# Initial Environmental and Social Examination Report

Project Number: 55135-001
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# Uzbekistan: Samarkand Solar Power Project
# Part 3: Main Report

Prepared by AECOM Limited for the Asian Development Bank.

# 8.7 Landscape and Visual

## 8.7.1 Design Phase

Landscape and visual mitigation for the Project was embedded in the design of the solar farm to centre around the selection of a layout which minimise the potential for significant impacts whilst achieving operational objectives.

## 8.7.2 Construction Phase

The best form of mitigation for landscape and visual impacts arising from construction is related to conservation of soils and vegetation.

Mitigation to reduce the adverse impact resulting from litter and rubbish (plastic bags, bottles etc.) include:

- Floodlights will be positioned and directed so as not to point outside of the site.
- Provision of adequate facilities for the disposal of rubbish.
- Training of the workforce in waste management.
- Reduce the amount of waste to the maximum extent possible.
- Collect all solid waste and store until transported to an appropriate waste disposal facility and disposed.
- Organization of clean-ups for existing rubbish.

## 8.7.3 Operational Phase

Vegetation around the Project that does not affect the performance of the Solar Park will be left in place or rehabilitated.

# 8.8 Noise

## 8.8.1 Construction Phase

In order to reduce the impact of noise during construction, best practicable means will be followed to ensure that the quietest available plant and construction techniques will be used in order to limit noise output as far as practically possible. The initial noise assessment has concentrated on the settlement at Shurcha and Rassvet to the west and Damkhodzha to the east. It is deemed that the villages are of sufficient distance from the site to ensure that construction impacts are not likely to be significant. AECOM anticipate that the highest magnitude noise impacts will be experienced during piling operations.

Construction will generally be undertaken during normal working hours although some works may be required outside of this time. Where appropriate, micro siting will be undertaken to ensure construction noise impacts are minimised and equipment is located as far as possible from Noise Sensitive Receptors (NSRs). Mitigation measures will also include the use of a sufficient buffer between the Project and local properties to reduce noise to an acceptable level at those locations.

In addition, Project construction traffic routing through community areas will be minimised wherever possible.

A Noise Management Plan will be developer to identify the quietest available plant and construction techniques to be used to limit noise output during construction works. These include:

- Restrict all construction activities to daytime during normal working hours (0700 am – 1800 pm).
- Where appropriate, micro-siting is to be undertaken to ensure construction noise impacts are minimised and equipment is located as far as possible from noise sensitive receptors (NSRs). NSRs include onsite accommodation.

- Routing of project construction traffic shall be through the main highway and short section of unmarked road to site. Refer to the Transport MP for further details.
- Adopt and follow best practicable means to ensure that the quietest available plant and construction techniques are used. Such as:
  - Selecting equipment with lower sound power levels
  - Installing silencers for fans
  - Installing suitable mufflers on engine exhausts and compressor components ·
  - Installing acoustic enclosures for equipment casing radiating noise
- Provide prior information to the community of any planned noisy activity that is likely to exceed the permitted noise levels (piling work)
- Strictly ensure the use of protective personal equipment at all times while on site and noise reduction techniques such as silencers and ear mufflers to employees
- Machinery and equipment shall be maintained in good conditions in order to minimize noise.
- In the event of a valid grievance being received, carry out an investigation of noise levels to determine whether they comply with permitted maximum levels, including all vehicles and machineries on site. For this task, a handheld noise monitor will be used to measure IEC A-weighting ($dB(A)_{eq}$).

### 8.8.2 Operational Phase

The initial noise assessment has concentrated on the villages of Shurcha and Rassvet to the west and Damkhodzha to the east but it is deemed to be of sufficient distance from the site to ensure operational impacts are not likely to be significant.

Should additional mitigation be required during the operational phase, the following will be considered if required following detailed noise assessment:

- Installation of acoustic enclosures for equipment causing radiating noise (this would typically give 3 dB attenuation).
- Improving the acoustic performance of constructed buildings, through employing sound insulation.
- Installing acoustic barriers without gaps and with a continuous minimum surface density of 10 kg/m2 in order to minimize the transmission of sound through the barrier. Barriers will be located as close to the source or to the receptor location to be effective.
- Installing vibration isolation for mechanical equipment.

In addition, the Community Grievance Mechanism developed under IFC PS 1 will be implemented during both the construction and operational Project phases. This will be utilised to record, monitor and respond to / mitigate any noise related impacts raised by the local community and ensure compliance with noise limits is achieved at NSRs.

## 8.9 Socio-economic Impacts

The following sections provide indicative measures to mitigate the negative effects and enhance the positive effects of the Project according to the impacts listed in Section 7.1.8 and 7.2.9. The systematic approach for mitigation development will consider policy and procedure instruments, training and capacity building, and economic investment. The mitigation and monitoring measures identified within this section will be further developed within the Project's ESMP and associated sub-plans.

## 8.9.1 Construction Phase

### 8.9.1.1 Community Expectations of the Project

- Communicate employment estimates, timeframes and skills requirements clearly to the community on a continuous basis.
- Develop and disclose a Local Recruitment and Employment Plan in consultation with the community and in a way that meets long term operational needs of the Project as well as the short-term construction needs, taking into account the relatively low skill base of the local population when it comes to solar power related jobs. This Plan will outline the recruitment strategy and processes, including the promotion of equal opportunities. It will be developed on the basis of a social survey and will include a clear local content target, advertising of local job position will be made available in a central location and information will be available in the local language. The Plan will also describe how women and Project Affected People will be given priority, alongside with residents of Kattakurgan for recruitment and training before the start of construction activities (also included in the following section).
- A Stakeholder Engagement Plan will be implemented.

### 8.9.1.2 Economic Displacement

The Project will develop a Livelihood Restoration Plan (LRP) that considers any potential economic displacement that will be created by the Project including the OHTL and any consequent temporary land restriction. The LRP will be drafted in line with national regulations and international best practices, and it will respond to the following objectives:

- Define national and international requirements for economic displacement
- Outline procedures for the land acquisition and compensation to be carried out by State parties.
- Identify PAPs and understand the socio-economic characteristics of affected households.
- Evaluate and assess the socio-economic activities that are located within the Project Site.
- Define appropriate levels and means of compensation for losses resulting from the Project in line with National Law and ADB standards.
- Identify other assistance and measures to enable affected households to restore and improve their livelihood.
- Define roles and responsibilities of key parties in the Project.
- Propose an appropriate grievance resolution mechanism.
- Evaluate and address disclosure and consultation requirements required by the project lenders.

### 8.9.1.3 Increased local employment, capacity building and supply demand

To enhance the direct and indirect economic opportunities during the Project construction, the EPC Contractor will prioritize the appointment of workers from the area local to the Project site. The objective will be to develop a workforce, preferably, of a combination of nationals and expatriate workers that meets long term operational needs of the Project as well as the short-term construction needs, taking into account the relatively low skill base of the local population when it comes to solar power related jobs. This Project will consider the following activities:

- Investigation of local sourcing and procurement opportunities to promote sustainable small business and local training schools' partnerships that comply with the standards of the Project development.
- Investment in capacity building for small businesses to enable them to meet standards for procurement required by the company and to service the needs of influx populations and indirect employees (through service industries). This will be designed with a participatory and inclusive strategy between key stakeholders for economic development and the local people.
- Identification and monitoring procedures for compliment with IFC PS2 and ILO standards.

- Communication of job openings in the commonly used media identified in previous consultations through the Stakeholder Engagement Plan.
- Development of a transparent recruitment process, according to IFC PS2, which clearly communicate labour benefits (e.g. Health insurance), salary and contract length. The Plan will also describe how women and Project Affected People will be given priority, alongside with residents of Kattakurgan, for recruitment and training before the start of construction activities.
- Communication with local vocational training schools to develop curricula which will qualify local students to meet the project needs in further phases of the project and the solar industry locally, if possible.

#### 8.9.1.4 Capacity strain contribution to local public services and facilities

A Worker Accommodation Management Plan will be developed for the workforce. The Plan will identify the proper necessities of infrastructure, health and safety policies, and a clear strategy for the peak employee demand. Given the current assessment, the accommodation could be developed in Kattakurgan and surrounding towns and villages, but further evaluation might be developed. If a local accommodation is selected, the Plan must consider a clear communication with stakeholders about on Project schedule and necessities of accommodation according to PS2 and PS4.

An Occupational Health and Safety Plan and a Community Health and Safety Plan will be developed to ensure that all Contractors are provided with adequate health care (for work related injuries and off the job-related health issues) that is independent of the local health care system.

The Plans related to capacity strain will be communicated to key stakeholders, in order to promote transparency and avoid conflict related to community concerns or investment expectations. The information provided will be appropriate to demographic and cultural characteristics of the AoI.

#### 8.9.1.5 Loss of public access and reduced mobility through local paths

The Stakeholder Engagement Plan will provide detailed and regular information to local community members about Project activity to mitigate community concerns about mobilisation and inform updates on potential alternative access routes outside the Project site. The current Project design does not have an alternative community pathway which will allow community members and their herds to cross the area during the lifetime of the project. However, the local farm users may need to adapt and readjust to their new timings and distances compared to baseline conditions. Reduced access to grazing and pastoral land

As noted, the Solar PV will be fenced off at the start of construction to prevent unauthorised entry inside the site boundary. The change in land use in the Project area will result in change in local livelihoods mainly as a result of the reduction in available grazing area and reduction in income.

A livelihood Restoration Plan has been undertaken to quantify and mitigate potential impacts on livelihoods.

#### 8.9.1.6 Increased presence of workers and interaction with local communities

The Community Health and Safety Plan will be developed as a mitigation measure for unplanned worker migration and the presence of workers in the Project area. It will encompass:

- An induction for workers, that provides awareness training on communicable disease prevention (Covid-19), focusing on unplanned interaction with nearby community members.
- Ensure health screening is being conducted for employees and contractors before contracting workers and on a periodic basis throughout their employment/contract.
- Identify opportunities to support local public health campaigns that focus on prevention of communicable diseases.
- Enforce and monitor a zero-alcohol tolerance policy, including current intoxication, for workers during working hours and perform random alcohol testing through periodical screen before and / or after leaving the site. Include this policy on contractors' agreements.

- Training on the Project's goals to establish good relationships with local stakeholders, avoid unnecessary conflict with any inhabitant by respecting human rights and being acknowledgeable of culture differences.

To reduce adverse effects of influx the Project will develop an Influx Management Plan. This Plan must include, at a minimum, the following:

- Preference for hiring of people who are already established residents of local communities. Apply a mechanism to verify where job applicants come from (e.g. checking ID cards) so that jobs prioritised for members of local communities are not given to in-migrants;
- Prohibition of at-gate hiring to reduce the number of people waiting at and around the Project site;
- Working with local government in in-migration hot spots and building their capacity in dealing with impacts;
- Reviewing the range of management plans which will deal with in-migration impacts and ensuring each Project department is putting in place the required measures;
- Monitor in-migration impacts with local government and continue to provide capacity building support and report on findings;
- Mitigations will be included to manage potential risks on the issues of community relations; community health and safety and gender based violence and harassment (GBVH)[93];
- Suggestions on education campaigns and capacity-building training to the PACs on the dangers of alcoholism, drug abuse, domestic violence, prostitution and safe sex; and
- Ongoing engagement with the local communities to identify and respond to any grievances related to influx.

#### 8.9.1.7 Increased presence of security personnel

The Security Management Plan will make sure that security personnel or contractor personnel are trained on the Project's goals to establish good relationships with local stakeholders, according to IFC PS4. These training will seek to avoid unnecessary conflict with any local person and establish the operational area of the security personnel solely within the Project site boundary. The Plan will include actions leading to the full implementation of the Voluntary Principles on Security and Human Rights, UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials, the UN Code of Conduct for Law Enforcement Officials and the International Code of Conduct on Private Security Providers.

The Plan will consider a procedure to log all security incidents, which will be investigated, and any security grievances will be identified and actioned.

#### 8.9.1.8 Occupational health and safety impacts and impacts to Project workforce

The Project Developer and its contractors will comply with appropriate international Occupational Health & Safety regulations and standards in addition to Uzbek safety standards regarding construction works, electrical works, structural climbing and other hazards. In general, construction operations will be planned and implemented in accordance with these standards and with IFC safety guidelines[94]. Furthermore, the EPC Contractor will be required to demonstrate and implement a suitable management system which conforms to the standards equivalent to ISO 9001, ISO 14001 and OSHAS 18001. This be a key contractual requirement and will be monitored by the Developer.

Both the Developer shall commission an independent Labour Assessment undertaken by a qualified labour specialist, which shall include a corrective action plan with appropriate mitigation and remediation measures as well as monitoring requirements that will be implemented by the Project and its subcontractors.

[93] Guidance provided in: https://www.ebrd.com/gbvh-construction.pdf
[94] IFC (2007a)

Furthermore, a single Operation Health and Safety Management Plan will be developed for both construction and operational phases and will bring together the mitigation requirements discussed in preceding sections. This will apply to all parties. The document will also outline emergency preparedness and response along with a grievance mechanism to ensure that feedback is acknowledged and addressed appropriately.

- The OHS Plan will include specific measures to prevent and mitigate Covid-19, including: Induction for workers, awareness training on communicable disease prevention, and OMS precaution recommendations on COVID -19.
- Training on an ongoing basis on communicable disease and hygiene equipment, the correct use of Personal Protective Equipment, and in policies and procedures on health, safety and environment (e.g., aerial work, electrical safety, excavation safety, social distancing measures).
- Health screening on a periodic basis for employees and / or it will describe the parameters that contractors will comply on health monitoring to avoid the spread of communicable diseases and / or COVID-19.

In addition, the Developer and all its contractors will be required to stablish Safety Policies and Procedures for construction phase. The following policies and procedures are listed as examples for the Project development:

- Develop an Emergency Response Plan (ERP) - this plan will be developed in conjunction with the Occupational Health and Safety Plan and Community Health and Safety Plan. This might state the procedures for engaging local emergency responders to at minimum: (i) communicate ERP; (ii) depending on level of risk from emergency events build local capacity to ensure appropriate local response in case of emergency.
- Safety Reporting including incident occurrences.
- Stop Work Policy
- Supplementary to both Plans, and the Safety Policies and Procedures, the Developer will identify opportunities to support local public health campaigns that focus on prevention of diseases.

#### 8.9.1.9 Increased levels of gender-based violence, sexual exploitation and harassment

The Worker Code of Conduct shall:

- Direct Project Workers on appropriate behaviours to help avoid negative interactions with local communities and promote a positive working environment;
- Prohibit violence, discrimination, sexual exploitation, harassment, bullying, and promote equal opportunity;
- Require all project staff to adhere to safety measures;
- Prohibit working under the influence of alcohol and prohibited drugs;
- Prohibit intimidation, offensive language and behaviour, prostitution, or sexual harassment when carrying out project activities (e.g. driving project vehicles), working on Project sites or in local communities;
- Detail a mechanism for safe reporting of violations of these prohibitions and ensure investigation of any reported incidents; and
- Ensure serious actions are taken up to and including dismissal of the worker and referral of cases to the local police when there is evidence of criminal acts.

The Worker Code of Conduct will be provided to all Project workers before they sign their contract of employment, and the contract of employment must state that the project Worker agrees to abide by the Worker Code of Conduct.

Training on the Worker Code of Conduct will be provided to all members of staff irrespective of their seniority or department, emphasising the prohibition on violence between Project workers, as well as provide education about how their behaviours could contribute to different types of domestic violence and harassment, including GBVSEH and economic and social violence. This programme will be designed to be culturally appropriate for the audience, and will be delivered initially through the induction programme as well as through toolbox talk topics, workplace posters and presentations.

## 8.9.2 Operation Phase

### 8.9.2.1 Community expectations of the Project

The need for local labour will vary throughout the Project duration, which could raise expectations of economic opportunities above actual Project workforce demand. As a result, the Stakeholder Engagement Plan will consider an inclusive communication program that will emphasizes accurate employment estimates, timeframes and skills requirements with a clear local content target. This Plan includes a description of the responsibilities of Project staff and an organization chart related to the engagement activities. It will outline the recruitment strategy and processes to promote transparency and participation of the local population, including women.

### 8.9.2.2 Increased local employment, capacity building and supply demand

There will be approximately 25 workers employed during operation and the impact is not of a level that requires any specific mitigation or enhancement measures. However, the Project is in a leading position to develop skills through vocational training and other activities throughout the lifetime of the Project, particularly of residents within the Project AoI, leading to enhanced level of education, competency, and greater ability of the skilled workforce. Additionally, skills and vocational development will give local staff greater ability to find similar work in the future after their involvement in the Project is complete, increasing social mobility.

### 8.9.2.3 Increased presence of security personnel

Results from the Security Management Plan will be evaluated by the Developer and, if applicable, by local people. The assessment results will consider recommendations to improve relationships with local stakeholders, and best practices on human rights and cultural sensitivity training.

### 8.9.2.4 Occupational health and safety impacts and impacts to Project workforce

Further to social mitigation and enhancement measures developed in both phases, a grievance mechanism will be developed and implemented under IFC PS 1. This will provide a communication platform to identify, address, and monitor communities' concerns on the social impacts considered in this ESIA.

### 8.9.2.5 Potential for gender-based violence, sexual exploitation and harassment

Continued implementation of mitigation measures introduced during the construction phase.

# 8.10 Transportation and Access

It is recommended that the efficiency of deliveries of construction materials to the site is closely monitored and, if necessary, sufficient storage provision is made available on site to prevent any delays to the construction process.

A Traffic Management Plan (TMP) will be developed which will reduce risks to drivers and components being transported. This will include (amongst others):

- Detailed site access route.
- Speed controls (such as speed limits, signs, speed bumps etc.).
- Measures for ensuring use of well-maintained vehicles which are serviced regularly.
- Measures to maintain / make good the access roads.
- Details of the temporary site compound which will include parking for up to 40 light vehicles including HGV manoeuvring, holding and unloading areas.
- Information regarding road safety briefings which will be given to all staff and contractors.
- Procedures for ensuring appropriate licenses / permits are in place for all drivers and provision of suitable training to reduce potential accidents on route to, and within, the site.
- Measures to control the delivery / departure of all HGVs to avoid conflict with other road users.

- Detail sensitive receptors en-route and ensure all drivers are aware of these.
- It is recommended that the route for use by HGVs is verified through further assessment (including a route inspection undertaken prior to construction). Consultation with the relevant Roads Authority is recommended to further identify the most appropriate route and any permits or additional mitigation measures required.

The transportation of equipment and materials to site from the border with China utilises paved highways and dual carriageways which are suitable for and regularly used by HGV vehicles. Upgrade works may be required for several roads in the vicinity of the Project site due to the presence of potholes and poorly maintained bridges. This would be verified through further route inspection prior to construction.

Mitigation has been proposed to alleviate potential impacts and these measures will be incorporated into a Construction TMP for use prior to and during construction.

Overall, the assessment concludes that there will be no significant residual effects associated with transportation of materials and equipment during the construction and operation phases of the Project.

## 8.10.1 Construction Phase

### 8.10.1.1 Vehicle and Plant Requirements

**Operator Authorisation**

A person may only operate a vehicle or item of plant on the Project if they:

- Hold the appropriate licence (or statement of attainment for plant not covered by a licence) for the class of vehicle/plant being operated.
- Have completed the Project induction.
- Have undertaken a verification of competency assessment and been approved by a content expert.
- Are fit for work.
- Are under escort of an authorised person where access to work fronts is required (Delivery Drivers & Visitors only).

**Vehicle and Plant Specifications**

All vehicles and mobile plant must be fit for purpose and maintained to a safe and legal standard at all times, including roadworthy standards for vehicles and plant intended for use on a public road.

- Seat Belts: Occupants of any vehicle shall use seatbelts at all times. Where it is impossible to implement the requirement for buses or coaches or car, the minimum requirements are that the seat belts are fitted for driver, front seats and seats adjacent to doorway. Passengers should not occupy such seats if seatbelts are not fitted or functional.
- Condition of Tyres: The tread depth of all tyres including the spare shall not be less than 1.6 mm, or below the Tread Wear Indicator (TWI) embedded in tyres at the time of manufacturing. This applies to the whole area of the tyre. Tyres (including spare tyres) need to be maintained at the correct operating pressure.
- Pre mobilisation inspection: Prior to mobilisation, all vehicles shall be inspected by the HSE Safety Inspector and/or other agencies designated at site to verify compliance and will include all contractors and sub-contractors. Vehicles not meeting the requirements will be rejected. Vehicles shall be fit for purpose based on an assessment of usage, maintained in a safe working order in line with the manufacturers' specifications, servicing intervals and local legal requirements. Vehicles shall meet emission specifications as applicable in the country.
- Light Vehicles: All Vehicles as a minimum shall be fitted with working head lights, rear lights & brake lights, good tyres, seat belts, driver and passenger side mirrors, rear view mirror, reversing alarm, spare wheel and tyre.

- High Visibility Colour: High visibility colour should be preferred for light vehicles. Generally, bright light colours are better than darker colours as they reflect lighter and can be seen from up to four times the distance of vehicles painted in a darker colour.
- Authorisation: A stickering system is being developed showing vehicles inspected and approved for use and will be added once it is ready. There are no current plans have a requirement to use GPS/tracking. Only authorised vehicles will be permitted within the site area. Other vehicles shall require to be parked in the designated parking area.
- Heavy Vehicles: In addition to the above minimum requirements given for light vehicles, additional appropriate equipment shall be installed / provided in heavy vehicles.
- Mobile plant in areas of operation within the project worksite shall be fitted with the equipment including A flashing amber warning beacon clearly visible to approaching persons and traffic; an audible reversing alarm and emergency stop buttons.
- Grievances: A telephone number will be provided on Project vehicles to allow grievances to be reported.

