

192248.R.004

B5

Masdar

Zarafshan Wind Farm

Environmental & Social Impact Assessment

03 March 2022

Non-Technical Summary

Report Details

Client:	Masdar	
Client Contact:	Morten Sahl	
Report Distribution:		
Masdar:	Morten Sahl, Dias Kamaliyev, Ivan Montenegro, Tarik Mustapha Afachtal	
Wood:	Vicky McLean, Diane Scott, Suzy Yendell, Jeremy Short	
Report Classification:	Confidential	

Approval Record

	Name	Job Title	Signature
Prepared by:	Suzy Yendell	Senior Environmental Consultant	L'edus
Reviewed by:	Diane Scott	Senior Environmental Consultant	Dan QH_
Authorised by:	Vicky McLean	Senior Environmental Consultant	McLean
Date of issue:	03 March 2022		

Amendment Record

Revision Number	Date	Summary of Amendments	Purpose of Revision
A1	08/07/2021	n/a	First draft
A2	08/07/2021	Minor amendments following review	Internal authorisation
B1	09/07/2021	Minor amendments following authorisation	Client issue
B2	15/07/2021	Minor amendments following Lender comments.	Client issue.
В3	29/09/2021	Minor amendments to reflect final ESIA and following Lender comments.	Client issue.
B4	10/02/2022	Minor amendments to reflect further updates to ESIA.	Client issue.
B5	03/03/2022	Final for disclosure.	Client issue.

NOTICE AND DISCLAIMER

- 1. This document entitled *Environmental & Social Impact Assessment*, document number 192248.R.004 B5 dated *03 March 2022* has been prepared solely for Masdar ("the Client") in connection with the Zarafshan Wind Farm. This document in whole, or in part, may not be used or relied upon by any other person for any other purpose, without the express written permission of Wood Group UK Limited ("the Consultant") and any such approval shall be subject to receipt by the Consultant from the prospective person of a countersigned copy of the Consultant's reliance letter format (available upon written request). Any liability arising out of use of this document by the Client for any purpose not wholly connected with the above shall be the responsibility of the Client who shall indemnify the Consultant against all claims, costs, damages and losses arising out of such use. Any liability arising out of the use of this document by a third party shall be the responsibility of that party who shall indemnify the Consultant against all claims, costs, damages and losses arising out of such use.
- 2. The Client will indemnify the Consultant from and against any losses, claims, demands, damages, costs, charges, expenses or liabilities (or actions, investigations or other proceedings in respect thereof) which the Consultant may suffer or incur or which may be made against the Consultant relating to or arising directly or indirectly out of a claim by a third party where the Client has disclosed the document or has permitted the document to be disclosed to such third party without the prior written consent of the Consultant, and will reimburse the Consultant for all costs and expenses (including legal and other professional fees) which are incurred by the Consultant in connection with investigating or defending any such claim or proceeding
- 3. The Consultant accepts no liability whatsoever in relation to:
 - a. documents or advice marked as "indicative", "preliminary" or "draft";
 - non-technical matters, including but not limited to legal, financial and insurance considerations - it is recommended that the Client obtains advice on non-technical matters by suitably qualified parties; and
 - any omission or inaccuracy arising directly or indirectly from an omission, or error, in the data supplied by the Client, or any other party, to conduct the scope of work.
- 4. Other than where specifically agreed in writing, data has not been independently verified and is assumed to be accurate and complete at the time of data provision. This applies to any data used in conducting the scope of work, whether or not specifically referenced in this document.
- 5. Wind speed and energy yield estimations presented in this document are based on the data provided and assumptions made at the time of writing. Wind speed and energy yield estimations are subject to a level of uncertainty and as such actual wind speed and energy yield values may differ from those detailed in this document. A party must use its own skill and judgement in deciding the applicability and appropriateness of the estimation in any given situation.
- 6. The Consultant accepts no liability in relation to its opinion on construction schedules, financial contingency or predicted operational expenditure, due to inherent uncertainty and unforeseen factors.
- 7. Any technology and technical design reviews are non-exhaustive. Unless expressly agreed, no design calculations have been checked.

