Environmental & Social Impact Assessment (ESIA)

Kungrad 1.5GW Wind Farm in Uzbekistan

ECO Consult

acwa

REV-11

June 2026

Addendum: Revised OHTL Configuration

Some refinement to the initially assessed overhead transmisison line ("OHTL") design has became necessary due to technical conversations with the offtaker. The Offtaker required revision of the internal Wind Farm transmission configuration between the Wind Farm Substations and the Ustyurt Substation. Under the revised design, transmission lines from Kungrad 1 to Ustyurt (24km) and from Kungrad 3 to Ustyurt (34km) will now be double circuit configurations to achieve full redundancy. Only the Kungrad 2 cluster will be evacuated to Ustyurt via a single circuit OHTL (a length of about 500m). This introduces approximately 58 km of additional double circuit OHTL. The linear distance of the OHTL assessed for the Project remains unchanged (approximately 844 km); however, the total length of OHTL has increased from 1384km to 1442km.

This results in a minor incremental increase in potential avian collision risk relative to the configuration assessed in the original biodiversity impact assessment. The Project commits to implement all mitigation measures identified in the ESIA, Biodiversity Management Plan (BMP) and Biodiversity Action Plan (BAP) for the revised total length of OHTL, including installation of Bird Flight Diverters and participation in the Project's post-construction fatality monitoring programme.

Lenders reviewed the implications of the revised configuration and concluded that, while the change would theoretically increase the biodiversity offset requirement, the increase is small relative to the overall uncertainty and conservatism inherent in the offset calculation methodology. Accordingly, no adjustment to the committed biodiversity offset scale has been required. Any future review of offset requirements informed by post-construction fatality monitoring results will take account of the revised OHTL configuration and associated increase in double line length when considering the effectiveness of mitigation measures and achievement of no net loss objectives.

Internal OHTL Section	Original ESIA Configuration	Linear distance (km)	Assessed OHTL length (km)	Revised Configuration	Revised linear distance (km)	Revised OHTL length (km)
Kungrad-1 WFSS – Ustyurt SS	Single Line	24.0	24.0	Double Line	24.0	48.0
Kungrad-2 WFSS – Ustyurt SS	Single Line	0.5	0.5	Single Line	0.5	0.5
Kungrad-3 WFSS – Ustyurt SS	Single Line	34.0	34.0	Double Line	34.0	68.0
Total Internal Wind Farm OHTL	58.5 km Single Line	58.5	58.5	58 km Double Line + 0.5 km Single Line	58.5	116.5

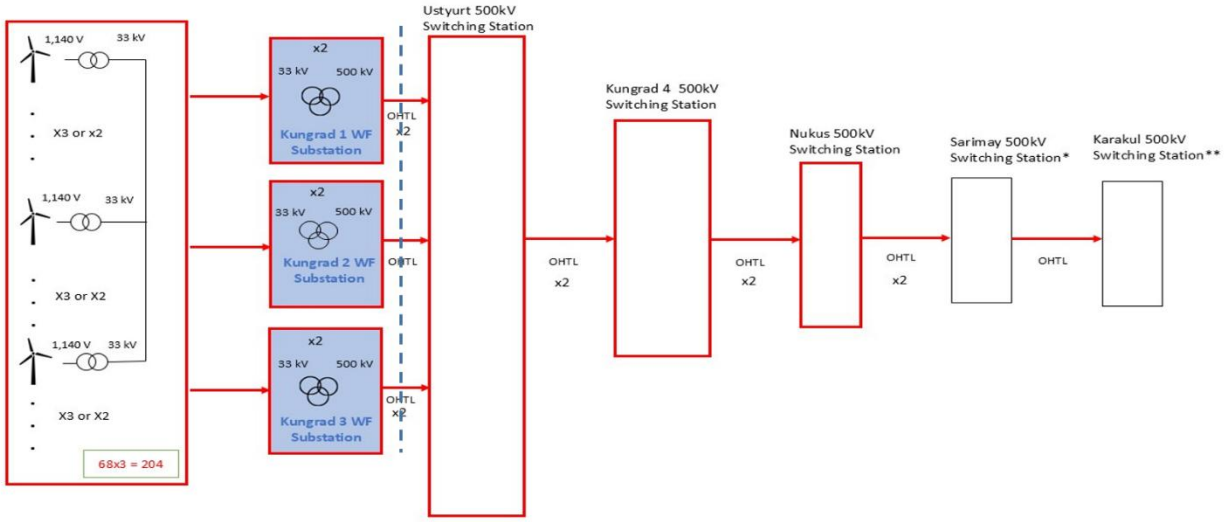

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TABLE OF CONTENT

Table of Content ..... **vi**
List of Figures ..... **ix**
List of Tables ..... **xii**
Abbreviation and Acronyms ..... **xv**
1. Introduction **1**
1.1 Background 1
1.2 The Environmental and Social Impact Assessment (ESIA) Report 1
1.3 Project Setup and Responsibilities 2
1.4 Document Structure 3
2. Project Description **5**
2.1 Project Location 5
2.2 Local Communities 8
2.3 Project Components 9
2.4 Overview of Project Phases 20
2.5 Project Schedule 22
2.6 Workforce Requirements 22
3. ESIA Approach and Methodology **23**
3.1 Analysis of Alternatives 23
3.2 Stakeholder Consultations and Engagement 23
3.3 Delineation of Study Boundaries and Scope Assessment 23
3.4 Impacts Assessment Methodology 26
3.5 Development of a Framework Environmental and Social Management Plan (ESMP) 30
4. Analysis of Alternatives **32**
4.1 Site Selection Alternatives 32
4.2 Technology Alternatives 38
4.3 Design Alternatives 41
4.4 No-Project Alternative 43
5. Regulatory and Policy Framework **45**
5.1 Environmental Clearance Process in Uzbekistan 45
5.2 Uzbekistan E&S Regulatory Context 46
5.3 International Agreements 50
5.4 Requirements for Project Financing 51
6. Stakeholder Consultion and Engagement **62**
6.1 Objectives 62
6.2 Stakeholder Identification and Analysis 62
6.3 Stakeholder Consultation and Engagement to Date 70

6.4 Future Stakeholder Engagement and Consultation 93
7. Overview of Strategic Environmental and Economic Impacts 96
7.1 Governmental Vision for the Energy Sector 96
7.2 Energy Security 96
7.3 Environmental Benefits 97
7.4 Overview of Project Specific E&S Impacts 97
8. Landscape and Visual 102
8.1 Assessment of Baseline Conditions 102
8.2 Assessment of Impacts 105
9. Land Use 125
9.1 Assessment of Baseline Conditions 125
9.2 Assessment of Impacts 131
10. Geology, Hydrology, and Hydrogeology 132
10.1 Assessment of Baseline Conditions 132
10.2 Assessment of Impacts 143
11. Biodiversity 153
11.1 Assessment of Baseline Conditions 153
11.2 Assessment of Impacts 240
11.3 Monitoring 281
11.4 Off Setting 282
12. Archeology and Cultural Heritage 283
12.1 Assessment of Baseline Conditions 283
12.2 Assessment of Impacts 307
13. Air Quality and Noise 311
13.1 Assessment of Baseline Conditions 311
13.2 Assessment of Potential Impacts 314
14. Infrastructure and Utilities 317
14.1 Assessment of Baseline Conditions 317
14.2 Assessment of Potential Impacts 328
15. Socioeconomics 353
15.1 Purpose 353
15.2 National Context and Project Location 353
15.3 Household Survey Findings 357
15.4 Socioeconomic Conditions of Local Communities 370
15.5 Assessment of Potential Impacts 378
16. Climate and Meteorology 402
16.1 Assessment of Baseline Conditions 402
16.2 Assessment of Potential Impacts 409

17. Subcontractor and Supplier Management 410
17.1 Assessment of Baseline Conditions 410
17.2 Assessment of Potential Impacts 410
18. Human Rights and Gender Assessment 413
18.1 Overview of Human Rights and Gender Context in Uzbekistan 414
18.2 The Labor Code in Uzbekistan 418
18.3 Classification of Identified Human Rights Risks 429
18.4 Mitigation Measures 434
18.5 Access to Remedy 438
19. Climate Change Risk Assessment 440
19.1 Project GHG Emissions 440
19.2 Compatibility with Host Country Climate Change Commitments 441
19.3 Sea Level Rise and Riverine Floods 443
19.4 Urban Floods 443
19.5 Temperature Increase and Heat Waves 444
19.6 Extreme Weather Events 447
19.7 Wildfires 450
19.8 Infectious Diseases 452
19.9 Water Scarcity and Drought 454
20. Assessment of Cumulative Impacts 459
20.1 Cumulative Impact Assessment 459
20.2 Rapid Cumulative Impact Assessment for Biodiversity 462
21. Environmental and Social Management Plan (ESMP) 471
21.1 Institutional Framework and Procedure Arrangements 471
21.2 Environmental, Social, Health, and Safety Management System (ESHS-MS) 474
21.3 Other ESHS Requirements for Temporary Facilities 476
21.4 Compilation of the Framework Environmental and Social Management Plan (ESMP) 477
22. Project Categorization 531
22.1 Safeguard Requirements 1: Environment 531
22.2 Safeguard Requirements 2: Involuntary Resettlement 533
22.3 Safeguard Requirements 3: Indigenous Peoples 535
23. Annexes 536
23.1 Annex 1 – Detailed Regulatory Review 536

LIST OF FIGURES

Figure 1: Region Division of Uzbekistan 6
Figure 2: District Divisions in Karakalpakstan 8
Figure 3: Project Site and Closest Communities 9
Figure 4: Typical Structural Components of a Wind Turbine and Wind Farm 10
Figure 5: Final WTG Layout 11
Figure 6: Internal Substation Options and Tower Manufacturing Facility 13
Figure 7: Typical Substation 13
Figure 8: Map of Internal Roads 14
Figure 9: Typical BESS 15
Figure 10: Access Road 16
Figure 11: LVDL 16
Figure 12: Typical Mobile Batching Plant 18
Figure 13: Typical Borrow Pit 18
Figure 14: Location of Accommodation Camps 19
Figure 15: Study Area 24
Figure 16: Land Plot Provided by Government for Selection of Project Boundary 32
Figure 17: Project Site in Relation to KBAs 33
Figure 18: Project Site and UNESCO WHS 'Cold Winter Deserts of Turan' 34
Figure 19: Identified E&S Constraints - Archeological Sites 35
Figure 20: Identified E&S Constraint - Geological Area 36
Figure 21: Identified E&S Constraint - Community Settlements 37
Figure 22: 4,600km^2 area, Project Site and E&S Constraints Identified 38
Figure 23: Solar Resource Map for Uzbekistan 39
Figure 24: Water Resources in Uzbekistan 40
Figure 25: Existing tracks and Final Roads 42
Figure 26: Project Layout and 10KM Buffer from Reserve 43
Figure 27: Sample Photos from the Meeting 83
Figure 28: Sample for Announcements 84
Figure 29: FGD with Ozodlik 89
Figure 30: FGD with Elobod Community 89
Figure 31: FGD with Kirkkiz 90
Figure 32: FGD with Jasliq 90
Figure 33: Selected Photos of the Workshop 92
Figure 34: General Site Topography and Landscape 103
Figure 35: 3D DEM Modeling of the Project Site 103
Figure 36: Zone of Theoretical Visibility 107
Figure 37: Land Ownership for the Area 127
Figure 38: Historical Land Use of the Project Site 129
Figure 39: Some of Unidentified Objects Onsite 130
Figure 40: Geological Map and Ground Investigation Locations of the Project Site 133
Figure 41: Regional Sedimentary Geology of Uzbekistan 134
Figure 42: Soil Types and Formations in Karakalpakstan Region 135
Figure 43: Mechanical Composition of Soils (FAO-DSMW) 136
Figure 44: Project Site in Relation with Earthquake Zones and Past Adjacent Earthquakes with M>5 137
Figure 45: Water Resources of the Aral Sea Basin 139
Figure 46: Project Site in Relation with the Closest Water Bodies 140
Figure 47: Project Site's Study Area in Relation to The Sub-Basins and The River/Channel Network 141
Figure 48: Mineralization of Groundwater 143
Figure 49: 3D DEM of the Project Site 144
Figure 50: Water Depths within the Project Site Due to 100-Year Storm 145
Figure 51: Overview Map About Compartments of the Cold Winter Deserts of Turam 169
Figure 52: Anabasis-saltwort-sagebrush community 181

Figure 53: Saltwort-sagebrush community 181
Figure 54: Solitary tree of Black Saxaul (Haloxylon ammodendron (C.A.Mey.) Bunge) 182
Figure 55: Takyr (periodically inundated loamy depressions with very sparse vegetation 182
Figure 56: Takyr (periodically inundated loamy depressions with very sparse vegetation 183
Figure 57: White saltwort (Xylosalsola arbuscula (Pall.) Tzvelev) 183
Figure 58: Vehicle tracks modified (lost) habitat within the Project AoI 184
Figure 59: Vehicle tracks modified (lost) habitat along track from Kirkkiz to site 184
Figure 60: Reptile Survey Transects – Spring Routes Blue, Summer Routes Yellow 186
Figure 61: Location of Camera Traps – First Deployment (February to March 2023) 189
Figure 62: Location of Camera Traps – Second Deployment (April to October 2023) 190
Figure 63: Location of Honey Badger Camera Trap Records 194
Figure 64: Honey badger Camera Trap Pictures 195
Figure 65: Global saiga antelope distribution within Kazakhstan, Uzbekistan, Mongolia, and Russia 197
Figure 66: Approximate range of the Ustyurt (A) and Betpak-Dala (B) Saiga populations 2013 197
Figure 67: Probable direction of autumn (red arrows) and spring (blue arrows) Saiga migration 198
Figure 68: Movement tracks of saiga fitted with GPS tracking devices within the Ustyurt saiga range 198
Figure 69: Goitered Gazelle records by camera traps 199
Figure 70: Goitered Gazelle Camera Trap Pictures 200
Figure 71: Caracal Records by Camera Traps 201
Figure 72: Caracal Camera Trap Pictures 202
Figure 73: Location of Static Bat Detectors (red dots – ground location, yellow pins – at height) 203
Figure 74: SM4BAT microphone 204
Figure 75: Location of Vantage Points 216
Figure 76: Location of Bird Survey Transects 221
Figure 77: Cumulative Daily Totals – Steppe Eagle Winter Survey Period 227
Figure 78: Cumulative Daily Totals – Steppe Eagle Autumn Migration Survey Period 228
Figure 79: Cumulative Daily Totals – Eastern Imperial Eagle Autumn Migration Survey Period 229
Figure 80: Main Migratory Direction of Steppe Eagle and Eastern Imperial Eagle in the Autumn 2023 233
Figure 81: Main Migratory Direction of Other Species with registration of 11 – 50 individuals 234
Figure 82: Main Migratory Direction of Other Species with registrations of less than 10 individuals 234
Figure 83: AviStep Sensitivity Mapping (Birdlife International) for NW Uzbekistan 270
Figure 84: Type of Blade Patterning to be used at the Kungrad Wind Farm 271
Figure 85: Project Site and Archeological Sites 286
Figure 86: Archeology and Cultural Heritage 306
Figure 87: Sample of Burials Onsite 306
Figure 88: Location of Monitoring Points 312
Figure 89: Water Demand Distribution in Uzbekistan 323
Figure 90: Project Site in Relation to Highway A380 325
Figure 91: Gas Pipeline and Infrastructure Onsite 326
Figure 92: Overlap between Project Area State Committee on Geology Recommendation 327
Figure 93: Fresnel Zone of Broadcasting Towers 329
Figure 94: Assake Audan Groundwater Well with the Project Site Location 336
Figure 95: Assake Audan Groundwater Well 337
Figure 96: Gurkurek Groundwater Well location within the Project Site 338
Figure 97: Gurkurek Groundwater Well 339
Figure 98: Water Supply under Urgench transgaz along the A380 highway 340
Figure 99: Transport and Road's Constraints 345
Figure 100: Proposed Transportation Routes 348
Figure 101: GDP Growth Rate of Uzbekistan (ADB, 2023) 354
Figure 102: Age Range of Household Members 358
Figure 103: Average Number of Household Members in Uzbekistan's regions 359
Figure 104: Average Monthly Maximum and Minimum Temperatures for the Past 30 Years 403
Figure 105: Average Monthly Wind Speeds for the Past 30 Years 404
Figure 106: Wind Speed Patterns in Karakalpakstan Over the Past 30 Years 404

Figure 107: Wind Rose of Karakalpakstan 405
Figure 108: Average Monthly Rainfall Distribution in Karakalpakstan for the Past 30 Years 406
Figure 109: Snow Days in Karakalpakstan 406
Figure 110: Number of Days with Temperatures Higher Than 40 Degrees Celsius in Uzbekistan 408
Figure 111: Months Characterized by Temperatures Surpassing 40 Degrees Celsius 408
Figure 112: Number of Cold Days Below 0°C in Karakalpakstan 409
Figure 113: Elevation Change between Project Site and Aral Sea (up) and Ama Daru River (bottom) 443
Figure 114:Average Monthly Temperature and Rainfall in Uzbekistan, 1991–2020 444
Figure 115: Mean Temperature in Uzbekistan (1950-2020) 445
Figure 116: Project Maximum Temperature Increase (left) and Minimum Temperature Increase (Right) 445
Figure 117: Historic (1986–2005) and Projected Annual Count of Days in which Temperatures Surpass 35°C . 446
Figure 118: Think Hazard – Hazard Level for Karakalpakstan for Extreme Heat 446
Figure 119:Think Hazard – Hazard Level for Karakalpakstan for Landslide 449
Figure 120:Think Hazard – Hazard Level for Karakalpakstan for Earthquakes 450
Figure 121: Think Hazard – Hazard Level for Karakalpakstan for Wildfires 451
Figure 122: Project Habitat with Shrub Vegetation 451
Figure 123:Think Hazard – Hazard Level for Karakalpakstan for Water Scarcity 456
Figure 124: Wind Farm and OHTL Developments for Cumulative Assessment 459
Figure 125: Wind Farm and OHTL Developments for Cumulative Assessment 463

LIST OF TABLES

Table 1: Overall ESIA Structure 3
Table 2: Region Divisions of Uzbekistan 5
Table 3: District Divisions of Karakalpakstan 6
Table 4: Worst-Case WTG Specifications 11
Table 5: Footprint of the Project Components 20
Table 6: Determination of Significance 28
Table 7: National Legislation and Guidelines Governing the E&S Compliance for the Project 46
Table 8: Relevant International Conventions and Agreements 50
Table 9: IFC Performance Standard Requirements 51
Table 10: Summary of Equator Principles 53
Table 11: Overview of Key Points of EBRD Performance Requirements of Relevance to the Project 56
Table 12: ADB SPS Requirements 58
Table 13: Other International E&S Requirements and Standards 60
Table 14: Identified Groups of Stakeholders 63
Table 15: List of Vulnerable Groups and Their Relevance 68
Table 16: Overall Summary of Targeted Consultations 70
Table 17: Outcomes of FGD 86
Table 18: Summary of Anticipated Impacts during the Planning Phase 99
Table 19: Summary of Anticipated impacts during the Construction Phase 99
Table 20: Summary of Anticipated Impacts during the Operations Phase 100
Table 21: Critical Visual Receptors 104
Table 22: Visual Receptor Sensitivity 109
Table 23: Definition of Magnitude of Visual Impact 110
Table 24: Significance of Visual Effects 111
Table 25: Viewpoint Analysis 123
Table 26: Annexes to the EU Birds Directive 154
Table 27: Criteria and Conditions for Identifying Critical Habitats and Priority Biodiversity Features* 156
Table 28: Criteria for Determining the Sensitivity of Valued Ecological Receptors 164
Table 29: Populations of IBA Trigger Species 166
Table 30: Populations of IBA Trigger Species 167
Table 31: Species of Global Conservation Concern 170
Table 32: Calculation of Habitat Condition Scores 172
Table 33: Results of Spring 2023 Survey 173
Table 34: Results of Summer 2023 Survey 174
Table 35: Results of the Spring and Summer Reptile Surveys 188
Table 36: Results of the 2023 Mammal Survey, Incidental Survey, Eagle Owl Pellet Analysis 191
Table 37: Saiga numbers in 2015-2022. (Ustyurt population are transboundary) 196
Table 38: Total Number of Recording Nights and Number of Data Files (April to August) 204
Table 39: Recording Nights and Data by At Height Detector 204
Table 40: Recording Nights and Data by Ground Detector (Period 1) (April to May) 205
Table 41: Recording Nights and Data by Ground Detector (Period 2) (May – July) 206
Table 42: Number of Recorded Files (Period 3 July to August) 206
Table 43: Bat Species Most Likely to Occur in the Project AoI 207
Table 44: Bat Species with Potential to Occur in the Project AoI 207
Table 45: Calls per Night from Ground-based Detectors (Period 1 and 2) 209
Table 46: Calls per Night from Met Mast Detectors (Period 1 and 2) 209
Table 47: Calls per Night from Met Mast Detectors (Period 3) 209
Table 48: Bat Calls Recorded by Detectors at Viewpoints (ground-based) and Met Masts 210
Table 49: Bat Calls Recorded by Detectors at Met Masts 211
Table 50: Bat Calls Recorded by Detectors at Viewpoints (ground-based) 211
Table 51: List of invertebrates in project site, their status, abundance, distribution and populations trends 212
Table 52: Target (Tier 1) Species 217

Table 53: Results of Winter, Spring, Summer and Autumn Vantage Point Surveys 224
Table 54: Combined (Yearly) Counts of Notable Species and Records and Number of at-Risk Flights 226
Table 55: Registration of MacQueen's Bustard during the Spring Migration Period 230
Table 56: Coordinates of Active and Abandoned Steppe Eagle Nests in the Project Area 232
Table 57: Coordinates of Active Long-legged Buzzard Nests in the Project Area 232
Table 58: Summary of Sensitive Receptors Species 236
Table 59: Habitat Areas being Affected by Construction 241
Table 60: CRM biometric data input 267
Table 61: CRM Output 268
Table 62: Archeological and Historical Sites 285
Table 63: Outcomes of Archeology and Cultural Heritage Survey 287
Table 64: Location of Monitoring Points 312
Table 65: Applicable National Ambient Air Quality Permissible Limits 312
Table 66: Applicable National Permissible Limits for Noise 313
Table 67: IFC and EU Limits for Noise and Air Quality 313
Table 68: Closest Landfill to the Project Site 318
Table 69: Closest WWTPs to the Project Site 319
Table 70: Disposal Methods for Hazardous Wastes 319
Table 71: Water Supply from LADB 321
Table 72: Current Coverage Centralized Water Supply and Water Sources in Karakalpakstan 322
Table 73: Water Demand in Karakalpakstan 323
Table 74: Type and Quantities of Waste Estimated for Construction Phase 330
Table 75: Total Water Requirements Summary 334
Table 76: Summary of Peak Vehicles 343
Table 77: Project and Existing Traffic 349
Table 78: Ethnic Groups of Uzbekistan and Karakalpakstan 354
Table 79: Location of Interviewed Households 357
Table 80: Age Range of Household Members 358
Table 81: Age per District 358
Table 82: Surveyed Household Distribution per District 359
Table 83: Ethnicity, Language and Religion - Household Head 360
Table 84: Marital Status 360
Table 85: Disabilities and Chronic Illness 360
Table 86: Education Levels 361
Table 87: Education Levels by Gender 361
Table 88: Literacy Rates 361
Table 89: Primary Occupation by District 362
Table 90: Primary Occupation by Gender 362
Table 91: Unemployment Rates per District 363
Table 92: Employable Skills by District 363
Table 93: Employable Skills by Gender 363
Table 94: Livestock per District 364
Table 95: Income Source per District 364
Table 96: Primary Occupations by Gender 365
Table 97: List of Vulnerable Groups and Their Relevance 365
Table 98: Socio-Economic Conditions for the Local Communities 371
Table 99: Average Humidity Levels 407
Table 100: Benchmarking National Legislation Against International Standards 419
Table 101: Classification of Human Rights Risks 429
Table 102: Uzbekistan Policies and Strategies on Climate Change 441
Table 103: Communicable Diseases in Uzbekistan 452
Table 104: Country Strategies Addressing Water Issues 456
Table 105: Annual Predicted Cumulative Avian Mortality 465
Table 106: Roles and Responsibilities of Entities Involved in ESMP 471

Table 107: Training Elements 473
Table 108: Inspection and Monitoring Elements 473
Table 109: Required Meetings 474
Table 110: Reports 474
Table 111: ESMP for the Planning Phase 478
Table 112: ESMP for the Construction Phase 481
Table 113: ESMP for the Operation Phase 510
Table 114: Definition of Project Categorization under International E&S Standards and Requirements 531
Table 222: Affected Lease holding by % of temporary land losses during the construction phase 534

ABBREVIATION AND ACRONYMS

AAC	Approximate Allowable Concentrations
ADB	Asian Development Bank
ALOS	Advanced Land Observing Satellite
AoI	Area of Influence
AQ	Air Quality
ASSR	Autonomous Soviet Socialist Republic
BAP	Biodiversity Action Plan
BESS	Battery Energy Storage System
BFDs	Bird Flight Diverters
BLI	Birdlife International
BMEP	Biodiversity Monitoring Evaluation Plan
BMP	Biodiversity Management Plan
BWEA	British Wind Energy Association
CAREC	Central Asia Regional Economic Cooperation
CBD	Convention on Biological Diversity
CBOs	Community Based Organizations
CCKP	Climate Change Knowledge Portal
CCRA	Climate Change Risk Assessment
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CH	Critical Habitat
CHA	Critical Habitat Assessment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLO	Community Liaison Officer
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CRA	Collision Risk Assessment
CRM	Collision Risk Model
CRPD	Convention on the Rights of Persons with Disabilities
CSO	Central Statistics Office
CV	Curriculum vitae
DC	Direct Current
DD	Data Deficient
DEM	Digital Elevation Model
DF	Debris Factor
DSMW	Digital Soil Map of the World
E&S	Environmental & Social
EAAA	Ecologically Appropriate Area of Analysis
EBBCC	Emirates Bird Breeding Centre for Conservation
EBRD	European Bank for Reconstruction and Development
EHS	Environmental, Health & Safety
EHSS	Environmental, Health & Safety and Social
EIA	Environmental Impact Assessment
EP	Equator Principles
EPAP	Equator Principles Action Plan
EPC	Engineering, Procurement, and Construction

EPFIs	Equator Principle Financial Institutions
EPRP	Emergency Preparedness and Response Plan
ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EN	Endangered
EU	European Union
FAO	Food and Agriculture Organization
FFDC	Fabric Filter Dust Collector
FGD	Focus Group Discussion
FTUU	Federation of Trade Unions of Uzbekistan
GBI	Green Business Innovation
GBVH	Gender-Based Violence and Harassment
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GIS	Geographical Information System
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GN	Guidance Note
GPN	Good Practice Note
GPS	Global Positioning System
GW	Gigawatt
GWh	Gigawatt hour
H&S	Health & Safety
HDI	Human Development Index
HH	Household
HR	Human Resources
HS	Health & Safety
HSE	Health & Safety and Environment
IBA	Important Bird Areas
IBAT	Integrated Biodiversity Assessment Tool
ICJ	International Court of Justice
IDF	Intensity-Duration-Frequency
IEMA	Institute of Environmental Management and Assessment
IFAS	International Fund for Saving the Aral Sea
IFC	International Finance Corporation
IFI	International Financial Institution
ILO	International Labor Organization
IOE	International Ecological Expert
IWGIA	International Work Group for Indigenous Affairs
JAXA	Japan Aerospace Exploration Agency
KBA	Key Biodiversity Areas
KfW	Kreditanstalt für Wiederaufbau
KPI	Key Performance Indicator

LADB	Lower Amu Darya Basin
LC	Least Concern
LESA	Lender Environmental and Social Advisor
LLA	Land Lease Agreement
LLC	Limited Liability Company
LoS	Line of Sight
LOTO	Lock Out/Tag Out
LRP	Livelihood Restoration Plan
LV	Low Voltage
LWCMP	Labor and Working Conditions Management Plan
MMIG	Ministry of Mining Industry and Geology
MMR	Measles-Mumps-Rubella
MoM	Minutes of Meeting
MoU	Memorandum of Understanding
MPC	Maximum Permissible Concentrations
MS	Management System
MV	Medium Voltage
NA	Not Applicable
NAP	National Adaptation Plan
NC	National Communications
NDC	Nationally Determined Contributions
NEGU	National Electric Grid of Uzbekistan
NGO	Non-Governmental Organizations
NNIS	Non-native Invasive Species
NNP	National Nature Park
NPL	Noise Pressure Levels
NT	Near Threatened
NTS	Non-Technical Summary
O&M	Operation and Maintenance
OAE	International Fund for Houbara Conservation in Abu Dhabi
ODSs	Ozone Depleting Substances
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
OHSP	Occupational Health and Safety Plan
OHTL	Overhead Transmission Line
OOG	out-of-gauge
OVOS	Otsenka Vliyaniya na Okruzhayushchuyu Sredu
PBF	Priority Biodiversity Features
PCFM	Post Construction Fatality Monitoring
PGA	Peak Ground Acceleration
PM	Particulate Matter
POPs	Stockholm Convention on Persistent Organic Pollutants
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
PR	Performance Requirement

PS	Performance Standard
PTW	Permit to Work
RES	Renewable Energy Sources
RR	Response Ratio
SCI	Sites of Community importance
SCADA	Supervisory Control and Data Acquisition
SDG	Sustainable Development Goals
SDOD	Shutdown on Demand
SEBH	Sexual Exploitation, Abuse, and Harassment
SEP	Stakeholder Engagement Plan
SMP	Security Management Plan
SNH	Scottish Natural Heritage
SPAs	Special Protection Areas
SPS	Safeguard Policy Statement
SRA	Security Risk Assessment
SRTM	Shuttle Radar Topography Mission
STDs	Sexually Transmitted Diseases
TASH	National Herbarium of Uzbekistan
TB	Tuberculosis
TBD	To Be Disclosed
TBT	Tool Box Talks
TSP	Total Suspended Particulate
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
UTM	Universal Transverse Mercator
UV	Ultra Violet
UZS	Uzbekistani Som
VP	Vantage Point
VU	Vulnerable
WAP	Worker Accommodation Plan
WF	Wind Farm
WTG	Wind Turbine Generators
WWTP	Wastewater Treatment Plant
ZTV	Zone of Theoretical Visibility

1. INTRODUCTION

1.1 Background

Uzbekistan is the region's third-largest gas producer, after Russia and Turkmenistan, due to its abundant natural gas reserves. Energy production and consumption contributes almost 20% of its Goss Domestic Product (GDP) and 15% of industrial output, and energy exports (primarily gas) were 17.3% of total commodity exports[1].

However, with that, in recent years, Uzbekistan has faced a severe energy crisis and is going through a power system collapse – particularly during winter. The problem has affected every part of society, from businesses and industry to residents' daily lives. In December 2022, extremely low temperatures created pressure drops in the gas pipelines, which in turn created a big national crisis given that 80% of Uzbekistan's electricity comes from thermal power facilities that run on gas. The crisis has resulted in severe power outages with nation-wide blackouts[2].

Acknowledging the severity of the situation, the Government of Uzbekistan has taken ambitious measures to alleviate the energy crisis. One of the first priorities was to reduce reliance and dependency on natural gas for electricity generation and promote renewable energy sources such as solar and wind power.

The Government issued a decree titled "Measures to Increase the Use of Renewable Energy Sources," which established a goal of raising the proportion of renewable energy in the country's entire energy mix to 25% by the year 2030.

In addition, the Government has implemented further actions to encourage investment and use of renewable energy, including the enactment of new regulations and legislation. The “Law on the Use of Renewable Energy Sources of 2017” provides a legal framework for development, use and promotion of renewable energy sources. Furthermore, the Resolution of the President of the Republic of Uzbekistan “Measures to Stimulate Investments in Renewable Energy" enacted in 2020 also aims to attract investments in the renewable energy sector by providing a range of financial incentives and support mechanisms.

In accordance with the above, ACWA Power (hereafter referred to as the ‘**Developer**’) signed a Memorandum of Understanding (MoU) with the Ministry of Energy and the Ministry of Investments and Foreign Trade of the Republic of Uzbekistan to develop a 1,500 Mega Watt (MW) wind power project to be located in the Republic of Karakalpakstan within Uzbekistan (hereafter referred to as the ‘**Project**’). Following this, three (3) Power Purchase Agreements (PPAs) for 500 MW (for a total of 1,500MW) + 100 MW Battery Energy Storage Systems (BESS) have been signed.

1.2 The Environmental and Social Impact Assessment (ESIA) Report

ACWA Power appointed ECO Consult to prepare the Environmental and Social Impact Assessment (ESIA) for the Project. ECO Consult in turn subcontracted the following entities: (i) Green Business Innovation (GBI) (a locally registered Uzbekistani Environmental and Social (E&S) consulting company); and (ii) Turnstone Ecology (an international consulting company specializing in ecological assessments and studies). ECO Consult, GBI and Turnstone are hereafter referred to as the ‘**E&S Team.’**

[1] Uzbekistan energy profile – Analysis - IEA
[2] Executive summary – Uzbekistan 2022 – Analysis - IEA

The Ministry of Ecology, Environmental Protection, and Climate Change serves as the primary environmental regulator in Uzbekistan, under which the Ministry is mandated in issuing environmental permits for development projects. In accordance with the "Resolution №541 of the Cabinet of Ministers on Procedure of EIA Mechanism (07 September 2020)", the Ministry requires for a project of this scale and nature to undertake an Environmental Impact Assessment[3] (EIA) study in order to obtain an environmental permit. Within the local context, the EIA process is referred to as Otsenka Vliyaniya na Okruzhayushchuyu Sredu (OVOS). The EIA was submitted to the Ministry, and an environmental permit was issued for the Project on 6 May 2024.

In addition, the Project will be seeking financing from International Financing Institutions (IFIs). Therefore, the Developer wishes to design and manage the Project in accordance with international Environmental and Social (E&S) standards and requirements. For the purpose of the ESIA, this will be based on the following requirements:

- Equator Principles 4 (EP 4);
- European Bank for Reconstruction and Development (EBRD's) requirements to include EBRD's 2019 E&S Policy and Performance Requirements (PRs);
- International Finance Corporation's (IFC's) requirements to include IFC Policy on E&S Sustainability (2012), IFC Performance Standards (2012), and relevant IFC EHS Guidelines;
- Asian Development Bank (ADB) requirements to include ADB's Safeguard Policy Statement (SPS) (2009), Social Protection Strategy (2001), Gender and Development Policy (1998) and Access to Information Policy (2018); and
- Guidance and Tool Kit for Impact Assessments in a World Heritage Site Context, UNESCO, ICCROM, ICOMOS, IUCN (2022)

Therefore, the ESIA has been prepared to ensure that local OVOS requirements are met as well as international E&S standards and requirements.

1.3 Project Setup and Responsibilities

Different entities are involved in the planning and implementation of the Project. Responsibilities of each entity are listed in the text below along with a general description of their roles.

- ACWA Power: The owner and developer of the Project (hereafter referred to as 'the Developer');
- Ministry of Ecology, Environmental Protection, and Climate Change[4]: the official governmental entity responsible for protection of the environment in Uzbekistan. The Ministry is responsible for approval of the ESIA and making sure it complies with the local environmental legislations and granting the environmental clearance for the Project;
- International Financing Institutions (IFIs): entities that will provide financing to the Developer for the development of the Project. Such IFIs will ensure that the Project is developed in accordance with

[3] within the local context, the requirement is to undertake an EIA, however as noted throughout the document an ESIA is being undertaken for the Project to meet international E&S standards and requirements. Therefore, throughout the document the term ESIA will be used.

[4] A recent restructuring within governmental units in Uzbekistan occurred in June 2023 under which it was named as the Ministry of Ecology, Environmental Protection and Climate Change. In December 2022 it was called the Ministry of Natural Resources and prior to that it was known as the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection.

international E&S standards and requirements. At this stage, the IFIs will include Equator Principle Financing Institutions lead by Standard Chartered (SC) and Asian Development Bank (ADB);

- Engineering, Procurement, and Construction (EPC) Contractor: will be responsible for preparing the detailed design and layout of the Project; supply of the material and equipment (e.g., wind turbines); construction of the Project and its various components (turbines, internal roads, building infrastructure, etc.). The EPC Contractor will also be responsible for construction of the associated facilities for the Project (i.e. the overhead transmission line). The EPC Contractor for this Project has not been assigned yet;
- Project Operator*:* responsible for Operation and Maintenance (O&M) of the Project. The Project Operator has not been assigned at this stage;
- JSC National Electric Grid of Uzbekistan (NEGU): will be the off taker of electricity and is the entity that signed the Power Purchase Agreement (PPA) with the Developer. In addition, they will also be responsible for taking over the overhead transmission line that will be developed for this Project once construction has been completed (additional details on this is provided in "Section 2.3.7" later); and
- E&S Team (ECO Consult, Green Business Innovation and Turnstone Ecology): is the ESIA Practitioner and the consultant commissioned by ACWA Power to prepare the ESIA for the Project in accordance with local requirements as well as international E&S standards and requirements.

1.4 Document Structure

The following table provides an overview of the sections within this ESIA document. In addition, the ESIA includes a standalone Non-Technical Summary (NTS) and a Stakeholder Engagement Plan (SEP).

Table 1: Overall ESIA Structure

Chapter	Description of Content
Section 2 – Project Description	Provides a detailed description of the Project in relation to its location, the key project components and an overview of the proposed activities that are to take place during the various Project phases.
Section 3 – ESIA Approach and Methodology	Presents the methodology and approach that was adopted for the ESIA study.
Section 4 – Analysis of Alternatives	Investigates several alternatives to the Project development and the reasons for the preferred choice. This includes alternatives in relation to the Project site, selected technology, Project design, and finally investigates the 'no action alternative' – which assumes that the Project development does not take place.
Section 5 – Regulatory & Policy Framework	Provides an overview of the environmental and social regulatory and policy framework applicable to the Project.
Section 6 – Stakeholder Consultation and Engagement	Discusses in detail the stakeholder consultation and engagement plans which were undertaken as part of the ESIA process for the Project and provides an overview of the findings. In addition, this Section also discusses the future stakeholder engagement and consultation plans which are to take place at a later stage of the Project development.
Section 7 – Overview of Strategic Environmental and Economic Impacts	Provides an overview of the significant positive environmental and economic impacts that will result from the Project development on the strategic and national level. The Section also highlights the site specific negative environmental and social impacts anticipated from the Project throughout its various phases – each of which is discussed in detail in the subsequent chapters.
Section 8 – Section 17	These sections first present the baseline conditions within the Project site and surroundings and then assess the anticipated impacts from the Project throughout its various phases on

	such a receptor. Finally, for each identified impact a set of mitigation and monitoring requirements have been identified which aim to eliminate the impact and/or reduce it to acceptable levels. This includes the following: Landscape and Visual (Section 8), Land Use (Section 9), Hydrology, Hydrogeology and Geology (Section 10), Biodiversity (Section 11), Archeology and Cultural Heritage (Chapter 12), Air Quality and Noise (Section 13), Infrastructure and Utilities (Section 14), Socio-economics to include employment/procurement, community health/safety/security and worker welfare/health/safety (Chapter 15), Climate and Meteorology (Section 16), Subcontractor and Supplier Management (Chapter 17).
Section 18 – Human Rights and Gender Assessment	Presents a standalone human rights and gender risk assessment for the Project.
Section 19 – Climate Change Risk Assessment	Presents a standalone climate change risk assessment for the Project.
Section 20 – Assessment of Cumulative Impacts	Investigates the cumulative impacts which could result from incremental impacts from other known existing and/or planned developments in the area based on currently available information.
Section 21 – Environmental and Social Management Plan (ESMP)	Presents the Environmental and Social Management Plan (ESMP) for the Project; which mainly summaries the impacts identified as well as the mitigation measures and monitoring requirements to be implemented throughout the various Project phases. In addition, this section describes the institutional framework and procedural arrangement for the ESMP implementation as well as the implementation of an Environment, Social, Health and Safety (ESHS) Management System.
Section 22 – Project Categorization	Presents a Project categorization based on ADB's 's Safeguard Policy Statement (SPS) (2009) for Environment, Involuntary Resettlement and Indigenous Peoples.

2. PROJECT DESCRIPTION

This section provides a detailed description of the Project in relation to its location, the key project components, and an overview of the proposed activities that are to take place during the construction, operation, and decommissioning phase.

2.1 Project Location

It is important to understand the administrative setup of Uzbekistan as several terminologies related to this will be referenced throughout the ESIA report.

Administratively, Uzbekistan is divided into 12 Regions (also known as *viloyatlar*), 1 sovereign republic (known as the Sovereign Republic of Karakalpakstan), and 1 independent city (which includes Tashkent as the capital of Uzbekistan).

The Project site is located within the Sovereign Republic of Karakalpakstan. The Republic occupies the whole northwestern part of Uzbekistan. The capital of the Republic is Nukus. Under Soviet rule, it was an autonomous area within the Russian Soviet Federative Socialist Republic before becoming part of Uzbekistan in 1936 as the Karakalpak ASSR. The Republic of Karakalpakstan maintained its predecessor's formal sovereignty, even after the independence of Uzbekistan in 1990.

Table 2: Region Divisions of Uzbekistan

Division	Legend	Division	Legend	Division	Legend
Andijan Region	2	Qashqadaryo Region	8	Khorazm Region	13
Bukhara Region	3	Samarqand Region	9	Namangan Region	6
Fergana Region	4	Sirdaryo Region	10	Navoiy Region	7
Jizzakh Region	5	Surxondaryo Region	11	Tashkent Region	12
Karakalpakstan	**14**	Tashkent	1		

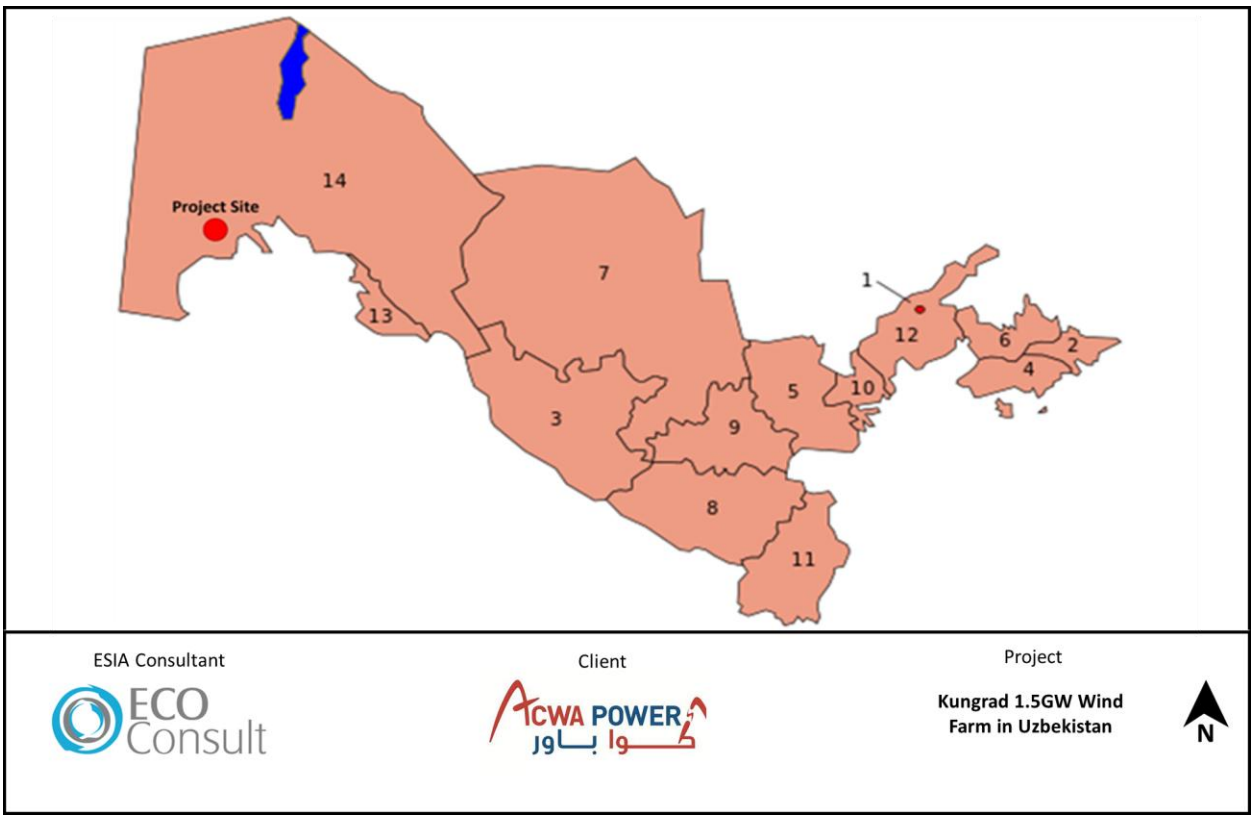


Figure 1: Region Division of Uzbekistan

The administrative setup of Karakalpakstan includes multiple levels of governance to ensure effective management and service provision within the region. At the highest level, Karakalpakstan is led by the **Supreme Council** (known as *Jokori Kenes*), which acts as the legislative body representing the interests of the population. The republic has its own constitution but follows all legislations as that of Government of Uzbekistan. However, it shares veto power with Uzbekistan over decisions concerning its affairs.

The Supreme Council Chairman is the head of the Government including the Council of Ministers. All ministries within Uzbekistan are also present in Karakalpakstan. For example, there is a Ministry of Ecology, Environmental Protection, and Climate Change in Tashkent, and a Ministry of Ecology, Environmental Protection, and Climate Change for the Republic of Karakalpakstan.

Administratively, Karakalpakstan is divided into 16 Districts (known as *Rayons)*. Each District has its own local administration (known as ***Khokimiyat***) led by the ***Hokim*** (equivalent to a Governor). The *Khokimiyat* is responsible for the local governance, development, and implementation of government programs and initiatives at the district level. They are also responsible for municipal services such as water supply, waste management and other.

The Project site is located within Kungrad District, approximately 225km west of Karakalpakstan's capital city of Nukus and 150km west of the District's capital (Kungrad City).

Table 3: District Divisions of Karakalpakstan

Division	Capital	Legend	Division	Capital	Legend
Amudaryo District	Mang'it	2	Qanliko'l District	Qanliko'l	5
Beruniy District	Beruniy	3	**Kungrad District**	**Kungrad**	**8**
Chimboy District	Chimboy	15	Qorao'zak District	Qorao'zak	6
Ellikqala District	Bo'ston	17	Shumanay District	Shumanay	16

Kegeyli District	Kegeyli	7	Taxtako‘pir District	Taxtako‘pir	12
Mo‘ynoq District	Mo‘ynoq	9	To‘rtko‘l District	To‘rtko‘l	**13**
Nukus District	Oqmang‘it	10	Xo‘jayli District	Xo‘jayli	14
Taxiatosh District	Taxiatosh	11	Bo‘zatov District	Bo‘zatov	4

The smallest administrative division in Uzbekistan as well as Karakalpakstan is known as the ***Mahalla***. It could include one (1) or more cities, towns, neighborhoods, and villages. The Mahallas have the following roles and responsibilities: (i) act as the community unit and governance institutions within these cities, towns, neighborhoods and villages; (ii) help facilitate local governance and service delivery to the residents; (iii) act as a coordination point with community; (iv) focal point for information sharing; (v) implement government programs and other.

The Mahalla is headed by a Chair who is elected by local communities. In addition, each Mahalla includes a Mahalla Committee composed of 3-4 people that are appointed formally by the government (this always includes at least one (1) woman that would be responsible for women and youth affairs). In addition, informally, the Committee also includes the participation of elderly and community leaders.

Kungrad District includes the following community settlements:

- One (1) city known as Kungrad (capital city of the district) which serves as an important urban center;
- Four (4) towns that include Jasliq, Kirkkiz, Elobod, and Karakalpakiya; and
- Seven (7) rural communities comprising various villages and settlements.

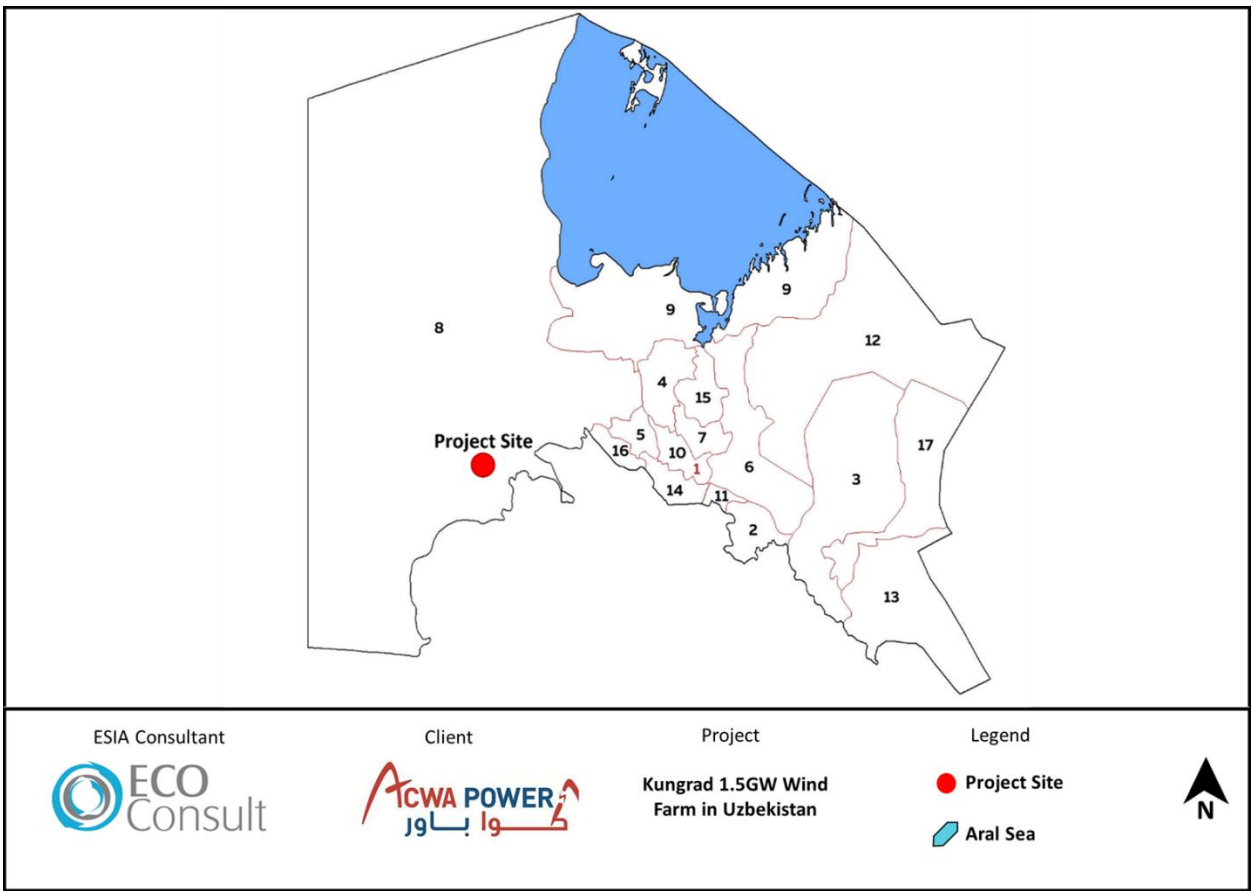


Figure 2: District Divisions in Karakalpakstan

2.2 Local Communities

Throughout the ESIA report, the term local communities will be used. This will refer to the following settlements and inhabited areas in particular:

- Kirkkiz town located around 110km to the east of the Project site;
- Elobod town located around 120km to the east of the Project site;
- Jasliq town located around 115km to the north of the Project site; and
- Kungrad City Center located around 150km to the east of the Project site.

The above communities have been selected as affected communities based on the following rationale:

- Administrative Setup: the Project site as explained earlier is located entirely within Kungrad District. The next closest District (Mo'ynoq District) is located more than 150km away from the Project site. Therefore, priority was for selection of villages/cities located within Kungrad District itself; and
- Proximity to Site: the closest settlements were considered as local communities. Although at a considerable distance from the Project site, these are the communities that are most likely to be impacted (positivity or negatively) in some way, as explained in detail throughout the ESIA.

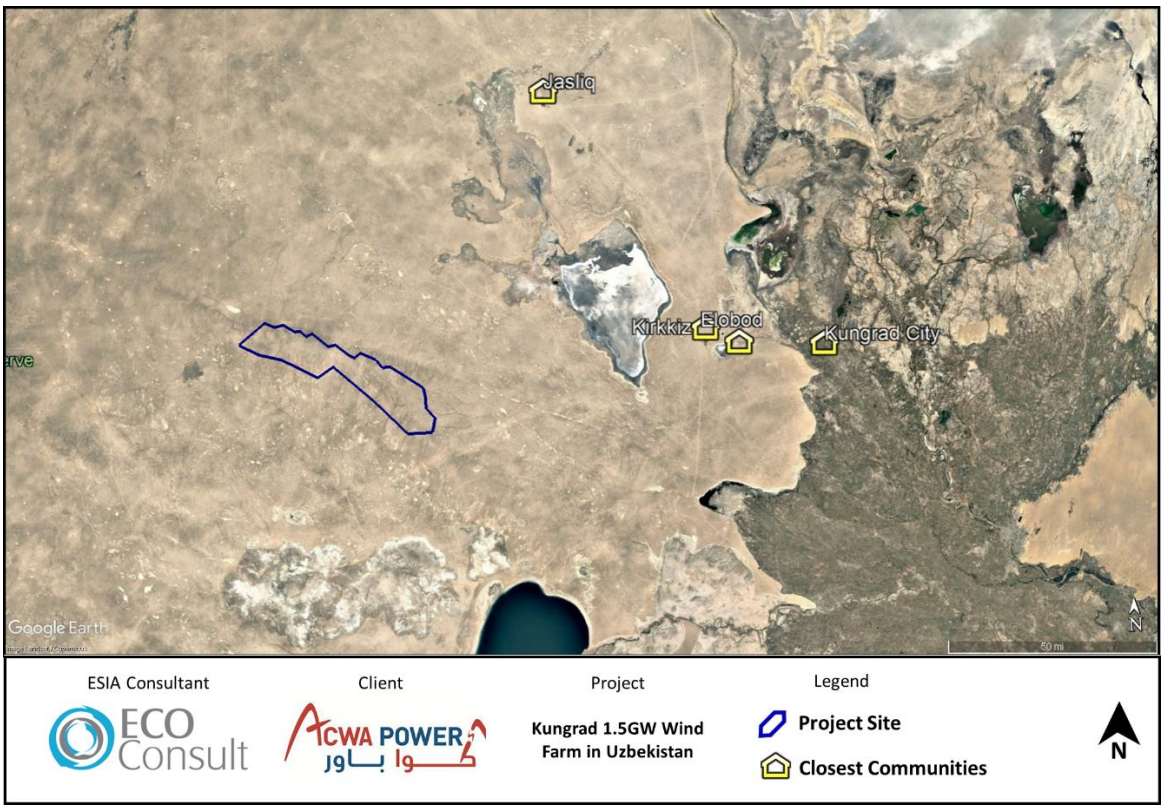


Figure 3: Project Site and Closest Communities

2.3 Project Components

2.3.1 Outline of Wind Energy Technology

Wind turbines convert kinetic energy from the wind that occurs naturally in the earth's atmosphere into electrical energy. Wind's kinetic energy is converted to rotational energy with the turbine's rotor. This rotational energy is then, inside the wind turbine, transferred to the gearbox to adjust its rotational speed, before it is transformed into electrical energy with the generator. After some rectifications through converters, transformers and substations the electricity is delivered to transmission and distribution systems and then to the end user.

The figure below presents the key components of a wind farm, each of which is discussed in further details throughout the subsequent sections.