#### 8.10.1.2 Site Rules and Regulations

**Site Security and Access**

The Project site will be secured with a fenced perimeter boundary. There will be one main entry and exit point. Security measures will be taken to ensure the safety of the site as detailed in the Site Security Management Plan.

As a minimum, to enter the Project area it is expected that all workers meet the requirements of the Code of Conduct.

Delivery drivers and visitors can enter Project construction area without the above requirements if they are escorted by a person who is authorised to operate on the Site.

All persons will wear the site-specific PPE at all times (e.g. helmets, safety boots and high visibility clothing, gloves etc.) including delivery drivers. Any delivery driver failing to adhere to this will be refused access to the Site.

**Signage**

All appropriate signage will be installed for the direction of construction-related traffic and the safety of pedestrians.

Temporary and permanent signage on site should be positioned for maximum visibility to inform operators of speed restrictions, warnings and other critical traffic information for the area. Signage outside the Project site during construction must be in accordance with required specifications.

**Speed Restrictions**

The following speed restrictions apply across the Project site:

- Site entry/exit – 20km/h.
- Laydown areas – 5 km/h.
- Satellite facilities and carpark – 5km/h.
- Main car park – 10km/h.
- Access roads – 30km/h or as Sign Posted.

Any adjustments to speed limits will be communicated via updated TMP and daily toolbox talks.

#### 8.10.1.3 Right of Way

Emergency vehicles entering the Project site will have right of way at all times. Additionally:

- Mobile plant shall have right of way over heavy and light vehicles.
- Light vehicles shall give way to mobile plant and heavy vehicles.

- Pedestrians shall give way to all vehicles and mobile plant.

#### 8.10.1.4 Internal Traffic Management

When assessing traffic-related risks, considerations should include (but not be limited to):

- Passing of high vehicles and loads under overhead power lines.
- Maintaining forward motion of vehicles and plant wherever possible to reduce reversing on site.
- Parking locations which do not obstruct access.
- Access for emergency vehicles.
- Unobstructed access to emergency assembly areas.
- Adequacy and visibility of signage.
- Delineation between mobile plant and pedestrians using physical barriers.
- Clearance from nearby infrastructure.

Supervisors will meet daily to plan and review construction works for the following day and where required will communicate any changes in traffic management for activities under their supervision via pre-start meetings.

#### 8.10.1.5 Pedestrian Delineation

Adequate separation between vehicles and pedestrians will be established to ensure safety or, where not reasonably practicable, other means of protecting pedestrians and effective arrangements for warning, persons liable to be crushed or trapped by a vehicle, of its approach.

Pedestrian accesses which lead on to a traffic route will be sufficiently separated to enable them to see approaching plant and vehicles, from a place of safety.

Signage will be implemented to advise of unrestricted pedestrian areas and exclusion zones. Signage for exclusion zones and restricted access areas must identify the area supervisor to be contacted in the case of persons requiring entry into the area.

### 8.10.2Operational Phase

Operational effects are likely to be minimal and limited to repair and maintenance work. No specific mitigation is required for operations although the general mitigation discussed for the construction phase would apply.

### 8.10.3Decommissioning Phase

Decommissioning effects are likely to be similar to that during construction although reduced in magnitude. At this stage, it is not possible to quantify the traffic effect during decommissioning of the Project as it is considered to be too far in the future to estimate any baseline traffic flows. It is unlikely however to present any significant effects. Mitigation would be similar to construction phase.

# 9. Residual Impacts

## 9.1 Construction Impacts

The assessment has been undertaken in accordance with the methodology and assessment criteria set out in Section 4 (Assessment Methodology). The residual impacts are assessed following the implementation of mitigation as described in Chapter 8.

### 9.1.1 Air Quality

| **Impact Assessment: Impacts on air quality during construction** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | **Medium** | High | |
| | Residential receptors are located within 250 m of the Project site therefore receptor sensitivity is determined to be Medium. | | | | |
| Impact Magnitude | No change | Negligible | **Low** | Medium | High |
| | Magnitude of change is anticipated to be high as there is likely to be an increase in levels and dust to air associated with construction of the Project at nearby residential receptors. | | | | |
| Impact Significance | None | Negligible | Low | **Medium** | High |
| | The potential impact during construction is considered to be Medium adverse, on the basis that residential receptors are within 250m of the site boundary but construction vehicles would pass closer to and from site. The implementation of Good International Industry Practise pollution prevention measures is considered very likely to reduce the impacts. However, additional mitigation measures are therefore required. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | The implementation of Good International Industry Practise pollution prevention measures is considered very likely to reduce the impacts to Negligible. | | | | |

### 9.1.2 Archaeology and Cultural Heritage

| **Impact Assessment: Impacts on archaeology and cultural heritage during construction** | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | **Low** | Medium | High | |
| | There are no known heritage assets within the Solar Array area. Possible remains of levelled burial mounds (kurgans) have been identified in the vicinity of the Transmission Line and associated burials and ceremonial features may be present. | | | |
| Impact Magnitude | No change | Low | **Medium** | High |
| | The magnitude of change is anticipated to be medium as there is localised potential to physically disturb any surviving archaeological remains. Setting impacts are low due to lack of views, intervening distance and topography. | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant prior to additional mitigation measures being implemented. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | The residual impact is assessed as Negligible and not significant following mitigation measures being implemented. | | | | |

## 9.1.3 Biodiversity

### 9.1.3.1 Avifauna

| **Impact Assessment: Impacts on Great Bustard (*Otis tarda*) during Construction – Critical Habitat is triggered for this species under Criteria 1: significant populations of nationally or regionally EN or CR species]** | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | As stated in the Critical Habitat Assessment (Turnstone Ecology, 2022 [Appendix D]), critical habitat requirements are applicable for Great Bustard. This species is assigned a 'High' sensitivity value. | | | |
| Impact Magnitude | Negligible | Low | Medium | High |
| | Given the unsuitability of the Project site for foraging/resting/roosting great bustard, and that there were no records of great bustard in Samarkand during the surveys by TYPSA/IFC in 2020-21, the impact magnitude is assessed as Negligible. | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | The impact is assessed as Low and not significant<br><br>There is a requirement for the project to achieve Net Gains for this Critical Habitat qualifying species. The mitigation measures required to achieve net gains will be detailed within a Biodiversity Action Plan (BAP) for this species. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve a Net Gain for CHs. As a result the project will result in a Low positive for CH qualifying species. | | | | |

| **Impact Assessment: Impacts on ornithology during construction (PBF species) – White-headed Duck Sociable Lapwing, Saker Falcon, Pallas's Fish Eagle, Steppe Eagle, Egyptian Vulture, Little Bustard and Asian Houbara** | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The PBF bird species which have been recorded as present or assessed as having a reasonable likelihood of occurrence are not critical habitat qualifying species and are therefore not of very high or high sensitivity according to the criteria detailed above. In terms of the PBF species which have been recorded, these have been recorded in numbers which are not significant and are assigned a Medium sensitivity value.<br>Sociable lapwing (IUCB [CR]) has the potential to occasionally overfly the project site on spring and autumn passage (the species was assessed as likely absent as a result of the targeted surveys for this species). However, there is no reasonable likelihood that the project is located on a significant migratory corridor for this species and the sensitivity is assessed a Low.<br><br>Houbara bustard (IUCN [VU]) has been shown to be likely absent from the Solar PV and the Overhead Line, as a result of the targeted breeding surveys for this species undertaken by AECOM. The sensitivity for this species is therefore is determined as Low. | | | |
| Impact Magnitude | Negligible | Low | Medium | High |
| | For the Solar PV the magnitude of the effect is predicted to be Negligible for breeding PBF birds given their likely absence from the Solar PV Project site. The magnitude of the effect | | | |

| **Impact Assessment: Impacts on ornithology during construction (PBF species) – White-headed Duck Sociable Lapwing, Saker Falcon, Pallas's Fish Eagle, Steppe Eagle, Egyptian Vulture, Little Bustard and Asian Houbara** | | | | | |
|---|---|---|---|---|---|
| | is predicted to be Negligible for non-breeding birds PBF raptor species overflying on spring and autumn migration, in terms of disturbance displacement (barrier to movement) during the construction phase.<br><br>The magnitude of the effect for the Overhead Line is expected to be Negligible in terms of breeding by PBF birds considering the likely absence of nest sites at the areas to be cleared within the respective very localised pylon footprints. The magnitude of the barrier effect is predicted to be Negligible for non-breeding birds PBF raptor species overflying the AOI on spring and autumn migration, in terms of disturbance displacement (barrier to movement) during the construction phase. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the impact is assessed as Low (overall) for PBF bird species and not significant for the Solar PV and the Overhead Line, respectively.<br><br>There is a requirement for the project to achieve No Net Loss of species defined as PBFs. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve NNL for PBFs. As a result the project will result in a Negligible impact for PBFs. | | | | |

| **Impact Assessment: Impacts on ornithology (non PBF species) during construction** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High | |
| | The Solar PV footprint supports a limited assemblage of breeding species which are not of international or national conservation concern.<br><br>This ornithological receptor has been assessed as Low value. | | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | The magnitude of the effect for the Solar PV site is predicted to be Medium given the area of the site that will require to be cleared and / or disturbed and that there is potential for loss/damage to eggs and nests of common ground nesting birds if site clearance occurs during the breeding bird season. The magnitude of the effect for the Overhead Line is expected to be Low as the areas to be cleared within the respective pylon footprints will be very localised. Therefore, the magnitude of the effect for the Project site is assessed as Medium (overall). | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the impact is assessed as Low and not significant, however it is recommended standard mitigation measures are implemented to ensure impacts remain minimal[95]. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be Negligible and not significant. | | | | |

[95] For example: NetRegs (2020). Guidance for Pollution Prevention (GPP). Available at: https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

### 9.1.3.2 Terrestrial Ecology

| **Impact Assessment: Impacts on terrestrial ecology (PBF species) during construction – Central Asia Tortoise and Tatar Sand Boa** | | | | | |
|---|---|---|---|---|---|
| Impact Nature | Positive | | | Negative | |
| | Impact is negative because construction activities may result in habitat loss and disturbance. | | | | |
| Impact Type | Direct | Indirect | Reversible | Irreversible | |
| | The impact is generally direct as habitat will be lost through construction activities (e.g. ground clearance to accommodate infrastructure associated with the Solar PV and transmission line [pylons]), this could include direct destruction or damage of fauna and flora. In addition, disturbance caused by construction activities may directly displace/disturb fauna. Construction vehicles and excavated areas can pose a risk of death or injury to fauna. | | | | |
| Impact Duration | Temporary | Short-term | Medium-term | Long-term | Permanent |
| | Initial topsoil stripping will take place during the first 1-2 months of construction within the parts of the Project Site required for permanent compounds and hard standing.<br>The impact is permanent as there would be an irreversible change to the baseline within the Project site for the lifetime of the Project.<br>Displacement impacts are temporary and short-term as construction works are expected to continue for a period of approximately 12-15 months. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the impact is assessed as Low (overall) and not significant. There is a requirement for the project to achieve No Net Loss of species defined as PBFs | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve NNL of PBFs. As a result the project will result in a Negligible impact for PBFs. | | | | |

| **Impact Assessment: Impacts on other terrestrial ecology (non PBF species) during construction** | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | High | |
| | The abundance and diversity of terrestrial fauna within the Solar PV site and Overhead Line route was found to be low.<br><br>The AECOM 2021 and 2022 field surveys confirmed that the plant and animal species (other than PBF reptile species) recorded within the proposed project site during the AECOM field surveys are not of conservation concern.<br><br>The sensitivity of the terrestrial habitat within the Solar PV has therefore been assigned as Low in terms of faunal species.<br><br>The historic (within the last 20 years) and the more recent (within the last 5 years) cultivated land that prevails within the Solar PV site is Modified Habitat as defined in PS6. Spiny cocklebur and Isirik are noxious weeds and are prominent components of the weed flora; the former is an introduced species. The OHL route crosses intensively cultivated and irrigated farmland habitat, with cropped fields (eg, cotton); it is Modified Habitat as defined in PS6. The habitat within the Project site is therefore assessed as Low sensitivity. | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | The magnitude of the effect is predicted to be Medium given the area of the Solar PV site that will require to be cleared and / or disturbed and the potential for loss/mortality of reptiles and small mammals. | | | | |

| Impact Assessment: Impacts on other terrestrial ecology (non PBF species) during construction | | | | | |
|---|---|---|---|---|---|
| | The magnitude of the effect for the Overhead Line is expected to be Low, as the areas to be cleared within the respective pylon footprints will be very localised. Therefore, the magnitude of the effect for the Project site is assessed as Medium (overall). | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the impact is assessed as Low (overall) and not significant. A suite of both standard mitigation measures[96] and species-specific mitigation measures will be implemented to ensure impacts are reduced to Low significance or below. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be Negligible and not significant. | | | | |

## 9.1.4 Geology and Soils

| Impact Assessment: Impacts on soil quality during construction | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The sensitivity of soils in the Project area is assessed as Low. Whilst it is recognised that soils will be most vulnerable during high rainfall and snowmelt, the limited geographical extent does not require higher sensitivity. | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | The magnitude of the effect is predicted to be Low, given that there is potential for construction activities to notably change the resource, particularly during rainy season. Impacts of fuel spills are deemed to be highly localised. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the significance of the impact is assessed as Low. The extent of reduced soil quality due to construction activities is considered local, and the duration assessed as being temporary and short-term. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | Good International Industry Practise pollution prevention measures will be implemented, reducing the impact further. | | | | |

## 9.1.5 Hydrology and Hydrogeology

### 9.1.5.1 Surface Water

| Impact Assessment: Impacts on surface water during construction | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High | |
| | The sensitivity of surface water is assessed as medium, recognising the fact that only a small number of local residents use this watercourse for irrigation and drinking water for livestock. | | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | The magnitude of the effect is predicted to be low given the limited area of the Project site in relation to the overall catchment area. | | | | |
| | None | Negligible | Low | Medium | High |

[96] For example: NetRegs (2020). Guidance for Pollution Prevention (GPP). Available at: https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

| Impact Assessment: Impacts on surface water during construction | | | | | |
|---|---|---|---|---|---|
| Impact Significance | As a result, the significance of the impact is assessed as low. The extent of reduced surface water quality due to construction activities is considered local, and the duration assessed as being temporary and short-term. Good International Industry Practise pollution prevention measures will be implemented, reducing the impact further. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | Good International Industry Practise pollution prevention measures will be implemented, reducing the impact further. | | | | |

### 9.1.5.2 Groundwater

| Impact Assessment: Impacts on groundwater during construction | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The sensitivity of groundwater is assessed as high, recognising the fact that local communities abstract groundwater for domestic use from local wells. | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | The magnitude of the effect is predicted to be low, given that the soil and superficial deposits present in the area are expected to provide protection to the groundwater. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | The potential impact during construction is considered to be Medium adverse, on the basis that local communities abstract groundwater for domestic use. The implementation of Good International Industry Practise pollution prevention measures is considered to make the contamination of groundward very unlikely. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | Good International Industry Practise pollution prevention measures will be implemented, reducing the impact further. | | | | |

## 9.1.6 Labour and Working Conditions

| Impact Assessment: Occupational health and safety impacts during construction | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | High | | |
| | The receptors in this case are the operational workers. Although there will be few personnel involved in the operational and maintenance activities (approximately 25), each individual is of high value/sensitivity. | | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | Occupational health and safety impacts could result in disease, injury, or death to workers and so the magnitude is high. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | Pre-mitigation, the impact is assessed as High and significant. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | Through the full implementation of the ESMS. ESMP and appropriate policies, the residual impact is predicted to be Low. | | | | |

## 9.1.7 Landscape and Visual

| Impact Assessment: Impacts on Landscape Character | | | | |
|---|---|---|---|---|
| | Negligible | Low | Medium | High |

| **Impact Assessment: Impacts on Landscape Character** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | The sensitivity this landscape is assessed to be Low as it is not important in a local context. It is noted that the landscape is not designated at the local or national level and is influenced by man-made features. | | | | |
| Impact Magnitude | No change | Negligible | **Low** | Medium | High |
| | The magnitude of the effect is predicted to be low, as it is unlikely that construction works become the dominant feature in an area already impacted by human activity. | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | As a result, the significance of the impact is assessed as low. Although impacts will be visible in places, the surrounding features are often of a larger scale in height and extent. Therefore, changes can be easily accommodated. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | **Low** | Medium | High |
| | As changes can be easily accommodated in the landscape, no further mitigation is proposed. | | | | |

| **Impact Assessment: Impacts on Visual Amenity** | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | **Medium** | High |
| | The sensitivity of the site is assessed to be Medium because the land at which the Project is located is flat, with very few trees, hedges or fences to obscure visibility, and as such visibility can extend for several kilometres. | | | |
| Impact Magnitude | No change | **Low** | Medium | High |
| | The magnitude of the effect is predicted to be low, because the visual impact of ground-level features is likely to be low, except at close range, due to the lack of vantage points overlooking the landscape. | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | As a result, the significance of the impact is assessed as low. Although impacts will be visible in places, the surrounding features are often of a larger scale in height and extent. Therefore, changes can be easily accommodated. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | **Low** | Medium | High |
| | As changes can be easily accommodated in the landscape, no further mitigation is proposed. | | | | |

## 9.1.8 Noise

| **Impact Assessment: Impacts on noise during construction** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | **High** | |
| | No residential receptors are located within 200 m of the Project site therefore receptor sensitivity is determined to be high. | | | | |
| Impact Magnitude | No change | Negligible | **Low** | Medium | High |
| | Magnitude of change is anticipated to be high as there is likely to be an increase in noise levels and dust / emissions to air associated with construction of the Project at nearby residential receptors. | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The potential impact during construction is considered to be Low adverse, on the basis that no residential receptors are within 200m of the site boundary. The implementation of Good International Industry Practice pollution prevention measures is considered very likely to reduce the impacts further. | | | | |

| Impact Assessment: Impacts on noise during construction | | | | | |
|---|---|---|---|---|---|
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The potential impact during construction is considered to be Low adverse. Other than the implementation of GIIP, no further mitigation is proposed. | | | | |

## 9.1.9 Socio-economic Impacts

### 9.1.9.1 Economic displacement

| Impact Assessment: economic displacement | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The receptor value is Low for leaseholders along the OTL given they will have sufficient land remaining. However herders will have limited alternative land and so the receptor value is high. | | | |
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Medium as there is the potential to result in economic resettlement, particularly of herders. | | | |
| Impact Significance | Negligible | Low | Medium | High |
| | The overall impact significance is High and specific mitigation in the form of cash compensation and livelihood restoration has been developed as part of the LRP. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Low. | | | |

### 9.1.9.2 Community expectations of the Project

| Impact Assessment: Community expectations of the Project | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | Kattakurgan is a predominantly rural area and thus its population may not have a clear understanding of the employment opportunities created by industrial development. However, the levels of unemployment in the Kattakurgan region are the lowest in the country and therefore expectations may be lower at the regional level. Therefore, the impact magnitude is medium at the local level (<5km) but reducing to Low at the regional level. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The receptor value is low given that local communities and local economically active population are not depending on this Project specifically as their main source of income. However, this impact has the potential to increase unmanaged expectations among the unemployed and more vulnerable groups. | | | |
| Impact Significance | Negligible | Low | Medium | High |
| | The overall impact significance is Low. This is an adverse impact and the ongoing consultation and dissemination of Project information through the SCA and LRP process will be included in the Stakeholder Engagement Plan. This impact will be continuously managed throughout the construction phase (and ongoing operation phase). | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | Although the ongoing consultation and dissemination of Project information will be managed through the SCA and LRP process and the Stakeholder Engagement Plan, this impact will be continuously managed throughout the construction phase (and ongoing operation phase). As a result, residual impacts will remain Low. | | | |

### 9.1.9.3 Loss of public access and reduced mobility through local paths

| **Impact Assessment: Impacts from a loss of public access to footpaths inside the project area** | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Low as the limited number of people who currently use the dirt tracks will be able to access alternative tracks or roads to reach their destination. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The receptor value is low given that local communities and local herders rely on these pathways for access to livelihoods. | | | |
| Impact Significance | Negligible | Low | Medium | High |
| | The impact is assessed as Low adverse, primarily because the local farm users may need to adapt and readjust to their new timings and distances compared to baseline conditions. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Low. | | | |

### 9.1.9.4 Reduced access to grazing and pastoral land

| **Impact Assessment: Reduced access to grazing and pastoral land** | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Medium because no grazing will be available of the Solar PV area and grazing area will be significantly reduced as there is limited alternative grazing land. Local herders may need to adapt to a new farming area and will need to travel around the Solar PV Area to access alternative grazing areas. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The receptor's sensitivities is High as herders will require alternative land. | | | |
| Impact Significance | Negligible | Minor | Medium | High |
| | The impact is assessed as High significance primarily because the local herders will need to adapt and readjust to their new timings and distances to access grazing land compared to baseline conditions. This will be assessed further as part of the LRP.. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Medium. As part of the LRP, additional support will be provided to vulnerable households, where applicable. | | | |