Contents

1	Introduction	6
1.1	Project Location and Description	6
1.2	Environmental and Social Impact Assessment	8
1.3	Importance of the Project	8
1.4	Alternative Options	8
1.5	Wind Power	9
1.6	Project Site	9
2	Environmental and Social Baseline, Potential Impacts and Mitigation	.10
2.1	Birds	10
2.2	Terrestrial Ecology	. 13
2.3	Social	. 14
2.3.1	Engagement	. 14
2.3.2	Impact Assessment	15
2.4	Transport and Access	. 17
2.5	Landscape and Visual	. 18
2.6	Archaeology and Cultural Heritage	19
2.7	Noise	. 20
2.8	Shadow Flicker	. 20
2.9	Hydrology and Hydrogeology	. 21
2.10	Geology and Soils	. 22
2.11	Aviation and Radar	. 22
2.12	Climate Change	22
3	Environmental and Social Management System	. 23
4	Contact Details	24

Figures

Figure 1-1: Project Location	7
Figure 1-2: Typical Wind Turbines	
Figure 1-3: Core Project Site Area	10
Figure 2-1: Steppe Eagle	11
Figure 2-2: Project Area – Rocky Deserts LCT	18

1 Introduction

1.1 Project Location and Description

Shamol Zarafshan Energy FE LLC (the Company), a special purpose company incorporated in Uzbekistan, wholly owned by Masdar, is proposing to construct and operate a wind farm project located in the Tamdy District of Uzbekistan, approximately 7 km east of Zarafshan City (the Project). The Project, once operational, will generate 500-megawatt (MW) of renewable energy. The Project location is shown on Figure 1-1.

The Project is proposed to include 111 wind turbines as well as a substation, compound area, tracks to access each turbine, underground cabling from the turbines to the substation and two short overhead transmission lines, connecting to two existing transmission lines that cross the Project site. There will be one access point from the A379 road to the site.

The site compound required during construction is proposed to be located off the Project site, near Zarafshan City, within a large yard adjacent to the proposed workers' accommodation.

Approval of the Project PZVOS (the National environmental impact assessment mechanism) was obtained in July 2021.

A new batching plant will be constructed by a third party, located to the north of Zarafshan City and this will be utilised for the Project. A separate Environmental Impact Statement (EIS) has been developed in support of an application for a PZVOS for the plant. This was approved in February 2022. There is an existing water supply to the batching plant (groundwater well) and an additional supply solely for the Project is not required.

It is expected that construction will take place from 2022 to late 2024 and, once operational, will supply power to the national grid. During construction it is expected there will be up to 700 workers on site. During operations the estimated operational workforce is likely to comprise 35-45 people. The Project will be operational for a maximum period of 25 years.

