provided in the table below. Complaints can also be addressed via the channels outlined below. Copies of this NTS in English, Russian and Uzbek can also be viewed at:

- Khokimyat Offices in Tuprokkala, Peshku and Gijduvan districts

Comments from the public disclosure process will be integrated into the ESIA documents for finalisation prior to decision making on the financing.

Please contact Juru Energy on the details below if you require a hard copy

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1 Introduction

1.1 Overview of the Project

The Sarimay-Dzhankeldy 500 kV overhead transmission line Project (S-D OHTL or "the Project") proposed by J.S.C NEGU is located in the southwestern part of the Kyzyl-Kum Desert. An Engineering, Procurement and Construction (EPC) contractor will perform the design, construction and commissioning work on behalf of J.S.C. NEGU following an open tender process.

The Project's main purpose is to facilitate the evacuation to the national power grid of the electricity generated by renewable energy power plants under development in Bukhara and Navoi regions. Implementation of the Project will also significantly improve the transmission network's reliability, efficiency, stability, and quality and security of the electricity supply.

The Project is split into two lots (together Lot 1 and Lot 2 are referred to as the "Project"):

- Lot 1 - 500 kV Sarimay- Dzhankeldy OHTL (S-D OHLT) - approximately 127 km OHTL located in the southwestern part of the Kyzyl-Kum Desert.
- Lot 2 – 500 kV Navoi TPP – Bash SS - Muruntau SS LILO OHTL (N-B-M LILO) - approximately 10 km in length, split between two 5 km sections for a LILO connection from the 500kV Bash SS (under development) to the 500 kV Muruntau-Navoi OHTL (under construction).

Figure 1 shows the two lots in Uzbekistan (Lot 1 is identified in blue, and Lot 2 is red). Lot 1 starts from the existing Sarimay Substation (SS) (Khorezm province), which is located close to Nukus village (300 m) and Sarimay village (4.3 km), to the planned Dzhankeldy SS passing close to the villages of Kalaata and Dzhankeldy through an unmodified area of Kyzilkum district. This route crosses Turtkul district of the Republic of Karakalpakstan, Tuprokkala district of Khorezm region and Peshku district of Bukhara region (Figure 2)

The N-B-M LILO (Lot 2) is entirely located in Bukhara province (Gizhduvan district) near the villages of Ayakagitma and Kuklam (Figure 3).

The landscape of the Project area is steppe, rather uniform and arid, except for the hills adjacent to Ayakagitma lake on the west side of Lot 2. The climate is characterised by mild winters and very hot summers. Strong winds are frequent in February and June and are accompanied by dust and sandstorms. There are three water pipelines in Lot 1 (two complete and one under construction) and a water pumping station with periodic water access points. Herders graze livestock in the wider area of both Lots Figure 4 to Figure 7 illustrate the landscape through which the S-D OHLT routes.

Figure 1: Project Location 500kV S-D OHTL Project.

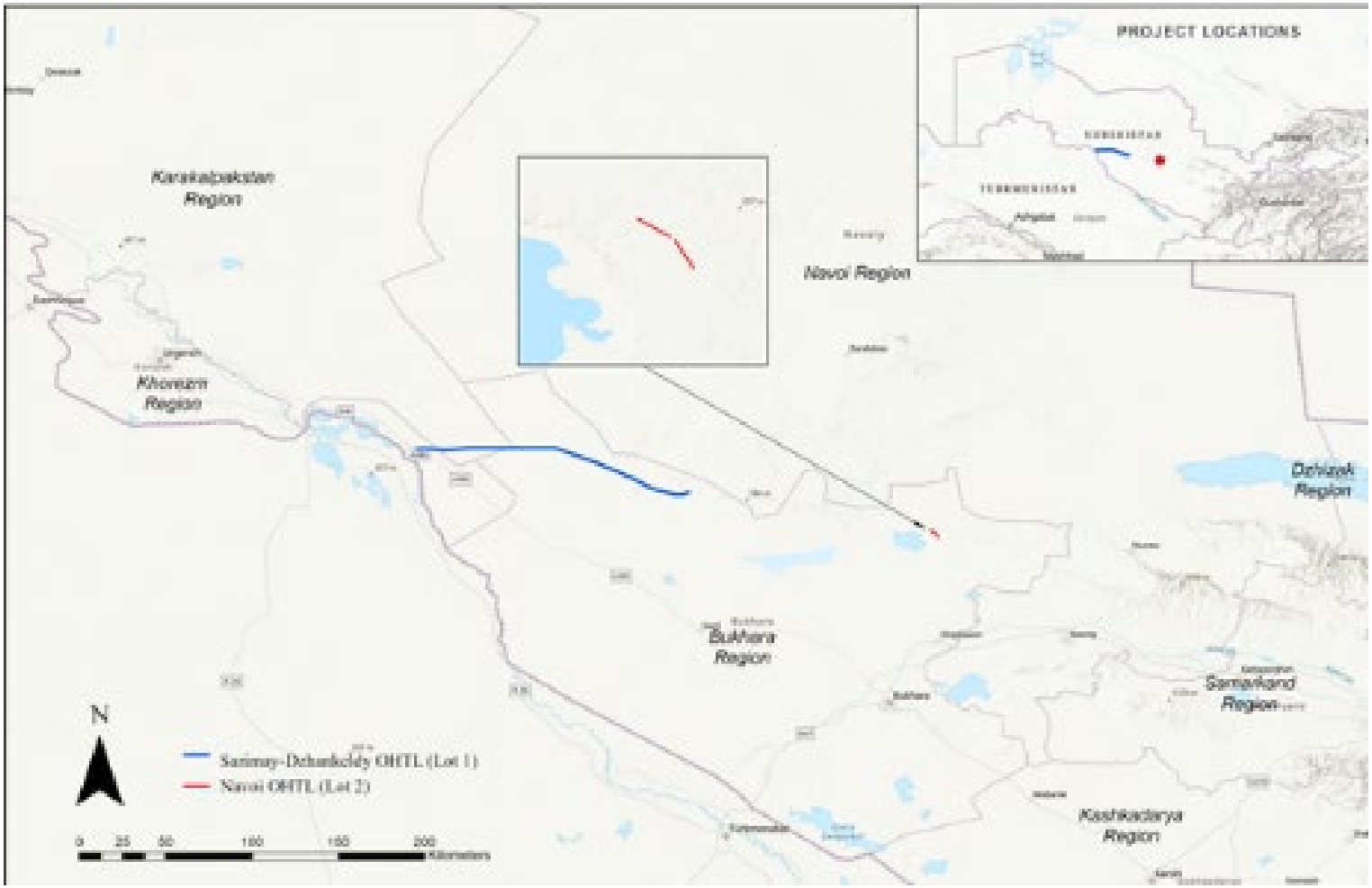


Figure 2: Project Location of S-D OHTL (Lot 1) (Source: Juru Energy)