### 9.1.9.5 Increased presence of workers and interaction with local communities

| **Impact Assessment: Increased presence of workers and interaction with local communities** | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Medium because the potential for workers to travel and interact with local residents may extend past the Project AoI. Both residents and workers may be exposed to increased health and safety risks. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The sensitivity is Medium as the local communities may be able to adapt to this change depending on the actual location of worker accommodation. Whereas Kattakurgan will have sufficient means to adapt, other localities such as may not have the same resilience to intake a large workforce or prevent their vulnerable groups from this potential increase to community H&S risks. Depending on the workforce composition, vulnerable worker population may be more sensitive to avoiding or treating communicable diseases, and this will have to be identified as a priority during the planning stage. | | | |
| | Negligible | Low | Medium | High |

| | | | | |
|---|---|---|---|---|
| Impact Significance | The potential impact during construction is considered to be Medium pre-mitigation. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact during construction is considered to be Low post-mitigation. | | | |

### 9.1.9.6 Increased presence of security personnel

| **Impact Assessment: Increased presence of security personnel** | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Medium because the potential for security guards to interact with local community members is a very perceptible change to the baseline conditions of ample passage and access to the site area. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The sensitivity is Medium as the local communities may be able to adapt to this change depending on the timing of previous disclosure of Project starting activities. | | | |
| Impact Significance | Negligible | Low | Medium | High |
| | The potential impact during construction is considered to be Medium adverse, pre-mitigation. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact during construction is considered to be Low post-mitigation. | | | |

### 9.1.9.7 Increased levels of gender-based violence, sexual exploitation and harassment

| **Impact Assessment: Increased levels of gender-based violence, sexual exploitation and harassment** | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Medium. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The sensitivity is High as women and children are regarded as vulnerable receptors. | | | |
| Impact Significance | Negligible | Low | Medium | High |
| | The potential impact during construction is considered to be Medium adverse, pre-mitigation. It is expected that the continued implementation of specific measures introduced during the construction phase to prevent and address GBVSEH), will reduce this to Low. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact during construction is considered to be Low post-mitigation. | | | |

## 9.1.10 Traffic and Transportation

### 9.1.10.1 Effects on the Road Network

| **Impact Assessment: Impacts on traffic during construction** | | | |
|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | High |
| | Although the transportation route passes a number of towns, the road is likely to have existing HGV traffic and the receptor sensitivity is determined to be low. | | |

| Impact Assessment: Impacts on traffic during construction | | | | | |
|---|---|---|---|---|---|
| Impact Magnitude | No change | Negligible | **Low** | Medium | High |
| | Magnitude of change is anticipated to be Low as the increased number of HGV movements is not expected to exceed 30% above baseline. | | | | |
| Impact Significance | None | **Negligible** | Low | Medium | High |
| | The impact is assessed as Negligible and not significant. Although no specific mitigation is required, standard good construction practice will be maintained to ensure no increase in predicted impacts during construction. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | A TMP will be implemented and the residual impact will remain as Negligible. | | | | |

# 9.2 Operational Impacts

## 9.2.1 Air Quality

| Impact Assessment: Impacts on air quality during operation | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | **Medium** | High |
| | Although residential receptors are located close to the site, none are within 250 m of the Project site therefore receptor sensitivity is determined to be Medium. | | | |
| Impact Magnitude | No change | **Negligible** | Low | Medium | High |
| | Magnitude of change is anticipated to be Negligible as almost no ground disturbance will take place. | | | | |
| Impact Significance | None | **Negligible** | Low | Medium | High |
| | The potential impact during construction is considered to be Negligible adverse, on the basis that no residential receptors are within 200m of the site boundary and almost no ground disturbance will take place. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | The potential impact during construction is considered to be Negligible. | | | | |

## 9.2.2 Archaeology and Cultural Heritage

| Impact Assessment: Impacts on archaeology and cultural heritage during operation | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | **Low** | Medium | High | | |
| | Any remains within the project footprint will have been recorded and removed during the construction phase. | | | | |
| Impact Magnitude | No change | Negligible | **Low** | Medium | High |
| | No works will be taking place other that maintenance and security. No physical impacts on archaeological remains are predicted. The new Transmission Line will impact on the setting of heritage assets. | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant. | | | | |
| Residual Impact | None | **Negligible** | Low | Medium | High |
| | The impact is assessed as Negligible and not significant. | | | | |

| Impact Assessment: Impacts on archaeology and cultural heritage during operation | |
|---|---|
| Significance post mitigation | |

## 9.2.3 Biodiversity

### 9.2.3.1 Avifauna

| Impact Assessment: Impacts on Great Bustard (*Otis tarda*) during Operation – Critical Habitat is triggered for this species under Criteria 1: significant populations of nationally or regionally EN or CR species. | | | | |
|---|---|---|---|---|
| | Great bustard has the potential to overfly the project site from known wintering areas within and outside the Samarkand region, as well as migrating between wintering and breeding habitats outside of Uzbekistan. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | This species, which is Critically Endangered nationally, is assigned a 'High' sensitivity value. | | | |
| Impact Magnitude | Negligible | Low | Medium | High |
| | Loss and change of habitat for the Solar PV would be an effect of Negligible magnitude for great bustard considering the unsuitability for this species and absence of records during the surveys undertaken.<br><br>Whilst Overhead Line route is not considered to be suitable for this species as a staging or wintering habitat, it is considered possible that this species could fly over the Overhead Line when moving between wintering grounds as well as migrating between wintering and breeding habitats. This species is known to be highly susceptible to collision with overhead lines. Therefore, the impact magnitude is assessed as High for the Overhead Line. | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | The potential impact is assessed as High and significant for the Overhead Line.<br><br>The potential impact is assessed as Low and not significant for the Solar PV. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve NG of CH qualifying species. As a result the project will result in a Low positive impact for CH. | | | | |

| Impact Assessment: Impacts on Ornithology (PBF species) during Operation – White-headed Duck, Sociable Lapwing, Saker Falcon, Pallas's Fish Eagle, Steppe Eagle, Egyptian Vulture, Little Bustard and Asian Houbara | | | | |
|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The PBF bird species which have been recorded as present or assessed as having a reasonable likelihood of occurrence are not critical habitat qualifying species and are therefore not of very high or high sensitivity according to the criteria detailed above. In terms of the PBF species which have been recorded, these have been recorded in numbers which are not significant and are assigned a Medium sensitivity value.<br><br>The project does not support breeding populations for PBF birds and the habitat is not suitable for these species. | | | |

| | |
|---|---|
| | Sociable lapwing (IUCB [CR]) has the potential to occasionally overfly the project site on spring and autumn passage (the species was assessed as likely absent as a result of the targeted surveys for this species). However, there is no reasonable likelihood that the project is located on a significant migratory corridor for this species and the sensitivity is assessed a Low.<br><br>Houbara bustard (IUCN [VU]) has been shown to be likely absent from the Solar PV and the Overhead Line, as a result of the targeted breeding surveys for this species undertaken by AECOM. The sensitivity for this species is therefore is determined as Low. |
| Impact Magnitude | Negligible \| Low \| Medium \| High<br><br>Loss and change of habitat for the Solar PV would be an effect of Medium magnitude for the breeding, wintering and migratory birds which utilise habitat within the working areas for breeding, roosting or foraging within the operational footprint of the Solar PV; a high proportion of the habitat will be covered by the solar panels. Loss of habitat for the transmission line would be an effect of Low magnitude for breeding, wintering and migratory birds which utilise habitat within the working areas for breeding, roosting or foraging, with only small areas are taken up by transmission line infrastructure (ie. pylon bases).<br><br>The operational Solar PV and transmission line will result in partial reduction of bird activity through the displacement of birds; this is assessed as Medium magnitude for the breeding, wintering and migratory bird assemblage. Human influences (primarily the land management) unique to each site. Consideration has been given to the Project site is already characterised by a high level of anthropogenic disturbance (primarily due to farming activities and proximity to human habitation).<br><br>The 4.5km transmission line alignment is not extensive in terms of migrating birds passing through the wider Samarkand region on a broad front and it is orientated along an approximately north-east-south-west alignment, which reduces the potential barrier effect of the power line/pylons with respect to birds migrating through the Project site south to north (in spring) or north to south (in autumn); a perfect east-west alignment would potentially be more impactful in this respect. Therefore, the magnitude of this potential impact is assessed as Low.<br><br>The Project Site is not sited on a migration bottle neck or High migration route; it is not located close to a mountain pass or wetland where large numbers of migratory birds could be concentrated or sited in an area where significant populations of species of conservation concern occur. The impact magnitude for collision of birds is therefore cautionary assessed as Medium, as the predicted mortalities for species of national and international concern are unlikely to be significant in the context of the Samarkand or Uzbekistan populations. The assessment does not take into account the probable reduction of bird activity resulting from displacement of birds around the proposed transmission line infrastructure, assuming instead that flight activity will continue unchanged during the operational period. Also, the assessment does not take into account that a proportion of bird flights will take avoiding action when flying towards the power line and therefore avoiding avoid collision with the power-line; assuming instead that all flights will result in a collision.<br><br>The proposed powerline is high voltage (220 kV) and therefore doesn't typically present the same risk of electrocution to raptors and other large birds as some lower-voltage powerlines (eg. where the distribution conductor cables attached via relatively short insulators to poles constructed of conducting materials) of medium voltage (e.g. 1kV to 59kV). However, the precise configuration and dimensions of the electrical design is not yet available for this project. Species recorded during the baseline surveys which are potentially most vulnerable to electrocution, both in flight and from perching, due to their likely frequent presence within the project site (and also behavioural trait for perching whilst feeding, resting and hunting), are: long-legged buzzard (not of national or international conservation concern). The risk of |

| | | | | | |
|---|---|---|---|---|---|
| | electrocution to steppe eagle and Egyptian vulture (both IUCN Endangered) is considered to be low due to their respective likely infrequent flight transits through the project area (in small numbers which are highly unlikely to be significant in terms of regional/national populations). The impact magnitude has been cautionary assessed as medium (overall) for electrocution. The impact magnitude is assessed as Medium (overall). | | | | |
| Impact Significance | None | Negligible | **Low** | **Medium** | High |
| | The potential impact is assessed as Medium and significant for the Overhead Line<br><br>The potential impact is assessed as Low and not significant for the Solar PV.<br><br>There is a requirement for the project to achieve No Net Loss of species defined as PBFs.<br>. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve NNL of PBFs. As a result the project will result in a Negligible impact for PBFs. | | | | |

| **Impact Assessment: Ornithology impacts (non PBF) during operation** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | **Low** | Medium | High | | |
| | The Solar PV footprint supports a limited assemblage of breeding species which are not of international or national conservation concern.<br><br>This ornithological receptor has been assessed as Low value. | | | | |
| Impact Magnitude | No change | Negligible | Low | **Medium** | High |
| | Loss and change of habitat for the Solar PV would be an effect of Medium magnitude for the breeding, wintering and migratory birds which utilise habitat within the working areas for breeding, roosting or foraging within the operational footprint of the Solar PV; a high proportion of the habitat will be covered by the solar panels. Loss of habitat for the transmission line would be an effect of Low magnitude for breeding, wintering and migratory birds which utilise habitat within the working areas for breeding, roosting or foraging, with only small areas are taken up by transmission line infrastructure (ie. pylon bases).<br><br>The operational Solar PV and transmission line will result in partial reduction of bird activity through the displacement of birds; this is assessed as Medium magnitude for the breeding, wintering and migratory bird assemblage. Human influences (primarily the land management) unique to each site. Consideration has been given to the Project site is already characterised by a high level of anthropogenic disturbance (primarily due to farming activities and proximity to human habitation).<br><br>The 4.5km transmission line alignment is not extensive in terms of migrating birds passing through the wider Samarkand region on a broad front and it is orientated along an approximately north-east-south-west alignment, which reduces the potential barrier effect of the power line/pylons with respect to birds migrating through the Project site south to north (in spring) or north to south (in autumn); a perfect east-west alignment would potentially be more impactful in this respect. Therefore, the magnitude of this potential impact is assessed as Low.<br><br>The Project Site is not sited on a migration bottle neck or High migration route; it is not located close to a mountain pass or wetland where large numbers of migratory birds could | | | | |

| Impact Assessment: Ornithology impacts (non PBF) during operation | | | | | |
|---|---|---|---|---|---|
| | be concentrated or sited in an area where significant populations of species of conservation concern occur. The impact magnitude for collision of birds is therefore cautionary assessed as Medium, as the predicted mortalities for species of national and international concern are unlikely to be significant in the context of the Samarkand or Uzbekistan populations. The assessment does not take into account the probable reduction of bird activity resulting from displacement of birds around the proposed transmission line infrastructure, assuming instead that flight activity will continue unchanged during the operational period. Also, the assessment does not take into account that a proportion of bird flights will take avoiding action when flying towards the power line and therefore avoiding avoid collision with the power-line; assuming instead that all flights will result in a collision.<br><br>The proposed powerline is high voltage (220 kV) and therefore doesn't typically present the same risk of electrocution to raptors and other large birds as some lower-voltage powerlines (eg. where the distribution conductor cables attached via relatively short insulators to poles constructed of conducting materials) of medium voltage (e.g. 1kV to 59kV). However, the precise configuration and dimensions of the electrical design is not yet available for this project. Species recorded during the baseline surveys which are potentially most vulnerable to electrocution, both in flight and from perching, due to their likely frequent presence within the project site (and also behavioural trait for perching whilst feeding, resting and hunting), are: long-legged buzzard (not of national or international conservation concern). The risk of electrocution to steppe eagle and Egyptian vulture (both IUCN Endangered) is considered to be low due to their respective likely infrequent flight transits through the project area (in small numbers which are highly unlikely to be significant in terms of regional/national populations). The impact magnitude has been assessed as low (overall) for electrocution.<br>The impact magnitude is assessed as Medium (overall). | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | The residual impact is predicted to be Negligible and not significant | | | | |

### 9.2.3.2 Terrestrial Ecology

| Impact Assessment: Impacts on PBF species: Central Asian Tortoise and Tartar Sand Boa | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | **Low** | Medium | High | | |
| | The abundance and diversity of terrestrial fauna was found to be low. A single species of conservation concern was recorded within the proposed project site: Central Asian tortoise (IUCN VU, RDB of Uzbekistan). However, there is no reasonable likelihood that the tortoise population occurring within the Project site is of regional importance. The sensitivity of the terrestrial habitat has been assigned as Low. Other plant and animal species recorded during the AECOM field surveys are not of conservation concern. | | | | |
| Impact Magnitude | No change | Negligible | **Low** | Medium | High |
| | It is anticipated that there will be very limited personnel and vehicle movements within the operational Solar PV site and that maintenance visits for the transmission line will be infrequent and will involve limited personnel and vehicle movements. | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and insignificant. | | | | |

| Impact Assessment: Impacts on PBF species: Central Asian Tortoise and Tartar Sand Boa | | | | | |
|---|---|---|---|---|---|
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve NNL of PBFs. As a result the project will result in a Negligible impact for PBFs. | | | | |

| Impact Assessment: Impacts on non PBF species during operation | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | High | | |
| | The abundance and diversity of terrestrial fauna was found to be low. Plant and animal species (other than PBFs) recorded during the AECOM field surveys are not of conservation concern. | | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | It is anticipated that there will be very limited personnel and vehicle movements within the operational Solar PV site and that maintenance visits for the transmission line will be infrequent and will involve limited personnel and vehicle movements. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | The impact is assessed as Low and insignificant. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Negligible and not significant | | | | |

## 9.2.4 Hydrology and Hydrogeology

| Impact Assessment: Hydrology and hydrogeology impacts during operation | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | Low | Medium | High | |
| | The sensitivity of surface water is assessed as medium, recognising the fact that a small number of local residents use the two watercourses adjacent to the site for drinking water for livestock.<br>The sensitivity of groundwater is assessed as high, recognising the fact that local communities abstract groundwater for domestic use from local wells. | | | | |
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | The magnitude of the effect in relation to surface water is predicted to be low given the limited area of the Project site in relation to the overall catchment area.<br>The magnitude of the effect in relation to groundwater is predicted to be low, given that the soil and superficial deposits present in the area are expected to provide protection to the groundwater, and that the use/handling of chemicals /oils/wastewater during operation will be limited. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | Pre-mitigation, the impact in relation to surface water is assessed as low, due to the limited extent.<br>Pre-mitigation, the impact in relation to groundwater is assessed as Medium and significant. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Low and not significant. | | | | |

## 9.2.5 Geology and Soils

| **Impact Assessment: Impacts on soil quality during operation** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Negligible | **Low** | Medium | High | |
| | The soils are considered to have a low sensitivity. | | | | |
| Impact Magnitude | No change | **Negligible** | Low | Medium | High |
| | The magnitude of the effect during operation is very low, since there will be much less frequent traffic than during construction, and only occasional use of heavy equipment.<br>In addition, the use/handling of chemicals /oils/wastewater during operation will be limited. | | | | |
| Impact Significance | None | **Negligible** | Low | Medium | High |
| | The impacts are assessed as Negligible and insignificant. | | | | |
| Residual Impact Significance post mitigation | None | **Negligible** | Low | Medium | High |
| | The residual impact is predicted to be Negligible and not significant. | | | | |

## 9.2.6 Glare and Glint

| **Impact Assessment: Glint and glare impacts during operation** | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | **High** | | |
| | There are safety concerns with regard to any potential to distract aircraft pilots and vehicle drivers, causing accidents leading to potential injuries or deaths. | | | | |
| Impact Magnitude | No change | **Negligible** | Low | Medium | High |
| | PV panels work on the concept of absorbing sunlight rather than reflecting it as compared to other technologies that concentrate solar energy.<br>Previous studies have been undertaken to compare the reflectivity of solar panels with other materials. The most commonly referenced source is a Federal Aviation study focusing on solar panels located at airports. This study states that modern solar panels reflect as little as 2% of the incoming sunlight. Solar PV panels have a lower level of reflectivity than many commonly occurring features such as bare soil and vegetation.<br>The site is not close to or located on a flight path to and from a local airport. | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant. | | | | |

## 9.2.7 Labour and Working Conditions

| **Impact Assessment: Occupational health and safety impacts during operation** | | | |
|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | **High** |
| | The receptors in this case are the operational workers. Although there will be few personnel involved in the operational and maintenance activities (approximately 25), each individual is of high value/sensitivity. | | |

| Impact Assessment: Occupational health and safety impacts during operation | | | | | |
|---|---|---|---|---|---|
| Impact Magnitude | No change | Negligible | Low | Medium | High |
| | Occupational health and safety impacts could result in disease, injury, or death to workers and so the magnitude is high. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | Pre-mitigation, the impact is assessed as High and significant. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | Through the full implementation of the ESMS. ESMP and appropriate policies, the residual impact is predicted to be Low. | | | | |

## 9.2.8 Landscape and Visual Impacts

### 9.2.8.1 Impacts on Landscape Character and Visual Amenity

| Impact Assessment: Impacts on Landscape Character | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | High | | |
| | The sensitivity this LCT is assessed to be Low as it is not important in a local context, with no sites of interest in the location of the Project. It is noted that the LCTs are not designated at the local or national level. The landscape in the wider area is expansive rural which determines the overall character of the region as a whole. | | | | |
| Impact Magnitude | No change | Low | Medium | High | |
| | The magnitude of the effect is predicted to be Low, as it is unlikely that construction works become the dominant feature in an area already impacted by human activity. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the significance of the impact is assessed as low. Although impacts will be visible in places, the surrounding features such as OHLs and pylons are of a larger scale in height and extent. Therefore, changes can be easily accommodated in all LCTs. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Low and not significant. | | | | |

| Impact Assessment: Impacts on Visual Amenity | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | High | | |
| | The sensitivity of all VPs are assessed to be Low as they are not important in a local or regional context. There are no sites of interest from a tourism perspective. The landscape in the wider area to the south is more industrialised which determines the context of the views experienced. | | | | |
| Impact Magnitude | No change | Low | Medium | High | |
| | The magnitude of the effect is predicted to be low, given that the significant screening provided and the expansive nature of the landscape reduce the magnitude of impacts experienced. | | | | |
| Impact Significance | None | Negligible | Low | Medium | High |
| | As a result, the significance of the impact is assessed as low. Although impacts will be visible in places, the surrounding features are often of a larger scale in height and extent. Therefore, changes can be easily accommodated at all VPs. Views from the minor road will be transient in nature and dominated by exiting villages and natural features in this location. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | Low | Medium | High |
| | The residual impact is predicted to be Low and not significant. | | | | |

## 9.2.9 Noise

| Impact Assessment: Noise impacts during operation | | | | | |
|---|---|---|---|---|---|
| Receptor Value / Sensitivity | Low | Medium | **High** | | |
| | There are settlements in relatively close proximity to the Project, receptors are of high sensitivity. | | | | |
| Impact Magnitude | No change | **Negligible** | Low | Medium | High |
| | The distance between the transformers and the nearest residential properties is considered sufficient to reduce any noise to an acceptable level, however the substation is located to the south of the site boundary in close proximity to receptors. Noise calculations have deemed operational noise to be within specified limits. A Low magnitude of change is therefore predicted. | | | | |
| Impact Significance | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant. | | | | |
| Residual Impact Significance post mitigation | None | Negligible | **Low** | Medium | High |
| | The impact is assessed as Low and not significant. | | | | |

## 9.2.10 Socio-economic Impacts

### 9.2.10.1 Impacts from local employment during operation

| Impact Assessment: Impacts from local employment during operation | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | **Low** | Medium | High |
| | The impact magnitude is low as the workforce required during operations is relatively small when compared to the construction stage. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | **High** |
| | The sensitivity is high as local employment during both construction and operations is a key expectation amongst local communities and their representatives. It is essential that Uzbeks comprise a significant component of the operational workforce. | | | |
| Impact Significance | Negligible | Minor | **Medium** | High |
| | As a result of the above, the overall impact is assessed as Medium and positive. | | | |
| Residual Impact Significance post mitigation | Negligible | Minor | **Medium** | High |
| | As a result of the above, the overall impact is assessed as Medium and positive. | | | |

### 9.2.10.2 Impacts on the national and regional economy during operation

| Impact Assessment: Impacts on the national and regional economy during operation | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | **Medium** | High |
| | The impact magnitude is medium as the quantity of energy generated by the project is an important contribution at 220MW. | | | |
| Receptor Value / Sensitivity | Negligible | Low | **Medium** | High |
| | The sensitivity is medium as the countries' energy demand shall continue to increase during the lifespan of the project. | | | |
| | Negligible | Low | **Medium** | High |

| | | | | |
|---|---|---|---|---|
| Impact Significance | The overall impact significance is Medium. | | | |
| Residual Impact Significance post mitigation | Negligible | Minor | Medium | High |
| | As a result of the above, the overall impact is assessed as Medium and positive. | | | |

#### 9.2.10.3 Potential for gender-based violence, sexual exploitation and harassment

| **Impact Assessment: Potential for gender-based violence, sexual exploitation and harassment** | | | | |
|---|---|---|---|---|
| Impact Magnitude | Negligible | Low | Medium | High |
| | The impact magnitude is Low. | | | |
| Receptor Value / Sensitivity | Negligible | Low | Medium | High |
| | The sensitivity is High as women and children are regarded as vulnerable receptors. | | | |
| Impact Significance | Negligible | Low | Medium | High |
| | The potential impact during operation is considered to be Medium adverse, pre-mitigation. It is expected that the continued implementation of specific measures introduced during the construction phase to prevent and address GBVSEH, will reduce this to Low. | | | |
| Residual Impact Significance post mitigation | Negligible | Low | Medium | High |
| | The residual impact during operation is considered to be negligible post-mitigation. | | | |

### 9.2.11 Traffic and Transportation

The residual transport impacts will occur during the construction phase. The number of vehicles during operation is likely to be very low, with access required only for maintenance and servicing. The majority of these will be light vehicles and, at the worst case, a HGV trip may be required to transport a replacement transformer to site. The residual effects of traffic movements stemming from the operational phase are therefore considered Negligible and not significant.