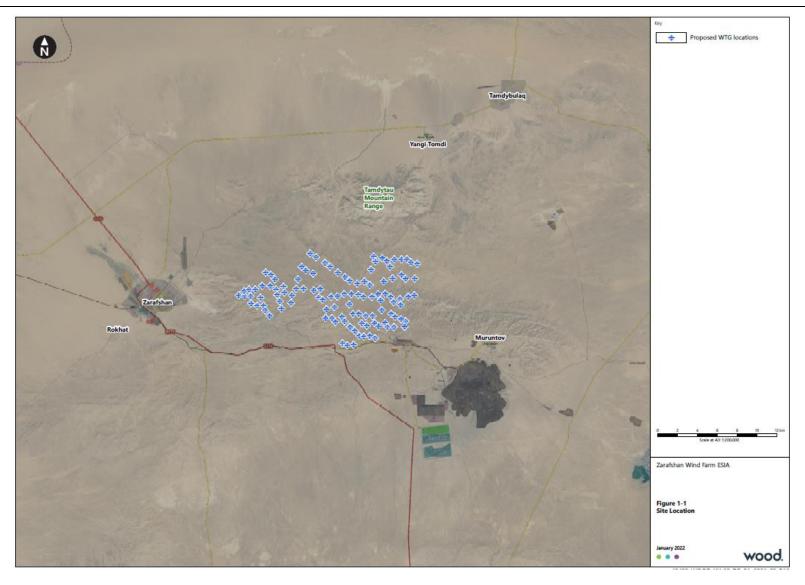


Figure 1-1: Project Location

1.2 Environmental and Social Impact Assessment

A Preliminary Environmental and Social Impact Assessment (ESIA) was prepared by Wood to identify and assess potential environmental and social impacts of the wind farm and all infrastructure associated with it. Mitigation measures were then identified to reduce and manage potential environmental and social impacts. The Preliminary ESIA was disclosed to stakeholders over the period August – September 2021. The ESIA was subsequently finalised to take account of disclosure feedback and to account for additional Project information. An Environmental and Social Action Plan (ESAP) has also been developed for the Project which sets out further outline of mitigation measures and approach. The ESAP will be updated following further consultation with the Company.

The purpose of this non-technical summary (NTS) is to present the key findings of the ESIA in a manner which is accessible to everyone that may be interested in the Project.

1.3 Importance of the Project

The Uzbek Government has ambitious energy transformation plans and the development of renewable energy is of key importance. Uzbekistan has a rich renewable energy potential, particularly for wind, solar PV and hydroelectric development. The Project is important as it will assist with the Uzbek Government's aim to increase the renewable energy sector and reduce reliance on non-renewable sources.

1.4 Alternative Options

A number of realistic alternatives were considered throughout the Project's development in terms of different options relating to:

- Site selection.
- Technological alternatives.
- Grid connection.
- Site layout.

Wind power was determined as the optimal technology for the Project location. The proposed wind farm layout and grid connection have been modified and refined, taking account of environmental and social factors, with the aim of minimising conflicts with existing roads, residential areas and on-site constraints.

1.5 Wind Power

Wind power is energy obtained from the wind. To be able to produce electricity from wind, a wind turbine is used. The turbines will have a tower and three blades with a total height to the tip of the blade of 172.5 m. Typical wind turbines are illustrated in the photograph below.



Figure 1-2: Typical Wind Turbines

1.6 Project Site

The main Project area is located within the Tamdy district, in the central part of the Kyzylkum desert occupying around 9,600 hectares in size of which, construction activities will take place on approximately 150 hectares in total. The area is largely used for rough grazing of sheep and to a lesser extent, goats and horses, with a number of access tracks crossing the site. All land within the Project area is owned by the government and managed by Tamdy District on behalf of central government. Certain parts of the Project are leased to farmers for agricultural activities in the form of animal keeping.

The photograph below provides an illustration of the Project site.

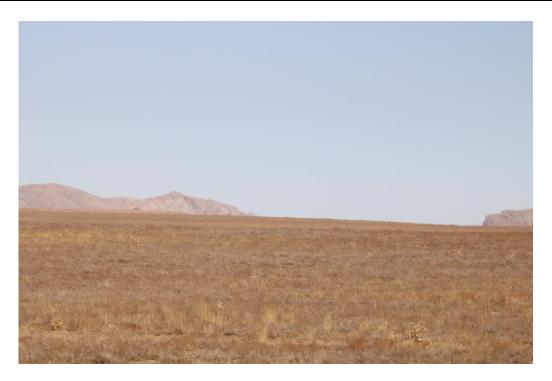


Figure 1-3: Core Project Site Area

2 Environmental and Social Baseline, Potential Impacts and Mitigation

The ESIA identifies the potential impact of the wind farm on the existing environmental and social conditions of the Project site and surrounding area.

The environmental and social baseline was collected through site survey and consultation exercises. The proposed Project site and turbine locations were identified to avoid the areas of highest sensitivity.

A summary of key impacts that have been identified by the ESIA process during the construction and operational phases of the wind farm are outlined below. Decommissioning impacts are typically similar to construction phase impacts and have not been summarised. Key mitigation measures are also outlined within the sections below.

2.1 Birds

The site is situated approximately 3.5 km from the Mount Aktau Important Bird and Biodiversity Area which supports breeding and resident populations of raptors which are of international and national conservation status.

Potential impacts on birds arising during construction comprise:

Direct loss of vegetation and habitat (including food sources).