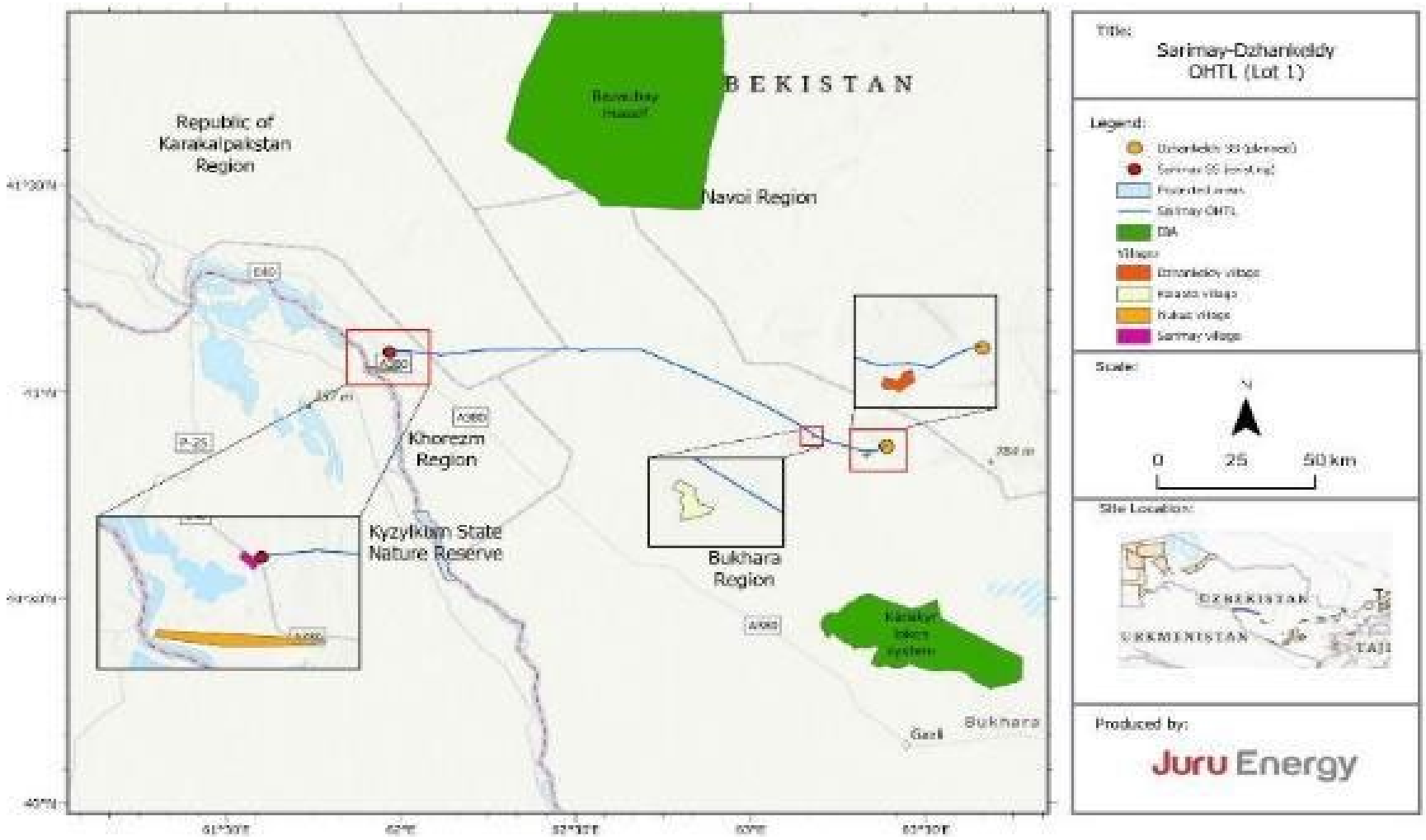


Figure 3 Project Location N-B-M LILO (Lot 2) (Source: Juru Energy)

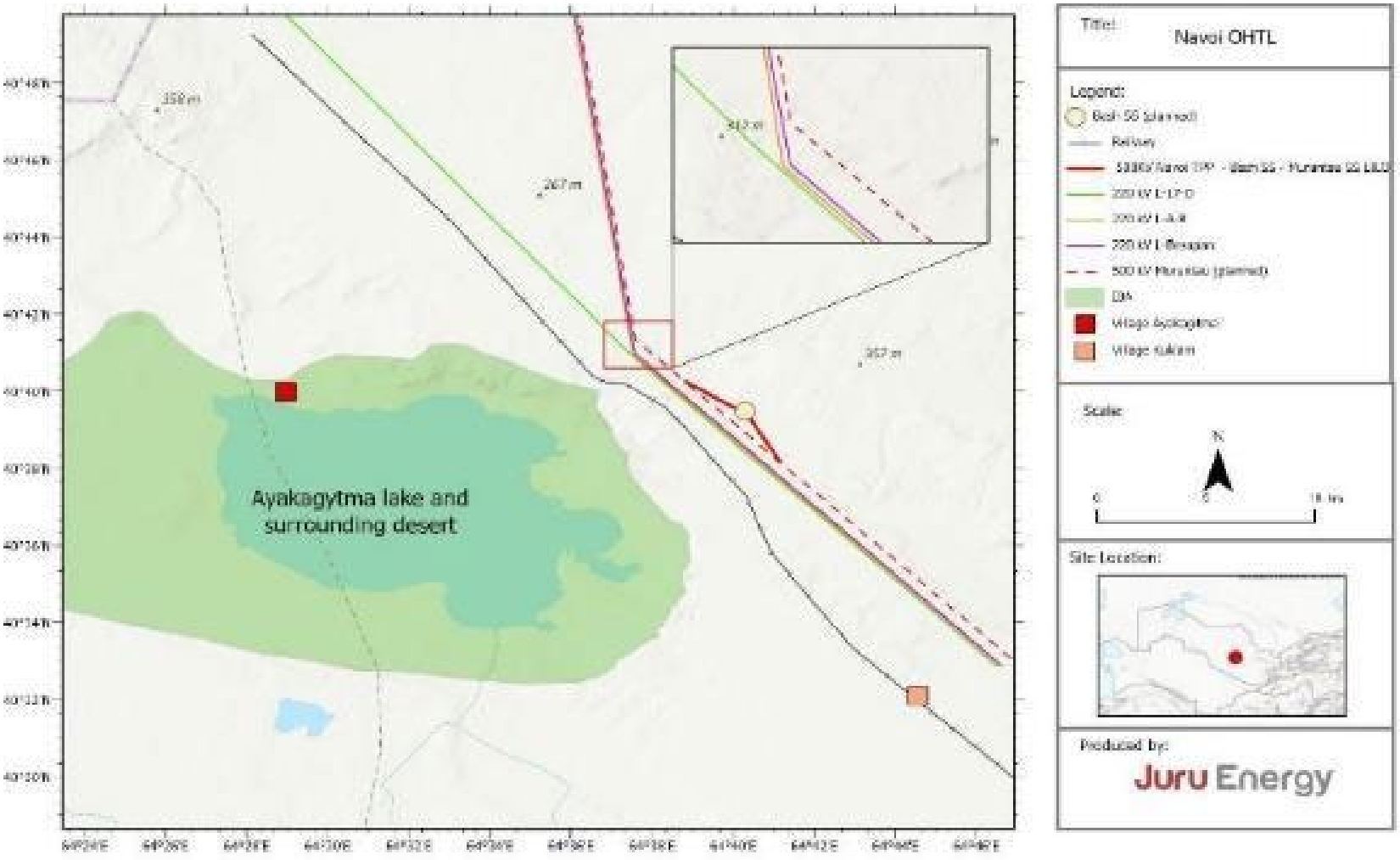


Figure 4: View of the predominant desert landscape along Lot 1 (source Juru Energy)

Figure 5:Sarimay SS (Lot 1) (source Juru Energy)

Figure 6:General landscape (Lot 2) (source Juru Energy)

Figure 7: Small village (Agitma) (Lot 2) (source Juru Energy)

2 Project Description

2.1 Project need

The Government of Uzbekistan aims to increase its power supply and has adopted the 2030 Energy Strategy, which defines several objectives and directions for electricity supply between 2020-2030, including the rapid development of renewable energy projects.

