Karatau 100 MW Wind Project

Republic of Uzbekistan

Environmental & Social Impact Assessment

Volume 1:

Non-Technical Summary

Prepared for:

March 2023

Document Information

Project Name	Karatau 100 MW Wind Project
5Cs Project Number	1305/001/118
Document Title	Environmental & Social Impact Assessment: Volume 1 Non-Technical Summary
Client	ACWA Power
5Cs Project Manager	Barney Chesher
5Cs Project Director	Ken Wade

Document Control

Version	Date	Description	Author	Reviewer	Approver
1.0	01/06/2022	ESIA – Volume 1: Non-Technical Summary	BC	BK	KRW
2.0	23/09/2022	Updated following ESIA updates	BC	MKB	KRW
3.0	01/03/2023	Revised following additional comments and completion of surveys	BC	MKB	KRW

1	Financial Capital
2	Social Capital
3	Natural Capital
4	Manufactured Capital
5	Human Capital

Regardless of location, mode of delivery or function, all organisations are dependent on *The 5 Capitals of Sustainable Development* to enable long term delivery of its products or services.

Sustainability is at the heart of everything that 5 Capitals achieves. Wherever we work, we strive to provide our clients with the means to maintain and enhance these stocks of capital assets.

Disclaimer

5 Capitals Environmental and Management Consulting
Principal office: PO Box 119899 Sheikh Zayed Road, Dubai, UAE
☏+971 4 343 5955 🖷+971 4 343 9366

CONTENTS

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
5 Capitals	5 Capitals Environmental and Management Consultancy
CESMP	Construction Environmental & Social Management Plan
CHA	Critical Habitat Assessment
CIA	Cumulative Impact Assessment
COD	Commercial Operation Date
CRM	Collision Risk Modelling
dB	Decibel
DEG	Deutsche Investitions- und Entwicklungsgesellschaft
E&S	Environmental & Social
EBRD	European Bank for Reconstruction and Development
EHS	Environmental, Health & Safety
EI	Evacuation Infrastructure
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
ESIA	Environmental & Social Impact Assessment
ESMS	Environmental and Social Management System
ESMP	Environmental and Social Management Plans
GBVH	Gender Based Violence & Harassment
GIIP	Good International Industry Practice
GOU	Government of Uzbekistan
GW	Gigawatt
IFC	International Finance Corporation
kV	Kilovolt
L_{A90}	The decibel level exceeded for 90% of each sample period
MW	Mega-Watt
NEGU	JSC National Electric Grid of Uzbekistan
NTS	Non-Technical Summary
O&M	Operations & Maintenance
OHSMP	Occupational Health and Safety Management Plan
OHTL	Overhead Transmission Line
PPA	Power Purchase Agreement
SCEEP	State Committee on Ecology and Environmental Protection
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
SEP	Stakeholder Engagement Plan
SNH	Scottish Natural Heritage
VEC	Valued Environmental Component
WTGs	Wind Turbine Generators
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

1.1 The Project

The Government of the Republic of Uzbekistan (GOU) through the Ministry of Energy aims to increase the electricity production in the country from 12.9 GW in 2019 to 29.3 GW in 2030 in order to foster economic growth as part of the Republic of Uzbekistan (Uzbekistan) 2030 Energy Strategy. Of the 29.3 GW of power generating capacity in 2030, 8 GW will be from renewable energy, with wind power accounting for 3 GW.

The GOU has signed a memorandum of understanding with the European Bank for Reconstruction and Development (EBRD) with a view to cooperate on the development of large-scale wind power projects up to a total capacity of 1,000 MW.

ACWA Power have been awarded the contract to design, finance, construct, operate, maintain and (at the request of the GOU) decommission or transfer, the Karatau 100 MW Wind Farm Project (including an access road and the Evacuation Infrastructure (EI), comprising an approximately 16 km overhead transmission line (OHTL) and substation) (the Project") in the Qorao'zak District of the Republic of Karakalpakstan, Uzbekistan. The Project consists of 16 Wind Turbine Generators (WTGs) and each WTGs has a capacity of 6.5 MW.

ACWA Power has appointed 5 Capitals Environmental and Management Consultancy (5 Capitals) as the lead Environmental and Social Consultant to undertake the independent Environmental Impact Assessment (EIA) and Environmental and Social Impact Assessment (ESIA) processes, to attain the relevant National regulatory permits and approval from the international lenders required for project finance.

This Non-Technical Summary (NTS) of the ESIA provides a description of the Project and the anticipated impacts (both positive and negative) associated with its construction, commissioning, operation and decommissioning phases. It also describes the design process taken to prevent impacts and the mitigation and management measures identified to minimise or manage negative impacts and where possible to enhance beneficial impacts.

The NTS has been prepared for the potential financing of the Project by the Project Lenders. The Project will comply with the environmental and social policies and safeguards of these Lenders including EBRD's Performance Requirements (PRs), International Finance Corporation's (IFC) Performance Standards (PSs) and the IFC/World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines.

1.2 Background and Rationale

1.2.1 National EIA

5 Capitals appointed a local consultant, 'Juru Energy' (based in Tashkent, Uzbekistan) to undertake baseline surveys, consultations, and preparation of the project specific Stage I EIA Preliminary Statement of Environmental Impact for submission to the local regulator.

The Stage I EIA was submitted to the State Committee on Ecology and Environmental Protection (SCEEP) of the Republic of Uzbekistan on the 19th of May 2022 and was subsequently approved in June 2022.

1.2.2 ESIA

An Environmental and Social Scoping Report was issued in January 2022, which identified the likely risks and impacts of the Project, and provided the terms of reference for the ESIA, including consultations and the scope and methods for baseline surveys, laboratory analyses and modelling that was used to determine the potential impacts and therefore establish the required mitigation and management measures.