- Indirect damage to habitats and disturbance of birds from presence of people, machinery, traffic, and noise, both within and outside of the Project area. This indirect impact could affect species of global and regional conservation concern.
- Indirect impacts associated with pollution.

The predicted impacts of construction are low and not significant, however mitigation during construction will include timing work to remove suitable nesting habitat to avoid the most sensitive times of year for ground nesting species.

The key potential impact during operation is the potential collision of birds with wind turbines, particularly species of conservation concern present at the Project site including the Cinerous Vulture, Eurasian Griffon Vulture, Egyptian Vulture and Steppe Eagle. The assessment identified the potential for significant impacts on these four species during operation.



Figure 2-1: Steppe Eagle¹

_

¹ https://ebird.org/species/steeag1?siteLanguage=en_GB

Mitigation to avoid impacts to these sensitive bird species will be implemented by the Project. Mitigation during the design phase included revised design of the Project layout to move turbines away from sensitive habitat and receptors including raptor nests. During the pre-construction phase this will include ongoing monitoring including nesting raptor surveys and breeding bird surveys. During construction a 500 m buffer of active nesting locations of species of conservation concern will be maintained for all WTG locations with the exception of one WTG where additional mitigation measures will be in place. Where works commence between January and June in a given year, checks prior to construction will take place and works will not commence if raptors are found to be nesting in the 500 m buffer.

During operation a number of measures will be in place. This will include, shutting down turbines if sensitive bird species fly too close to turbines using Identiflight technology for the operations phase. Identiflight is a system for bird detection which uses cameras with Artificial Intelligence (AI) software to detect birds as far as 1 km away, This will be monitored by experienced field surveyors during the initial phase of operation.

Additional mitigation is required for WTG 108A (if further movement of this WTG is not possible) as it is located in close proximity to historic nesting locations. Additional mitigation includes curtailment of WTG 108A from 01 March to 15 April for the first two years of operation. For WTG 108A, construction and operational / maintenance activities will be avoided during the breeding season, if breeding is confirmed through surveys.

A long-term post construction monitoring plan will be implemented, this includes fatality monitoring, ongoing nest monitoring throughout the lifespan of the Project, general activity monitoring (via the outputs from Identiflight), and studies into the feeding habits of sensitive species in the area.

Other measures during operation include (amongst others) investigating the feasibility of livestock management on site, removal of animal carcasses from the site and wider area and the commitment to perform a study into the feasibility of off-site feeding stations, provision of flight diverters on new sections of overhead line.

Enhancement and offset measures are also proposed including enhancement of areas of land for birds and other wildlife, erection of nesting boxes and a campaign to stop persecution of raptors and other species groups.

2.2 Terrestrial Ecology

The proposed Project site is situated within areas of low species diversity. Potential impacts on flora (plants) and fauna (animals) arising during construction comprise:

- Direct loss of vegetation and habitat (including food sources).
- Direct loss of fauna during construction activities.
- Damage to habitats and disturbance of fauna from presence of people, machinery, traffic, and noise, both within and outside of the Project area. This indirect impact could affect species of global and national conservation concern.
- Indirect impacts associated with pollution including li.

Potential impacts during operation of the Project are as follows:

- Disturbance of fauna from turbine noise, shadow flicker, people, and traffic.
- Displacement from immediate surrounds of turbines and wind farm area resulting in loss of feeding resources.
- Loss of fauna from collision with turbines (bats).

The impacts on flora and fauna on, or within the vicinity of, the proposed Project site have been assessed as low generally, with some impacts anticipated at local levels. Mitigation is proposed to ensure the overall effect of the Project will not be significant in the long-term.

The construction timetable will be designed so that excavation work in un-surveyed areas will be focused around avoiding the most sensitive times (i.e. mid-October to March (or sooner if conditions allow) when vulnerable species of reptile, such as Russian Tortoise may be hibernating below ground) as well as June and July during aestivation unless recent survey data confirms no presence of protected species or there are exceptional circumstances. Where works are required to take place during sensitive times, they will be in line with the agreed protocol included in relevant management plans prior to construction.