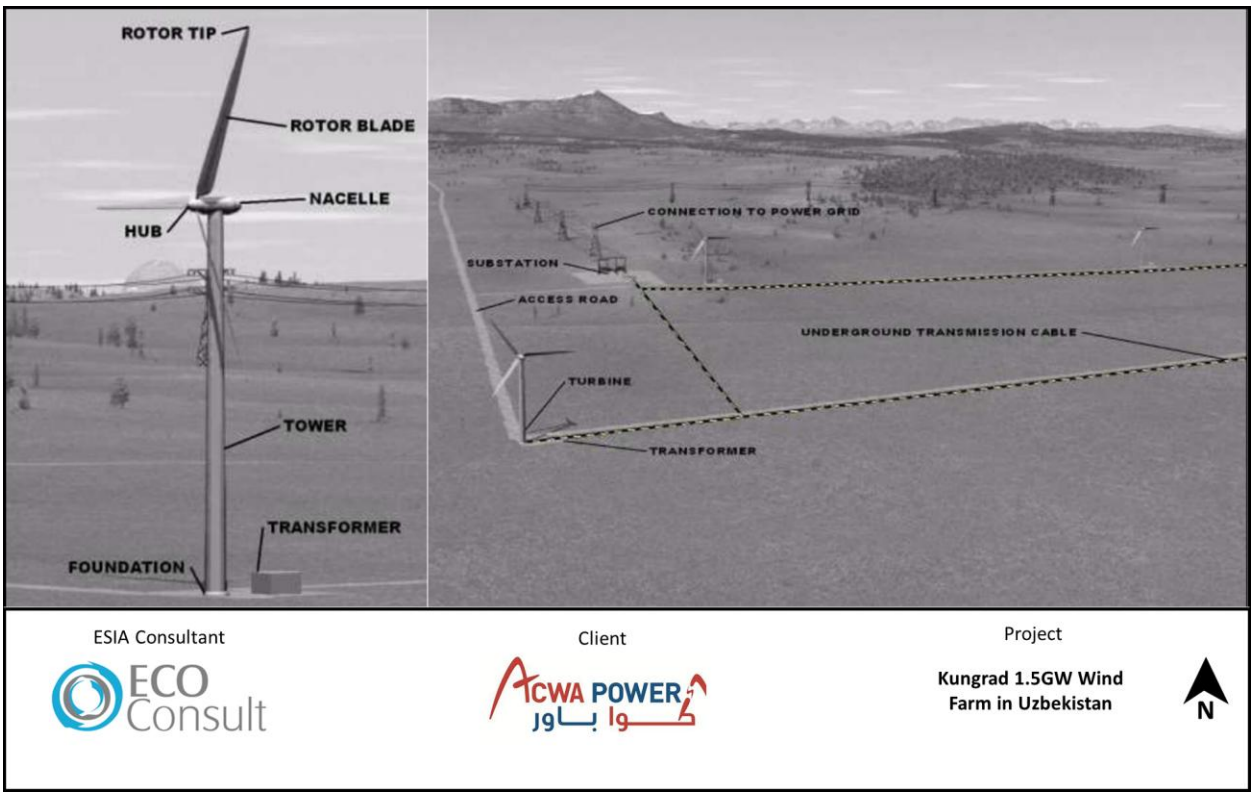


Figure 4: Typical Structural Components of a Wind Turbine and Wind Farm (Source: EHS Guidelines for Wind Energy, IFC)

2.3.2 Wind Turbine Generators (WTG)

Generally, a WTG consists of a foundation, tower, nacelle, rotor blades, a rotor hub, and a transformer (refer to figure above).

Foundations will be constructed to bolt the tower of the WTG in place (one for each WTG); where in general each foundation consists of a circular footing of around 24m diameter, with a depth of 3m to 4m and an elevation of 1m. The foundation will be built with concrete reinforced with structural corrugated steel. *Note: based on initial information from geotechnical investigations, it is unlikely that blasting activities will be required for WTG foundations – this is to be verified by the EPC Contractor once appointed.*

The WTG contains the electrical conduits, supports the nacelle, and provides access to the nacelle for maintenance. Typically, three (3) blades are connected to the hub which then connects with the nacelle; the box-like component that sits atop the tower and which most importantly contains the gear box (which steps up the revolutions per minute to a speed suitable for the electrical generator) and the generator (which converts the kinetic energy into electricity).

In addition, each WTG is equipped with a transformer that converts/steps up the output from the turbine to a higher voltage (from 0.61/1.1kV to 22kV or 33kV) to meet a specific utility voltage distribution level that is appropriate for connection with a substation (explained in detail below).

Finally, next to each WTG will be a crane pad to accommodate cranes for the installation of the turbines and for maintenance activities during operation. The crane pads will be suitable to support loads required

for the erection, assembly an operation and maintenance of the turbines. Generally, crane pads have an area of around 4,500m^2.

The table below presents the final WTG specifications and the figure that follows presents the final WTG layout.

Table 4: Worst-Case WTG Specifications

Item	Specification
Rotor Diameter (m)	183.4
Hub Height (m)	140
Tip height (m)	231.7
Number of turbines	204
Capacity per turbine (MW)	7.5
Area Swept by rotors (m^2)	26,417

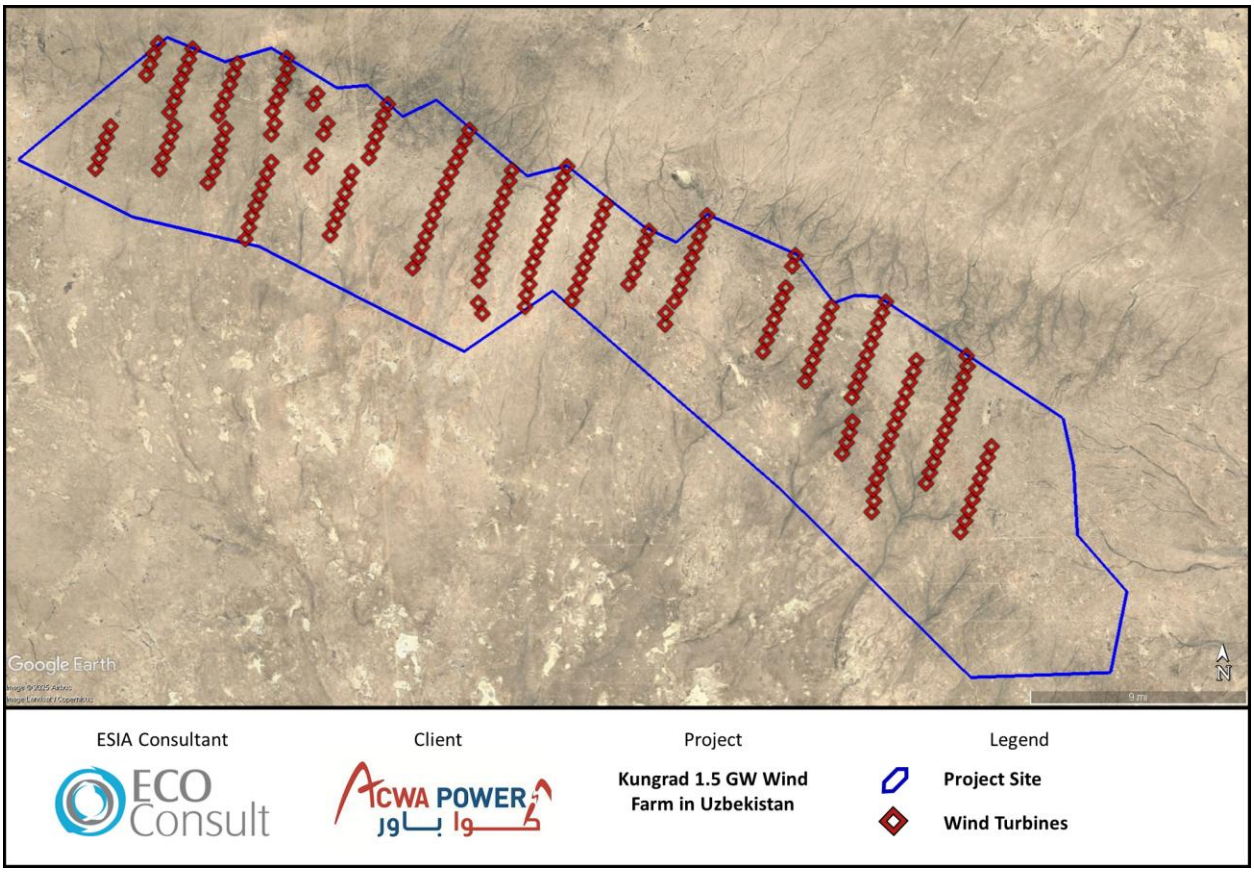


Figure 5: Final WTG Layout

2.3.3 Infrastructure and Utilities

The following highlights the key infrastructure and utility elements that will be required for the Project.

- Medium Voltage (MV) Cables: The wind turbines will be connected through medium voltage cables (33kV or 35kV) to an onsite substation (discussed below). The connection between the turbines and the substation will be made using underground transmission cables buried in ground by trenches.

- Communications Network: The Project will have a Supervisory Control and Data Acquisition (SCADA) system for the remote operation of the facilities. A communication network will be installed which will consist of fiber optic cables connecting the turbines together to the SCADA system at substation. The communication system will be installed in the same trenches as the MV cables discussed above.

- Substation: The substation is a high voltage transformer unit that collects and converts the output from the turbines to a higher voltage (from 33kV or 35 kV to 500 kV) that is appropriate for connection with the High Voltage National Grid (500 kV). There will be three (3) substations within the Project area – one for each 500MW capacity. The location of the substations is presented in the figure below.

- Building Infrastructure: Onsite building infrastructure will be required for the daily operation of the Project. Such buildings could include an administrative building (offices) used for normal daily operational related work, control room, workshop and a warehouse for storage of equipment and machinery such as spare parts, oil cartridges, fuel, lubricants, etc. There will be three (3) building infrastructure areas – one next to each substation. The location of the building infrastructure elements is presented in the figure below.

- Tower Manufacturing Facility: the Developer was required by the Government of Uzbekistan to utilize a hybrid WTG tower made from concrete (as opposed to steel which is the typical component for a WTG). The objective of the Government in this approach is to increase local procurement opportunities (e.g. local cement) instead of relying on imported steel tower structures.

  The facility will mainly include a dedicated batching plant and molding structures. Cement, water and aggregate (from burrow pits as discussed in further details below) will be combined at the batching plant to produce concrete will be poured into the molds to develop the tower structures which will then be transported to the WTG construction sites. The facility will have an area of 0.1km^2 and will be located just outside of the Project boundary as noted in the figure below.

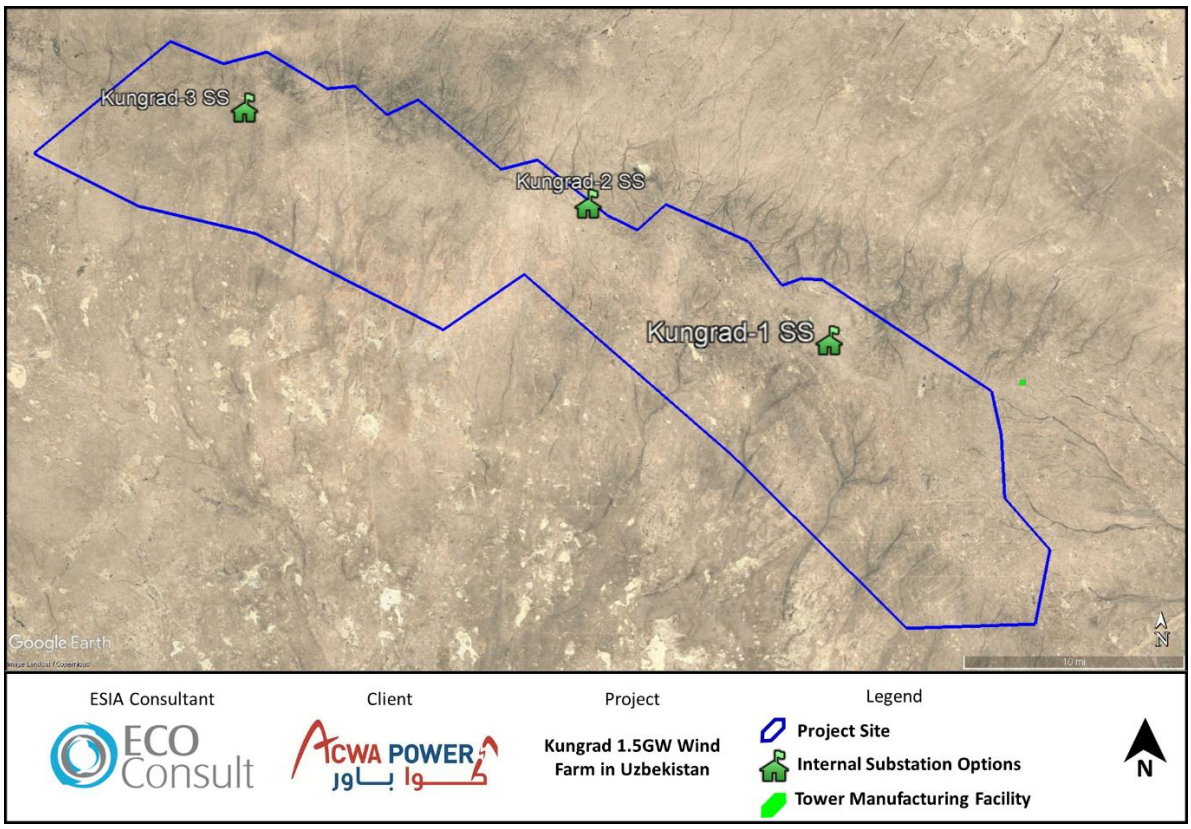


Figure 6: Internal Substation Options and Tower Manufacturing Facility

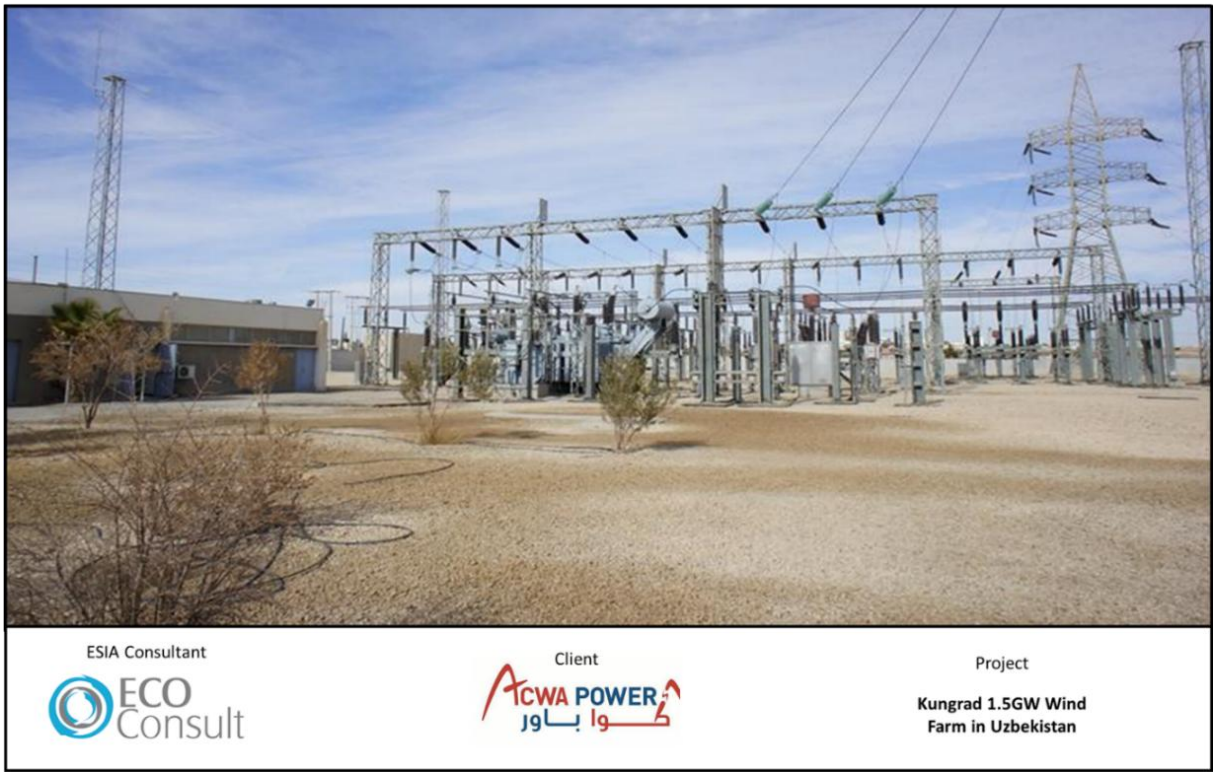


Figure 7: Typical Substation

- Road network: An internal road network will be required within the Project site for installation of the turbines during the construction process and for ease of access to the turbines for maintenance purposes during operation. The internal road network followed to the greatest extent possible the existing track and dirt roads within the Project site (this issue is discussed in further details in "Section 4.3"). The figure below presents the layout of the internal road network. The internal road network will have a width of 12m.

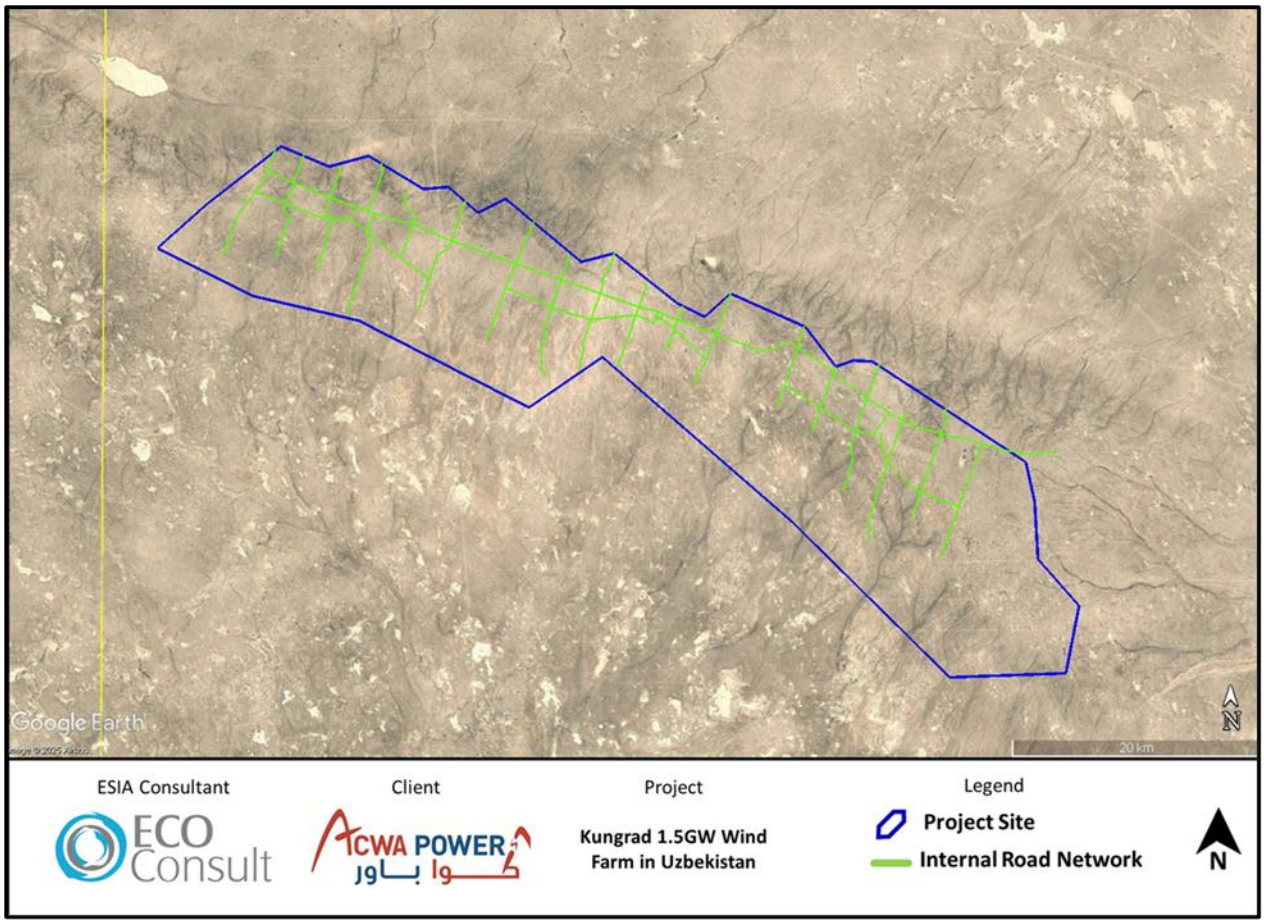


Figure 8: Map of Internal Roads

2.3.4 BESS

As mentioned earlier, there will be three (3) substations located onsite – one for each 500MW capacity. Located next to each substation, a 100 MW Battery Energy Storage Systems (BESS) will be installed that will be connected to the substation through a 33kV MV collector bus. The figure below presents a typical BESS. Based on preliminary information available at this stage, the technology will be Lithium Ion. The BESS will be used to store excess energy from the Wind Project and to control the ramp rate.

2.3.5 Access Road

Due to the remoteness of the site, an access road will be required to connect the Project from the nearest highway available. Such access road will be required to provide general access to the site, delivery of WTGs as well as other equipment and machinery, as well as transportation of workers and other personnel.

The access road starts from the main highway running with Kungrad District passing near Kirkkiz and Kunkhodja village (known as Highway A380). From there the access road runs all the way to the southern parts of the Project site where it will connect with the internal road network (discussed earlier under the section above). The total length of the access road is around 118km and a width of 12m. In general, the access roads follow an existing dirt road running from the main Highway to the Project site.

The figure below presents the access road.

Note: based on the above, entire lands for the access road are under governmental ownership and will not require land acquisition. If, during the construction phase of the Project, the access road will require further upgrades or expansions and therefore additional lands; this process shall be assessed and covered by an addendum to the Livelihood Restoration Plan (LRP) currently being undertaken for the OHTL component, which also assessed temporary land impacts. Please refer to the OHTL LRP for additional details.

Figure 9: Typical BESS

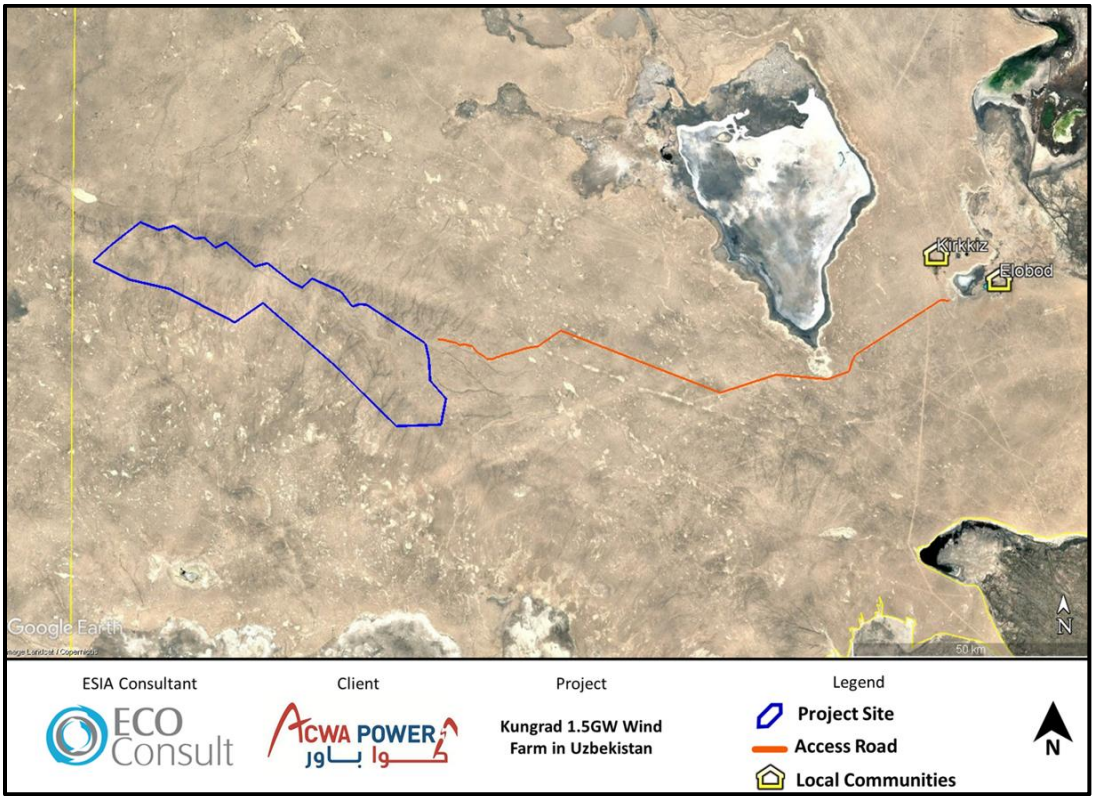


Figure 10: Access Road

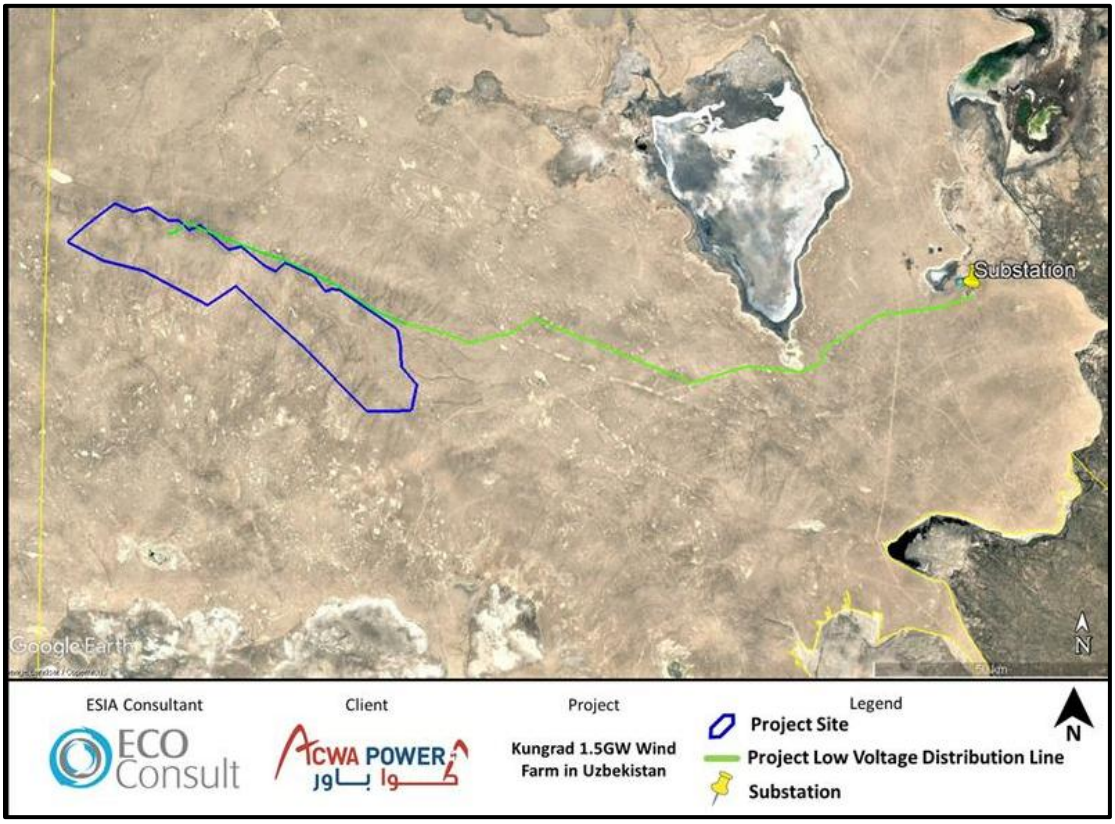


Figure 11: LVDL

2.3.6 Other Temporary Components

There are additional Project components that will be required on a temporary basis throughout the construction phase of the Project in particular. Those are identified below. The location of such components in particular will not be available at this point, nor is it expected to be available during the ESIA preparation phase. Those will be identified once the EPC Contractor is appointed and a detailed design is completed.

- Site Offices: temporary offices that will be used by Developer and EPC Contractor staff during the construction phase. It is expected that this will be within the Project footprint.
- Laydown areas: this is a temporary storage area where tools, materials, equipment and vehicles are stored when not in use. It is expected that this will be within the Project footprint.
- Batching Plant: a mobile concrete batching plant will be established within the Project footprint for preparation of the concrete to be used for foundation installation and other infrastructure requirements (e.g. substation, buildings, etc.). This will reduce transportation requirements compared to an off-site plant which is considered of significance importance given the remoteness of the site. A typical batching plant is provided in the figure below. It is expected that this will be within the Project footprint.
- Borrow Pits: borrow pits are used to provide fill materials such as gravel, sand, clay for various construction requirements such as base for road networks, foundations for WTGs, tower manufacturing facility, and other. A typical borrow pit is provided in the figure below. Those are expected to be from authorized / approved / licensed quarries that are located offsite.
- Worker Camp Area: due to the remoteness of the site, the Developer and EPC Contractor will establish worker camps onsite for housing of various workers involved in the construction phase of the Project. Those will be within the Project footprint and will consist of four (4) accommodation camps as presented in the figure below – three within the windfarm site and one along the access road.
- Low Voltage Distribution Line (LVDL): a 110KB line (LVDVL) will be constructed temporarily to supply electricity for the construction phase of the Project for various power supply requirements as well as worker camp areas. The LVDL will run from an existing substation in Elobod town and will follow the exact same route as that of the access road for a total distance of 120km. After completion of construction activities, the LVDL will be dismantled and removed. The route of the LVDL is provided in the figure below.

"Section 21.3" provides additional E&S requirements for temporary components to be considered by the EPC Contractor when planning for such components.

Figure 12: Typical Mobile Batching Plant

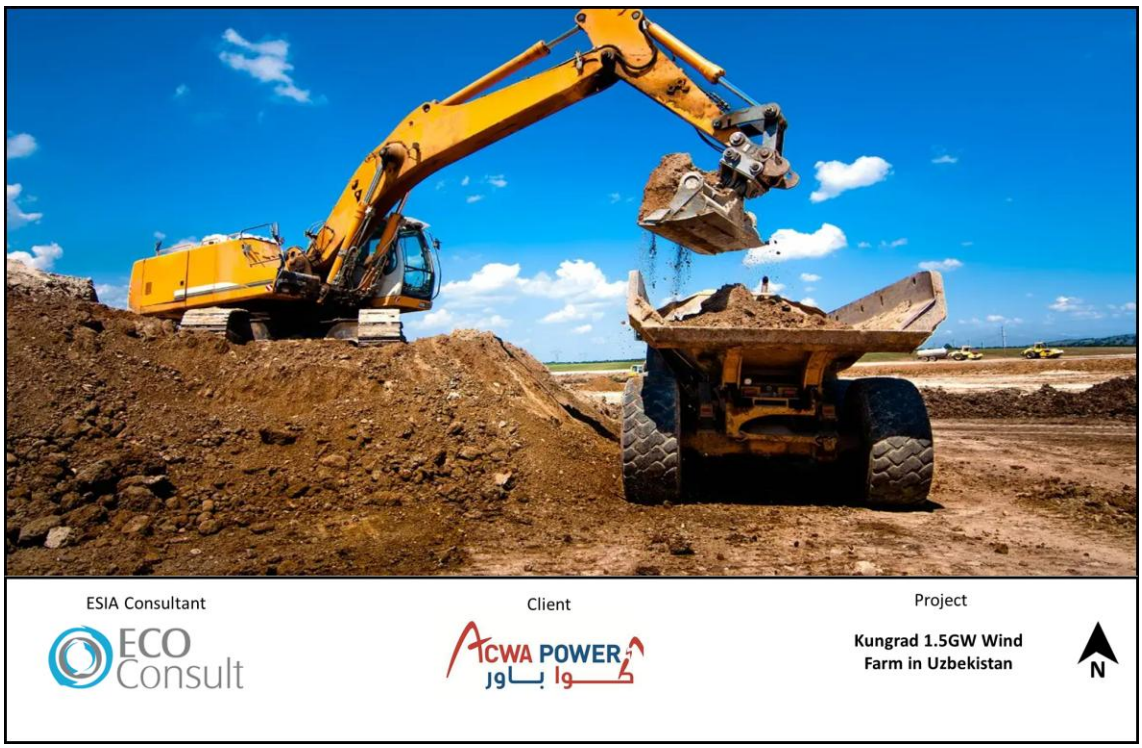


Figure 13: Typical Borrow Pit

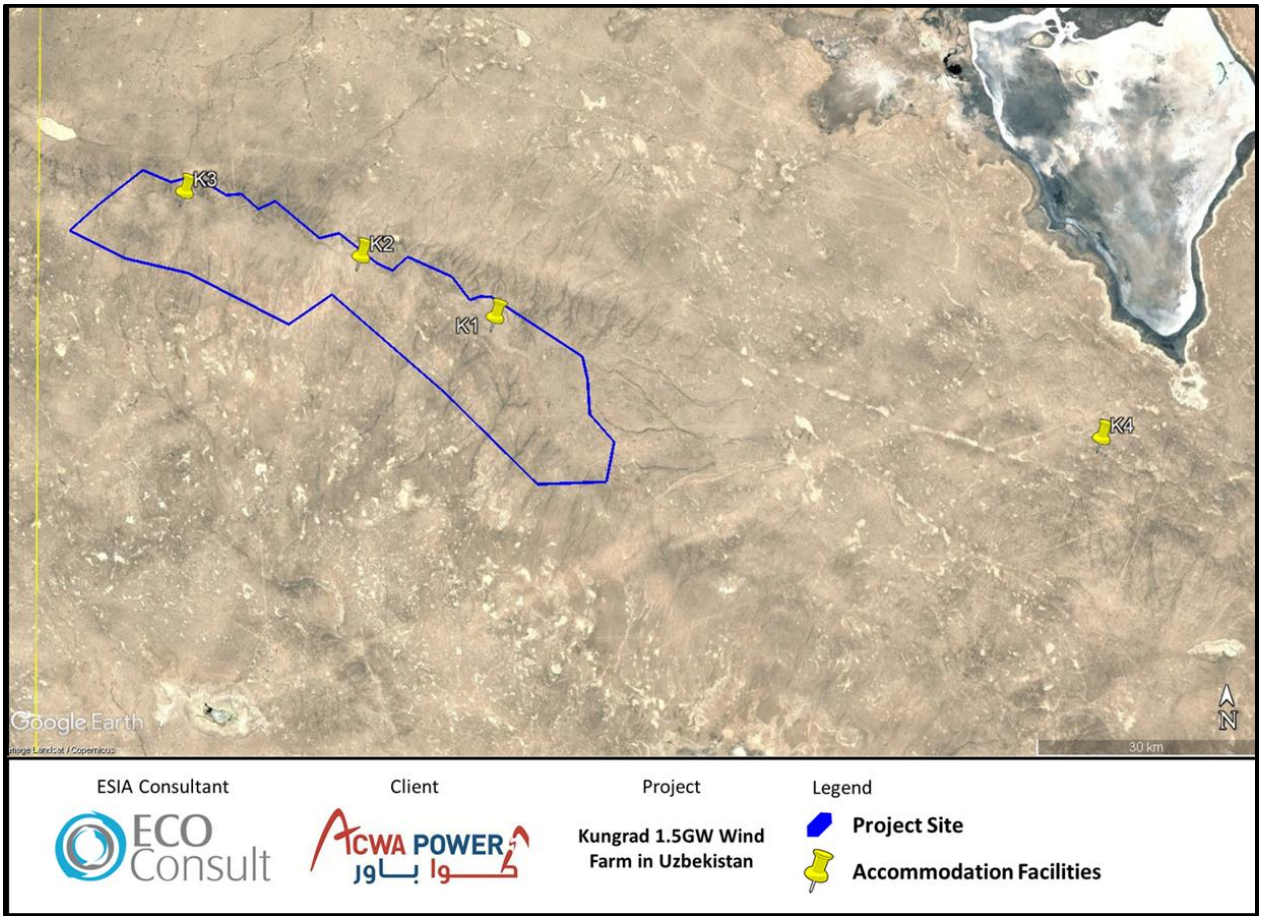


Figure 14: Location of Accommodation Camps

2.3.7 Associated Facilities

Associated facilities are facilities that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable. For the purpose of this Project, the key associated facility is the Overhead Transmission Line (OHTL) that will connect from the three (3) Project substations to the national grid in order to supply electricity to end users.

The OHTL for this Project will be a high voltage line (500kV) that will run for around 800km that will also be constructed by the EPC Contractor. The OHTL will run from the Project site up until the Bukhara Region connecting with the national grid at various areas along the way through three (3) substations.

A standalone ESIA has been undertaken for the OHTL as well as a Livelihood Restoration Plan (LRP). Please refer to the standalone OHTL ESIA and LRP for additional details on this Project component.

2.3.8 Project Footprint

This section provides an estimate on the footprint of the Project taking into account the components discussed in the previous section, based on technical input provided by engineers that have prepared the final layout of the Project.

As noted in the table below, the total area of disturbance for the Project is significantly small, calculated at less than 1% of the total boundary of the Project area.

Table 5: Footprint of the Project Components

Component	Footprint	Description	Land Ownership
Turbines	1.06km^2	This includes the footprint for the foundation and the crane pad area for each of the 204 turbines. Typically, each crane pad is around 4,500m^2 in area, whereas each foundation typically consists of a circular footing of 24m diameter	Lands are under governmental ownership and subject to a land allocation process that will entail the transfer to the ownership of the Ministry of Energy of the Republic of Karakalpakstan and subsequently a Land Lease Agreement (LLA) will then be signed between the Developer and the Ministry of Energy. This process will require around 3-4 months to complete from the appointment of EPC Contractor (expected in Q2 2024). Additional details on land use is provided in "Section 9".
Access Road	1.42km^2	This includes a total length of 118km and width of 12m.	
Substation and Warehouse and Storage Facilities	0.24km^2	Footprint for each substation, warehouse, building facilities and BESS component is around 0.0812km^2. The Project has 3 internal substations.	
Cables	0.48km^2	This includes MV cables (total length of 152 km and width of 0.7m) and telecommunication cables (total length of 322km and width of 1.15m)	
Internal Road Networks	2.71km^2	This includes the road network with a total length of 226km and a width of 12m.	
Temporary facilities	0.145 km^2	This includes site offices, laydown areas, batching plant, worker camp. Those will be located within the Project boundary.	
Total Project Footprint	6.06 km^2		
Total Project Site Boundary Area	**950 km^2**	**Project footprint is around 0.6% of the total boundary of the Project area**	

2.4 Overview of Project Phases

This section presents the likely activities to take place during the Project development and which will include three distinct phases: (i) planning and design, (ii) construction, (iii) operation, and (iv) decommissioning. Each of which is summarized below.

2.4.1 Planning and Design Phase

This phase will involve the following;

- Completion of all required studies for the Project development. This will include but not limited to ESIA, topography study, geotechnical study, stakeholder engagement, resettlement planning (if applicable), etc.;
- Obtaining and finalizing required financing from IFIs;
- Obtaining required permits;
- Appointment of EPC Contractor; and
- Preparation of detailed design and layout requirements.

2.4.2 Construction Phase

The typical activities that will take place during the construction phase for wind farms include the following:

- Mobilization of Project team and equipment to the site and recruitment of workers;
- Undertake mobilization works for temporary facilities which will involve deployment of site offices, worker camp, worker facilities, laydown areas, turbine manufacturing facility, and batching plant;
- Transportation of wind turbine components to the Project site. The components are expected to be transported to the closest marine port and then transported by road to the Project site;
- Site preparation of the turbine foundation. Such activities are limited to relatively small individual footprints of the foundations and will include excavations and land clearing activities and cement works for bolting of the tower to the foundation;
- Installation of turbine components to include tower assembly, hub, rotor, and nacelle lift and rotor assembly which most likely will occur through onsite mobile cranes;
- Civil works for construction and development of the access road and internal road network;
- Installation of underground cables and SCADA system;
- Construction works to include civil works, electrical works and mechanical works for the development of the substation and building infrastructure, etc.; and
- Decommissioning of temporary facilities.

2.4.3 Operation Phase

Wind farm projects generally require limited operational activities as this mainly includes the following:

- Commissioning tests of the wind farm which usually involves standard electrical tests for the electrical infrastructure as well as the turbine, and inspection of routine civil engineering quality records. Careful testing at this stage is vital if a good quality wind farm is to be delivered and maintained;
- Normal daily operation of the wind farm. The long-term availability of a commercial wind turbine is usually in excess of 97 percent (i.e. 97% of the time, the turbine will be available to work); and
- Maintenance will also take place through a dedicated team. Typical routine maintenance time for a modern wind turbine is 40 hours per year. Non-routine maintenance may be of a similar order. Although minimal, maintenance activities may include turbine and rotor maintenance, lubrication of parts, washing of blades, maintenance of electrical components, full generator overhaul, etc.

2.4.4 Decommissioning Phase

According to the PPA agreement, the Project is expected to be operational for 25 years. In the case of complete decommissioning of a wind turbine, the tower and blades of the removed wind turbine will be taken down by crane, disassembled into components, and then the turbine will be refurbished at source and used elsewhere for another Project or sent for final disposal. The base will typically be left in place

and covered by gravel and peat or loam. Internal road networks and access roads are typically kept in place. Gates and fences (e.g. substation area and onsite offices) will be removed.

2.5 Project Schedule

Discussed below is the preliminary and tentative schedule for the overall Project development that is available at this point, as provided by the Developer.

- Planning and Design phase: This phase is ongoing and is expected to be completed by Q1 2025;
- Construction phase: This will involve undertaking of all construction activities as identified earlier for the Project development. This is expected to require 42 months starting from Q2 2025; and
- Operation phase: is expected to start in Q3 2028 for the duration of the PPA which is as discussed earlier set for 25 years.

It is important to note that there will be a phased approach to the overall development process of the Project. The first turbines are expected to be commissioned and operated by September 2027 and last turbines are expected to be commissioned and operated by September 2028 (i.e. 42 months from Q1 2025 as per timeline above). However, it is important to note that the final and detailed project schedule is currently being developed and will be agreed with EPC Contractor.

2.6 Workforce Requirements

According to information provided by the Developer, the Project will require the following workforce throughout the construction and operation phase:

- Around 2,200 job opportunities at peak during the construction phase for a duration of approximately 42 months. This will mainly include 600 skilled job opportunities (to include engineers, technicians, consultants, surveyors, etc.) and 1,600 semi-skilled and unskilled job opportunities (such as laborers, security personnel, housekeeping, etc.).
- Around 80 job opportunities during the operation phase for a duration of 25 years. This will include skilled job opportunities (such as engineers, technicians, administrative employees, etc.) and unskilled job opportunities (such as security personnel, drivers, etc.).

The Developer is committed to adhering to transparent recruitment procedures which include local community members.

Taking the above into account, the Developer is aiming to hire local community members to the greatest extent possible throughout the construction and operation phase for skilled and unskilled jobs. Where community members have the prerequisite skills and qualities for the job. Recruitment will be undertaken in accordance with Uzbekistan law, on fair assessment of skills and qualities for the job. All employees will be subject to normal human resource practices and will have to conduct themselves in accordance with the Developer's disciplinary code. No discrimination, on ethnic, gender, race or other such demographic factor be allowed during recruitment. The only preferential factor shall be the fact those that are directly affected, subject to meeting all the prerequisites for recruitment of the specific job.

3. ESIA APPROACH AND METHODOLOGY

This section presents the overall approach and methodology that was followed throughout the ESIA process for the Project.

3.1 Analysis of Alternatives

The "Resolution №541 of the Cabinet of Ministers on Procedure of EIA Mechanism (07 September 2020)" requires that the ESIA identify and analyze alternatives and present the main reason for the preferred choice. The examination of alternatives is also considered to be a key element of the ESIA process under all international E&S standards and requirements as well.

The analysis of alternatives is presented in “Section 4“. The section discusses and compares several alternatives to the Project development in relation to: (i) the Project site, (ii) the chosen technology, (iii) the Project design, and finally investigated the ‘no action alternative’ - which assumes that the Project development does not take place.

3.2 Stakeholder Consultations and Engagement

Stakeholder consultation and engagement is an essential part of the ESIA process and has been carried out in accordance with the regulatory requirements in Uzbekistan and the international E&S standards and requirements. The previous and future stakeholder consultation and engagement for the Project are summarized below and discussed in detail in “Section 6”.

The Project to date has included extensive stakeholder consultation and engagement with various stakeholder groups such as national governmental entities, regional and local governmental entities, Non-Governmental Organizations (NGOs) (e.g. Birdlife International, Bank Watch, etc.), local communities, and other as appropriate. This has been undertaken through bi-lateral meetings, Focus Group Discussions (FGD), e-mail communication, phone communication, formal letters, and other.

“Section 6” also discusses future stakeholder engagement and consultations which are to take place at a later stage. This mainly includes: (i) public disclosure session with stakeholders to present the findings and recommendations proposed within the ESIA; and (ii) implementation of the Stakeholder Engagement Plan (SEP) by the Developer which describes the planned stakeholder consultation activities and engagement process’ to take place after the ESIA approval.

3.3 Delineation of Study Boundaries and Scope Assessment

3.3.1 Definition of Spatial Study Area or Area of Influence (AoI)

The overall study area (or AoI) for the ESIA represents the potential Area of Influence (AoI) of the Project. This is ‘the area over which significant effects of the Project could reasonably occur, either on their own, or in combination with those of other developments and projects’.

In general terms, the study area for the Project ESIA includes the footprint of Project disturbance as demarcated in blue in the figure below. This includes the Wind Farm Project Site with a total area of 950 km^2.

However, for certain E&S parameters (such as landscape and visual, socioeconomics, etc.), the study area goes beyond the actual footprint of the Project site, and therefore an appropriate thematic study area is determined for each theme on a case-by-case basis. Such a thematic study area is clearly identified within the relevant section it relates to throughout this ESIA.

In identifying this thematic study area, the type and degree of the potential direct and indirect effects were taken into consideration. The core area where direct effects are likely to occur was determined, as well as the wider area of influence where indirect, combined and cumulative effects are likely to occur on the surrounding areas and communities.

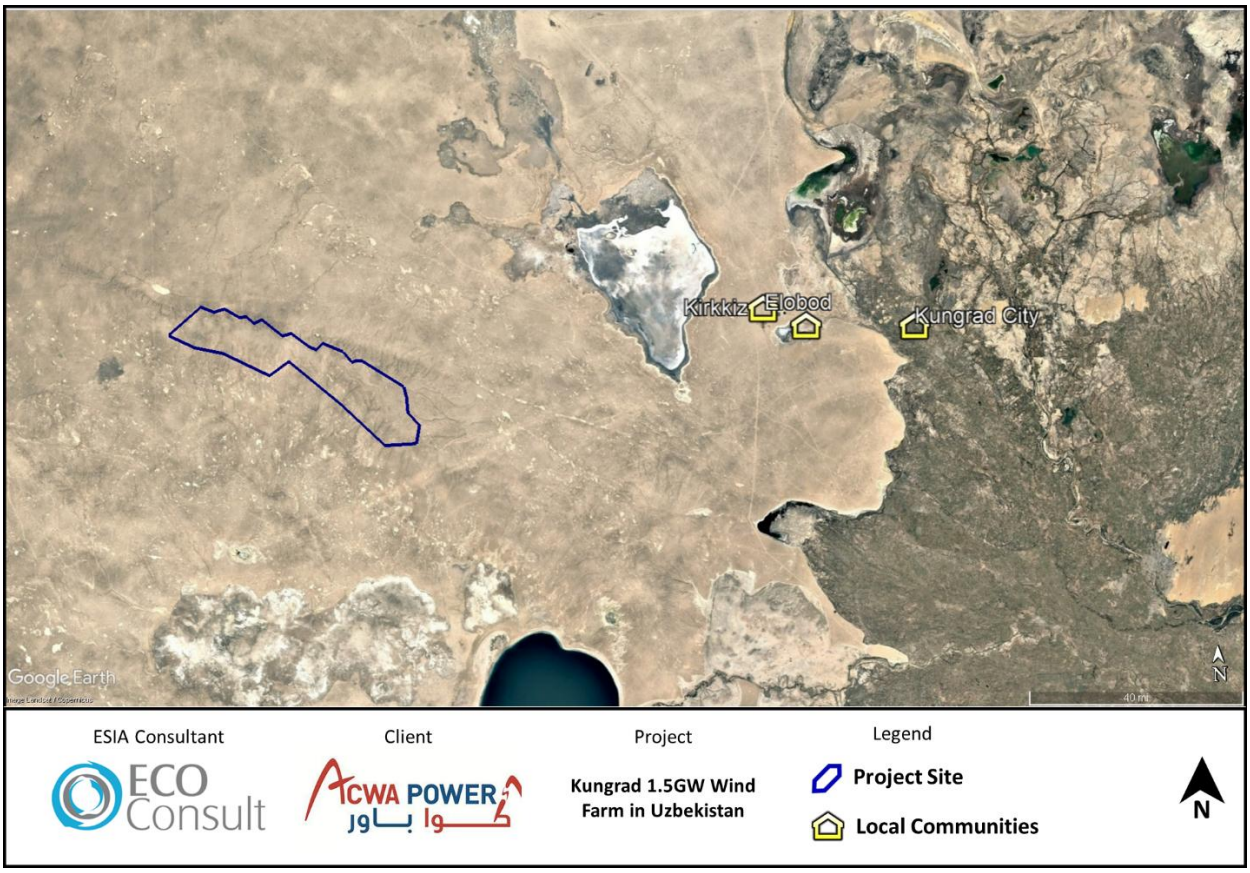


Figure 15: Study Area

3.3.2 Temporal Scope of the Assessment

The Project will be developed in a three-phase sequence as follows. The potential impacts are assessed throughout the various Project phases.

- Planning and Construction Phase;
- Operation Phase; and
- Decommissioning Phase.

(i) Planning and Construction Phase

This includes onsite construction activities which will be undertaken by the EPC Contractors under the guidance of the Developer. This mainly includes preparing the detailed design and layout of the turbines, transportation of Project components onsite, construction of the substation, as well as onsite site preparation and construction activities for installation of wind turbines.

(ii) Operation Phase

This includes activities to be undertaken by the Project Operator. Activities expected to take place mainly include the normal daily operation of the Project and the routine maintenance activities.

(iii) Decommissioning Phase

Generally, the anticipated impacts throughout the decommissioning phase are similar in nature to impacts assessed during the construction phase – and specifically in impacts related to soil and groundwater (from improper management of waste streams), air quality and noise, and occupational health and safety. Therefore, the assessment of impacts for those receptors and mitigation identified during the construction phase is assumed to apply to this phase in particular without the need to reiterate or emphasize this throughout subsequent chapters.

3.3.3 Environmental and Social Baseline Conditions

As part of the ESIA process, the baseline environmental and social conditions of the study area were established. Describing the baseline includes identifying and defining the importance and sensitivity of the various environmental and social resources and receptors likely to be impacted, i.e. within the study area. Understanding the value or sensitivity of the resources and receptors to impacts and changes is an important consideration when determining the significance of effects and allows for better identification of the most appropriate measures that could be employed to avoid impacts, and to mitigate any adverse impacts.

The description of environmental and social baseline conditions has considered a wide range of data and information gathered from various sources, including:

- Desk-based studies and literature reviews;
- Data from statutory and non-statutory stakeholders; and
- Field surveys and site investigations.

These studies have covered all the environmental and social aspects related to the Project. The baseline conditions are treated as those conditions which would prevail in the absence of the Project.

Studies of the environment and social baseline are described in “Section 8” – “Section 16” to include the following: landscape and visual; land use; geology/hydrology/hydrogeology; biodiversity; archaeology and cultural heritage; air quality and noise; infrastructure and utilities; socio-economic conditions; and climate and meteorology. Within each section, the methodology which was undertaken for assessment of each of those baseline conditions is described in detail. This also included accounting for seasonal factors for biodiversity, avifauna, and bats – refer to each section for additional details on timing of surveys undertaken.

3.4 Impacts Assessment Methodology

Given the scale and type of the Project, the ESIA commences with an assessment of the positive environmental and economic impacts on the strategic and national level given the current challenges the energy sector in Uzbekistan faces – as highlighted in "Section 7.4".

It then moves forward into the main body of the ESIA undertaking the assessment of impacts on environmental and social parameters for each receptor under the relevant chapter, from ""Section 8" – "Section 17". The following section provides a description of the approach, methodology and process adopted for the impact assessment presented within this ESIA.

3.4.1 Approach to Assessment of Impacts

The adverse and beneficial E&S impacts of the Project have been identified and assessed against the established baseline. A consistent approach to the assessment of impacts was followed to enable E&S impacts to be broadly compared across the ESIA. A set of generic criteria were used to determine significance (see below) which were applied across the various E&S parameters.

As far as possible, E&S impacts were quantified. Where it was not possible to quantify impacts, a qualitative assessment was conducted using professional experience, judgment and available knowledge, and including the consideration of stakeholder views. Where there were limitations to the data, and/or uncertainties, these have been recorded in the relevant chapters, along with any assumptions that were taken during the assessment.

In order to determine the significance of each impact, two overall factors are considered:

- The sensitivity of the E&S receiving parameter, as determined during the assessment of baseline conditions; and
- Magnitude and Nature of the impact.

3.4.2 Sensitivity of the Receiving Parameter

Receiving parameter sensitivity was determined using information taken from the baseline description on the importance, significance or value of the E&S component under examination. It is important to understand the sensitivity of the receiving parameter, as this is a measure of the adaptability and resilience of an E&S parameter to an identified impact. The following categories of sensitivity were applied to the assessment:

- High: The E&S parameter/receptor is fragile and an impact is likely to leave it in an altered state from which recovery would be difficult or impossible;
- Medium: The parameter/receptor has a degree of adaptability and resilience and is likely to cope with the changes caused by an impact, although there may be some residual modification as a result; and
- Low: The parameter/receptor is adaptable and is resilient to change.

3.4.3 Magnitude and Nature of the Impact

The magnitude of the impact is the scale of change which the impact may cause compared to the baseline and how this change relates to accepted thresholds and standards. The following categories were applied to the assessment:

- High: a large change compared to variations in baseline. Potentially a clear breach of accepted limits;
- Medium: change which may be noticeable and may breach accepted limits; and
- Low: when compared with the baseline, change which may only just be noticeable. Existing thresholds would not be exceeded.

Furthermore, in determining the magnitude of the impact it is important to take into account and consider several other factors which define the nature of the impact. This includes the following:

Type of Impact

- Positive: applies to impacts that have a beneficial E&S result, such as enhancement of conditions; and
- Negative: applies to impacts that have a harmful aspect associated with them such as loss or degradation of E&S resources.

Type of Effect

- Direct: applies to impacts which can be clearly and directly attributed to a particular E&S parameter (e.g. generation of dust directly impacts air quality); and
- Indirect: applies to impacts which may be associated with or are subsequent to a particular impact on a certain E&S parameter (e.g. high levels of dust could affect occupational health and safety).

Duration (how long the stressor or its effect last)

- Short Term: applies to impacts whose effects on the E&S attributes will disappear within a 1-year period;
- Medium Term: applies to impacts whose effects on E&S attributes will disappear within 5-years; and
- Long Term: applies to impacts whose effects on E&S attributes will disappear in more than 5 years.

Reversibility

- Reversible: applies to impacts whose significance will be reduced and disappeared over time (either naturally or artificially), once the impacting activity ceases; and
- Irreversible: applies to impacts whose significance will not be reduced nor disappeared over time (either naturally or artificially), once the impacting activity ceases.

Likelihood

- Low: applies to impacts that are unlikely to occur for several reasons either related to onsite conditions, nature of construction activities or other factors;
- Medium: applies to impacts that are likely to occur; and
- High: applies to impacts that are almost certain to occur.

Frequency

- Rare: applies to impacts that are expected to occur once throughout the duration or in very minimal occasions in a given month;
- Periodic: applies to impacts that are expected to occur regulatory in a given month; and
- Frequent: applies to impacts that are expected to occur frequently in a given month.

Timing

This will be relevant for certain and specific impacts only that are expected to occur during a specific time period within the year. For example, impacts on certain biodiversity species are expected during spring season only (e.g. March). If so, the timing of the impact will be clearly identified and for other impacts a "not relevant" statement will be added for the impact.

Extent

- Low: applies to impacts that will occur within the actual footprint of project component / impact area.
- Medium: applies to impacts that will occur up to 5km from the footprint of project component / impact area. For example, dust from construction activities can impact the exact footprint area where activities are undertaken and up to 2km radius within the surrounding area due to wind; and
- High: applies to impacts that will occur more than 10km from the footprint of project component / impact area. For example, installed turbines have a visual impact that could extend up to 15km.

3.4.4 Assessing the Significance of the Impacts

The concept of 'significance' is central to the ESIA process and aids the identification and categorization of E&S effects. As noted, in order to determine impact significance, the sensitivity of each E&S parameter/receptor is considered in combination with the magnitude of the impact. The table below demonstrates how these parameters are considered in the assessment of significance.

Table 6: Determination of Significance

Sensitivity of Receiving Parameter/Receptor \ Magnitude of Impact	Low	Medium	High
Low	Not significant	Minor	Minor
Medium	Minor	Moderate	Moderate
High	Minor	Moderate	Major

While the above matrix provides a framework for the determination of significance, and enables comparison across E&S parameters, a degree of professional judgement must be used and some parameter-specific factors to be considered in making the determination of significance. Below provides additional guidance to the degrees of significance used in this ESIA. Note that positive impacts are defined but are not rated for significance.