The key objectives of the ESIA include the following:

- To provide an overview of the Project design, identification of sensitive receptors in the Project's area of influence;
- Assessment of baseline conditions prior to the development of the Project through review of available data and conducting surveys;
- Assessment of the Project's environmental & social impacts for the construction and operational (and decommissioning, where applicable) phases;
- To review of compliance obligations, including applicable Uzbekistan regulations and international regulations & standards as well as international requirements;
- To engage with key Project stakeholders and Project affected people to disclose Project information, study outcomes, gain lay knowledge about the local environmental & social context, seek feedback on proposal and to understand & map any resettlement/livelihood restoration requirements;
- Determination of applicable mitigation and management measures including monitoring requirements to be implemented in order to avoid or minimise potential impacts and maximise potential environmental and social gains;
- Consideration of design alternatives that can reduce impacts and/or provide greater social and environmental gains; and
- To prepare an Environmental & Social Management Plan Framework from which the construction phase and operational phase respective environmental & social management systems and plans can be developed and implemented.

The ESIA has been divided into four volumes as follows:

- **Volume 1**: ESIA Non-Technical Summary;
- **Volume 2**: ESIA Main Text, Tables, Figures and Plates;
- **Volume 3**: ESIA Framework for Environmental & Social Management; and
- **Volume 4**: ESIA Technical Appendices

The Project's Environmental & Social documentation also includes a standalone Stakeholder Engagement Plan (SEP).

1.3 Key Project Information

Table 1-1 Key Project Information

PROJECT TITLE	Nukus 100 MW Wind Farm
PROJECT DEVELOPER	ACWA Power
PROJECT COMPANY	ACWA Power Wind Karatau FE LLC
OFF TAKER	JSC National Electric Grid of Uzbekistan (NEGU)
EPC CONTRACTOR	To be confirmed
O&M COMPANY	To be confirmed
ENVIRONMENTAL CONSULTANT	5 Capitals Environmental and Management Consultancy (5 Capitals) PO Box 119899, Dubai, UAE Tel: +971 (0) 4 343 5955, Fax: +971 (0) 4 343 9366 www.5capitals.com
	Juru Energy Consulting LLC Chust Str. 10A, 100077, Tashkent, Uzbekistan Tel: +998 71 202 0440, Fax: +998 71 202 0440 info@juruenergy.com
POINT OF CONTACT	Ken Wade, Director ken.wade@5capitals.com

2 PROJECT INFORMATION

2.1 Project Location

The Project is located in a greenfield location in Karatau mountain region in Karauzak District, in the Republic of Karakalpakstan, Uzbekistan. The site is situated around 730 km west of Tashkent, 83 km east of the city of Nukus, and 62 km north of the city of Urgench.

The allocated site boundary for the WTGs is within a 1,678 hectare area, although the land take required will be limited to WTG locations and the internal access road, located at an altitude ranging from approximately 250 - 345 m above sea level. As part of the Project, a new 220 kV OHTL approximately 16 km in length will connect to an existing 220 kV OHTL near to the highway A380 and an access road approximately 12 km in length will connect the Project area with an existing road to the north-west which connects the A380 to the settlements Aimbed-Ishan and Karauzak to the north.

The following figures depict the national and local context of the Project.