## 9.3 Decommissioning Impacts

### 9.3.1 Air Quality

The change in ambient air quality may arise at decommissioning as a result of fugitive dust and particulate matter emissions. However, such impacts are expected to be temporary and of short-term nature as they are limited to the decommissioning phase only. The impacts will be similar to the construction phase.

### 9.3.2 Archaeology and Cultural Heritage

The activities which may impact upon archaeological and cultural heritage sites include an increased workforce presence, reinstatement activities and vehicle movements, which may result in damage to, or interference with, archaeological and cultural heritage sites. It is unlikely however to present any significant effects. Following the removal of the structures and the reinstatement of the land use there would be no further potential effects to the archaeology and cultural heritage receptors.

### 9.3.3 Biodiversity

#### 9.3.3.1 Avifauna

Similar to construction, the main impacts during decommissioning are likely to comprise disturbance to birds. Following decommissioning, reinstatement will be important to re-establishing the ecosystem in areas previously occupied by solar panels, site roads and other structures. At the time of decommissioning, the sensitivity of some

species, particularly those which are regionally rare, may have increased. The residual impact will be informed by the mitigation measures detailed in the BAP. There is a requirement for the project to achieve No Net Loss of species defined as PBFs and a net gain for CH qualifying species. As a result the project will result in a residual impact of Negligible for PBFs and a Low positive residual impact for CH qualifying species.

#### 9.3.3.2 Terrestrial Ecology

Similar to construction, the main impacts during decommissioning are likely to comprise habitat loss, loss of small numbers of mammals, and disturbance to animals. Following decommissioning, reinstatement will be important to re-establishing the ecosystem in areas previously occupied by solar panels, site roads and other structures. At the time of decommissioning, the sensitivity of some species, particularly those animals which are regionally rare, may have increased.

### 9.3.4 Geology and Soils

Similar to construction, soils will be highly vulnerable to traffic and erosion during decommissioning. The movement of materials off-site may involve the construction of temporary roads and use of large vehicles. There is also potential for chemical or oil spills, or the incorrect handling/disposal of wastes during decommissioning. Similar measures to those outlined for the construction phase will need to be taken to minimize impacts on soils. Reinstatement of land and after-care will be critical to mitigating the damage to soils.

The panels and supports will be dismantled and steel and other useful materials will be recycled. Inert materials which cannot be recycled will be taken to a suitable disposal site. However, foundations and other inert belowground materials will be buried. This is not likely to have a significant impact on soils as it will not prevent re-vegetation or restoration of land.

### 9.3.5 Hydrology and Hydrogeology

Effects on water resources during decommissioning are likely to be similar to those during construction, so sensitive features such as drainage channels would need to be avoided. Contaminated materials such as oil storage tanks would need to be removed from the site and taken to a suitable disposal site to prevent future contamination of surface and groundwater.

### 9.3.6 Labor and working conditions

Similar to construction, the use of a workforce and decommissioning activities could potentially generate a variety of risks to the workforce, due to general site decommissioning activities (removal of site equipment and infrastructure) and the presence of project vehicles on local risks posing a risk to. An Occupational Health and Safety Plan, Traffic Management Plan and Emergency Response Plan will be in place for the decommissioning phase of the Project. Appropriate policies will be in place to protect worker’s rights.

### 9.3.7 Landscape and visual

Impacts of landscape will result from removal of solar PV panels, substations and transformer stations, on-site and off-site transmission lines. New machinery and equipment will be introduced into the landscape, including heavy goods vehicles excavators, bulldozers, and other heavy equipment. The residual impacts are expected to be the same as those experienced during construction.

### 9.3.8 Noise

Local noise levels will be affected temporarily by decommissioning activities such as equipment movement during building demolition and use of heavy machinery. The impacts will be similar to those experienced during the construction phase.

### 9.3.9 Socio-economic Impacts

Similar to construction, the use of a workforce and decommissioning activities could potentially generate a variety of health and safety risks to the local residents, due to general site decommissioning activities (removal of site equipment and infrastructure) and the presence of project vehicles on local risks posing a risk to local residents and school children. A Community Health and Safety Plan, Traffic Management Plan and Emergency Response Plan will be in place for the decommissioning phase of the Project.

### 9.3.10 Transportation and Access

Decommissioning effects are likely to be similar to that during construction although reduced in magnitude. At this stage, it is not possible to quantify the traffic effect during decommissioning of the Project as it is considered to be too far in the future to estimate any baseline traffic flows. It is unlikely however to present any significant effects.

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# Appendix A Species List

| Common Name | Latin Name | IUCN Category | Uzbek Red Data Book | Sept 2021 | Nov 2021 | | April 20221 | Comment |
|---|---|---|---|---|---|---|---|---|
| | | | | Solar PV | Solar PV | T-line | Solar PV | |
| **Birds** | | | | | | | | |
| Black-bellied sandgrouse | *Pterocles orientalis* | Least Concern | No | P | | | P | 6 (peak count) |
| Feral pigeon | *Columbia livia* | N/A | No | P | | P | P | |
| Laughing Dove | *Spilopelia senegalensis* | Least Concern | No | P | | | | |
| Oriental turtle dove | *Streptopelia orientalis* SL | Least Concern | No | P | | | | |
| Eurasian Collared dove | *Streptopelia decaocto* | Least Concern | No | P | | | | |
| Northern lapwing | *Vanellus vanellus* | Least Concern | No | | | P | | Flock of 4 birds |
| Western white stork | *Ciconia ciconia ciconia* | Least Concern | No | | | P | | Flock of 4 birds |
| Grey heron | *Ardea cinerea* | Least Concern | No | | | P | | |
| Egyptian vulture | *Neophron percnopterus* | Endangered | VU | | | | | Recorded on migration (Solar PV) during the Typsa 2020 surveys |
| Steppe eagle | *Aquila nipalensis* | Endangered | VU | P | | | | |
| Western marsh harrier | *Circus aeruginosus* | Least Concern | No | P | P | P | P | |
| Hen harrier | *Circus cyaneus* | Least Concern | No | P | P | P | | |
| Montagu's harrier | *Circus pygargus* | Least Concern | No | | | | P | |
| White-tailed eagle | *Haliaeetus albicilla* | Least Concern | VU | | P | | | 1 overflying |
| Long-legged buzzard | *Buteo rufinus* | Least Concern | No | P | | | | |
| Peregrine | *Falco peregrinus* | Least Concern | No | | P | | | |
| Common kestrel | *Falco tinnunculus* | Least Concern | No | P | P | P | | |
| Merlin | *Falco columbarius* | Least Concern | No | | | P | | |
| Hobby | *Falco subbuteo* | Least Concern | No | P | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sparrowhawk | *Accipiter nisus* | Least Concern | No | | | | P | |
| Shikra | *Accipiter badius* | Least Concern | No | | | | P | |
| Little owl | *Athene noctua* | Least Concern | No | P | P | P | | |
| Great grey shrike | *Lanius excubitor* | Least Concern | No | | | P | | |
| European bee-eater | *Merops apiaster* | Least Concern | No | P | | | | |
| Blue-cheeked bee-eater | *Merops persicus* | Least Concern | No | P | | | | |
| Rook | *Corvus frugilegus* | Least Concern | No | P | P | P | P | |
| Carrion crow | *Corvus corone* | Least Concern | No | | P | P | | |
| Hooded crow | *Corvus cornix* | Least Concern | No | | | P | | |
| Raven | *Corvus corax* | Least Concern | No | P | | | | |
| Magpie | *Pica pica* | Least Concern | No | P | | | | |
| Swift | *Apus apus* | Least Concern | No | | | | P | |
| Crested lark | *Galerida cristata iwanowi* | Least Concern | No | P | P | P | P | |
| Asian Short-toed lark | *Alaudala (rufescens) cheleensis* | Least Concern | No | P | | | | |
| Skylark | *Alauda arvensis* | Least Concern | No | P | P | P | | |
| White-winged lark | *Alauda leucoptera* | Least Concern | No | | P | | | c90 overflying birds |
| Calandra lark | *Melanocorypha calandra* | Least Concern | No | | P | P | | |
| Tree Pipit | *Anthus trivialis* | Least Concern | No | | | | P | |
| Common myna | *Acridotheres tristis* | Least Concern | No | P | | P | | |
| Common starling | *Sturnus vulgaris* | Least Concern | No | P | | P | | |
| Siberian stonechat | *Saxicola maurus* | Least Concern | No | | | | P | |
| Wheatear | *Oenanthe oenanthe* | Least Concern | No | P | | | | |
| Isabelline wheatear | *Oenanthe isabellina* | Least Concern | No | | | | P | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Desert wheatear | *Oenanthe deserti* | Least Concern | No | P | | | | |
| Pied wheatear | *Oenanthe pleshanka* | Least Concern | No | P | | | P | |
| Common rockthrush | *Monticola saxatilis* | Least Concern | No | | | | P | |
| Meadow pipit | *Anthus pratensis* | Least Concern | No | | | P | | |
| White wagtail | *Motacilla (alba) alba* | Least Concern | No | P | | P | | |
| Masked wagtail | *Motacilla (alba) personata* | Least Concern | No | P | | | | |
| Hoopoe | *Upopa epops* | Least Concern` | No | P | | | P | |
| Barn swallow | *Hirundo rustica* | Least Concern | No | P | | | P | |
| Sand martin | *Riparia riparia* | Least Concern | No | P | | | | |
| Tree sparrow | *Passer montanus* | Least Concern | No | P | | P | | |
| Spanish sparrow | *Passer hispaniolensis* | Least Concern | No | P | | P | | |
| Desert finch | *Rhodospiza obsoleta* | Least Concern | No | | | P | | |
| Chaffinch | *Fringilla coelebs* | Least Concern | No | | | P | | |
| Brambling | *Fringilla montifringilla* | Least Concern | No | | | P | | |
| Linnet | *Linaria cannabina* | Least Concern | No | | | P | | |
| Reed bunting | *Emberiza schoeniclus* | Least Concern | No | | | P | | |
| Corn bunting | *Emberiza calandra* | Least Concern | No | | P | P | P | |
| **Mammals** | | | | | | | | |
| Tolai hare | *Lepus tolai* | Least Concern | No | | P | | N/A | |
| Zaisan mole vole | Ellobius tancrei | Least Concern | No | P | P | | N/A | Burrows observed |
| Shrew spp. | *Soricidae* spp. | Least Concern | No | | P | | N/A | Bones founds in kestrel pellet |
| Long-eared hedgehog | *Hemiechinus auritus* | Least Concern | No | P | | | N/A | Skin found |
| Common pipistrelle | *Pipistrellus pipistrellus* | Least Concern | No | P | | | N/A | |
| Red Fox | *Vulpes vulpes* | Least Concern | No | P | | | N/A | Scats found |
| **Reptiles** | | | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Central Asian tortoise | *Testudo horsfieldii* | Vulnerable | Yes | | P | 5 tortoises |
| **Higher plants** | | | | | | |
| Hare barley | *Hordeum leporinum* | Not yet assessed | No | P | N/A | Abundant |
| Camelthorn/Yantak | *Alhagi pseudoalhagi* | Not yet assessed | No | P | N/A | Frequent (locally abundant) |
| Viviparous bluegrass | *Poa bulbosa* | Not yet assessed | No | P | N/A | Rare |
| Desert daisy | *Microcephala lamellata* | Not yet assessed | No | P | N/A | Frequent |
| Ceratocarpous spp. | *Ceratocarpus utriculosus* | Not yet assessed | No | P | N/A | Rare |
| Poppy spp. | *Papaver pavoninum* | Not yet assessed | No | P | N/A | Frequent |
| Cousinia | *Cousinia bungeana* | Not yet assessed | No | P | N/A | Rare |
| Goose onion | *Gagea sp.* | Not yet assessed | No | P | N/A | Frequent |
| Eremopyrum sp. | *Eremopyrum bonaopartis* | Not yet assessed | No | P | N/A | Rare |
| Roemeria sp. | *Roemeria refracta* | Not yet assessed | No | P | N/A | Rare |
| Bermuda grass | *Cynodon dactylon* | Not yet assessed | No | P | N/A | Locally abundant |
| Common caper | *Capparis spinosa* | Not yet assessed | No | P | N/A | Rare |
| Spiny Cocklebur | *Xanthium spinosum* | Not yet assessed | No | P | N/A | Locally abundant |
| Cocklepur sp. | *Xanthium strumarium* | Not yet assessed | No | P | N/A | Rare |
| A legume | *Sphaerophysa salsula* | Not yet assessed | No | P | N/A | Frequent |
| A legume | *Psorolea drupacea* | Not yet assessed | No | P | N/A | Frequent |
| Isirik | *Peganum harmala* | Not yet assessed | No | P | N/A | Locally abundant |
| Common saltwort | *Salsola tragus* | Not yet assessed | No | P | N/A | Rare |
| A saltwort | *Girgenshonia oppositiflora* | Not yet assessed | No | P | N/A | Rare |
| Halocharis sp. | *Halocharis hispida* | Not yet assessed | No | P | N/A | Rare |
| A lily | *Ixiolirion tataricum* | Not yet assessed | No | P | N/A | Rare |
| A sedge | *Carex pachystylis* | Not yet assessed | No | P | N/A | Rare |

| | | | | | | |
|---|---|---|---|---|---|---|
| A grass | *Aegilops squarrosa* | Not yet assessed | No | P | N/A | Locally abundant |
| A grass | *Bromus oxyodon* | Not yet assessed | No | P | N/A | Rare |
| A brassica | *Malcolmia trichocarpa* | Not yet assessed | No | P | N/A | Rare |
| A brassica | *Cryptospora omissa* | Not yet assessed | No | P | N/A | Rare |
| Bearded fescue | *Vulpia cilicata* | Not yet assessed | No | P | N/A | Locally abundant |
| A trefoil | *Trigonella geminiflora* | Not yet assessed | No | P | N/A | Rare |
| A compositae | *Amberboa bucharica* | Not yet assessed | No | P | N/A | Rare |
| Caltrop | *Tribulus terrestris* | Not yet assessed | No | P | N/A | Frequent |

Footnote
[1] The April 2022 species list only includes incidental bird records recorded during the Asian houbara surveys and reptile species recorded during the Central Asian tortoise surveys which were undertaken in April 2022.

# Appendix B Outline ESMMP

The mitigation measures for the construction and operation phases are summarised in Table 44 and Table 45, respectively and will be incorporated into the Project ESMS and CESMP/OESMP. Management measures for decommissioning will mirror that of construction and will be contained in the DESMP. The names of the individual management plans described are indicative and will be updated to maintain consistency with Masdar's ESMS.

For the avoidance of doubt, the following table and the measures listed in the ESIA should all be incorporated into the ESMS/ESMPs.

**Table A-10-1. Summary of the mitigation measures for the Construction Phase**

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| Loss of vegetation cover and biodiversity | Implement robust management measures[97] to ensure good construction practice within the proposed project site.<br>Employ an ecologist during construction to oversee implementation of the BAP.<br>Initial site preparation and clearance to be undertaken outside of the bird breeding season, where possible.<br>Storage of top 30cm of topsoil separately from subsoil. All of it should be stored on areas of modified habitat.<br>A pre-construction survey should be completed for works undertaken in the breeding season to check for animals (reptiles and active bird nests) and, if species of conservation importance are identified, construction activities are to be programmed to avoid such features until they have been moved or, in terms of nesting birds, there is a natural cessation of breeding effort.<br>Construction vehicles must remain on the access roads and not drive in the un-cleared bush. All workers and contractors must use the designated parking areas on site and the designated tracks.<br>Pre-construction surveys for species of conservation concern.<br>Topsoil to be used for restoration purposes. Natural regeneration is proposed. There will be an active management approach to ensure revegetation is successful but will be detailed in the BAP.<br>Areas to be cleared, precisely demarcated with vegetation clearing only in agreed areas. | Biodiversity Action Plan | EPC EHS Manager<br>HSE MANAGER<br>ESHS Officer | Site Inspection Reports | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