A number of other mitigation measures will be implemented to include pollution prevention measures, bat carcass monitoring during the first year of operations, management and restoration of habitat and protection of excavations to prevent sensitive species such as Russian Tortoise, Caspian Monitor or hedgehog species falling into excavations and becoming trapped/injured.

2.3 Social

2.3.1 Engagement

A number of stakeholder engagement activities were completed with local stakeholders during preparation of the ESIA. All stakeholder and public comments received to date have been considered when developing the ESIA and included within the Project Stakeholder Engagement Plan (SEP).

Stakeholders' opinions towards the Project typically reflect the following:

- A clear expectation of local employment opportunities and improved electricity supply, which is expected to result in follow-on industrial developments, bringing even more employment and improved economic opportunities in the future.
- The expectation for Project employment opportunities to benefit men more than women.
- Community investment projects that are funded by the developer to address challenges such as inadequate teaching materials, water supply problems, and the living standards and future opportunities for young and disabled people.
- The opportunity for young people to learn about this type of renewable energy which is new to both the region, and country as a whole.

The Preliminary ESIA was disclosed over the period August – September 2021 alongside the draft Environmental and Social Management and Monitoring Plan (ESMMP). Disclosure activities included meetings with government representatives, community leaders, local women residents, educational establishments, farmers, herders and local communities, amongst others. Disclosure materials included posters indicating the Project layout, leaflets with Project information / grievance mechanism and a presentation pack providing detail on the ESIA process and outcome.

The feedback from the disclosure activities was used to inform the Final ESIA and ESMMP.

During the stakeholder engagement activities, key points were raised included the potential to provide electricity from the wind farm to homes and businesses, employment opportunities and concerns regarding the Project's use of water placing higher demands on the region's water supply (amongst others). Consultations were carried out in the language preference of stakeholders and were tailored to the needs of disadvantaged and vulnerable groups that were identified within the Project area. Full details can be found in Chapter 7 of the ESIA.

Disclosure of the Final ESIA, ESMMP and SEP will commence in early March 2022 for a period of 90 days. Disclosure activities will include provision of formal letters to relevant governmental bodies, local and district authorities and the New Committee, a series of public meetings and small group discussions with communities, community leaders, affected farmer and herder households and targeted engagements to women of affected households and residents. Disclosure materials include formal letters, leaflets, summary documentation and topic specific posters.

The Project has been received very positively to date with the potential for increased supply in electricity (to the national grid) and creation of employment for local people. Ongoing engagement and consultation activities are being undertaken as part of the Project Livelihood Restoration Plan (LRP). These include additional consultations with land users, community leaders and community members. Engagement activities to disclose the LRP commenced at the end of February 2022 and will be undertaken alongside the ESIA disclosure period. Disclosure activities include small group discussions with affected farmers and herder households as well as targeted engagements to women of affected households and residents. Disclosure materials include a summary of the LRP and topic specific posters in relation to grievance management, livestock management and livelihood restoration measures.

Consultation will be continued as the Project progresses and the programme is set out in the SEP. A community grievance mechanism has been set up and is included within the SEP. This has also been communicated throughout the consultation and disclosure process.

2.3.2 Impact Assessment

A number of positive impacts are anticipated to arise from the Project. The Project will positively influence the local, regional and national economy during construction, from the direct procurement and supply of materials and services, and during operation contributing towards the ongoing development of the country using a low-carbon, renewable source. The Project will also result in local employment opportunities both during construction and operation.

During construction and operations, the Company will design and implement a Community Development Plan (CDP) that aims to provide a range of benefits to people in local communities in the vicinity of the Project. The CDP will have the following objectives:

- To establish procedures for responding to community needs, working with the community and other partners including local government, planning and implementing community Projects, and managing financial arrangements.
- To describe the way in which information associated with community development is to be disclosed and shared in a culturally appropriate manner.
- To ensure that the needs of women and vulnerable groups are taken into consideration during the selection of community development Projects.
- To define clear roles and responsibilities between the various stakeholder groups involved; and
- To define monitoring and reporting procedures that can be used to track implementation over time.

The social assessment also determined negative impacts associated with the Project. Key impacts are described below.