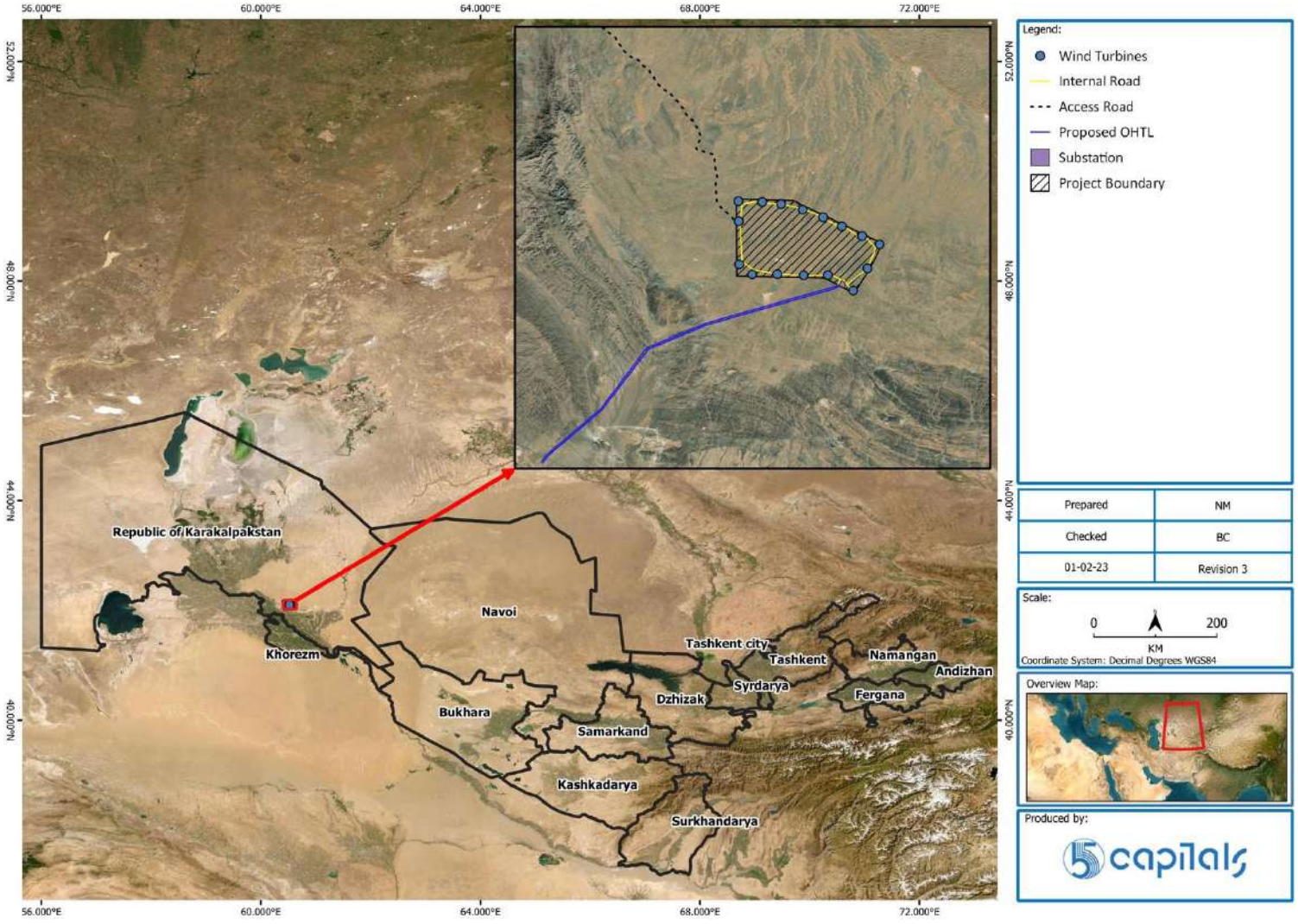

Figure 2-1 Project Location – National Context

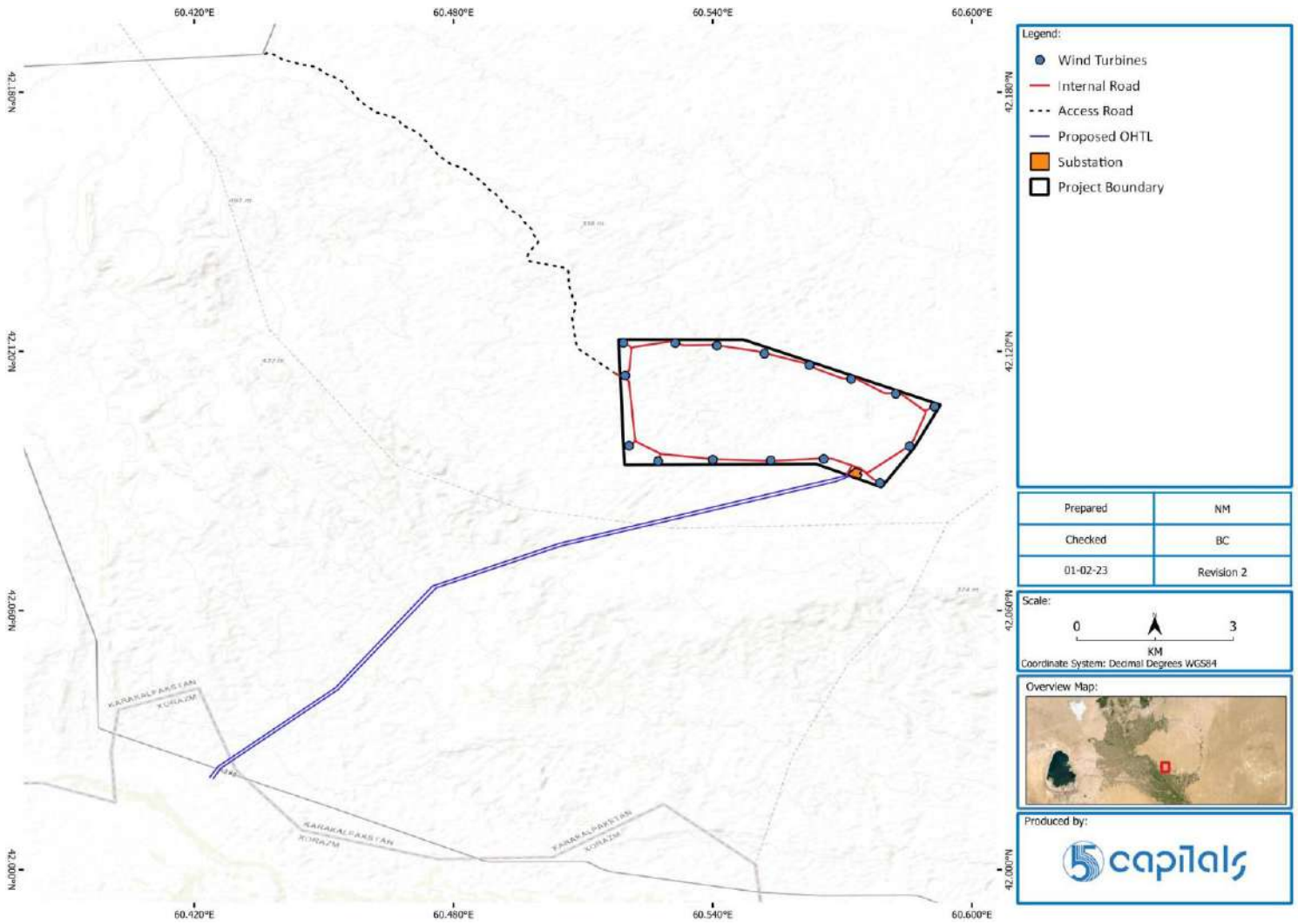

Figure 2-2 Project Location – Local Context

2.2 Project Description Summary

2.2.1 Wind Turbine Generators

The Project consists of 16 Wind Turbine Generators (WTGs), located along the edges of the allotted site boundary. All 16 WTGs will be the same specification and will be Envision EN171 6.5 MW Model with the following specifications.

Table 2-1 WTG Specifications

WTG Model	Envision EN171 6.5 MW
Capacity	6.5 MW
Blades	3
Hub Height	120 m
Rotor Diameter	171 m
Swept Area	22,965 m^2
Cut-in Wind Speed	3 m/s
Cut-out Wind Speed	25 m/s
Maximum Wind Speed (10 min average)	42.5 m/s
Design Lifetime	25 years

The locations of the WTGs are shown in the following figure.