EBRD's 2030 Energy Sector Strategy sets a key objective to "*develop and expand renewable energy use and its integration into the unified power system*" (BDS18-237(F)

EBRD's Green Economy Transition approach promotes "*cleaner production and distribution of energy through greater energy and resource efficiency*" (BDS15-196(F)

The Project will strengthen the power supply stability between the South-West and North-West regions of the country and support the wider integration of renewable energy projects in the South-West to the national grid.

2.2 Alternative options

Alternative concepts and route options have been considered, including the "do nothing" option. Not constructing the Project will avoid any potential environmental and social (E&S) impacts; however, this will hinder the objectives of the country's Concept Note for ensuring electricity supply in Uzbekistan in 2020-2030 and renewable energy transition goals. There is no viable alternative strategic option available for the wider grid strengthening in the North-West. The S-D OHTL plays a key role in connecting the North-West region to the rest of the 500 kV network.

The S-D OHTL route corridor itself is defined by the start and endpoints of the OHTL. Over the ESIA duration, three route corridor options were assessed against technical, environmental, and social criteria through an iterative process. The preferred corridor option (as presented in this NTS) was selected based on the best balance between impact on undisturbed habitat and species of key importance, the length of the line, environmental factors and impact on local receptors.

Final decisions on the design of the Project components (towers, insulators) and tower siting as described in this ESIA may be subject to change by the EPC Contractor selected to deliver the Project. This ESIA has identified specific design mitigations for inclusion in the EPC specification. These are noted in the ESMP and will be integrated into the EPC contract for implementation during the Project's next phase.

2.3 Land requirements

For newly designed 500 kV OHTL, buildings and structures must be set back 30 m from the outermost conductor on either side of the OHTL; this forms the ROW or servitude. The state owns all land in Uzbekistan. The owners of the land rights along the Project ROW are the government-owned Committee for Development of Sericulture and Wool Industry, and the company managing the land is the Dzhankeldy LLC. The Project will need to obtain servitude

rights over the land for the OTHL and any permanent and temporary access roads (unsurfaced). J.S.C NEGU will enter into a servitude agreement with the landowner (Committee for Development of Sericulture and Wool Industry).

Procedures for obtaining the use of a ROW in Uzbekistan are well defined. Calculation and compensation of losses to those with and without official land rights will be performed following the Project Land Acquisition and Livelihood Restoration Framework (LARF) which follows national regulations and EBRD ESP 2019 Performance Requirement 5 (PR5), thus ensuring landowners, land users, and lessees are liable to be fully refunded (including the lost profit) in the case of limitation of their rights from the construction or operation of the Project. Land law relating to servitude in Uzbekistan also protects the owner/user and does not deprive the owner of their parcel's possession, use, and disposition rights.

The ESIA has assessed potential livelihood losses, summarised later in this NTS. Permanent land take will be for the OHTL tower footprints only. Grazing and other activities may continue under the line once operational. Work at the substations will be entirely within the exiting substation footprints.

2.4 Labour requirements

The construction workforce is not anticipated to exceed 200 persons in total. There may be limited opportunities for local workers in unskilled or semi-skilled temporary employment. A system for hiring personnel and local suppliers will be developed for the Project. Operations work is expected to comprise of maintenance work only, which will be sporadic and undertaken by existing NEGU staff.

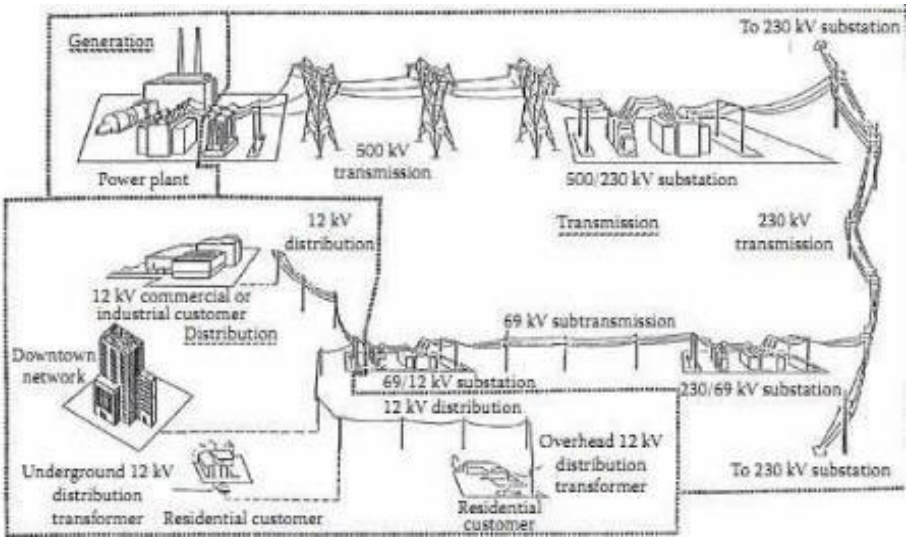
Potential risk and impacts to the labour workforce are identified as relating to the risk of insufficient or inadequate personal protective equipment (PPE); workers not provided with contracts or documentation that clarify worker rights; withholding of personal documents or passports, lack of or insufficient payment (often related to overtime hours or night work); excessive working hours, and/or lack of sufficient breaks; and unsuitable accommodation. Workers' accommodation is likely to be a temporary work camp or accommodation in nearby settlements.

To mitigate these risks all contractors will be required to prepare a Human Resource (HR) policy and must adhere to the "labour management plan". A workers and security guard "code of conduct" will be signed by all relevant workers and labour monitoring will be undertaken. A worker grievance mechanism will be established to be accessible to all workers.

2.5 Project components

An OHTL is the structure by which electrical energy is transmitted from one location to another see Figure 8.

Figure 8: Concept of electric energy transmission (Source: http://www.industrial-electronics.com/elec_pwr_3e_9.html)



The main components of an OHTL are the towers, foundations, and conductors.

- Towers are typically either suspension, angle or terminal towers that can either be self-supporting or guyed towers with a tower height of approximately 30 to 40 m.
- Foundations are required to fix the towers in place, the foundations may be up to two meters deep, depending on geotechnical requirements.
- Conductors are the lines that string between each tower that transmit the electricity. The distance between each tower is the span; typical spans are between 300 m and 400 m.

Related works in of the OHTL work s will include:

- End-user works at the existing Sarimay SS (Lot 1)
- End-user works at the planned Dzhankeldy SS (Lot 1)
- End-user works at the planned Bash SwS (Lot 2)
- Establish ROW under the OHTL (including the provision of any related livelihood compensation) (Lot 1 and Lot 2)
- Upgrade existing or new roads (unsurfaced) suitable for providing access to the OHTL towers worksites (Lot 1 and Lot 2)

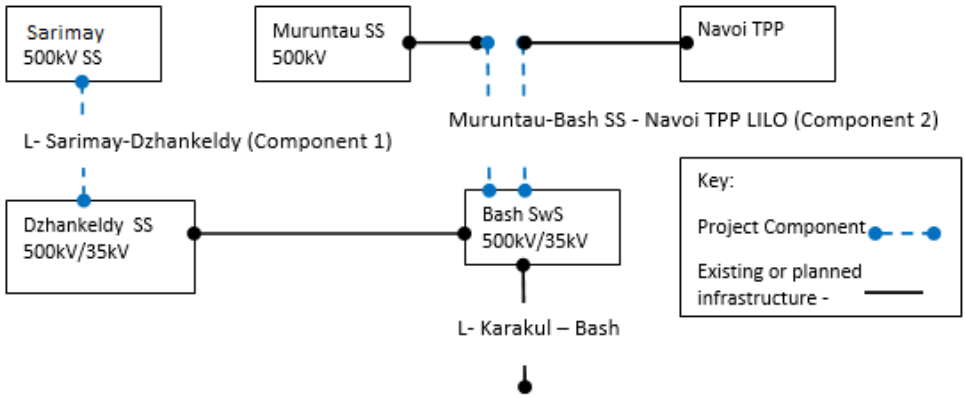
ROW[1] size is dictated by Uzbekistan standards and for a 500 kV project it is 30 m on either side of the OHTL outermost conductor).