- *Major significance*: Based on the above methodology such impacts result in high magnitude and affect receptors that are highly sensitive. Those are impacts that are considered to have potentially significant and adverse risks and will be a key factor in the overall decision-making process of the Project. In addition, they will also require detailed considerations for mitigation and monitoring measures;
- *Moderate significance*: Based on the above methodology such impacts either (i) result in medium magnitude and affects receptors that are of medium or high sensitivity; or (ii) result in high magnitude and affect receptors that are of medium sensitivity. Those are impacts that are considered to have potentially limited adverse risks and are unlikely to have a significant effect on the overall decision-making process. In addition, mitigation and monitoring measures require some consideration;
- *Minor significance*: Based on the above methodology such impacts either: (i) result in low magnitude and affects receptors that are of medium or high sensitivity; or (ii) result in medium magnitude and affects receptors that are of low sensitivity; or (iii) result in high magnitude and affects receptors that are of low sensitivity. Those are impacts that are considered to have minimal risks and unlikely to be of importance for the overall decision-making process. In addition, mitigation and monitoring measures are readily available to address such risks; and
- *Not significant*: Based on the above methodology such impacts result in low magnitude and affect receptors that are of low sensitivity. Such impacts are beneath the level of perception and do not require any mitigation or monitoring measures.

3.4.5 Management Measures

Based on the impact assessment undertaken a set of management measures are identified for each impact which aims to address it. Management measures include the following:

- *Additional Requirements*: those are generally regulatory requirements which have been identified and which must be taken into account at a later stage;
- *Additional Studies*: for certain E&S receptors additional studies must be undertaken at a later stage. Such studies and their scope, timing, etc. have been highlighted were relevant;
- *Mitigation Measures*: a vital step in the ESIA process is the identification of measures that can be taken to ensure that impacts are mitigated or reduced to acceptable levels. The ESIA will firstly consider the significance of any impacts caused by the Project and then assigned mitigation options through applying the following hierarchy:
  - Avoiding or 'designing out' impacts wherever possible;
  - Considering alternatives or modifications to the design to reduce the impacts wherever possible;
  - Applying measures to minimize and manage impacts on the receptor; then
  - As a last resort, identify fair compensation, remediation and offsetting measures to address any potentially significant residual effects.

  Some negative impacts can be easily mitigated, whilst others cannot or are too difficult and costly to mitigate. The various potential impacts are described in this ESIA, along with the provision of 'feasible mitigation measures' that can be implemented; and

- *Recommendations*: for positive impacts it is not possible to identify mitigation measures, but rather recommendations have been identified which aim to enhance the positive impact.

3.4.6 Assessment of Residual Significance

If there are mitigation measures it is then necessary to make an assessment of the 'residual significance' after mitigation has been taken into account. A re-assessment of Project impacts is then made, taking into account the effect of the proposed mitigation measures in order to determine the significance of the residual effects. Residual effects are discussed for each E&S theme in the ESIA chapters, and their significance determined and summarized in an Impact Assessment Table in "Section 7.4".

3.4.7 Assessment of Cumulative Impacts

For each of the impacts assessed, the ESIA investigates the cumulative impacts which could result from incremental impacts from other known existing and/or planned developments in the area and based on currently available information on such existing/planned developments. Assessment of cumulative impacts is presented in "Section 20".

3.4.8 Assessment of Associated Facilities

As discussed earlier, for the purpose of this Project, the key associated facility is the Overhead Transmission Line (OHTL) that will connect from the three (3) Project substations to the national grid in order to supply electricity to end users. The OHTL for this Project will be a high voltage line (500kV) that will run for around 843km. The OHTL will run from the Project site up until the Bukhara Region connecting with the national grid at various areas along the way through three (3) substations.

A standalone ESIA has been undertaken for the OHTL as well as a Livelihood Restoration Plan (LRP). Please refer to the standalone OHTL ESIA and OHTL for additional details on this Project component.

3.5 Development of a Framework Environmental and Social Management Plan (ESMP)

Based on the results of the impact assessment, development of management measures, and development of monitoring plan, a framework ESMP was compiled into a single table that details all of the above. The framework ESMP will be a key document and will list the E&S requirements and detail the procedures necessary for managing the significant E&S issues connected to proposed Project activities. The framework ESMP will be developed specifically to provide flexibility in the nature and exact location of operations, while ensuring all potential impacts are identified and properly mitigated and monitored throughout the later stages of the Project. This framework ESMP can be used as a stand-alone document during the different phases of the Project by Developer, EPC Contractor, Ministry of Ecology, Environmental Protection, and Climate Change, and other responsible parties.

The framework ESMP aims to provide high level mitigations and requirements for managing the E&S risks anticipated from the Project. Throughout the Project's construction and operation phase an Environmental, Social, Health, and Safety Management System (ESHS MS) must be implemented by all relevant parties (i.e. Developer, EPC Contractor and Project Operator). The ESHS MS must be project and

site specific and must build on and take into account the requirements of the framework ESMP presented throughout this document. The development and implementation of an ESHS MS is considered a key requirement under international E&S standards and requirements. The ESIA also identifies the overall framework, structure and key requirements for the ESHS MS for the key entities involved in the Project.

Note: all 'operational phase' mitigation actions identified within the framework ESMP for the operation phase (under "Section 21.4") apply whenever any group of turbines is commissioned, not just when all have been commissioned. This is critical to note given that Project commissioning will be undertaken in phases as noted earlier in "Section 2.5".

4. ANALYSIS OF ALTERNATIVES

This section presents the alternatives for the Project to include site alternatives, technology, design and finally the no-action alternative.

4.1 Site Selection Alternatives

As discussed earlier under "Section 1.1", the Developer signed an MoU with the Ministry of Energy and Ministry of Investments and Foreign Trade of the Republic of Uzbekistan.

Based on the above, the Government provided the Developer with a total area of 4,600km^2 from which they were to select the required area as a Project boundary for the development of a 1.5GW Wind Farm. The Developer had no influence, authority or control over the Government in the selection process or identification of the 4,600km^2 area. This 4,600km^2 land area is presented in the figure below.

An exclusivity period was granted by the Government, within which the Developer was required to conduct a due diligence and select the Project boundary. As part of this due diligence phase, the Developer took into account key E&S considerations that influenced the selection of the Project boundary, all of which are discussed in further details below.

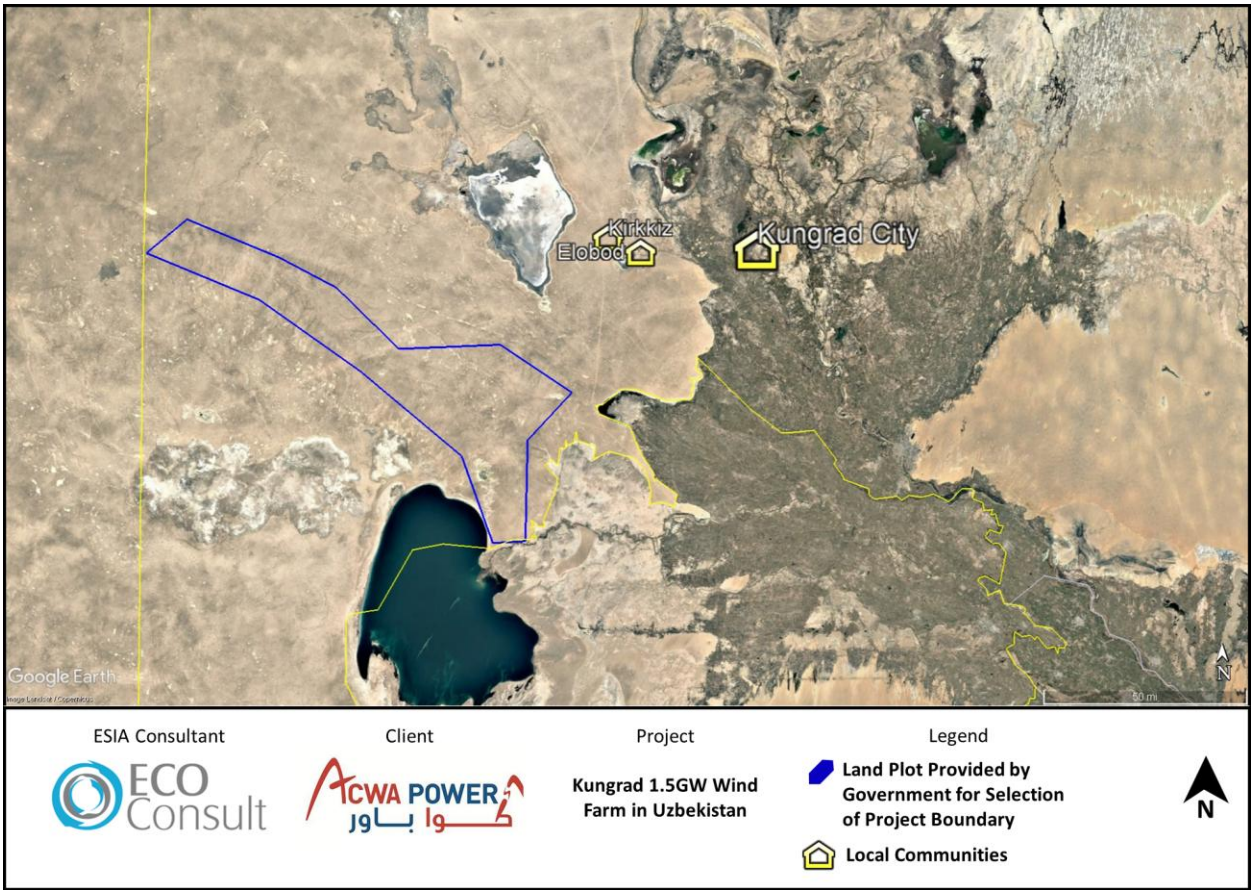


Figure 16: Land Plot Provided by Government for Selection of Project Boundary

4.1.1 Biodiversity and Avifauna

Consultations were undertaken in late 2022/early 2023 with the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection[5] and Uzbekistan Society for the Protection of Birds to identify and map out any restrictions in relation to Key Biodiversity Areas (KBAs). This included Important Bird Areas (IBA), reserves, parks, etc. Additional details on the outcomes of consultation are provided in "Section 6.3.1". The outcomes included the identification of several areas of interest to include:

- South Ustyurt National Nature Park;
- Sarykamysh lake and Surrounding Ustyurt Plateau IBA;
- Northern part of the Assake-Audan depression IBA; and
- Sarykamysh IBA.

Additional details on the above KBAs are provided in "Section 11".

The 4,600km^2 area overlaps with both the South Ustyurt National Park and Sarykamysh lake IBA. As noted in Figure 22 below, both of these areas were avoided during the selection of the final Project boundary.

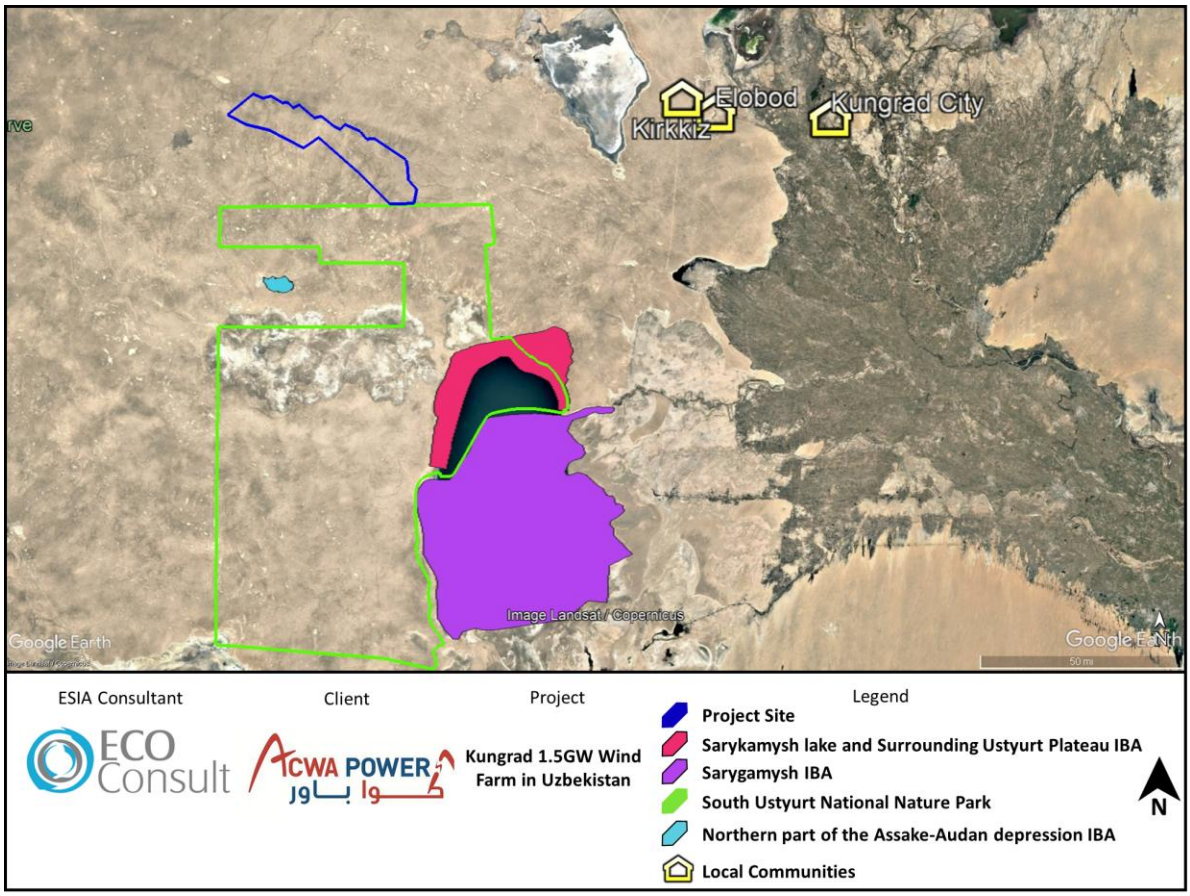


Figure 17: Project Site in Relation to KBAs

[5] A recent restructuring within governmental units in Uzbekistan occurred in June 2023 under which it was named as the Ministry of Ecology, Environmental Protection and Climate Change. In December 2022 it was called the Ministry of Natural Resources and prior to that it was known as the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection.

In addition, at a later stage further consultations were undertaken with Birdlife International (2023 and 2024), Bank Watch (2024) and John Burnside (International MacQueen's Bustard Expert, 2024). Based on such consultations, the Project aimed to ensure that boundaries avoid Compartment 15 of the UNESCO World Heritage Site 'Cold Winter Deserts of Turan' as noted within the figure below. Additional details on such consultations are provided further within "Section 6.3".

Note: the figure below only presents the sites for the 'Cold Winter Deserts of Turan' located within Uzbekistan.

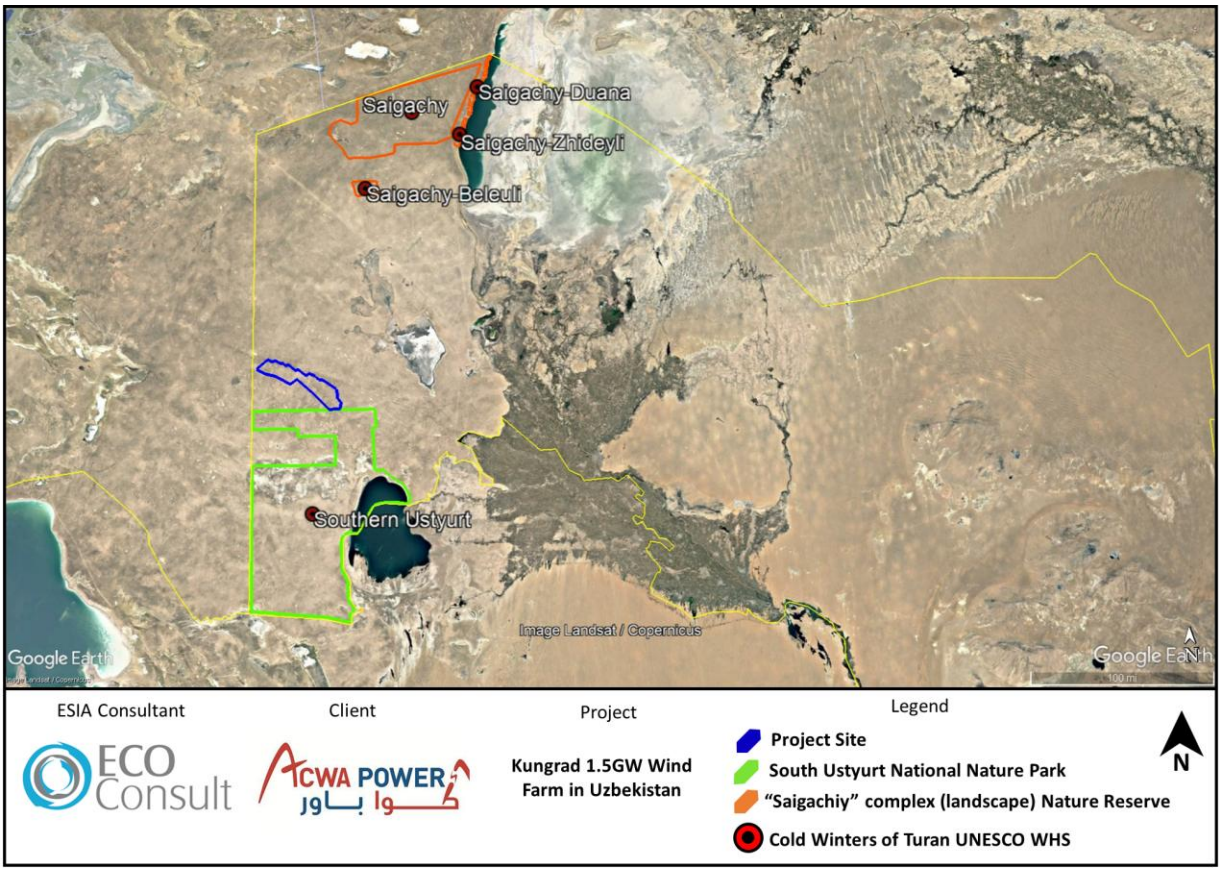


Figure 18: Project Site and UNESCO WHS 'Cold Winter Deserts of Turan'

4.1.2 Archeology and Cultural Heritage

Consultations were undertaken with the Agency of Cultural Heritage and Karakalpak Research Institute for the Human Sciences to identify any possible archeology and/or cultural heritage sites within the area. Additional details on the outcomes of consultation are provided in "Section 6.3.1".

Such entities provided key sites known within the area based on previous surveys undertaken within the region. As noted in the figure below, several sites were located within the 4,600km^2 area. All these areas were avoided for selection of the final Project boundary.

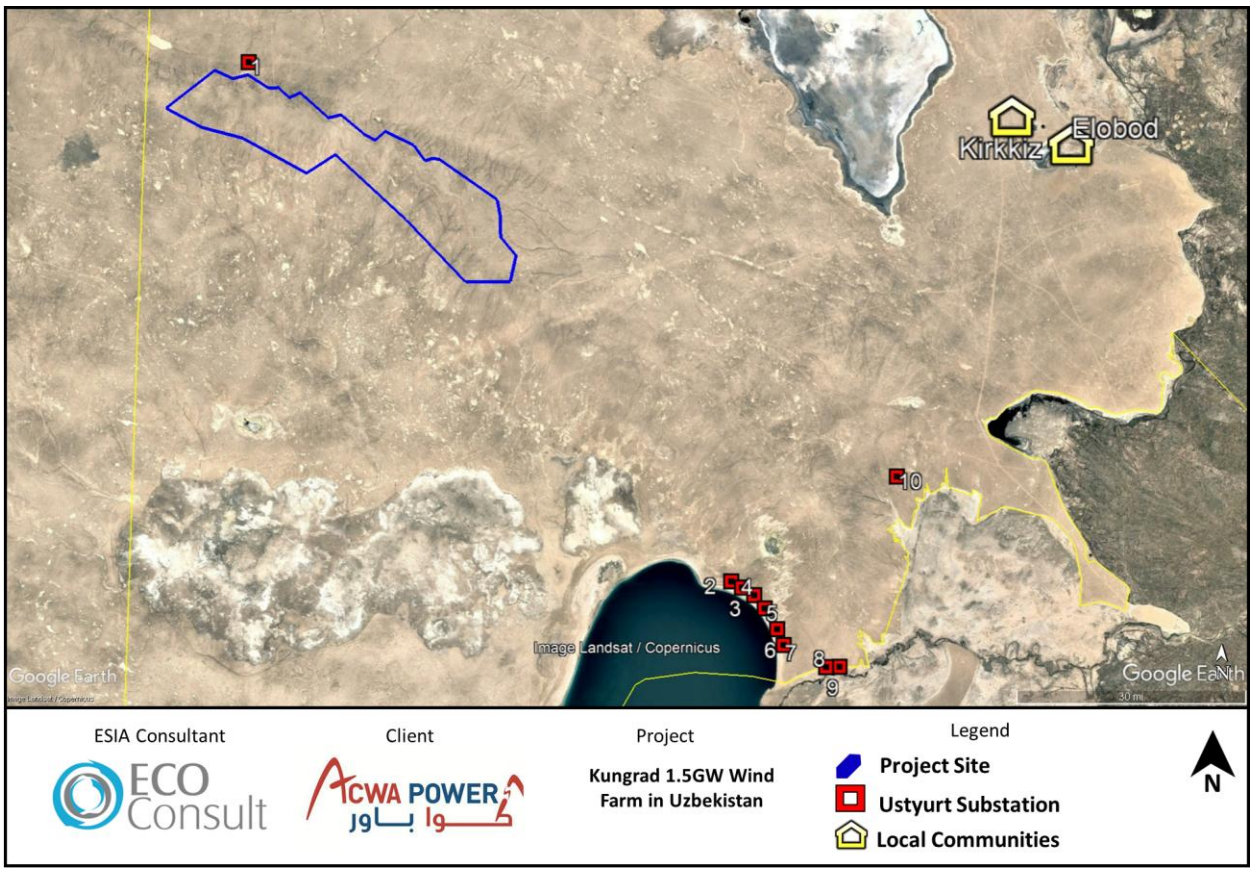


Figure 19: Identified E&S Constraints - Archeological Sites

4.1.3 Land Use

Consultations were undertaken with the Department of the Republic of Karakalpakstan of the Chamber of State Cadasters in order to identify land tenure of the sites and therefore avoid to the extent possible any acquisition process as well as physical and/or economical displacement impacts. Additional details on the outcomes of consultation are provided in "Section 6.3.1".

Data indicated that the entire 4,600km^2 parcel is under governmental ownership. In addition, a satellite image review and a rapid site visit was undertaken to the area in order to verify any possible land use activities onsite so that they are taken into account. None were recorded. Therefore, based on this, no restrictions on land use were considered for the final Project boundary.

4.1.4 Gas Exploration Activities

The area is well known for gas exploration activities. Therefore, consultations were undertaken with the State Committee on Geology and Mineral Resources of Republic of Uzbekistan in order to identify any areas for development that should be avoided. Additional details on the outcomes of consultation are provided in "Section 6.3.1".

The Committee stated that within the 4,600km^2 area there are sites which will entail important exploration activities and therefore should be avoided. The Committee provided an area within which the Project boundary should be considered that is presented in black in the figure below. As noted, the majority of the Project site is within this area but a very small part within the most western Project

boundary is located outside of this area. This issue is discussed in further details in "Section 14.1.7" and appropriate measures have been identified to account for this.

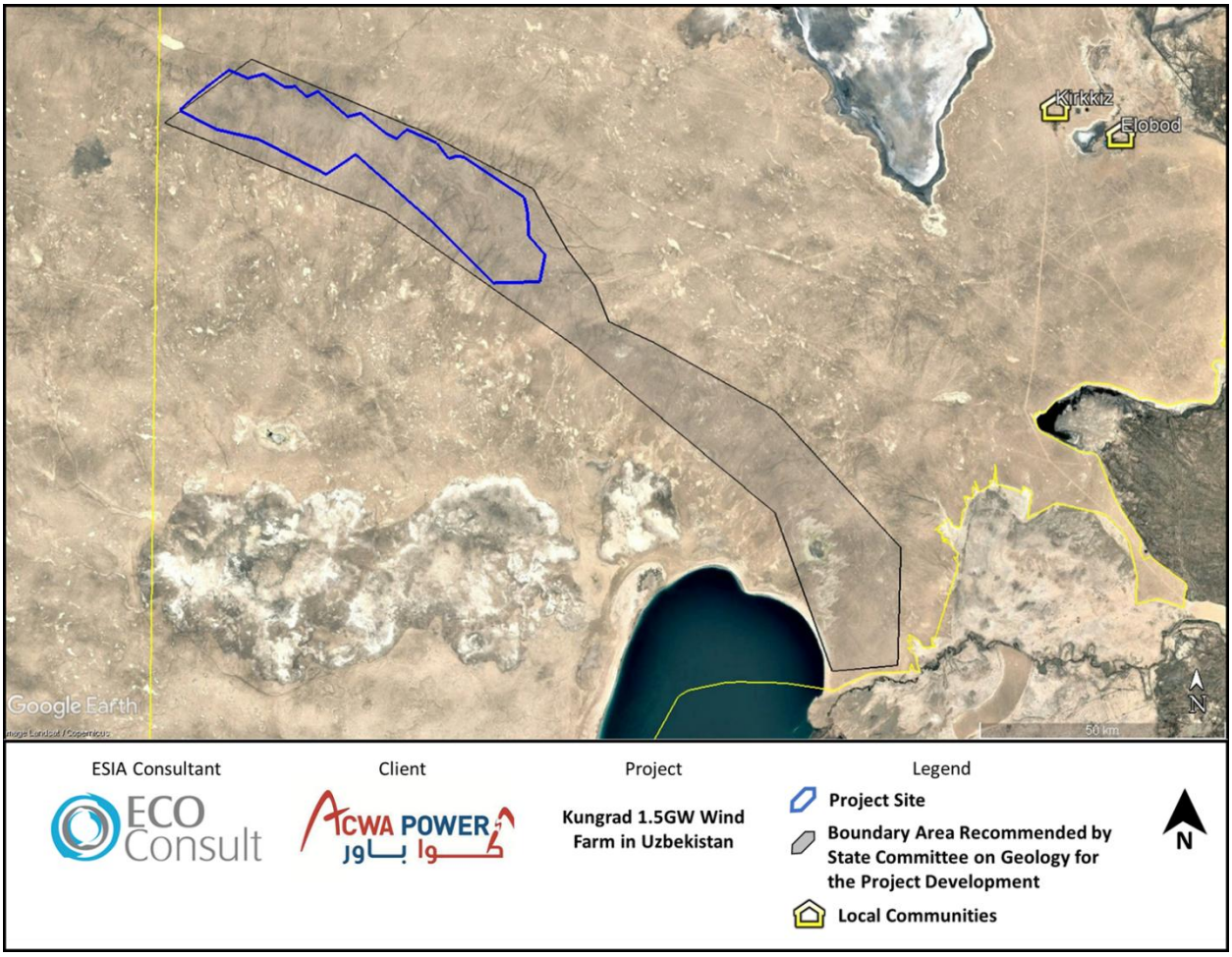


Figure 20: Identified E&S Constraint - Geological Area

4.1.5 Community Settlements

Data was obtained on all potential community settlements within the area to ensure boundary is sited away from such areas to the extent possible. As noted in the figure below, the closest were all located at a significant distance from the 4,600km^2 area. Therefore, based on this, no restrictions on community settlements were considered for the Project boundary.

This includes the following settlements:

- Kirkkiz town located around 110km to the east of the Project site;
- Elobod town located around 120km to the east of the Project site;
- Jasliq town located around 115km to the north of the Project site; and
- Kungrad City Center located around 150km to the east of the Project site.

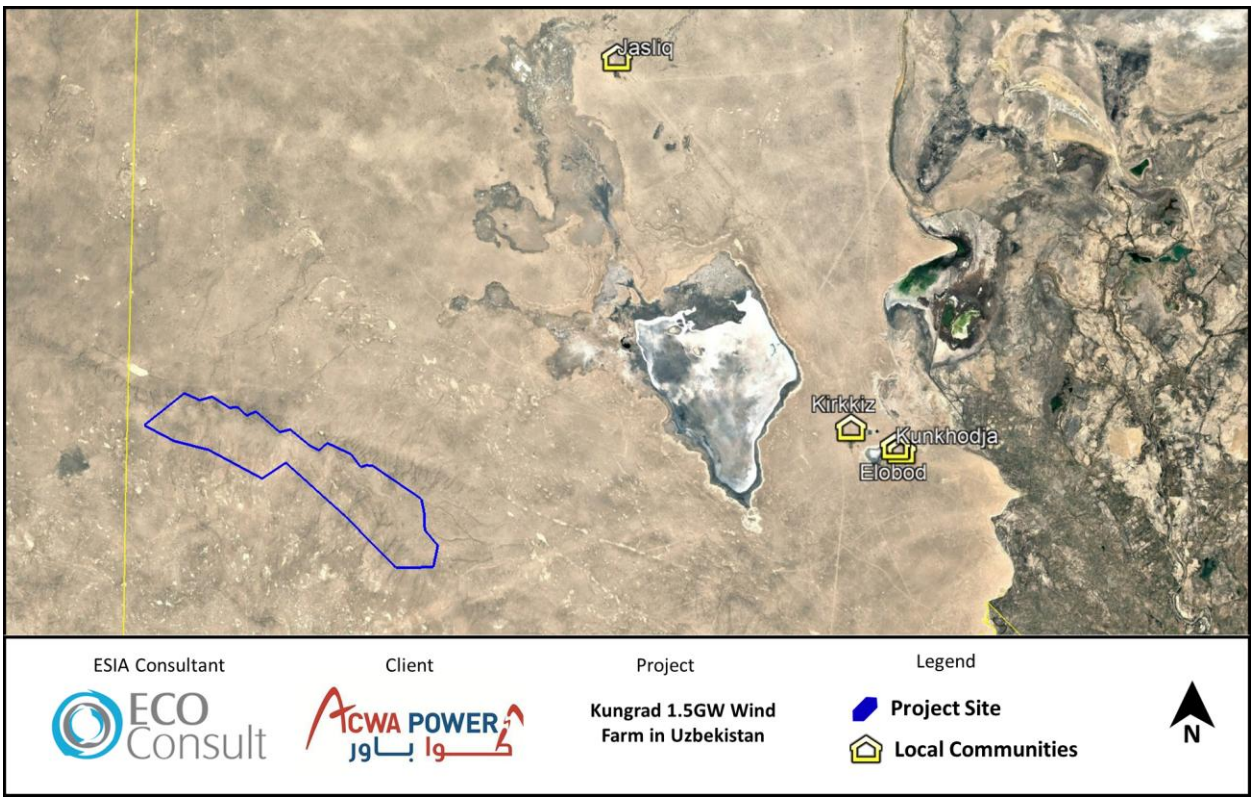


Figure 21: Identified E&S Constraint - Community Settlements

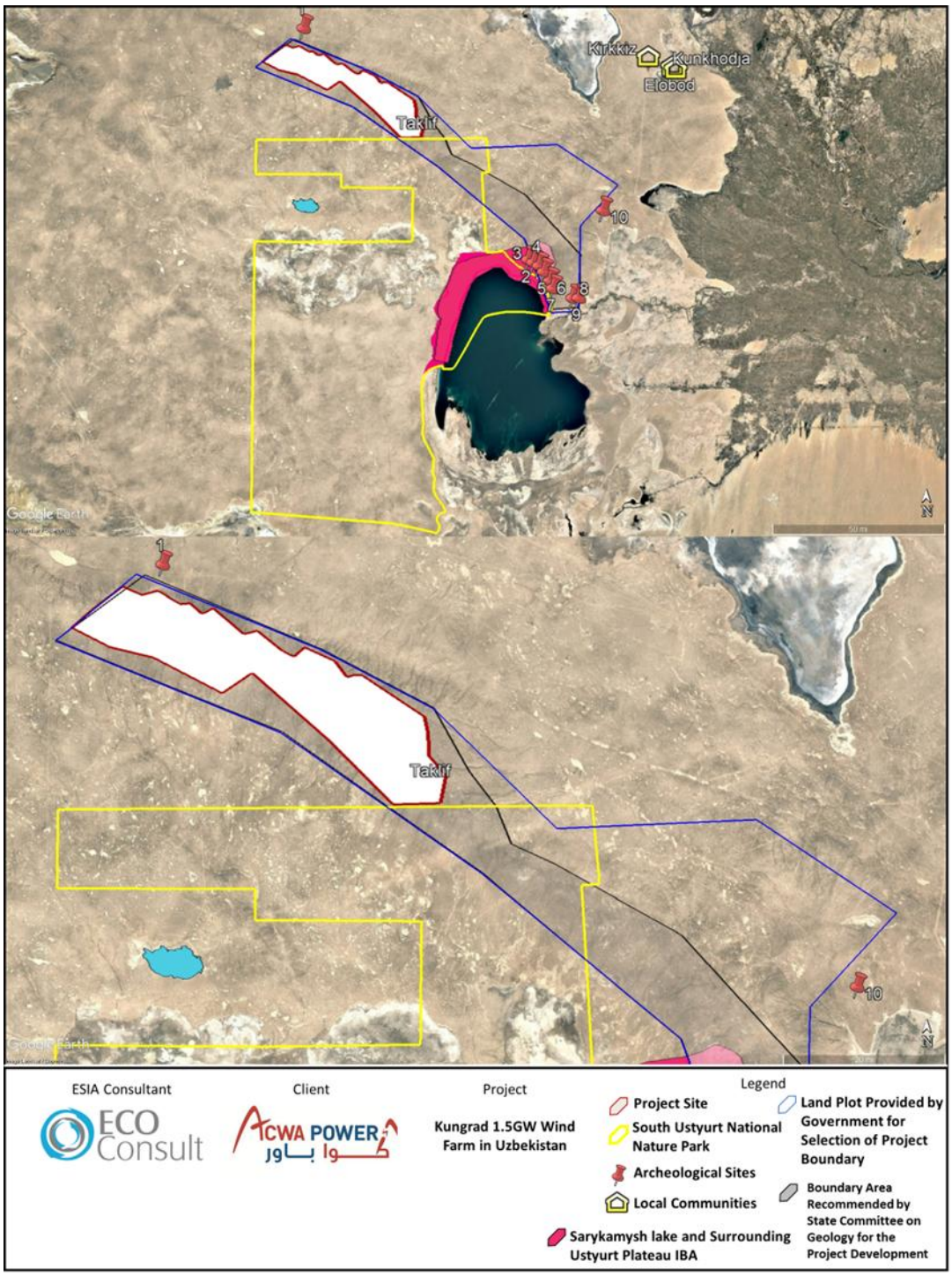


Figure 22: 4,600km^2 area, Project Site and E&S Constraints Identified

4.2 Technology Alternatives

This section discusses several alternatives besides the development of a wind farm project which are relevant within the context of Uzbekistan.

Based on the latest available statistics, 83% of the country's electricity is generated by gas, 13% by hydropower, and 4% by coal,[6] with renewable energy (solar and wind) expected to achieve 25% of the electricity mix by the year 2030.

4.2.1 Solar PV

The figure below presents a solar resources map for Uzbekistan. The map provides a concise overview of the projected solar PV power generation capacity for the country. As noted in the figure below, the Project site is located in an area with the lowest potential in country estimated at 1400 kWh/kWp as opposed to key optimal areas within regions like Bukhara which have an estimated potential at 1640 kWh / kWp[7].

Therefore, the Project site is not located within an area considered to be optimal for solar PV generation and therefore this option has been excluded.

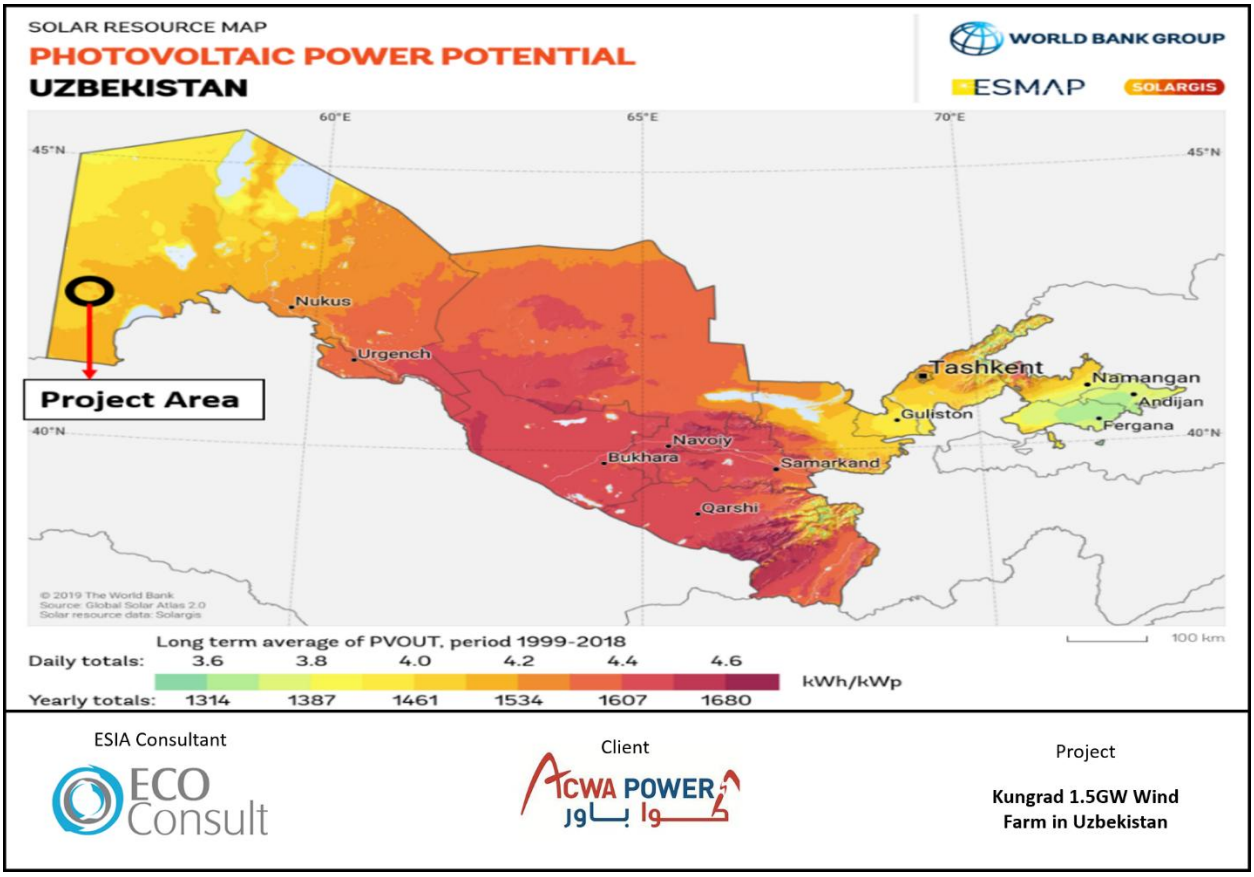


Figure 23: Solar Resource Map for Uzbekistan

4.2.2 Hydropower

The figure below presents the surface water resources within Uzbekistan. As noted, within the Project area there are no key surface water resources. Therefore, the Project site is not located within an area considered to be relevant for hydropower generation and therefore this option has been excluded.

[6] *Modern state of the energy sector of Uzbekistan and issues of their development (e3s-conferences.org)
[7] Global Solar Atlas

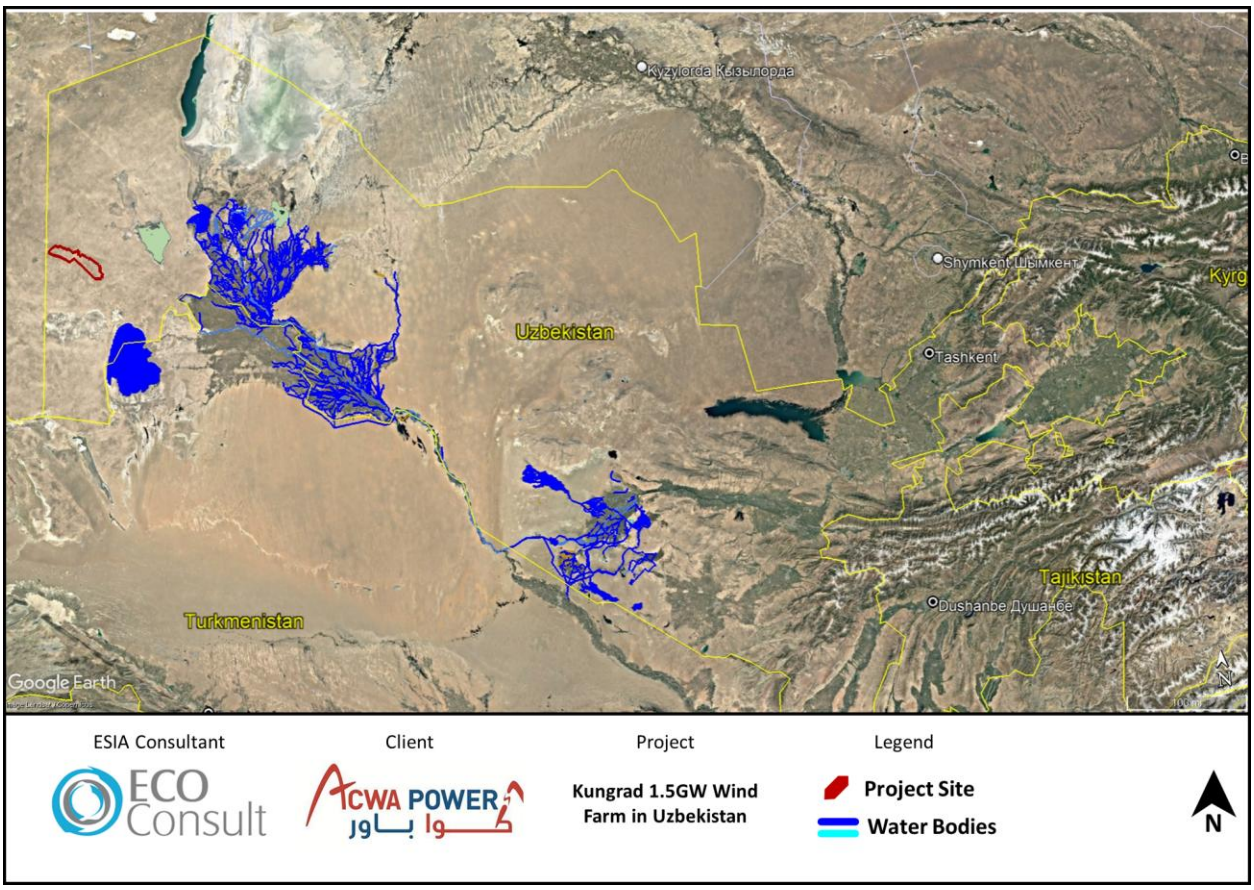


Figure 24: Water Resources in Uzbekistan

4.2.3 Thermal Power Plants

Other energy generation alternatives suitable to be built in Uzbekistan include conventional thermal power plants, similar to others already existent in the country. As noted earlier, this dominantly includes natural gas thermal power plants (accounting for 83% of the country's electricity) and some coal (estimated at 4%).

Despite the advantages that a solution of this kind would entail - such as a potential bigger energy generation capacity or the creation of more jobs during both construction and operation - the disadvantages would be significant; especially those related to environmental impacts. Conventional thermal power plants are well known for their E&S impacts when compared to this Project and could include significantly higher water consumption, generation of air pollutants and greenhouse gas emissions, etc.

More importantly, as noted earlier such developments would not be in line with the Government's policies which on broad terms advocates for the diversification of energy resources and increasing the share of renewable energy to 25% by the year 2030.

Based on the above, this option has been excluded.

4.2.4 Selection Criteria from Developer

The Developer uses a robust and stringent internal evaluation process for potential suppliers and products, including those on this Project. Selected suppliers ultimately make it to an Approved Vendor List. Process is as detailed below.

- Project Request for Proposal (RfP) is shared with all approved suppliers;
- LCOE Levelized Cost of Energy (LCOE);
- The following technical parameters are also considered:
  - Availability and Performance Guarantee
  - Commercial Competitiveness
  - Grid Compliance
  - Technical Competitiveness for Project Implementation
  - Site Suitability

4.3 Design Alternatives

The Developer has prepared a final layout for the Project that was updated on a continuous basis based on outcomes of E&S surveys and studies undertaken throughout the ESIA study. The Developer is committed to ensuring that all identified E&S constraints throughout the ESIA process are considered fully throughout the Project design, specifications and layout.

Taking the above into account, the final layout and design discussed earlier under “Section 2.3” for the Project components has taken into account the following site-specific constraints:

4.3.1 Infrastructure and Utilities

- Avoidance of the existing gas pipeline that runs within the Project site along with a 250m buffer as required by the pipeline operator. This is discussed in further details in “Section 14”.

4.3.2 Biodiversity

- A topography survey was undertaken for the entire Project area. The ‘E&S team’ required the topography team to map out as part of their scope all existing tracks/dirt roads within the Project site. The objective is that the Developer’s design team consider such existing tracks/dirt roads as part of the internal road layout requirements to minimize impacts on biodiversity and minimize the amount of natural habitat being lost. This issue is discussed in further details under “Section 11”. The figure below presents the existing tracks/dirt roads and the final internal road network with overlaps between both presented in red in the figure below. Similar to the above, the access roads have also followed to the greatest extent possible existing tracks/dirt roads to minimize impacts on biodiversity in particular.

- As part of the biodiversity and baseline surveys, key species were recorded onsite from which a buffer distance has been considered. This issue is discussed in further detail in “Section 11”.
  - Honey Badger burrows
  - Steppe Eagle nests
  - Long-legged Buzzard nests
- Throughout earlier communication in 2022 on the Project with the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection, they required a 10-km setback distance from the South Ustyurt National Park the boundary of which is synonymous with the UNESCO World Heritage Site; Compartment 15 of the ‘Cold Winter Deserts of Turan’. This issue is discussed in further detail in “Section 6.3”. However, a dedicated workshop was undertaken by the ‘E&S Team’ (refer to “Section 6.3.2”) with biodiversity experts and relevant governmental entities that included providing scientific justification based on international best practice as well as available site-specific data to date on why a 10-km setback distance is not required. Based on the outcomes of the workshop, an updated official communication was received revising the setback distance to 2-3km which has been taken into account as part of the preliminary design at that time. In addition, the environmental permit that was issued for the Project on 6 May 2024 also required a setback of 3km.

  However, at a late stage, the final layout that was prepared by the Developer maintained this 10km setback distance that was initially required as noted in the figure below. No construction activities will be completed within 10-km of the National Park / World Heritage Site.

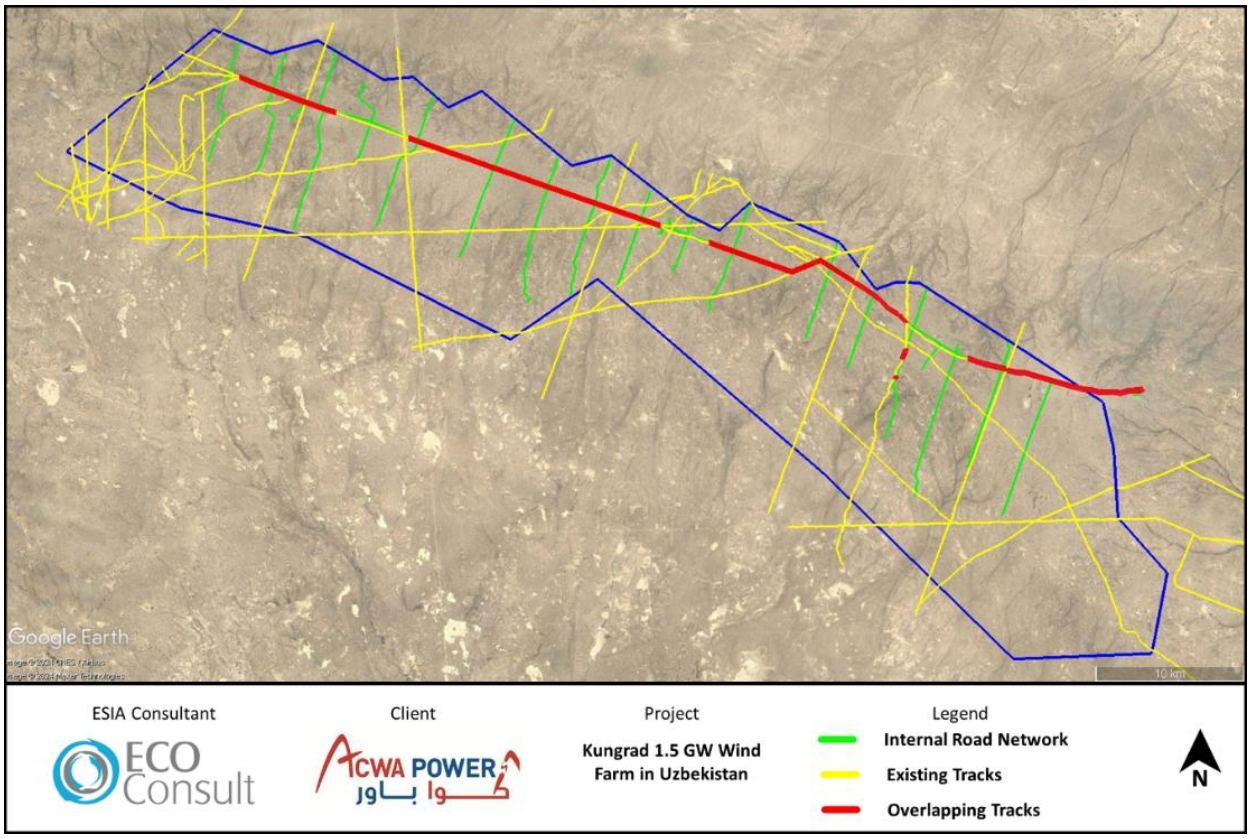


Figure 25: Existing tracks and Final Roads

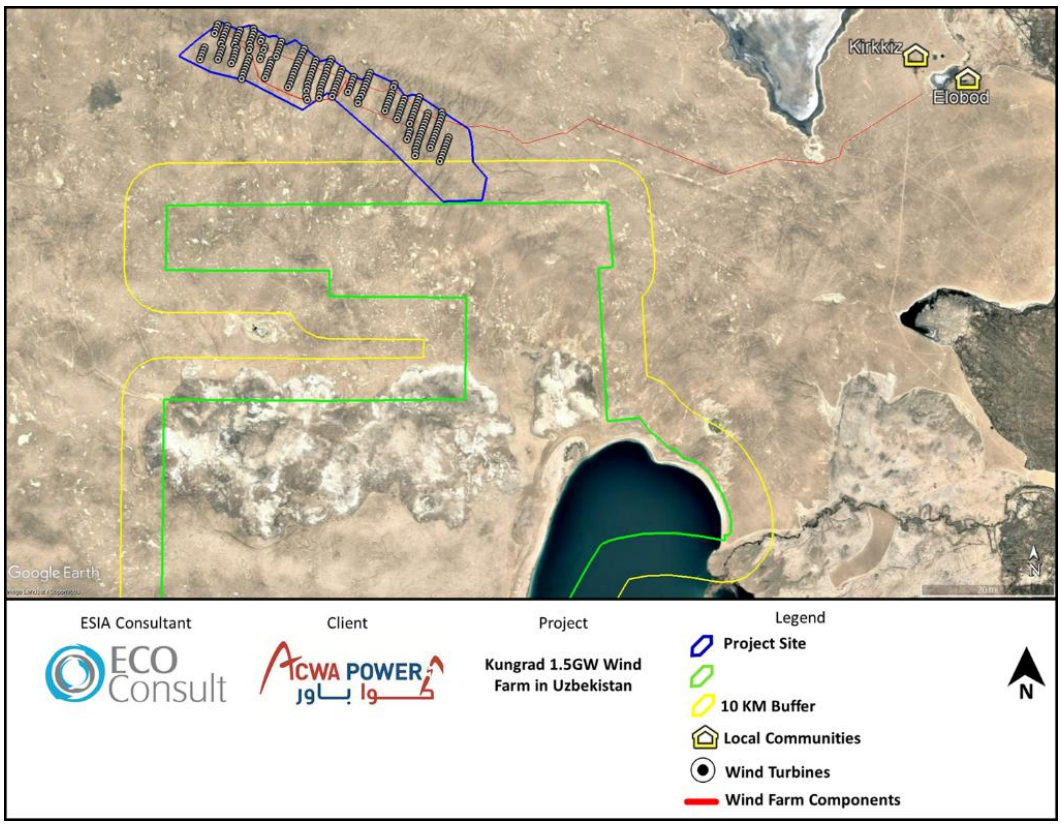


Figure 26: Project Layout and 10KM Buffer from Reserve

4.3.3 Archeology and Cultural Heritage

- As part of the archelogy and cultural heritage baseline survey, several sites were recorded within the Project boundary all of which have been avoided along with appropriate buffer distances. This issue is discussed in further details under “Section 12”.

4.4 No-Project Alternative

The ‘no Project’ alternative assumes that the 1,500MW Project will not be developed. Should this be the case, then the Project site area would remain the same. The land area would remain with its current characteristics – vast desert grounds with sparse vegetation with no particular land use.

Should the Project not move forward, then the Project-related negative E&S impacts discussed throughout this ESIA would be averted. However, as noted throughout the ESIA, generally such impacts do not pose any key issues of concern and can be adequately controlled and mitigated through the implementation of the ESMP discussed in “Section 21”. Nevertheless, should the Project not move forward; the significant and crucial positive economic and E&S benefits would not be realized. Such benefits include the following:

- This development allows for more sustainable development and shows the commitment of the Government of Uzbekistan to realizing the energy strategy;
- Contribute to increasing energy security through development of local energy resources and reducing dependency on external energy sources;

- The clean energy produced from renewable energy resources is expected to reduce consumption of alternative fuels for electricity generation, and will thus help in reducing greenhouse gas emissions, as well as air pollutant emissions; and
- Project is expected during the construction and operation phase to generate local employment and commit to other social responsibilities. As such, this is expected, to a certain extent, to subsequently enhance the socio-economic conditions and standards of living of the local communities.

In conclusion, an ESIA must investigate all potential positive and negative impacts from a project development. In the case of this Project, it is important to weigh the significant positive economic and E&S impacts incurred from the Project development, against the negative E&S impacts anticipated at the site-specific level – in which generally the ESIA concludes that they can be mitigated, managed and controlled to acceptable levels. The comparison in this chapter clearly concludes that the 'no Project' alternative is not a preferable option.

5. REGULATORY AND POLICY FRAMEWORK

This section presents the environmental clearance process in Uzbekistan, the key E&S legislations that are applicable for the Project, and the relevant international E&S standards and requirements.

5.1 Environmental Clearance Process in Uzbekistan

The Ministry of Ecology, Environmental Protection and Climate Change is the primary environmental regulator who reports directly to the Parliament and is responsible at national, regional and local levels for the development and enforcement of the national environmental and conservation policy, issuing environmental permits, overseeing environmental compliance, and integrating environmental management across various sectors.

The Ministry's mandate is set forth in the Regulation on the State Committee for Nature Protection of the Republic of Uzbekistan enacted by the Parliament in 1996, including issuance of environmental permits for development projects.

The Uzbekistan EIA requirements are set forth within the "Resolution №541 of the Cabinet of Ministers on Procedure of EIA Mechanism (07 September 2020)". The EIA process is known as Otsenka Vliyaniya na Okruzhayushchuyu Sredu (OVOS) within the local context.

Annex 1 of the Resolution classifies any electricity generation projects that exceed 300MW as Category 1, which will require the undertaking of an EIA study in order to obtain an environmental permit (EIA study is known as PZVOS within the local context). Category 1 EIA studies should be submitted to the central Ministry in Tashkent and not its representative ministry in Karakalpakstan.

The key components of the EIA study (or PZVOS) for Category 1 projects includes the following:

- Public hearing: a public hearing is required to be undertaken for the Project which should take place with the Karakalpakstan District Khokimiyat;
- Current state of the environment (before the project implementation): physical and geographical location, climatic characteristics of the area, existing sources of anthropogenic impact on the environment, condition of atmospheric air, geomorphological characteristics of the area, surface and ground water, soil, flora and fauna, noise, cultural heritage sites and socio-economic aspects;
- Characteristics of the design object: description of the production facility, production technology with the provision of a master plan of the facility being designed and a technological scheme of production, data on water supply and sanitation, data on waste generated and methods of their processing;
- Assessment of the types and levels of impact on the environment;
- Assessment of existing alternatives;
- Assessment of possible emergency situations with environmental impact at the enterprise;
- Environmental control and management measures; and
- Forecast of the state of the environment after the implementation of the project.

The Draft EIA is then submitted to the Ministry for review. A conclusion is received within four (4) weeks following submission. The conclusion will either include approval of the EIA and issuance of environmental

permit or determination for a ZVOS. The ZVOS involves updating the PZVOS (i.e. EIA) with any additional information / research / surveys as requested by the Ministry based on their review of the PZVOS.

The environmental permit that will be issued will be for the construction phase of the Project. Prior to the operational phase, the Developer will be required to submit the ZEP, which is the final stage of the OVOS to be conducted prior to Project commissioning. This involved submission of a report that details any minor modifications compared to the submitted PZVOS as well as reporting normative to be provided during the operational phase.

Taking the above into account, the EIA was submitted to the Ministry and an environmental permit has been issued on 6 May 2024.