Engagement of the Project (sub) contractors is associated with risks related to labour and working conditions for the Project personnel. These include, for example, poor working conditions, a lack of written worker contracts being used, low-levels of occupational health and safety, child labour, forced labour and other forms of labour-related exploitation. Risks related to child and forced labour, as well as health and safety risks are also relevant to the Project supply chain.

The findings of the Labour and Working Conditions Assessment conducted for the Project did not identify non-compliance issues against the combined standards from national legislation and international standards.

During construction there is a potential for people from outside the Tamdy District, Zarafshan City and the wider Navoi Region to turn up without invitation, seeking employment and other types of economic opportunities from the Project. This may result in a spread of communicable diseases, increased tensions between local people and newcomers, and may result in an increase in the local incidence of crime.

The incoming, non-local construction workforce will be accommodated in rented property close to Zarafshan City. Workers may be exposed to health and safety risks associated with fire, poor sanitation and food safety, electrical safety and security risks of theft or assault. There is also the potential for workers based in accommodation facilities to interact with local people and communities during non-working hours, increasing the risk of communicable diseases (including COVID-19), raising local tensions, and increasing crime (including sexual assaults) on local people.

The use of a workforce and construction activities generates a variety of occupational health and safety risks to the workforce and to local people, such as the risk of injury should a local person gain unauthorised entry into a working area where excavations are present. In addition, the use of road vehicles to transport materials and personnel to/from the site introduces significant community health and safety risks.

There is also the potential for impacts to land-based livelihoods as a result of the Project. Construction areas will be fenced off during construction works to ensure safety of the community and livestock. As a result, there will be temporary restrictions on the use of small areas of leased and communal land during construction. During operation there will be a loss of a small area of leased and communal land that is used for livestock grazing, the collection of materials and other purposes. During operations livestock will be able to graze in between the WTGs. None of the informal herder shelters shall be impacted by land-use change arising from the Project.

A number of mitigation measures will be implemented to ensure impacts are minimised. These will include engagement with land users prior to construction commencing, development of an Occupational Health and Safety Plan, a Labour and Working Conditions Management Plan (to include Worker Code of Conduct), Security and Human Rights Management Plan (to include Community Health and Safety), and a Worker Accommodation Management Plan.

The Project has also prepared a LRP to address any involuntary economic displacement prior to construction.

2.4 Transport and Access

The wind turbine components need to be transported to the Project site using oversized vehicles, larger than typical heavy goods vehicles (HGVs). HGVs will also be required to transport other Project components. This will result in increased traffic on the transportation route and local roads surrounding the Project site.

It is assumed at this stage that turbine components will be transported from Baiyin City in Gansu Province, China to Korgas in the Xinjiang Uygur Autonomous region, through Kazakhstan, into Uzbekistan and down to the Project. The Project site will then be accessed from the south via one access point off the A379 road.

During the construction phase potential impacts include:

• Traffic generation during construction period with potential for increased accidents, severance, driver delay and pedestrian delay.

Damage to road edges and surfaces.

During operation the number of vehicles is likely to be low, with access required only for maintenance and servicing. The majority of these will be light vehicles with HGVs only required if turbine components need replacing.

Mitigation is proposed to include the development of a construction Traffic and Transportation Management Plan (TTMP) to manage potential impacts on the road network and its users. In addition to the TTMP, a road safety campaign will be implemented in local schools within the settlements in Zarafshan City along with consultation with local communities. With mitigation measures implemented impacts are predicted to be minor.

2.5 Landscape and Visual

An assessment of landscape and visual impacts has been undertaken. Seven viewpoints have been identified within the 35 km study area for the visual assessment. The Project is located within the Kyzulkum desert and is considered to largely be within a Rocky Deserts landscape character type (LCT). The photo below, illustrates the Project site area and landscape type.



Figure 2-2: Project Area – Rocky Deserts LCT

Landscape

During construction new machinery and equipment will be introduced into the landscape, including a crane, trucks, excavators, bulldozers, and other heavy equipment. In addition, there will be temporary storage and laydown areas. Due to the temporary nature of the works and the surrounding topography that will provide screening of the works, no significant landscape impacts are predicted during construction.