[97] For example: NetRegs (2020). Guidance for Pollution Prevention (GPP). Available at: https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| | Clearing to commence on sign-off from ecologist and HSE MANAGER /ESHS Officer.<br>Any areas outside of the footprint of the Project, that are cleared as a result of construction activities (compound, storage areas etc.) should be restored following the completion of construction phase.<br>Fires will not be allowed under any circumstances.<br>Cleared areas no longer required for construction activities should be restored by natural revegetation/reseeding using the existing seed bank contained in the topsoil. | | | | |
| Disturbance, alteration & destruction of faunal and avifaunal habitats | Environmental toolbox talks prior to, and during, construction to raise awareness, limit conflict and reduce additional disturbance to fauna and avifauna.<br>Prior to undertaking any works on site, the ecologist and HSE MANAGER /ESHS Officer shall clearly delineate the approved clearing and disturbance footprint using temporary fencing, flagging tape, para-webbing or similar. Daily inspections will be carried out on excavations to check for animals that might be trapped in the excavation. These individuals must be carefully moved to a safe area outside construction activities.<br>Procedure will be implemented for removal of animals found within the construction area.<br>Drivers operating in the area must be well briefed and must be aware of the dangers that vehicles pose to the local fauna, particularly slow moving species such as tortoise.<br>Vehicle speed limits must be imposed and adhered to. A limit of 20kph is proposed but will be agreed with the EPC.<br>Record all instances of collisions with project vehicles. | Biodiversity Action Plan | EPC EHS Manager | Site Inspection Reports | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| | Bird divertors installed along entire extent of overhead lines. Tortoise holes cut in selected parts of the perimeter fence to enable free movement. | | | | |
| Conflict between construction workers and fauna | The collection, harvesting or hunting of plants or animals is strictly prohibited. A 'no tolerance' policy will be adopted with respect to construction workers.<br>Any person found guilty of poaching will be apprehended, immediately dismissed and referred to the appropriate authority. | Biodiversity Action Plan | EPC EHS Manager | Site Inspection Reports | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Risk of invasive flora species | Identification of potential invasive species and action taken to clear these species if they occur in or around areas designated for vegetation clearance prior to construction.<br>Vehicles will be cleaned in a designated wash down area within the construction compound prior to entrance to site. Wash water will be part of the surface water drainage system. | Biodiversity Action Plan | EPC EHS Manager | Site Inspection Reports | Mitigation work to be carried out as and when identified. |
| Surface water | Buffer distance of 25m applied to the seasonal watercourses and irrigation channels.<br>Routes of roads to be selected to avoid existing drainage channels or depressions where possible.<br>Culverts or other drainage control features should be installed where crossings of drainage routes are unavoidable and to prevent ponding of surface water on the upstream side.<br>Vehicles shall not be washed in nearby drainage canals. Washing will take place in designated wash down area within the construction compound. | Water and Wastewater Management Plan | EPC EHS Manager | Site Inspection Reports<br>Note: water quality samples are to be taken if there are signs of pollution. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Soil erosion | Run-off and erosion control features included in all civil designs by contractor. | Soil Erosion Management Plan<br>Water and Wastewater Management Plan | EPC EHS Manager | Site Inspection Reports | Prior to start of Construction. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| | Demarcate storage and staging areas and store all materials, equipment and vehicles in these areas to reduce soil damage.<br>Vehicles confined to demarcated roadways.<br>Where possible, establish native vegetation by natural revegetation in excavated areas immediately after final disturbance. Stockpiles of stripped topsoil with be used for revegetation as it contains native seeds.<br>Salvage and store the top 30cm of topsoil and subsoil separately from areas excavated.<br>On completion of earthworks, backfill material in same stratigraphic sequence i.e. subsoil first then topsoil.<br>If narrowing access roads following construction, scarify compacted areas and establish native grasses.<br>Once construction and road-building are complete, scarify all areas compacted by off-road vehicle / equipment movements and establish native vegetation.<br>In the first instance monitor natural regeneration of vegetation. If unsuccessful an appropriate seed mix shall be used and will be applied at the start of the active growing season.<br>Store all materials within designated areas of temporary storage facilities and provide supplies to clean-up of minor spills.<br>Confine all vehicles and equipment to the roadway and, to extent possible, minimize activities during wet conditions. When activities must occur in wet conditions, control storm water by using fabric, straw bales or other measures to impede storm water flow and prevent erosion.<br>When damage to wet soil occurs, repair once dry conditions return. Surface levelling should be carried out in the first instance. | Biodiversity Action Plan | | | Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| Wastewater | Ensure temporary storage of wastewater at the site before disposal to a designated facility by a contracted waste handler.<br>Where third party wastewater disposal & transport companies are to be utilized, the Company / EPC will ensure all required licenses / permits are in place and that they facilities are audited to ensure that they are fit for purpose.<br>Prohibit illegal disposal of wastewater into the canals around the project site.<br>Ensure regular inspection of wastewater management practices within the solar plant to check for compliance.<br>Ensure there is proper and adequate sanitation facilities at the site during construction. | Water and Wastewater Management Plan<br>Quantity of wastewater generated.<br>Quantity of wastewater disposed by a licensed waste carrier | EPC EHS Manager<br>Licensed waste carrier | Monthly ESHS reports prepared by EPC.<br>Monthly HSE MANAGER audits of the MPs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Sewage Effluent | The construction compound will have a local effluent collection and/ or treatment system. The contractor will design, build and operate these systems in accordance with Uzbek legislation and Good International Industry Practise.<br>Effluent from domestic sewerage treatment shall meet the relevant standards acceptable to the Uzbek environmental authorities.<br>Effluent will be stored in a septic tank or untreated storage tank and removed and disposed of periodically by a licenced contractor. | Water and Wastewater Management Plan | EPC EHS Manager<br>HSE MANAGER | Monthly ESHS reports prepared by EPC.<br>Monthly HSE MANAGER audits of the MPs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified |
| Non-hazardous solid wastes | Train workers on solid waste management practices described in the Storage & Management of Waste MP and Lender Group requirements.<br>Segregate all solid wastes at source.<br>Re-use, re-cycle or reduce solid waste generation onsite to the extent possible.<br>Dispose all construction wastes that cannot be recycled or reused to a licensed solid waste disposal site using a licensed refuse handler.<br>Provide suitably sized facilities for proper handling, segregation and storage of wastes at | Storage & Management of Waste MP<br>Quantity of solid waste generated.<br>Quantity of solid waste correctly disposed to licensed disposal sites. | EPC EHS Manager<br>Licensed waste carrier. | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | designated points within the construction compound.<br>Do not leave wastes on site at the end of the work.<br>Provide adequate number of properly contained litter bins and containers properly marked with type of wastes.<br>Strictly prohibit burning or dumping of any wastes at the site.<br>Perform regular inspection of solid waste management practices onsite.<br>Implement Duty of Care with respect to waste consignments, tracking where waste is transported to and disposed of. | | | | |
| Hazardous materials / wastes | Provide facilities for proper handling, segregation and storage of wastes at designated points within the construction compound.<br>Hydrocarbons will not be stored on site.<br>Refuelling will take place at fuel station located at the junction with the highway.<br>For heavy equipment, a fuel tanker will be brought to site at a pre-defined time to refuel this equipment at site. Drip trays will be installed under refuelling points.<br>Bunds to be located on impermeable surfaces with controlled drainage away from natural water courses. Bunds should be sufficient to contain 110% of the volume of liquids to be stored within. They should also be roofed to stop contamination of rainwater run-off.<br>Train site workers on proper hazardous waste management.<br>Segregate site wastes by separating hazardous waste from non-hazardous waste.<br>Ensure the hazardous waste collection containers are emptied at appropriate intervals to prevent overflow. | Storage & Management of Wastes MP<br>Storage and Management of Hazardous Materials MP.<br>Pollution Incident Response Plan<br>Quantity of Hazardous Waste generated.<br>Quantity of Hazardous Waste disposed. | EPC EHS Manager<br>Licensed waste carrier | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Ensure that hazardous materials are stored in proper areas, where they cannot reach land in case of any spillage.<br>Incorporate dripping pans at machinery, equipment and area prone to contamination by leakage of hazardous materials such as oil and fuel<br>Regular maintenance of all equipment and machines used onsite so as to minimise leakage of hazardous materials<br>Containers for storing hazardous waste, including used oil, should be stored securely, labelled and disposed in line with the governing regulations<br>Undertake regular inspection of hazardous waste management practices onsite.<br>Strictly prohibit illegal disposal of hazardous wastes onsite<br>Store hazardous materials in designated areas secured with a fence.<br>Implement Duty of Care with respect to waste consignments, tracking where waste is transported to and disposed of.<br>Follow Uzbek Government requirements set out in the international Convention "The Control of Transboundary Movements of Hazardous Wastes and Their Disposal (IEA ID# 3042) | | | | |
| Noise and vibration | Adopt and follow best practicable means to ensure that the quietest available plant and construction techniques are used.<br>Where appropriate, micro-siting is to be undertaken to ensure construction noise impacts are minimised and equipment is located as far as possible from noise sensitive receptors (NSRs). NSRs include on-site accommodation.<br>Routing of project construction traffic shall be through the main highway and short section of unmarked road to site. | Noise and Vibration MP.<br>Traffic MP<br>Noise monitoring devices procured and installed on site<br>Levels of noise and vibration produced at the site<br>Number of Noise complaints received. | EPC EHS Manager | Monthly ESHS reports prepared by EPC | Prior to start of Construction.<br>Monitoring carried out on a monthly basis or following a complaint.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Restrict all construction activities to daytime during normal working hours<br>Conduct construction activities within the maximum permitted noise levels<br>Provide prior information to the community of any planned noisy activity that is likely to exceed the permitted noise levels (piling work)<br>Strictly ensure the use of protective personal equipment at all times while on site and noise reduction techniques such as silencers and ear mufflers to employees<br>Monthly monitoring of LAeq in the daytime and night-time (if night-time work is required) should be carried out at the Solar PV, OHL, and access roads nearest receptors during construction only.<br>. | | | | |
| Archaeology and cultural heritage | Train workers on the importance of archaeological and cultural resources and how to deal with them through toolbox talks.<br>In case of chance find, the work should be halted and the area protected and the matter reported immediately to the Department of Culture for appropriate action. | Chance Find Procedure.<br>Stop Work Protocol<br>Number of recorded chance finds. | EPC EHS Manager<br>Department of Culture. | Monthly ESHS reports prepared by EPC | Throughout the construction works. |
| Visual and landscape | Remove in a timely manner all the construction machinery, equipment and vehicles that are not in use and keep them in specific locations within the Project site.<br>Conduct demobilization audit prior to EPC leaving site to ensure that site conditions are acceptable for handover to the operations team. | Site Restoration Plan<br>Biodiversity Action Plan | EPC EHS Manager | Monthly ESHS reports prepared by EPC | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Occupational Health and Safety | Comply with 'governing regulations' and international best practise.<br>Establish a permit to work system for all high-risk activities (i.e. hot works, confident space, working at high etc.) | Occupational Health and Safety Plan.<br>Incident Investigation Report<br>Covid 19 MP. | EPC EHS Manager<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Train employees on the importance of occupational health and safety requirements and develop work instruction.<br>Provide workers with appropriate personal protective clothing such as helmets, safety boots, gloves, dust masks, ear mufflers and overalls for use during construction.<br>Strictly enforce the use of the Personal Protective Equipment to minimise the accidents.<br>Provide regular medical checks for the workforce.<br>Provide fully equipped First Aid Kit and sanitary facilities on site, including water for drinking and bathing, at all times.<br>Provision and placement of appropriate fire extinguishers and training personnel on their use<br>Put clear signage to restricted areas in Chinese, Uzbek, Russian and English languages.<br>Prohibit unauthorised persons from entering the site through installation of a perimeter fence.<br>Undertake regular inspection to ensure compliance with OHSP.<br>Report and investigate all incidences of accidents or near misses and keep proper records of the actions taken.<br>An Incident Investigation Report should be developed.<br>Promote Covid-19 Awareness<br>Provide appropriate traffic safety training to all drivers (employers and contractors) as part of their induction and on an on-going basis. | Workers Accommodation MP<br>IFC/ EBRD Guide for Workers Accommodation.<br>Emergency Preparedness and Response Plan.<br>Confirmation of the appointment of medical professional on site.<br>PPE procured and being used by the workers<br>Fire extinguishing facilities on site<br>First aid kit on site<br>Signage installed on site. | | Record of accidents and near misses<br>Corrective Action Reports<br>Grievance mechanism forms. | Mitigation work to be carried out as and when identified. |
| Socio-economic – employment | Develop Local Recruitment and Employment Plan to encourage & maximize local workers, vulnerable persons and women in the workforce including retention and promotion. | Stakeholder Engagement Plan.<br>Community Grievance Mechanism<br>Local Recruitment & Employment Plan. | CLM / CLO | CGM log.<br>Corrective Action Reports<br>Number of local people employed on the Project. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Communicate employment estimates, timeframes and skills requirements clearly to the community.<br>Invest in skills training to enable greater employment of local population throughout Project life, for both construction and operations phases, to start as early as possible ensuring maximum employment during construction.<br>Implement a local employment plan in consultation with the community and in a way that meets long term operational needs of the Project as well as the short-term construction needs, taking into account the relatively low skill base of the local population when it comes to solar power related jobs (see separate line item below).<br>Investigate local sourcing and procurement opportunities to promote sustainable small business development.<br>Invest in capacity building for small businesses to enable them to meet standards for procurement required by the company and to service the needs of indirect employees (through service industries).<br>Work with local vocational training schools to develop curricula which will qualify local students to better meet the needs to the developing solar industry locally. | Stakeholder engagement activities.<br>Number of grievances recorded.<br>Number of local workers hired.<br>Minutes of stakeholder meetings.<br>Skills training agreement with local vocation training centre.<br>Agreement to provide support to local businesses | | Training places provided and completed. | Mitigation work to be carried out as and when identified. |
| Local hiring and workforce management | Develop a local employment plan including roles and responsibilities (there will be a need for HR, EPC hiring manager, CLM/CLO, EPC CLO and oversight by site management)<br>Identification of job roles required and targets as appropriate. Use targets to measure the success of the Local Recruitment and Employment Plan.<br>Identify level of interest in the project. This should include a list of names, skills, availability to start work. Identify training needs and verify the skills/qualifications. | Local Recruitment & Employment Plan.<br>Monthly workforce statistics. | CLM<br>EPC EHS Manager<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Inspection reports<br>CGM log.<br>Number of local people employed on the Project. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Community Liaison Officer to maintain a database of local workers expressing an interest in employment opportunities at the Project as per bullet point above,<br>Pass this information on to the EPC contractor or responsible person.<br>Periodically the EPC contractor will publish a list of required roles and will review the list of interested persons. The CLO should make sure this information is disclosed to the communities. The most suitable will be invited for interview and if suitable they will be offered jobs. | | | Training places provided and completed. | |
| Socio-economic – population and land use | Implement measures to ensure access to local villages is not adversely affected by the fencing of the Project area. Such measures may include providing alternative routes to the village, which can be accessed by pedestrians as well as vehicles. Appropriate signage should be erected around the site.<br>Provide detailed and regular information to local community members about Project activity to mitigate community concerns as a result of misinformation.<br>Consider scheduling construction activities to minimise the effects on local communities and farmers. For example, higher impact activities such as piling could be carried out outside of prayer times to reduce impacts on the nearby mosque.<br>Prohibit non-local workers from entering the local communities.<br>Operate a closed camp status for non-local residents. | Community Health & Safety MP.<br>Water Management Plan<br>SEP<br>Confirmation of access arrangements.<br>Minutes of stakeholder meetings.<br>Noise and Vibration Management Plan | CLO<br>EPC EHS Manager<br>HSE MANAGER | Inspection reports<br>CGM log<br>Corrective Action Reports | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Social Infrastructure | Provision of a dedicated medical professional to be employed by the Project.<br>Investing in local social infrastructure through a community benefit program which will be developed in consolation with communities | Occupational Health and Safety Plan.<br>Contract of employment for medical professional(s) | EPC EHS Manager<br>HSE MANAGER | Confirmation of employment. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | during the construction phase. Care will be taken to manage community expectations about social infrastructure.. | | | | |
| Air Quality | Identify strategies to manage dust on the road during the execution of the Project.<br>Provision of designated wash down area to spray and wash wheel spokes. tires and around the wheel opening of all vehicles entering and exiting the construction compound.<br>Use of properly maintained vehicles and construction equipment with emission controls.<br>If necessary, use water to dampen down on-site roads and excavations to reduce dust.<br>Maximum speed limit of 20kph in place on site.<br>Trucks carrying aggregates have covered loads when entering or leaving the site.<br>Communicate project risk to local communities and address concerns accordingly. Monitor any complaints filed (via grievance mechanism) from local stakeholders as an additional tool to monitor dust management measures. | Traffic MP<br>Dust Suppression MP<br>Vehicle inspection checks carried out<br>Minutes of stakeholder meetings.<br>SEP<br>CGM and WGM Grievances received. | EPC EHS Manager<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Inspection reports<br>Record of traffic accidents and near misses<br>CGM and WGM logs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Spread of Food and Water-borne Disease | Food stored and prepared in accordance with good hygiene standards and required by Uzbek and IFI standards.<br>Establish food hygiene procedures including bacterial testing regimes to be established for camp kitchens and water supply.<br>Where appropriate, support local public health campaigns against food and water borne diseases. | Water and Wastewater Management Plan<br>Storage & Management of Waste MP<br>OHS and CHS MP<br>Adherence to International food standards (for example FAO/ WHO Codex Alimentarius)<br>Agreements with relevant government | EPC EHS Manager<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Inspection reports<br>WGM grievances log<br>Corrective Action Reports | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | | /NGOs to support health campaigns<br>Information disclosed as part of health campaigns | | | |
| Spread of Communicable Disease | Workers accommodation designed in compliance with the IFC/ EBRD Guide for Workers Accommodation and will not be based on site but rather use existing accommodation available<br>Health screening and quarantine if necessary, carried out in accordance with Covid-19 MP.<br>Establishment of designated areas to handle quarantine cases.<br>Establishment of a COVID19 management plan.<br>Ensure health screening is being conducted for employees and contractors before contracting workers and prior to entrance to site.<br>Temperature screening will be carried out on entrance to site each day.<br>Random Covid-19 testing will be carried out throughout their employment/ contract.<br>As part of health and safety induction for workers, provide awareness training on communicable disease prevention. Provide this training on an ongoing basis.<br>Work in collaboration with an onsite medical team to ensure that such awareness and education training is appropriately provided to workers and contractors.<br>Identify opportunities to support local public health campaigns that focus on prevention of communicable diseases. | Covid 19 MP<br>Workers Accommodation Plan<br>OHS MP<br>Provision of employee health screening.<br>Provision of health-related awareness and training to workforce<br>Agreements with relevant government/ NGOs to support health campaigns | EPC EHS Manager<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs.<br>Corrective Action Reports<br>Heath related advertising and communication.<br>Number of reported heath incidents. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| Increased Pressure on Health Services | Ensure that all Contractors are provided with adequate health care (for work related injuries and off the job-related health issues) that is independent of the local health care system.<br>Liaise with local health professionals to identify ways that the Project can provide sustainable investments in the health care facilities used by their workers.<br>Consider an agreement or contract with health care provider to provide investments in facilities used by workers | OHS Plan<br>Provision of worker healthcare through dedicated Project professional. | EPC EHS Manager<br>HSE MANAGER | Inspection reports<br>Number of reported heath incidents. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Pressure on Water Resources | Ensure that workers and employees must not use water from the canals located east and west of the Project site. Ensure a system of penalties is put in place for non-compliance.<br>Vehicles will not be washed in canals. | Water & Wastewater MP<br>Grievances received<br>Provision of water use and resource studies. | EPC EHS Manager<br>HSE MANAGER | Inspection reports<br>Corrective Action Reports<br>Grievance mechanism forms. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Sale and Use of Drugs and Alcohol | Enforce and monitor the zero-alcohol and drugs tolerance policy, including current intoxication, for workers during working hours.<br>Ensure random alcohol testing is conducted for workers entering and leaving the site.<br>Design a system of penalties for anyone found with drugs or alcohol on site. | Workers Accommodation MP<br>HR MP<br>OHS MP | EPC EHS Manager<br>HSE MANAGER | Inspection reports<br>Corrective Action Reports<br>Test results.<br>Disciplinary action taken. | Communicated prior to start of Construction.<br>Monitoring carried out during weekly site inspections. |
| Safety of Local Community | Ensure that Project security is aware of the Project's goals to establish good relationships with local stakeholders; the grievance mechanism for communities to voice concerns; and receives human rights and cultural sensitivity training to ensure the respect and protection of the local community.<br>Include policy requirements to prevent Gender Based Violence and Harassment (GBVH) of community members by the construction workforce. | Community Health & Safety MP<br>Provision of information through the SEP and grievance mechanism.<br>Trainings provided on GBVH<br>Senior representatives for managing GBVH appointed | CLO<br>EPC EHS Manager<br>HSE MANAGER | Monthly HSE MANAGER audits of the MPs.<br>Inspection reports<br>Corrective Action Reports<br>Grievance mechanism forms. | Communicated prior to start of Construction.<br>Monitoring carried out during weekly site inspections. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Appoint senior people in construction teams who are responsible for ensuring commitments regarding GBVH are implemented and to conduct a GBVH risk assessment and mitigate these risks appropriately inline with policy. These senior people should include women at senior decision-making levels.<br>Include a safe and confidential reporting mechanism from local communities as part of the grievance process.<br>Provide periodic training on GBVH to all of the workforce and ensure to vet all contractors with based on their performance of managing GBVH. | | | | |
| Site security | Develop a Security MP / Code of Conduct for site security personnel which will be in line with the requirements of PS2, PS4 and the Voluntary Principles of Security & Human Rights.<br>Security provided by private security firm only, not the home guard.<br>Firearms are prohibited on site.<br>Fence the entire solar plant to restrict entrance to the site.<br>Inspect the fence around the facility regularly and seal all loopholes.<br>Ensure adequate lighting within and around the solar plant.<br>Regularly check and maintain security lights at the site.<br>Train the onsite guards to adequately handle trespass incidents<br>Ensure that the security staff act in compliance with relevant Uzbek laws;<br>Ensure that robust background checks are carried out staff to make sure they have not been implicated in past abuses; | Security and site access MP<br>Provision of code of conduct for security personnel.<br>Results of background checks for security staff.<br>Minutes of stakeholder meetings.<br>CGM and WGM Grievances received. | EPC EHS Manager<br>Security Contractor<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs.<br>Inspection reports<br>CGM and WGM logs. | Communicated prior to start of Construction.<br>Monitoring carried out during weekly site inspections |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Implement a Code of Conduct for security personnel;<br>Introduce head of security personnel to neighbouring communities and outline the necessary safety precautions that will need to be put in place to ensure both the safety of the Project and safety of local communities;<br>Community safety meetings should be organised with all potentially affected groups and be conducted in advance of construction activities; and<br>Ensure that all potentially affected stakeholders know how to contact the company and to file grievances or concerns about security arrangements. | | | | |
| Emergency response | Work with local emergency responders to at minimum: (i) communicate ERP; (ii) depending on level of risk from emergency events build local capacity to ensure appropriate local response in case of emergency.<br>Communicate potential risks and ERP to those potentially most affected by emergency events.<br>Provide safety information to local community via the SEP.<br>Emergency drills must be completed. | OHS Plan<br>Emergency Management and Response<br>Minutes of community meetings<br>Findings of Emergency Drills<br>CGM and WGM Grievances received. | Masdar<br>EPC EHS Manager<br>Security Contractor<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs.<br>Emergency Drills | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |
| Traffic management | The Traffic Management Plan must aim to reduce risks to drivers, communities along the transport route, as well as components being transported. The TMP is to include (amongst others) a detailed site access route; stopovers, speed controls; measures for ensuring well-maintained vehicles and access roads; procedures for ensuring appropriate training programmes and licences are in place for all drivers; and detail on sensitive receptors along the transport route. | Traffic MP<br>Number of road safety briefings provided.<br>Number of road safety complaints received.<br>Number of driving incidents including speed violations. | EPC EHS Manager<br>Security Contractor<br>HSE MANAGER | Monthly ESHS reports prepared by EPC<br>Monthly HSE MANAGER audits of the MPs.<br>Inspection reports<br>Record of accidents and near misses<br>WGM and CGM Logs. | Prior to start of Construction.<br>Monitoring carried out during weekly site inspections.<br>Mitigation work to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Provide appropriate traffic safety training to all drivers (employees and contractors) as part of their induction and on an ongoing basis.<br>As part of pre-construction engagement activities, ensure that traffic safety and “rules of the road” are discussed with local communities. Discuss and address community concerns. Special sessions may be required for particularly vulnerable groups such as children. At minimum communicate type, frequency and traffic risks before heavy traffic begins for the construction phase. All discussions and training sessions are to be made available in language that the workers can understand.<br>Construction traffic through community areas will not be permitted with the exception of public meetings and stakeholder engagement activities. | | | | |