In addition, it is important to note that the EPC Contractor will be required to obtain an OVOS for other Project components for which details were not available at the EIA stage – this includes (but not limited to) batching plant, temporary LVDL, and burrow pits. This has been added as a requirement within the ESMP.

5.2 Uzbekistan E&S Regulatory Context

This section lists those legislations that are directly related to E&S compliance that must be adhered to by all parties involved in the Project throughout the planning and construction, operation, and decommissioning phase. These legislations include: (i) those issued by the Ministry of Ecology, Environmental Protection and Climate Change (laws, regulations and instruction), and (ii) the relevant national legislations issued by other line ministries (laws, regulations, instructions, standards).

The table below lists the key relevant legislation to each of the E&S parameters and attributes being studied and assessed within this ESIA. **Annex I** present a full legal review of each of the legislations provided below along with its relevance for the Project development.

Table 7: National Legislation and Guidelines Governing the E&S Compliance for the Project

Legislation
Environmental Management
Constitution of the Republic of Uzbekistan
Environmental Audit Law No. ZRU-678 of 2021
Law on Efficient Use of Power Energy of 1997
Law on Environmental Control of 2013
Law on Renewable Energy Sources of 2019
Land Use
Decree of the President of the Republic of Uzbekistan №5495, “On measures on major improvement of the investment climate in the Republic of Uzbekistan."
Land Code of 1998
Law of the Republic of Uzbekistan No. ZRU-728 “On the privatization of non-agricultural land plots.”
Law of the Republic of Uzbekistan №ZRU-781 on Procedures for Withdrawal of Land Plots for Public Need with Compensation
Law of the Republic of Uzbekistan on State Land Cadaster No.666-1 of 1998
Presidential Decree 6243 of 2021, “On Measures to Ensure Equality & Transparency in Land Relations, Reliable Protection of Land Rights & their Transformation into a Market Asset.”
Presidential Decree No. UP-5742 "On Measures for The Efficient Use of Land and Water Resources in Agriculture" of 2019
Resolution of 2011 "On the procedure for compensation for losses of owners, users, tenants and owners of land plots, as well as losses in agricultural and forestry production."

Resolution of Cabinet Ministers №3857, “On procedure for preparation and implementation of projects with the participation of International Financial Institutions and foreign Governmental Financial Organizations.”
Resolution of Cabinet of Ministers No.317 “On amending and adding to some decrees of the Republic of Uzbekistan, aimed the further improvement of registration of cadastral document on a real property.”
Resolution of Cabinet of Ministers № 146, “On measures to improve the procedure for providing land plots for urban planning activities and other non-agricultural needs.”
Geology, Hydrology, Hydrogeology
Resolution of the Cabinet of Ministers No. 255 "On Approval of Some Administrative Regulations of State Services in The Sphere of Nature Management."
SanPin No 0183-05: Hygienic Requirements for the Quality of Soil in Populated Areas in the Specific Natural and Climatic Conditions of Uzbekistan.
SanPin No.0191-05: Maximum Permissible Concentrations (MPC) and Approximate Allowable Concentrations (AAC) of Exogenous Harmful Substances in soil.
SanPin No.0212-06: Sanitary Rules and Norms for the Hygienic Assessment of Soil Contamination of Different Types of Land Use.
SanPin № 0272-09: Sanitary Rules and Norms for Drawing Up Hygienic Justifications for Soil Protection Schemes from Pollution in the Conditions of Uzbekistan.
Biodiversity
Law № 73-II on Environmental Expertise
Law on Nature Protection of 1992
Law ZRU-363 on Environmental Control
Law ZRU-678 on Environmental Audit
Presidential Decree No. UP-5863 “Validating the Strategy for Environmental Protection in The Republic of Uzbekistan Until 2030.”
Resolution of Cabinet of Ministers of Republic of Uzbekistan No. 95 “On Approval of General Technical Regulations of Environmental Safety.”
Resolution of the Cabinet of Ministers No. 286 “Standard Regulations on the Procedure for Implementing Industrial Environmental Control.”
Resolution of the Cabinet of Ministers No. 484 “On Approval of the Strategy for the Conservation of Biodiversity in The Republic of Uzbekistan for the Period 2019-2028”.
Resolution of the Cabinet of Ministers No. 86 "Approval of The Uniform Regulation on the Procedures for Issuing Certain Documents Through a Special Electronic System.”
Resolution of the Cabinet of Ministers No. 93 "On Additional Measures to Conserve Valuable Varieties of Trees and Shrubs Not Included in the State Forest Fund".
The Law of the Republic of Uzbekistan № 543-I “On Protection and Use of Flora and Vegetation.”
The Law of the Republic of Uzbekistan № 710-II “On Protected Natural Reserves.”
The Law of the Republic of Uzbekistan № 73-II “On Ecological Expertise.”
The Law of the Republic of Uzbekistan ZRU-408, "On Protection and Use of the Wildlife."
The Red Book of the Republic of Uzbekistan
The Resolution of Cabinet of Ministries of the Republic of Uzbekistan No. 820 “On Measures to Further Improve the Economic Mechanisms for Ensuring Nature Protection.”
The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 14. “On Approval of the Regulation on the Procedure for the Development and Agreement of Projects with Environmental Standards.”
The Resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 “On further improvement of the environmental impact assessment mechanism.”
The Resolutions of Cabinet of Ministers of the Republic of Uzbekistan No. 290 "About the Settlement of Use of Biological Resources and about the Procedure for Passing of Allowing Procedures in the Field of Environmental Management."
Archaeology and Cultural Heritage
Constitution of the Republic of Uzbekistan
Criminal Code of the Republic of Uzbekistan
Code of the Republic of Uzbekistan on Administrative Responsibility

Law No. ZRU-229 “On Protection and Use of the Objects of Archaeological Heritage.”
Law No. 269-II “On the Protection and Use of Cultural Heritage Sites.”
Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 846 “On Approval of the National List of Real Estate Sites and Objects of Tangible Cultural Heritage.”
Presidential Decree No. R-5181 “On Improving the Protection and Use of Objects of Tangible Cultural and Archaeological Heritage.”
Presidential Decree no. PP-4068 “Regarding the Strengthening of the Protection, Management and Enhancement of Tangible and Intangible Cultural Heritage.”
Air Quality and Noise
Sanitary Standards and Rules No. 0008-20 on Permissible Noise Levels in Residential Buildings, Public Buildings and Recreation Zones.
Sanitary Standards and Rules No. 0325-16 for Permissible Noise Levels in the Workplace
SanPin № 0293-11 “Hygienic regulations List of maximum permissible concentrations (MPC) of contaminants in the atmospheric air of inhabitant areas in the territory of the Republic of Uzbekistan.”
SanPin №. 0339-16. “Sanitary rules and norms of planning and development of settlements of Uzbekistan.”
Standard No. 0350-17, “Sanitary norms and rules for the protection of atmospheric air in populated areas of the Republic of. Uzbekistan.”
The Law of the Republic of Uzbekistan № 353- I “On Atmospheric Air Protection.”
Community Development
Decree No. 964 of 5 December 2017 "On the Measures for Perfection of the Activity of Self-Government Bodies Aimed at Ensuring Employment, firstly for the Youth and Women."
Decree of the Cabinet of the Ministers No. 1011 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement.”
Resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 “On further improvement of mechanism for Environmental Impact Assessment.”
Infrastructure and Utilities
Construction measure (KMK) 2.10.10-97: Norms & regulations for allocation of land for railways
Criteria and Procedure for Determining International Road Transportation of Loads.
Decree of the Cabinet of Ministers of the Republic of Uzbekistan No.1050 “On approval of Rules for Protection of Power Grid Facilities
Law No. 818-I “About traffic safety” of the Republic of Uzbekistan.
Law No. ZRU-117 on Highways
Law No. ZRU-56 on Telecommunications of 1995
Law № 725-1 “On Radio Frequency Spectrum.”
Law on Electricity of 2009
Regulations on Provision of Energy Services, Resolution of the Cabinet of Ministers of the Republic of Uzbekistan.
Regulations on road safety during transportation of large and heavy loads by road transport.
Regulations on Rules for Cargo Transportation by road in the Republic of Uzbekistan
Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 22: Rules for Using Power Energy
Resolution of the President of the Republic of Uzbekistan №PP-57, “On measures to accelerate the implementation of renewable energy sources and energy-saving technologies in 2023.”
Sanitary Norms No. 0236-07: Sanitary Standards and Regulations to Ensure Safety for Populations Living near High Voltage Power Lines.
Sanitary Rules and Regulations for The Placement and Operation of Radio Engineering Facilities in Populated Areas
Air Code for the Republic of Uzbekistan of 1993
Aviation Regulations (AP RUZ-150) Registered under No. 73
Labor and Working Conditions
Decree of the Cabinet of the Ministers No. 965 "On the Measures of Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social protection and Face Difficulties in Searching Employment and Incapable of Competing in Labor Market with Equal Conditions."

Joint Decree of the Ministry of Labor and Social Protection of the Population (No. 33) and the Ministry of Healthcare (No. 13) of Uzbekistan "On the approval of the list of jobs with unfavorable working conditions where the employment of persons under 18 years is prohibited" registered by the Ministry of Justice of the Republic of Uzbekistan.
Labor Code of the Republic of Uzbekistan 1995
Law "On the employment of the population, No. ZRU- 642
Law No. ZRU-641 on Rights of Persons with Disabilities
Resolution of Cabinet of Ministers No. 244 "On the approval of the regulations on the procedure for the attraction and use of foreign workforce in the Republic of Uzbekistan."
Management of Solid Waste, Hazardous Waste and Wastewater
Law No. ZRU-784 on Drinking Water and Wastewater
Regulation "On the Procedure for the Disposal, Collection, Pay Settlement, Storage and Removal of Waste Industrial Oils."
Regulation on the Procedure for Handling Colored and Black Metal Scrap."
Resolution of Cabinet of Ministers of Republic of Uzbekistan No. 95 "On Approval of Regulatory and Legal Acts in the Field of Waste Management."
SanPin No. 0158-04 - Sanitarian Rules and Norms on collection, transportation and disposal of wastes contained asbestos in Uzbekistan."
SanPin № 0127-02 "Sanitary procedures for inventory, classification, storage and disposal of industrial waste."
SanPin № 0157-04 "Sanitary requirements to the storage and neutralization of solid domestic waste on special grounds in Uzbekistan."
SanPin of the Republic of Uzbekistan № 0128-02 – "Hygienic classifier of toxic industrial wastes in the Republic of Uzbekistan."
SanPin of the Republic of Uzbekistan №0300-11 "Sanitary Rules and Standards for managing collection, inventory, classification, treatment, storage and disposal of industrial waste in the context of Uzbekistan."
The Law of the Republic of Uzbekistan No. 362-II "On Waste."
The Resolution of Cabinet of Ministries of the Republic of Uzbekistan No. 820 "On Measures to Further Improve the Economic Mechanisms for Ensuring Nature Protection."
The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No 14. "On Approval of the Regulation on the Procedure for the Development and Agreement of Projects with Environmental Standards."
Occupational Health and Safety
Joint Decree of the Ministry of Labor and Social Protection of the Population (No.7) and the Ministry of Healthcare (No. 1) of Uzbekistan.
Law No. ZRU-174 "About mandatory state social insurance against industrial accidents and occupational diseases."
Law No. ZRU-393 of the Republic of Uzbekistan "On Sanitary and Epidemiological Welfare of Population."
Order of the Head of the State Inspectorate for Supervision in the Electric Power Industry, No. 19 "On approval of safety rules when performing electrical installation work at power facilities."
Ordinance No. 30-31 of the Ministry of Labor and Social Security and the Ministry of Health of the Republic of Uzbekistan
Sanitary Standards and Rules No 03225-16 for permissible noise levels in the workplace
SanPin (Sanitary Rules & Norms) 0372-20 (May 2020) on "Temporary sanitary rules and regulations on the organization of activities of state authorities and other organizations."
Standard No. 0294-11 on "Permissible Amount of Harmful Substance in Air in Working Space."
Public Health and Safety
Sanitary Norms No. 0236-07 "Sanitary Standards and Regulations to Ensure Safety for Populations Living near High Voltage Power Lines."
The Electrical Installation Rules
Water Resources
Decree of the President of the Republic of Uzbekistan No. PP-5005 "On approval of the strategy for water resources management and development of the irrigation sector in the Republic of Uzbekistan for 2021-2023."
Law No. ZRU-784 on Drinking Water and Wastewater
Presidential Decree No. UP-6024 Validating the Concept for The Development of Water Sector of The Republic of Uzbekistan for The Period Of 2020-2030.

The Law of the Republic of Uzbekistan No. ZRU-837-XII "On Water and Water Use."

5.3 International Agreements

Uzbekistan has signed and ratified a number of international conventions committing the country to the conservation of E&S resources and protection of workers' health & safety and labor rights. The following table lists the key conventions:

Table 8: Relevant International Conventions and Agreements

Name of Multilateral E&S Agreement	Year
Biodiversity and Natural Resources	
Agreement between the Government of Kazakhstan, the Government of Kyrgyzstan and the Government of Uzbekistan on Management of Water Resources in Central Asia	1996
Agreement on the Convention of African-Eurasian Migratory Waterbirds	2004
Agreement on the Cooperation in the Field of Joint Water Resources Management and Conservation of Interstate Sources	1992
Agreement on the Use of Water and Energy Resources of the Syr Darya Basin	1999
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1996
Convention on Biological Diversity (CBD)	1995
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1997
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	1998
Convention on the Convention of the Migratory Species of Wild Fauna and Flora	1997
Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)	2007
Convention on Wetlands of International Importance (Ramsar Convention)	2002
Kyoto Protocol	1997
Montreal Protocol on Substances that deplete the Ozone Layer	1993
Paris Agreement	2017
Stockholm Convention on Persistent Organic Pollutants (POPs)	2019
United Nations Convention to Combat Desertification (UNCCD)	1995
United Nations Framework Convention on Climate Change (UNFCCC)	1993
Vienna Convention on the Protection of the Ozone Layer	1993
Human Rights	
UN Convention on the Elimination of All forms of Discrimination against Women	1995
UN International Covenant on Economic, Social and Cultural Rights	1995
UN Convention on the Rights of a Child	2008
UN Convention on the Elimination of All Forms of Racial Discrimination	1995
UN Convention on the Rights of Persons with Disabilities	2009
UN International Covenant on Civil and Political Rights	1995
Cultural Heritage	
Convention for the Safeguarding of the Intangible Cultural Heritage	2008
Paris Convention Concerning the Protection of the World Cultural and Natural Heritage	1993
Key ILO Conventions	
C 105: Convention on the Abolition of Forced Labor (ratified 1997)	1957
C 138: Convention on the minimum Age (ratified 2009)	1973
C 111: Discrimination (Employment and Occupation) Convention (ratified 1992)	1958
C 100: Equal Remuneration Convention (ratified 1992)	1951
C 29: Forced Labor Convention (ratified in 1992)	1930
C 87: Freedom of Association and Protection of the Right to Organize Convention (ratified in 2016)	1948
C 81: Labor Inspection Convention (ratified in 2019)	1947
C 138: Minimum Age Convention (ratified 2009)	1973

C 187: Promotional Framework for Occupational Safety & Health Convention (ratified in 2021)	2006
C 98: Right to Organize and Collective Bargaining Convention (ratified 1992)	1949
C 182: Worst Forms of Child Labor Convention (ratified 2008)	1999

5.4 Requirements for Project Financing

The Project will be seeking financing from International Financing Institutions (IFIs). Therefore, the Developer wishes to design and manage the project in accordance with international E&S standards and requirements. For the ESIA, it will be based on the requirements of the following entities, each of which is discussed in further details below:

- International Finance Corporation (IFC);
- Equator Principles (EP);
- European Bank for Reconstruction and Development (EBRD);
- Asian Development Bank (ADB); and
- Asian Infrastructure Investment Bank (AIIB).

5.4.1 International Finance Corporation (IFC)

The IFC of the World Bank provides a range of guidance documents related to the assessment and management of E&S issues in project development. Not only does IFC guidance provide a generally accepted basis for good practice, but it also provides the technical cornerstone for the Equator Principles which set out the E&S requirements of banks for project finance. The IFC requirements have become the *de facto* international E&S performance benchmark for project financing.

The IFC policy on E&S Sustainability puts into practice IFC's overall commitments to E&S sustainability. The policy seeks to: (i) enhance the predictability, transparency, and accountability of IFC's actions and decision making; (ii) help clients manage their environmental and social risks and impacts and improve their performance; and (iii) enhance positive development outcomes on the ground. In addition, the Policy identifies IFC's commitments, its roles and responsibilities and other as applicable.

The IFC Performance Standards (PS) on Social and Environmental Sustainability set out a framework for managing and improving project performance from planning and assessment, through construction and operations to closure. The Performance Standards requirements are summarized in the table below.

Table 9: IFC Performance Standard Requirements

IFC PS	Key Points	Applicability to ESIA
PS1: Assessment and Management of Environmental and Social	PS1 underscores the importance of managing social and environmental performance throughout the life of a project by using a dynamic social and environmental management system. Specific objectives of this Performance Standard are: ▪ To identify and assess social and environment impacts, both adverse and beneficial, in the project's area of influence; ▪ To avoid, or where avoidance is not possible, minimize, mitigate, or compensate for adverse impacts on workers, affected communities, and the environment;	Applicable and considered for this ESIA

Risks and Impacts	▪ To ensure that affected communities are appropriately engaged on issues that could potentially affect them; and ▪ To promote improved social and environment performance of companies through the effective use of management systems.	
PS2: Labor and Working Conditions	The requirements set out in this PS have been in part guided by a number of international conventions negotiated through the International Labor Organization (ILO) and the United Nations (UN). Specific objectives of this Performance Standard are: ▪ To establish, maintain and improve the worker-management relationship; ▪ To promote the fair treatment, non-discrimination and equal opportunity of workers and compliance with national labor and employment laws; ▪ To protect the workforce by addressing child labor and forced labor; and ▪ To promote safe and healthy working conditions, and to protect and promote the health of workers.	Applicable and considered for this ESIA
PS 3: Resource Efficiency and Pollution Prevention	This Performance Standard outlines a project approach to pollution prevention and abatement in line with international available technologies and practices. It promotes the private sector's ability to integrate such technologies and practices as far as their use is technically and financially feasible and cost-effective in the context of a project that relies on commercially available skills and resources. Specific objectives of this Performance Standard are: ▪ To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; and ▪ To promote the reduction of emissions that contribute to climate change.	Applicable and considered for this ESIA
PS 4: Community Health, Safety and Security	This PS recognizes that project activities, equipment, and infrastructure often bring benefits to communities including employment, services, and opportunities for economic development. However, projects can also increase risks arising from accidents, releases of hazardous materials, exposure to diseases, and the use of security personnel. While acknowledging the public authorities' role in promoting the health, safety and security of the public, this PS addresses the project sponsor's responsibility in respect of community health, safety and security.	Applicable and considered for this ESIA
PS 5: Land Acquisition and Involuntary Resettlement	Involuntary resettlement refers both to physical and economic displacement as a result of project-related land acquisition. Where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.	Not applicable, Refer to "Section 9"
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	This Performance Standard reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the use of renewable natural resources in a sustainable manner. This Performance Standard addresses how project sponsors can avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources. Specific objectives of this Performance Standard are: ▪ To protect and conserve biodiversity; and ▪ To promote the sustainable management and use of natural resources through the adoption of practices that integrate conservation needs and development priorities.	Applicable and considered for this ESIA
PS 7: Indigenous Peoples	Indigenous peoples may be particularly vulnerable to the adverse impacts associated with project development, including risk of impoverishment and loss of identity, culture, and natural resource-based livelihoods. PS7 seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and	Not applicable, Refer to "Section 15.3.4 0"

	culture of indigenous populations, and promote development benefits in culturally appropriate ways. PS 7 (Indigenous Peoples) is not considered to be applicable to this Project. The Indigenous World 2018 Report (IWGIA, 2018) states that Uzbekistan is not classified as a country with indigenous people.	
PS 8: Cultural Heritage	Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to protect irreplaceable cultural heritage and to guide project sponsors on protecting cultural heritage in the course of their business operations.	Applicable and considered for this ESIA

In addition, to the Performance Standards, the IFC have sector-specific EHS guideline documents. With regards to the ESIA the following are applicable:

- IFC General EHS Guidelines (2007): identifies detailed EHS management and technical recommendations which are applicable for all development projects; and
- EHS Guidelines for Wind Energy (IFC, 2015*):* Provide guidance's and information to users on EHS issues related to onshore and offshore wind energy facilities. The Guideline provides a summary of EHS impacts associated with wind energy facilities along with recommendations for their management as well as performance indicators and monitoring programs for environmental, occupational health and safety and community health and safety. Where relevant, the requirements of this guideline are reiterated clearly in subsequent sections that discuss the environmental attributes they relate to where national legislations are not available.

5.4.2 Equator Principles 4 (EP 4)

The Equator Principles Financing Institutions (EPFIs) have consequently adopted a set of E&S guidelines to ensure that large scale development projects properly determine, assess and manage the associated potential impacts on the natural environment and the affected communities.

The latest principles (EP 4) were issued in July 2020. The EP are summarized below.

Table 10: Summary of Equator Principles

No.	Principle	Discussions	Applicability for ESIA
1	Review & Categorization	Identifies categorization for projects as either Category A, B or C. This is determined by an E&S review and due diligence undertaken by the financial institution (and/or their advisor).	Not relevant for this ESIA study
2	Environmental & Social Assessment	This requires that for Category A and B projects an Environmental and Social Impact Assessment (ESIA) is undertaken. The Principle provides guidance and illustrative list of issues that the ESIA study should address. This is discussed in further details in the table that follows. In addition, the Principle requires an assessment of potential adverse **human rights impacts** and **climate change risks**.	Applicable and considered for this ESIA
3	Applicable Environmental and Social Standards	Principle requires that the assessment process comply with relevant host country laws. In addition, for projects located in Non-Designated Countries (such as the Uzbekistan) compliance with IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) is required.	Applicable and considered for this ESIA
4	E&S Management	For all category A and category B projects, the financing institution will require that the client develop and/or maintain an Environmental and Social Management	Applicable and

	System and EP Action Plan	System (MS). In addition, an Environmental and Social Management Plan (ESMP) must be prepared by the Client.	considered for this ESIA
5	Stakeholder Engagement	Category A and B projects require effective and continuous stakeholder engagement with affected communities, workers and other stakeholders as relevant.	Applicable and considered for this ESIA
6	Grievance Mechanism	Category A and B projects require an effective grievance mechanism for affected communities and workers as appropriate to receive and facilitate resolution of concerns and grievances.	Applicable and considered for this ESIA
7	Independent Review	An independent E&S review will be undertaken for Category A and B projects will on the EIA, ESMP, ESMS, SEP and other as applicable and an Equator Principles Action Plan (EPAP) will be prepared.	Not relevant for the ESIA study
8	Covenants	The Principle requires that the Client covenant and comply with ESMP and EPAP requirements and provide periodic reports to document compliance with ESMP and EPAP and local E&S regulations.	Not relevant for the ESIA study
9	Independent Monitoring and Reporting	After financial close, for category A and B projects, financing institution will require independent monitoring and reporting to assess project compliance with Equator Principles.	Not relevant for the ESIA study
10	Reporting and Transparency	Identifies E&S reporting requirements for the client for category A and B projects.	Not relevant for the ESIA study

As discussed in the table above and specifically under Principle 2, the Principle provides guidance and an illustrative list of issues that the ESIA study should address. Such issues are identified below. The ESIA ensures that all issues identified below are addressed.

- Assessment of baseline E&S conditions (applicable and considered for ESIA);
- Consideration of feasible E&S preferred alternatives (applicable and considered for ESIA);
- Requirements under host country laws and regulations (applicable and considered for ESIA);
- Protection and conservation of biodiversity and identification of legally protected areas (applicable and considered for ESIA);
- Sustainable management and use of renewable energy sources (applicable and considered for ESIA);
- Use and management of dangerous substances (applicable and considered for ESIA);
- Major hazards assessment and management (applicable and considered for ESIA);
- Efficient production (applicable and considered for ESIA);
- Pollution prevention and waste minimization, pollution control and waste management (applicable and considered for ESIA);
- Greenhouse gas emissions level and emissions intensity (applicable and considered for ESIA);
- Water usage, water intensity and water source (applicable and considered for ESIA);
- Land cover and land use practices (applicable and considered for ESIA);

- Consideration of physical climate risks and adaptation opportunities and viability of project operations under changing weather patterns/climatic conditions (applicable and considered for ESIA);
- Cumulative impacts of existing projects, the proposed project and anticipated future projects (applicable and considered for ESIA);
- Consideration of actual or potential adverse human rights impacts (applicable and considered for ESIA);
- Labor issues and occupational health and safety (applicable and considered for ESIA);
- Consultation and participation of affected parties in the design, review and implementation of the project (applicable and considered for ESIA);
- Socio-economic impacts (applicable and considered for ESIA);
- Impacts on affected communities and disadvantaged or vulnerable groups (applicable and considered for ESIA);
- Gender and gender disproportionate gender impacts (applicable and considered for ESIA);
- Land acquisition and involuntary resettlement (not applicable, Refer to "Section 9");
- Impacts on indigenous people (not applicable, Refer to "Section 15.3.4");
- Protection of cultural property and heritage (applicable and considered for ESIA);
- Protection of community health, safety and security (applicable and considered for ESIA); and
- Fire prevention and life safety (applicable and considered for ESIA).

5.4.3 European Bank for Reconstruction and Development

EBRD's 2019 Environmental and Social Policy seeks to ensure, through its E&S appraisal and monitoring processes, that the projects it finances:

- Are socially and environmentally sustainable;
- Respect the rights of affected workers and communities; and
- Are designed and operated in compliance with applicable regulatory requirements and good international practice.

In addition, EBRD's E&S policy identifies large scale wind power projects as 'Category A' which are projects that could result in potentially significant environmental and/or social impacts that require an environmental and social impact assessment.

To translate this objective into successful practical outcomes, EBRD has adopted a comprehensive set of Performance Requirements (PRs) covering key areas of environmental and social impacts and issues.

EBRD is committed to promoting European Union (EU) environmental standards as well as the European Principles for the Environment, to which it is a signatory, and which are also reflected in the PRs. EBRD expects clients to assess and manage the environmental and social issues associated with their projects so that projects meet the PRs.

The EBRD Performance Requirements applicable to this project are summarized in the table below.

Table 11: Overview of Key Points of EBRD Performance Requirements of Relevance to the Project

EBRD PR	Key Points Relevant to the Project	Applicability
PR 1: Assessment and Management of E&S Risks and Impacts	This PR outlines the process of appraising, managing and monitoring environmental and social issues associated with a project consistent with the European Union environmental impact assessment directive (85/337/EEC as amended).	Applicable and considered for this ESIA
PR 2: Labor and Working Conditions	This PR assures that human resources policies, procedures and standards will meet the following minimum requirements during the life of the Project with regards to labor and working conditions: ▪ Establish and maintain a sound worker-management relationship and promote the fair treatment, non-discrimination and equal opportunity of workers; ▪ Promote compliance with any collective agreements to which the client is a party, national labor and employment laws, and the fundamental principles and key regulatory standards embodied in the applicable ILO conventions; and ▪ Protect and promote the health of workers, especially by promoting safe and healthy working conditions. In addition, EBRD requires compliance with applicable EU Occupational Health and Safety requirements and, where such requirements do not exist, applicable IFC Occupational Health and Safety guidelines (IFC PS2).	Applicable and considered for this ESIA
PR 3: Resource Efficiency and Pollution Prevention and Control	Pollution prevention and abatement are key ingredients of a sustainable development agenda and EBRD - financed projects must meet good international practice in this regard. The impacts and issues associated with polluting activities need to be considered in all economic activities, and from effluents and emissions at the facility level, to impacts at a regional and global level where appropriate. This performance requirement assures that all aspects of the Project will meet the following objectives: ▪ To avoid or, where avoidance is not possible, to minimize adverse impacts on human health and the environment by avoiding or minimizing pollution directly arising from projects; ▪ To assist clients in identifying project-related opportunities for energy and resource efficiency improvements and waste reduction; and ▪ To promote the reduction of project-related greenhouse gas emissions.	Applicable and considered for this ESIA
PR 4: Health. Safety and Security	While bringing many positive benefits to local communities, projects can also increase the potential for community exposure to risks and impacts arising from temporary or permanent changes in population; transport of raw and finished materials; construction, operations and decommissioning; accidents, structural failures, and releases of hazardous materials. This performance requirement addresses the project proponent's responsibility to identify and to avoid or minimize the risks and adverse impacts to community health, safety and security.	Applicable and considered for this ESIA

EBRD PR	Key Points Relevant to the Project	Applicability
PR 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Involuntary resettlement refers both to physical and economic displacement as a result of project-related land acquisition. Where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.	Not applicable, Refer to "Section 9"
PR 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	EBRD recognizes the need for the protection and conservation of biodiversity in the context of projects in which it invests. In pursuing these aims, EBRD is guided by and supports the implementation of applicable international law and conventions and applicable EU Directives: ▪ To protect and conserve biodiversity; ▪ To avoid, minimize and mitigate impacts on biodiversity and offset significant residual impacts, where appropriate, with the aim of achieving no net loss or a net gain of biodiversity; ▪ To promote the sustainable management and use of natural resources; ▪ To provide for fair and equitable sharing of the benefits from project development and arising out of the utilization of genetic resources; ▪ To strengthen companies' license to operate, reputation and competitive advantage through best practice management of biodiversity as a business risk and opportunity; and ▪ To foster the development of pro-biodiversity business that offers alternative livelihoods in place of unsustainable exploitation of the natural environment.	Applicable and considered for this ESIA
PR 7: Indigenous Peoples	Indigenous peoples may be particularly vulnerable to the adverse impacts associated with project development, including risk of impoverishment and loss of identity, culture, and natural resource-based livelihoods. PR 7 seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways.	Not applicable, Refer to "Section 0")
PR 8: Cultural Heritage	Cultural heritage is important as a source of valuable historical and scientific information, as an asset for economic and social development, and as an integral part of a people's cultural identity, practices, and continuity. EBRD requires the protection of cultural heritage from project activities.	Applicable and considered for this ESIA
PR 10: Information Disclosure and Stakeholder Engagement	EBRD considers stakeholder engagement as an essential part of good business practice and corporate citizenship. In particular, effective community engagement is central to the successful management of risks and impacts on communities, as well as central to achieving enhanced community benefits. The specific objectives of this PR are: ▪ To identify people or communities that are or could be affected by the Project, as well as other interested parties; ▪ To ensure that such stakeholders are appropriately engaged on environmental and social issues that could potentially affect them through a process of information disclosure and meaningful consultation; and ▪ To maintain a constructive relationship with stake holders on an ongoing basis through meaningful engagement during project implementation.	Applicable and considered for this ESIA

5.4.4 Asian Development Bank (ADB)

ADB's Safeguard Policy Statement (SPS) (2009) builds on three previous safeguard policies on the environment, involuntary resettlement and indigenous peoples, bringing them into one policy to more comprehensively address E&S impacts and risks.

The SPS aims to promote sustainability of project outcomes by protecting the environment and people from project's potential adverse impacts through minimizing, mitigating, and /or compensating for adverse impacts when avoidance is not possible.

In addition, the SPS helps borrowers/clients to strengthen their safeguard systems and develop the capacity to manage E&S risks.

The key requirements under the ADB SPS are summarized in the table below.

Table 12: ADB SPS Requirements

Scope of Application	Requirements	Applicability
Environment	- Environmental Assessment - Environmental planning and Management - Information Disclosure, Consultation and Participation - Grievance Redress Mechanism - Monitoring and Reporting - Unanticipated Environmental Impacts - Biodiversity Conservation and Sustainable Natural Resource Management - Pollution Prevention and Abatement - Health and safety - Physical cultural resources	Applicable and considered for this ESIA
Involuntary Resettlement	- Compensation, Assistance, and Benefits for Displaced Persons - Social Impact Assessment - Resettlement Planning - Negotiated Land Acquisition - Information Disclosure - Consultation and Participation - Grievance Redress Mechanism - Monitoring and Reporting - Unanticipated Impacts - Special Considerations for Indigenous Peoples	Not applicable, Refer to "Section 9")
Indigenous Peoples	- Consultation and Participation - Social Impact Assessment - Indigenous Peoples Planning - Information Disclosure - Grievance Redress Mechanism - Monitoring and Reporting - Unanticipated Impacts	Not applicable, Refer to "Section 0"

In addition, the following is also considered applicable in relation to ADB requirements:

- Social Protection Strategy (2001). This strategy defines social protection as a set of policies and programs designed to reduce poverty and vulnerability by promoting efficient labor markets, diminishing people's exposure to risks, and enhancing their capacity to protect themselves against hazards and interruption/loss of income. It spells out the scope of ADB's commitment to develop priority interventions in supporting social assistance and welfare service programs including child protection and micro- and area-based schemes to address poverty, and vulnerability; social insurance programs to cushion risks associated with unemployment, ill-health, disability, work-related injury and old age; and labor market policies and programs designed to generate employment, improve working conditions;
- Gender and Development Policy (1998). The policy focuses on mainstreaming gender considerations into all ADB activities and aims to promote gender equity and improve status of women and treats gender as a cross-cutting themes influencing all social and economic processes; and
- Access to Information Policy (2018). The Policy reflects ADB's ongoing commitment to transparency, accountability, and participation by stakeholders.

5.4.5 Asian Infrastructure Investment Bank (AIIB)

AIIB's operations are required to comply with policies addressing environmental and social impacts, among other policies. The Environmental and Social Framework (ESF) incorporates AIIB's policy addressing environmental and social impacts. An update to AIIB's Environmental and Social Framework (ESF) was approved on June 26, 2024, introducing provisions for the newly approved Climate Policy-based Financing instrument. In addition to the update approved in June 2024 ESF, there are three other versions of the ESF, one as amended through February 2019 (2019 ESF), one as amended through May 2021 (2021 ESF) and one as amended through November 2022 (2022 ESF). The version applicable to a given AIIB-financed project (Project) depends on when the Project enters or entered AIIB's investment pipeline.

The Environmental and Social Policy (ESP) of AIIB comprises mandatory environmental and social requirements for each Project and is accompanied by (a) three associated mandatory Environmental and Social Standards (ESSs) setting out requirements applicable to Clients on; and (b) an Environmental and Social Exclusion List (ESEL) which sets forth activities and items that are excluded from financing by AIIB and that the Client is required to exclude from the Project.

The ESSs cover the following:

- ESS 1: Environmental and Social Assessment and Management,
- ESS 2: Land Acquisition and Involuntary Resettlement, and
- ESS 3: Indigenous Peoples.

ESS 1 (Environmental and Social Assessment and Management): When the Bank determines the Project is likely to have adverse environmental and/or social risks and impacts, the Client must conduct an assessment and design appropriate measures to avoid, minimize, mitigate, offset, or compensate for them. The objective is to achieve environmental and social soundness and sustainability and support integration into decision-making. ESS 1 applies if the Project is likely to have adverse risks and impacts. The scope is proportional to the risks, and it ensures quality assessment and management through mitigation and monitoring.

ESS 2 (Land Acquisition and Involuntary Resettlement): (not applicable to Wind Farm)

If the Project is likely to involve Involuntary Resettlement, the Client must address it in the social section of the assessment and provide a plan or framework (e.g., LARP/LAP/RP or LARPF/LAPF/RPF) to the Bank.

The objectives of ESS 2 are: (a) to avoid Involuntary Resettlement wherever feasible; (b) to minimize Involuntary Resettlement by exploring Project alternatives; (c) where avoidance of Involuntary Resettlement is not feasible, to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-Project levels and to provide resettlement assistance; (d) to understand and address gender-related risks and differential impacts of Involuntary Resettlement; (e) to improve the overall socioeconomic status of the displaced poor and other vulnerable groups; and (f) to conceive and implement resettlement activities as sustainable development programs, providing sufficient resources to enable the persons displaced by the Project to share in Project benefits. ESS 2 applies if the Project would or may involve Involuntary Resettlement (including Involuntary Resettlement of the past or foreseeable future that the Bank determines is directly linked to the Project).

ESS 3 (Indigenous Peoples): If the Project would involve Indigenous Peoples the Bank requires the Client to address this in the social section of the assessment report, complemented by more in-depth coverage, as required under ESS 3. The Client covers impacts on Indigenous Peoples in an Indigenous Peoples Plan or Indigenous Peoples planning framework, which is provided to the Bank as a freestanding document, an annex to the assessment report, or incorporated as a recognizable element of the report.

ESS 3 is not applicable for the Projects in Uzbekistan, since there is no communities or groups of people which can be identified/defined as indigenous peoples in the country. Refer to "Section 15.3.4" for additional details.

5.4.6 Other

There are additional international E&S standards and requirements that were considered throughout the ESIA study. Those are identified in the table below along with their applicability.

Table 13: Other International E&S Requirements and Standards

Requirement	Applicability
IFC Good Practice Note – Addressing Grievances from Project-Affected Communities & IFC Good Practice Manual – Doing Better Business Through Effective Public Consultation and Disclosure	Those identify additional requirements that should be considered and taken into account as part of the planned stakeholder engagement activities as well as the SEP that is provided as a standalone document.
IFC Good Practice Note: A Good Practice Handbook for Companies Doing Business in Emerging Markets	The note identifies key concepts and principles of stakeholder engagement and how to integrate stakeholder engagement with the project cycle. This has been considered for the SEP that is provided as a standalone document.
EBRD and IFC Guidance Note on Worker's accommodation	identify key issues of concern that should be addressed as well as best practice requirements to be taken into account in relation to worker accommodation.
▪ IFC Good Practice Note on Non-Discrimination and Equal Opportunity ▪ IFC Good Practice Note – Managing Retrenchment	Those are related to workforce management as applicable within the ESIA and associated management plans.

▪ IFC Handbook for Labor and Working Conditions – Measure & Improve Your Labor Standards Performance ▪ Good Practice Note: Managing Risks Associated with Modern Slavery ▪ International Labor Organization (ILO) Conventions. This will include all ILO conventions signed and ratified by the Government of Uzbekistan and at a minimum all ILO conventions covering core labor standards and all ILO conventions covering the basic terms and conditions of employment	
Good Practice Note (GPN) IFC's Use of Security Forces: Assessing and Managing Risks and Impacts	The handbook provides practical, project-level guidance for companies to better understand and implement the requirements outlined in PS 4. Chapters focus on risk assessment, managing private security, managing the relationship with public security, preparing a security management plan, and assessing allegations or incidents related to security personnel.
UN Voluntary Principles on Security and Human Rights	Promotes implementation of a set of principles on providing security for their operations in a manner that respects human rights
Addressing Gender-Based Violence and Harassment (GBVH): Emerging Good Practice for the Private Sector	The note prevents the physical, sexual, emotional and financial harm GBVH causes to individuals, as well as the financial, reputational and legal risks it poses to businesses and investors
UNESCO Guidance and Toolkit for Impact Assessments in a World Heritage Context (2022)	Outstanding Universal Values (OUVs) (receptors of biological significance) identified in UNESCO nomination text and associated documents. Baseline surveys to identify the presence of OUVs and subsequent assessment of likely ecological impact of the project (construction and operation) on OUVs. Assessment should include a 'futures' assessment should the baseline ecological value of the WHS (and surrounding area) improve with wider conservation efforts.

6. STAKEHOLDER CONSULTION AND ENGAGEMENT

This section discusses in detail the stakeholder consultation and engagement plans which were undertaken as part of the ESIA process for the Project and provides an overview of the findings. In addition, this section also discusses the future stakeholder consultation and engagement plans which are to take place at a later stage of the ESIA process as well as the Project development.

6.1 Objectives

Stakeholder engagement is an integral part of ESIA good practice. The Developer is committed to a technically and culturally appropriate approach to consultation and engagement with all stakeholders affected either directly or indirectly by the Project. The consultation program for the Project is based on informed consultation and participation in line with good international practice requirements with affected people and is designed to be both fair and inclusive. Consultation activities have been an ongoing process since the commencement of the ESIA study in December 2022.

Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interest in a project and/or the ability to influence its outcome, either positively or negatively.

Stakeholders may include: (i) locally affected communities or individuals and their formal and informal representatives, (ii) national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, (iii) the academic community, or other businesses.

The objective of stakeholder consultation is to ensure that a participatory approach takes place, which in turn documents concerns of all stakeholder groups and makes sure that such concerns are considered, responded to, and incorporated into the decision-making process of the development. Stakeholder consultation needs to be a two-way communication process that imparts information to stakeholders, but also obtains additional and on-the-ground information from them. Stakeholder consultation and engagement must take place at the inception phase of the ESIA process and implemented all through the study period.

The specific objectives of this chapter are to:

- Describe and identify the stakeholders affected and/or with an interest in the Project;
- Summarize stakeholder engagement and consultation conducted to date. In addition, describe how the views and issues raised have informed and influenced the development of the Project; and
- Outline the future plans and approach to stakeholder engagement.

6.2 Stakeholder Identification and Analysis

The purpose of stakeholder identification is to identify and prioritize Project stakeholders for consultation. Stakeholder identification is an ongoing process, and thus key stakeholders will be identified during different stages of the Project. A systematic approach is used to map the stakeholders based on the Project zone of impacts. In this approach, by mapping the zone of social impacts, stakeholders are identified by the impact area.

As a result of the stakeholder mapping, Project stakeholders are categorized into the following main categories:

1. People and groups who will be directly or indirectly affected by the Project (such as local communities);
2. People and groups who may participate in the implementation of the Project (such as investors and lenders); and
3. People and groups who are not affected by the Project development per se may but have a possibility to influence and make decisions on implementation of the Project (such as Ministries or regulatory agencies).

The main groups of stakeholders identified so far are listed in the table below. The list can be updated and modified in the course of the Project development and as a result of the cooperation of the parties.

Table 14: Identified Groups of Stakeholders

Stakeholder Group	Description	Relevance
Stakeholders who may be directly or indirectly affected by the Project		
Local communities which as identified in "Section 2.2" earlier includes: ▪ Kirkkiz town; ▪ Elobod town; ▪ Jasliq town; and ▪ Kungrad City Center.		This includes the following groups within the local communities in specific: ▪ Community Members: local community members have a vested interest in the Project due to mainly potential for job opportunities. In addition, local community members could be impacted by other potential negative impacts (e.g. worker influx, noise & shadow flicker, etc.). Such impacts are discussed and identified within the ESIA. ▪ Community Leaders: They are socially active members and known figureheads for local community members, who may or may not hold government positions. ▪ Business Community (local subcontractors): such groups have a vested interest in the Project due to mainly potential for procurement opportunities such as subcontracting works (e.g. civil works, provision of food and amenities, etc.).
Stakeholders who may Participate in Implementation of the Project		
Investor / lender	Entities that will provide financing for the Project development.	They have interest in ensuring that the Project is developed and implemented in accordance with their E&S requirements and standards and will monitor the compliance of the Project against such requirements.
Stakeholders who may have a possibility to influence and make decisions on implementation of the project and/or may have an interest in the Project		
Government Ministries		
Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan	Local government body mandated to implement state laws on environment protection and management and the use of natural resources within Karakalpakstan.	For this Project, this will include review and approval of ESIA, issuance of environmental permit, monitoring implementation of Environmental and Social Management Plan (ESMP) and compliance with other conditions, as applicable.

Ministry of Water Resources of Karakalpakstan	Local government body mandated to protect and manage water resources within Karakalpakstan.	For this Project, this will include ensuring water requirements of the Project do not impact and affect existing water resources.
Ministry of Health of Karakalpakstan	Official governmental entity responsible for setting health policies and legislations as well as ensuring protection of the public within Karakalpakstan.	Has a vested interest in ensuring that community health and safety is maintained for local communities in accordance with public health laws and regulations.
Ministry of Transport of Karakalpakstan	Responsible for the provision and maintenance of transport infrastructure including road networks used to transport personnel and equipment to the Project Area.	For this Project they are to ensure that transportation requirements of the project (WTG in particular) are undertaken properly and in accordance with relevant legislations.
Ministry of Labor of Karakalpakstan	Official governmental entity responsible for setting labor policies and legislations as well as ensuring protection of labor rights and working conditions.	Has a vested interest in ensuring that labor rights and proper working condition are maintained for the Project in accordance with labor laws and regulations.
Ministry of Culture and Tourism of Karakalpakstan	The ministry is the entity responsible for the preservation and protection of archaeology and cultural heritage, under which operates all inspector offices within various regions.	Such entity must be notified in case of chance finds related to archeology and cultural heritage for implementation of specific requirements.
Civil Aviation Administration	Official governmental entity responsible for civil aviation management and responsible for issuing permits for projects with specific height requirements.	A permit prior to construction is to be obtained for turbines to ensure civil aviation infrastructure and operations are maintained.
Uzbekistan Air and Air Defense Forces	Official governmental entity responsible for military aviation management and responsible for issuing permits for projects with specific height requirements.	A permit prior to construction is to be obtained for turbines to ensure military aviation infrastructure and operations are maintained.
The Ministry for Development of Information Technologies and Communication	Responsible for overall regulation and administration of the telecommunication, TV and radio sector including interface with telecommunication operators and their infrastructure elements such as broadcasting towers.	Given that the Project could impact such infrastructure elements (i.e. through line of sigh connections of broadcasting towers), approvals might be required.
State Committee on Geology and Mineral Resources of the Republic of Uzbekistan	Official governmental body responsible for overall land use planning related to geology exploration, oil and gas exploration activities and other.	Given that Project area is located within an oil and gas exploration concessions, coordination and approvals are required from this entity in particular.
Department of Chamber of State Cadasters for the Republic of Karakalpakstan	Official governmental body responsible for overall land use planning and allocations within Karakalpakstan.	Ensuring that Project boundary does not overlap or conflict with any existing or planned governmental land uses within the area.
JSC National Electric Grid of Uzbekistan	Entity responsible for electricity transmission development projects in the country.	Off-taker and entity that signed the Power Purchase Agreement (PPA) with Company.

Youth Union of the Republic of Karakalpakstan	This is a government agency that works on programs and social issues for youth within Karakalpakstan.	Their specific focus is expected to be the potential for inclusion and engagement of young people to become part of the workforce as well as other overall development process of the project.
Family and Women's Committee of the Republic of Karakalpakstan	This is a government entity that works on programs and social issues for women within Karakalpakstan.	Their specific focus is expected to be the potential for inclusion of and engagement of women groups within the workforce as well as other overall development process of the project.
Committee for Development of Sericulture and Wool Industry	Governmental Committee established 2 years ago to oversee and manage all pasture lands across Uzbekistan.	Could be relevant in case there are grazing activities within the Project site.
Regional and Local Government Ministries and District Authorities		
Supreme Council / Parliament of the Republic of Karakalpakstan	Acts as the legislative body representing the interests of the population.	Specific interest areas are expected to include obtaining overall Project updates as well as ensuring benefits to local communities through procurement and employment opportunities as well as social responsibility programs.
Kungrad District Khokimiyat	Responsible for acting on behalf of its citizens for the sustainable development of the District.	Specific focus areas are expected to be grievance management, land-related impacts, local employment opportunities, and community development benefits implemented by the Developer.
Kirkkiz, Elobod, Jasliq and Kungrad Mahalla	Representing the interests of its residents.	Their specific focus is likely to include grievance management, local employment opportunities, and community development benefits implemented by the Developer.
NGOs		
Birdlife International (BLI)	International partnership for nature conservation. BLI uses bird science and collect and analyze data from around the world to implement the most effective and innovative conservation measures possible. BLI are the official scientific source of information on birds for the IUCN Red List.	Their specific focus is likely to include the potential impacts on biodiversity during construction and operation including in particular protection of birds from collisions with wind turbine blades as well as impacts from associated facilities (discussed in OHTL ESIA accordingly).
Uzbekistan Society for the Protection of Birds	National organization involved in the protection of nature within the Project Area and wider region. *This society is the local partner for Birdlife International in Uzbekistan.*	Their specific focus is likely to include the potential impacts on biodiversity during construction and operation including in particular protection of birds from collisions with wind turbine blades as well as impacts from associated facilities (discussed in OHTL ESIA accordingly).
IUCN SSC Bustard Specialist Group	NGO that works to increase communication and collaboration among bustard researchers and conservation actors, develop and communicate best practices for their conservation, and raise awareness and concern for bustards.	Might have relevant data as applicable relate to bustards within the Project area and/or Uzbekistan in general. In addition, they could have concerns about impacts from the Project on bustards mainly due to collisions with turbines as well as impacts from associated facilities (discussed in OHTL ESIA accordingly).
Karakalpak Republican State	This is the only NGO for Disabled People in Karakalpakstan	Their specific focus is expected to be the potential for disabled people to become part of the workforce as well as other overall development process of the project.

Committee for Disabled People		
Karakalpak branch of the Republican Social Information Center for youth "Istikbolli avlod" NGO	This is an active NGO for youth in Karakalpakstan	Their specific focus is expected to be the potential for inclusion and engagement of young people to become part of the workforce as well as other overall development processes of the Project.
National Association of NGOs in Uzbekistan	Umbrella NGO for all NGOs in Uzbekistan including social NGOs. They also have a Karakalpakstan branch office.	Their specific focus is expected to be the potential for inclusion and engagement of workforce and businesses within the Project development process.
Khunarmand Association and Business Women Association / members of cleantech entrepreneurs	They have branches in Karakalpakstan and they focus on empowering women and developing their business skills and livelihoods.	Their specific focus is expected to be the potential for inclusion and engagement of women within the workforce and women-owned businesses within the Project development process.
Ne Molchi	NGO that works within the area of women domestic violence.	Could be interested to participate in the GBVH grievances from workers or stakeholders (such as local communities).
Republican information and educational center "INTILISH"	With divisions in all regions of Uzbekistan (including Karakalpakstan). Center works to improve the quality of life of the vulnerable groups by maintaining health, increasing cultural and educational levels, and social adaptation.	Their specific focus is expected to be the potential for inclusion and engagement of workforce and businesses within the Project development process.
Republican Kungrad Interdistrict Phthisiatric Hospital № 4 / Kungrad Central District Hospital / Kungrad Railway hospital / Kungrad Infectious diseases Hospital	The key and main health care facilities located within Kungrad District under which Project is administratively located .	They could provide health care services to the project and its workforce (such as routine and non-routine medical examinations, checkups, etc.) including emergency response should they occur (such as workforce occupational accidents).
Other		
Ustyurt Gas (Branch of Uzbekneftegas JSK)	Uzbekneftegas is the official governmental entity responsible for drilling and extraction of gas. Ustyurt Gas is the entity responsible for the Ustyurt area (under which the Project is located).	Ensuring that Project activities do not impact any of their infrastructure and utility elements within the area.
UrgenchtransGaz	This is an entity that is part of Uzbekneftegas and responsible for operation of all gas pipelines across all Uzbekistan.	Ensuring that Project activities do not impact any of their infrastructure and utility elements within the area.
Ustyurt Exploration Drilling Organization	This is an entity that is part of Uzbekneftegas and responsible for gas exploration within the Ustyurt region.	Ensuring that Project activities do not impact any of their infrastructure and utility elements within the area.

Gasprom International Limited	This is a private entity company working in Ustyurt in Gas extractions.	Ensuring that Project activities do not impact any of their infrastructure and utility elements within the area.
Saneg, IP LLC Industrial Energy Group	This is a private entity company working in Ustyurt in gas extractions.	Ensuring that Project activities do not impact any of their infrastructure and utility elements within the area.
Falcon Hunting Solutions	This is the entity managing MacQueen's Bustard (Houbara Bustard hunting activities for Arab royal families within the Ustyurt plateau.	Such hunting activities and their locations can conflict with the proposed wind farm project location.
International Fund for Houbara Conservation in Abu Dhabi (OAE) / Emirates Bird Breeding Center for Conservation (EBBCC)	This entity is managing re-introduction efforts for this species in Uzbekistan.	Such release and reintroduction efforts and their locations can conflict with the proposed wind farm project location.
Academic and Research Institutions		
National University of Karakalpakstan	This is the national university of Karakalpakstan.	Could have potential interest to partner with Project to provide graduates within renewable energy sector, biodiversity, etc.
RES group of the Karakalpak branch of the Academy of Sciences	Branch under the Academy of science with specific focus on environmental protection and management.	Potential interest to obtain information and updates on potential impacts of the Project on key E&S attributes to include biodiversity, birds, bats, archeology and cultural heritage, environment and other.
Karakalpak Research Institute for the Human Science under Academy of Science	Branch under the Academy of science with specific focus on archeology and cultural heritage.	
National Institute of Zoology under Academy of Science	Branch under the Academy of science with specific focus on biodiversity.	

6.2.1 Vulnerable Groups

A key stakeholder group to which particular attention must be considered during identification are vulnerable groups. Those are groups that due to their socio-economic characteristics may experience impacts more severely and/or disproportionally compared to the rest of the community members.

Vulnerable groups are project specific and depend on a range of issues which must be understood such as project location, socio-economic and demographic context, as well as the nature of the development and type of impacts anticipated. Vulnerable groups may be severely affected by the Project by virtue of their physical disability, social or economic standing, and limited education, lack of employment or access to land. The key vulnerable groups within the context of the Project and their relevance are summarized in the table below.

It is noted that there are no people living within the Project site or its surrounding areas. The nearest human settlements are over 100km from the Project site. As noted in Table 14 above, those settlements beyond the 100km are termed "local communities" and were considered for the purpose of current and future stakeholder engagements, including potential vulnerable groups as summarized in Table 15 below. However, such local communities are not expected to be impacted by the windfarm components of the Project as demonstrated throughout this ESIA.

Nevertheless, the ESIA has included direct engagement approaches with vulnerable groups and relevant institutions as noted in subsequent sections below.

Table 15: List of Vulnerable Groups and Their Relevance

Group	Relevance	
Women groups	Could be considered vulnerable as cultural norms could limit their participation in the decision-making process in general that is related to the Project.	Women representatives were engaged as part of the scoping process as discussed under "Section 6.3.2".
		Women representative will be engaged as part of the disclosure process as discussed in further details in "Section 6.4.1".
		Stakeholder engagement strategy and plan within the Stakeholder Engagement Plan (SEP) will target women groups. Refer to "Section 6.4.3".
Disabled groups	Could be considered vulnerable groups mainly due to physical disability which could limit their access to information on the Project as well as participation in the decision-making process in general that is related to the Project.	Representatives of disabled groups were engaged as part of the scoping process as discussed under "Section 6.3.2".
		Representatives of disabled groups will be engaged as part of the disclosure process as discussed in further details in "Section 6.4.1". Practical logistical support will be provided to assist disabled participants or their representatives to enable them to attend the disclosure process.
		Stakeholder engagement strategy and plan within the Stakeholder Engagement Plan (SEP) will target disabled group representatives. Refer to "Section 6.4.3". SEP will emphasize on venue accessibility as applicable.
Ethnic Minorities	Are defined as groups within a community which has different national or cultural traditions from the main population which could include language, religion, tribe, nationality, race or a combination thereof. Such groups are considered vulnerable as they could have difficulties in accessing social protection benefits as well as social development opportunities (e.g. employment) usually as a result of discrimination, economic and social disadvantage and other. Uzbeks make up the vast majority of the country's population (86.2%), with other communities such Tajiks, Kazakhs, Russians, Karakalpak, and Tatars making up the remaining 16.2%. Approximately 85% of the population is native Uzbek speakers, and the language is recognized as the sole official language. In addition, Russian is widely used in governmental and interethnic communication. Tajik, Kazakh, Tatar, and Kyrgyz are only some of the various ethnic languages spoken there. The majority of the population (about 88%) is Muslim, with the vast majority identifying as Sunni. There are 9% Eastern Orthodox Christians and 3% adherents to other faiths in the country. ▪ Karakalpak are a Turkic ethnic group who live mostly in Karakalpakstan. They bring a distinct cultural identity, including their own language, to Uzbekistan's already varied population. Karakalpak are not the only people who call the Sovereign Republic of Karakalpakstan home; various other ethnic groups also call it their home. Despite being the majority ethnic group in Uzbekistan, Uzbeks are a sizable minority in Karakalpakstan, largely residing in cities. ▪ Kazakhs are a sizable minority among Uzbeks. They have deep cultural and historical ties to Kazakhstan, with whom they share a same language and bordering provinces like Tashkent and Surkhandarya.	