[1] The right of way (ROW) is termed the Sanitary Health Protection Zone (HPZ) in Uzbekistan and may also be referred as servitude.

The Muruntau SS and the 500kV Navoi to Muruntau/Besopan OHTL are considered associated facilities to the Project and have already been subject to ESIA following EBRD ESP 2019 by third party entities. Details of these projects can be found at EBRD website[2].

A simplified line diagram illustrating how the proposed Lots connect to the region's transmission network is provided in Figure 9.

Figure 9: Simplified schematic of the proposed Project at wider 500kV transmission network



The mobilisation and construction phase for Lot 1 and Lot 2 is expected to take 12 to 18 months and 9 to 12 months, respectively, followed by 3 months of testing and commissioning. Works at the substations will be of shorter duration and timed to be finished before OHTL commissioning works commence.

2.6 Project development

There are four main stages of the Project cycle, pre-construction, construction, operation and decommissioning. Pre-construction work includes finalising the design, recruitment and procurement of equipment and site setup. Construction of the OHTL typically progresses sequentially by one or more teams (of a small number of workers) working along the whole or sections of the OHTL route. The main construction activities are site clearance (rocks, utilities, vegetation), establishing vehicle access to each tower location, civil works (tower foundation works), steel delivery, tower construction, conductor stringing and commissioning.

Conductor stringing is typically performed by using a guy wire/pilot wire that is used to “pull” the conductor from the “conductor reel” at the start of the stringing point to another “pilot line winder reel” where the guide/pilot wire is collected. Pull sections incorporate, on average, about four towers and using this method can avoid disturbance to the habitat below the line.

A laydown area will be established for each Lot at a location central to the OHTL route and close to the main delivery rail station. For Lot 1, smaller and temporary equipment storage sites may also be established at strategic locations along the route.

2 https://www.ebrd.com/sites/Satellite?c=Content&cid=1395283946426&d=Touch&pagename=EBRD%2FContent%2FContentLayout

At this time, the water source for the construction process is unknown. Materials and equipment will likely be delivered to the nearest railway station (Sarimay/Navoi) and then delivered to the site using trucks, where possible existing tracks will be used.

JSC NEGU will operate the OHTL and implement preventative, and emergency maintenance works following their corporate operations and maintenance (O&M) procedures. The substations with either be remotely operated or have one or two permanent workers (operating in a shift system). The substation maintenance works will be intermittent and within the operational site boundary.

The expected lifetime of the infrastructure is 30 to 40 years (at least). At the end of its lifetime, options will be considered to replace the OHTL, repair it or remove all infrastructure from the site.

Following the Resolution "On the State Environmental Expertise", approved by the Resolution of Cabinet of Ministers No. 541 “On further improvement of the environmental impact assessment mechanism’ (2020), a national Environmental Impact Assessment (EIA) Study must be submitted for approval by the state unitary enterprise "The Centre of the State Environmental Examination" of the SCEEP. J.S.C. NEGU will hire a consultant to perform the national EIA at a later date.

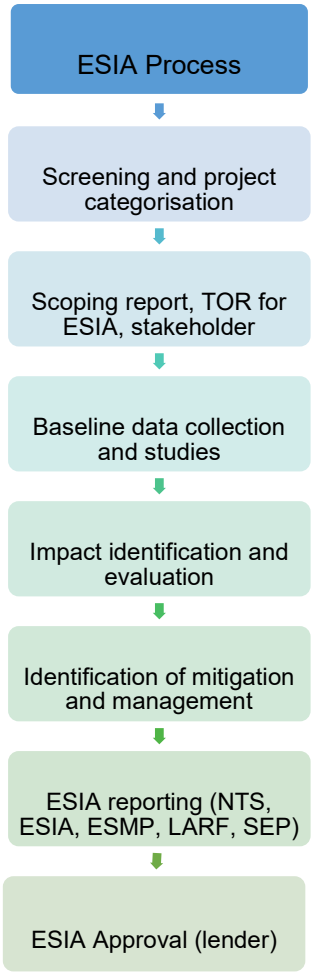
3 Assessment Approach

3.1 Assessment framework

The Project has been assessed against the national regulatory framework and the requirements of EBRD ESP 2019, and the supporting Performance Requirements (PRs).

3.2 Assessment methodology

Box 1 Steps of ESIA preparation



This ESIA and its supporting documentation are prepared for EBRD to support the financing process following the steps outlined in Box 2. The ESIA has identified and evaluated potential E&S impacts that the Project may have on the environment and communities within the direct[3] and indirect[4] area of influence (AOI). The evaluation of impacts has considered the ***magnitude*** of the predicted impacts and the ***sensitivity*** of the receptors (physical, human or biological) as defined by the baseline studies and data collection.

The magnitude of the impact considers:

- type and nature of impact (positive / negative)
- scope (e.g., local, regional, global)
- duration (continuous / temporary)
- time period (immediate / delayed)
- reversibility (reversible / irreversible)
- likelihood to occur (none, small, average, high)

The sensitivity of the receptors considers such things as the ability of the receptors to absorb the change or recover from change once the impact is removed.

Magnitude (high medium, low) combined with sensitivity (high, medium, low) have been combined to assign impact significance in one of the following categories:

- **Critical:** These effects represent key factors in the decision-making process. They are generally, but not exclusively, associated with impacts where mitigation is not practical or would be ineffective.
- **Major**: These effects are likely to be important considerations but where mitigation may be effectively employed such that resultant adverse effects are likely to have a Moderate or Slight significance.

3 Direct area of influence: considers the physical footprint of the project such as the site layout, work staging area and area affected during construction and operation works (e.g. traffic patterns)

4 Indirect area of influence: includes area which may experience project related changes in combination with activities not under the direct control of the project (e.g. inward migration, induced development, visitor influx, access to employment

- **Moderate**: These effects, if adverse, while important, are not likely to be key decision-making issues.
- **Minor**: These effects may be raised but are unlikely to be of importance in the decision-making process.
- **Neutral:** No effect, not significant, noise need not be considered as a determining factor in the decision-making process

Mitigation and management measures have been identified following the mitigation hierarchy of avoid, reduce/minimise, mitigate and compensate//offset to reduce impact significance to acceptable levels (residual significance). Mitigation and management measures identified in the ESIA have been included in a framework ESMP (Volume IV) which outlines the framework for implementing the mitigation measures across the different phases of the development cycle. All contractors will be required to demonstrate that they have the procedures in place to implement the requirements of the framework ESMP. J.S.C NEGU and the Lenders, or their representatives, will undertake regular audits of works against the requirements of the framework ESMP commensurate with the nature of the risk.