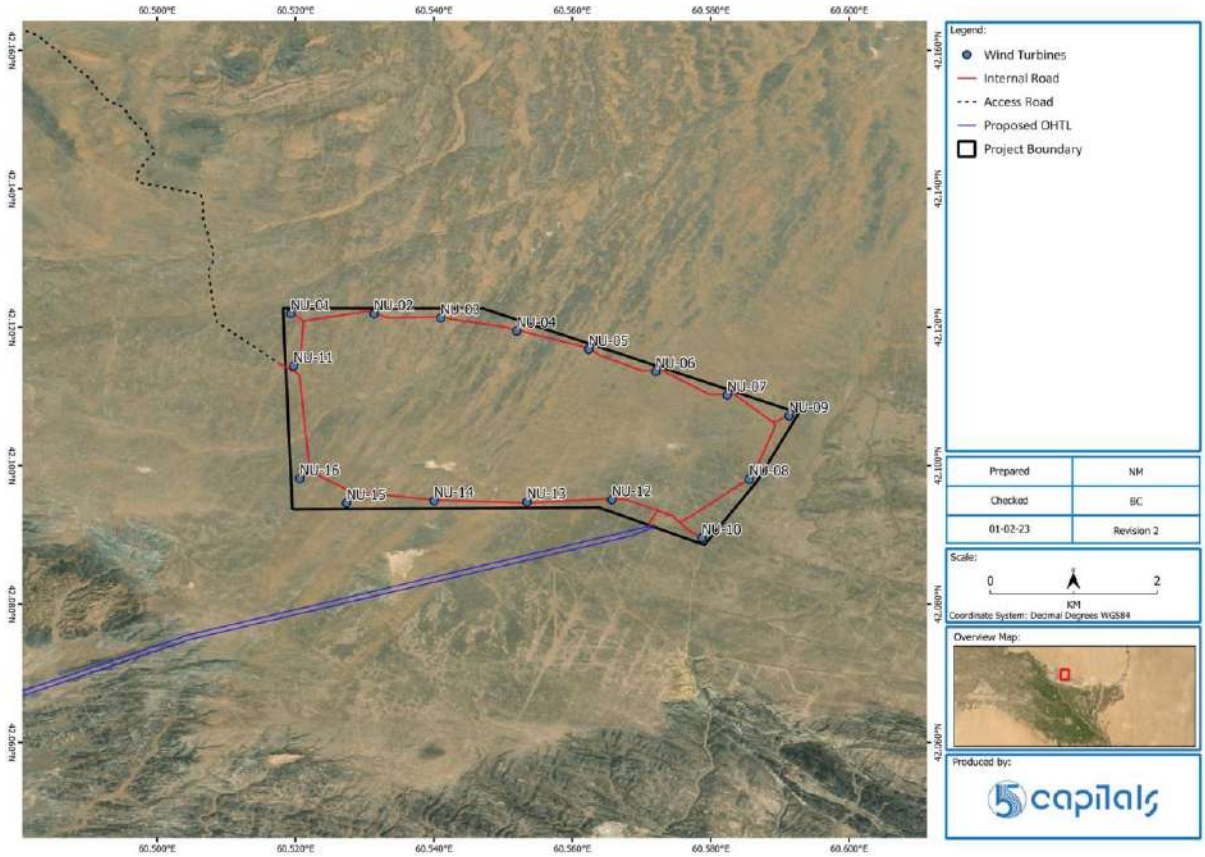

Figure 2-3 Proposed Location of the WTGs

2.2.2 Power Evacuation Infrastructure

The power evacuation infrastructure (EI) includes a switching station (substation) and OHTL route of approximately 16 km length. The OHTL will connect to the national grid at the interconnection point on the existing OHTL 220 kV Takhiatash substation – Khorezm substation.

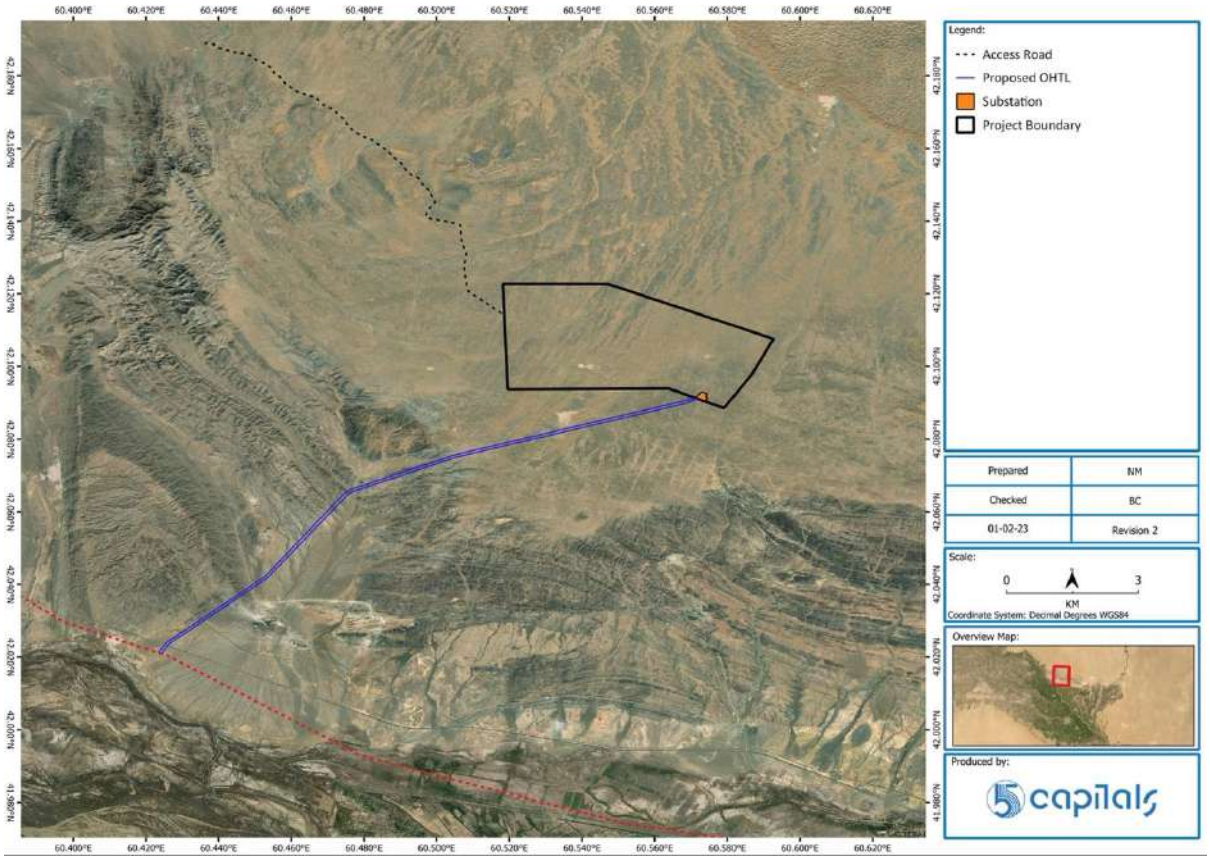

Figure 2-4 Power Evacuation Infrastructure

2.2.3 Access Road

The site is separated from roads and the regional highway (the A380) by the Karatau hills. The Project includes the design and construction of an access road connecting the site to the local road, referred to as '4P190' which will connect to the A380 to the settlements Aimbed-Ishan and Karauzak to the north. The access road shall be approximately 13 km in length and will be mostly gravel, unless local strengthening is required.