**Table A-10-2. of the mitigation measures for the Operation Phase**

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| Biodiversity | Confine all vehicles to roadways.<br>Road condition monitored regularly, and damaged and rutted roads repaired rather than bypassing damaged sections.<br>Monitoring of erosion controls and repair as needed.<br>Re-stabilise existing eroded tracks with restoration of vegetation cover as required.<br>Hunting prohibited on site, particularly in relation to Houbara bustard.<br>During routine maintenance any invasive flora species should be identified and removed. Cutting and poisoning of saplings is an effective control measure.<br>Record bird collisions with the panels and overhead lines.<br>Monitor and maintain bird flight diverters on OHL throughout operational phase.<br>Implementation of mitigation measures for Central Asian Tortoise (TBC) as set out in the BAP.<br>Record sightings of Sociable lapwing and Houbara bustard in the vicinity of the Solar Park,<br>Identify a recently excavated area on site and manage it to understand rate and success of natural revegetation. Active management approaches shall be implemented if necessary.<br>Routine inspections will record any bird collisions and fatalities on site in line with IFC guidance: Bird rescue protocol and monitoring at PV solar sites | Biodiversity Action Plan<br>Annual audits<br>Number of bird collisions with OHL<br>Tortoise population<br>Success level of vegetation restoration.<br>Level of plant cover.<br>Presence of indicator species. | Project Developer | Audit Reports | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as and when identified. |
| Liquid wastes | Develop a Water Management Plan for operations.<br>Train employees on the importance of proper liquid waste management and water resource management.<br>Reduce, reuse or re-cycle all liquid waste generated onsite to the extent possible.<br>Dispose all liquid wastes that cannot be recycled or reused to liquid waste disposal facilities a licensed transporter. | Water Management Plan<br>Pollution Incident and Response Plan<br>Quantity of liquid waste generated<br>Quantity of liquid waste correctly disposed to disposal sites | Project Developer<br>Licensed hazardous waste transporter | Water Management Plan and Inventory<br>Inspection reports<br>Audit Reports | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | Prohibit illegal disposal of wastewater into waste resources (canals or groundwater).<br>Conduct inspection of wastewater management practices to check for compliance<br>Emphasise on proper sanitation during operation phase of the project. | Number of Waste storage facilities the plant<br>Number of Sanitation facilities on at the plant<br>Number of Audits completed | | | and when identified. |
| Solid Wastes | Develop a Waste Management Plan for operations. This will establish the Chain of Custody system to be implemented.<br>Train employees on the importance of proper solid waste management<br>Reduce, reuse or re-cycle all solid waste generated to the extent possible<br>Dispose all solid wastes that cannot be recycled or reused to solid waste disposal sites using a licensed refuse handler. Disposal sites shall be appropriately licensed and meet the general requirements of IFC PS.<br>Maintain proper records of solid wastes to know the quantity of wastes generated on site<br>Provide adequate waste bins and containers at specific places and ensure they are properly marked with type of wastes<br>Perform regular inspection of waste management practices onsite.<br>Wastes will be stored in a designated storage area within the substation area to facilitate collection of the wastes by third party waste collector. | Implementation of Waste Management Plan.<br>Quantity of solid waste generated<br>Number of solid waste storage facilities at the plant<br>Quantity of solid waste correctly disposed to disposal sites<br>Number of completed inspection missions<br>Annual audits | Project Developer<br>Licensed hazardous waste transporter | Solid waste management Plan and inventory<br>Inspection Reports<br>Audit Reports | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as and when identified. |
| Water availability | A full Water Management Plan will be developed prior to the commencement of operations. | Water Management Plan<br>Operational water availability / resource use assessment. | Project Developer | Inspection reports. | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
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| | | | | | and when identified. |
| Soil erosion/compaction | Confine all vehicles to roadways.<br>Monitor road condition regularly; then repair damaged and rutted roads rather than bypassing damaged sections.<br>Monitor erosion controls and repair as needed.<br>Where possible, maintain any existing grass cover on berms and ditches.<br>Prohibit use of vehicles and equipment off prepared roads.<br>Re-stabilize existing eroded tracks and restore grass cover as needed. | Biodiversity Action Plan<br>Number of completed inspections,<br>Annual audits. | Project Developer | Inspection reports. | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as and when identified. |
| Visual Impacts | Implement site rehabilitation and landscaping measures to restore the site. This should be implemented in the first available active growing season following the completion of construction.<br>Ensure proper storage, regular collection and disposal of waste streams generated.<br>Carry out the facility inspection work on regular basis. | Biodiversity Action Plan<br>Waste management plan developed and implemented<br>Site inspection missions completed<br>Annual audits | Project Developer. | Inspection Reports<br>Grievance Reports<br>Audit Reports | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as and when identified. |
| Hazardous Materials / Wastes | Develop and implement a Waste Management Plan.<br>Train employees on Hazardous waste management<br>Segregate waste by separating hazardous waste from non-hazardous waste.<br>Establish a designated storage area for fuels / chemicals with an impervious base and impermeable bund walls and protected from precipitation. Capacity must be 100% of the full volume to be stored within a bund and secured area.<br>Containers for storing hazardous materials / waste (including used oil) should be stored in the designated, secured with a fence. All containers are to be labelled correctly. | Waste Management Plan developed and implemented<br>Number of trained Workers on Hazardous Waste Management<br>Amount of Hazardous Waste Segregated<br>Quantity of accidental hazard spillage<br>Quantity of hazardous waste correctly disposed | Project Developer<br>Licensed hazardous waste transporter | Inspection Reports<br>Hazardous Waste Management Plan and Inventory<br>Audit Reports | Plan developed prior to start of Operation.<br>Monitoring carried out during detailed monthly audits.<br>Mitigation to be carried out as and when identified. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| | Ensure the hazardous waste collection containers are emptied at appropriate intervals to prevent overflow.<br>Prohibit illegal disposal of hazardous wastes on the solar plant during solar plant maintenance exercise.<br>Undertake regular inspection of hazardous waste management practices onsite.<br>Vehicles will not be refuelled on site but at the nearby filling station.<br>Provision for chemical, oil and hazardous spills kits to be located in strategic locations to immediate access and to control the spill and contain any hazards. | Number of completed inspection missions<br>Annual Audits | | | |
| Occupational Health and Safety | Develop and implement an O&M ESHS MP for operations.<br>Train new employees on the importance of occupational health and safety<br>Ensure compliance with the governing regulations<br>Maintain the fence around the entire solar park to prohibit unauthorized persons from accessing the site<br>Provide workers with appropriate personal protective clothing such as helmets, safety boots, gloves, dust masks (if required) and overalls.<br>Strictly enforce the use of the Personal Protective Equipment to minimise the accidents during decommissioning<br>Regular medical checks including screening for Covid-19<br>Provide fully equipped First Aid Kit and sanitary facilities on site, including water for drinking and bathing<br>Put clear signage to restricted areas in Uzbek, Chinese and English language to reduce risk of accidents<br>Undertake regular inspection of the plant<br>Promote Covid-19 Awareness in languages that the workers understand. | O&M ESHS MP developed and implemented<br>Number of employees trained on occupational health and safety<br>PPE procured and being used by the employees<br>Fire extinguishing facilities at the plant<br>First aid kit on site<br>Signage installed at the plant<br>Number of inspection missions competed<br>Annual Audits | Project Developer | Inspection reports<br>Record of accidents and near misses<br>Corrective Action Reports | Plan developed prior to start of Operation.<br>Monitoring carried out during weekly and monthly audits.<br>Mitigation to be carried out as and when identified. |
| Noise and Vibration | Carry out an operational noise survey in the event of complaints being received. | Levels of noise and vibration produced at the site<br>Number of Noise complaints received | Project Developer | Inspections<br>Project Grievance Mechanism | In the event of a complaint being received. |

| Impact | Mitigation Measures | MP Reference and KPI (if appropriate) | Responsibility | Monitoring Means | Frequency |
|---|---|---|---|---|---|
| | | Number of inspection missions completed | | | |
| Socio-economic | Continuing stakeholder engagement in accordance with the SEP and manage expectations in terms of the number of employment opportunities generated during operations.<br>Continued implementation of the Local Recruitment & Employment Plan in consultation with the local community.<br>Continued implementation of community grievance mechanism.<br>Continued implementation and compliance with O&M ESHS MP.<br>Development of Security Management Plan and use of private security personnel.<br>National Guard will not be used to provide security. | Stakeholder Engagement Plan<br>Stakeholder engagement activities.<br>Number of grievances recorded.<br>Number of local workers hired.<br>Security Management Plan | Contractor<br>Project Developer | Inspection reports<br>Community consultation.<br>Project Grievance Mechanism | Monitoring carried out during detailed monthly audits.<br>. |

# Appendix C Example Key Performance Indicators

The Project's E&S targets will be assessed by the following key performance indicators which were set according to the national standards and international best practice (adhere to more stringent standards) for the project during construction and operational phases. The following table shows the elements that are proposed to be monitored during the life of the Project.

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| **Air Quality** | | | | | |
| Ambient air quality | Fugitive dust and particles (SPM, PM10) | Construction<br>Decommissioning | PM10: 50 µg/m3 (24-hours); | In the event of a valid complaint being received. | Independent 3rd party consultant |
| Ambient air quality | No visible dust outside the site boundary | Construction<br>Decommissioning | Visual observation | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of dust suppression | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Ambient air quality | Pollution Prevention and Control Plan | Construction<br>Decommissioning | Confirmation of compliance with measures specified in the Pollution Prevention and Control Plan as it relates to air quality.<br>Refer to the Pollution Prevention and Control Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of prevention measures to reduce air quality impacts. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Vehicle emissions | Traffic management plan | Construction<br>Decommissioning | Confirmation of compliance with measures specified in the Traffic management plan<br>as it relates to air quality.<br>Refer to the Traffic management plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of prevention measures to reduce air quality impacts. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Vehicle emissions | Vehicle inspection checks | Construction<br>Decommissioning | Confirmation that checks have been carried out and that vehicles have passed. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of prevention measures to reduce air quality impacts. | Monthly checks: EPC and ROLE TBC. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Ambient air quality | Complaints relating to dust and air quality | Construction<br>Decommissioning | Minutes of community meetings<br>Grievances received | During weekly checks and monthly detailed audit | Weekly checklist: CLO, EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Noise and vibration** | | | | | |
| Ambient noise and vibration level | Observed sound levels in $L_{Aeq}$ dBA for day and night time against nature and recipient. Limits apply at the boundary of closest residential properties. | Construction<br>Operation<br>Decommissioning | Construction limits:<br>70 dBA<br>Operation limits:<br>Daytime: 55 dBA<br>Night-time: 45 dBA | Noise measurements to be taken in the event of a valid complaint being received. | Independent 3rd party consultant |
| Noise and vibration | Noise monitoring devices procured and installed on site | Construction<br>Operation<br>Decommissioning | Number and type of noise monitoring devices | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Noise and vibration | Number of PPE procured and being used by workers | Construction<br>Operation<br>Decommissioning | Visual inspection of PPE use on site | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Noise and vibration | Number of Noise complaints received | Construction<br>Operation<br>Decommissioning | Review of grievance log | During weekly checks and monthly detailed audit | Weekly checklist: CLO, EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Hydrology and Water Quality** | | | | | |
| Surface and groundwater quality | Level of pollutants in surface and groundwater | Prior to start of Construction<br>Prior to Operation<br>Decommissioning | pH (SI)<br>Conductivity (µS/cm)<br>TDS (mg/L)<br>TSS (mg/L)<br>DO (mg/L)<br>ORP<br>Metals (mg/L)<br>E-coli (cfu)<br>Hydrocarbons (mg/L) | Sampling prior to start of construction and following completion of construction.<br>Further sampling to be taken pre and post decommissioning.<br>Additional sampling should be carried out in the event of a valid complaint being received. | EPC and ROLE TBC.<br>Lab analysis carried out by suitable qualified laboratory. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Loss of habitat and disturbance to waterbodies. | Water Management Plan | Construction<br>Decommissioning | Confirmation of compliance with measures specified in the Water Management Plan.<br>Refer to the Water Management Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of flora to maintain both biodiversity and to protect against erosion. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Loss of habitat and disturbance to waterbodies. | Biodiversity Action Plan | Construction<br>Decommissioning | Confirmation of compliance with measures specified in the Biodiversity Action Plan as it relates to waterbodies.<br>Refer to the Biodiversity Action Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of waterbodies. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager with support from 3rd party ecology as required. |
| Alteration of surface water flow | Culverts or other drainage control measures constructed. | Construction<br>Operation<br>Decommissioning | Confirmation of number of culverts or other drainage control measures constructed and condition of such culverts. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of waterbodies. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Alteration of surface water flow | Water Management Plan | Construction<br>Operation<br>Decommissioning | Confirmation of compliance with measures specified in the Water Management Plan as it relates to waterbodies.<br>Refer to the Water Management Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of waterbodies. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager with support from 3rd party ecology as required. |
| Alteration of surface water flow | Drainage system design | Pre-Construction.<br>Construction<br>Operation<br>Decommissioning | Confirmation of suitability of drainage system design. | Prior to sign off on detailed design.<br>Performance of drainage system verified during weekly and monthly audits. | Pre-construction: Masdar<br>Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager. |
| Alteration of surface water flow | Flood risk assessment. | Construction<br>Operation<br>Decommissioning | Confirmation that measures specified in the FRA have been implemented on site. | During monthly detailed audit. | Monthly detailed audit: Masdar<br>E&S Manager with support from 3rd party ecology as required. |
| Untreated Sewage Effluent | Water Management Plan | Construction<br>Operation<br>Decommissioning | Confirmation of compliance with measures specified in the Water Management Plan as it relates to sewage effluent.<br>Refer to the Water Management Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of waterbodies. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager. |
| Untreated Sewage Effluent | Provision of waste management plan | Construction<br>Operation<br>Decommissioning | Confirmation of compliance with measures specified in the waste management plan as it relates to sewage effluent.<br>Refer to the waste management plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of waterbodies. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager. |
| Untreated Sewage Effluent | Information disclosed as part of health campaigns | Construction<br>Operation<br>Decommissioning | Review of health related information disclosure and awareness programs being undertaken. | During monthly detailed audit | Monthly detailed audit: Masdar |
| **Geology and Soils** | | | | | |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Alteration of surface water flow | Civil engineering design | Pre-Construction.<br>Construction<br>Operation<br>Decommissioning | Confirmation of suitability of civil engineering design. | Prior to sign off on civil engineering design.<br>Performance of civils design verified during weekly and monthly audits. | Pre-construction: Masdar<br>Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager. |
| Soil quality and erosion | Erosion rate observation | Construction<br>Operation<br>Decommissioning | Visual observation | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of managing erosion | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager |
| **Biodiversity** | | | | | |
| Flora protection | Destruction rate observation and revegetation success. | Construction<br>Operation<br>Decommissioning | Visual observation | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of protection of flora to maintain both biodiversity and to protect against erosion. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager with support from 3rd party ecology as required. |
| Flora protection | Destruction rate observation and signs of erosion. | Construction<br>Operation<br>Decommissioning | Confirmation of the use of designated roads and parking areas | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of flora to maintain both biodiversity and to protect against erosion. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar<br>E&S Manager. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Flora protection | Preparation and implementation of Biodiversity Action Plan. | Construction<br>Operation<br>Decommissioning | Confirmation of compliance with measures specified in the Biodiversity Action Plan.<br>Refer to the Biodiversity Action Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance in terms of the protection of flora to maintain both biodiversity and to protect against erosion. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager with support from 3rd party ecology as required. |
| Conflict between construction workers and fauna | No evidence of workforce damaging or hunting/collecting flora and fauna | Construction<br>Operation<br>Decommissioning | Visual observation and monitoring of grievance mechanism | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of protection of flora and fauna and prohibition of hunting and collecting species. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager with support from 3rd party ecology as required. |
| Risk of invasive flora species | No sign of spread of invasive species. | Construction<br>Operation<br>Decommissioning | Visual observation | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of protection of flora to maintain both biodiversity and to protect against erosion. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager with support from 3rd party ecology as required. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Risk of invasive flora species | Preparation and implementation of Biodiversity Action Plan. | Construction<br>Operation<br>Decommissioning | Confirmation of compliance with measures specified in the Biodiversity Action Plan.<br>Refer to the Biodiversity Action Plan for further details. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of protection of flora to maintain both biodiversity and to protect against erosion. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager with support from 3rd party ecology as required. |
| **Occupational Health and Safety** | | | | | |
| Occupational Health and Safety | Occupational Health and Safety Plan developed and implemented | Construction<br>Operation<br>Decommissioning | Compliance with the measures specified in the OHS plan | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager and EPC HSE Manager. |
| Occupational Health and Safety | Develop and implement Emergency Preparedness and Response Plan. | Construction<br>Operation<br>Decommissioning | Compliance with the measures specified in the Emergency Preparedness and Response Plan | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager and EPC HSE Manager. |
| Occupational Health and Safety | Workers trained on occupational health and safety | Construction<br>Operation<br>Decommissioning | Workers trained on occupational health and safety and confirmation that number meets the requirement for the total workforce on site | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager and EPC HSE Manager. |
| Available of suitable PPE | PPE procured and being used by the workers | Construction<br>Operation<br>Decommissioning | Visual inspection and review of the number of H&S incidents, near-misses or accidents recorded. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager and EPC HSE Manager. |
| Availability of fire fighting facilities | Fire extinguishing facilities on site | Construction<br>Operation<br>Decommissioning | Visual inspection and review of the number, availability and condition of facilities. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager and EPC HSE Manager. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Availability of first aid kit and qualified first aiders | Qualified first aid professionals on site and first aid kit on site | Construction<br>Operation<br>Decommissioning | Visual inspection and review of the number, availability and condition of first aid kits.<br>Confirmation of a medical professional on site. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Occupational Health and Safety | Signage installed on site | Construction<br>Operation<br>Decommissioning | Confirmation of appropriate signage on site particularly at meeting areas or where work will be undertaken.<br>Number of H&S incidents, near-misses or accidents recorded. | During weekly checks and monthly detailed audit<br>Daily toolbox talks should emphasise the importance of OHS. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Waste** | | | | | |
| Solid and Liquid wastes | Pollution Prevention and Control Plan | Construction<br>Operation<br>Decommissioning | Confirmation of implementation of the Pollution Prevention and Control Plan | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Solid and Liquid wastes | Water Management Plan | Construction<br>Operation<br>Decommissioning | Confirmation of implementation of the Water Management Plan | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Liquid wastes | Quantity and quality of liquid waste generated<br>Number of Sanitation facilities on site | Construction<br>Operation<br>Decommissioning | Confirmation of Quantity and quality of liquid waste generated.<br>Confirmation that waste water has been collected and disposed of at a licensed facility or appropriately treated on site in the case of sewage. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Eppert. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Liquid wastes | Number of Sanitation facilities on site | Construction<br>Operation<br>Decommissioning | Confirmation of number of sanitation facilities on site and confirmation that it meets the needs of the workforce. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Solid wastes | Quantity of solid waste generated and correctly disposed to licensed disposal sites. | Construction<br>Operation<br>Decommissioning. | Confirmation of Quantity and quality of liquid waste generated.<br>Confirmation of disposal by licensed solid waste transporter. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Solid wastes | Solid waste storage facilities on site. | Construction<br>Operation<br>Decommissioning. | Confirmation of number of waste facilities on site and confirmation that there has been appropriate segregation and storage. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Hazardous materials / wastes | Hazardous Waste Management training | Construction<br>Operation<br>Decommissioning. | Number of Trained Workers on Hazardous Waste Management | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Hazardous materials / wastes | Amount of Hazardous Waste Segregated | Construction<br>Operation<br>Decommissioning. | Confirmation of amount of hazardous waste generated. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Hazardous materials / wastes | Quantity of accidental hazard spillage | Construction<br>Operation<br>Decommissioning. | Confirmation of number of spillages of hazardous wastes. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Security** | | | | | |
| Project site safety and security | Security Management Plan developed and implemented | Construction<br>Operation<br>Decommissioning. | Confirmation of implementation of the Security Management Plan | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Project site safety and security | Number of Security personnel employed | Construction<br>Operation<br>Decommissioning. | • Confirmation of implementation of the Water Management Plan | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Project site safety and security | Site Fence<br>Trained workers on site security | Construction<br>Operation<br>Decommissioning. | Visual inspection of the condition of the site perimeter fence and evidence of damage. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Project site safety and security | Trained workers on site security | Construction<br>Operation<br>Decommissioning. | Review of number of trained workers on site security | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Project site safety and security | Provision of code of conduct for security personnel. | Construction<br>Operation<br>Decommissioning. | Confirmation that a code of conduct is in place and that all security personnel have sign up to it. | Prior to the appointment of security personnel | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Project site safety and security | Results of background checks for security staff. | Construction<br>Operation<br>Decommissioning. | Review of Results of background checks for security staff. | Prior to the appointment of security personnel | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Project site safety and security | Positive view of the security personnel by local community meetings | Construction<br>Operation<br>Decommissioning. | Minutes of community meetings<br>Confirmation of provision of information through the SEP and grievance mechanism | During weekly checks and monthly detailed audit | Weekly checklist: CLO, EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Community Health and Safety** | | | | | |
| Safety of Local Community | Community H&S Plan | Construction<br>Operation<br>Decommissioning. | Confirmation of implementation of the Community H&S Plan<br>See separate CHS Plan for further details. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Safety of Local Community | Provision of information through the SEP and grievance mechanism | Construction<br>Operation<br>Decommissioning. | Review of information provided to communities and review of grievance log. | During weekly checks and monthly detailed audit | Weekly checklist: CLO, EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Archaeology and Cultural Heritage** | | | | | |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Archaeology and cultural heritage | Chance Find Procedure | Construction | Confirmation of implementation of the Chance find procedure and review of reports produced | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Archaeology and cultural heritage | Number of recorded chance finds | Construction | Number and type of chance finds | During weekly checks and monthly detailed audit for the initial site preparation and topsoil stripping work. | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Visual and Landscape** | | | | | |
| Visual and landscape | Site rehabilitation and landscaping | Operation<br>Decommissioning. | Visual inspection of success of site rehabilitation and landscaping | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Visual and landscape | General site condition | Construction<br>Operation<br>Decommissioning. | Visual inspection of site condition and presence of litter particularly on the perimeter fence. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Socio-economic** | | | | | |
| Socio-economic – population and economy | Stakeholder Engagement Plan and grievance mechanism | Construction<br>Operation<br>Decommissioning. | Confirmation of implementation of the Stakeholder Engagement Plan and grievance mechanism<br>Review of Stakeholder engagement activities.<br>Number of grievances recorded. | During weekly checks and monthly detailed audit | Weekly checklist: CLO<br>Monthly detailed audit: Masdar E&S Manager. |
| Socio-economic – population and economy | Skills training agreement with local vocation training centre. | Construction<br>Operation<br>Decommissioning. | Confirmation of training places provided and completed. | During weekly checks and monthly detailed audit | Weekly checklist: CLO<br>Monthly detailed audit: Masdar E&S Manager. |
| Local hiring and workforce management | Local employment plan | Construction<br>Operation<br>Decommissioning. | Confirmation of the implementation of a Local employment plan<br>Monthly audit results showing workforce statistics | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |

| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Socio-economic – population and economy | Adherence to GIIP with respect to construction works. | Construction | Visual inspection of construction works | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Socio-economic – population and economy | Access arrangements for local residents. | Construction<br>Operation<br>Decommissioning. | Review of grievance log | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Spread of Food and Water-borne Disease | Agreements with relevant government/NGOs to support health campaigns | Construction<br>Operation<br>Decommissioning. | Agreements with relevant government/NGOs to support health campaigns | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Spread of Food and Water-borne Disease | Information disclosed as part of health campaigns | Construction<br>Operation<br>Decommissioning. | Heath related advertising and communication. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Spread of Communicable Disease | Provision of employee health screening. | Construction<br>Operation<br>Decommissioning. | Confirmation of health screening.<br>Number of reported heath incidents. | During monthly detailed audit | Monthly detailed audit: Masdar E&S Manager. |
| Spread of Communicable Disease | Provision of H&S induction focus on heath matters. | Construction<br>Operation<br>Decommissioning. | Confirmation that all workers have completed the health related induction. | During monthly detailed audit | Monthly detailed audit: Masdar E&S Manager. |
| Spread of Communicable Disease | Provision of health related awareness and training to workforce | Construction<br>Operation<br>Decommissioning. | Review of heath related advertising and communication.<br>Number of reported heath incidents. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Increased Pressure on Health Services | Provision of worker health care through dedicated Project professional | Construction<br>Operation<br>Decommissioning. | Agreement or contract with health care provider.<br>Confirmation of presence of health care professional on site. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |

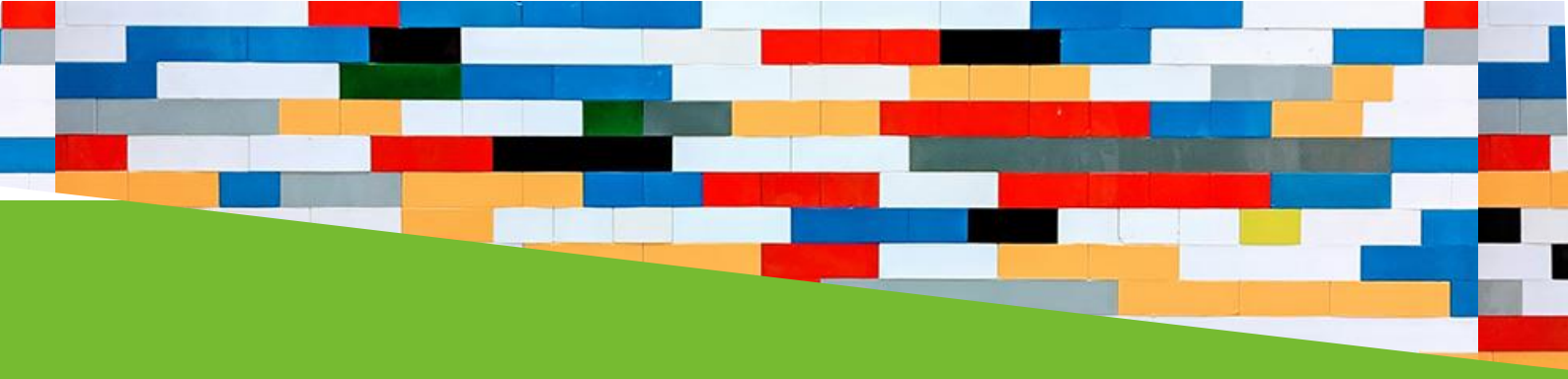
| Environmental component | Key performance indicators | Project phase | Parameter to be measured | Sampling frequency | Responsibility |
|---|---|---|---|---|---|
| Increased Pressure on Health Services | Investments in facilities used by workers | Construction<br>Operation<br>Decommissioning. | Agreement or contract with health care provider to provide investment in facilities. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Pressure on Water Resources | Provision of worker code of conduct | Construction<br>Operation<br>Decommissioning. | Review of signed worker code of conduct.<br>Review of grievance log.<br>Visual inspection confirming availability of bottled water for workforce. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Sale and Use of Alcohol | Development of zero-alcohol policy | Construction<br>Operation<br>Decommissioning. | Review of reported incidents and results of failed alcohol tests | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| **Traffic and Transportation** | | | | | |
| Traffic Management | Traffic Management Plan | Construction<br>Operation<br>Decommissioning. | Confirmation of implementation of the Traffic Management Plan.<br>Review of grievance log. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Traffic incidents | Advanced driver training. | Construction<br>Operation<br>Decommissioning. | Number of drivers that received advanced driver training. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Traffic incidents | Road safety briefings provided. | Construction<br>Operation<br>Decommissioning. | Number of road safety briefings provided. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |
| Traffic incidents | Reported driving incidents including speed violations. | Construction<br>Operation<br>Decommissioning. | Number of driving incidents including speed violations. | During weekly checks and monthly detailed audit | Weekly checklist: EPC and ROLE TBC<br>Monthly detailed audit: Masdar E&S Manager. |

# 10. References

# Appendix D Turnstone Ecology CHA Report

SEE SEPARATE ATTACHMENT

# Appendix E DRAFT Central Asian Tortoise Relocation Report



# CENTRAL ASIAN TORTOISE RELOCATION REPORT

## 220 MW Solar Farm in Kattakurgan, Samarkand, Uzbekistan

Green Business Innovation

DRAFT V1

**Nur Samarkand Solar FE**

**16.12.2022**

## TABLE OF CONTENTS

# 1 INTRODUCTION

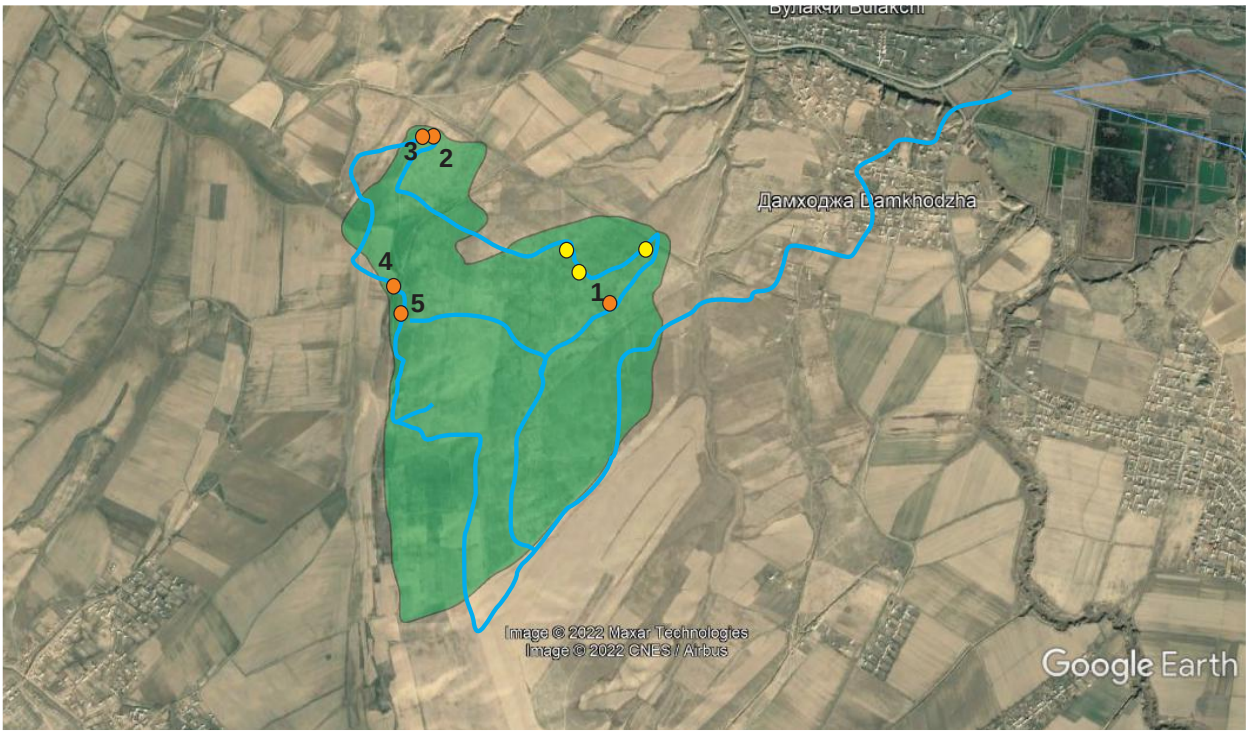
## 1.1 Overview

The purpose of this document is to provide a report on the tortoise relocation activities to date in terms of the Project specific requirements informed by herpetological assessment conducted in April 2022 and conducted consultations with the Regional Ecology Department in September, December 2021 and State Ecology in May 2022.

## 1.2 Background

As described in Project ESIA "The herpetofauna study comprised of literature and online resource searches of species and region accounts to determine what species may be present on site, and on-site field survey which was completed in October 2022 and April 2022. During the field survey an attempt was made to assess the status of reptiles and amphibians in the study area (specification of the species and quantitative composition, territorial distribution, including places of concentration, the state of habitats).

During herpetological survey in April 2022 the total quantitative counting of species was carried out through the line transect census method at typical habitats. During the field observations, only 5 individuals of species were recorded at the total transect length of 12.4 km. The species' places in the community were estimated according to indices determined by the dominance gradation scale for zoogeographic analysis: less than 0.1 individuals/ha – very rare species, 0.1 to 0.9 – uncommon one, 1.0 to 9.0 – common one, more than 10.0 – abundant one. The species with more than 10% of the total population density were considered as dominant and co-dominant ones.




**Source:** Figure1**.** Herpetological survey, April, 2022. The tracks of April observation; an orange circles – *Testudo horsfieldii*; yellow circle marked the burrows of *Testudo horsfieldii*.

The census showed that the population density of the tortoise does not exceed 0.1 ind./ha. The state of the carapace of many individuals also manifests itself in the extremely depressed state of this population. Almost all tortoises show injuries, probably traces of ploughing the territory.

The project site is surrounded by ploughed fields for many kilometres around. In this regard, it turned out to be problematic to find a suitable site for the relocation of tortoises from the project area.

Recommended actions:

- Creation of the "Closed Zones", which will be located on the territory of the object (behind the fence). This area should represent biotopes and serve as an indicator of the presence of protected species. It will serve as a kind of buffer zone for the facility, and at the same time, a kind of nature reserve where wild animals can live peacefully. Depending on the construction project, I can give recommendations on where it is most appropriate to allocate a buffer zone at the facility.

The population density of *Testudo horsfieldii* in the project area extremely low. According to our estimates, only a few dozen tortoises inhabit the project area (no more than 20-30).

- In order to protect tortoises in the project area, it is recommended to fence off a plot of about 50x50 meters, in a suitable biotope with developed vegetation and a large number of bushes.
- Prior to the start the construction work, necessary to scan the entire territory and relocate all tortoises to this enclosure for the entire period of active construction. Captured tortoises should be tagged and photographed before being placed in the enclosure. This will enable monitoring and control of the moved tortoises. If necessary, organize the feeding of tortoises before they hibernate.
- In the next year it will be possible to remove the fence of the enclosure and the tortoises will be able to disperse around the project area and live in their original areas. At the same time, tortoises can quite successfully live within inside the project area, because they natural habitats (beams, ravines, gullies and depressions) will not been deeply affected of the construction process. However, it is necessary to take into account the design specifics of the location of solar panels on the site, how close they will be located to each other, in which area the top layer of soil will be removed to level the surface, whether it is expected to use herbicides or other chemicals during the operation of this area. The answers of these questions will determine the choice of strategy.

Source: April survey, 2022. Central Asian Tortoise feeding in the ravine.

During this season, the tortoises are usually not bound to permanent burrows, but use temporary burrows to lodge for the night. Therefore, recording the position of temporary burrows will not help detect tortoises during hibernation. Moreover, it is highly undesirable to conduct the relocation process of tortoises at their hibernation period.

The tortoise relocation was conducted in June 2022. The relocation surveys for Central Asian tortoise were conducted within the solar farm project land footprint area total 426 ha area that required for construction of the solar PV farm.

Total 52 tortoises were caught and relocated to the receptor area - Nursery Site in the project area, suggesting 0.1 per hectare.

## 1.3 Survey Work protocol

The survey works within the areas covered the objective to record the presence and relocate any active animals:

5. Searching for active tortoises was conducted on 9-14 June (+ 2 days nursery arrangement time) in Kattakurgan. The footprint area was divided into 6 parts (refer to Map 1.)

Any active animals were caught, health checked and marked and then moved to the receptor areas confirmed with Samarkand Regional ecology department.

6. Burrows search (methodology described in Section 2.1)

The search has been undertaken in early summer, hence there was a chance that some species could be in early stage of summer hibernation. This is why all identified burrows within working areas were checked using endoscopes. The checked burrows were not destroyed since at this season there is a risk related to eggs. The burrows within the area (Zone 1) of higher density of tortoises (the areas where majority of tortoises were caught) have higher probability of laid eggs. The Special Attention Zone (Zone 1, Map 1) was marked to inform the pre-works ecological walkover survey to have the area re-checked by the EPC before clearing.

Each day working protocol:

Working hours: from 6 am to 11 am and from 4 to 7 pm with 5 hours break at hot time of the day as reptiles were not active at these hours. This was time of the day with good visibility.

- 6 am. Team briefing and setting the plan for a day.
- 7 pm. Reporting results at the end of the day, marking the animals and releasing them in the receptor area.

The Surveyors performed a transect walk 15m apart. Every person was observing 15 m on the right and 15 m on the left. The team walked in parallel and in straight lines to sweep the full section. Given the higher density in Zone 1, the team revisited the area number of times.

Manpower:

The surveyors were organized into 3 teams. Each team consisted of a specialist and assistant:

- Professional herpetologist oversight. Herpetologist and biodiversity specialists were working with assistants to insure professional monitoring of the works.

Details of the engaged team are provided in the Appendix 1.

## 1.4 Legislation

The main legislation of Uzbekistan applicable to biodiversity management is listed below.

- Law №3РУ- 408 of the Republic of Uzbekistan on “The Protection and use of the animal world ” (new edition) as of 19.09.2016
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 290 dated 20.10.2014, on “The Regulation of the use of biological resources and on the permission procedures in the sphere of nature use”.

The State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection (Goscomecology) executes state control in the field of protection and use of the animal world.

Legal entities and individuals are obliged to take measures to prevent diseases and death of wild animals, preserve their habitat, breeding grounds and their migration routes in the implementation of any types of economic and other activities. All actions have to be coordinated with Goscomecology.

The team presented the herpetological survey results (conducted in April 2022) to the representatives of Goscomecology in Tashkent. The relocation permit (provided in the Appendix 3) was obtained from Goscomecology to execute relocation activities. The permit prescribed conditions to provide summary of BAP and Pre-construction ecology survey protocols. A copy of the permit letter from Goscoecology was sent to Samarkand regional Department for further monitoring of the activities.

At the regional level Goscomecology is represented by its regional departments, that undertake control and coordination in the respective regions of Uzbekistan.

Samarkand region Department for Ecology and Environmental Protection is regional department in charge of coordination and control of all environmental issues for Nur Samarkand Solar project.

Relocation of animals was monitored by assigned representative of Samarkand regional Department for Ecology and Environmental Protection (Rusiboev Dilmurod). Upon completion of relocation works *Relocation protocol* with list of relocated animals and coordinates of agreed receptor area (provided in the Appendix 3) was signed by representative of Gallaorol gional Department for Ecology and Environmental Protection, Nur Samarkand Solar representative and consultants.

# 2 TORTOISE RELOCATION METHODOLOGY

## 2.1 Rationale

Described methodology has been implemented in order to protect the ecosystem of the project area and vulnerable species from the negative effects of construction work. The main goal of the reptile's relocation is to achieve zero mortality among tortoises and other reptiles during construction phase.

### *Central Asia tortoises*

The relocation of tortoises to a safe place is carried out by two methods: the first is the collection of tortoises from the project area in the spring (March-early June) and relocation to another receptor area, the second method is the destructive search of tortoises in a state of hibernation. The first method is recommended to be used by herpetologist assessment report as well as approved State ecology permit methodology.

Special attention zone was marked to inform the pre-works ecological walkover survey and to have the area to be re-checked by the EPC before clearing.

While surveying areas, the team paid attention to several points that inform potential presence of tortoises in the area. First, searching for residential and non-residential old burrows with horizontally oval shapes. Second, the presence of tortoise day-beds under the bushes. These are usually shallow pits, where tortoise might hide from the heat in the daytime. Also, a characteristic feature of the habitat is the presence of tortoise excrement and dry carapace shells on the territory. Special attention zone is the areas where the majority of tortoises were caught and described by concentration of burrows and traces suggesting potential presence of tortoises.

All animals seen as well as those caught and moved are subject to a health check and the following details will be recorded:

- Age
- Sex
- Size (length and width of carapace)
- Weight

- Location moved to (GPS)
- A photograph of each animal will be taken to include pictures of the carapace

Each animal caught and moved in 2022 will have the same marking applied.

Pre-construction and pre-works surveys will be completed throughout the construction period following the methodology detailed above

The presence of burrows within working areas should be noted and checked for the presence of hibernating animals. If hibernating reptiles are found, then the area shall be avoided until the following spring when the area will be subject to secondary checks.

If during the initial pre-construction surveys the Reptile Expert identifies the presence of other species of international conservation concern they must immediately report the findings to the EPC Contractor and Project Company, who shall communicate it to the relevant stakeholders (biodiversity authorities & lenders).

The process was conducted in communication with Goscomecology. Appointed Goscomecology specialist has visited the area and signed the act of relocation of the reptiles to the receptor area.