3.3 Stakeholder engagement

An important part of the ESIA process has been consultation with local communities and other interested groups (collectively known as stakeholders). Stakeholder engagement started in October 2021 with a scoping site visit and will continue throughout the Project lifetime. A systematic approach to stakeholder engagement has been employed that has sought to build a constructive relationship with stakeholders, particularly the directly affected communities.

The Project has held public meetings and one-on-one meetings with various stakeholders, including:

- government bodies (national, provincial, municipal and local departments/khokimiyats)
- regionally based industries, community leaders
- project-affected communities (PAC) (Nukus, Sarimay, Dzhankeldy, Kalaata),
- communities in the wider area of influence (Agitma, Koklam, Cholobod, Kockcha)
- land users (herders)

Project information leaflets and drafts of the non-technical summary have been distributed during the engagement activities. Public meetings have been held; including separate meetings at each PAC and with vulnerable groups (women, youth and children, elderly or disabled and illiterate or semi-literate persons); and letters sent to relevant non-governmental organisations. In addition, a number of khokimiyat and government entities were contacted by mail. No concerns were raised during this process. The main feedback was on the topics of biodiversity (avifauna assessment and mitigation), the need for archaeological survey along sections of Lot 1, maintenance of adequate buffer zones with other nearby infrastructure (water pipeline, fibre optic cable), and requests for information on the construction duration, budget, potential impacts on grazing livestock, positive impacts for nearby community including employment opportunities. Table 1 provides a summary of the stakeholder engagement undertaken between October 2021 and January 2022. The Project has established a communication plan (referred to as a Stakeholder Engagement Plan) that includes a detailed communication program to manage stakeholder contact and relations in the future.

Table 1: Summary of stakeholder engagement

Type of visit	Date	Stakeholders	Concerns raised	How concerns were addressed	Information disclosed
Scoping site visit	October 12 – 13, 2021	Tuprokkala district khokimiyat Sarimay substation Local herders Water station of Navoi Mining Company Sarimay and Nukus Communities	Baseline information was provided. No concerns were raised Suggestions that the district can supply food, tents and clothing for construction	Information added to ESIA baseline section 4.5 and the LARF.	Project leaflet
ESIA Prep. visit	November 12-19, 2021	Impacted herders (three herders) Department of Makhalla and Family Support under Ministry of Makhalla and Family of Republic of Karakalpakstan Dzhankeldy, Kalaata, Sarimay and Nukus community leaders	The Administration of Khorezm region and Karakalpakstan Republic are reviewing borders of their regions. The Project informed village leaders of the upcoming survey.	Information added to ESIA baseline section	Project leaflet
Surveys	November 15-17, 2021	Dzhankeldy, Kalaata, Sarimay and Nukus villages	Conducted survey with community members.	Surveys used to inform the ESIA baseline section	Project leaflet
Official request letters sent	November 25-26, 2021	State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection Bukhara and Khorezm khokimiyats Ministry of Employment and Labour Relations of the Republic of Uzbekistan Ministry of Health (or MHRUz) Institute of Archaeology under Academy of Sciences of the Republic of Uzbekistan National Centre for Archaeology Agency of Cultural Heritage under Ministry of Sport and Tourism of the Republic of Uzbekistan “Uztransgas” JSC “Uztelecom” JSC Navoi mining company JSC “O’zbekiston temir yo’llari”	Stakeholders provided the technical conditions that should be followed during construction of the route related to their relevant area of expertise.	Project design and route selection has been prepared considering the information provided. Information has also informed relevant sections of the ESIA	Project information and questions included in a letter

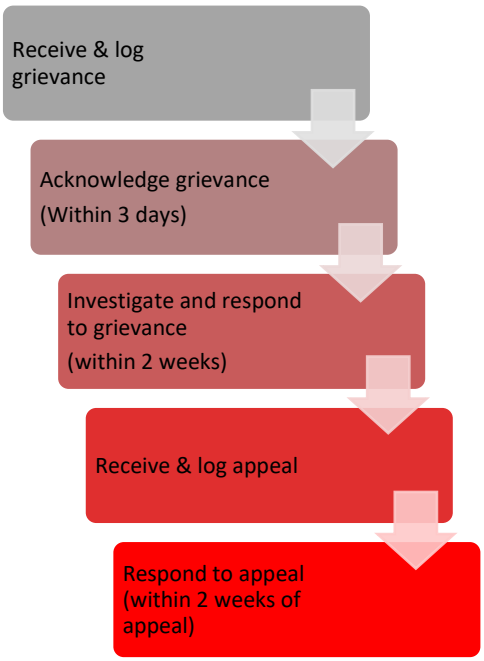
Type of visit	Date	Stakeholders	Concerns raised	How concerns were addressed	Information disclosed
Phone calls	December 6 and 10, 2021	Navoi mining company	Requesting additional information to letters sent in November, 2021	No additions required	Project information provided by phone
		JS "Uzbekistan Railways"			
		Specialist of Soviet Ministers of Karakalpakstan Republic			
Public consultations	January 10-12, 2022	Peshku, Gijduvan and Tuprokkala municipality officials	Community members and officials raised questions related to Project timelines, impacts, employment opportunities and impacts on livestock, which were answered by the Project team	No additions were required as a result of the questions asked	Non-technical summary ESIA, Project presentation and brochures
		Dzhankeldy, Kalaata and Nukua villagers – separate meetings with male and female representatives			
		Herders (five herders in total)			
		Unit on women affairs in Makhalla committee			
		Sarimay community villagers – men only			
		Sarimay village (walk through to speak to women)			

3.4 Grievance mechanism

Any concerns or questions the community may have can be raised to the Project via the "community grievance mechanism" (GM), which sets out how the Project will receive, investigate and respond to all concerns. The steps in the GM are provided in Box 2. Grievances can be raised through the following methods:

- Directly to Project staff during meetings, or Project site visits,
- Via telephone calls
- In written form (text messages, via email, mobile applications, letters, written requests etc).
- The grievance mechanism will keep strict confidentiality of data, including the personal information of all applicants. At the stage of grievance receipt/registration the complainant will be informed that they can submit a grievance anonymously.

Box 2 Steps in the Community Grievance Mechanism (GM)



Contact details for each of these methods are included in the introduction to this document and below.

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NEGU NEGU Complaints line	Telephone +998 7) 236-68-65 Email: info@uzbekistonmet.uz Address: Tashkent city, 100084, Yunusabad district, Osiye street, 42nd house. **Web site:** uzbekistonmet.uz
NEGU Islombek Saparmatov – NEGU contact person	Email: sarimay.jankeldi@gmail.com Telephone +998 71 236-68-08

In cases, where the complainant is not satisfied with proposed solution/response to the grievance, they have the right to take other legal action to resolve the grievance.