	▪ Russians are the largest Slavic ethnic group in Uzbekistan and have been present the longest. Tashkent, the country's capital and a major center of Russian influence, is home to a sizable population of Russian speakers. ▪ Tajiks represent Uzbekistan's second largest ethnic group. They are predominantly located around the borders, particularly in the provinces of Surkhandarya and Samarkand. The Tajik people have their own unique language and customs. ▪ Kyrgyz people in Uzbekistan are primarily concentrated in areas bordering Kyrgyzstan, such as the Fergana Valley. They have maintained their Kyrgyz cultural identity and language. Kyrgyz in Uzbekistan engage in various economic activities, including agriculture, livestock breeding, and handicrafts. As noted in "Section 6.3.2" and later in "Section 15.4" the majority of the community ethnic composition is Uzbek, Karakalpak and Kazakh. There are other ethnic compositions that represent less than 1% that include Russian, Tajik, and Kyrgyz. However, all of these groups are part of the community since the Soviet Union era and are well integrated into society and are not subject to any discrimination or economic/social disadvantage. As such these will not be considered as vulnerable groups.	
People living in poverty / underprivileged communities	Could be considered vulnerable as their status could limit their access to information on the Project as well as participation in the decision-making process in general that is related to the Project.	It was ensured that all consultation and engagement activities undertaken as part of the scoping process as discussed under "Section 6.3.2"entailed stakeholder materials free of charge (e.g. venue, handouts, etc.). Similarly, the stakeholder engagement strategy within the Stakeholder Engagement Plan (SEP) will emphasize such a requirement as well.
The Aged	Could be considered vulnerable by limitations of access to participate in the Project related community decision-making process.	Practical logistical support will be provided to assist aged participants or their representatives to enable them to attend the disclosure process as discussed in further details in "Section 6.4.1". Stakeholder engagement strategy and plan within the Stakeholder Engagement Plan (SEP) will target the elder representatives. Refer to "Section 6.4.3".
The Youth	Could be considered vulnerable due to their young adult, unmarried, non-asset owning status, yet likely to be savvier in 21st century technology than their elders, but may be unable to contribute to Project related community decision-making process, which will affect their generation more than most.	Youth representatives were engaged as part of the scoping process as discussed under "Section 6.3.2". Youth representatives will be engaged as part of the disclosure process as discussed in further details in "Section 6.4.1". Stakeholder engagement strategy and plan within the Stakeholder Engagement Plan (SEP) will target youth groups. Refer to "Section 6.4.3".
Language	Specific groups within local communities might have different languages. This could limit their access to information on the Project as well as participation in the decision-making process in general that is related to the Project.	All consultation and engagement activities undertaken as part of the ESIA or to be identified within the SEP (including materials and presentations) were/are undertaken in accordance with the key languages of the local communities (i.e. Karakalpak, Uzbek and Russian as applicable).

6.2.2 Indigenous Peoples

As noted above regarding vulnerable groups, there are no resident people within the Project site nor its surrounding areas, nor are there any land use activities (as presented within "Section 9" later). In addition, the assessment of whether there are Indigenous Peoples in Uzbekistan in general and Karakalpakstan

Region in specific concluded that there are no indigenous groups in the country. This assessment is included under "Section 15.3.4". Please refer to that section for more details

It is therefore concluded that the Project will not entail any relevant impacts on indigenous peoples.

6.3 Stakeholder Consultation and Engagement to Date

6.3.1 Targeted Consultations

Targeted consultations were undertaken with various stakeholder groups as highlighted below. During such targeted consultations, a handout was provided in advance in local language (mainly in Karakalpak language) which provides information on Project, its location, components, ESIA process, key impacts, and other.

- National governmental entities;
- Regional governmental entities;
- Non-Governmental Organizations (NGOs);
- Gas Exploration Entities; and
- Academic and research institutions.

Table 16: Overall Summary of Targeted Consultations

Entity	Date	Key Outcomes
National Governmental Entities in Uzbekistan & Regional Governmental Entities in Karakalpakstan		
Supreme Council / Parliament of the Republic of Karakalpakstan **Meeting with Deputy Chairman of the Supreme Council**	18 May 2023	▪ All support will be provided that is required for the Project given its significance to the country, including facilitating any works required for the ESIA process. ▪ It is crucial to provide employment opportunities for the local communities during the construction and operation phase. In addition, the Project is also expected to improve and increase demands on service-related activities within the area which could include food and beverage, transportation, accommodation, translation, etc. ▪ Developer is expected to maintain continuous communication and engagement at an early stage with central governments and local stakeholders (including local Khokimiyat and Mahallas) and provide information on the Project, progress, construction schedule, plans, etc. ▪ Khokimiyat and Mahallas can share information to local communities through their appropriate local channels. ▪ It is important to keep Mahallas informed of any job and procurement opportunities and announcements as they will help with announcements of such opportunities. ▪ The Project should consider risks associated with its remote location including ensuring availability of amenities such as water, gas, and transportation for workers. ▪ Project should coordinate with ongoing geological exploration work in Ustyurt territory.

		▪ Project should consider providing local communities with discarded material which could be of value such as vehicles, furniture, equipment, and other – this includes discarded material during the construction process, or anything used throughout the 25 years of operation of the Project. This was a lesson learned from another project in Kungrad District where after completion of construction all equipment were burned and/or discarded as trash when it would have been beneficial to provide to local community organizations to be used by the local communities. ▪ There is a private airport near Lake Sudochye and it should be considered in the construction of high-rise facilities such as WTGs. ▪ No studies on water resources have been done for a long time in Karakalpakstan. The issue of water is considered important in general for Uzbekistan and more so for Karakalpakstan. If the Developer will be undertaking any water studies that investigate water resources, they should be provided.
Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan / Forestry Committee	31 May 2023	▪ Methodology undertaken for the ESIA, and for ecological assessments in specific are considered sufficient. There are no additional requirements or issues of concern to be considered. ▪ The Project can contribute to conservation of area habitats in collaboration with biologists and scientists and the improvement of the surrounding area to promote the growth and development of the ecosystem. ▪ Note: as noted in "Section 9" later, small part of the Project site is designated for the Forestry Committee. During the consultation, it was confirmed that they have no current or planned activities within this area in specific. They also indicated that they have no objection and no further issues of concern.
Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan / Department of Biodiversity Conservation, Digitization and Cadaster	31 May 2023	▪ There are some legal environmental requirements which should be followed in order to obtain the environmental permit / clearance for the Project. ▪ In accordance with Paragraph 5 of the Resolution 541 of the Cabinet of Ministers of the Republic of Uzbekistan dated September 7, 2020 for the "Procedure of State Environmental Expertise", it is required to undertake an EIA study for the Project. ▪ Annex 1 of the Resolution classifies any electricity generation project that exceeds 300MW as Class 1 which requires an EIA study submitted to the central Ministry of Ecology, Environmental Protection and Climate Change in Tashkent to obtain a permit.
Ministry of Ecology, Environmental Protection and Climate Chane / Hydrometeorological Center of Karakalpak Republic	26 May 2023	▪ Project site is considered a good location for a wind power project as the area has stronger winds. ▪ Project area is subject to extreme temperatures, with hot summers and cold winters. Therefore, the climate of the region must be taken into account when constructing and operating the Project.
State Committee of the Republic of Uzbekistan for Ecology and	28 Dec 2022	▪ Location of southern Ustyurt National Park location is provided. An excerpt from the Regulations of the "Southern Ustyurt" National Nature Park on the restrictions and prohibitions established in the area regarding the conduct of economic activities (including the construction of wind power stations) is provided.

Environment Protection		▪ The State Ecological Committee in cooperation with GIZ (German cooperation organization) and the Zukov Foundation prepared and submitted the relevant documents for the candidacy of "Southern Ustyurt" National Nature Park to be included in the list of UNESCO World Heritage Sites. At that time, the application was being reviewed by UNESCO. In the National Nature Park and its adjacent areas, the types of economic activities that have a negative impact on the natural complexes, including flora and fauna, should be limited. ▪ The Park and surrounding areas are considered to be habitat for rare animals which are included in the Red Book of the Republic of Uzbekistan and the International Red List. ▪ The borders of the Project area should be placed at a distance of at least 10 km from the borders of the "Southern Ustyurt" national nature park, because flying birds are observed to fly at low altitudes when approaching their stopover destinations on the main routes of flight. Planning the Project area should be in the meridian direction and not planning between the territories of "Southern Ustyurt" national nature park and "Borsakelmas" state order farm. The main migration routes of migratory birds during the flight pass through these areas. The deployment of wind power plants along the Project area from east to west puts their lives at risk during migration. However, it is recommended to get detailed conclusions of the Academy of Sciences of the Republic of Uzbekistan on the impacts of the Project on birds and habitats. ▪ *Note: Please refer to "Section 4.1". The above consultation was undertaken at an early stage of the Project development when there was a 4,600km^2 area provided by the Government from which the final Project boundary was to be selected. At that point, the entire 4,600km^2 area was provided to the Committee (not the final Project boundary as currently selected). As noted in section below, follow up discussions were undertaken to discuss the issue of the setback distance and it was agreed to reduce the setback distance in accordance with international best practice standards and requirements.*
Department of Chamber of State Cadasters for the Republic of Karakalpakstan	18 May 2023	▪ Official land designation for the Project is provided. Note: the figure is provided in "Section 9" later. ▪ Total area of the Project is 95,051.15 hectares that is under governmental ownership and allocated to the following entities: - 47,063.01 hectares registered under State Reserve Land of Kungrad District Khokimiyat by the decision of the Council of Ministers of the Republic of Karakalpakstan 551-13-0-Q/22 dated 09.12.2022. This area is classified as "other lands not used in agriculture". - 44,205.07 hectares that are registered under State Reserve Land of Khokimiyat of Kungrad District based on the decision of the Council of Ministers of the Republic No. 204-13-0-Q/21 of 16.12.2021. This area is classified as "agriculture reserve land" and sub-classified under this category as "type of other unused land." - 3,782.94 hectares that are registered under the Kungrad State Forestry based on decision No. 65-b dated 29.07.2016. This area is classified as "not used for agriculture and belongs to the type of other lands". ▪ Process for land allocation will entail the transfer of these lands to the district reserve fund and they will be given a new classification (e.g. industrial or infrastructure project) after which they will be transferred to the Ministry of Energy.

		▪ South of the Project site there is an allocated area of 0.03 hectares to "Kungrad Main Gas networks" on 07.12.2020 through decision no. 4769/12. This land has been allocated for the construction of gas networks, taps and electricity transmission infrastructure. ▪ From this area a gas pipeline runs within the Project area that also includes an overhead transmission line.
Ministry of Culture and Tourism of Karakalpakstan	26 May 2023	▪ No secondary data is available on archeology and cultural heritage sites within the Project boundary. ▪ Methodology and scope of work to be undertaken for archeology and cultural heritage assessment is sufficient – in particular the site survey. Specialists could be engaged from the local archaeology department, national university, or archeology department if required. ▪ No additional issues of concern or additional requirements to be considered at this stage.
Ministry of Culture and Tourism of Karakalpakstan / Department of Cultural Heritage of Karakalpakstan Republic	26 May 2023	▪ The area in general was studied 35-40 years ago but no new studies were conducted. ▪ The Project site should be investigated by archeologists. ▪ The methodology and scope of work to be undertaken for archeology and cultural heritage assessment is sufficient. If required, the organization can assist in further research by providing specialists. ▪ Apart from the above, there are no additional issues of concern or additional requirement to be considered at this stage.
Ministry of Culture and Tourism of Uzbekistan / Agency of Cultural Heritage	15 Dec 2022	▪ There are no objects of cultural heritage on the Project site.
Ministry of Water Resources of Karakalpakstan / Kungrad Water Supply Department	18 May 2023	▪ The key water supply pipeline runs near Highway A380 (which runs near Kirkkiz village). The pipeline has a diameter of 1000 mm and a length of 307 km was constructed for Kungrad District. ▪ The entity will be able to supply water requirements of the Project but details on water quantities are required for construction and operation to verify this. ▪ Should the Project require constructing a pipeline for water supply it will require pumping stations for pressure requirements and a separate line should be constructed so that the main pipeline for Kungrad District is not affected in any way. ▪ In general, the source of water supply in Kungrad District is the Amu Darya River. This is supported by pipelines and pumps. On average, 300 million cubic meters of water is allocated per year from the river. The water resources within the river depend on the water levels in the Amu Darya basin. ▪ Additional consultations were undertaken to obtain key data and information on water supply and water demand in Karakalpakstan in general and Kungrad District in specific.
Ministry of Health of Karakalpakstan	17 May 2023	▪ Before the decommissioning of the Project, a disposal/utilization plan for the turbines should be available.

		▪ Apart from the above, all Project related impacts were identified and considered by ESIA Consultant. No additional requirements or issues of concern are to be considered.
Ministry of Health of Karakalpakstan / Republican Sanitary Epidemiological Service	17 May 2023	▪ Given that the closest residential area is more than 100KM away, there are no issues of concern and Project will meet all legislative requirements related to: - Protection of atmospheric air in residential areas of the Republic of Uzbekistan under "Sanitary hygiene standards No. 0350-17 for Protection of Ambient Air". - Sanitary rules, norms and hygiene regulations No. 0236-07 for ensuring the safety of residents living near high-voltage power transmission networks. - Sanitary rules, norms and hygiene regulations No. 0008-20 on permissible noise level in residential areas, public buildings, residential areas and recreation zones. ▪ Given the remote location it is expected that worker housing will be established. Therefore, the Project should create comfortable conditions for workers that should include sleeping rooms, dining rooms, rest rooms, washrooms, toilets, and laundry services. ▪ Additional legal requirements that Project should consider include: - SanQvaM No. 0294-11 "Hygienic norms for the permissible amount of harmful substances in the air of the working area" - SanQvaM No. 0325-16 "Sanitary norms on the permissible noise level in workplaces" - SanQvaM No. 0326-16 "Sanitary norms of general and local vibrations in workplaces" - SanQvaM No. 0269-09 "Sanitary rules and norms for working with sources of electromagnetic fields of radio frequencies"
Ministry of Labor of Karakalpakstan	19 May 2023	▪ All Project related impacts were identified and considered by ESIA Consultant. ▪ The only addition issues to be considered include: (i) transportation modes should be ensured for workers given the remote area of the Project; and (ii) consider providing professional training for communities to be involved in job opportunities.
Ministry of Transport of Karakalpakstan / Kungrad District Road Use Unitary Enterprise	19 May 2023	▪ An analysis of the transport route should be carried out and a detailed plan should be developed that should take into account the load carrying capacity of the highways. ▪ Depending on the final route key issues should be identified and considered. For example, if the highway from Kazakhstan is used there are current sections on the main A380 Highway that are under repair. ▪ There should be accountability in the case the transport company affects/impacts any roads. reinstatement plans should be in place. ▪ Project will require intensive transportation requirements for the WTGs that will include heavy loads. It is recommended that Developer coordinate with the Logistics Center under the Road Use Unitary Enterprise to arrange for the logistics of the transportation requirements.

		▪ Developer should consider as part of their social responsibility program providing road upgrades. ▪ Note: data was requested on key and major highways in Karakalpakstan (e.g. to include AM/PM traffic counts, existing conditions, etc.) but it was indicated that such information is not available.
Ministry of Emergency Situations of the Republic of Uzbekistan	1 Feb 2023	▪ Project site has a dry climate. ▪ There are no settlement areas on the Project site. ▪ According to records, there has not been any emergency situation within the Project area or within nearby areas up to date. However, strong sand and salt-storms, as well as sand-salt mixed winds are very likely to occur there. ▪ Based on the above, a range of measures should be taken to prevent emergency situations that can occur on the Project site as a result of strong storms. ▪ Construction of buildings on the Project site should follow national requirements to include: SHNK 2.01.02-04, 4.02.13-04, 2.01.01-22, KMK 2.03.11-96, PEU.
State Committee on geology and Mineral Resources of the Republic of Uzbekistan	17 Jan 2023	▪ There are important investments in hydrocarbon resources within the area. ▪ It is recommended that the boundary area coordinates provided are considered for the Project as no geological surveys will not be carried out within this boundary for the next 30 years. The coordinates have been provided and this issue has been discussed in "Section 14".
Kungrad District Khokimiyat / Deputy Hokim for Construction and Ecology	17 May 2023	▪ The closest villages to the Project site are considered to be Kirkkiz and Elobod. ▪ The most appropriate and effective way for sharing any Project related information (including potential for job and procurement opportunities as applicable) with local communities is through the Mahalla Community Unions. ▪ Job and procurement opportunities should also be announced through the Khokimiyat. ▪ There are current contracts with particular organizations within the Ustyurt area for underground resources utilization. This includes Gazprom, Uzbekneftegas, and Jizzakh Petroleum. In addition, there are also mining projects currently within the Ustyurt area as well. These entities should be consulted to ensure there is no conflict. ▪ Apart from the above there are no key formal land uses within the area and its surrounding. ▪ All Project related impacts were identified and considered by ESIA Consultant. ▪ Key impacts are believed to be those related to ecology from construction and operation activities and impacts on work health and safety. Another key risk is related to traffic and transport. The A380 highway capacity should be taken into account for the transportation of the WTG components since it is the main road that is used by many users and trucks including gas companies and it also connects with Kazakhstan. ▪ No additional requirements or issues of concern are to be considered. ▪ Note: as noted in "Section 9" later, most of the Project site is designated for the Kungrad District Khokimiyat. During the consultations it was confirmed that they have no current or planned activities within this area in specific. They also indicated that they have no objection and no further issues of concern.

Committee for Development of Sericulture and Wool Industry	1 May 2023	▪ There are no grazing activities in the area. ▪ The area does not belong to the Committee. ▪ There is a gas pipeline within the Project site. ▪ There are no additional requirements or issues of concern to be considered. ▪ Within the area there is a gas pipeline that should be investigated by relevant authorities.
Youth Union of the Republic of Karakalpakstan	30 May 2023	▪ Youth should receive training for skilled jobs and professions that are required at the wind farm. ▪ The most appropriate way to ensure that youth receive Project related information (including potential for job opportunities as applicable) is through the following platforms: - Social media channels - NGOs working with youth ▪ There are no additional requirements or issues of concern to be considered.
Family and Women's Committee of the Republic of Karakalpakstan	24 May 2023	▪ A significant number of women residing within the local communities surrounding the Project lack higher education, which makes them more inclined towards service-oriented jobs. However, for employment opportunities for women, it is crucial to consider the challenges of transportation to the Project site and ensure their safety in the area. ▪ When providing work opportunities for women in the Project, it is important to consider their education level, social background, traditions, and safety measures. It is important to establish safe and comfortable working and commuting conditions for women. ▪ The Project should implement procedures for developing skills and knowledge that specifically support local women. ▪ The Family and Women's Committee of the Republic of Karakalpakstan has established branches in every Region and can be considered a key method for women groups in particular to receive Project related information (including potential for job opportunities as applicable). ▪ The Khokimiyat is responsible for employing the unemployed and they can manage the process as well as announcement of job opportunities which can be shared through the Mahalla Community Union's Telegram Channels. In addition, they also maintain a list of unemployed individuals classified by various criteria, which can be utilized for recruitment purposes.
Ministry for Development of Information Technologies and Communication	1 Aug 2023	▪ Obtain information on telecommunication, TV and Radio broadcasting towers ▪ Obtain any requirements on WTG project micro-siting ▪ Obtain any other requirements that should be considered for Project
Civil Aviation Administration	2 Aug 2023	▪ Obtain any requirements on WTG project micro-siting ▪ Obtain any other requirements that should be considered for Project
Uzbekistan Air and Air Defense Forces	3 Aug 2023	▪ Obtain any requirements on WTG project micro-siting ▪ Obtain any other requirements that should be considered for Project

State Unitary Enterprise / Ministry of Ecology, Environmental Protection and Climate Change under Republic of Uzbekistan	3 Aug 2023	▪ Obtain information on: (i) closest municipal AND construction waste disposal facility to the Project site; (ii) wastewater facilities; and (iii) hazardous waste disposal facilities. Information was collected on location, current capacity, design capacity, whether it is operated according to international standards or not, and other. ▪ Obtain any other requirements that should be considered for Project
NGOs		
Uzbekistan Society for the Protection of Birds / Main Office Uzbekistan	26 Dec 2022	▪ The main threats to the animal species living in the proposed area for the wind farm are obstacles on the flight paths and the transformation of habitats as a result of construction. ▪ The claimed wind farm area could prevent bird migration routes from the north and east and bird access to the coastal part of the nearby IBA. ▪ The actual territory of the wind farm is located in the Karabaur ridge. This is a unique landscape area of the Ustyurt Plateau. It serves as a habitat for many reptiles, birds and mammals, including such rare and endemic species. This area needs to be preserved. ▪ 60 km to the south of the wind farm is the national natural park "Southern Ustyurt", and 15 km to the north is the Barsa-Kelmes sor, the territory of which is declared by the State Committee for Ecology of the Republic of Uzbekistan for the creation of a state reserve. Both of these protected areas are aimed at the conservation of animal species listed in the Red Book of the Republic of Uzbekistan. ▪ Considering the comments about large-scale projects for the construction of wind farms in Uzbekistan, given in the bulletin of the CEE Bank Watch Network dated December 1, 2022, the location of the wind farm should be considered, since there will be an impact both on the unique natural landscapes and on the protected and key natural territories surrounding it. ▪ *Note: Please refer to "Section 4.1". The above consultation was undertaken at an early stage of the Project development when there was a 4,600km^2 area provided by the Government from which the final Project boundary was to be selected. At that point, the entire 4,600km^2 area was provided to the Society (not the final Project boundary as currently selected). In addition, follow up consultations were undertaken – please refer to section below.* ▪ Please refer to OHTL ESIA for outcomes of consultations related to associated facilities.
Uzbekistan Society for the Protection of Birds / Karakalpakstan Branch	24 May 2023	▪ Methodology used for the biodiversity assessment for the ESIA (birds, habitats, bats, etc.) is based on international best practice. ▪ The majority of the land is located on the Ustyurt Plateau, with a smaller portion situated in the floodplain of the Amu Darya River. The vegetation in the area is primarily desert and tugai, and the main hunting species include wolves, foxes, tolai hares, pheasants of the Khiva subspecies, and waterfowl. Although the farm does not have specially equipped places, it is still able to provide adequate conditions for hunting and fishing. Unfortunately, poaching is a prevalent issue in Ustyurt, with saigas and gazelles being the primary targets.

		▪ It is planned to release from 2,000 to 3,000 MacQueen's Bustards (Houbara Bustard) into the wild nature of the Republic of Karakalpakstan, a rare bird included in Appendix 1 of the CITES Convention. In 2022, a total of 2,910 yurt birds were released to the Kungrad district, the Ustyurt plain, Takhtakopir and Ellikkala districts, and the western part of the Kyzylkum desert. Before that, in 2019 – 1,002 species, in 2020 – 4,548 individuals, in 2021 – 2,028 individuals of birds were released into the wild nature of the territory of the Republic of Karakalpakstan. During 2019-2022, a total of 10,488 houbara bastards were released into the wild. But there is no accurate information about how many of them survived and how many birds are in nature today; the reason has not been fully studied to this day. ▪ The birds were brought to the center of the International Fund for Houbara Conservation in Abu Dhabi (OAE) and brought to the framework of the partnership between State Ecology Committee and Falcon Hunting Solutions. ▪ The above is mainly for hunting of the houbara that is undertaking in Uzbekistan by Arab state royalties. ▪ It is hard to find MacQueen's Bustards (Houbara Bustard) during hunting, despite the fact that more than 2,000 of them are released here every year. ▪ It is necessary to build a nursery for breeding MacQueen's Bustards (Houbara Bustard) in the Ustyurt area. ▪ To ensure the well-being of animals in the Project area, it is important to study their cycles. This includes understanding the nesting and migration periods of birds, as well as the nesting and reproduction periods of rodents and reptiles. Creating a corridor for migrating birds is necessary, and the migration patterns of other species should be considered as well. ▪ Providing a suitable habitat for animals that nest in the Project area is also important, and consultation with botanists and zoologists can help in creating natural conditions for wild animals passing through the area. ▪ It is also crucial to consider the source of feed for these animals when creating a healthy habitat. ▪ If animals need to be relocated from the construction site, sound devices such as shiny papers or sounds can be used to scare them away without causing harm. During bird migration periods, the height of bird's flight should be taken into account, as their flight patterns differ in spring and autumn. ▪ It is important to prioritize the preservation of animals and birds that are endangered in the region, and guidelines should be developed to ensure their protection during the Project. If any objects are built in the habitats of these birds, the plants that they use for nesting should be propagated in another area. ▪ Please refer to OHTL ESIA for outcomes of consultations related to associated facilities.
Karakalpak Republican State Committee for Disabled People	17 May 2023	▪ The Committee should be considered for sharing of any Project related information (including potential for job opportunities as applicable) to disabled people across Karakalpakstan. Channels and departments are available in 17 regions of the Republic that facilitate the sharing of information. The total number of members in the Republic is approximately 54,000. ▪ Project should consider development projects for disabled people as part of their social responsibility programs.

		▪ Project should consider job opportunities for disabled people if possible
Karakalpak branch of the Republican Social Information Center for youth "Istikbolli avlod" NGO	29 May 2023	▪ The most appropriate way to ensure that youth receive project related information (including potential for job opportunities as applicable) is through the following platforms: - Social media channels - Responsible government entities working with youth such as Youth Union (who was consulted earlier) - In some areas there are specific clubs for youth. ▪ Main entities working with youth include the Youth Union, Barkamol Avlod). ▪ There are no additional requirements or issues of concern to be considered.
Birdlife International	21 December 2023 13 March 2024	▪ Main concern is related to potential landscape level impacts as a result of opening up a relatively un-disturbed area through the induction of the access road. This would likely result in increases in disturbance impacts as well as increases in anthropogenic impacts (e.g. poaching / hunting) as well as potentially introducing barriers for free movement of ungulates across the Ustyurt Plateau as well as potential cumulative impacts associated with other potential projects across Ustyurt. ▪ In isolation they do not consider the Project to be significant and are satisfied with the amount of fieldwork and level of assessment within the ESIA. Collision Risk Assessment concluded that no significant impact on migrating birds would be expected and changes in layout as well as migratory behaviors over the site are likely to increase natural avoidance behavior a view that was agreed with. ▪ The mortality of Steppe Eagle will breach the country-wide PBR thresholds and off-setting or additional adaptive management will be required. ▪ Birdlife will aim to provide possible Projects for Steppe Eagle conservation that the windfarm Project could contribute for offsetting. ▪ Please refer to OHTL ESIA for outcomes of consultations related to associated facilities.
IUCN SSC Bustard Specialist Group / Bank Watch	Online meetings and e-mail communication (June – October 2024)	▪ Based on the request of this stakeholder group, no summary of discussions will be included. ▪ Please refer to OHTL ESIA for outcomes of consultations related to associated facilities.
John Burnside (International Expert in MacQueen's Bustard)	29 April 2024	▪ Confirmed that breeding of MacQueen's Bustard in north-western Uzbekistan is not widespread and that he had only encountered breeding records to the north of the highway from Kirkkiz to Kazakhstan around Jasliq (approximately 110km north-east of the Project Site). He has previously visited the area around Kungrad 1, 2 and 3 wind farms and had never encountered breeding MacQueen's. He also stated that habitats within the wind farm area were sub-optimal for breeding of this species.
Nature Conservation / WWF	17 April 2024	▪ Obtain information on Cheetah reintroduction efforts in Central Asia (including Ustyurt Plateau) that were announced under the Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS

		COP 14) undertaken in February 2024 in Samarqand. This included information on plans, timeline, locations, types, etc. ▪ To date, only provided response stating that reintroduction into Central Asia is likely to be the Northeast African cheetah (Acinonyx jubatus soemmeringii), however no further details were available or provided apart from that to date.
IUCN Cat Specialist Group	September	▪ Email communication requesting consultations. ▪ No response to date
Gas Exploration Entities		
Ustyurt Gas (Branch of Uzbekneftegas JSK)	5 June 2023	▪ There are several gas investment blocks in the vicinity of the Project, owned by state organizations and joint ventures. ▪ The Shakhpakhty field, discovered in 1964, could be located in the southeastern part of the Project site. Currently Gasprom has extraction rights for the field up until 2024 after which his can be extended or terminated. ▪ For detailed information the State Committee for Geology must be contacted. ▪ In addition, the Project area is crossed by a main gas pipeline with a diameter of 820mm. The pipeline extends from the Shakhpakhty field to Karakalpakiya with a total length of 235 km. The operator of the pipeline is UrgenchtransGaz which must be contacted (check below).
UrgenchtransGaz	6 June 2023	▪ The Shahpakhty-Karakalpakiya gas pipeline crosses the Project site and in particular points 6-7 and 28-29. ▪ A 250m protection zone in each direction is required to be maintained as part of the Project design. ▪ Inappropriate consideration of this could entail key and serious health and safety risks. ▪ For additional detailed information an official letter and request must be submitted.
Ustyurt Exploration Drilling Organization	30 May 2023	▪ There are no activities currently in the area nor any planned activities. ▪ The closest planned activity areas are located away from the Project site. ▪ There are no additional requirements or issues to be considered.
Gasprom International Limited	5 June 2023	▪ They do not have any current or planned activities in the Project area. ▪ Based on their knowledge there could be an existing pipeline operated by UrgenchtransGaz which starts from their Shakhpakhty field. ▪ No additional issues or requirements were raised.
Saneg, IP LLC Industrial Energy Group	5 June 2023	▪ Based on review of Project coordinates the closest drilling works are currently carried out in various areas to include Yuksalish, Western Aral and Ergazi but none within the Project site. ▪ 2D Seismic works are planned in several investment blocks that include Sengir, Murun, Kassrmas but none are located within or even near the Project area. ▪ There is a possibility that the Project site is located within the boundaries of “South Ustyurt” National Natural Park. This should be investigated further.

		▪ Environmental Impact Statement should be developed within the framework of the national laws and an environmental review should be carried out. In addition, it is necessary to coordinate the site work area with the district environmental inspectors. ▪ When public hearings are held, it is necessary to coordinate with the epidemiology department (which were consulted as noted earlier).
Academic and Research Institutions		
National University of Karakalpakstan	19 May 2023	▪ Support the Project and are willing to provide specialist for the studies to be undertaken as required. ▪ Aware that both local and international specialists are being engaged in the surveys of the Project and required that they are informed about the results and outcomes. ▪ An agreement can be signed between the University and the Developer to create master's degree programs in areas that are relevant for the Project so that graduates can be utilized at a later stage. This could include: - Masters in Ornithology, designed for students who have completed a bachelor's degree in the field of biology. - Master's in engineering with focus on wind farms, intended for students who have completed a Bachelor's degree in physics or engineering.
RES group of the Karakalpak branch of the Academy of Sciences of the Republic of Uzbekistan	31 May 2023	▪ From an archeological perspective there could be possible archaeological sites which include: the remains of ancient settlements, the ruins of the well-known so-called "Ustyurt Arrows" (the oldest devices for hunting antelopes), etc. ▪ From biodiversity perspective the following should be considered - It is necessary to take into account the influence of wind turbines on insects, which are the food base for many birds, rodents, reptiles and bats. These insects may not be endangered species, but they might significantly affect the animal feed base. - It is necessary to compile a review of methods and techniques for scaring away birds that could be applied in the operation of wind turbines in order to reduce the number of collisions of birds with the blades. ▪ From an air quality perspective, it would be important to investigate the extent to which the level of dust in the surrounding land might increase as a result of the turbines. ▪ In general, if all proper plans and procedures are carried out and implemented, the construction of this wind farm will be an efficient and important infrastructure project for the country.

Karakalpak Research Institute for the Human Science / Academy of Science	23 Dec 2022	▪ There are several known archaeological objects that have undergone archaeological studies on the Project site and nearby areas in the past, as well as objects that have been discovered using remote sensing. Coordinates have been provided and were discussed in "Section 4.1.2" ▪ Partial archaeological research was carried out within the territory in 1980-1990s. Currently, there is no ongoing research there. ▪ The Project site is poorly explored, and a site-specific survey should be undertaken.
Other		
Kungrad Soda Plant	29 May 2023	▪ There are no activities currently in the area nor any planned activities. ▪ There are no additional requirements or issues to be considered.
Emirates Bird Breeding Center for Conservation (EBBCC)	Oct 2023	▪ Cooperation agreement will be signed between ACWA Power and EBBCC for project activities in Uzbekistan. ▪ This could include for example, providing support for offset requirements that ACWA Power might have related to breeding and release of certain species (if and as required).

6.3.2 Focus Group Discussions (FGD)

The following key FGDs were undertaken in relation to the Project each of which is discussed in further details below:

- FGD with Supreme Council and Kungrad City Council;
- FGD with local communities; and
- FGD with key biodiversity experts from governmental entities and NGOs.

(i) Supreme Council and Kungrad City Council

A meeting was held with the Supreme Council of Karakalpakstan, and which was chaired by the Deputy Chairman of the Supreme Council. The meeting was held on 18 May 2023.

A second meeting was held at the Kungrad City Council, and which was chaired by the Deputy Chairman of the Supreme Council and Kungrad District Hokim. The meeting was held on 19 May 2023.

The attendees included ministers, local leaders, extraction gas companies, members of councils, the Hokim and other key members of the Government.

Throughout both sessions, the meeting was opened by the Deputy Chairman where he emphasized on his support for the Project given its significance for the country given the electricity crisis, as well its importance in terms of development of the region's infrastructure and job creation. He also emphasized the need to train specialists such as ornithologists, zoologists, power engineers, and renewable energy specialists.

Then the 'E&S Consultant' presented various aspects of the Project, including its components, timeline, phases, as well as the overall requirements for the E&S assessments.

All attendees in general expressed their readiness to support the Project by providing essential information and data as required. General questions were raised on the Project to include its timeline, workforce required, design details, contractor requirements, and supply of electricity. All questions were answered based on available information to date.

This meeting was the basis for conducting the targeted consultations with various governmental and non-governmental entities as discussed earlier under "Section 6.3.1".

Figure 27: Sample Photos from the Meeting

(ii) Local Communities

Four (4) key FGDs were undertaken with the local communities that are relevant to the Project as identified within "Section 2.2" earlier and which include:

- Session #1: Ozodlik Mahalla. Kungrad City has many Mahallas therefore one (1) was selected which is considered the most central Mahalla for Kungrad city.
- Session #2: Elobod Mahalla;
- Session #3: Kirkkiz Mahalla; and
- Session #4: Jasliq Mahalla.

All sessions were open invitation sessions that were announced to local communities through the following avenues at least five (5) days in advance of the session.

- Official news channel of Kungrad District Khokimiyat; and
- Telegram groups of each Mahalla.

Figure 28: Sample for Announcements

However, key invitations were sent to the following groups in particular:

- Mahalla Committee including Mahalla Chair (for details on setup of the Mahallas please refer to "Section 2.1" earlier);
- Village leaders that include elected leaders, religious leaders, business leaders and key members of the local community;
- Women that include women group representatives, female-headed households, housewives, widows and single mothers, women engaged in business activities; and
- Educational workforce (teachers in schools).

At the beginning of each session, a presentation on the Project was first provided along with a handout on the following key topics. This session was attended by all of the groups above (i.e. Mahalla Committee, village leaders, women, education any of the local communities that attended based on the open invitation):

- Description of the Project location along with maps;
- Description of key Project components along with figures and illustrations;
- Description of the key activities anticipated in each key phase of the Project (planning, construction and operation);
- Description of ESIA studies and its key components and requirements;
- Explanation of key anticipated E&S impact under each phase of the Project; and
- Explanation of the methodology and scope of work that will be undertaken for the ESIA.

Upon completion of the above informative session, each group was separated for general discussions as well as discussion on any comments or key issues of concern on the overall Project and/or the ESIA process in particular. Key discussions were undertaken in relation to the following key aspects:

- Economic activities and livelihood strategies;
- Land use activities;
- Community quality of life;
- Perceptions towards the Project;
- Community structure (ethnic and tribal groups, religion, ethnic minorities, etc.); and
- Cultural and Heritage sites.

The presentation and handouts were provided in Karakalpak language, while the delivery of the presentation was in Karakalpak, Uzbek and Russian language depending on the audience.

The table below presents an overall summary of the outcomes of these FGD for each community.

Table 17: Outcomes of FGD

Community	Date	Key Outcomes
Ozodlik Mahalla	19 May 2023	▪ The population of the village is 3,498. ▪ The majority of livelihood patterns is through waged and formal employment mainly within the railway station. Agriculture and pastoralism are considered minor activities within the local communities. ▪ Key ethnicities in the village are Karakalpak, Uzbek and Kazakh. There are small number of other ethnic composition that are less than 1% that include Russians. ▪ Islam is the main religion in the village. ▪ There are no sacred or cultural heritage sites within the Project site or its vicinity. ▪ No local community members use the land within the Project area or its surroundings for any activity in particular. ▪ Food and water security are not considered an issue if concern within this village. ▪ The local community is supportive of the Project. ▪ Employment opportunities are the key expectations from this Project development. *Note: through the consultation it was explained in detail that opportunities during the construction phase will be temporary and opportunities during operation are considered limited due to the nature of the Project.* ▪ Women are willing and want to be involved in job opportunities for the Project. ▪ Some issues raised included in particular the following: (i) updates on Project including when employment will start, and specialties required; (ii) potential impacts from worker influx as based on another plant in the area this has caused in an increase in Sexually Transmitted Diseases (STDs) amongst females win the community. ▪ Key methods for communication with local communities for engagement, providing updates, etc. is through: (i) Telegram channels; and (ii) word of mouth through Mahalla Community Union.
Elobod Mahalla	19 May 2023	▪ The population of the village is 3,455. ▪ The majority of livelihood patterns is through waged and formal employment mainly within a soda plant and the railway station. Agriculture and pastoralism are considered minor activities within the local communities. ▪ Key ethnicities in the village are Karakalpak and Uzbek. There are small number of other ethnic composition that are less than 1% that include Russians. ▪ Islam is the religion in the village. ▪ There are no sacred or cultural heritage sites within the Project site or its vicinity. ▪ No local community members use the land within the Project area or its surroundings for any activity in particular.

		▪ Food and water security are not considered an issue if concern within this village. ▪ The local community is supportive of the Project. ▪ Employment opportunities are the key expectations from this Project development, especially for women and youth. *Note: through the consultation it was explained in detail that opportunities during the construction phase will be temporary and opportunities during operation are considered limited due to the nature of the Project.* ▪ Women are willing and want to be involved in job opportunities for the Project. ▪ Some issues raised included in particular the following: (i) impacts on roads from heavy transportation of turbines to the Project site; (ii) impacts on dust from construction activities; (iii) updates on Project including when employment will start and specialties required; (iv) if transportation and facilities will be provided onsite due to remoteness of Project area (including those for women in particular). ▪ Key methods for communication with local communities for engagement, providing updates, etc. is through: (i) Telegram channels; and (ii) word of mouth through Mahalla Community Union.
Kirkkiz Mahalla	20 May 2023	▪ The population of the village is 4,231. ▪ The majority of livelihood patterns is through waged and formal employment mainly within a Akcholak facility (gas pipeline facility) and the railway station. Agriculture and pastoralism are considered minor activities within the local communities. ▪ Key ethnicities in the village are Karakalpak, Uzbek and Kazak. There are small number of other ethnic composition that are less than 1% that include Russians, Tajik and Kyrgyz. ▪ Islam is the religion in the village. ▪ There are no sacred or cultural heritage sites within the Project site or its vicinity. ▪ No local community members use the land within the Project area or its surroundings for any activity in particular. ▪ There is an issue related to water shortage in the community, but no food security issues. ▪ The local community is supportive of the Project. ▪ Employment opportunities are the key expectations from this Project development, especially for youth. *Note: through the consultation it was explained in detail that opportunities during the construction phase will be temporary and opportunities during operation are considered limited due to the nature of the Project.* ▪ Some issues raised included in particular the following: (i) impacts on road networks from Project related transportation activities; (ii) impacts on soil layers during construction activities; (iii) how can women groups in particular benefit from the Project given that Project area is in a very remote area for women in the community to go work there (females in this community do not work in places far from their living area) ▪ Key methods for communication with local communities for engagement, providing updates, etc. is through: (i) Telegram channels; and (ii) word of mouth through Mahalla Community Union.

Jasliq Mahalla	20 May 2023	▪ The population of the village is 4,198. ▪ The only livelihood pattern is waged and formal employment mainly within a compressor station and the railway station. There are no agriculture and/or pastoralism activities undertaken. ▪ Key ethnicities in the village are Kazak, Karakalpak, and Uzbek. There are small number of other ethnic composition that are less than 1% that include Russian, Tajik, and Kyrgyz. ▪ Islam is the religion in the village. ▪ There are no sacred or cultural heritage sites within the Project site or its vicinity. ▪ No local community members use the land within the Project area or its surroundings for any activity in particular. ▪ Food and water security are not considered an issue of concern within this village. ▪ The local community is supportive of the Project. ▪ They believe they are considered far from the site and if in this case employment opportunities are relevant and could be available for them. Employment opportunities are the key expectations from this Project development, especially for youth. *Note: through the consultation it was explained in detail that opportunities during the construction phase will be temporary and opportunities during operation are considered limited due to the nature of the Project.* ▪ They inquired if there will be community development programs targeted to the local communities by the Developer. ▪ No issues were raised in particular as they believe they are very far from the Project area for any potential impacts to be realized. ▪ Key methods for communication with local communities for engagement, providing updates, etc. is through: (i) Telegram channels; and (ii) word of mouth through Mahalla Community Union.

Figure 29: FGD with Ozodlik

Figure 30: FGD with Elobod Community

Figure 31: FGD with Kirkkiz

Figure 32: FGD with Jasliq

(iii) Biodiversity Specialists

A workshop was held on 24 August 2023 in Tashkent for key biodiversity experts and specialists and which included the following:

- Institute of Zoology to include but not limited to the following departments: (i) Laboratory of Vertebrate Animals; (ii) Laboratory of Entomology; and (iii) Laboratory of Accounting and Cadaster of Endangered Species;
- Parliament of the Republic of Karakalpakstan (*Jokari Kenes);*
- Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan to include the following departments:
  - Department of Protected Areas;
  - Biodiversity Department;
  - Cadaster Department; and
  - Centre for State Ecological Expertise.
- Department for Protected Areas of the State Committee of the Republic of Uzbekistan for Forestry;
- Uzbekistan Society for the Protection of Birds (including Karakalpakstan branch);
- Falcon Hunting Solution LLC; and
- International Fund for Houbara Conservation in Abu Dhabi (OAE).

The objective of the workshop was to:

- Discuss and present biodiversity survey results available at that time for the Project to include but not limited to habitats, flora, ornithology, mammals, reptiles, invertebrates, etc. The biodiversity experts that are part of the 'E&S Team' provided a detailed presentation on the methodology for the surveys and the outcomes and results;
- Together with all stakeholders discuss scientific and ecological importance of the Project site and gather any available existing scientific research works on wind farm territory;
- Discuss in specific conservation efforts and requirements of the MacQueen's bustard; and
- Discuss national and international standards in defining setback distance from Key Biodiversity Areas (KBAs).

Note: the workshop also aimed to present the outcomes and results of the assessments undertaken for the OHTL. Please refer to the OHTL ESIA for additional details on this aspect.

Figure 33: Selected Photos of the Workshop

Key outcomes of the meeting and discussions were as follows:

- The importance of balancing environmental protection with economic development and job creation is always a challenge. This entails finding a compromise between investment and nature preservation;
- The importance of involving students and young talents from Karakalpakstan University in various research activities related to the Project throughout its lifecycle;
- The importance of minimizing impacts from the wind farm on biodiversity in general was emphasized including adhering to national and intentional standards. Some key issues raised included:
  - Impacts on invertebrate populations and their impacts on rare species of birds and mammals;
  - Impacts on wildlife, including Gazelles and MacQueen's Bustards (Houbara Bustard)in particular;
  - Impact of wind farms on water sources, especially in attracting birds and the potential risks to migrating birds given the importance of water for red-listed bird species;
  - Turbine height, spacing and micro-siting and their impact on bird migration;
  - The use of radar technology and artificial intelligence to detect and prevent bird collisions as applicable for the Project; and

- Possibility of restoring species populations off-site.

- Need for ongoing research and data collection within the area, particularly regarding the impact on birds, mammals, invertebrates, and other key species;

- The "Cabinet of Ministers Resolution No. 382" approves the regulations on buffer zones of protected areas for various activities. Due to the absence of national standards in defining the size of the buffer zone from turbine to a closest National Park, during the discussion, ***it was suggested to consider existing international standards and best practice. This was confirmed through a formal letter from the Ministry of Ecology, Environmental Protection and Climate Change and a setback of 2-3km was agreed from the South Ustyurt Proposed Reserve. In addition, at a later stage, the environmental permit that was issued for the Project also required a setback of 3km;***

- The International Fund for Houbara Conservation in Abu Dhabi (OAE) expressed an interest in information and data exchange on the release of MacQueen's bustard in Karakalpakstan. ***Note: This has not been provided to date;***

- Importance of cooperation with local and international organizations and experts. This also includes cooperation with regards to research through ongoing data exchange/sharing to include: (i) outcomes of ornithology, mammals, geobotany, reptiles and entomology; (ii) identification of endangered species within Project area; (iii) other. This would support other studies undertaken on some issues such as assessing invertebrate food supply, monitoring rodent populations, impact of the wind farm on wildlife behavior and conditions and other; and

  The Project site is a territory at the loop of many international and government projects. Many organizations, as UNDP, GIZ, Saiga Alliance, UNESCO and others carried out projects on the territory of Ustyurt and gathered experience and information on this territory. The State Cadaster on rare and endangered species of Karakalpakstan is a good platform for data exchange/sharing. A large database that is now being digitized.

- Outcomes in relation to the OHTL are included within the OHTL ESIA. Please refer to OHTL ESIA for additional details.

6.4 Future Stakeholder Engagement and Consultation

Future stakeholder engagement and consultations will mainly include the following, each of which is discussed in further detail.

6.4.1 Undertake a Disclosure Sessions

Similar to the scoping FGDs undertaken, disclosure FGDs will be undertaken with the key stakeholders as follows:

- Session #1: Ozodlik Mahalla. Kungrad City has many Mahallas therefore one (1) was selected which is considered the most central Mahalla for Kungrad city;

- Session #2: Elobod Mahalla;

- Session #3: Kirkkiz Mahalla;

- Session #4: Jasliq Mahalla; and

- Session #5: Regional session at Karakalpakstan Regional level.

All sessions will be open invitation sessions that will be announced to local communities through the following avenues at least two (2) weeks in advance of the session.

- Official news channel of Khokimiyat as applicable; and
- Telegram groups of each Mahalla as applicable.

In addition, key invitations were sent to the following groups in particular:

- Mahalla Committee including Mahalla Chair;
- Village leaders that include elected leaders, religious leaders, business leaders and key members of the local community;
- Vulnerable groups (as identified within Table 15) and women that include women group representatives, female-headed households, housewives, widows and single mothers, women engaged in business activities. It will be ensured that conditions will be in place for them to attend (e.g. accessibility);
- Educational workforce (teachers in schools);
- Key and main healthcare facilities in Kungrad District to include Kungrad Interdistrict Phthisiatric Hospital № 4, Kungrad Central District Hospital, Kungrad Railway hospital, and Kungrad Infectious diseases Hospital; and
- Local and national grassroot social NGOs to include but not limited to: (i) Karakalpak Republican State Committee for Disabled People, (ii) Karakalpak branch of the Republican Social Information Center for youth "Istikbolli avlod" NGO, (iii) Republican information and educational center "INTILISH"; (iv) Khunarmand Association and Business Women Association / members of cleantech entrepreneurs; (v) Ne Molchi; (vi) National Association of NGOs in Uzbekistan; (vii) Youth Union of the Republic of Karakalpakstan; (viii) Family and Women's Committee of the Republic of Karakalpakstan

For Session #1 For this session in specific, all regional Karakalpakstan governmental entities and NGOs will be invited as well as identified within "Section 6.2" earlier.

The objective of the sessions is to:

- Introduce the Project to stakeholders;
- Identify the key anticipated impacts;
- Present the methodology for the ESIA study;
- Present key outcomes and conclusions;
- Comments on scope of work undertaken, key issues identified and any other issues of concern; and
- Cover issues and solicit feedback on key issues such as worker influx, accommodation and transportation, labor condition and skill needs, and others as appropriate.

In addition, the sessions will ensure consultation and disclosure provisions for the illiterate.

As discussed earlier, once the public disclosure FGDs are completed, all received comments will be addressed and taken into account and an updated ESIA will be submitted.

6.4.2 Disclosure of Documentation

The below documents will be disclosed on the Developer's website to allow any stakeholder to review the studies and comment on the scope of work undertaken, key issues identified and any other issues of concern they might have. At the end of the disclosure period, all received comments will be addressed and taken into account and updated as appropriate.

- Environmental and Social Impact Assessment (ESIA);
- Non-Technical Summary (NTS) ;
- Stakeholder Engagement Plan (SEP) ;
- Critical Habitat Assessment (CHA) ; and
- Environmental, Social, Health and Safety (ESHS) Management System (MS) Manuel.

The above will be disclosed in three (3) main languages to include English, Uzbek and Karakalpak language.

Note, the Livelihood Restoration Plan for the OHTL will also be disclosed online in English, with summary brochures also disclosed in Uzbek and Karakalpak. These documents only focused on the OHTL however.

6.4.3 Implementation of the Stakeholder Engagement Plan (SEP)

Stakeholder Engagement is an on-going process that involves stakeholder analysis & planning, disclosure & dissemination of information, consultation & participation, grievance mechanism, and on-going reporting to Affected Communities. A Stakeholder Engagement Plan (SEP) is developed and implemented that is scaled to the Project risks and impacts and development stage and tailored to the characteristics and interests of the Affected Communities and key stakeholders.

The SEP for the Project describes the planned stakeholder consultation activities and engagement process and includes the following:

- Define the Project's approach to future stakeholder engagement;
- Identify stakeholders within the area influenced by the Project;
- Profile identified stakeholders to understand their priorities;
- Propose an action plan for future engagement with identified stakeholders; and
- Set out the grievance/project complaints mechanism.

The Developer is committed to implementing the requirements of the SEP throughout the lifetime of the Project. The SEP is provided as a standalone document.

7. OVERVIEW OF STRATEGIC ENVIRONMENTAL AND ECONOMIC IMPACTS

7.1 Governmental Vision for the Energy Sector

The government of Uzbekistan has taken ambitious measures to alleviate the ongoing energy crisis. One of the first priorities was to reduce reliance and dependency on natural gas for electricity generation and promote renewable energy sources such as solar and wind power.

The government issued a decree titled "Measures to Increase the Use of Renewable Energy Sources" which established a goal of raising the proportion of renewable energy in the country's entire energy mix to 25% by the year 2030.

In addition, the Government has implemented further actions to encourage investment and use of renewable energy, including the enactment of new regulations and legislation. The "Law on the Use of Renewable Energy Sources of 2017" provides a legal framework for development, use and promotion of renewable energy sources. Furthermore, the Resolution of the President of the Republic of Uzbekistan "Measures to Stimulate Investments in Renewable Energy" enacted in 2020 also aims to attract investments in the renewable energy sector by providing a range of financial incentives and support mechanisms.

In line with the above, this development allows for more sustainable development and shows the commitment of the Government of Uzbekistan to realizing its energy strategy and meeting the set targets for renewable energy sources.

7.2 Energy Security

Recently, most policy makers around the world are grappling with issues related to energy security, energy poverty, and an expected increase in future demand for all energy sources – and Uzbekistan is no exception. Almost certainly, the most spoken words by policy makers and government bodies in the last couple of years revolved around 'energy security'.

Through various governmental strategies and policies discussed above, Uzbekistan has emphasized on the importance of energy security and diversification of energy sources.

In line with the above, the Project in specific will contribute to increasing energy security through reliance on an indigenous, inexhaustible and mostly import-independent energy resource. The estimated electricity generation from the Project is estimated at around 5,304 Gigawatt hours (GWh) per year on average; which will serve the annual electricity needs of around 1,600,000 local households.

The above has been calculated based on electricity that will be produced by the Project per year (5,304 GWh) and latest statistics on average electricity consumption per household in Uzbekistan from the Ministry of Energy (estimated at peak at 250 kilowatt-hours per month, equivalent to an annual consumption of 3,000 kilowatt-hours [8]).

[8] The social norm is 250 kWh per month. The Ministry of Energy gave calculations on the example of electrical appliances - News of Uzbekistan - Gazeta.uz

7.3 Environmental Benefits

The negative environmental impacts from generating electricity through conventional fossil fuel burning at thermal power plants are very well known. This most importantly includes air pollutant emissions such as ozone, Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Particulate Matter (PM), and other gases which are the cause of some serious environmental concerns such as smog, acid rain, health effects, and many others.

In addition, the burning of fossil fuels results in carbon dioxide emissions; a primary greenhouse gas emitted through human activities which contributes to global warming. The main human activity that emits CO_2 is the combustion of fossil fuels for electricity production and transportation. Concurrently, global climate change has become an issue of concern and so reducing greenhouse gas emissions have also emerged as primary issues to be addressed as the world searches for a sustainable energy future.

Generating electricity through wind power is rather pollution-free during operation. Compared with the current conventional way of producing electricity in Uzbekistan through thermal power, the clean energy produced from renewable energy resources is expected to reduce consumption of fossil fuels, and will thus help in reducing GHG emissions, as well as air pollutant emissions. The Project will likely displace around 2,500,000 metric tons of CO_2 annually.

The above has been calculated based on the electricity that will be produced by the Project per year (5,304 GWh) and statistics obtained from the "IFI Dataset of Default Grid Factors[9]" (UNFCCC, 2021) which provided a CO_2 generation factor for electricity production in Uzbekistan, and which was estimated at 467 gCO2/kWh.

7.4 Overview of Project Specific E&S Impacts

Nevertheless, the Project will result in negative E&S impacts on various E&S attributes throughout its overall development process. The table below presents an overview of the key impacts during the planning, construction, and operation phases of the Project.

The below is based on the outcomes of the detailed assessment process undertaken throughout the subsequent sections of the ESIA.

It is also important to note that the table below presents the worst-case scenario for the impacts. As included in further details within the relevant sections, some impacts have a range of significance (e.g. moderate to major) however the table below presents the worst-case scenario.