2.3 Project Construction

The principal construction activities and associated requirements in relation to the wind farm are anticipated to include the following;

- Transportation of components to the Project site;

- Delivery of machinery & equipment to the site;
- Construction of temporary laydown facilities and building site equipment (e.g., containers at the Project site);
- Site preparation (comprising excavation, grading, levelling, and land clearing at WTG platforms) to create flat land area for preparation of turbine pads, installation of wind turbine towers and various project components;
- Additional facilities to facilitate construction work (comprising excavation and levelling etc.) for access road and the internal road network, construction of any building infrastructure (if required);
- Provision of electricity supply, generation and distribution system as required for installation;
- Erection of WTGs;
- Commissioning tests of electrical infrastructure (including WTGs) and inspection of civil engineering quality records.

Principal construction activities for the OHTL and access road are anticipated to include:

- Site preparation (comprising excavation, grading, levelling, and land clearing at tower footprint, OHTL corridor and access road alignment;
- Transportation and delivery of equipment/machinery and OHTL components;
- Construction of platforms for pylons/towers and delivery of materials along OHTL route;
- Assembly of OHTL towers/pylons;
- Construction of the substation;
- Installation & erection of OHTL towers/pylons, installation and laying of wires & transmission cables on pylons, connecting wires and cables, stringing of conductors, tensioning and sagging of conductors;
- Construction of gravel access road and local strengthening, if required; and
- Provision of electricity supply, generation and distribution system as required for installation, erection, etc.

Temporary construction laydown areas will be established within the site boundary of the land allocated for the WTGs. After completion of construction, the construction laydown areas will be disassembled, and the area will be returned to its original condition.

It is estimated that the peak construction workforce will comprise 150 people and it is understood that the workers' accommodation will be located adjacent to the main laydown area.

2.4 Project Operation

As per the Power Purchase Agreement (PPA), the Project lifetime is 25 years,

Wind farms generally require limited operational activities and typically include the following:

- Operation and maintenance to include normal daily operation of equipment including maintenance (electromechanical and housekeeping) to optimise energy yield and life of the system;
- Remotely activated turbine shutdown during excessive wind speeds; and
- Routine planned preventative maintenance and unplanned maintenance (if required).

The operational period is expected to require a permanent workforce of 10 – 15 with up to 5 temporary employees.

2.5 Project Milestones

Based on the details provided by ACWA Power and the PPA, the milestones for the Project are outlined in the below table.

Table 2-2 Key Project Milestone/Timeline Dates

MILESTONE	DATE
Project Award	10th October 2021
Signing of EPC & O&M Agreement	Q4 2022
Project Commercial Operation Date (PCOD)	17th September 2024 Subject to Gov. approval

2.6 Project Decommissioning

Upon completion of the Project, it shall either be decommissioned or transferred, at the discretion of the GOU.

Potential impacts relating to decommissioning will be similar to those encountered during the construction phase. There are only likely to be a few decommissioning related risks to wind turbines such as minor quantities of hazardous components. Due to the small footprint of the project WTG, all structures and infrastructure could feasibly be dismantled for material recovery.

Given that the decommissioning phase, if chosen by the GOU, will not occur before 25 years from COD, there are no specific requirements for decommissioning at this time, since future environmental and social regulations have yet to be developed. As such, it is not considered practical to speculate on future environmental and social conditions or the sensitivity of current or future receptors at this time. However, high level key risks (e.g., from Project wastes) have been considered within the ESIA Report.

It is proposed that the decommissioning process will be managed via an updated ESIA and Environmental, Social Management System (ESMS) to identify measures for the prevention, avoidance or minimisation of impacts. A specific Decommissioning Plan will also be required. The studies should be undertaken at least 12 months prior to the time of decommissioning to reflect changes in regulations and standards, and requirements for compliance with the expected "circular economy" that is likely to be a condition at that time. This will require maximising the re-use, recovery and recycling of components and materials to provide resource for future use.

Where potentially significant decommissioning risks have been identified, these have been discussed at a high level within the ESIA, however, as stated previously, decommissioning impacts are expected to be further assessed for appropriate management at a later time in the Project lifecycle.

2.7 Project Alternatives

2.7.1 No Project Option

The GOU, through the Ministry of Energy, aims to increase the electricity production in the country to foster economic growth, develop and expand the use of renewables and develop public-private partnerships in the country's energy sector.

The Project forms part of the Ministry of Energy's plan to develop and expand renewable use to 8 GW and increase total electricity production in the country to 29.3 GW by 2030. The generating capacity of the Project will be 100 MW and this will contribute to the 3 GW estimated wind power contribution to the total renewable power generating capacity.

Given the national strategy for additional renewable energy contribution to the total power generating capacity, a 'No Project' option has not been considered further. This alternative would delay the GOU from meeting its renewable energy target and potentially continue the reliance on non-renewable energy sources.

Upon reviewing the anticipated impacts as a result of the development of the Project, although the construction phase may likely result in potential temporary negative impacts, the operational phase of the project will result in an overall positive impact, particularly due to the socio-economic benefits and the increase in renewable energy being supplied to the Uzbekistan grid.

2.7.2 Alternative Project Sites

The Project was initially to be located close to the meteorological mast, which is located approximately 4 km west of the Project site boundary. Constraints with respect to mining rights

have led to the definition of a reserved zone in which the Project will be designed, built and operated. These constraints made it necessary to shift the Project further away from the location of the measurement mast as originally planned. The access road and OHTL alignments have also been modified slightly from initial Project layouts.