4 Summary of environmental and social assessment

Potential impacts have been assessed and residual risk significance evaluated based on the proposed mitigation measures set out in the ESIA. The findings of the ESIA are summarised in Table 2:

Table 2: Summary of ESIA

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
Air quality	Baseline air quality is good with no non-natural sources of air emissions in the AOI (200m on either side of the OHTL and work areas). There is potential for vegetation removal, leading to exposure of bare soil and increased risk of dust emissions. The operation of construction vehicles and other construction activities can lead to fugitive dust and gas emissions. Sensitive receptors in the area are mainly the project workers and workers at the nearby water pumping station. No operational air quality impacts are expected. Decommissioning air quality impacts at Lot 1 and Lot 2 will be similar to those generated during the construction phase.	Design measures to route the OHTL and access routes at least 200m away from sensitive receptors will help to minimise the significance of impacts. Sustainable land clearance practices and rehabilitation and restoration actions, will ensure disturbed areas of land are restored/rehabilitated as soon as possible to minimise dust generation. GIP for vehicle management, including demarcated access routes, speed limits, well-maintained vehicles, siting of generators away from receptors) will reduce the potential impact from gaseous emissions to acceptable levels. Regular daily visual monitoring of dust episodes, soiling of vegetation, dust resuspension on the roads and dust clouds will also help ensure the significance of fugitive dust and gas emissions are managed to acceptable levels.	Minor (Workers) Neutral (other receptors)
Noise	The baseline noise environment in the direct AOI (200m on either side of the OHTL and work areas) is low. and strongly influenced by natural sources of sound, e.g., wind or traffic noise. The absence of permanent receptors in the direct AOI means	Design measures to route the OHTL and access routes at least 200m from sensitive receptor will help to minimise any impacts. GIP for noise management, includes restricting works to daytime hours and locating all	Minor (construction works) Neutral (construction traffic)

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	that noise impacts are expected to be insignificant. Herders and other receptors occasionally in the AOI e.g., road users may be susceptible to changes in noise level during site preparation, from construction-related traffic movements and operation of mobile generators. Works will be short-term and temporary at each tower location. No noise is expected to be generated during the operations phase. Decommissioning noise impacts will be similar to those generated during the construction phase.	temporary worksites more than 200m from sensitive receptors (specifically the water pumping stations, water pumps, herder camps (active or inactive) and good vehicle management practices (e.g., no revving of engines etc.). Combined, these measures ensure impacts from noise are insignificant.	
Waste	Most waste generated during construction, operation and decommissioning will be non-hazardous and low-level hazardous wastes (e.g., oils, paints, solvents). These will be disposed to a regulated landfill. The availability of non-hazardous or construction waste disposal facilities in the local area is good. There is less capacity to dispose of hazardous wastes locally and wastes either have to be transported to sites in Tashkent or Nukus or are accepted at landfills that are not designed in alignment with GIP for hazardous waste disposal. Inadequate handling, transfer and disposal of hazardous waste may lead to uncontrolled releases to land, air, groundwater leading to the degradation and pollution of the receiving environment.	All prohibited materials that may generate hazardous waste will be prohibited in project contracts. A site waste management plan will be required for each phase of the project to set out the plans for handling and to store waste at the Workfront and centrally coordinate transportation and disposal to an appropriate landfill in line with national laws, standards, and GIP. There will be limited if any opportunity for recycling wastes or re-using wastes. Weekly and monthly waste generation volumes for construction wastes (segregated by waste stream defined by waste disposal option) will be reported.	Neutral (general waste and low-level hazardous waste) Minor (hazardous wastes)
Climate resilience	The Project is predominantly susceptible to physical climate-related risks on infrastructure, and worker health is given the expected lifetime of the OHTL (30 to 40 years) that will be evident during	Climate-resilient design choices and appropriate emergency response planning are key to managing these impacts. Design recommendations will consider climate	Minor

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	the construction phase. Climate risk screening in the short, medium and long-term has projected increasing trends for frequent storms (dust storms), extreme rain events and potential for prolonged periods of extreme heat during the summer months as the key effects of climate change to be managed. Increased wind speed can damage conductors, increase heat convection, and impact worker heath (dust storms). Increased temperatures can lead to technical issues and impact worker health leading to a higher prevalence of heat-related medical conditions or greater restrictions on periods of physical work. There is also potential for extreme rain events to create wet soils conditions that, if not accounted for, can lead to groundwork and tower foundation issues.	projections up to 2085 and whether there is a need to reinforce the structures/foundations for higher design standards (stronger winds, higher temperatures). Emergency preparedness plans will include evacuation/sheltering against dust storms, thresholds for stopping work when the temperature exceeds safe limits for physical exertion (~35 °C), extended rest periods, adequate drinking water. Contractors will be required to establish an early warning system for wind and extreme heart events through continuous weather monitoring and provide awareness training to workers on their rights regarding working in these conditions.	
Water resource and quality	No surface water features, or seasonally flooded areas are noted within the direct AOI. The indirect AOI includes the Amu-Darya River and Lake Ayakagitma, which feed the municipal water supply close to Lot 1 and the irrigated supply to Agitma village near Lot 2. Groundwater boreholes feed nearby local villages. Relatively low volumes of water will be required for the construction works, and no water will be required for operations. The main water use is during cement manufacture at offsite facilities under relevant licence. No groundwater or other water sources will be used for construction works. Drinking water will be tinkered to each Workfront daily. No significant indirect impact on Amu-Darya River and Lake	During the design phase, measure will be implemented to minimise water needs in the construction process. Methods for minimising water use at the site will be explored. Measures to prevent contamination of groundwater from construction works will align with GIP and include such measures as appropriate storage for chemicals, fuels and oils, refuelling offsite, minimising increased run-off from work areas, no cement washout at the Workfront sites and no direct discharge of contaminated water or potentially contaminated water to the ground without prior treatment.	Minor

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	Ayakagitma or existing water sources used by the local community. expected. The groundwater levels in the region may be quite high, so there is also potential for pollutants to contaminate the groundwater sources if not managed appropriately. Operations-related activities were scoped out from the assessment based on low volumes and short-term maintenance work requirements.	Construction water use will be monitored throughout the construction phase.	
Soils	Soils along the OHTL route is predominantly fixed and semi-fixed sands with a high sensitivity to erosion when disturbed. The vegetation cover of the fixed and semi-fixed sands is a major factor in retaining their structure. If disturbed or compacted, it can lead to a loss in this vegetation cover and a phenomenon known as “shifting sands”. Due to soil conditions (low organic matter and nitrogen content), natural re-vegetation cannot be expected and therefore the potential magnitude of the impact is deemed moderate. There is potential for risk of causing contamination to soils and experience a deterioration of worker health in particular during foundation excavation works due to the naturally elevated levels of heavy metals in the soils.	The construction specification will require a tension stringing technique to be used to avoid impact on habitat between the towers and stringing points. A site clearance plan will set out measures to minimise soil removal, confine vehicle movements to reduce compaction impacts and for any area impacted by compaction a requirement to rehabilitate the compacted area to support the return of the impacted area to the original state as quickly as possible following completion of the works. This may require aeration of the topsoil, enrichment of the topsoil or reintroduction of selected species and shrubs. Good practice techniques for retaining and re-using the topsoil will be implemented. GIP (including risk assessments) will minimise releases of pollutants to the ground. All workers will be to wear the appropriate personal protective equipment (PPE) when doing groundworks.	Moderate (Soil erosion) Minor (Soil contamination and worker heath)