## 2.2 Receptor Site Selection- Nursery site

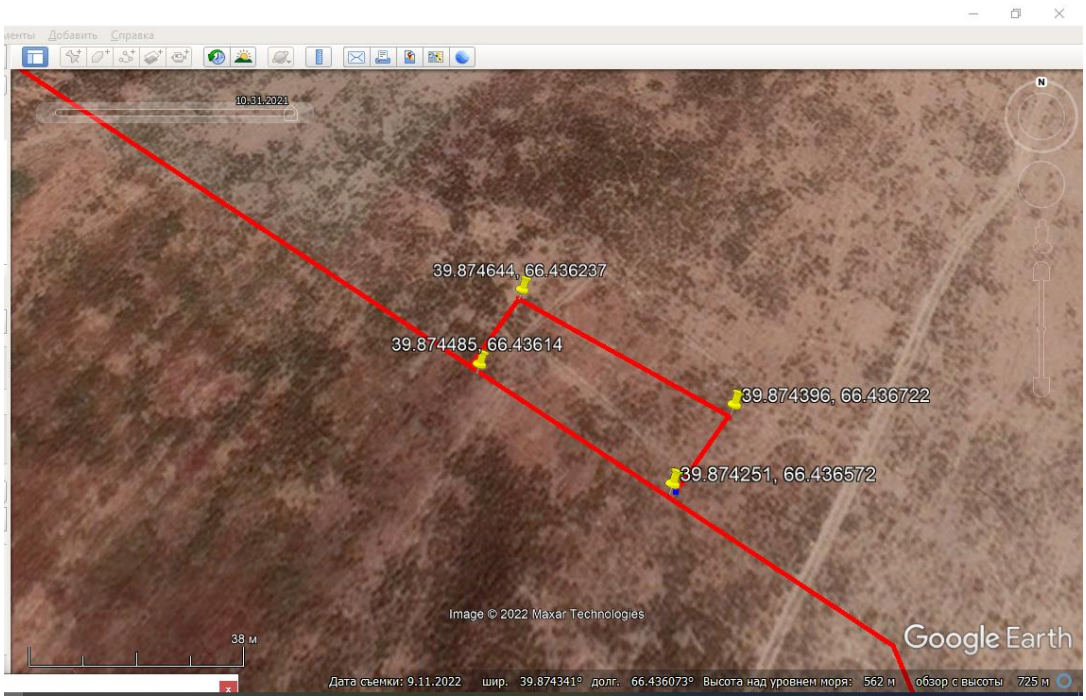
The results of the assessment conducted in April 22 showed the relatively small number of tortoises population in the area, and most importantly, there is no suitable area for relocation within a 20 km zone around the project site.

It was recommended to fence off a plot of about 50x50 meters, in a suitable biotope with developed vegetation and a large number of bushes and relocate tortoises for the period of construction to the created nursery in the project site.

The nursery site selection was undertaken in consultation with Herpetologist (methodology advisor) and head of bio control department of Samarkand regional ecology (Map 3, Appendix 2) and confirmed by the Samarkand regional ecology.

Nursery site coordinates are as follows:

- 39.874644,66.436237
- 39.874485,66.436141
- 39.874396,66.436722
- 39.874251,66.436572




It is a square plot of 50x70 meters. Selected area in the north-west edge of the project area. Selected area is characterized as typical habitat for tortoises with ravines, gullies where vegetation lasts longer and there are enough shelters.

Following specialist's recommendations, the fence was installed 40 cm underground and 60 cm above the ground. The height enough to protect the nursery from grazing.

Source:Tortoise relocation, fencing the nursery, June 2022

## 2.3 Marking of Tortoises for Monitoring

In order to further monitor and not to confuse relocated tortoises, tortoises were marked with a waterproof paint of a yellow color that is easily noticeable.

Source: Survey in June, 2022. Marking the tortoises

# 3 RESULTS

## 3.1 Relocation results

Total 52 tortoises were caught and relocated to the nursery site. Map 2 and3 in the Appendix 2 shows the area where the tortoises were collected and relocated.

Source: Tortoise relocation, June, 2022

Source: Tortoise relocation, June, 2022

Before placing the tortoises in the Nursery site, preparatory measures were undertaken.
To make the digging process for tortoises in the nursery site easier, the team has prepared burrows that made the upper soil softer and allowed the tortoises to go underground easier.

Source: Tortoise relocation, Nursery site arrangement, June, 2022

Also the 3 tons of water was delivered to the nursery site to additionally soften the soil and cool down the surface that helped tortoises to start the estivation season. The team continued to monitor the process for two consecutive days and after that visited the area regularly next two weeks.

Source: Source: Tortoise relocation, June, 2022

## 3.2 Special attention zone

The location of tortoises, burrows and traces were used to inform Special attention zone (Zone 1) (Map 1 in the Appendix 2). The marked area is suggested for pre-works surveys to avoid the risk of juvenile and hibernating tortoises. Congestion of tortoises and burrows are observed in the polygon indicated as special attention zone. All construction works in these areas must be carried out under the close supervision and control of ecologist.

Although, there is a reasonable level of certainty that the number of collected and relocated animals represent the majority part of population in the surveyed area, the special attention are needs to be revisited for the presence of juveniles and hibernating tortoises at the pre-works surveys and, the ecologist should supervise the track construction works in these areas by working closely with the machine drivers under an Ecological Watching Brief, to ensure the ground is carefully and methodical removed by the machine operators and the ecologist removing any tortoises which might be found this way (and advising changing/adapting the work method if higher numbers of tortoises are unexpectedly found). In case of higher numbers of tortoises are unexpectedly found it is recommended to place the animals in wild animals nurseries until next spring when the animals can be released to the receptor areas.

# 4 RELOCATED ANIMALS STATISTICS

Relocated reptiles details are provided in the attached relocation protocol:

*The statistics of relocated*

- Gender distribution: 38 females, 8 males, 6 immature.
- Condition: 4 individuals with very good condition, 20 - normal, 28- satisfactory;
- Age: from 1 to 15 years;

Provided data can be used for further monitoring and inform the research of the herpetofauna of the area.

*Procedures undertaken:*

Communication with Samarkand Department of Goscomecology was kept on regular basis during relocation survey. Head of the Department for Biodiversity and Protected Areas was appointed by Samarkand Goscomecology to monitor the process of relocation of the animals to the receptor site and sign respective documents. Photos and document including list of tortoises is provided in the Appendix 3.

# 5 FURTHER MITIGATION AND MONITORING REQUIREMENTS

Further mitigation requirements/prescriptions described in the BAP should be observed.

# APPENDCES

# APPENDIX 1. TEAM DETAILS

## 1. Fazlullakhon Agzamov, biodiversity specialist

*Date of birth*: 18.11.1987

*Address:* Uzbekistan/Tashkent Chilanzar district, 5th-Khiva-3

*Career:*

2018- currently, research specialist on biodiversity, Research Institute of Ecology and Environmental Protection, Tashkent.

Projects engaged:

- Development of legal framework for urban trees molding;
- Reseach for establishment of new protected areas and national nature parks in Central Kysilkum, Babatak moutines, Tamdy Aktau mountines;
- Study of the range of seasonal migrations of ungulates in the western Tien Shan;
- Biodiversity assessment of Tamdy, Ustyurt, Surkhandarya, Karmana.

2018- 2020, Coordinator of eco-inspectors, Tashkent city department of the State committee on ecology and environment protection;

2019 - Research project in Karakalpakstan, Biodiversity conservation chapter;

2016 – 2018, Bird census project, Bird Watchers Society of Turkey;

2010 – 2015, Specialist of expedition to 11 nature reserves in Uzbekistan, joint project of Goscomecology and Zukkov Fund and Greifswald University;

2010 – 2013, National consultant on capacity assessment of nature reserve workers, UNDP/GEF project for nature reserves, Tashkent.

*Education:*

- Tashkent state Pedagogical University named after Nizami, faculty of Law, Bachelor Degree, 2009
- Tashkent State University, Biology department, 2013
- Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Department of Environmental protection and geoinformation technologies, Master Degree, 2020
- Landscape ecology & nature conservation (study course at Greifswald University/Germany) 1.5 month in 2011

Member of bird watchers society of Uzbekistan

Mentor of Central Asia cleantech startups platform

**2. Zoir SHARIPOV, herpetologist, researcher**

*Address*: Tashkent, Mirabad district, Yangi Kuyluk street, 1/6

*Nationality:* Uzbekistan

Wor*k experience:*

1974 – 1978 Zoology Institute, Laboratory of Ecology and Herpetology, Researcher, Herpetologist;

1979 - 1988 Central Asia ZOO Combinat under CheifHunting Department of USSR, Head of laboratory on taking poison from arthropods, research material for Academy of Science of Uzbekistan USSR;

1989 - 1992 ZOO KOMPLEX, Herpetologist (poisonous animals);

1993- 1999 Biology Institute under the name of Shimyakin, Moscow, Researcher, project developer;

1999-2004 Kazakhstan Academy of Science of Kazakhstan (Plant Protection Institute, Locust project);

2005 – Individual consultant and researcher. Consultant of State committee on ecology and environment protection;

*Education:*

1973-1979, Biology Faculty, Taskent State University

**3. Farhod Niyazov, ecologist**

*Address*: Navoi region, Hatirchi district

*Date of birth*: 01.10.1986

*Nationality*: Uzbekistan

*Work experience:*

2019 – Navoi region Department of Ecology and Environmental Protection, Chief specialist, Biocontrol department;

2018- 2019, Navoi region Department of Ecology and Environmental Protection Category 1, environmental specialist;

2017-2018 Navoi region Department of Ecology and Environmental Protection Inspection of waste collection, storage, transportation, disposal, processing, burial and sale, Control of waste generation, storage, collection, transportation;

2015-2017 Karmana District Consumer Protection Monitoring Specialist.

*Education*:

Tashkent Automile and Roads institute, Ecology Department, completed in 2012

**4. Bakhrom YUSUPOV, ecologist**

*Address:* Navoi region, Kiziltepa district

*Nationality:* Uzbekistan

*Work experience:*

2017 – Navoi region department of Ecology and Environmental Protection, Junior research assistant

2018 -2019 Assistant ecologist, part time, Environmental impact Assessment. A draft statement on the environmental impact (Draft EIS) on silk products "Construction of new smelting furnace at copper smelting plant»

2018- 2019 Assistant ecologist, part time, Assessment of the impact on the environment. Draft environmental impact statement for PTEO "Construction of Copper processing plant No. 3 (MOF-3) within the framework of the investment project" development of the Yeshlik-I Deposit»

*Education :*

Navoi Colleage , Biology and chemistry class, completed in 2018

Student of Nanjing University of Science and Technology, since 2019

**5. Aminjon MALIKOV, veterinarian, zoologist**

*Address*: Navoi region, Kiziltepa district

*Nationality*: Uzbekistan

*Work experience*:

2018 – ecologist, Navoi region department of Ecology and Environmental Protection, Inspection Department

2013-2016 Reseach Assistant, Expedition specialist in the project: Census of vertebrates number on the territory of Kazakhdarya, Kungrad state forest hunting farms, Karauzyak and Takhtakupir forestry of the Republic of Karakalpakstan

2010 -2012 SpecialistVeterinarian, State Vet Control, Navoi

2008- 2009 Research Lab Assistant, Samarkand Agrarian institute

*Education* :

Samarkand Agrarian institute, Department of Veterenary , Bachelor degree, 2008

**6. Abdusalom Normatov, senior researcher, Forestry scientific research institute, Tashkent**

*Address:* Tashkent, Uzbekistan

*Nationality*: Uzbekistan

*Work experience*:

2018- currently, senior researcher, Forestry Scientific Research Institute, Tashkent

2015-2018, Agronomist, Botanical Institute of the Academy of Science of the Republic of Uzbekistan;

2007 -2015, Director, private company “Jargurghon Urmon” in Surkhandarya region (sprouts harvesting);

2004- 2007, Lead Forester, Surkhandarya State Nature Protection Committee, “Tabiyat” experimental research centre;

2002-2004, Lead specialist for bio-control inspection, Surkhandarya State Nature Protection;

1996-2002, Head Forester, Sherobod Forestry, Qiziriq district, Surkhandarya region;

1988-1993, Deputy Head, Tajik Agrarian Scientific research insitute, Tajikistan;

1987-1988, Junior researcher, Ural Institute for decorative plants, Russia.

*Education*:

Ural Forestry Institute, Ural, Russian Federation 1990

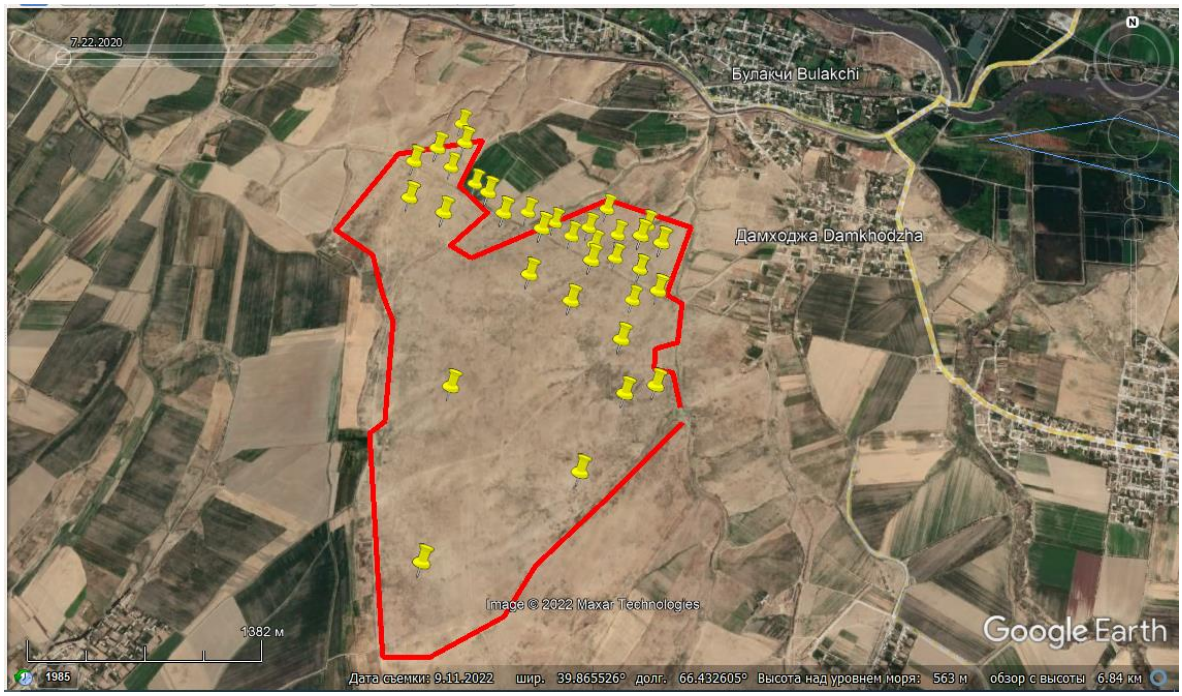
PHD thesis: “The choice of promising tree and shrub species for landscaping objects located in the desert zone on the example of Uchkuduk area in Uzbekistan”

# APPENDIX 2. MAPS

Map 1. *Survey protocol: division of area*


1 Zone –tortoise high concentration zone (Special attention zone)
2 Zone – low density zone

Map 2. Tortoise location map




Map 3. Tortoise nursery site


## APPENDIX 3: PERMIT AND RELOCATION PROTOCOL

*Relocation permit of Goscomecology*

O‘ZBEKISTON RESPUBLIKASI EKOLOGIYA VA ATROF-MUHITNI MUHOFAZA QILISH DAVLAT QO‘MITASI RAISINING BIRINCHI O‘RINBOSARI TOPSHIRIG‘I

100043. Toshkent shahri, Chilonzor tumani, Bunyodkor shoh ko‘chasi, 7a-uy. tel.: 71-207-11-02, faks: 71-236-02-32 veb-sahifa: http://www.eco.gov.uz, elektron pochta: info@eco.gov.uz

2022-yil "10" 06 02-02/1-756 - son Toshkent sh.

**Жиззах вилояти Экология ва атроф-мухитни муҳофаза қилиш бошқармаси**

**Самарқанд вилояти Экология ва атроф-мухитни муҳофаза қилиш бошқармасига**

"SHAMOL ZARAFSHAN ENERGY" масъулияти чекланган жамияти Давлат экология қўмитасига умумий қуввати 440 МВт бўлган куёш фото-электр станциялар қурилишини бошлаш ниятидалигини билдириб ўтди. Лойиҳанинг маҳаллий биохилмахилликка салбий таъсирини минималлаштириш ва (2019 йилда Ўзбекистон Республикаси Қизил китобига киритилган) ўртаосиё чўл тошбақасининг биологик фаоллик вактини инобатга олган холда, ҳаётига зарар етказиш хавфининг олдини олиш мақсадида, Давлат экология қўмитаси лойиҳа доирасида "SHAMOL ZARAFSHAN ENERGY" МЧЖ томонидан таклиф этилган бир катор хорижий олим ва мутахассислар томонидан берилган илмий асосланган тавсиялар доирасида тошбақаларни қурилиш режалаштирилган ҳудуддан ўхшаш биотопга эга хавфсиз ҳудудга 2022 йил 20 июнга қадар кўчиришни тавсия қилди.

Шу муносабат билан, Жиззах ва Самарқанд вилоятлари Экология ва атроф-мухитни муҳофаза қилиш бошқармаларидан мазкур тадбирларда иштирок этиш учун малакали мутахассис ажратишингиз ва ўз навбатида назоратга олишингиз топширилади. Тошбақаларнинг кўчирилганлиги тўғрисидаги маълумотни (фото суратлар илова қилинган холда) далолатнома тузишингиз ва жорий йилнинг 20 июнда Давлат экология қўмитаси биохилмахилликни асраш бошқармасига ҳисобот беришингиз топширилади.

*Илова: 1 варақда*

Раиснинг
биринчи ўринбосари У.Халилов

*Relocation protocols signed by Goscomecology.*

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Компания подрядчик
_____ GBI consult

**Акт**
**о переселении**
**диких животных**

20.06.2022
Самарканд

Мы, нижеподписавшиеся, представитель ИП ООО «NUR SAMARKAND SOLAR PV», реализующий инвестиционный проект по строительству солнечной электростанции мощностью 220 МВт составили настоящий акт в присутствии представителя Самаркандская областного управления экологии и охране окружающей среды и консультантов проекта о перемещению диких животных на соседнюю территорию со схожим биотопом, найденных на частичной территории проекта подлежащей выравниванию.
Место сбора животных – территория отведенный под строительство солнечной электростанции
Место выпуска животных 39.874458, 66.436436
Животные были помещены в временный загон размером в на территории объекта и 20*50 метром. По завершению строительства будут обратно выпущены на территорию.

Список животных и спецификация приводятся в (Приложение 1.)

Акт составлен в двух экземплярах, по экземпляру каждой из сторон.

Стороны:

ИП ООО «NUR SAMARKAND SOLAR PV»,

_____ Хуршид Караматов

Представитель Самаркандская областного управления экологии и охране окружающей среды:

_____ Д.Рўзибоев, Начальник отдела управления по сохранения биоразнообразия, оцифровки и ведения кадастра

Консультанты:

_____Ф. Агзамов, специалист по биоразнообразию, консультант, GBI consult

_____С. Юсупова, директор GBI consult

Приложение 1:

Список и спецификация животных:

- ID номер, пол, длина панциря, фото (Фото будут размещены в Гугл диск)

| № | Животное | Детали (пол, возраст, состояние, длина панциря, вес, координаты нахождения, фото) |
|---|---|---|
| 1 | Черепаха | Самка 16 см |
| 2 | Черепаха | Самка 16,5 см |
| 3 | Черепаха | Самка 15 см |
| 4 | Черепаха | Самка 15 см |
| 5 | Черепаха | Самка 13 см |
| 6 | Черепаха | Самец 11 см |
| 7 | Черепаха | Самец 13 см |
| 8 | Черепаха | Самка 17 см |
| 9 | Черепаха | Самка 17 см |
| 10 | Черепаха | Самка 15,5 см |
| 11 | Черепаха | Самец 13,5 см |
| 12 | Черепаха | Самец 13 см |
| 13 | Черепаха | Самка 14 см |
| 14 | Черепаха | Самец 12 см |
| 15 | Черепаха | Самец 11 см |
| 16 | Черепаха | Самка 14 см |
| 17 | Черепаха | Самка 14 см |
| 18 | Черепаха | Самка 16 см |
| 19 | Черепаха | Самка 17 см |
| 20 | Черепаха | Самец 12 см |
| 21 | Черепаха | Самка 16 см |
| 22 | Черепаха | Самка 16 см |
| 23 | Черепаха | Самка 14,5 см |
| 24 | Черепаха | Самец 17 см |
| 25 | Черепаха | Самка 17 см |
| 26 | Черепаха | Самка 10 см |
| 27 | Черепаха | Самка 14 см |
| 28 | Черепаха | Самка 16 см |
| 29 | Черепаха | Самка 16 см |
| 30 | Черепаха | Самка 15 см |
| 31 | Черепаха | Самка 15,5 см |
| 32 | Черепаха | Самка 17 см |
| 33 | Черепаха | Самка см 12 |
| 34 | Черепаха | Самка 16 см |
| 35 | Черепаха | Самка 15 см |
| 36 | Черепаха | Самец 12 см |
| 37 | Черепаха | Самка 13 см |
| 38 | Черепаха | Самка 15 см |
| 39 | Черепаха | Самка 13,5 |
| 40 | Черепаха | Самка 14 см |
| 41 | Черепаха | Самец 12 см |
| 42 | Черепаха | Самка 16 см |
| 43 | Черепаха | Самка 16 см |
| 44 | Черепаха | Самка 14,5 см |
| 45 | Черепаха | Самец 10 см |
| 46 | Черепаха | Самка 17 см |
| 47 | Черепаха | Самка 13,5 см |
| 48 | Черепаха | Самец 12 см |
| 49 | Черепаха | Самка 16 см |
| 50 | Черепаха | Самец 10 см |
| 51 | Черепаха | Самка 15 см |
| 52 | Черепаха | Самец 13 см |

Мониторил:

_____ Д.Рўзибоев, Начальник отдела управления по сохранения биоразнообразия, оцифровки и ведения кадастра

*Фото прилагаются*

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