If the Project had been developed in the original location, the environment and social impacts are expected to be largely similar, however, the Project would have been closer to the identified herder's shelters and therefore the impacts relating to noise, air quality and shadow flicker are likely to have been more significant and the potential for resettlement increased.

2.7.3 Project Technology

Turbines from Goldwind, Envision, Mingyang, Shanghai Electric, Vestas, Siemans Gamesa and Dongfang have all been considered.

The Envision EN171 6.5 model was selected for the current layout and was based on the following criteria:

- Technology options for flexible use and maximising energy generation during high and low wind conditions;
- Least cost of energy which results in highest generation at lowest cost;
- Site suitability of the chosen WTG model; and
- Project schedule.

From an environmental and social perspective, the turbines are essentially the same and will each result in similar impacts. However, one difference will be with respect to supply chain risks.

2.7.4 Wind Farm Project Layout

Initially the Project was to consist of 17 WTGs, however, it was deemed cost and energy effective to have only 16 WTGs. It is considered likely that the reduction in number of WTG would have environmental and social benefits, due to the reduction of transport needed, reduction in required construction effort and the reduction in operational impacts such as noise, shadow flicker and potentially bird collisions. Note that noise, shadow flicker and collision risk modelling have not been undertaken for the previous layout and therefore assumptions that 16 WTGs will result in less significant impacts than 17 WTGs considers only number of turbines and not specifics including siting of turbines.

2.8 Local Receptors

The Project site is undeveloped, and the nearest permanent communities are located more than 10 km from the nearest WTG. Potential cultural, industrial and social receptors have been identified through a combination of site visits and desktop review.

Details of the identified receptors, and potential impacts including mitigation measures are provided in detail in ESIA, Volume 2. Summaries of the impacts and the key mitigations are provided in Chapter 3.

3 SUMMARY OF MAIN ENVIRONMENTAL & SOCIAL IMPACTS

3.1 Air Quality

Construction activities will result in temporary dust generation and gaseous (including volatile organic compounds and odour) emissions which may impact upon construction workers and one herder shelter that is understood to no longer be in use. Such impacts are expected to be negligible in significance and will be managed through the implementation of Good International Industry Practice (GIIP) and the Project specific Construction Environmental and Social Management Plan (CESMP).

The Project will have no operational air emissions besides the use of operation and maintenance vehicles, which are not expected to result in discernible air impacts.

3.2 Noise and Vibration

Temporary noise & vibration impacts are expected to arise from the construction activities at the WTG site, OHTL route and access road. Receptors to noise and vibration impacts include construction workers and the Karakalpakstan Cement Factory. However, following noise calculations, significant impacts are not anticipated on the Cement Factory. Noise and vibration impacts have been assessed as negligible.

Operational noise impacts from the WTGs have been assessed using modelling suite *IMMI2021* in order to evaluate noise emissions from the wind turbines at the nearest noise sensitive receptors. The outcome of the preliminary noise model identified that none of the receptors exceeded the IFC initial screening criteria of 35 dB L_{A90} and therefore neither further studies nor mitigation measures are necessary.

The movement of operations and maintenance vehicles and the potential low magnitude humming from the electrical transformers are potential sources of noise, however, are not considered to be significant.

3.3 Geology, Soils and Groundwater

During construction, impacts on soil and groundwater could arise from a number of activities. These include excavation and soil compaction, accidental spills or leaks, disposal of wastewater and inadequate management of waste. Impacts on groundwater are considered unlikely due to depth. Impacts can be managed to negligible significance with the implementation of GIIP.

Specific project impacts to geology, soils, and groundwater are not expected during the operational phase as the site will be static and will not have direct interactions with these environmental parameters. Potential risks of concern during the operational phase are expected to be limited to the management and storage of the limited hazardous materials/wastes/wastewater, chemicals and fuels and sanitary provision.

3.4 Hydrology and Surface Water

The Project area is part of the Amu-Darya hydrographic network, the Amu-Darya River passes more than five km from the closest point on the OHTL route and over 15 km from the nearest WTG and no permanent surface water bodies or rivers are observed within 10 km of the site, however, seasonal stream beds are evident.

Significant changes in surface water drainage are not expected as a result of the construction or operation phases of the Project due to the relatively limited areas for construction over the wider area. Flood risk impacts during construction and operation phases are considered negligible. The hydrology and flood risk studies conducted have proposed design mitigation such as culverts along the access road alignment, in addition, GIIP mitigation measures such as the O&M team checking drainage infrastructure after flood events will be implemented.

3.5 Terrestrial Ecology and Avifauna

The site comprises natural habitat. A critical habitat assessment (CHA) has been conducted and the site does not trigger criticality for any species. Refer to Volume 2 for the CHA.

The construction phase will lead to impacts to flora and fauna, such as biodiversity loss during excavations required for the WTG, biodiversity displacement, environmental quality (air, noise and light) impacts, however, following implementation of the mitigation and management measures in Volume 2, the majority of impacts are reduced to negligible and minor.

Regarding turbine collisions for birds, a Collision Risk Model (CRM) was undertaken for the Project as per Scottish Natural Heritage (SNH) Guidelines, using Band et al. predictive modelling. The results of the CRM analysis indicate that the Project has a low level of collision risk for sensitive bird species. Among Tier 1 target species, a category that includes all bird species with elevated national and/or international conservation/protected status that potentially occur at the site, only three species have been detected at the site during the vantage point survey effort, and none are predicted to experience an annual collision frequency greater than one fatality per 28 years under the most likely collision avoidance rate parameters modelled.

A Collision Risk Management Plan (considering both the impact of turbine and OHTL collisions) and Fatality Monitoring Plan will be required to be prepared in order to establish acceptable mortality rates, fatality monitoring methodologies and adaptive management measures.

Other operational impacts, such as OHTL collision, electrocution, disturbance, environmental quality (air, noise, light) impacts can typically be reduced to negligible and minor following implementation of the proposed mitigation and management measures.

3.6 Landscape and Visual Amenity

During the construction phase, the Project is likely to give rise to a number of changes to the landscape character and visual amenity, arising from site preparation and construction activities. In addition, the construction activities in themselves may also be a source of disruption and visual intrusion. However, there are no highly valued visual receptors nor are any of the landscape characters within the site or surrounding area considered to be of high value.