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
Electric and Magnetic Fields (EMF)	Sensitive receptors in the AOI with the potential to be exposed to levels of EMF and their sensitivity to EMF impacts are predominantly herders who will graze their livestock in the vicinity of the OHTL and workers undertaking maintenance works during the operation phase. There is a potential for short term health effects on electricity workers and members of the public from exposure to EMF; however, the levels of EMF fall away to acceptable levels well within 30m of the OHTL. Furthermore, land-users will not be beneath the OHTL for significant periods. The resultant impact magnitude is therefore deemed to the low.	The OHTL routing will maintain at least 200m between the sensitive receptor and the OHTL centre line to manage EMF. All maintenance workers will receive EMF safety program training as per J.S.C NEGU operational procedures. Awareness-raising activities with local farmers and herders are planned to raise awareness of how to reduce exposure when grazing livestock in the ROW.	Minor
Traffic and transportation	Traffic volumes on main (tarmacked roads) are low. Roads used for the delivery of materials will experience increased traffic for a short duration and are considered capable of absorbing this additional road use and therefore impacts on traffic volumes and transportation infrastructure in Sarimay and other nearby communities is expected to be low. Traffic volumes on the existing track between Sarimay and Uzunkuduk are infrequent and the road condition is unsurfaced and requiring some upgrade works to be suitable for use by project vehicles. The impacts of construction traffic are likely to be temporary, lasting only for the duration	A traffic management plan will be prepared that sets out: ● Designated traffic routes are proposed for the transportation of heavy and abnormal loads. ● GIP for delivery times, routes, speed limits, signage, laydown locations, rest locations. ● Any damage to existing infrastructure will be made good by the Project. ● Community safety campaign to improve the people's knowledge of the traffic	Minor

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	of the construction phase. Given the low volumes of traffic on this road, impacts are expected to be negligible. The condition of the road is expected to be improved as a result of the works.	hazard on their roads, public information and other activities to address the issue.	
Biodiversity - General	Impacts may include: ● Introduction of invasive species ● Habitat/vegetation loss and degradation ● Disturbance to and displacement of animals ● Injury/death of terrestrial (non-flying) animals ● Bird collisions with powerlines ● Bird electrocutions on powerline pylons/towers . Twenty-three distinct biodiversity features have been identified as Priority Biodiversity Features or Critical Habitat features, potentially sensitive to impacts from the Project, based on the definitions and criteria of EBRD PR6. These are discussed further in the sections below.	A Biodiversity Action Plan (BAP, will be developed covering all mitigation for SEFG), including full description of off-site SEFG habitat rehabilitation plan, in relation to achieving "net gain" for SEFG (Lot 1 only) ● Pre-Construction monitoring and Relocation Procedure including requirement to survey population immediately before construction and relocating to the nearest habitats ● Creation of closed zones, at least temporary, for the period of construction where transport, livestock and people should not get into that can be used for the release of the geckos after relocation and if found during the excavation works ● Long-term monitoring of the population after construction	Moderate (SEFG)
Habitats and Flora	Neither Lot 1 nor Lot 2 pass through or adjacent to any national or international protected area. Impacts on habitat and flora are expected to have an impact at the tower footprint locations, along access roads and at any temporary laydown areas within the ROW. In addition, direct impacts to two plant species classed as PBF and with national protected status (*Acanthophyllum*	Spring/summer surveys will be performed to identify the location of these species relative to the ROW. Seeds will be collected to support a replanting program to achieve NNL outside the direct area of impact. A bio-monitor will be on hand to direct this work. IN addition, micro siting of pylons and access road to avoid Tulipa lehmanniana (Lot 2) and Acanthophyllum	Minor

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	cyrtostegium and *Tulipa lehmanniana)* were noted during the baseline survey work. No invasive species were identified in the baseline mapping.	cyrtostegium (Lot 1) to the extent possible will be performed.	
Terrestrial Fauna and Avifauna – construction and decommissioning	The receptors most at risk of disturbance and habitat loss/degradation, discernment and displacement or injury and death include several sensitive species of reptiles and mammals, as well as the Macqueen's (or Asian Houbara) Bustard. Reptiles identified as PBF and protected species status are Russian Tortoise, Southern Even-fingered Gecko (SEFG). The SEFG is categorised as Critically Endangered globally by IUCN and, therefore will trigger critical habitat as per EBRD PR6 definitions over a 22km stretch of the eastern portion of Lot 1. All of the sensitive species of terrestrial (non-flying) animals identified during the baseline study, plus Macqueen's Bustard, may experience either *Habitat loss/degradation* Impacts or *Disturbance/displacement* impacts during the Project's construction and/or decommissioning phases and have the potential to be injured by construction related activities. Particular periods of note where disturbance impacts to disturbance-sensitive animals may be most significant include the following:	A BMP will be prepared that includes off-site vegetation restoration/rehabilitation to compensate for all permanent habitat loss generated by the Project. This will be combined with a restriction of construction activity to outside of April and May, the key birthing period for Goitered Gazelle (GG) and the nesting period for Macqueen's Bustard (applies to eastern third of Lot 1 subject to restrictions from GG above). GIP for vegetation removal (including minimising vegetation removal along the ROW as much as possible) and for restoring or rehabilitating the area to minimise the risk of "shifting sands" will be employed as set out in a Site Clearance and Rehabilitation Plan. Micro siting of towers and access road to avoid takyrs to the extent possible within the potential habitat of SEFG	Minor (all species and habitats) Moderate (SEFG)

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	• Goitered Gazelle – April 20 – May 20 (calving season). • SEFG – June-August (active season) • Macqueen's Bustard – April-May (nesting season)		
Terrestrial Fauna and Avifauna – construction and decommissioning	Birds may become electrocuted and experience mortality during the Project's operations phase if they make simultaneous contact with two different electrified parts of the OHTL or with an electrified and a grounded part. Sections of the route identified as having a potentially higher susceptibility for bird collision based on the baseline bird characterization are: • Lot 1: 1 km to 5 km, corresponding to the section where water birds and other migratory birds that use the Amu Darya River may pass through, especially during spring and fall migratory periods. • Lot 1: Eastern ~33% (kilometre 81 km to 127 km), corresponding to the section containing potentially suitable nesting habitat for Macqueen's Bustard. Lot 2: Entire route, due to presence of nesting habitat for Macqueen's Bustard, and proximity (minimum ~5 km) to Ayakagitma Lake, which contains high seasonal concentrations of many sensitive and other species of water birds All of these named species have been classified as PBF for the Project. In addition, certain other migratory birds (including other species of migratory raptors	The project will install Bird Flight Diverters on overhead, or static lines of the OHTL as follows: - all of Lot 2 (40.687271° 64.625539° to 40.620080° 64.705109°) - westernmost 5 km of Lot 1 (41.097761° 61.969967° to 41.098389° 62.029836°), - eastern 33% of Lot 1 (41.008969° 62.943141° to 40.870647° 63.386358°) The project will install "Raptor safe" pylon designs for the entire OHTL: - Electrified cables suspended below, rather than above support structures - ≥2m of insulators at each attachment point of a powerline to a support structure - ≥2m separation between electrified cables - Jumper cables suspended below insulators/support structures	Electrocution – Egyptian Vulture, Steppe Eagle, Saker Falcon (Moderate) Electrocution – other *Aquila* eagles and other sensitive raptors (minor) Electrocution – other migratory birds (insignificant) Collision with powerlines – Sociable Lapwing (Moderate) / sensitive water birds and Macqueen's Bustard (Minor)

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	and vultures) may also be affected by electrocution impacts.		
Job creation	The Project will result in a small amount of job creation, local procurement and increased local spending in the local economy resulting in a positive impact on the local economy. This work is likely to be related to unskilled or semi-skilled temporary employment generation related to ground clearance works, cement batching, construction of the foundations, catering, drivers and security work.	During construction a local recruitment plan to encourage employment of workers from villages within 15km of the project will be prepared. The project will communicate casual or unskilled employment and procurement opportunities in advance of the start of works.	Moderate (positive)
Labour – working conditions	Potential risk and impacts to the labour workforce (in particular day labourers and security personnel are identified as: ● Insufficient or inadequate personal protective equipment (PPE). ● Not providing a contract or other related documentation that clarify worker rights. ● Withholding of personal documents or passports. ● Lack of payment or insufficient payment (often related to overtime hours or night work). ● Excessive working hours, and/or lack of breaks and rest periods; and	Each contractor will be required to put in place a Human Resource policy and labour monitoring on all project contractors. All contractors and their subcontractors must adhere to the “labour management plan”, which sets out requirements for contractors, including disciplinary actions. All workers will be required to sign a workers “code of conduct” – workers and a security personnel to sign “code of conduct” – security personnel A worker grievance mechanism, accessible to all workers will be established.	Moderate (local workers only) Minor (skilled contract workers / NEGU employees)