During operation, there is the potential for significant landscape impacts within 5 km of the Project however further afield, as the desert landscape is vast there is the capacity to absorb the Project within the landscape.

Visual

During construction, the greatest visual impacts will be during the wind turbine erection process. Impacts during construction at viewpoints are not considered to be significant.

During operation of the Project, significant impacts are predicted to occur at two viewpoint locations due to the number of turbines visible.

Mitigation measures will be implemented, to include the reinstatement of construction areas and the implementation of a Community Development Plan, to ensure that any visual impacts experienced by the local population are offset by an appropriate level of community benefit.

2.6 Archaeology and Cultural Heritage

The potential impacts of the Project and associated works on cultural heritage assets in the surrounding area has been assessed.

There are no known archaeological or cultural heritage sites within the Project area, however, the area has not been well studied with respect to archaeology. A religious site is located just south of the Project, approximately 2 km west of the closest WTG and adjacent to the Golden Key Tourist Resort.

As there are no identified sites within the Project area, the Project is not deemed to directly impact on any international or nationally recognised heritage. There remains the potential to uncover previously buried archaeology (chance finds) during construction works therefore an observation and investigation exercise (an archaeological chance finds procedure) will be implemented during initial construction works to identify any uncovered archaeological features.

2.7 Noise

Noise sensitive receptors were identified during the baseline collection phase of the Project. These represent a mix of temporary farm dwellings, hotel and settlements (including mining area settlement for workers). The closest is located just under 1 km from the closest wind turbine.

Construction noise is short term and typically managed through standard measures. Noise management measures will be developed within the construction Environmental Management Plan (CEMP) for the construction phase. The measures will set out how permitted working hours will be adhered to, mitigation to ensure construction noise limits are met and community consultation details and grievance mechanism process in the event of any noise-related complaints.

Wind turbines emit noise during their operation. Noise from the turbines must meet fixed lower limits for day-time and night-time. The following operational noise limits from local regulations and international guidelines have been applied to the Project for the noise assessment:

- Day-time limit of 55 dB(A).
- Night-time limit of 45 dB(A).
- For industrial areas, the day and night LAeq values are relaxed to 70 dB(A).

A detailed noise modelling exercise has been carried out to ensure that the turbines do not exceed the specified limits. The operational noise impact assessment concluded that the predicted levels for total operational wind farm noise meet the limits at all noise sensitive receptors close to the Project and therefore no significant impacts are predicted.

2.8 Shadow Flicker

Shadow flicker occurs during the operational phase of a wind farm when the sun passes behind the turbines and casts a shadow. As the blades rotate, shadows pass over the same point causing an effect termed shadow flicker. Shadow flicker may become a problem when potentially sensitive receptors (residential properties, workplaces, learning spaces and health care settings are all potentially sensitive to shadow flicker) are located near, or have a specific orientation to, the wind farm.

Modelling of shadow flicker duration was undertaken for 11 identified sensitive receptors within the area predicted to be impacted by shadow flicker. The limit of 30 minutes per day and 30 hour per year is predicted to be breached at three receptors. Mitigation is therefore proposed and will include the installation of shadow flicker modules on the identified wind turbines (34, 39 and 71) to shut down the turbines at specific dates and times of the year when shadow flicker is an issue. This will ensure there are no significant impacts relating to shadow flicker.

Consultation has been undertaken through the initial ESIA disclosure process to inform the affected peoples and the wider community with regards to potential effects. No concerns have been raised to date in relation to shadow flicker.

If any complaints are raised by the local community (through the grievance mechanism or other channels) relating to shadow flicker from the Project, the Project operator shall investigate and, where found to be necessary, instigate appropriate further measures to mitigate the shadow flicker effects.

2.9 Hydrology and Hydrogeology

Potential impacts resulting from the construction, operation and decommissioning of the Project on the water environment including surface water and groundwater conditions, have been examined.

There are no permanent waterbodies on or adjacent to the Project site. A number of seasonal drainage channels were observed across the site. The temporary channels are active during the Spring period and during heavy rains and snow melt.

Potential impacts on water resources include:

- Water consumption, potentially affecting local water resources.
- Alteration of surface and groundwater flow.
- Water discharge and pollution.