[9] IFI Default Grid Factors 2021 v3.1 | UNFCCC

Table 18: Summary of Anticipated Impacts during the Planning Phase

Environmental Attribute	Likely Impact – Planning Phase	Impact Assessment											
		Nature	Duration	Reversibility	Magnitude	Sensitivity	Likelihood	Frequency	Timing	Extent	Significance	Management Action	Residual Significance
Geology, Hydrology and Hydrogeology	Flood Risks. During the rainy season, flash flood events could occur. Improper siting could cause damage to Project and its components and this could also entail safety risks to workers.	No anticipated impacts										N/A	N/A
Infrastructure and Utilities	Potential Impacts on Civil and Military Aviation. Any tall structure, such as wind turbines, could impact aircraft safety if located near airports or known flight paths and routes – to include both civil aviation as well as military aviation.	No anticipated impacts.										Additional requirements	N/A
	Potential Impacts on Radio, TV and Telecommunication Infrastructure. Inappropriate siting of Project components could damage and/or disturb such infrastructure elements (e.g. telecom microwave connections, underground cables, etc.)	No anticipated impacts.										N/A	N/A
	Improper planning and site selection of the Project could damage/disturb existing gas pipeline which would affect its operation, and it could also entail serious safety risks to workers.	Negative	Long-term	Irreversible	Medium	High	Low	Rare	Not relevant	Medium	**Moderate**	Mitigation available	Not significant

Table 19: Summary of Anticipated impacts during the Construction Phase

Environmental Attribute	Likely Impact – Construction Phase	Impact Assessment											
		Nature	Duration	Reversibility	Magnitude	Sensitivity	Likelihood	Frequency	Timing	Extent	Significance	Management Action	Residual Significance
Landscape and Visual	Visual and landscape impacts due to presence of typical elements of a construction site such as equipment and machinery (e.g. cranes, excavators, etc.).	Negative	Medium- term	Reversible	Medium	Low	Medium	Frequent	Not relevant	Medium	**Minor**	Mitigation available	Not significant
Land Use	Project could result in land use impacts related to economic displacements (e.g. grazing, farming, etc.) and/or physical displacement impacts (e.g. housing structures).	No anticipated impacts on private land use										N/A	N/A
Geology, Hydrology and Hydrogeology	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.).	Negative	Medium-term	Reversible	Medium	Medium	Medium	Frequent	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Construction activities could disturb soil, and result in erosion and runoff could result in siltation of surface water (during rain events)	Negative	Medium-term	Reversible	Medium	Medium	Medium	Periodic	During rain events	Medium	**Moderate**	Mitigation available	Not significant
Biodiversity	Habitat loss, fragmentation, and degradation	Negative	Medium-term	Both	Medium	Medium	High	Rare	Not relevant	Low	**Moderate**	Mitigation & Offset	Not significant
	Impacts on sensitive receptors (habitats and flora) – non-native species and introduced flora	Negative	Long-term	Reversible	Medium	Medium	Medium	Rare	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Mortality Central Asian Tortoise	Negative	Medium-term	Irreversible	Medium	High	High	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Mortality Desert Sand Boa and Blotched Rat-Snake	Negative	Medium-term	Irreversible	Medium	Medium	High	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Mortality ground and tree nesting birds (passerines / waders)	Negative	Medium-term	Irreversible	Medium	Low	High	Rare	Mar – Jul	Low	**Minor**	Mitigation available	Not significant
	Mortality MacQueen's Bustard	Negative	Medium-term	Irreversible	Low	High	Low	Rare	Mar – Jul	Low	**Minor**	Mitigation available	Not significant
	Mortality, loss of nesting sites and reduction in habitat quality – raptors (Steppe Eagle)	Negative	Long-term	Irreversible	High	High	High	Rare	Mar – Jul	Low	**Major**	Mitigation available	Not significant
	Mortality and reduction in habitat quality – mammals (Honey Badger, Caracal and Marbled Polecat)	Negative	Long-term	Irreversible	High	High	High	Rare	Not relevant	Low	**Major**	Mitigation available	Not significant
	Impacts on sensitive receptors (habitat and vertebrates) - (poaching and collection, etc.).	Negative	Medium-term	Irreversible	High	High	Medium	Rare	Not relevant	High	**Major**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates and birds) – habitat fragmentation and barrier impact	Negative	Medium-term	Both	High	High	Low	Rare	Not relevant	High	**Major**	Mitigation by design and additional mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – vehicle collisions	Negative	Medium-term	Irreversible	High	High	Medium	Rare	Not relevant	Low	**Major**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – disturbance	Negative	Medium-term	Reversible	High	High	Medium	Periodic	Not relevant	Low	**Major**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – reduced air quality / dust	Negative	Medium-term	Reversible	Medium	High	Medium	Periodic	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – noise and vibration	Negative	Medium-term	Reversible	Medium	High	Medium	Periodic	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – lighting	Negative	Medium-term	Reversible	Medium	High	Medium	Periodic	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – littering, waste management	Negative	Medium-term	Reversible	Medium	High	Medium	Periodic	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – pest species	Negative	Medium-term	Both	High	High	Medium	Periodic	Not relevant	Medium	**Major**	Mitigation available	Not significant
	Impacts on Sensitive Receptors (Birds) – Collision and Electrocution from LVDL	Negative	Medium-term	Reversible	High	Low – High	Low	Periodic	Not relevant	High	**Minor – Major**	Mitigation by design, adaptive management, off-setting	Not significant
Archaeology and Cultural Heritage	Improper management could potentially disturb or damage potential archaeological remains on the surface as well as some of which could be buried in the ground (if any).	Negative	Medium-term	Irreversible	High	Medium	Medium	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
Air Quality and Noise	Construction activities will likely result in an increased level of dust and particulate matter emissions as well as noise emission to surrounding environment which in turn will directly impact ambient air quality. This could entail indirect impacts on workers' health and safety.	Negative	Medium-term	Reversible	Medium	Low	High	Frequently	Not relevant	Medium	**Minor**	Mitigation available	Not significant
Infrastructure and Utilities	Waste Utilities. Ensure that waste utilities will be able to handle the waste requirements that are generated from the Project.	Negative	Medium-term	Reversible	Medium	Medium	High	Periodic	Not relevant	High	**Moderate**	Additional requirements	Not significant
	Road network. Transportation requirements of the Project could affect level of service and capacity of existing highways and road networks.	Negative	Medium-term	Reversible	Medium	Medium	High	Frequent	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Road network. Improper transportation activities could result in traffic related accidents on roads which in turn could affect the health and safety of users on the roads, workers and other.	Negative	Medium-term	Reversible	Low	High	High	Frequent	Not relevant	Low	**Minor**	Mitigation available	Not significant
	Water Resources. Water requirements of the Project could entail constraints on existing users such as local communities or industrial establishments.	Negative	Medium-term	Reversible	Medium	High	High	Frequent	Not relevant	High	**Moderate**	Additional requirements	Not significant
Socio-economic	Employment and Procurement. The Project is expected at a minimum to provide job opportunities as well as procurement opportunities for local communities. This, to some	Positive	Not applicable.										

	extent, could contribute to enhancing the living environment for its inhabitants, elevate their standard of living, and bring social economic prosperity to the local community.												
	Employment and Procurement. If: (i) local community engagement is not implemented properly; OR (ii) if priority on all employment and procurement opportunities are not provided to local communities; OR (iii) if expectations are not properly managed and addressed – this could result in distrust and resentment with the Developer and might eventually lead to other potential escalated events (e.g. demonstrations, blockage of access road, etc.).	Negative	Medium-term	Reversible	Medium	High	Medium	Rare	Not relevant	Low	**Major**	Recommendations	Not significant
	Impact on Indigenous Populations	Not applicable										N/A	N/A
	Community Health, Safety and Security. Inappropriate management of security issues (e.g. conduct of security personnel) could result in health and safety issues for local communities.	Negative	Medium-term	Irreversible	Medium	Medium	Medium	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not Significant
	Community Health, Safety and Security. Influx of huge number of workers to the area could result in community impacts such as pressure on infrastructure elements, increase in social vices, risk of spread of disease, and other.	Negative	Medium-term	Reversible	Medium	Medium	Medium	Frequent	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Community Health, Safety and Security. Trespassing of unauthorized personnel into construction active areas could result in health and safety impacts.	Negative	Medium-term	Irreversible	Medium	Medium	Low	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Worker Welfare, Health and Safety. Inappropriate management of the workforce could entail human rights violations (e.g. engaging child workers, confiscation of passports of foreign workers, unacceptable working hours, and others).	Negative	Medium-term	Reversible	High	High	High	Frequent	Not relevant	Low	**Major**	Mitigation available	Not significant
	Worker Welfare, Health and Safety. Generic occupational health and safety risks to workers, as working onsite increases the risk of injury or death due to accidents	Negative	Medium-term	Irreversible	Medium	Medium	Medium	Frequent	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Worker Welfare, Health and Safety. Potential impacts on worker health and safety related to blasting activities should they be undertaken onsite.	Negative	Short-term	Irreversible	High	High	Medium	Rare	Not relevant	Medium	**Major**	Mitigation Available	Not significant
	Worker Welfare, Health and Safety. Inappropriate accommodation facilities for workers will entail impacts on worker welfare as well as their overall health and safety.	Negative	Medium-term	Reversible	Medium	Medium	Medium	Frequent	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Community and Worker Health and Safety. Inappropriate management of the workforce (which could be from the local community) as well as inappropriate conduct of workers within local community areas could entail gender related risk and impacts such as Gender based violence, and harassment (GBVH) or Sexual Exploitation, abuse, and harassment (SEBH)	Negative	Medium-term	Irreversible	Medium	Medium	Medium	Frequent	Not relevant	Low	**Moderate**	Mitigation available	Not significant
Subcontractor and Supplier Management	Improper management of subcontractors and supplier poses risks of major environmental impacts, human right abuses, criminal abuses or other	Negative	Short term	Reversible	Medium	Medium	High	Periodic	Not relevant	Low	**Moderate**	Mitigation available	Not significant

Table 20: Summary of Anticipated Impacts during the Operations Phase

Environmental Attribute	Likely Impact – Operation Phase	Impact Assessment											
		Nature	**Duration**	**Reversibility**	**Magnitude**	**Sensitivity**	**Likelihood**	**Frequency**	**Timing**	**Extent**	**Significance**	**Management Action**	**Residual Significance**
Landscape and Visual	Impacts related to interaction of wind turbines within the overall landscape and visual character of the area including any potential sensitive visual receptors.	Negative	Long-term	Reversible	Medium	Low	Medium	Frequent	Not relevant	High	**Minor**	Mitigation available	Not Significant
Land Use	Project could result in land use impacts related to economic displacements (e.g. grazing, farming, etc.) and/or physical displacement impacts (e.g. housing structures).	No anticipated impacts on private land use										N/A	N/A
Geology, Hydrology and Hydrogeology	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.).	Negative	Long-term	Reversible	Medium	Medium	Medium	Frequent	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
Biodiversity	Impacts on sensitive receptors (vertebrates and birds) - habitat fragmentation and barrier impact	Negative	Long-term	Both	High	High	Low	Periodic	Not relevant	High	**Major**	Avoidance / Mitigation by design	Not significant
	Impact on sensitive receptors (birds) – collision with turbines	Negative	Long-term	Irreversible	High	High	High	Periodic	Not relevant	High	**Major**	Mitigation by design, adaptive management, off-setting	Not significant
	Impact on sensitive receptors (bats) – collision with turbines	Negative	Long-term	Irreversible	Medium	Low	Low	Periodic	Not relevant	High	**Minor**	Adaptive management / mitigation available	Not significant
	Impacts on sensitive receptors (terrestrial mammals and breeding / resident birds) – disturbance	Negative	Short-term	Reversible	Medium	High	Low	Periodic	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – vehicle collisions	Negative	Long-term	Irreversible	High	High	Medium	Rare	Not relevant	Low	**Major**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – lighting	Negative	Long-term	Reversible	Medium	High	Medium	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (habitats and flora) – non-native species and introduced flora	Negative	Long-term	Reversible	Medium	Medium	Medium	Rare	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
	Impacts on sensitive receptors (vertebrates) – pest species	Negative	Long-term	Reversible	Medium	High	Medium	Rare	Not relevant	Medium	**Moderate**	Mitigation available	Not significant
Archaeology and Cultural Heritage	Improper management could potentially disturb or damage potential archaeological remains recorded on the surface.	Negative	Long-term	Irreversible	High	Medium	Medium	Rare	Not relevant	Low	**Moderate**	Mitigation Available	Not significant
Infrastructure and Utilities	Waste Utilities. Ensure that waste utilities will be able to handle the waste requirements that are generated from the Project.	Negative	Long-term	Reversible	Low	Medium	High	Periodic	Not relevant	High	**Minor**	Additional requirements	Not significant
	Water Resources. Water requirements of the Project could entail constraints on existing users such as local communities or industrial establishments.	Negative	Long-term	Reversible	Low	High	High	Frequent	Not relevant	High	**Minor**	Additional requirements	Not significant
Socio-economic	Employment and Procurement. The Project is expected at a minimum to provide job opportunities as well as procurement opportunities for local communities. This, to some extent, could contribute to enhancing the living environment for its inhabitants, elevate their standard of living, and bring social economic prosperity to the local community.	Positive	Not applicable										
	Employment and Procurement. If: (i) local community engagement is not implemented properly; OR (ii) if priority on all employment and procurement opportunities are not provided to local communities; OR (iii) if expectations are not properly managed and addressed – this	Negative	Long-term	Reversible	Medium	High	Medium	Periodic	Not relevant	Low	**Major**	Recommendations	Not significant

	could result distrust and resentment with the Developer and might eventually lead to other potential escalated events (e.g. demonstrations, blockage of access road, etc.).												
	Impacts on Indigenous Populations	Not applicable										N/A	N/A
	Community Health, Safety and Security. Inappropriate management of security issues (e.g. conduct of security personnel) could result in health and safety issues for local communities. towards the local communities.	Negative	Long-term	Irreversible	Medium	Medium	Medium	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Community Health, Safety and Security. Trespassing of unauthorized personnel into Project area could result in health and safety impacts.	Negative	Long-term	Irreversible	Medium	Medium	Low	Rare	Not relevant	Low	**Moderate**	Mitigation available	Not significant
	Community Health, Safety and Security. Operating wind turbines will produce noise which could be a source of disturbance and nuisance to noise sensitive receptors.	No anticipated Impacts.										N/A	N/A
	Community Health, Safety and Security. Operating wind turbines will produce shadow flicker which could be a source of disturbance and nuisance to sensitive receptors.	No anticipated impacts.										N/A	N/A
	Community Health, Safety and Security. Operating wind turbines might cause blade and ice throw that entail public health and safety concerns on receptors.	No anticipated impacts.										N/A	N/A
	Worker Welfare, Health and Safety. Generic occupational health and safety risks to workers, as working onsite increases the risk of injury or death due to accidents	Negative	Long-term	Irreversible	High	High	Medium	Frequent	Not relevant	Low	**Major**	Mitigation available	Not Significant
	Worker Welfare, Health and Safety. Inappropriate accommodation facilities for workers will entail impacts on worker welfare as well as their overall health and safety.	Negative	Long-term	Reversible	Medium	Medium	Medium	Frequent	Not relevant	Medium	**Moderate**	Mitigation available	Not Significant
	Worker Welfare, Health and Safety. Inappropriate management of the workforce could entail human rights violations (e.g. engaging child workers, confiscation of passports of foreign workers, unacceptable working hours, and others).	Negative	Long-term	Reversible	High	High	High	Frequent	Not relevant	Low	**Major**	Mitigation available	Not significant
	Community and Worker Health and Safety –Inappropriate management of the workforce (which could be from the local community) as well as inappropriate conduct of workers within local community areas could entail gender related risk and impacts such as Gender based violence, and harassment (GBVH) or Sexual Exploitation, abuse, and harassment (SEBH)	Negative	Long-term	Irreversible	Medium	Medium	Medium	Frequent	Not relevant	Low	**Moderate**	Mitigation available	Not significant
Subcontractor and Supplier Management	Improper management of subcontractors and supplier poses risks of major environmental impacts, human right abuses, criminal abuses or other	Negative	Long-term	Reversible	Medium	Medium	High	Periodic	Not relevant	Low	**Moderate**	Mitigation available	Not significant

8. LANDSCAPE AND VISUAL

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to landscape and visual. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

8.1 Assessment of Baseline Conditions

8.1.1 Methodology for Assessment

The baseline assessment of the Project site was based on secondary data review and a field survey, each of which is discussed in further detail below.

A. Secondary Data Review

Prior to the undertaking of any site-related surveys, a full and detailed review of up-to-date high-quality satellite images for the Project area was undertaken. Such satellite images were provided the Developer and were part of the topography study undertaken. The objective was to identify any potential visual receptors within the entire Project footprint and boundary so that it can be inspected during the site survey.

In addition, desktop review was undertaken to identify any other potential visual receptors within the wider area of the site (up to 50km).

Note: definition of visual receptors is discussed in further detail in the section below.

B. Site Survey

A detailed site survey for the Project area was undertaken in August 2023. The survey aimed to characterize the general topography and landscape characteristics of the Project area as well as any potential visual receptors onsite.

8.1.2 Results and Outcomes

Based on a site visit, the Project site in general is characterized with wide, flat and uniform surfaces with minimal changes in topography across the entire site. The figure below presents the general landscape of the Project site while the figure that follows presents the topography variations onsite based on a 3-D Digital Elevation Model (DEM).

The Project site can be classified as a desert-like habitat that is arid and barren with bare soil dotted with saline deposits and shrubby vegetation in some areas. Typical views of the Project site are limited to the open landscape and topography of a desert-like habitat as noted within the figure below.

Figure 34: General Site Topography and Landscape

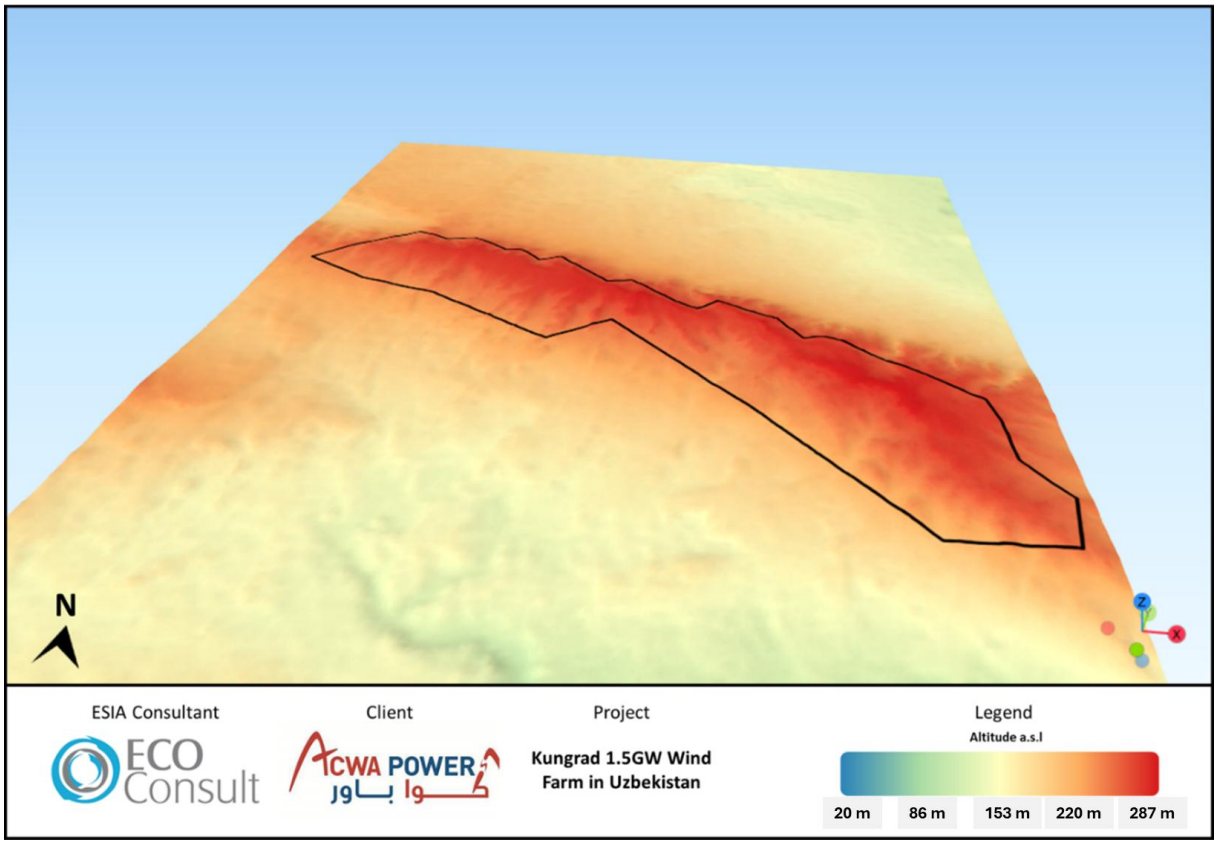


Figure 35: 3D DEM Modeling of the Project Site

In addition, based on the site visit and desktop review undertaken, critical visual receptors were mapped out as noted within the table below. The definition of key critical visual receptor was based on the "Guidelines for Landscape and Visual Impact Assessment (GLVIA)" as defined below.

Table 21: Critical Visual Receptors

Critical Receptors definition per GLVIA	Implication for Project
Residents at home.	Local communities to include the following as defined earlier under "Section 2.2": ▪ Kirkkiz village ▪ Elobod village ▪ Jasliq village ▪ Kungrad City
People engaged in outdoor recreation, whose attention/interest is likely to be focused on the landscape or particular views, including from public rights of way.	
Communities where views contribute to landscape setting enjoyed by residents.	
Visitors to heritage assets or other attractions, where views of the surroundings are an important contributor to the experience.	Ustyurt Nature Reserve in Kazakhstan. It is a nature reserve, with an area of 2,230 km^2 which lies within Ustyurt Plateau. It mainly includes two (2) touristic routes that include: (i) Kokesem route (43.1696447, 54.8868588); and (ii) Onere route (**420 36 30. 66 540 08 38.21)**
	South Ustyurt Proposed Reserve in Uzbekistan. As stated in "Section 11" the reserve is under nomination as a UNESCO World Heritage Site and will include the following key areas: - Nature reserve zone - Zone of economic use - Recreation area No details are available yet on the exact location of any proposed visitor/touristic sites.
	Kunya-Urgench UNESCO World Heritage site. Kunya-Urgench is situated in Turkmenistan, on the left bank of the Amu Daria River. Urgench was the capital of the Khorazm region, part of the Achaemenid Empire. The old town contains a series of monuments, including a mosque, the gates of a caravanserai, fortresses, mausoleums and a 60-m high minaret
	Known archaeology sites within the area as identified to date (refer to "Section 12" for additional details). As noted within that section, this site has no touristic value or importance and is not considered unique nor a key site of importance as such sites are found heavily within the area.
Travelers on scenic routes	Travelers on Kungrad – Karakalpakstan Highway (Highway A380)

8.2 Assessment of Impacts

This section identifies the anticipated impacts on landscape and visual from the Project throughout its various phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

8.2.1 Overall Methodology

Note: the impact assessment methodology for landscape and visual in particular did not follow the impact assessment methodology discussed earlier under "Section 3.4" per se as it followed the requirements of international standards in relation to visual assessments as highlighted throughout this section.

Visual impact assessments can be defined as a mechanism by which the landscape can be assessed against its capacity to accommodate change.

Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes and to the overall effects with the respect of visual amenity.

The aim of this section is to provide a full assessment of the visual effects of the Project, in line with current legislation and guidance. This document includes an appraisal of the following:

- Direct impacts of the development upon views in the landscape; and
- Overall impact on visual amenity.

The assessment was based on the following information:

- General arrangement and layout drawings of the wind farm, including topography;
- Wind Turbine supplier data – geometric sizing, rotor diameter and hub height;
- Onsite observations and landscape photography; and
- Viewpoint locations.

There are currently no laws or regulation regarding visual assessment of wind farms in Uzbekistan. However, several countries (including the UK) have developed guidelines around potential visual impacts and are aligned with the World Bank Group Guidelines. The relevant guidelines include:

- Guidelines for Landscape and Visual Impact Assessment (Third Edition), published by the Landscape Institute and the IEMA (2013) (GLVIA);
- World Bank Group / IFC EHS Guideline for Wind Energy (IFC, 2015);
- Visual Representation of Wind Farms (Version 2.2), published by Scottish Natural Heritage (2017); and
- Visualization Standards for Wind Energy Developments, published by The Highland Council (2016).

In accordance with the Guidelines for Landscape and Visual Impact Assessment (GLVIA) and other best practice guidance noted above, the visual assessment will include baseline studies that describe, classify and evaluate the visual resources, focusing on their sensitivity and ability to accommodate change.

The prediction and extent of the impact's forecast may not always be definitive. It is the responsibility of each evaluation to establish the evaluation criteria and the thresholds of importance, using informed and well-reasoned professional judgement supported by comprehensive rationale for their selection. Additionally, it should clarify how the conclusions regarding the significance of each assessed effect has been derived, as noted in GLVIA 3rd edition paragraphs 2.23-2.26 and 3.32-36.

Zone of Theoretical Visibility (ZTV)

In order to assist in the assessment of the potential visual effects of the wind farm, a computer-generated ZTV was modelled. A ZTV is used to identify the theoretical extent of visibility of a development. Computer processing algorithms are combined with digital elevation data to model the likely extent of visibility.

The development of a ZTV for the Project was carried out using QGIS, an open-source Geographical Information System (GIS) software package.

Elevation data was acquired from a dataset made available by the Japan Aerospace Exploration Agency (JAXA). The Advanced Land Observing Satellite (ALOS) Global Digital Surface Model (AW3D30) is a global elevation dataset with a spatial resolution of 30m. It is one of the most precise elevation datasets of this type available. The algorithm operates by utilizing the elevation data of wind turbines to simulate potential visibility across the landscape.

The ZTV is used as a working tool to inform the extent of the zone in which the proposed windfarm may have an influence on visual amenity. It should be noted that this is a topographical information-based exercise with no account being taken of the visual barrier effects of vegetation or buildings.

from the ZTV it is clear that the following receptors were excluded from the assessment (as previously presented in Table 21) given that there will be no impacts from the Project on such receptors.

- Local communities;
- Ustyurt Nature Reserve in Kazakhstan; and
- Kunya-Urgench UNESCO World Heritage site.

For the remaining receptors and from the ZTV study eight viewpoints (visual receptors) were identified to give representative views at various distances from the scheme. The location of the eight viewpoints is presented in the figure below (VP 1 – VP 8).

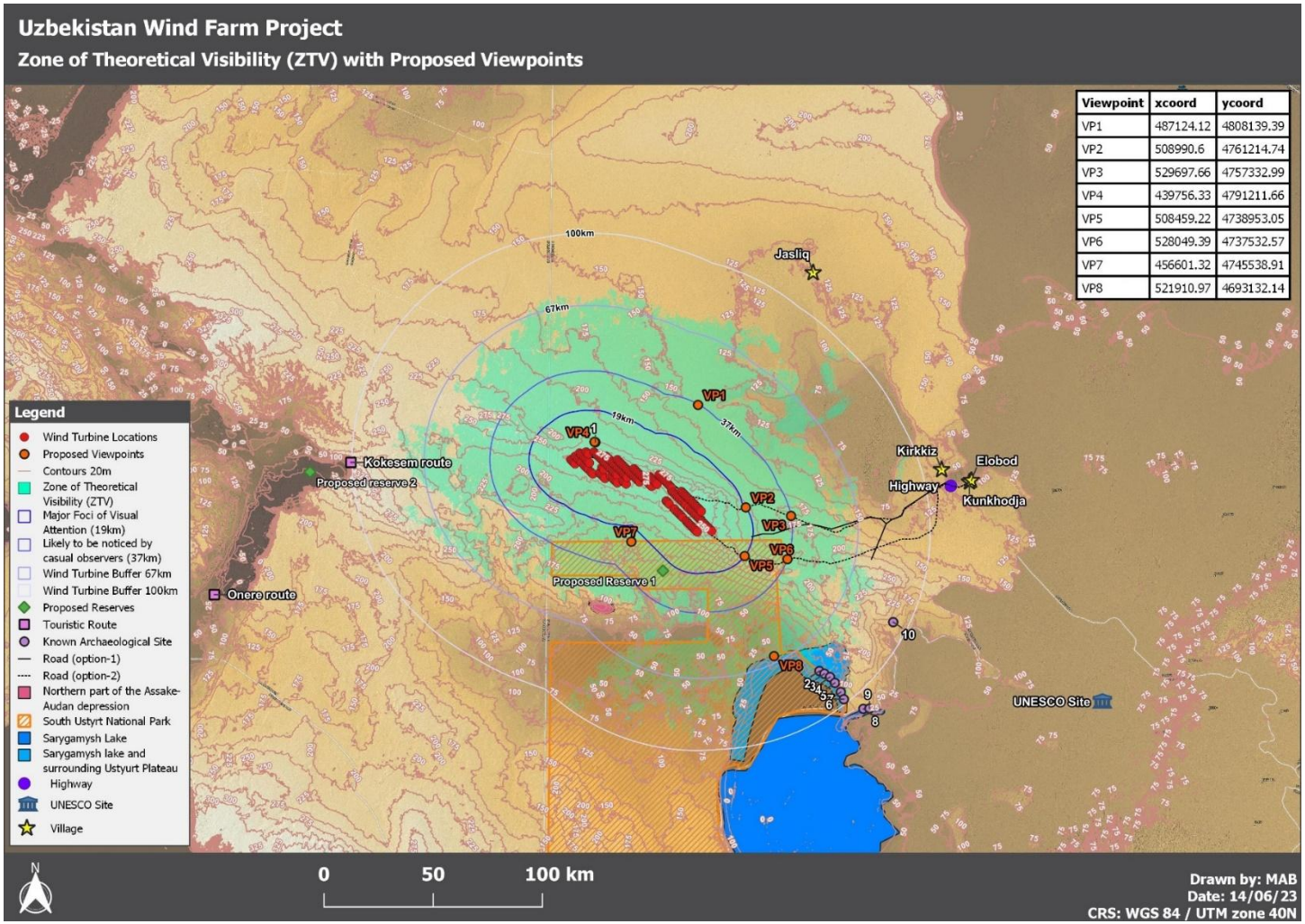


Figure 36: Zone of Theoretical Visibility

Visual Assessment Criteria

The visual impact assessment has been based on an evaluation of the sensitivity of the visual receptors, and the magnitude of change associated with the introduction of the Project into the visual context of the study area.

Describing the existing situation is a prerequisite for assessing the potential visual impact of the development and determining any suitable measures for mitigating that impact if deemed necessary. The assessment of visual impact from any one location takes into account the following:

- Sensitivity of the views and viewers (visual receptor) affected;
- Nature, scale or magnitude and duration of the change;
- Extent of the proposed development that will be visible;
- Degree of visual intrusion or obstruction that will occur;
- Distance of the view;
- Change in character or quality of the view compared to the existing;
- The activity of the receptor and the expectation of the view it entails;
- The importance of the view with respect to the number of people affected;
- The popularity of the view – whether it appeals to locals, visitors, or whether it is cited in books, guides and maps; and
- Their susceptibility to change, which is mainly a function of the occupation or activity of people experiencing the view, and the extent to which their attention or interest may be focused on the view.

Visual Receptors

A visual impact assessment considers the sensitivity to change of visual receptors within the study area, and the magnitude of change associated with the introduction of the proposed development into the existing visual context.

A range of fixed visual receptors were initially considered, with emphasis placed on identification and selection of locations with a clear relationship to the proposed scheme where potential visual implications were deemed to be greatest. The key visual receptors include statutory and non-statutory designated or protected areas, cultural heritage resources, residential properties and farmsteads, recreational/tourist resources, panoramic hilltop views, focused or directed views, and cumulative views.

A selection of representative viewpoints was chosen to represent these visual receptor types. These representative viewpoints are used as ‘samples’ on which to base judgements on visual amenity in the area.

Field investigation from the viewpoints was used to assess the actual visibility of the proposed development within the study area.

Photographic Studies

The photographic study was undertaken in May 2023. Landscape photography was captured in accordance with best practice guidelines published in Scottish Natural Heritage Visual Representation of Wind Farms Guidance (2017).

This included the use of the following:

- High-quality digital camera (Canon EOS R6 Mark II), a camera lens set to a focal length of 50 mm and a professional tripod to elevate the camera 1.5 m above the ground;
- An accurate Global Positioning System (GPS) receiver was used to accurately record (within 5 m) the location of each viewpoint; and
- Sufficient photographs at each viewpoint were captured to give a complete 360° view of the surrounding landscape.

Photomontage Methodology

To visualize the proposed windfarm, a technique known as photomontage was employed. This is where the proposed changes (i.e., the new turbines) are superimposed on top of an existing photo.

The technique behind a photomontage is to establish a camera model that can transform any point with known elevation and coordinates from a map to a 2-dimensional photo. Once the camera model is established, the camera model can position a 3-dimensional model of a turbine into the image with the correct proportions.

Photomontages were created from photographs captured at each of the viewpoints.

To create the photomontage, photographs were stitched together to create a panoramic view using Adobe Photoshop vs25.0. The photomontage was then created within WindPRO 3.6.

Visual Receptor Sensitivity

The assessment of visual receptor sensitivity considers both the category of the visual receptor and the nature of their existing view. It takes account of the location of the receptor or viewpoint, the expectations, occupation, or activity of the people present, the quality of the existing visual context, and the importance or value likely to be attributed by them to the available view. It is therefore the case that not all receptors within a given category are deemed to display equal sensitivity.

In accordance with the GLVIA, for the purposes of the visual assessment, the visual receptors have been graded according to their sensitivity to change against criteria set out in the table below.

Table 22: Visual Receptor Sensitivity

Receptor Sensitivity	Description
High	Occupiers of residential properties Users of outdoor recreational facilities, including public rights of way, whose attention or interest may be focused on the landscape. Communities where the development results in changes in the landscape setting or valued views enjoyed by the community.
Medium	People travelling through or past the affected landscape in cars, on trains or other transport routes where higher speeds are involved and views sporadic and short-lived.

	People engaged in outdoor recreation where enjoyment of the landscape is incidental rather than the main interest.
Low	People at their place of work, Industrial facilities.

The number of people likely to be present as well as the duration that a view is likely to be experienced may also influence the visual sensitivity of a particular location.

Visual Magnitude of Change

The visibility of the proposals and the magnitude of their change upon a view and the resulting significance of visual effect are dependent on the range of factors already outlined, together with, the angle of the sun, the time of year and weather conditions.

Of equal importance will be whether:

- The site is completely visible or in part;
- The site appears on the skyline;
- The site is viewed with a backcloth of land or vegetation, or with a complex foreground; and
- The site forms part of an expansive landscape or is visible within a restricted view.

The aspect of dwellings and whether the view is from a main window or a secondary window, which may be used less frequently, is also a consideration.

The direction and speed of travel from highways are also a consideration. The magnitude of change, in accordance with the GLVIA, is outlined in the table below.

Table 23: Definition of Magnitude of Visual Impact

Magnitude	Result	Description
Very Large	The development would result in a dramatic change in the existing view and/or would cause a dramatic change in the quality and/or character of the view. The development would appear large scale and/or form the dominant elements within the overall view and/or may be in full view the observer or receptor.	Commanding, controlling the view.
Large	The development would result in a prominent change in the existing view and/or would cause a prominent change in the quality and /or character of the view. The development would form prominent elements within the overall view and/or may be easily noticed by the observer or receptor.	Standing out, striking, sharp, unmistakable, easily seen.
Medium	The development would result in a noticeable change in the existing view and/or would cause a noticeable change in the quality and/or character of the view. The development would form a conspicuous element within the overall view and/or may be readily noticed by the observer or receptor.	Noticeable, distinct, catching the eye or attention, clearly visible, well defined
Small	The development would result in a perceptible change in the existing view, and/or without affecting the overall quality and/or character of the view. The development would form an apparent small element in the wider landscape that may be missed by the observer or receptor.	Visible, evident, obvious

Very Small	The development would result in a barely perceptible change in the existing view, and/or without affecting the overall quality and/or would form an inconspicuous minor element in the wider landscape that may be missed by the observer or receptor.	Lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred, indefinite
Negligible	Only a small part of the development would be discernible and/or it is at such a distance that no change to the existing view can be appreciated.	Weak, not legible, near limit of acuity of human eye.

Significance of Visual Effect

The significance of the visual effects, in accordance with the GLVIA, is determined by the assessment of receptor sensitivity set against the magnitude of change, as indicated by the matrix in the table below.

For the purposes of this assessment, 'Significant' landscape effects would be those effects assessed to be severe, major or major/moderate and are indicated by blue shading in the table below.

Table 24: Significance of Visual Effects

Magnitude	Sensitivity		
	High	Medium	Low
Very Large	Severe	Major	Major/moderate
Large	Major	Major/moderate	Moderate
Medium	Major/moderate	Moderate	Moderate/Minor
Small	Moderate	Moderate/Minor	Minor
Very Small	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible

Note: the above table is from the GLVIA and is not to be confused with the ESIA impact assessment methodology discussed earlier under "Section 3.4". As discussed earlier, the visual assessment followed the GLVIA methodology for significance assessment as an international best practice requirement.

Representative Viewpoint Assessment

Viewpoint selection has been chosen based on the assessment undertaken within the baseline section earlier. The choice of representative viewpoints has been limited due to the location of the scheme and surrounding land uses. The baseline description of each view is contained within the visual impact assessment. The following viewpoints in the table below were selected as being representative of the potential visual issues associated with the proposed wind farm.

A visual representation of viewpoint locations can be found in the figure that follows.

Viewpoint ID	Location	Distance from windfarm (km)	Direction of View	Easting (UTM)	Northing (UTM)	Rationale for selection
VP1	Landscape	37km	SSW	487124	4808139	Representative location for view in the natural landscape. Users of recreation in the landscape within ZTV.
VP2	Offroad track	19km	W	508990	4761214	Road Users within the ZTV.

						Users of recreation in the landscape within ZTV.
VP3	Offroad Track	37km	W	529697	4757332	Road Users within the ZTV. Users of recreation in the landscape within ZTV.
VP4	Known Archaeological Site	3.9km	S	440131	4791045	Users of recreation in the landscape within ZTV.
VP5	Offroad Track	19km	W	508459	4738953	Road Users within the ZTV. Users of recreation in the landscape within ZTV.
VP6	Offroad Track	37km	WNW	528049	4737532	Road Users within the ZTV. Users of recreation in the landscape within ZTV.
VP7	South Ustyurt National Park	27km	NE	456601	4745538	Users of recreation in the landscape within ZTV.
VP8	Sarykamysh lake and surrounding Ustyurt Plateau	60km	NW	521910	4693132	Users of recreation in the landscape within ZTV.

8.2.2 Visual Impacts during Construction

Construction works expected to have a visual impact might include the following:

- Site establishment works including temporary spoil mounds;
- Construction activities, including the location of site compound areas, laydown areas and the use of cranes and task lighting; and
- Permanent features introduced as part of the operational stage wind farm proposals, including the principal visual features of the phased development which are proposed to be:
  - Raised ground levels to form building platforms;
  - Amended road infrastructure and associated vehicle parking together with external lighting; and
  - Amended road infrastructure and associated car parking together with external lighting.

The potential for visual impact will fluctuate throughout the period of construction. The intermittent but temporary introduction of prominent tall features such as cranes used during the construction phases would have some medium term (given construction duration of 42 months), temporary visual effects on the visual amenity of both nearby and to a lesser degree longer distance sensitive receptors.

In particular, for Viewpoint 4 the taller cranes will have obvious, distinct and clearly visible (temporary) features within the landscape that will be readily noticed by receptors. To a much lesser degree the cranes may also be visible from Viewpoints 4 and 5.

Additional temporary visual effects will be caused as a result of construction vehicle movements to and from the construction site and for general construction operations.

During the construction phases, some temporary lighting will be required. It is not anticipated that there will be any activities requiring work on a 24- hour basis, however, the use of lighting to ensure safe working will probably be required.

For the wind turbines, lighting at higher elevations will be required, consequently the greatest potential for visual impact from construction lighting for receptors will result primarily, (but not solely), from the construction of the wind turbines.

With the introduction of all these construction activities, given that the scheme would occur over a relatively short period, it would result in a perceptible change in the existing view.

The sensitivity of visual receptors in closest proximity to the proposed construction activities can be classified as medium (people engaged in outdoor recreation).

Due to the proximity of Viewpoint 4 to the construction activities the magnitude of change would be large, however as discussed in further details in "Section 12" this site has no touristic value or importance and is not considered unique nor a key site of archaeological or cultural heritage importance as such sites are found heavily within the area. Therefore, the impact can be assessed as minor.

For the other viewpoints the construction would form an apparent small element in the wider landscape that may be missed by the observer or receptor. At most this would result in a medium magnitude of change.

Consequently, with minor receptor sensitivity set against a medium magnitude of visual change, the temporary visual effect during construction period would, as a worst case, result in a significance of effect that can be assessed as minor.

Construction Phase		
Type	Negative	N/A
Duration	Medium-term	Limited to construction phase which is 42 months
Magnitude	Medium	Given that visual impacts will be noticeable
Reversibility	Reversible	With completion of construction activities
Sensitivity	Low	Given that there are no sensitive receptors
Likelihood	Medium	Given nature of activities expected
Frequency	Frequent	Expected throughout entire construction activities
Timing	Not relevant	Applicable throughout entire construction activities
Extent	Medium	Under worst-case scenario and for tall construction elements this is expected to be within 5km radius
Significance	**Minor**	

Mitigation Measures

The following identifies the mitigation measures to be applied by the EPC Contractor during the construction phase and which include:

- Ensure proper general housekeeping and personnel management measures are implemented which could include:
  - Ensure the construction site is left in an orderly state at the end of each workday.
  - To the greatest extent possible construction machinery, equipment, and vehicles that are not in use should be removed in a timely manner and kept in locations to reduce visual impacts to the area.

- Ensure proper storage, collection, and disposal of waste streams generated as discussed in detail in "Section 10.2.2".

- Implement restoration and rehabilitation measures to restore the site's visual quality through, for example, re-contouring the land and removing temporary structures (e.g. batching plant).

Following the implementation of these mitigation measures, the significance of the residual impact is categorized as not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by EPC Contractor during the construction phase:

- Inspections of the works should be carried out at all times to ensure the above measures are implemented.

8.2.3 Visual Impact during Operation

The potential visual impact of the Project during the operational phase is assessed from the photomontages that have been created from the photographic viewpoints.

The viewpoints have been selected to be representative of the types of views by a range of sensitive receptors that were identified within the table and figure earlier (VP 1 – VP 8).

Viewpoint 1

VP1	Panoramic View (Distance 37km looking SSW)
Baseline Description	This is a representative view for a location within the natural landscape and it is representative of recreational users (if any). The topography is flat in this location, gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will barely be visible for users of recreation within the landscape. It would be barely visible on the horizon.
Type of Effect	The development would form an apparent small element in the wider landscape that may be missed by the observer or receptor.
Magnitude of Change	The development would result in a perceptible change in the existing view, and/or without affecting the overall quality and/or character of the view.
Assessment	Sensitivity – Low
	Magnitude - Small
Significance of Effect	Minor

Viewpoint 2

VP2	**Panoramic View (Distance 19km looking W)**
Baseline Description	The view is from an offroad track due east of the windfarm site. The topography is flat in this location, gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of road users using the offroad track and users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will be noticeable for recreational and road users within the landscape
Type of Effect	The development would form a conspicuous element within the overall view and/or may be readily noticed by the observer or receptor.
Magnitude of Change	The development would result in a noticeable change in the existing view and/or would cause a noticeable change in the quality and/or character of the view.
Assessment	Sensitivity – Low
	Magnitude - Medium
Significance of Effect	Minor

Viewpoint 3

VP3	**Panoramic View (Distance 37km looking W)**
Baseline Description	The view is from an offroad track due east of the windfarm site. The topography is flat in this location gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of road users using the offroad track and users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will barely be visible for road or recreational users within the landscape. It would be just visible on the horizon.
Type of Effect	The development would form an apparent small element in the wider landscape that may be missed by the observer or receptor
Magnitude of Change	The development would result in a perceptible change in the existing view, and/or without affecting the overall quality and/or character of the view.
Assessment	Sensitivity – Low
	Magnitude - Small
Significance of Effect	Minor

Viewpoint 4

VP4	Panoramic View (Distance 3.9km looking S)
Baseline Description	The view is from a known archaeological site near the northwestern section of the proposed windfarm. This issue is discussed in further details in "Section 12". As noted within that section, this site has no touristic value or importance and is not considered unique nor a key site of archaeological or cultural heritage importance as such sites are found heavily within the area. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of visitors to the archaeological site (which is not expected) and users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will take a commanding, controlling view of the landscape.
Type of Effect	The development would appear large scale and/or form the dominant elements within the overall view and/or may be in full view the observer or receptor.
Magnitude of Change	The development would result in a dramatic change in the existing view and/or would cause a dramatic change in the quality and/or character of the view.
Assessment	Sensitivity – Low
	Magnitude – Very Large
Significance of Effect	Moderate

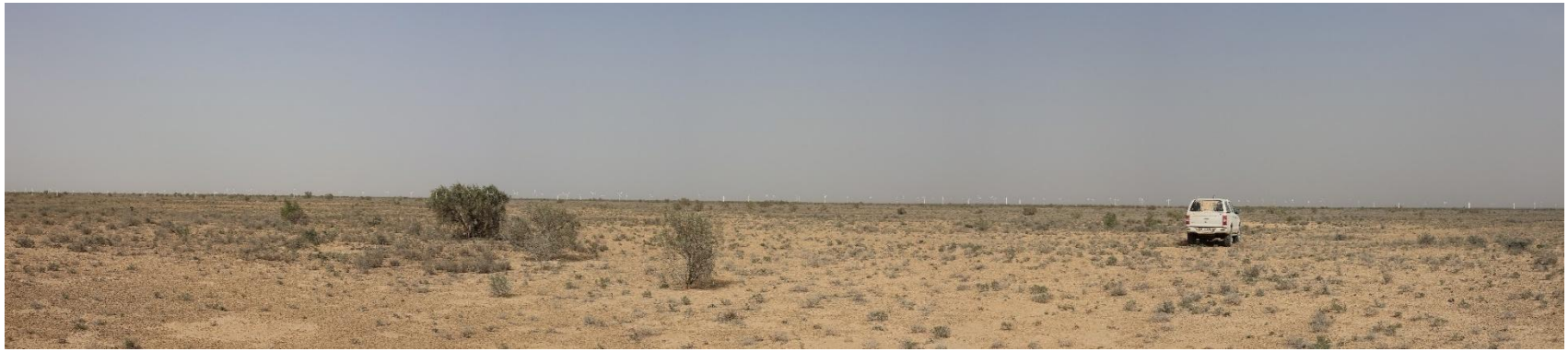
Viewpoint 5

VP5	Panoramic View (Distance 19km looking W)
Baseline Description	The view is from an offroad track due east of the windfarm site. The topography is flat in this location, gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of road users using the offroad track and users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will be noticeable for recreational and road users within the landscape
Type of Effect	The development would form a conspicuous element within the overall view and/or may be readily noticed by the observer or receptor.
Magnitude of Change	The development would result in a noticeable change in the existing view and/or would cause a noticeable change in the quality and/or character of the view.
Assessment	Sensitivity – Low
	Magnitude - Medium
Significance of Effect	Minor

Viewpoint 6

VP6	Panoramic View (Distance 37km looking WNW)
Baseline Description	The view is from an offroad track due east of the windfarm site. The topography is flat in this location gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of road users using the offroad track and users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will barely be visible for road or recreational users within the landscape. It would be just visible on the horizon.
Type of Effect	The development would form an apparent small element in the wider landscape that may be missed by the observer or receptor
Magnitude of Change	The development would result in a perceptible change in the existing view, and/or without affecting the overall quality and/or character of the view.
Assessment	Sensitivity – Low
	Magnitude - Small
Significance of Effect	Minor

Viewpoint 7



VP7	Panoramic View (Distance 27km looking NE)
Baseline Description	The view is from South Ustyurt National Park to the south of the windfarm site. The topography is flat in this location gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm will barely be visible for recreational users within the landscape. It would be just visible on the horizon.
Type of Effect	The development would form an apparent small element in the wider landscape that may be missed by the observer or receptor
Magnitude of Change	The development would result in a perceptible change in the existing view, and/or without affecting the overall quality and/or character of the view.
Assessment	Sensitivity – Medium
	Magnitude - Small
Significance of Effect	Moderate/Minor

Viewpoint 8

VP8	Panoramic View (Distance 67km looking WNW)
Baseline Description	The view is from Sarykamysh lake and surrounding Ustyurt Plateau. The topography is flat in this location gently gaining in elevation towards the proposed windfarm. The landscape predominantly consists of substrate covered by low lying vegetation. The view is representative of the potential views of users of recreation in the landscape. Due to the remote location of the site the number of users is expected to be minimal.
Predicted Change	The windfarm is imperceptible to recreational users within the landscape.
Type of Effect	Weak, not legible, near limit of acuity of human eye.
Magnitude of Change	Only a small part of the development would be discernible and/or it is at such a distance that no change to the existing view can be appreciated.
Assessment	Sensitivity – Medium
	Magnitude - Negligible
Significance of Effect	Negligible

Summary of Visual Impacts and Significance for Operations Phase

The table below provides a summary of the viewpoint analysis for the Operations Phase.

Table 25: Viewpoint Analysis

Viewpoint ID	Location	Receptor Type	Receptor Sensitivity	Magnitude of Change	Significance of Visual Effect
VP1	Landscape	Representative location for view in the natural landscape Users of recreation	Low	Small	Minor
VP2	Proposed Road	Road Users	Low	Medium	Minor
VP3	Proposed Road	Road Users	Low	Small	Minor
VP4	Archaeological Site	Users of recreation	Low	Very Large	Moderate
VP5	Proposed Road	Road Users	Low	Medium	Minor
VP6	Proposed Road	Road Users	Low	Small	Minor
VP7	South Ustyurt National Park	Users of recreation	Medium	Small	Moderate/Minor
VP8	Sarykamysh lake and surrounding Ustyurt Plateau	Users of recreation	Medium	Negligible	Negligible

In accordance with the table above, the table below provides an overall impact assessment for the windfarm on landscape and visual receptors during the operation phase.

Operation Phase		
Type	Negative	N/A
Duration	Long-term	Throughout the operation phase
Magnitude	Medium	Given that visual impacts will be noticeable in general
Reversibility	Reversible	With decommissioning of WTGs
Sensitivity	Low	Given that there are no key sensitive receptors
Likelihood	Medium	Given nature of activities expected
Frequency	Frequent	Expected throughout entire operational phase
Timing	Not relevant	Applicable throughout entire operational phase
Extent	High	Turbines can be visible for distances greater than 10km
Significance	**Minor**	

Mitigation Measures

The following identifies the mitigation measures to be applied by the Project Operator during the operation phase of the Project:

- Consider to the extent possible painting turbines with non-reflective, matt finishes that blend better with the natural surroundings.
- In the case grievances are received from South Ustyurt National Park operators in relation to turbine visibility (i.e. at a later stage once recreational areas are established within the Park) (as they are considered the only relevant receptor from which such impacts could be relevant however this is highly unlikely given that WTGs are barely visible as demonstrated throughout the assessment)

consider planting native vegetation or trees around the wind farm to screen the view of the turbines from certain vantage points. Create buffer zones of natural or landscaped features to help blend the wind farm into the landscape; **OR**

In line with the above, consider coordinating with South Ustyurt National Park operators (i.e. at a later stage once recreational areas are established within the park) to create designated public viewing areas or platforms where people can appreciate the wind farm from a distance and learn about renewable energy.

- Use minimal or no lighting on the turbines unless required for aviation safety. Lighting can increase visibility and, therefore, the visual impact. Limit signage to what is necessary for safety and regulatory compliance.

Following the implementation of the mitigation measures highlighted throughout this section, the residual significance can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the Project Operator during the operational phase unless stated otherwise:

- Documentation of submitted grievances related to visibility (if applicable) as part of the SEP and measures undertaken to resolve such grievances.
- Visual inspections to ensure mitigation measures are implemented as applicable.

9. LAND USE

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to land use. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

9.1 Assessment of Baseline Conditions

9.1.1 Methodology for Assessment

The baseline assessment of the Project site was based on stakeholder consultation and engagement, secondary data review and a field survey, each of which is discussed in further details below.

A. Stakeholder Consultation and Engagement

Stakeholder consultation and engagement activities were undertaken with key entities in relation to land use. This included the entities below. Refer to "Section 6.3.1" earlier for additional details.

- Department of Chamber of State Cadasters for the Republic of Uzbekistan;
- Kungrad District Khokimiyat;
- Kungrad State Forestry; and
- Committee for Development of Sericulture and Wool Industry.

In addition, as part of the FGD undertaken with the local communities, specific discussions were undertaken in relation to land uses within the Project area. Refer to "Section 6.3.2".

B. Secondary Data Review

Prior to the undertaking of any site-related surveys, a full and detailed review of up-to-date high-quality satellite images for the Project area was undertaken. Such satellite images were provided the Developer and were part of the topography study undertaken.

The objective was to identify any potential sites of interest within the entire Project footprint and boundary so that it can be inspected during the site survey.

C. Site Survey

A detailed site survey for the Project area was undertaken from 1 August 2023 until 20 August 2023. The methodology included the following:

- The detailed survey for the entire Project components and footprint which included the following:

- Substation and BESS areas as well as building infrastructure (e.g. offices, workshop areas, etc.) along with 2km buffer;
- All WTG location along with a 700m buffer;
- Access road along with a 200m buffer on each side;
- Internal road network and cables along with 500m buffer on each side; and
- Internal OHTL network along with 500m buffer on each side.

- Remaining areas (i.e. areas outside of Project components but within the project footprint) were surveyed through a transect methodology (with transects every 1km) to try to cover as much ground as possible within the Project area. This aimed to cover other project footprint areas where exact locations were not known at the time of the survey and which mainly includes the temporary facilities (e.g. site offices, laydown areas, batching plant and worker camp).

The objective of the field survey was to ascertain the presence of any land use activities to include physical structures (e.g. houses, settlements, tents, etc.) or economic activities (e.g. agriculture, grazing, etc.).

9.1.2 Land Ownership

The consultation with the Department of Chamber of State Cadasters for the Republic of Uzbekistan took place on the 18th of May of 2023, and the official land designation for the Project was provided. Based on the following consultation the land is considered under governmental ownership. The total area of the Project is 95,051.15 hectares, of that the total area is under governmental ownership, and allocated to the following entities (as noted in the figure below):

- 47,063.01 hectares registered under State Reserve Land of Kungrad District Khokimiyat by the decision of the Council of Ministers of the Republic of Karakalpakstan 551-13-0-Q/22 dated 09.12.2022. This area is classified as “other lands not used in agriculture”;
- 44,205.07 are registered under State Reserve Land of Khokimiyat of Kungrad District based on the decision of the Council of Ministers of the Republic No. 204-13-0-Q/21 of 16.12.2021. This area is classified as “agriculture reserve land” and sub-classified under this category as “type of other unused land.”; and
- 3,782.94 hectares that are registered under the Kungrad State Forestry based on decision No. 65-b dated 29.07.2016. This area is classified as “not used for agriculture and belongs to the type of other lands”.

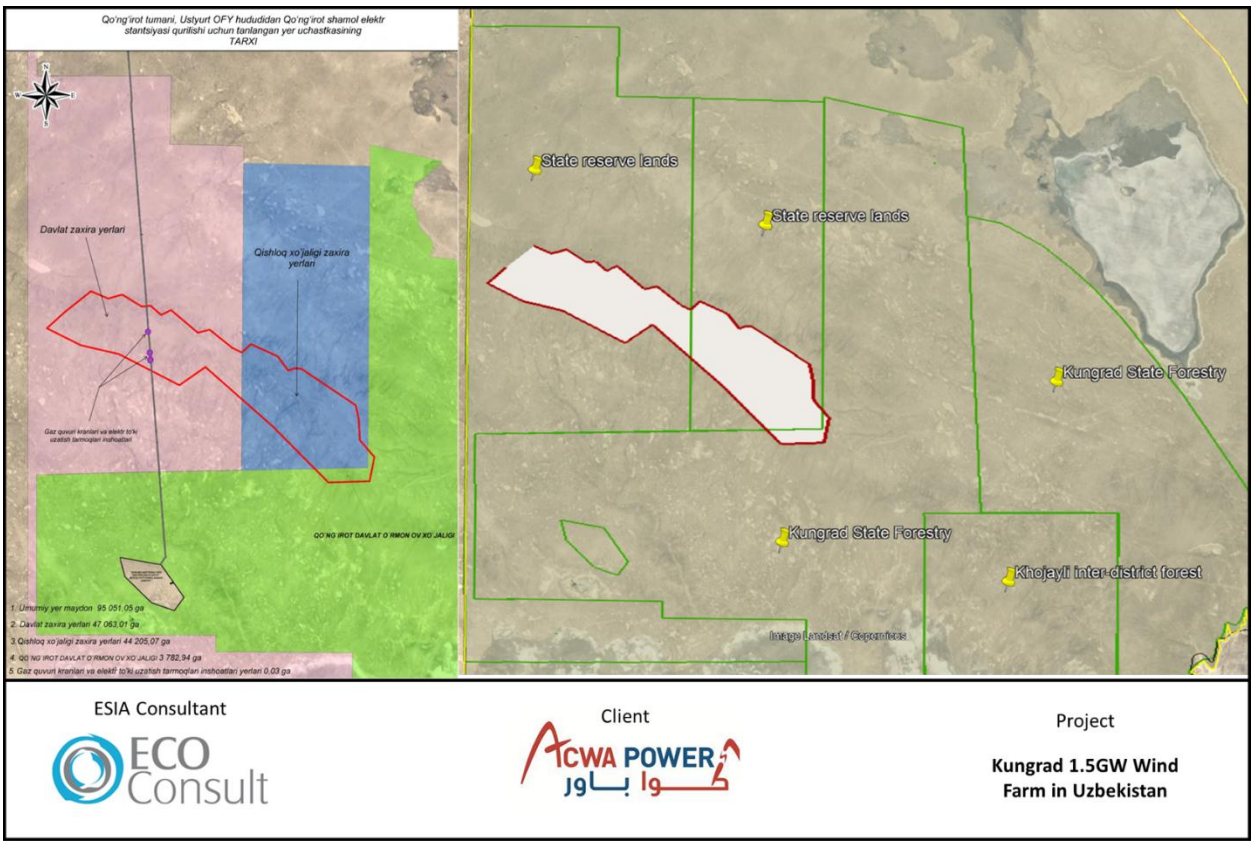


Figure 37: Land Ownership for the Area

Additional consultations were undertaken with both the Kungrad District Khokimiyat and Kungrad State Forestry, which indicated that there are no current or planned activities within their designated areas in specific. Furthermore, indicating that they have no objection and no further issues of concern.

Process for the land allocation will entail the transfer of these lands to the district reserve fund, which will then update their classification (e.g., industrial or infrastructure project) after which they will be transferred to the ownership of the Ministry of Energy of the Republic of Karakalpakstan. The following transfer will take place via an internal governmental process that will entail a Presidential Decree. Therefore, a Land Lease Agreement (LLA) will then be signed between the Developer and the Ministry of Energy. This process will require around 3-4 months to complete from appointment of EPC Contractor (which is expected in Q2 2024).

Note: the above covers and is applicable for the entire Project footprint where all project components will be located.

9.1.3 Formal and Informal Land Use

Based on the land use survey undertaken, no physical or economical land use activities were recorded onsite nor any evidence which could indicate any such activities of informal activities. In particular, the following was noted:

- No physical structures were noted onsite (such as human settlements or structures);
- No key evidence of any economic activities to include in particular agriculture activities or recent

grazing activities which are common practices undertaken by local communities. In particular, no ploughing marks were noted within the Project area (which would be indicative of agricultural activities) nor any animal feces (which would be indicative of grazing activities); and

- No nomadic activity was noted within the Project site or evidence of such activities.

In addition, based on consultations undertaken, the following is noted:

- Consultation activities undertaken with the local communities indicated that there are no land uses undertaken by any groups within the site (to include but not limited to hunting, grazing, agriculture, etc.);
- Consultation activities undertaken with the Committee for Development of Sericulture and Wool Industry indicated that there are no grazing activities undertaken onsite; and
- The bird observer team have been asked for input on any key land uses potentially observed during the VP and transect surveys which have been undertaken from January 2023 to November 2023 (refer to “Section 11”). No key land uses were reported or noted in particular.