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	• Unsuitable accommodation Gender-based violence and harassment (GBVH) arising from gender disparities at the community level may also need to be considered. The operational phase is not expected to create many employment opportunities.		
Occupational health and safety	During construction, the majority of the workforce will be skilled, experienced workers. However, local workers may not have worked on a construction site previously and will be at a higher risk of accidents or incidents. Certain risks identified include: 1) Climate risk (see above) 2) Contaminated soils 3) Electrocution 4) EMF (see relevant section) 5) Falls from heights 6) Machinery handling injuries 7) Slips, trips and falls Temporary construction worker accommodation camps could expose workers to the risks of illness and below standard welfare arrangements. Specific risks related to the prevalence of dust storms, extreme heat and lighting strikes have also been identified. During the operations phase, workers will undertake operations and maintenance works at	• Follow national legislation on the design of OHTLs. • Prepare a Project-specific health and safety plan (OHS plan) for each Project phase that covers requirements for all Project-specific and general risks in the construction of OHTLs. • Perform Project-specific risk assessment. • Provide appropriate PPE. • Undertake OHS awareness training throughout construction and operations for all workers and affected community. • Maintain an accident and incident reporting procedure. • Monitor health of workers. • Produce a Workers' Accommodation Plan	Minor

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	along the OHTL and at the substations in accordance with J.S.C NEGU H&S management policies, plans and procedures.		
Community health and safety	Communities may be at risk of the following: ● Introduction of workers increasing GBVH between workers and community members. ● An influx of people causes strains on local infrastructure. ● Risk of passing communicable diseases, particularly COVID-19, between workers and the community.	● Implement awareness-raising activities to inform local community members of key risks and the Project grievance mechanism. ● Require workers to sign a workers "code of conduct". ● House workers outside the Project area or municipality in accommodation away from the local communities. ● Prepare a plan/strategy to guard workers and community members against contracting communicable diseases (particularly COVID-19)	Minor
Hazardous materials safety	The mismanagement of hazardous materials has the potential to cause contaminated to ground and also risk to workers.	● Procurement procedures will set out in contracts the prohibition of hazardous substances based on international protocols. ● The use of hazardous materials will be addressed according to national laws and international standards and GIP. ● Appropriate training and PPE will be given to works and defined in the OHS plan. ● All hazardous material at the warfronts will be security stored to minimise risks to community members.	Minor
Security	Security guards will likely be assigned to protect Project equipment during the construction phase.	● Prepare a security plan that outlines the security requirements for construction and	Minor

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	Security guards are often the first point of contact between community members and the Project; therefore, they are the most vulnerable to conflict or harassment or to receiving conflict or harassment from community members.	operations (including numbers of guards, whether they will be armed, use of video technology, training and background checks for guards etc.). ● Employ local security guards where possible. ● Require all security personnel to sign "code of conduct" – security personnel. ● Where necessary, include fencing, safety signage (in locally used languages) and other relevant features to deter community members from entering the work area or climbing the OHTL towers.	
Emergency preparedness and response (construction and operation)	Accidents and emergencies can happen unexpectedly. The Project site is remote, so any access to medical facilities or support from local emergency services may be difficult. In addition, communication along the OHTL route is patchy and cannot be relied upon. Natural hazards including dust storms, and earthquakes may also occur unexpectedly.	● Prepare an emergency preparedness and response plan (EPRP), particularly including access to medical facilities, and dust storms given the location of the Project. ● Establish a communication network along the entire OHTL route during the construction phase. ● Undertake OHS and emergency drills throughout construction and operations. ● Incorporate provision for dealing with climate-related risk (as per section above) into the EPRP. ● Establish a schedule for emergency drills.	Minor
Land	The Project will not result in any physical displacement impacts to create the ROW for the OHTL or the access tracks.	● Livelihood restoration measures are outlined in Project LARF to address the loss of land or income resulting from the construction works or the presence of the OHTL.	Moderate

E&S aspect	Summary of impact (Lot 1 and Lot 2 unless stated otherwise)	Summary of Mitigation and Monitoring measure	Residual significance (post mitigation)
	There are no new land requirements for the works at the Sarimay SS, Dzhankeldy SS, and Bash SS. Some permanent and temporary land taken for the Project may adversely impact livelihoods for local herders. During operation, the Project footprint will reduce to the tower foundation area only and the access tracks to the right of way. No livelihood issues are anticipated during this phase.	• A Livelihood Restoration Plan will be prepared once the Project design has been completed, which discloses all compensation for loss of livelihoods, and, if relevant, livelihood restoration activities.	
Cultural heritage	No protected or identified cultural heritage has been identified in the direct AOI. Consultation indicates potential disturbance of previously unidentified cultural heritage items (called chance finds) during construction, based on recent localised finds in the region for Lot 1 and Lot 2 during the construction phase.	• Conduct archaeological surveys along Lot 1 Sarimay-Dzhankeldy (as recommended by the Archaeological Institute) once the design is finalised. • Establish a chance find procedure (including national and EBRD requirements and following GIP) for the construction or any phase requiring excavation works.	Minor

5 E&S mitigation, management and monitoring approach

As part of the ESIA, a framework Environmental and Social Management Plan (ESMP) has been prepared (Volume IV of the ESIA). The ESMP sets out Project-specific mitigation measures arising from the impact assessment process and GIP. The requirements of the ESIA will be implemented by JSC NEGU or the EPC Contractor.

JSC NEGU will establish a Project Implementation Team (PIT) to oversee the development and construction works. Once the Project is operational, responsibility for operations and maintenance works (O&M) and any operational E&S requirements will be transferred directly to NEGU operations team.

The EPC Contractor will be required to implement an environmental and social management system (ESMS) to oversee the Project's development and construction activities. The ESMS will include policies, assessment documentation, Project-specific management plans, key sub-plans on waste management, labour management, accommodation, employment procurement, biodiversity, including biodiversity action plan for the SEFG and reporting templates for monitoring progress. The ESMS framework must be aligned with the requirements of ISO14001 Environmental management and ISO 45001 Occupational Health and Safety management. Underpinning the project plans will be a Project Policy setting out core values and principles of the Project.

6 Conclusion

The overall outcome of the ESIA is that the Project is an effective and viable energy infrastructure project that is central to the transition of the country to renewable power and grid strengthening needs.

The Project is considered to be suitable for development and able to comply with the national regulatory framework and the requirements of EBRD ESP 2019 subject to implementing the mitigation measures identified in the ESIA. The measures identified in the ESIA enable the Project to avoid, or where avoidance is not possible, minimise, mitigate or compensate adverse environmental or social impacts and issues to workers, affected communities, and the environment including priority biodiversity features and critical habitats. For the SEFG, a critical habitat species, a pathway to net gain has been outlined that will be elaborated in a Biodiversity Action Plan.

Key commitments outlined in the ESIA and ESMP are incorporated into the Lender Environmental and Social Action Plan (ESAP) that will be appended as a contractual obligation to the financing agreement with EBRD.