Principal aspects of the Project during operation which are likely to have permanent effects on the landscape character and visual amenity of the site and its surroundings are:

- the removal of open landscape and the introduction of 16 WTGs;
- the establishment of access road and internal road; and
- establishment of the OHTL and substation.

WindFarm Release 5 software was used to determine the Zone of Theoretical Visibility (ZTV) of the WTG within a 50 km radius and, in addition, was used to produce wireframe visualisations of the WTG from viewpoints selected during the desktop review and field survey. Visual impacts are assessed as negligible to minor.

3.7 Shadow Flicker

Shadow flicker modelling for the Wind Farm considered two scenarios: (i) a conservative worst-case approach based on the requirements outlined in IFC EHS Guideline for Wind Energy and (ii) a more realistic approach to consider actual site conditions. The modelling predicted that none of the assessed locations exceed the IFC worst-case criteria and therefore no mitigation measures are necessary for shadow flicker impacts, nor is any monitoring.

3.8 Solid Waste and Wastewater Management

The construction of the Project will result in the generation of waste including excavation waste, packaging waste and small quantities of hazardous waste. This will also include sanitary waste which will be contained in septic tanks prior to removal by a licensed wastewater

contractor. During the operational phase, there will be relatively few waste streams, although maintenance waste may be generated in small quantities on a continued basis.

The ESIA outlines the mitigation and management measures and the requirement for the preparation and implementation of a Waste Management Plan.

During decommissioning of the Project, there is a potential for inert demolition waste and materials such as steel reinforced bars, broken concrete, cabling, transformer oils etc. to contaminate soils. The decommissioning of the wind farm provides significant opportunity for resource efficiency and material re-use/recovery/recycling. As such, a Decommissioning Plan will be developed to include detailed methods for re-use, recovery, recycling, removal and finally disposal of decommissioning wastes.

3.9 Traffic and Transportation

WTG components will be manufactured abroad and transported to the Project site by road from either Dulata, Khorgos or Alanshankhou borders in China and from either of these borders to custom points at Nur Zholy / Kolzhat in Kazakhstan and thereafter to the site. As such, appropriate roads are needed for the hauling of equipment. If improperly planned and managed, the trailers hauling the heavy Project components can potentially damage the existing highways, bridges, overpasses, roads, utilities, local access roads and other structures.

Construction activities will also result in an increase of the numbers of movements of Heavy Goods Vehicles and other vehicles for the delivery of heavy plant, equipment and materials, close coordination will be required with the road transport authorities to manage the transport of materials for the Project, which will be detailed in a Traffic Management Plan.

Transportation impacts during the operation phase are not expected to be significant, as the operation of the Project will not require continuous delivery of materials or other equipment to operate. General operation and maintenance of the Project will require vehicle movement however, this will be restricted to security and maintenance teams using light vehicles, pick-ups and small vans. As such, the limited vehicle movements for operation and maintenance are not expected to result in discernible or significant impacts on existing road infrastructure.

3.10 Archaeology and Cultural Heritage

There are two cultural heritage sites within 45 km of the wind farm site boundary, Chilpak Kala and the Sultan Uwais Baba Complex. The Project is not expected to impact upon these sites. In addition, impacts to intangible cultural elements are not expected.

Three archaeological sites (all burial locations) were identified within 5 km of the Project (including the OHTL route). Following consultations with the Institute of Archaeology of

Uzbekistan Academy of Sciences and the Karakalpak Research Institute of the Humanitarian Sciences of the Karakalpak Branch of the Academy of Sciences of the Republic of Uzbekistan, an archaeology survey was commissioned for locations in which earthworks will be conducted (e.g., WTG locations). The survey was conducted between in May 2022, although some ceramic pottery dating from 12th – 14th Centuries A.D., was identified in the wider area, no sites with signs of cultural or archaeological importance were identified.

The conclusion from the survey was that no buffer zones or micro-siting of WTG/OHTL towers is required, however, construction work (specifically excavations) must take place under the supervision of an archaeologist.

In addition to the known archaeological sites, there remains potential to uncover previously buried archaeology (chance finds) within the Project footprint during the construction phase. As such, a Chance Find Procedure will be implemented.

During the operational phase of the Project, there will be no further excavations at the Project site and as such, there is no risk of uncovering an item of archaeological importance.

3.11 Socioeconomics

3.11.1 Stakeholder Engagement

A number of stakeholder engagement activities have been undertaken as part of the ESIA process. The outcome of stakeholder consultations has been considered in the development of the ESIA and the Project specific Stakeholder Engagement Plan (SEP).

Following submission of the Advanced Draft ESIA to Lenders in April 2022, a request was sent to Council of the Ministers Republic of Karakalpakstan for their assistance in arranging a meeting with the nearest communities. The Council of Ministers informed Karauzak and Beruniy Municipalities who in turn informed local communities. Consultations with the representatives from Municipalities and local communities was conducted on the 19th and 20th April 2022.

Since December 1, 2020, in accordance with Annex 3 to the Decree 541, the planned activities of I and II categories of environmental impact are subject to public hearings. The state environmental expertise of the national EIA reports is carried out in case of approval by the local community as a result of the public hearings. Public hearings must be conducted according to the procedure indicated in the law, representing all environmental impact assessments (to be justified by calculations) for construction and operation phases (if applicable).

Public hearings were conducted at Karauzak and Beruniy Municipalities on 18th April and 19th April 2022 respectively. The public hearing participants were selected members of the local

communities, members from the Department of Ecology from the municipalities and members from the Department of Investment.

Consultations with the local herder family have been ongoing since December 2021, with subsequent phone call consultations, economic surveys and visits conducted in April 2022. The Project information brochure was provided and details including allocated area for the Project, potential impacts, construction procedures, timeline and the Grievance Redress Mechanism process were explained.

Based on the consultations and surveys undertaken, the main comments that were raised about the Project include the potential for the creation of job opportunities and the desire to have improvement in water accessibility and infrastructure.

3.11.2 Socioeconomic Impacts

The Project is expected to positively influence the local, regional and national economy, through employment, direct procurement and supply of materials, increased power supply and contribute towards a low carbon economy.