Finally, the history of the Project area has been traced through satellite maps (Google Earth) from 1985 to 2023. As indicated in the figure below, the maps do not show any visible and previous physical or economical activities within the project site.

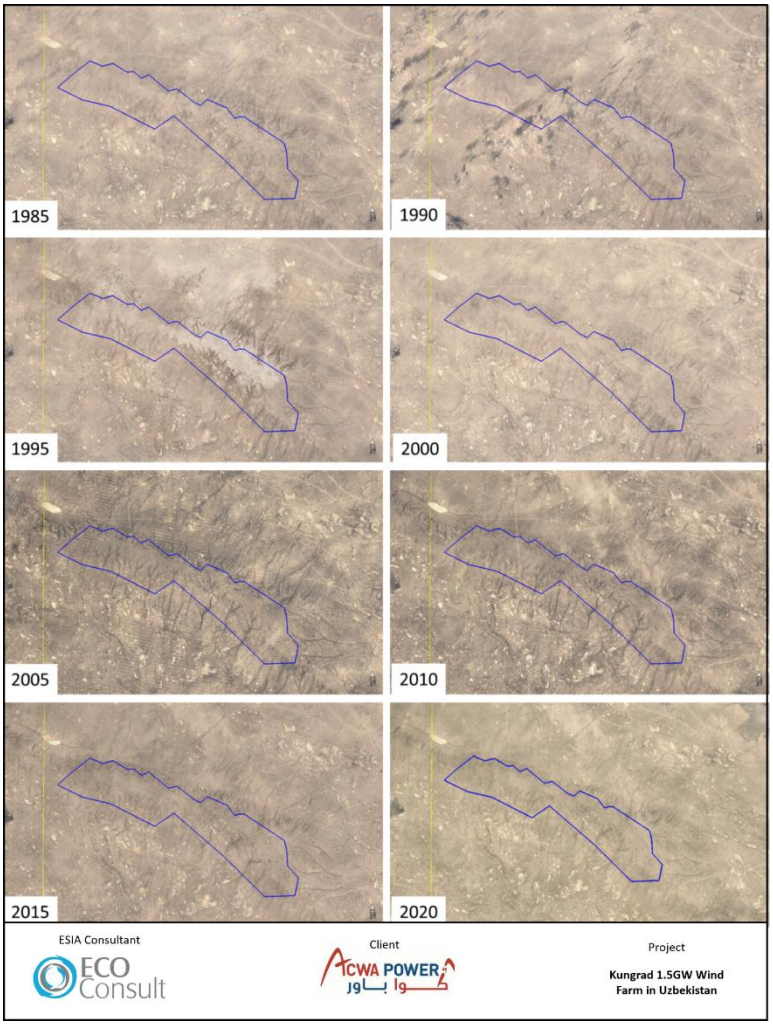


Figure 38: Historical Land Use of the Project Site

9.1.4 Other

Based on the land use survey undertaken, there are additional land uses noted onsite which include the following:

- Other unidentified objects were noted throughout the Project site (as note within the figure below) which include concrete foundations, metals scraps, and wells. All such structures were abandoned and deteriorated. It is believed that these were previously used as part of geological explorations throughout the soviet era or previous geological explorations by the Government of Uzbekistan;

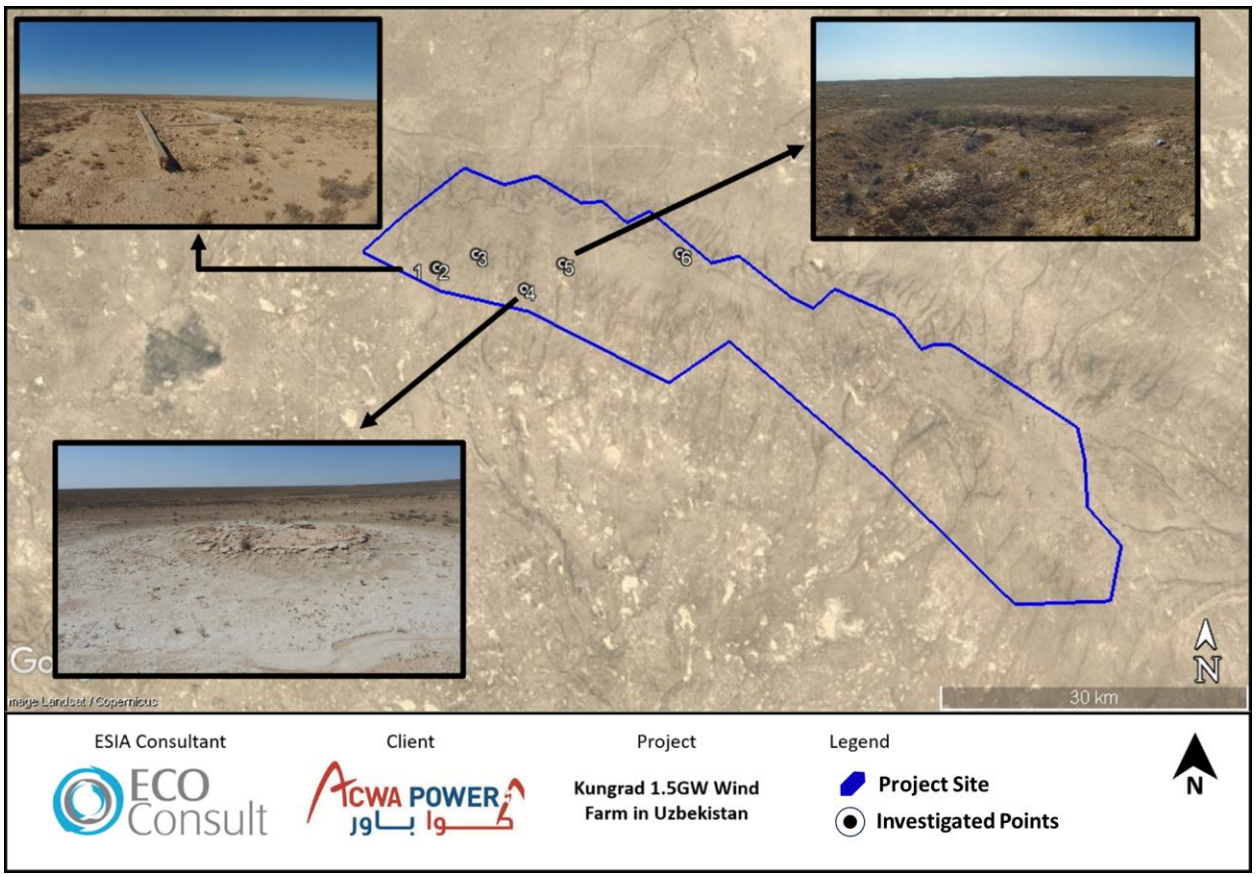


Figure 39: Some of Unidentified Objects Onsite

- Based on the site visit infrastructure and utility elements were recorded which included the following: (i) pumping station, (ii) gas pipelines, and (iii) electricity towers and lines. **Those are not considered relevant for land use and are discussed under the infrastructure and utilities Section. Refer to "Section 14" for additional details;**
- Based on site visit undertaken during the scoping phase (March 2023) it was noted that there were geological exploration activities. "Section 14" for additional details; and
- Based on consultations undertaken (refer to "Section 6.3.1"), it was indicated that there are release programs for the MacQueen's Bustards (Houbara Bustard) into the wild nature in Karakalpakstan. MacQueen's Bustards (Houbara Bustard) release programs undertaken mainly by International Fund for Houbara Conservation in Abu Dhabi (OAE) and brought to the framework of the partnership between Ministry of Ecology, Environmental Protection and Climate Change. In addition, Falcon Hunting Solutions (private sector company) is involved in organizing hunting expeditions in Karakalpakstan for the houbara in Uzbekistan by Arab state royalty who use a private civil airport within the area.

  Based on consultations it was indicated that no activities (release programs or hunting expeditions) are undertaken within the Project specific area. However, no further details were provided on specific inquiries stating that it is confidential information. This issue is also discussed further within "Section 11" related to biodiversity.

9.2 Assessment of Impacts

This section identifies the anticipated impacts on land use from the Project throughout its various phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

As discussed earlier, the Project is under governmental ownership and the land ownership will eventually be transferred to the Ministry of Energy. Therefore, there is no land expropriation or acquisition process to be undertaken for the Project and also no impacts anticipated in terms of land ownership.

In addition, there are no physical or economical activities undertaken at the Project site. Therefore, there are no anticipated impacts on private land use in relation to physical and/or economical displacement from the Project footprint to include WTGs, substations and BESS, access road, internal road network, temporary facilities (e.g. offices, laydown areas, etc.).

Based on the above, this impact is scoped out and there are no further requirements to be considered for the ESIA study.

A Livelihood Restoration Plan (LRP) has however been developed for the project's OHTL which was developed in consultation with PAPs included within this ESIA. The LRP includes provisions for compensation and livelihood restoration of all known leaseholders affected by the OHTL and informal land users (ever no informal users were identified). The WTGs, substations and BESS, access road, internal road network and temporary facilities mentioned above are not included in the scope of the LRP due to the fact that no formal or informal land use was identified in these areas.

As noted earlier, there are potential impacts on infrastructure and utility elements which were recorded onsite – however those are related to infrastructure and utilities and are discussed under **"Section 14".**

10. GEOLOGY, HYDROLOGY, AND HYDROGEOLOGY

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to geology, hydrology and hydrogeology. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

10.1 Assessment of Baseline Conditions

Baseline assessment was based on secondary data as available from desktop review as well as a standalone assessment undertaken by the Developer (through technical consultant) to include a geotechnical and hydrology assessment.

The above entailed collecting information on the following:

- Geological conditions within the Project site to include formations, soil types, and geomorphology along with illustrative maps;
- Hydrology conditions of the Project site to include catchment within which the Project is located along with maps as appropriate. This includes drainage patterns, runoff volumes and surface water resources; and
- Hydrogeology conditions of the Project site along with maps as appropriate. This includes groundwater resources, groundwater quality, etc.

10.1.1 Geology

The geological evolution of the Kungrad District in the Republic of Karakalpakstan has been significantly impacted by the Cenozoic era, which encompasses the Neogene and Quaternary periods and spans a duration of approximately 66 million years to the present. During this extensive timeframe, marked by significant geological transformations, dynamic tectonic activity has been a key driver.

The convergence and collision of the Eurasian and Indian plates have resulted in the notable uplift of prominent features, including the Ustyurt Plateau. Concurrently, sedimentary deposition, erosion, and weathering processes have actively shaped the landscape, giving rise to sedimentary basins, erosional features, and expansive alluvial plains. Fluvial processes, influenced by the region's rivers and lakes, have meticulously carved river valleys and deposited a range of sediments.

At the same time, the terrain has been actively sculpted by sedimentary deposition, erosion, and weathering processes, resulting in the formation of sedimentary basins, erosional features, and vast alluvial plains. River valleys have been carefully sculpted by fluvial processes, which have been influenced by the Region’s lakes and rivers and have deposited a variety of sediments. Furthermore, Kungrad District has been subject to tectonic faults, as demonstrated by the existence of fault lines such as the Ustyurt and South Karakum faults, which are periodically associated with seismic activity.

As shown in the figure below, it is evident that the surface geology of the Project site is influenced by the Cenozoic era. More specifically, the Project site is mostly made up of deposits belonging to the Neogene period with a small portion in the northern part of the Project land is made up of deposits from the

Quaternary deposits. However, it is evident that the majority of the Project land has Neogene deposits that are mainly composed of the alternation of limestone and marl underlying sandstone unit.

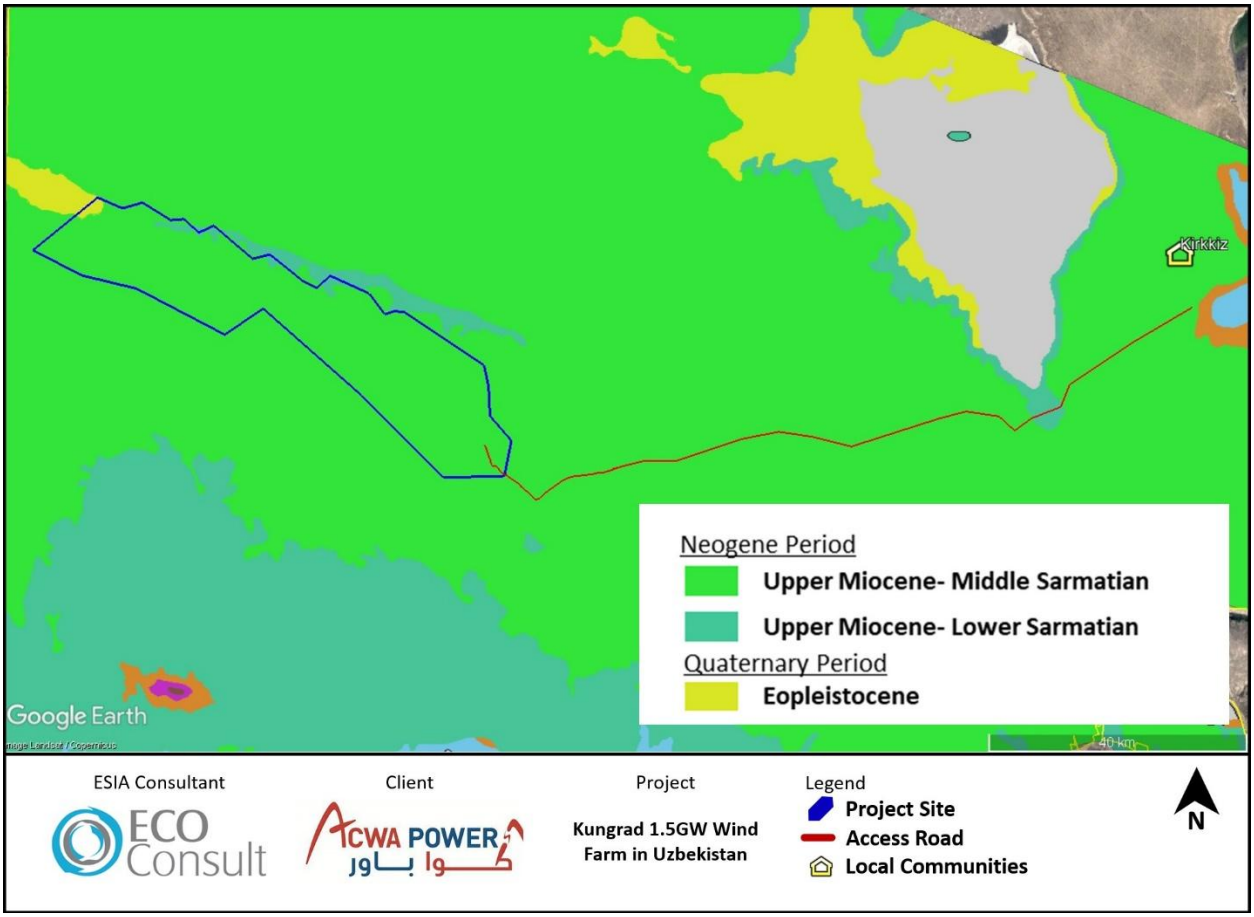


Figure 40: Geological Map and Ground Investigation Locations of the Project Site

The Project site exhibits diverse geological compositions. Predominantly, the Project site is characterized by the Upper Miocene to Middle Sarmatian geological formation, which plays a central role in its geological profile. This formation comprises sedimentary rocks and deposits that date back to the Upper Miocene and Middle Sarmatian epochs, spanning approximately 11.6 to 5.3 million years ago. These sedimentary rocks encompass sandstone, siltstone, claystone, and marl, often containing fossils and mineral deposits.

In the northern section of the Project site, an area of approximately 11.5km^2 encompasses Eopleistocene deposits. These deposits, originating from the early Pleistocene epoch, which spans from approximately 2.6 million to 11,700 years ago, consists of diverse sediment types, including gravel, sand, silt, and clay. Over time, these deposits have undergone weathering and erosion processes, warranting particular attention in the assessment of potential impacts.

Furthermore, within the Project site, there is an area of about 27km^2 that comprises Upper Miocene to Lower Sarmatian geological units. These units represent a temporal range from the Upper Miocene to the Lower Sarmatian, approximately 11.6 to 5.3 million years ago. Similar to the Upper Miocene-Middle Sarmatian deposits, these formations typically consist of sedimentary rocks, such as sandstone, siltstone, claystone, and marl, and may contain fossils and mineral deposits.

Age	Maximum Thickness	Description
Quaternary	5-60m	Deposited mainly by river systems in mountainous regions. Reddish sand dunes in desert region
Neogene - Miocene to early Pliocene	500-700m	Red shale, clays, marls, sandstone and conglomerate, with rare gypsum.
Middle – Late Palaeogene	600m	Sandstone, clay and limestone. Oil and gas deposits are concentrated in the lower part of this formation.
Early – Middle Paleogene	300-500m	Gypsum and carbonate
Cretaceous	200-1200	Shale, siltstone, grey sandstone and limestones. Many petroleum deposits.
Upper Jurassic	60-300m	Conglomerate and cross bedded sandstones
Middle Jurassic (Dogger)	150-300m	Coal bearing Finer than lower Jurassic
Lower Jurassic (Lias)	90-400m	Conglomerate, sandstone, shale and coal
Upper Triassic	20-80m thick	Sandstones, conglomerates and dark reddish shales Unconformity at base.
Lower Triassic	20-80m	Grey, yellow and reddish sandstone, shales and conglomerates.

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Figure 41: Regional Sedimentary Geology of Uzbekistan

Soil Type and Characteristics

As shown in the figure below, the Project site soil composition is mostly Haplic Arenosols, which is commonly known as "Ustyurt soils" due to their prevalence in the Ustyurt Plateau region. These soils are widely distributed and notably found in arid and semi-arid regions. The expansive Ustyurt Plateau, spanning parts of Kazakhstan, Turkmenistan, and Uzbekistan, is a prime example of their occurrence.

Haplic Arenosols are characterized by their sandy or loamy sand textures, lacking discernible soil horizons. They primarily consist of sand-sized particles, imparting a gritty texture. The color of these soils can vary from pale yellow to reddish-brown, influenced by mineral content and the presence of organic matter.

A defining feature of Haplic Arenosols is their formation in arid to semi-arid climates. Here, limited precipitation and high evaporation rates lead to the accumulation of sandy materials. Prevailing strong winds in these regions further shape the soil's texture and composition.

Although Haplic Arenosols are generally unsuitable for agriculture due to their poor water-holding capacity, drainage, and nutrient retention, certain plant species adapted to arid conditions may thrive in these soils. Traditional land uses such as pastoralism and grazing are practiced in such areas.

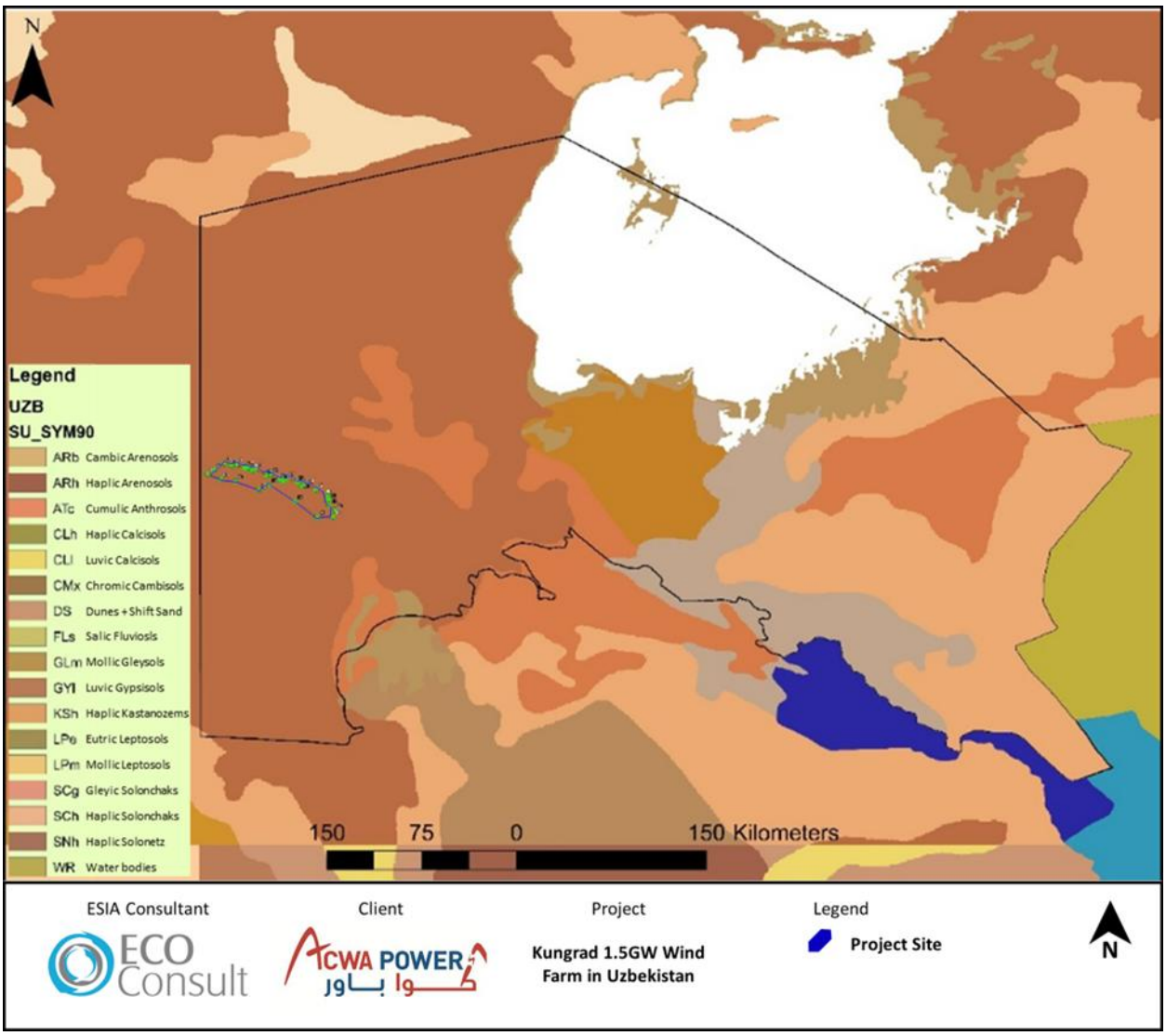


Figure 42: Soil Types and Formations in Karakalpakstan Region

According to Food and Agriculture Organization - Digital Soil Map of the World (FAO-DSMW), the soil composition in the Kungrad Region, including the Project site, comprises three fundamental components: sand, fines (potentially including silt and smaller particles), and clay. The analysis specifically targets the topsoil layer, spanning 0-30cm, a critical zone for plant roots and soil processes. As shown in the figure below, the Project site is located within the Percentage values (58.9%, 16.2%, and 21.6%) which signify the volumetric or weight-based distribution of sand, fines, and clay within this layer. Sand dominates at 58.9%, offering efficient drainage but limited water and nutrient retention. Fines at 16.2% enhance retention, while clay at 21.6% excels in water and nutrient retention but may impede drainage and compact easily. This data rigorously outlines the mechanical composition of the surface soil layer.

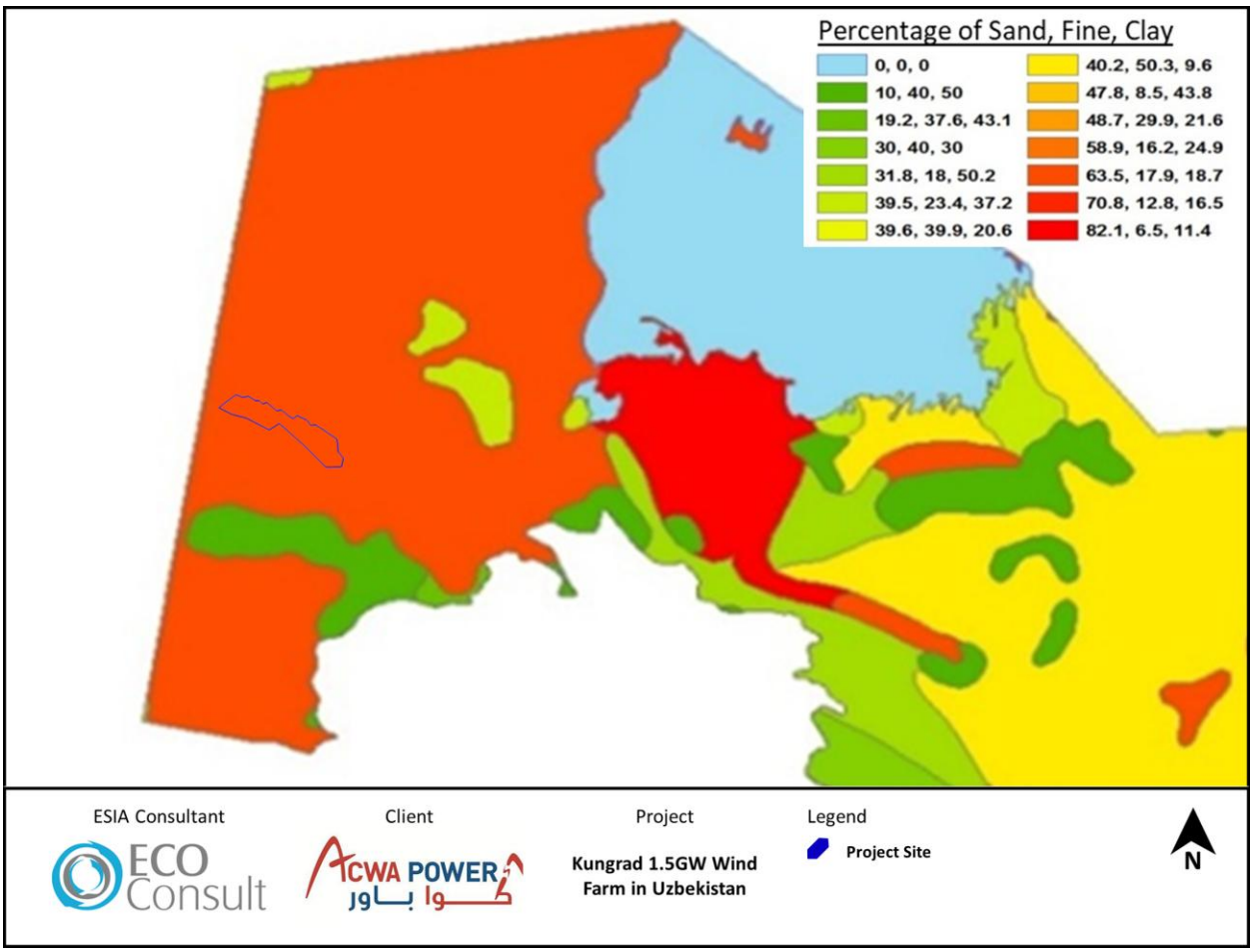


Figure 43: Mechanical Composition of Soils (FAO-DSMW)

Seismic Activity

The Project site, located in an area prone to seismic activity, is influenced by seismic zones like Sultanuizdag, Bukuntausk, Predkyzylkum, and Besapano – North – Nurtinsk. The Project site itself falls within the Sultanuizdag seismic zone, with a potential earthquake magnitude exceeding M>5.5. Notably, earthquakes with magnitudes greater than M>6 have occurred about 250 km southeast of the Project site in Kunya-Urgench. Other nearby zones, including Bukuntausk, Predkyzylkum, and Besapano – North – Nurtinsk, also pose seismic risks exceeding M>5.5. Thus, seismic activity with a magnitude exceeding M>6.0 should be considered. Historical data records over 500 strong earthquakes with M>5 in Uzbekistan, with 81 such earthquakes occurring between 1955 and 2000.

According to the figure below, the Project site falls within Zone 6, with a Peak Ground Acceleration (PGA) value of 100 cm/s^2 based on a return period of 475 years, indicating a high seismic risk. Notably, active fault lines run parallel to the Project site's northern and southern boundaries. These faults are classified into four confidence levels (A, B, C, D), which are indicative of the extent of their known activity and study. Furthermore, the rate of movements on these active faults is ranked into three grades: <1 mm/year, 1–5 mm/year, and >5 mm/year, denoted as grades 1, 2, and 3, respectively. In the vicinity of the project area, fault levels B, C, and D are identified, all assigned a rate of "3," suggesting some indications of fault activity, albeit with varying degrees of clarity and certainty. However, it's important to note that Level D faults lack clear evidence of Late Quaternary displacements.

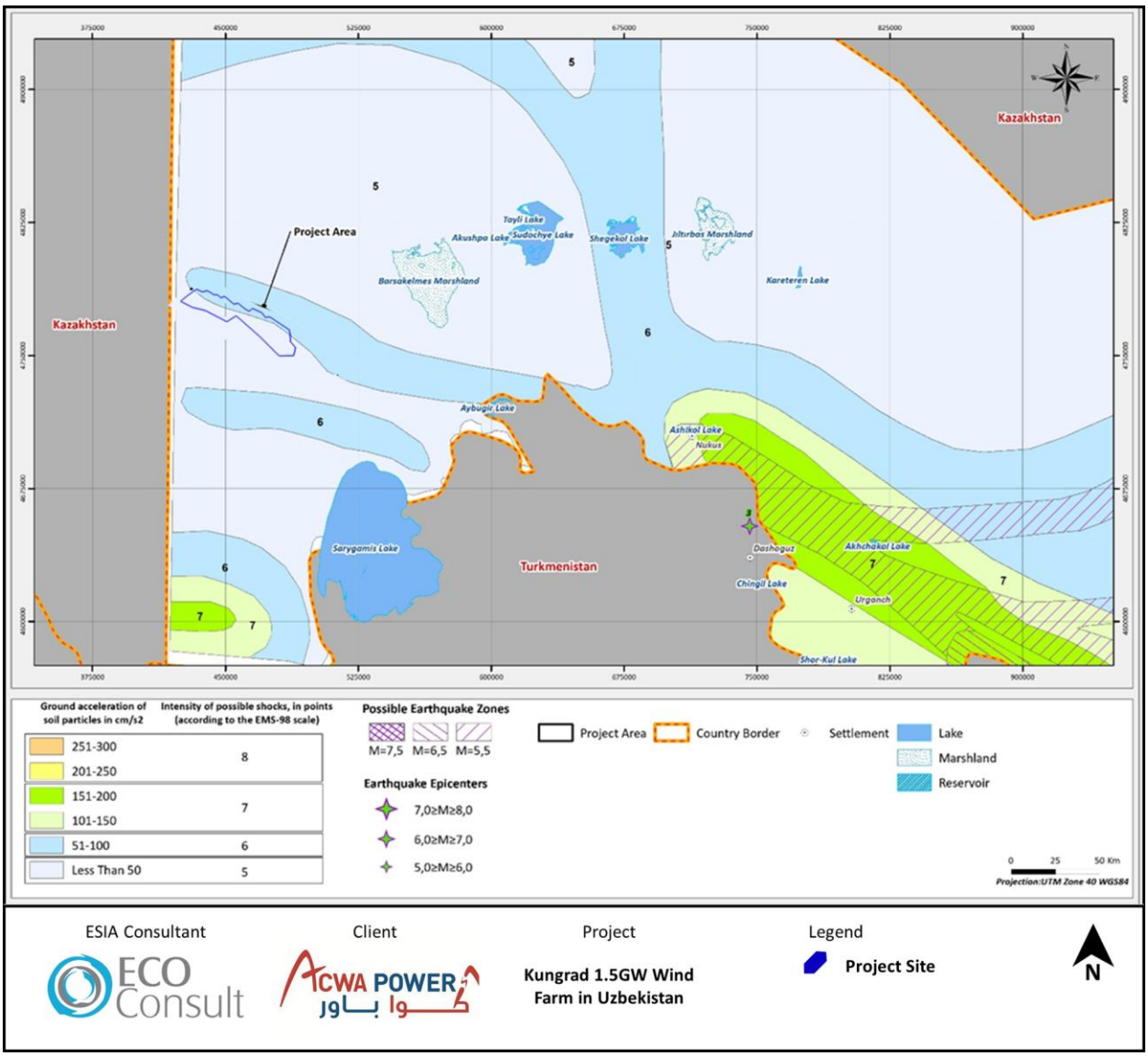


Figure 44: Project Site in Relation with Earthquake Zones and Past Adjacent Earthquakes with M>5

10.1.2 Hydrology

In general, the Republic of Uzbekistan, along with its neighboring countries, lies within the Aral Sea internal drainage basin. This geographical context necessitates the shared utilization of freshwater resources across borders, catering to both economic and environmental demands. These freshwater sources, including rivers, lakes, and reservoirs, serve multiple purposes, such as irrigation for agriculture, industrial processes, and meeting domestic and public utility needs. Unfortunately, the overuse of saline lands for agriculture, in-stream disposal of drainage waters, and inadequate wastewater treatment systems have collectively deteriorated the water quality in Uzbekistan and led to heightened salinity levels.

The key rivers in this region are the Amu Darya River, formed by the confluence of the Vakhsh and Pyandj Rivers, and the Syr Darya River, formed by the confluence of the Narin and Karadarya rivers, with the Chirchik River near Tashkent (the Capital of Uzbekistan) playing a significant role as well. Within Uzbekistan's borders, the Amu Darya River basin encompasses the Surkhandarya, Sherabad, Kashkadarya,

and Zarafshan rivers, although only the Kashkadarya and Sherabad Rivers are entirely confined to Uzbekistan's territory.

The Amu Darya River, the larger of the two rivers nourishing the Aral Sea, now divided into two or three separate water bodies, boasts a vast catchment area of 1,017,800 km². However, it's important to note that the actual catchment area for the Amu Darya is approximately 250,000 km², as some of the rivers within this basin do not reach the Amu Darya itself. Notably, the majority of the catchment area lies beyond Uzbekistan's borders, with approximately 82% of surface runoff originating in Turkmenistan, while the remaining 16% is generated within Uzbekistan.

The Amu Darya River's current flow is regulated through a network of reservoirs, including the Channel, Kaparas (comprising Kaparas, Sutansanjar, and Koshbulak reservoirs), created by four primary dams constructed between 1981 and 1983 near Tuyamuyun, around 300 km upstream of the former Aral Sea boundaries. These reservoirs span both Uzbekistan and Turkmenistan. The primary purpose of this complex is to manage the Amu Darya's flow, primarily for agricultural use (98%) and, to a lesser extent, for industrial and drinking water purposes (up to 2%). Collectively, these reservoirs offer a cumulative operational storage capacity of 5.4 billion m³, though their initial capacity at commissioning was 7.8 billion m³. Notably, siltation poses a significant challenge in managing these reservoirs, with a decrease in storage volume to 6.9 billion m³ in 2001, attributable to the deposition of 0.9 billion m³ of silt, occurring at a rate of 45 million m³ per year.

The multi-annual average total runoff of the Amu Darya varies between 47 and 108 billion m³ per year, averaging at 78.46 billion m³ annually. The expansion of irrigation abstractions reached 120 billion m³ in 2008, resulting in a rapid decline in the Aral Sea's water volume. Notably, from 1993 to 1999, no Amu Darya water reached the Aral Sea. Presently, the upstream Amu Darya flow only extends to Porlitau village, situated 40 km southeast of Muynak city, where it is redirected into a lagoon via impoundment, located south of the Shagilik-Porlitau road.

Furthermore, as depicted in the figure below, regional water usage patterns confirm that waters from the Amu Darya are redirected to the Aral Sea before reaching the Project area, reaffirming the Project's minimal influence on the broader water ecosystem.

It's important to note that the Project site does not intersect with any rivers or water bodies. The nearest surface water features, Sarykamysh Lake, Borsakelmas, and Sudochye Lake, are located around 67km to the south, 65km to the east and 140km to the east respectively, of the Project. Additionally, the Amu Darya River is located more than 180km away from the Project site to the east. A brief description of each of the water bodies is presented below:

- Sarykamysh Lake, located in Kungrad, Karakalpakstan, is a natural basin, serving as a significant water reservoir due to tectonic processes, with fluctuating size and water volume. It plays a crucial role in irrigation and local biodiversity;
- Borsakelmas, another key reservoir in Kungrad, is artificial and supplies water for irrigation, domestic, and industrial use, regulated by a dam infrastructure. It brings water security but poses land and environmental challenges; and
- Sudochye Lake, also in Kungrad, is a natural lake with varying water levels, supporting diverse ecosystems and human activities. It's culturally, ecologically valuable but susceptible to human impacts.

These reservoirs collectively contribute to Kungrad's water resources, meeting various human and ecological needs, each with unique origins and roles.

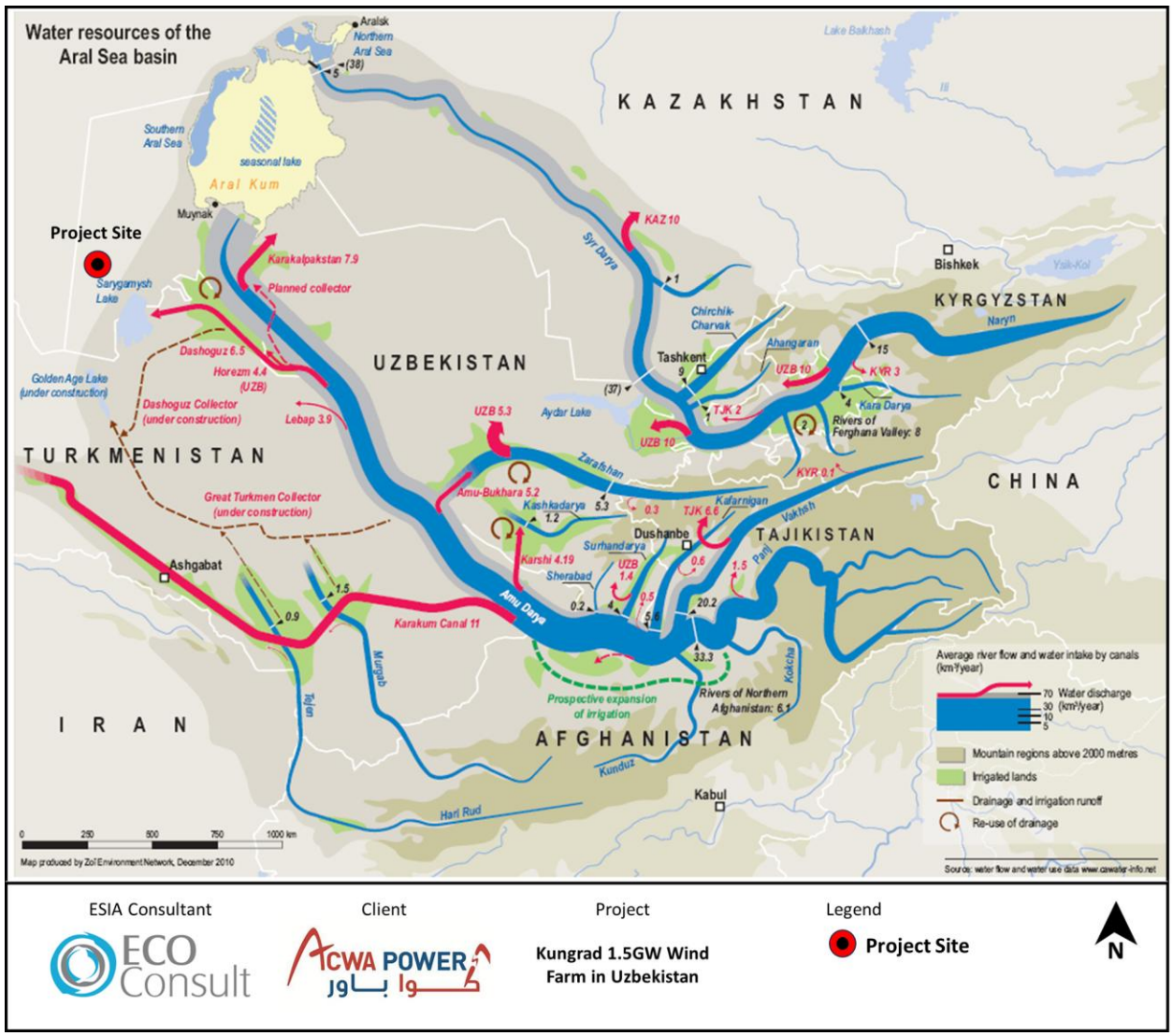


Figure 45: Water Resources of the Aral Sea Basin

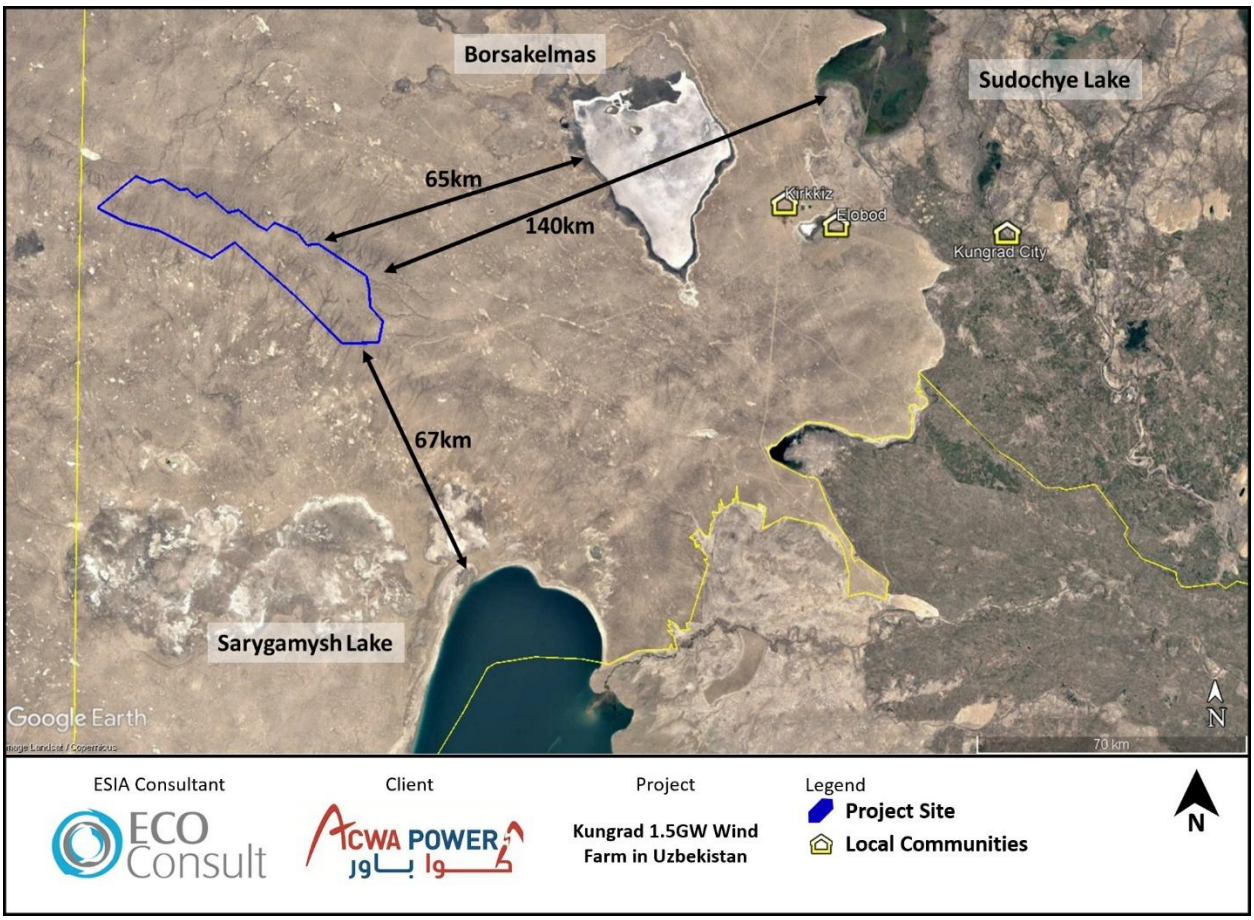


Figure 46: Project Site in Relation with the Closest Water Bodies

A stream order map has been prepared by the Developer's standalone hydrology study that is based on Digital Elevation Model (DEM) having a 1m resolution and ArcGIS/hydrology tools with data on topographical features of a basin, such as a slope, flow direction, flow accumulation, stream order, and catchment area. Based on that, the given DEM shows no water streams or drainage lines in the Project site. The figure below shows the Project site's study area in relation to the sub-basins and the river/channel network.

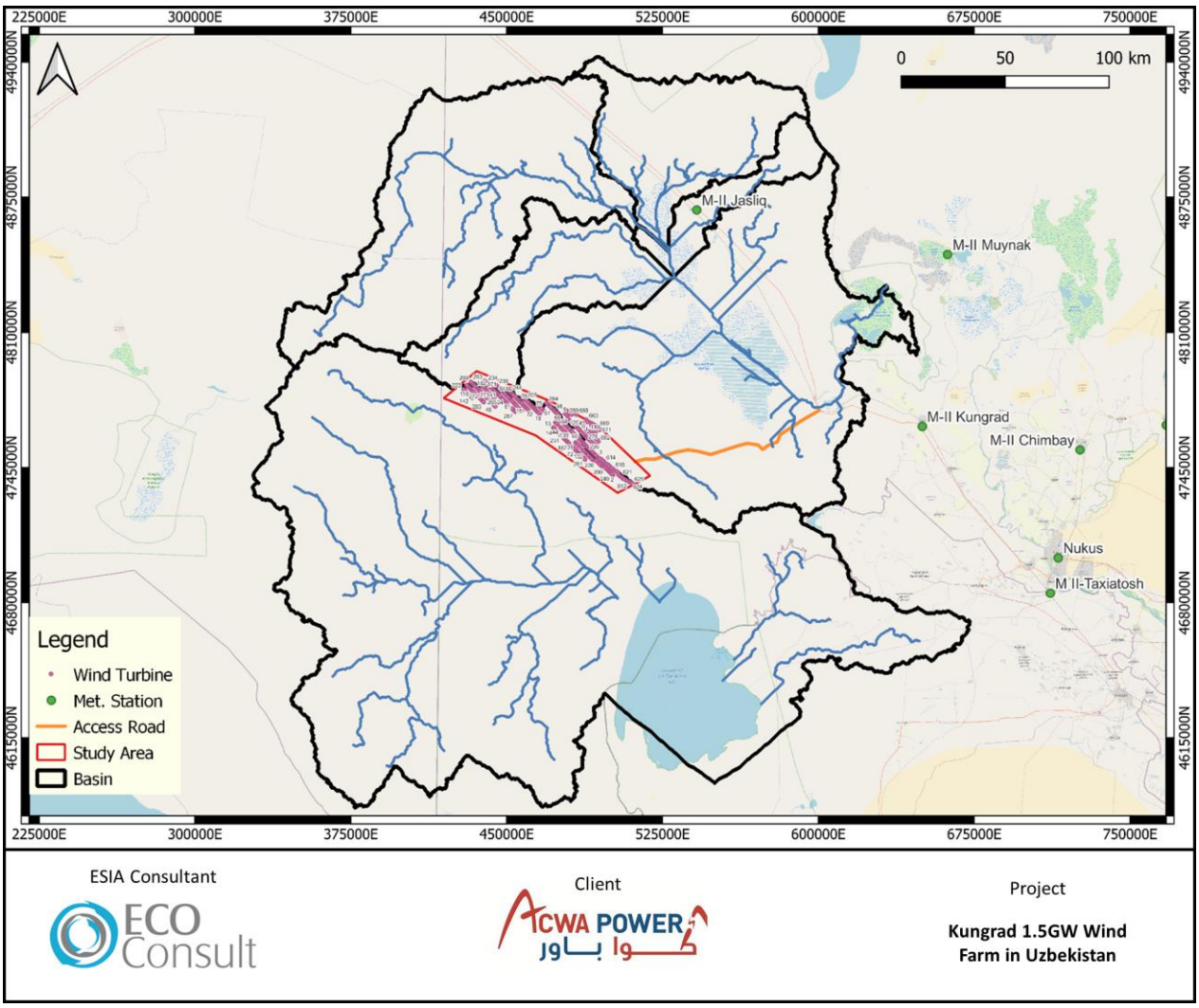


Figure 47: Project Site's Study Area in Relation to The Sub-Basins and The River/Channel Network

10.1.3 Hydrogeology

One of the key hydrogeological features is the Amu-Bukhara Aquifer System, which is located in the Karakalpakstan region of Uzbekistan and extends into Turkmenistan. This aquifer system, which is primarily composed of sedimentary deposits such as sands, silt, and clay, is essential to the supply of groundwater. It plays vital roles in maintaining a number of vital activities, including irrigation, industrial uses, and municipal consumption, both in Karakalpakstan and in the neighboring areas.

The replenishment of the Amu-Bukhara Aquifer System is primarily dependent on the Amu Darya River, which flows through the area and seeps into the aquifer, providing an essential supply of groundwater. Because the region is dry, the groundwater that has accumulated plays a vital role in supporting farming activities and providing for the local population.

Despite these benefits, a number of significant obstacles remain, mostly related to the excessive and inefficient use of groundwater from the Amu-Bukhara Aquifer System. The most significant of these difficulties is the ongoing decline in groundwater levels, which has consequences like land subsidence that have an impact on the environment and the economy. There is also growing concern about the declining

quality of water resources, which are characterized by increasing salinity levels and contaminant intrusion that are observed in various locations.

Uzbekistan has implemented a number of carefully thought-out measures to effectively manage and preserve the Amu-Bukhara Aquifer System in order to address these difficult issues. These actions include strict control over groundwater extraction in an effort to prevent additional depletion as well as active promotion of the use of wise irrigation techniques. At the same time, proactive initiatives have been started in the field of alternative water sourcing. It is critical to emphasize that Karakalpakstan's aquifer status is inherently dynamic and subject to change in response to changing environmental, social, and economic demands.

The comprehensive knowledge of current aquifer conditions and their accompanying features takes center stage within the field of hydrogeology. The abstraction rates, which indicate the amount of groundwater that is taken out for a variety of uses—such as irrigation, industrial activities, and household needs—show variations depending on the location, time of year, and economic factors.

On the other hand, the recharge rates indicate the rate at which groundwater naturally regenerates. Natural processes like riverine seepage and rainfall percolation are primarily responsible for this phenomenon's development. The protection of aquifer integrity is greatly aided by the increase in recharge rates in arid regions such as Karakalpakstan. Surface water availability concurrently with land use patterns and meteorological dynamics are factors influencing recharge rates. Karakalpakstan contains various small groundwater lenses, which are characterized by their limited spatial and volumetric characteristics. These lenses primarily depend on the infiltration of water from irrigation canals to facilitate the process of recharge. Unfortunately, the availability of their exploitable reserves is limited due to a lack of replenishment and the intrusion of saline incursion. Discrete discharge wells are commonly utilized to provide water to remote communities that are strategically located outside the coverage area of existing water distribution networks.

The existing problems related to the aquifer conditions in Karakalpakstan, which include declining groundwater levels and land subsidence, are made worse by inadequate irrigation practices and infrastructure. Moreover, the threat of declining water quality, based on rising salinity levels and contaminant intrusion, intensifies the problems associated with the area.

One of the most common issues with data on water quality for groundwater in Karakalpakstan is the occurrence of salinization as shown in the figure below, which is mostly caused by the extremely saline substratum that is characteristic of the geological composition. Unfortunately, groundwater aquifers that possess sufficient reserves and meet the necessary water quality standards for consistent provisioning are extremely uncommon. Because of the Amu Darya River's natural recharge proclivities, the majority of these aquifers are concentrated along its precincts. Inversely, the real amount of groundwater extraction exceeds sustainable thresholds, which also results in a decrease in surface water flow.

Finally, based on consultations undertaken with the Ministry of Mining Industry and Geology (MMIG) it was indicated that there are no site-specific studies on groundwater depth for the Project site. However, in general based on studies undertaken within the wider area, groundwater depth depends on area height and for the Project site it is expected to be within between 70-300 m with salinity levels around 3-10 g/ml.

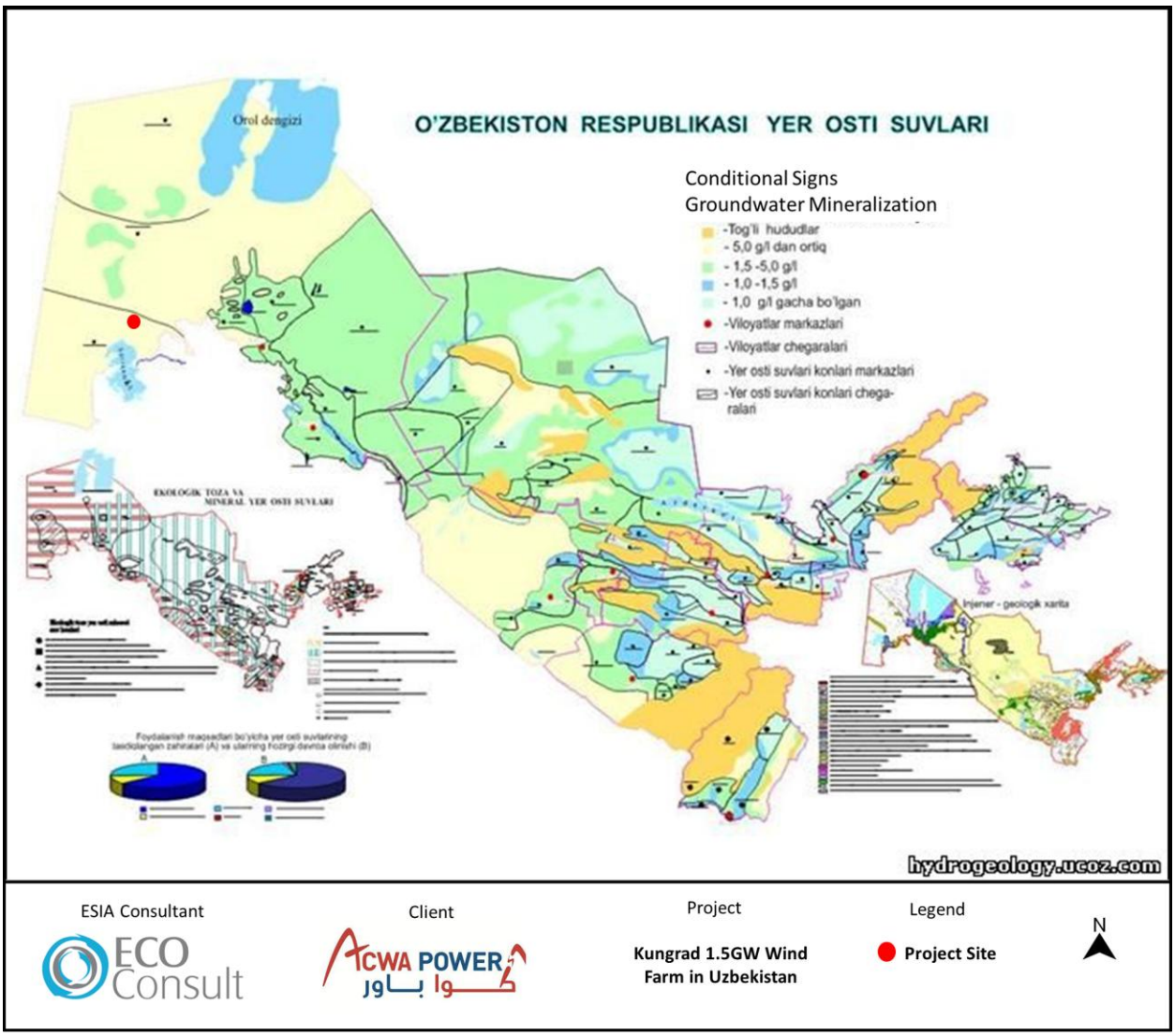


Figure 48: Mineralization of Groundwater

10.2 Assessment of Impacts

This section identifies and assesses the anticipated impacts from the Project activities on geology, hydrology and hydrogeology during the construction and operation phase. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

10.2.1 Potential Impacts from Flood Risks on the Project Site

It is important to investigate potential risks of local flood hazards from drainage systems as during the rainy season and especially during flash flood events, this could affect the Project components. As discussed earlier, the Project is located within an area with low or absent drainage lines ("Section 10.1.2" earlier).

As noted within "Section 10.1.2" earlier, according to topographic maps, Landsat images and the digital elevation models that were developed for the Project area using the Shuttle Radar Topography Mission

(SRTM) images (as also shown in Figure 47), the Project site is not located within any drainage system and more specifically it is located at the upstream of the catchment given that the Project site's topography is elevated when compared to its surrounding as shown in the figure below.