All water required for construction purposes on the Project site will be imported to the site via tankers, from Zarafshan City. This is limited to water required for fire protection, washdown, dust suppression and welfare facilities. Bottled drinking water will be provided for the construction workers. The EPC Contractor will be responsible to obtaining any necessary permit / agreement obtained from the local State Unitary Enterprise for Water Supply and Wastewater (SUVSOZ) prior to construction.

Standard mitigation measures are proposed during construction and operation to prevent pollution and contamination of surface and groundwater, and to reduce the potential of erosion particularly during spring months when drainage channels are utilised.

2.10 Geology and Soils

The main impacts on soils and geology are likely to arise during the various site preparation and construction activities associated with the Project and its access roads.

Soils in the Project area are identified as vulnerable to erosion and desertification. In particular, soil erosion can be caused by vehicles on unimproved tracks, and water erosion may occur during winter. During operation, the main impacts on soils would be from continued vehicle traffic.

Standard mitigation measures are proposed during construction and operation to control erosion, prevent pollution and contamination of soils, and to reduce soil damage.

2.11 Aviation and Radar

Turbines can present as physical obstruction to aircraft. Turbines can also cause radar and other navigational aid interference whereby the blades appear as 'clutter' on radar screens and can be mistaken for aircraft.

The closest airport to the Project is Zarafshan at a distance of around 5.8 km west-north-west of the western edge of the Project site. Consultation will therefore need to take place with the Civil Aviation Authority to provide the information required to obtain a permit for the Project. This will be undertaken prior to construction once the Project layout and turbine positions have been finalised / microsited.

2.12 Climate Change

A climate change risk assessment has been carried out for the Project to ascertain ongoing and expected changes in climatic patterns and an evaluation of the climate-related physical risks which included implications for the Project associated with increasing air temperatures and a high number of high heat days. There is also the potential for ice being thrown from turbine blades to increase with climate change however this is not considered a significant issue for the Project as there is sufficient distance to residential receptors.

A greenhouse gas (GHG) emissions calculation has also been undertaken. Benefits are envisaged through carbon emission reductions each year by reducing reliance on fossil fuels for electricity generation. The Project will contribute to Uzbekistan's target to reduce annual GHG emissions per unit of gross domestic product by 10% by 2030 (relative to 2010), thereby providing a minor overall benefit.

3 Environmental and Social Management System

The mitigation, monitoring and performance improvement measures identified within the ESIA will be incorporated into the Project Environmental and Social Management System (ESMS) developed by the Company. The measures and actions to address identified impacts and risks will favour the avoidance and prevention of impacts over minimisation, mitigation or compensation wherever technically and financially feasible. Where risks and impacts cannot be avoided or prevented, mitigation measures and actions are identified so that the Project can operate in compliance with applicable laws and regulations in addition to meeting international standards.

The scope of the ESMS for the Project will include:

- The operational standards to be applied to the Project.
- The Company's policy for environmental management, occupational health and safety, labour and community health, safety and security.
- Organisational chart for environmental, social, health and safety (ESHS) elements, roles and responsibilities and Contractor management.
- ESHS reporting both of routine and incidents / accidents.
- Audit, review and management of non-conformances.
- Community grievance mechanism (alongside the Stakeholder Engagement Plan).
- Workers' grievance mechanism.

A number of management plans (sub-plans) will be produced as part of the ESMS. The construction ESMS will constitute the overarching document referring to a number of sub-plans required for the Project and implemented by the Project engineering contractor.

Management plans consist of a combination of operational policies, procedures and practises. These plans will provide a system against which to monitor and audit environmental and social performance. In addition, they will detail the practical methods required to ensure work is completed in accordance with current best practice, the mitigation measures in the ESIA and legislative and regulatory requirements.

A programme of Environmental and Social Monitoring will be undertaken by the Company in order to verify the effectiveness of the proposed mitigation and management measures.

4 Contact Details

Any queries regarding the Project or the ESIA can be raised directly with the Company by contacting:

Khurshid Karamatov (Community Liaison Officer)

Tel No: +998 93 522 00 70

Email: kkaramatov@masdar.ae