Potential negative impacts relating to the construction phase include the consumption of water, with the area experiencing a lack of water availability. There is expected to be limited impact with regards to restriction of grazing lands due to the large expanse of grazing areas available, the fact that there will only be a few fenced areas due to active construction and the continued consultation with the local herder family. The herder family currently have two shelters in the area, one approximately 6 km from the closest WTG and one approximately 19 km. On this basis, the Project is not expected to negatively impact the livelihood of the herder or his family. However, the family will remain a stakeholder in the SEP for the implementation of the Project and will have access to the GRM should any issues need to be raised. Issues will be dealt with on a case-by-case basis.

3.12 Community Health, Safety and Security

All construction projects have potential risks relating to public safety that could arise, particularly in regard to the use of high-powered equipment, heavy construction machinery, excavations, transportation of oversized loads and use of heavy goods vehicles, Risks also include fire and pollution releases. Risks will be suitably managed in the construction phase through the implementation of a robust CESMP and the preparation and implementation of an Emergency Preparedness and Response Plan.

Potential risks to communities also include human rights, Gender Based Violence & Harassment (GBVH), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) risks. These risks will be managed through the implementation of the mitigation measures in the ESIA and of

appropriate plans, procedures and policies such as the Influx Management Plan, GBVH policy etc.

The operational phase of the Wind Farm will include similar risks to those identified during the construction phases, however, no risks are anticipated with regards to blade & ice throw from the WTGs due to the distance to receptors.

3.13 Labour & Working Conditions

Construction activities will generate a variety of occupational health and risk to the workforce. These will include physical risks such as traffic on site, working at height, movement of heavy machinery, excavations, scaffolding etc. other risks may include handling of fuels, chemicals, paints and solvents, noise and emissions from machinery and generators etc. These will be managed through the implementation of an Occupational Health and Safety Management Plan (OHSMP) which will be prepared at the start of the construction phase.

In addition, there will be potential working condition and labour risks such as supply chain risks, child labour, forced labour, poor accommodation facilities, restrictions for workers to join trade unions, GBVH, wage discrimination based on gender etc. To address these issues, a number of measures will be implemented to mitigate against these impacts such as the implementation of a Supply Chain Management Plan, Human Resources Policies & Procedures, Equal Opportunity Policy, Human Rights Policy, GBVH Policy, Worker Code of Conduct and provision of a Worker Grievance Mechanism.

3.14 Climate Affairs

Fuel combustion during the construction phase for diesel generations and mobile plant will results in greenhouse gas emissions, however, the primary operation of the Project will lower the carbon intensity of Uzbekistan's grid electricity and result in avoidance of CO_2 emissions. Fuel combustion from the use of operation vehicles and emergency diesel generators will be negligible. This will be in line with the Uzbekistan 2030 Energy Strategy to reduce reliance on fossil fuels. Climate physical risks and transition risks are not expected for the Project.

3.15 Cumulative Impacts

The GOU is contemplating development of a 200 MW wind project in the Karatau mountain range adjacent to the site. The specific area reserved for the potential 200 MW wind project is located east of the site. In addition, areas adjacent to the Project are allocated for future mining exploitation with the mineral rights currently owned by the State.

No further information has been provided with regards to future wind or mining projects and therefore at this time it is not possible to conduct a cumulative impact assessment. However, based on an understanding of the Project it is possible to conduct a high-level discussion of potential cumulative impacts on receptors. The majority of potential impacts can be ruled out due to the fact that the Project would already be constructed and therefore cumulative construction impacts (such as air, noise and waste impacts) can be ruled out. Due to the limited operational waste impacts cumulative waste impacts are also not anticipated.

Although impacts to terrestrial ecology and avifauna as a result of the Project have been shown to be relatively minor, it is considered likely that ecology will be a Valued Environmental Component (VEC) that will need to be considered when a Cumulative Impact Assessment (CIA) is conducted for any future developments in the area. The CIA will need to consider the Collision Risk Modelling from this Project, alongside the other ecology impacts as listed in this ESIA.

In addition, cumulative socioeconomic impacts are a possibility. Although the Project has a relatively small construction workforce and an even smaller operational workforce, the cumulative influx of further workforce for other projects will need to be assessed.

4 ENVIRONMENTAL AND SOCIAL MANAGEMENT & MONITORING

Both the construction and operational phases will need to incorporate mitigation and monitoring requirements established within Volume 2 of the ESIA as well as requirements set out by the State Committee on Ecology and Environmental Protection and the Lenders.

Volume 3 of the ESIA provides a framework for the development of the Environmental and Social Management System (ESMS) for the construction and operational phases of the Project. The framework has been developed to ensure that all Environmental & Social impacts identified for both construction and operational phases are appropriately identified and controlled through the development of a robust construction and operational phase ESMS. ACWA Power has developed an ESMS Implementation Manual for the Project Companies to ensure there is sufficient oversight of contractors and operators and ensure compliance, risk and opportunity management including monitoring.

In addition, there will be dedicated competent Project teams put in place by the EPC Contractor and the O&M Company overseen by the Project Company to ensure the implementation of the E&S mitigation measures.

The primary documents guiding the environmental and social management of the construction and operational phases will be the Environmental and Social Management Plans (ESMPs) respective to construction and operational risks, impacts and compliance requirements.

4.1 Independent Auditing and Monitoring

The Project will be subject to periodic independent monitoring in accordance with the requirements of the Lenders. The scope of the independent audits will include the implementation of the Project ESMS and will evaluate on-site activities and documented controls and monitoring efforts, with respect to the Project's compliance obligations.

APPENDIX A – PROJECT CONTACT INFORMATION

Table A1 Project Contact Information

NAME	ASPECT	CONTACT DETAILS
Mr. Sherzod Onarkulov	Uzbekistan local address and contact details General public enquiries Public enquiries related to environmental & social issues	International Business Center Block-A, 13th Floor 107-B, Amir Temur Avenue Tashkent, 100084, Uzbekistan T + 998 71 238 9960 M + 998 90 003 9960 Sonarkulov@acwapower.com