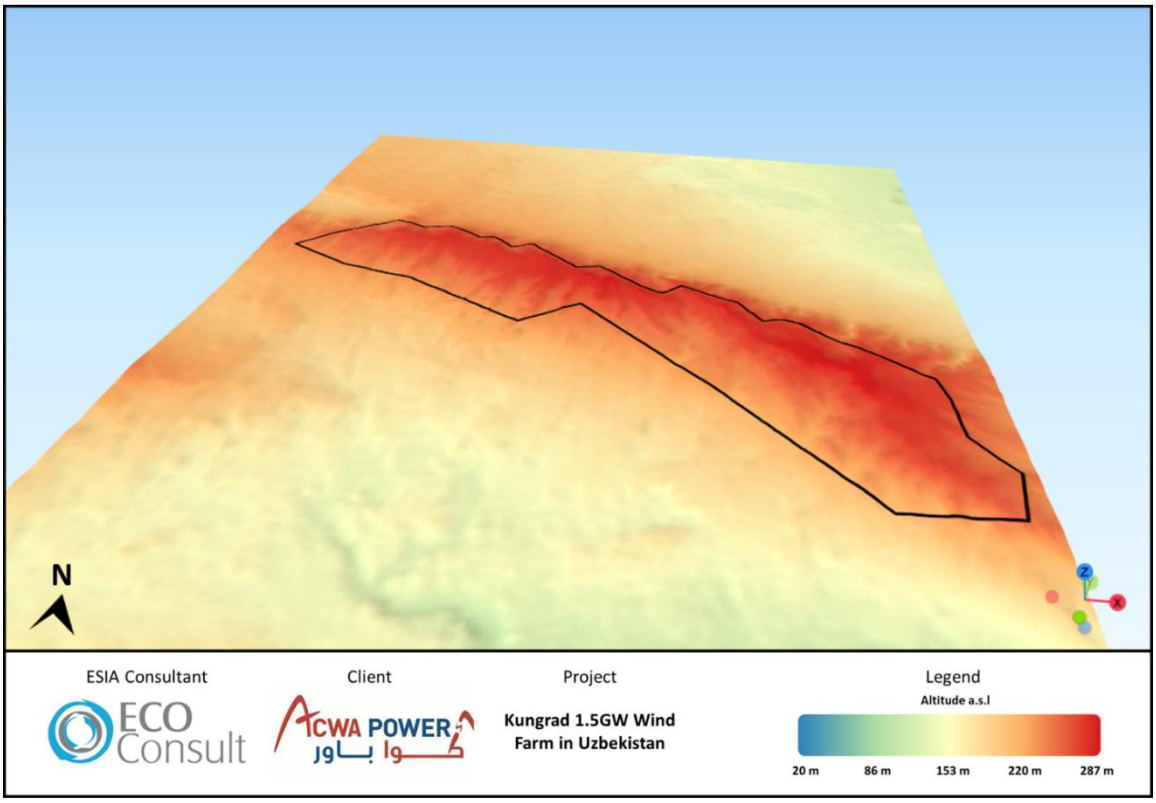


Figure 49: 3D DEM of the Project Site

However, such risks are considered critical and must be taken into consideration throughout the planning phase of the Project as they could inflict damage to the Project and its various components. A flash flood is defined as a rapid developed flood in just a few minutes or hours of excessive rainfall without visible signs of rain, or an accident like a dam or levee break. A flash flood can be generated during or shortly following a rainfall event, especially when high-intensity rain falls on steep slopes with shallow, impermeable soils, exposed rocks and poor or sparse vegetation.

The Developer undertook a standalone hydrology assessment that included flood modeling using HEC-RAS 2D software, adhering to a comprehensive 2D modeling approach that considered topographical features and the hydrodynamic response of the Project site. The working terrain was generated from a provided DEM with a 1m spatial resolution. Variable Manning's roughness coefficients were employed, taking into account geological formations, surface characteristics, and land use, utilizing satellite imagery as a reference. The selection of roughness coefficients was based on existing literature. Variable mesh sizes, ranging from 1 to 3m, were strategically chosen to align with the topography, resulting in the utilization of over 3,000,000 mesh elements. At the downstream end, an outflow boundary condition conducive to a stable 2D model was implemented, considering normal depth.

For the creation of hazard maps, the FD2321/TR1 methodology (Defra and Agency, 2006) was followed, with the hazard rating (HR) calculated using the formula:

$$HR = d \times (v + n) + DF$$

where:

- HR represents the flood hazard rating.
- d signifies the depth of flooding (in meters).
- v indicates the velocity of floodwaters (in m/s).
- DF stands for the debris factor (0, 0.5, 1), contingent on the probability of debris causing a hazard.
- n is a constant set at 0.5.

The debris factor (DF) is determined by the water depth values within the cells as follows:

- DF = 0.5 if the water depth is less than or equal to 0.25.
- DF = 1 if the water depth exceeds 0.25 or if the velocity surpasses 2 m/s.

In the flood modeling for the Project site, the Intensity-Duration-Frequency (IDF) data from the M-II Jasliq meteorological station was utilized. Specifically, the rainfall intensity with a 10-minute duration was employed to simulate flash flooding, while a 24-hour rainfall duration corresponding to a 100-year storm event was used to assess water accumulation downstream within the catchment area. Notably, the water depth observed at the Project site remained below 20 cm.

As a result, it was determined that all WTG were sited in locations characterized as having either no or low hazard potential. The figure below illustrates the water depths for the 100-year storm event at the Project site.

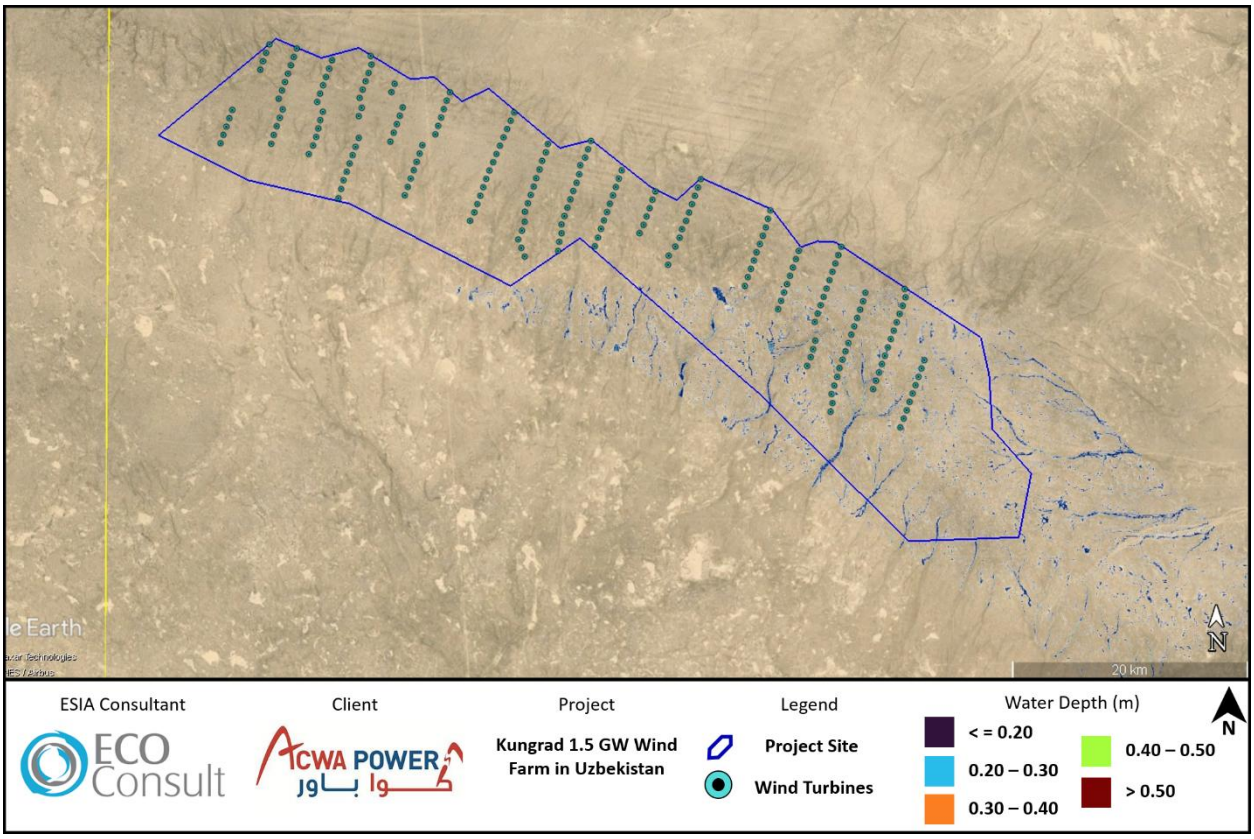


Figure 50: Water Depths within the Project Site Due to 100-Year Storm

Therefore, taking the above into account, the assessment concludes that there is no evidence to support risks of serious flooding in the Project area. Therefore, there are no anticipated impacts in relation to flood risks and there are no further mitigation or monitoring measures to be considered as part of the planning or design phase of the Project.

10.2.2 Potential Impacts from Improper Management of Waste Streams during Construction and Operation

Given the generic nature of the impacts on soil and groundwater for both phases of the Project (construction and operation) those have been identified collectively throughout this section. Generally, this includes potential impacts from improper housekeeping practices (e.g. improper management of waste streams, improper storage of construction material and of hazardous material, etc.).

Improper housekeeping practices during construction and operation (such as illegal disposal of waste to land) could contaminate and pollute soil which in turn could pollute groundwater resources. This could also indirectly affect flora/fauna and the general health and safety of workers (from being exposed to such waste streams). Generally, such impacts can be adequately controlled through the implementation of general best practice housekeeping measures as highlighted throughout this section, and which are expected to be implemented by the EPC Contractor throughout construction phase and Project Operator during the operation phase.

Construction Phase			**Operation Phase**		
Type	Negative	Such impacts are controlled through implementation of general best practice.	Type	Negative	Such impacts are controlled through implementation of general best practice.
Duration	Medium-term		Duration	Long -term	
Magnitude	Medium		Magnitude	Medium	
Reversibility	Reversible		Reversibility	Reversible	
Sensitivity	Medium		Sensitivity	Medium	
Likelihood	Medium		Likelihood	Medium	
Frequency	Frequent		Frequency	Frequent	
Timing	Not relevant		Timing	Not relevant	
Extent	Medium		Extent	Medium	
Significance	**Moderate**		**Significance**	**Moderate**	

Following the implementation of the mitigation measures highlighted throughout this section, the residual significance can be reduced to not significant.

(i) Solid Waste Generation

Solid waste is expected to be generated from construction and operational activities. Solid waste generated will likely include construction waste (such as debris) and municipal solid waste (during construction and operation such as cardboard, plastic, food waste, etc.).

Municipal solid waste and construction waste generated will likely be collected and stored onsite and then disposed to the closest approved landfill or, if possible, reused in the construction activities.

Note: expected waste quantities, the landfill that will be used for the Project and impacts on landfills is discussed separately under "Section 14.2.3".

Mitigation Measures

The following identifies the mitigation measures to be applied by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Coordinate with State Unitary Enterprise for the collection of solid waste from the site to the municipal approved landfill or for recycling (as discussed in further details below).
- Prohibit fly-dumping of any solid waste to the land.
- Distribute appropriate number of properly contained litter bins and containers properly marked as "Municipal Waste".
- Adhere to waste hierarchy principles with associated mitigation measures to include prevent, minimize, reuse, recycle, recover and dispose.
- EPC Contractor only - during construction, distribute a sufficient number of properly contained containers clearly marked as "Construction Waste" for the dumping and disposal of construction waste.
- EPC Contractor only – during construction, it is recommended that recycling measures are implemented. It is recommended that recycling is undertaken in the following approach: (i) separation and disposal of recyclables in a separate container (cardboard, paper, glass, metal, etc.); and (ii) separation and disposal of non-recyclable materials in a separate container (e.g. food waste). Each container must be clearly marked. In addition, EPC Contractor must seek ways to reduce construction waste by reusing materials (for example through recycling of concrete for road base coarse). This is a key requirement given that with the Project's workforce there could be huge amounts of waste that could be recycled (e.g. plastic from water bottles supplied for drinking purposes). "Section 14.1.4" identifies further details on recycling companies operating in Karakalpakstan and coordination / engagement with such entities should be considered.
- Implement proper housekeeping practices on the construction site at all times.
- Maintain records and manifests that indicate volume of waste generated onsite, collected by contractor, and disposed of at the landfill. The numbers within the records are to be consistent to ensure no illegal dumping at the site or other areas.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Inspection of waste management practices onsite.
- Review of records and manifests for volume of waste generated to ensure consistency.
- Regular environmental reporting on implementation of waste management practices onsite.

(ii) Wastewater Generation

Wastewater is mainly expected to include black water (sewage water from toilets and sanitation facilities), as well as grey water (from sinks, showers, etc.) generated from workers during the construction and

operation phase. Wastewater quantities are expected to be minimal. It is expected that wastewater will be collected and stored in fully contained septic tanks and then collected and transported by transportation tankers to be disposed at the closest Wastewater Treatment Plant (WWTP).

Note: expected wastewater quantities, the WWTP that will be used for the Project and impacts on WWTP is discussed separately under "Section 14.2.3".

Mitigation Measures

The following identifies the mitigation measures to be applied by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Coordinate with State Unitary Enterprise to hire a private contractor for the collection of wastewater from the site to the closest WWTP.
- Prohibit illegal disposal of wastewater to the land.
- Maintain records and manifests that indicate volume of wastewater generated onsite, collected by contractor, and disposed of at the WWTP. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas.
- EPC Contractor only - ensure that constructed septic tanks during construction and those to be used during operation are well contained and impermeable to prevent leakage of wastewater into soil.
- Ensure that septic tanks are emptied and collected by wastewater contractor at appropriate intervals to avoid overflowing.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Inspection of wastewater management practices onsite.
- Review of records and manifests for volume of wastewater generated to ensure consistency.
- Regular environmental reporting on implementation of the wastewater management practices discussed above.

(iii) Hazardous Waste Generation

Hazardous waste is expected to be generated throughout both the construction and operation phase and this could include consumed oil, chemicals, paint cans, etc. Hazardous waste generated will likely be collected and stored onsite and then disposed at the approved hazardous waste disposal facilities.

Note: expected hazardous waste quantities, the hazardous waste landfill that will be used for the Project and impacts on the landfill is discussed separately under "Section 14.2.3".

Mitigation Measures

The following identifies the mitigation measures to be applied by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Coordinate and hire a private contractor for the collection of hazardous waste from the site to the approved hazardous waste disposal facilities.
- Ensure that hazardous waste is disposed in a dedicated area that is enclosed; roofed and of hard surface; with proper signage and suitable containers as per hazardous waste classifications and that they are labelled for each type of hazardous waste.
- Ensure hazardous waste storage area is equipped with spill kit, fire extinguisher and anti-spillage trays and a hazardous waste inventory is available.
- Prohibit illegal disposal of hazardous waste to the land.
- Possibly contaminated water (e.g. runoff from paved areas) must be drained into appropriate facilities (such as sumps and pits). Contaminated drainage must be orderly disposed of as hazardous waste.
- Ensure that containers are emptied and collected by the contractor at appropriate intervals to prevent overflowing.
- Maintain records and manifests that indicate volume of hazardous waste generated onsite, collected by contractor, and disposed of at the hazardous waste disposal facilities. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Inspection of hazardous waste management practices onsite.
- Review of records and manifests for volume of hazardous waste generated to ensure consistency.
- Regular environmental reporting on implementation of the hazardous waste management practices onsite.

(iv) Hazardous Material

The nature of construction and operational activities entail the use of various hazardous materials such as oil, chemicals, and fuel for the various equipment and machinery. Improper management of hazardous material entails a risk of leakage into the surrounding environment either from storage areas or throughout the use of equipment and machinery.

Mitigation Measures

The following identifies the mitigation measures to be applied by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Ensuring any new support equipment does not contain Polychlorinated Biphenyl (PCBs) or Ozone Depleting Substances (ODSs) to avoid having hazardous wastes. ***This includes in particular the BESS and substation components.***
- Ensure that hazardous materials are stored in proper areas and in a location where they cannot reach the land in case of accidental spillage. This includes storage facilities that are of hard impermeable surface, with a hard roof, flame-proof, accessible to authorized personnel only, locked when not in use, and prevents incompatible materials from coming in contact with one another.
- Identify handling requirements for lithium-ion batteries in specific
- Maintain a register of all hazardous materials used and accompanying Material Safety Data Sheet (MSDS) must present at all times. Spilled material should be tracked and accounted for.
- Incorporate dripping pans at machinery, equipment, and areas that are prone to contamination by leakage of hazardous materials (such as oil, fuel, etc.).
- Regular maintenance of all equipment and machinery used onsite. Maintenance activities and other activities that pose a risk for hazardous material spillage (such as refueling) must take place at a suitable location (hard surface) with appropriate measures for trapping spilled material.
- Ensure that a minimum of 1,000 liters of general-purpose spill absorbent is available at hazardous material storage facility. Appropriate absorbents include zeolite, clay, peat and other products manufactured for this purpose.
- If spillage on soil occurs, spill must be immediately contained, cleaned-up, and contaminated soil disposed as hazardous waste.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by all involved entities to include the EPC Contractor during the construction phase and the Project Operator during the operational phase unless stated otherwise:

- Inspection for storage of hazardous materials to include inspections for potential spillages or leakages.
- Report any spills and the measures taken to minimize the impact and prevent from occurring again.

10.2.3 Potential Impacts from Erosion and Runoff during the Construction Phase

Site preparation activities which are to take place onsite by the EPC Contractor for installation of the various Project components to include wind turbines, substation, cables, etc. are expected to include land clearing activities, excavation, grading, etc.

The nature of construction activities discussed above could disturb soil, exposing it to increased erosion during rainfall events. If onsite erosion and runoff are not controlled, they can result in siltation of surface water. Generally, such impacts can be adequately controlled through the implementation of general best practice housekeeping measures as highlighted throughout this section, and which are expected to be implemented throughout construction phase.

Construction Phase		
Nature	Negative	Such impacts are controlled through implementation of general best practice.
Duration	Medium-term	
Magnitude	Medium	
Reversibility	Reversible	
Sensitivity	Medium	
Likelihood	Medium	
Frequency	Periodic	
Timing	During rain events	
Extent	Medium	
Significance	**Moderate**	

Following the implementation of the mitigation measures highlighted throughout this section, the residual significance can be reduced to not significant.

Mitigation Measures

The following identifies the mitigation measures to be applied by all involved entities to include the EPC Contractor during the construction phase:

- Existing natural flows will be maintained where possible as part of the drainage system design and any change to the natural/pre-development surface water conditions within the site to be minimized to the extent possible.
- Scheduling to avoid construction activities during heavy rainfall periods (i.e., during the wet season) to the extent practical. In addition, this will include modifying or suspending activities during extreme rainfall and high winds to the extent practical.
- Salvage and store topsoil and subsoil before areas are excavated, with topsoil stripped and stockpiled separately.
- Place clear markers indicating stockpiling area of excavated materials to restrict equipment and personnel movement, thus limiting the physical disturbance to land and soils in adjacent areas.
- Erect erosion control barriers around work sites during site preparation and construction to prevent silt runoff where applicable. This could include but not limited to silt fences, gravel bag berms, fiber rolls, or other similar applications.
- Return surfaces disturbed during construction to their original (or better) condition to the greatest extent possible.
- Specifically in terms of road design the following shall be considered:
  - All roads shall be graded and shaped appropriately;
  - Provision of limiting access road gradients to reduce runoff-induced erosion;
  - Provision of effective short-term measures for slope stabilization, sediment control and subsidence control;
  - On steep sections of access road, transverse drains (‘grips’) will be constructed where appropriate in the surface layer of the road to divert any runoff off the road into swales/roadside drains; and

- To reduce damage to soil and risks of soil erosion, the length and width of the on-site and off-site roads should be with the route optimized to reduce the need for cut-and-fill material. Run-off and erosion control features should be included in designs.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by all involved entities to include the EPC Contractor during the construction phase:

- Inspection for erosion and runoff control to include inspections for implementation of mitigation measures.

11. BIODIVERSITY

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to biodiversity. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

11.1 Assessment of Baseline Conditions

11.1.1 Standards and Regulatory Requirements

(i) National Requirements

The management of protected areas in the RUz depends on different bodies, from the Cabinet of Ministers at national level to regional and local authorities. The main institutions responsible of managing these sites and for protection nature resources, biodiversity and hunting are:

- Ministry of Ecology, Environmental Protection, and Climate Change[10];
- Department of Protection of Water, Land Resources and Subsoil under the Ministry;
- Department of Biodiversity and Protected Areas under the Ministry;
- Department for Monitoring the Implementation of Forest Legislation Requirements under the State Forestry Committee;
- Ministry of Water Resources;
- The State Committee on Geology and Mineral Resources; and
- Regional administrations ("Khokimiyat").

Protected areas fall under the law "On Natural Protected Areas" (updated 2014) that follow the IUCN classification of Protected Areas Management (IUCN 1994); these account for a total 10,634,666 ha. There are 7 types of Protected Areas under Uzbekistan law, as follows:

- State Sanctuary;
- Complex (landscape) Reserves;
- Natural Parks;
- State Natural Monuments;
- Territories for the preservation, reproduction and restoration of individual natural objects and complexes;
- Protected Landscape; and
- Territories for the management of individual natural resources.

[10] As noted earlier this was previously known as State Committee on Ecology and Environmental Protection (SCEEP)

(ii) Lender Requirements

European Bank for Reconstruction and Development (EBRD)

EBRD PR6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources establishes general requirements for the conservation of biodiversity and sustainable management of living natural resources covering aspects such as the assessment of issues and impacts on biodiversity.

Where applicable the Project will follow the EBRD's E&S Eligibility Criteria for Onshore Wind Power Projects which includes targets set out by the EU Biodiversity Strategy including the Habitats Directive (92/43/ECC), the Birds Directive (2009/147/EC), the Bern Convention (June 1973) and the EU Regulation on Invasive Alien Species (1143/2014).

The Birds Directive (2009/147/EC)[11]

Often migratory, wild bird species can only be protected by cooperating across borders. Urban sprawl and transport networks have fragmented and reduced their habitats, intensive agriculture, forestry, fisheries and the use of pesticides have diminished their food supplies, and hunting needs to be regulated in order not to damage populations. Concerned with their decline, Member States unanimously adopted the Directive 79/409/EEC in April 1979. It is the oldest piece of EU legislation on the environment and one of its cornerstones. Amended in 2009, it became the Directive 2009/147/EC PDF.

Habitat loss and degradation are the most serious threats to the conservation of wild birds. The Directive therefore places great emphasis on the protection of habitats for endangered and migratory species. It establishes a network of Special Protection Areas (SPAs) including all the most suitable territories for these species. Since 1994, all SPAs are included in the Natura 2000 ecological network, set up under the Habitats Directive 92/43/EEC.

500 wild bird species across Europe are protected under the five annexes to the Birds Directive as explained in the table below.

Table 26: Annexes to the EU Birds Directive

Annex	Explanation
I	194 species and sub-species are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival and all migratory bird species.
II	82 bird species can be hunted. However, the hunting periods are limited and hunting is forbidden when birds are at their most vulnerable: during their return migration to nesting areas, reproduction and the raising of their chicks.
III	Overall, activities that directly threaten birds, such as their deliberate killing, capture or trade, or the destruction of their nests, are banned. With certain restrictions, Member States can allow some of these activities for 26 species listed here.
IV	The directive provides for the sustainable management of hunting but Member States must outlaw all forms of non-selective and large scale killing of birds, especially the methods listed in this annex.
V	The directive promotes research to underpin the protection, management and use of all species of birds covered by the Directive, which are listed in this annex.

The Habitats Directive (92/43/EEC[12]*)*

Adopted in 1992, the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora aims to promote the maintenance of biodiversity, taking account of economic,

[11] Source: http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

[12] Source: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

social, cultural and regional requirements. It forms the cornerstone of Europe's nature conservation policy with the Birds Directive and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments.

Annex I list 233 European natural habitat types, including 71 priorities (*i.e.* habitat types in danger of disappearance and whose natural range mainly falls within the territory of the European Union).

All in all, over 1,000 animal and plant species, as well as 200 habitat types, listed in the directive's annexes are protected in various ways:

Annex II species (about 900): core areas of their habitat are designated as sites of Community importance (SCIs) and included in the Natura 2000 network. These sites must be managed in accordance with the ecological needs of the species.

Annex IV species (over 400, including many annex II species): a strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura 2000 sites.

Annex V species (over 90): Member States must ensure that their exploitation and taking in the wild is compatible with maintaining them in a favorable conservation status.

Definition of EBRD Critical Habitat and Priority Biodiversity Features

PR6 defines critical habitat and priority biodiversity features as:

Critical Habitat:

The most sensitive biodiversity features; which comprise one of the following:

- Highly threatened or unique ecosystems;
- Habitats of significant importance to endangered or critically endangered species;
- Habitats of significant importance to endemic or geographically restricted species;
- Habitats supporting globally significant migratory or congregatory species;
- Areas associated with key evolutionary processes; or
- Ecological functions that are vital to maintaining the viability of biodiversity features described in this paragraph.

Priority Biodiversity Features (PBF):

This concept replaces the previous definition of natural habitat and encompasses a sub-set of biodiversity that is particularly irreplaceable or vulnerable, but at a lower priority level than critical habitats; which include:

- Threatened habitats;
- Vulnerable species;
- Significant biodiversity features identified by a broad set of stakeholders or governments (such as Key Biodiversity Areas or Important Bird Areas); and
- Ecological structure and functions needed to maintain the viability of priority biodiversity features.

The criteria for the determination of Critical Habitat Features and those defined as Priority Biodiversity Features are shown in the table below.

Table 27: Criteria and Conditions for Identifying Critical Habitats and Priority Biodiversity Features*

Criterion	Priority Biodiversity Feature	Critical Habitat
1. Priority ecosystems		
Threatened ecosystems (a) Habitats listed in Annex 1 of EU Habitats Directive (EU members only) or Resolution 4 of Bern Convention (signatory nations only) (b) IUCN Red-List EN or CR ecosystems	(PR6 para. 12-i) (a) EAAA is habitat type listed in Annex 1 of EU Habitats Directive or Resolution 4 of Bern Convention (b) EAAA** < 5% of the global extent of an *ecosystem* type with IUCN status of CR or EN	(PR6 para. 14-i) (a) EAAA is habitat type listed in Annex 1 of EU Habitats Directive marked as "priority habitat type" (b) EAAA ≥5% of global extent of an ecosystem type with IUCN status of CR or EN (c) EAAA is ecosystem determined to be of high priority for conservation by national systematic conservation planning
2. Priority Species and their Habitats		
Threatened species (a) Species and their habitats listed in EU Habitats Directive and Birds Directive (EU members only) or Bern Convention (signatory nations only) (b) IUCN Red List EN and CR species (c) IUCN Red List VU species (d) Nationally or regionally (e.g., Europe) listed EN or CR species	(PR6 para. 12-ii) (a) EAAA for species and their habitats listed in Annex II of Habitats Directive, Annex I of Birds Directive, or Resolution 6 of the Bern Convention (b) EAAA supports < 0.5% of global population OR < 5 reproductive units of a CR or EN species. (c) EAAA supports VU species (d) EAAA for regularly occurring nationally or regionally listed EN or CR species	(PR6 para. 14-ii) (a) EAAA for species and their habitats listed in Annex IV of the Habitats Directive (See EU restrictions) (b) EAAA supports ≥ 0.5% of the global population AND ≥ 5 reproductive units of a CR or EN species (c) EAAA supports globally significant population of VU species necessary to prevent a change of IUCN Red List status to EN or CR, and satisfies threshold (b) (d) EAAA for important concentrations of a nationally or regionally listed EN or CR species
Range-restricted species	(PR6 para 12-ii) (a) EAAA for regularly occurring range-restricted species	(PR6 para. 14-iii) (a) EAAA regularly holds ≥ 10% of global population AND ≥ 10 reproductive units of the species***
Migratory and congregatory species	(PR6 para 12-ii) (a) EAAA identified per Birds Directive or recognized national or international process as important for migratory birds (esp. wetlands)	(PR6 para. 14-iv) (a) EAAA sustains, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population at any point of the species' lifecycle (b) EAAA predictably supports ≥10 percent of global population during periods of environmental stress

*Quantitative thresholds derived from IUCN Key Biodiversity Area Standard and aligned with International Finance Corporation's (IFC) Guidance Note 6 (rev. 2019)

**EAAA = *ecologically appropriate area of analysis*, as defined above

***The IUCN Key Biodiversity Areas standard cites the following definition for reproductive unit: "the minimum number and combination of mature individuals necessary to trigger a successful reproductive event at a site. Examples of five reproductive units include five pairs, five reproducing females in one harem, and five reproductive individuals of a plant species."

International Finance Corporation (IFC)

The biodiversity section of this ESIA also follows the IFC PS6 (2012) and associated Guidance Note (GN6 published on January 1, 2012 and last updated June 14, 2021) on biodiversity conservation and sustainable management of living natural resources.

The IFC PS6 main objectives are:

- To protect and conserve biodiversity
- To maintain the benefits from ecosystem services
- To promote the sustainable management of living natural resources through the adoption of practices that integrates conservation needs and development priorities

IFC PS6 requires that a conservation value is allocated to the ecological features (protected areas, habitats and species) which are likely to be directly or indirectly impacted in the Project Area of Influence (AoI). Under the IFC guidance, the requirements of PS6 apply to projects in all habitats, whether or not those habitats have been previously disturbed and whether or not they are legally protected. Specifically, a project is required to:

- Assess significance of project impacts on all levels of biodiversity as an integral part of the social and environmental assessment process
- Take into account differing values attached to biodiversity by specific stakeholders
- Assess major threats to biodiversity, especially habitat destruction and invasive alien species

In accordance with IFC PS6, habitats are divided into modified, natural and critical habitats. Critical habitats can be either modified or natural habitats supporting high biodiversity value, including:

- Habitat of significant importance to critically endangered and/or endangered species (International Union for Conservation of Nature and Natural Resources (IUCN) Red List)
- Habitat of significant importance to endemic and/or restricted-range species
- Habitat supporting globally significant concentrations of migratory species and/or congregatory species
- Highly threatened and/or unique ecosystems
- Areas associated with key evolutionary processes

Since habitat destruction is recognized as a major threat to the maintenance of biodiversity and to assess likely significance of impacts, IFC PS6 requires the following depending on habitat status:

Modified Habitat: exercise care to minimize any conversion or degradation of such habitat, depending on scale of project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of operations.

Natural Habitat: developer will not significantly convert or degrade such habitat unless no financial/technical feasible alternatives exist, or overall benefits outweigh cost (including those to biodiversity), and conversion or degradation is suitably mitigated. Mitigation must achieve no net loss of biodiversity where feasible; offset losses through creation of ecologically comparable area that is managed for biodiversity, compensation of direct users of biodiversity.

Critical Habitat: in areas of critical habitat the developer will not implement project activities unless there are no measurable adverse impacts on the ability of the critical habitat to support established populations of species described or on the functions of the critical habitat; no reduction in population of a recognized critically endangered or endangered species and lesser impacts mitigated as per natural habitats.

IUCN Red List of Threatened Species[13]

The IUCN Red List of Threatened Species is the world's most comprehensive information source on the extinction risk of animals, fungi and plants. Assessors place species into one of the IUCN Red List Categories, based on a series of assessment criteria. For each species, The IUCN Red List provides information about its range, population size, habitat and ecology, use and/or trade, threats and conservation actions. The IUCN Red List Categories indicate how close a species is to becoming extinct.

Species are assessed against five criteria based on geographic range, population size and population decline/increase, in addition to extinction probability analyses. These criteria determine which category is most appropriate for the species.

Species in the Vulnerable, Endangered and Critically Endangered categories are collectively described as 'threatened'. The IUCN Red List does not include Not Evaluated species. Critically Endangered species may also be tagged as Possibly Extinct or Possibly Extinct in the Wild.

11.1.2 World Heritage Site Ecological Impact Assessment: Reference Framework

Information and guidelines contained within 'Guidance and Toolkit for Impact Assessments in a World Heritage Context[14]', have been incorporated into this assessment. The Toolkit presents a Step-by-Step approach for impact assessment and is based on using the Statement of Outstanding Universal Values (OUVs) to identify the site's values and attributes. The WHS is designated for its ecological value and the reasons for designation and identification of the site's OUVs (values and attributes) are fully presented in 11.1.6 (i).

The assessment of all likely ecological impacts as a result of both construction and operation on all sensitive ecological receptors, including those that are included as OUV's of the World Heritage Site are considered in full throughout this Chapter. It is therefore considered that this impact assessment is compliant with the WHS IA methodology, as set out in Section 5 of the guidelines. The OUVs of the WHS are clearly defined in Section 11.1.6 of this chapter and each OUV has been fully considered within the subsequent construction and operational impact assessment sections.

[13] https://www.iucnredlist.org/
[14] https://whc.unesco.org/en/guidance-toolkit-impact-assessments/

The World Heritage Site impact assessment has been undertaken with reference to the UNESCO and IUCN Guidance and Toolkit for Impact Assessments in a World Heritage Context. The assessment followed the key steps of: (i) identification of the attributes and Outstanding Universal Values (OUVs) of the World Heritage Site; (ii) identification of project activities with potential pathways to affect those attributes and OUVs during construction and operation; (iii) assessment of the nature, magnitude, duration and significance of potential effects on OUVs; and (iv) identification of mitigation measures and residual effects. The OUVs relevant to the Property are described in Section 11.1.6 and are subsequently assessed within the impact assessment sections of this chapter. Based on this assessment, no significant adverse impacts on the OUVs or integrity of the World Heritage Site are predicted.

11.1.3 Critical Habitat Assessment

(i) Introduction

Critical Habitat' is a concept applicable to several international financial lending institutions, designed to enable the identification of areas of high biodiversity value in which development would be particularly sensitive and require special attention. The concept has been developed in consultation with numerous international conservation organizations and thus takes into account many pre-existing conservation approaches, such as Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Sites.

The concept is further defined in the following documents:

- EBRD PR6 Biodiversity Conservation and Sustainable Management of Living Natural Resources
- IFC PS 6 on Biodiversity Conservation and Sustainable Management of Living Resources.
- Asian Development Bank (ADB) Safeguard Policy Statement (SPS) 2009, ADB Environment Safeguards A Good Practice Sourcebook Draft Working Document.
- A number of multilateral banks have policies closely aligned with PS6, and more than 75 private banks signed up to the Equator Principles have an implicit commitment to PS6.

The CHA comprises several steps in order to ensure the process is robust:

- Initial Screening – which involves making stakeholder consultation and/or an initial published and grey literature IUCN Red List of Threatened Species; IFC PS6 GN6 (IFC, 2012); EBRD PR6; Biodiversity Conservation and Sustainable Management of Living Natural Resources Guidance Note (EBRD 2022) and; World Database of Key Biodiversity Areas.
- Establishment of baseline which includes field data collection and verification of available information e.g. Habitat Survey; Bird Survey; Bat Survey; Invertebrate Survey; Reptile Survey.
- Critical habitat determination:
    a) Identification of appropriate scale for assessment
    b) Determination of Ecologically Appropriate Area of Analysis.
    c) Assessment against Critical Habitat criteria.

(ii) Literature Review and Stakeholder Consultation

The Critical Habitat Assessment was based on existing literature in addition to global and regional datasets, including Integrated Biodiversity Assessment Tool (IBAT, 2020). All species classified as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) in the IUCN Red List have been screened within the CHA, as well as those species considered to be endemic, near-endemic or range restricted and those of elevated in-country conservation status (e.g. UzRDB CR or EN Species).

The assessment has been conducted using the best recent and available information at the time of its production and the full results of the Critical Habitat Screening and Assessment are included as a standalone document – ***Kungrad 1.5GW Wind Farm Critical Habitat Assessment (CHA).***

(iii) Scale of Assessment

A Critical Habitat Assessment is usually carried out at a landscape scale, using Ecologically Appropriate Areas of Analysis (EAAA) for determining the presence or absence of Critical Habitat qualifying features under PS6 Criteria 1 – 3 and PR6 Criterion 2 – Priority Species and their Habitats. They are identified at a landscape scale, considering large-scale ecological processes where appropriate, and can therefore be much larger than the project concession or lease area itself. The principles of determination of EAAA only apply to terrestrial areas and cannot be applied to airspace above a site unless it is associated directly with the utilization of a terrestrial habitat.

The Critical Habitat Assessment (CHA) methodology described in IFC's Guidance Note 6 heavily draws on the IUCN's Key Biodiversity Area (KBA) Standard, which focuses on geographic areas of land and water that are amenable to site-based conservation. It is for this reason that, for birds, the CHA methodology can be readily applied to terrestrial and water areas, such as stopover points and breeding grounds where concentrations of birds are dependent on the conservation of the habitat at these areas. Considering the airspace in a CHA is more challenging.

Birds utilizing important terrestrial areas will naturally also use the airspace above and around it. Under certain circumstances, this airspace should be considered as part of the habitat and part of the EAAA of a CHA.

Using this approach, a CHA would not be conducted with respect to the airspace where there is no associated important terrestrial area used by birds (or concentrations of them) and no intersection with the Project footprint, which will often be the case for long-distance migrants using high altitude airspace between continents or countries. In this scenario, it would be difficult or impossible to delineate the airspace EAAA at this large scale, recalling that "critical habitat boundaries should be equivalent in scale to areas mapped for practical site-based conservation management activities" PS6 GN59). Without an EAAA, the Critical Habitats thresholds cannot be applied. It is also important to note that the location of a project within a recognized bird migratory corridor (flyway) does not automatically generate high collision risk, not trigger CH determination, because most bird migration activity occurs in a diffuse "broad front" pattern, and recognized bird migration corridors are as ubiquitous as bird migration activity itself, and collectively covers most terrestrial land areas. The migratory/congregatory species criterion described in the CHA sections of IFC PS6 and EBRD PR6 is intended to trigger CH determination only in areas that host continentally significant concentrations of migratory activity. In many cases, these sites have already been designated as IBAs based on the KBA criteria and thresholds[15].

(iv) Outcome of Critical Habitat Assessment

The Critical Habitats Screening and, where relevant, subsequent Assessment has been completed for all species returned on the IBAT Search as being listed by the IUCN as Critically Endangered, Endangered or

[15] Memorandum Determining Biodiversity Management Requirements Related to Airspace around Wind Energy Facilities (EBRD, June 2023)

Vulnerable within 50km of the Project AoI as well as on other species identified as being present within the AoI as a result of on-site surveys.

The CHA was completed for both the windfarm and OHTL combined. Critical Habitat was triggered for three species as a result of the OHTL AoI supporting significant populations of the CH triggering species (see below). These species are not present in significant numbers in the windfarm AoI. The windfarm, as a result of the OHTL being an Associated Facility, is inherently within CH for these species.

The results of the combined projects CHA are shown below along with recommendations for further action.

Range-restricted that are not of international conservation concern have been discounted from the Critical Habitats Assessment, as they are considered to be very unlikely present within the AoI or the habitats in which they are found will not be impacted by the proposals.

Critical Habitat has been triggered for White-headed Duck as a result of the EAAA supporting a significant proportion of the global population of this IUCN Endangered species and for Red-crested Pochard (significant wintering populations of IUCN LC species in the EAAA) and whilst the Project will not affect any areas of terrestrial habitats (e.g. lakes) it is considered likely that both species' will regularly move across the Project AoI. Critical Habitat has also been determined for MacQueen's Bustard as a significant proportion of the global population of this species are likely to be utilizing the airspace occupied by the Project (OHTL).

There are also a number of other species that are considered to be PBF species within the windfarm AoI, and these are detailed in further in this ESIA.

The Project will therefore need to develop a Biodiversity Action Plan which will include all relevant species mitigation included within the ESIA to ensure No Net Loss to these valued ecological receptors as well as Net Gain for White-headed Duck, Red-crested Pochard and MacQueen's Bustard. All mitigation and monitoring, included in the ESIA will also be included in the Biodiversity Action Plan which will include a robust Adaptive Management Strategy should the results of monitoring indicate a significant impact on species of conservation concern.

With appropriate mitigation it is highly unlikely that the Project will result in impacts on White-headed Duck or Red-crested Pochard and therefore, at this stage off-sets for this species may not be required. The final operational BAP will however include potential off-set measures to be undertaken if any impacts are identified in order that the Project results in a Net Gain for these CH triggering species. It is however likely that even with mitigations applied off-sets will be required to achieve No Net Loss, and then Net Gain, of MacQueen's Bustard as industry standard mitigations have been shown to be largely ineffective for this species and significant residual negative impacts will remain. Off-setting will be undertaken in the form of identification and removal of deadlines and undergrounding of existing or newly (2025 onwards) constructed distribution lines with the core areas for breeding MacQueen's Bustard (e.g. Bukhara region). The location and extent of undergrounding will be determined through detailed post-construction fatality monitoring which will be completed along the OHTL as well as the wider distribution network. Undergrounding of distribution lines will also ensure that other significant residual negative impacts (*e.g.* collision mortality over accepted PBR thresholds on bird (raptor) species of conservation concern) (*e.g.* Steppe Eagle) are off-set.

In addition to the mitigation measures defined in this ESIA, the Project will implement offset measures during construction and operations to address residual impacts and thus achieve no net loss for priority biodiversity features, and for Natural and Critical Habitat. In particular, the Project will – in collaboration

with the relevant stakeholders – support undergrounding of current or proposed Low Voltage Distribution Lines (LVDL), or removal of any such lines which are no longer necessary, within a priority area for MacQueen's Bustard in Bukhara Province. The detailed location, scale and schedule of this offset will be agreed in consultation with key stakeholders. While this offset is primarily targeted at MacQueen's Bustard, removal of LVDL in this area is likely to also have significant benefits to birds of prey by removing electrocution risks. Monitoring of current electrocution risks in the area would allow removal of LVDL to also function as an offset towards any unforeseen collisions of birds of prey with wind turbines. These offset measures are further detailed in the Project's Biodiversity Offset Plan (BOP).

The scale of offsets necessary has currently been estimated on a precautionary basis, using existing data on bustard collisions with powerlines near part of the Project OHTL route. This estimate will be refined during Project implementation via a program of Post Construction Fatality Monitoring (PCFM). That Program will not only enable refinement of offsets for MacQueen's Bustard but also identify the need for any other adaptive management of mitigation or offsets owing to unforeseen impacts. It will be developed for both turbines and powerlines following good international industry practice and carried out for an initial minimum 3-year period, but the actual timeframe will depend on fatality results. If PCFM indicates collisions of other Critical Habitat-qualifying bird or bat species with turbines to levels that exceed PBR-based fatality thresholds, additional mitigation or offset actions will be implemented as part of adaptive measurement as contained in the ESIA. Those may include operational controls (such as turbine curtailment or shut-down-on-demand during high-risk periods) or the enhancement of mitigation and offset measures.

The Operational Biodiversity Action Plan will also include a robust Biodiversity Monitoring Evaluation Plan (BMEP), and this will include details of Post Construction Fatality Monitoring, which will be based on the latest IFC, EBRD, KfW Handbook for such post-construction studies (or updated guidance as appropriate).

No habitats, plant, reptile or invertebrate species were recorded that are of significant international or national conservation concern (CR or EN) nor are they considered to be present within the Project AoI. IUCN Vulnerable species are present (e.g. Central Asian Tortoise) however predicted impacts are not such that unmitigated they would result in a change of conservation status to IUCN CR or EN.

Of the mammals recorded two species are listed on the UzRDB as Critically Endangered (Caracal and Honey Badger) however both are listed by the IUCN of being Least Concern globally. In addition, the thresholds for conservation status for species included in the UzRDB are not aligned with the IUCN criteria and as such neither species was screened within the CHA.

Critical Habitat Assessment was undertaken in line with GIIP and relevant guidance notes.

11.1.4 Stakeholder Consultation and Engagement Activities

Stakeholder consultation and engagement activities were undertaken with the following entities in specific. Please refer to "Section 6.3" earlier for the outcomes of such consultations in detail.

- Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan
- Uzbekistan Society for the Protection of Birds / Main Office Uzbekistan and Karakalpakstan Branch
- Birdlife International
- IUCN SSC Bustard Specialist Group Nature Conservation / WWF

- Bank Watch Network
- John Burnside, International MacQueen's Bustard Expert

In addition, a workshop was held on 24 August 2023 in Tashkent for key biodiversity experts and specialists and which included the following:

- Institute of Zoology to include but not limited to the following departments: (i) Laboratory of Vertebrate Animals; (ii) Laboratory of Entomology; and (iii) Laboratory of Accounting and Cadaster of Endangered Species
- Parliament of the Republic of Karakalpakstan (*Jokari Kenes)*
- Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan to include the following departments:
  - Department of Protected Areas
  - Biodiversity Department
  - Cadaster Department
  - Centre for State Ecological Expertise
- Department for Protected Areas of the State Committee of the Republic of Uzbekistan for Forestry
- Uzbekistan Society for the Protection of Birds (including Karakalpakstan branch)
- Falcon Hunting Solution LLC
- International Fund for Houbara Conservation in Abu Dhabi (OAE)

The outcomes of the consultation were presented in "Section 6.3.1 and 6.3.2" earlier and were considered throughout assessment.

11.1.5 Ecological Impact Assessment Methodology

(i) Ecological Area of Influence

The Ecological Area of Influence (AoI) was determined to include the areas directly and permanently affected by the Project and areas which will be temporarily affected during construction as follows:

- Project Area which encompasses the whole of the Wind Farm territory and at least 500m buffer around the proposed turbines;
- Access Road from Kirkkiz, which is approximately 100km from the nearest surfaced road to the Project site;
- Internal site roads, internal MV buried transmission lines and communication;
- Internal site facilities including permanent structures such as site offices, sub-stations as well as temporary laydown areas and site worker accommodation;
- Low Voltage Distribution Line (LVDL);

- The total AoI of the Wind Farm is 950 km^2; and
- An OHTL is planned in order to export generated energy to the National Grid. All medium-volt transmission lines within the wind farm AoI to export generated power to on-site sub-stations will be buried along with communication cables. Impacts (construction and operation) associated with OHTL are not discussed in this document and are included in a separate OHTL ESIA.
- It is possible that the Project could affect a much larger area than the 'AoIs' due to interruption of migration patterns or could affect populations of birds that breed and winter outside of the AoIs as a result of mortality with active turbines whilst on annual migrations. Possible impacts on migrating birds have been accounted for within the Collision Risk Assessment along with possible impacts of barrier impact. Possible impacts on mammals and the effects of the operational wind farm are also included, including a 'future' assessment should the baseline biodiversity of the wind farm and surrounding area improve over time as a result of wider conservation measures (e.g. changes to border fences allowing greater movement of ungulates across Karakalpakstan / Ustyurt Plateau and or future re-introductions (e.g. Cheetah (*Acinonyx jubatus*))). Impacts of construction on ungulates is included and the assessment is based on the results of the baseline biodiversity surveys completed for the Project.

The assessment of impacts on valued ecological receptors follows the methodology as set out in "Section 3.4" of this ESIA. The sensitivity of the identified valued ecological receptors has been determined by the parameters as set out in the table below.

Table 28: Criteria for Determining the Sensitivity of Valued Ecological Receptors

Conservation Value (Sensitivity)	Species Criteria	Habitat or Site Criteria
High	IUCN Critically endangered, endangered and Vulnerable species. UzRDB Critically Endangered or Endangered species Nationally protected species of significant population size and importance. Local endemic flora species Bird species with elevated conservation concern; species with declining local population; breeding residents.	Internationally designated sites (or equal status). Nationally designated sites (or equal status). Critical habitats of significant international or national ecological importance.
Medium	IUCN Near Threatened species. Nationally protected species or rare species, but not a significant population size and not of national importance. Regional endemic flora species	Regionally important natural habitats. Priority habitats listed under Annex I of the Habitats Directive. Natural or Modified habitats with high biodiversity or under significant threat of loss within the region.
Low	IUCN Least Concern. Widespread species Non-breeding and non-resident bird species	Undesignated sites and habitats of natural habitats of some local biodiversity and cultural heritage interest. Modified habitats with limited ecological value. Other sites with little or no local biodiversity and cultural interest. Modified habitats with limited biodiversity value.
Negligible	Species of no national importance / no relevance to the site	Highly modified habitats of no biodiversity value.

11.1.6 Baseline Conditions

(i) Desktop Review

IBAT Search - Protected Areas

The location of Protected Areas within approximately 50 km of the site boundary were taken from a search of the Integrated Biodiversity Assessment Tool (IBAT) database. The results of the search are as follows:

- Protected Areas
  - South Ustyurt National Nature Park
- Sites of Biodiversity Importance
  - Northern Part of the Assake-Audan Depression
  - Sarykamysh Lake and Surrounding Ustyurt Plateau 68km from redline, 49km from originally proposed boundary.
- World Heritage Site (not included on IBAT Return)
  - Cold Winter Deserts of Turan: Compartments 11 (Saigachy), 12 (Saigachy-Beleuli), 13 (Saigachy-Duana), 14 (Saighachy-Zhideyli) and 15 (Southern Ustyurt).

South Ustyurt National Nature Park

This protected area is approximately 10 km south of the Project site and is designated for:

- The NNP is legally protected by the Law of the Republic of Uzbekistan on Protected National Territories.
- On November 11, 2020, by Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 707, the national nature Park (NNP) "Southern Ustyurt" was established, with an area of 1,447,143 hectares. Its creation was approved by the Council of Ministers of the Republic of Karakalpakstan, the State Committee of Ecology of the Republic and the Forest State Committee of the Republic of Uzbekistan.
- The National Park was created preserve the biodiversity of the region's unique Ustyurt plateau, which is considered a critical habitat for over 700 species of plants and 300 species of vertebrates, including the Critically Endangered Saiga Antelope, which according to the IUCN Red List has a decreasing population trend.
- As discussed in “Section 6.3.1” initially the State Committee required a 10km setback distance from the park. However, during the workshop undertaken by the ‘E&S Team’ with various biodiversity experts (refer to Section 6.3.2) where site specific data was presented, it was agreed that this setback distance will be reduced to be based on existing international standards and best practice (around 2-3km). This was confirmed through a formal letter from the Ministry of Ecology, Environmental Protection and Climate Change. In addition, the environmental permit issued for the Project also required a 3km setback distance for the Project.

Nevertheless, as discussed earlier, the Project did account for a 10km setback distance in the final site layout. None of the Project components including roads or WTGs will be within 10 km of the National Park / UNESCO World Heritage Site.

Northern Part of the Assake-Audan Depression[16]

This site is also included as an Important Bird Area and is approximately 53 km south-west of the Project site. The IBA is located in the south of the Karakalpak Ustyurt in the Assake-Audan depression. There are several artesian wells with brackish water in the depression along with dense thickets of Common Reed (*Phragmites australis*) and Tamarisk (*Tamarisk sp*.) around these wells. The IBA includes part of the depression and the adjoining highlands in the north and north-west with Haloxylon forests.

Key biodiversity of the IBA is not accurately known due to the difficulties in accessing the site. The Assake-Audan depression is however known to be a stop-over for many species passing through the Ustyurt Plateau and it likely to be a staging post for birds of several intersecting flyways. The presence of species within the IBA is highly dependent on the availability of water. Two days of IBA fieldwork in 2007 recorded Grey Heron (*Ardea cinerea*), Eurasian Sparrowhawk (*Accipiter nisus*), Hen Harrier (*Circus cyaneus*), Water Rail (*Rallus aquaticus*), Lesser Short-toed Lark (*Calandrella rufescens*) subsequently split in to Turkestan Short-toed Lark, (*Alaudala heinei*), Barn Swallow (*Hirundo rustica*), White Wagtail (*Motacilla alba*), Bluethroat (*Luscinia svecica*), Cetti's Warbler (*Cettia cetti*), Lesser Whitethroat (*Sylvia curruca*), Common Chiffchaff (*Phylloscopus collybita*), Common Chaffinch (*Fringilla coelebs*), Brambling (*Fringilla montifringilla*), Desert Finch (*Rhodospiza obsoletus*), House Sparrow (*Passer domesticus*), Common Starling (*Sturnus vulgaris*), Red-headed Bunting (*Emberiza bruniceps*) and Rook (*Corvus frugilegus*). The remains of a dead gull were also found.

Table 29: Populations of IBA Trigger Species

Species		IUCN Category	Season	Year(s) of Estimate	Population at Site	IBA Criteria Triggered
Common Name	**Scientific Name**					
Pallas's Sandgrouse	*Syrrhaptes paradoxus*	LC	Breeding	2007	10 – 15 inds	A3
MacQueen's Bustard[17]	*Chlamydotis macqueenii*	VU	Breeding	2007	2 – 4 inds	A3
Saker Falcon	*Falco cherrug*	EN	Breeding	2007	2 – 4 inds	A1
Turkestan Ground Jay	*Podoces panderi*	LC	Breeding	1937 – 2007	3 – 6 inds	A3
Brown-necked Raven	*Corvus ruficollis*	LC	Breeding	2007	2 – 4 inds	A3
Asian Desert Warbler	*Curruca nana*	LC	Breeding	2007	20 – 40 inds	A3
Desert Finch	*Rhodospiza obsoletus*	LC	Breeding	2007	10 – 50 inds	A3
Red-headed Bunting	*Emberiza bruniceps*	LC	Breeding	2007	15 – 30 inds	A3

The mammal fauna present within the IBA is very similar to that of the Ustyurt. Typical species are likely to include Urial (*Ovis vignei*) (IUCN: VU and UzRDB:CR), which was present in 1956, Goitered Gazelle (*Gazella subgutturosa*) (IUCN: VU and UzRDB:VU), Saiga Antelope (*Saiga tatarica*) (IUCN: NT and UzRDB:CR although considered likely extirpated from much of their previous range) and Central Asian Tortoise

[16] BirdLife International (2023) Important Bird Area factsheet: Northern part of the Assake-Audan depression. Downloaded from http://datazone.birdlife.org/site/factsheet/22283 on 12/06/2023.
[17] MacQueen's Bustard will be used throughout this report for this species and it will not be referred to as Asian Houbara or Houbara Bustard.

(*Testudo horsfieldii*) (IUCN:VU and UzRDB:VU). Two plant species are also present which are included in the National Red Book. These are *Malococarpus crithmifolius* and *Euphortia sclerocyathium*.

During the 2023 site visit completed by Turnstone Ecology, a site visit to the Assake-Audan Depression, where the northern shore of the depression was surveyed on the 24th of April 2023. During the site visit it was noted that the main area of the depression was largely dry however a well / spring was located, around which was thick vegetation including Common Reed and Tamarisk. The footprints and scats of Grey Wolf (*Canis lupus*) were recorded along with a dead Brandt's Hedgehog (*Hemiechinus hypomelas*) (IUCN LC and UzRDB:NT) and Central Asian Tortoise (IUCN:VU and UzRBD:VU). The following bird species were recorded around the small area of open water and associated vegetation included; Common Kestrel (*Falco tunnunculus*), Red-necked Phalarope (*Phalaropus lobatus*), Wood Sandpiper (*Tringa glareola*), Green Sandpiper (*Tringa ochropus*), Little-ringed Plover (*Charadrius dubius*), Black-winged Stilt (*Himantopus himantopus*), Bluethroat (*Luscinia svecica*), Citrine Wagtail (*Motacilla citreola*) and Western Yellow Wagtail (*Motacilla flava*).

Sarykamysh Lake and Surrounding Ustyurt Plateau[18]

This site is also included as an IBA and is approximately 68 km to the south of the redline site boundary (this site was previously 49 km from the original site boundary (see "Section 4.1.1" for Project Alternatives) and was therefore included in the data search area. The IBA includes Sarykamysh Lake, the Ustyurt Plateau and the Eastern Cliffs (Chink) of Ustyurt. The lake is a closed brackish lake located in the central part of the Sarykamysh depression about halfway between the Caspian and Aral seas. It is a cross-border site and the Turkmen portion of the lake is also designated as an IBA. The deep northern part of the lake belongs to Uzbekistan and the remainder to Turkmenistan. It is one of the largest water bodies in Central Asia. The Eastern Cliffs of Ustyurt are located along the east and north-eastern shores of the lake and are of special importance for breeding birds of prey including Egyptian Vulture (*Neophron percnopterus*) and Saker Falcon (*Falco cherrug*). The lake has been rarely surveyed so there is not much data available however it is known to support, or has previously supported, breeding MacQueen's Bustard (*Chlamydotis macqueenii*) and Pin-tailed Sandgrouse (*Pterocles alchata*). Since 2007 three short surveys (spring 2007 and summer and autumn 2010) have been undertaken and 108 species of birds were recorded.

Table 30: Populations of IBA Trigger Species

Species		IUCN Category	Season	Year(s) of Estimate	Population at Site	IBA Criteria Triggered
Common Name	**Scientific Name**					
White-headed Duck	*Oxyura leucocephala*	EN	Passage	2010	2 inds	A1
Common Goldeneye	*Bucephala clangula*	LC	Passage	2010	95 – 595 inds	A4i
Egyptian Vulture	*Neophron percnopterus*	EN	Passage	2010	2 breeding pairs	A1

During the Turnstone Ecology site visit this IBA was visited on the 24th and 25th April 2023, with the western shores visited on the 24th and the northern and eastern shores, including the Chinks on the 25th. Shorebirds were very abundant around the margins of the lake and species recorded included passage flocks of Red-necked Phalarope, Little Stint (*Calidris minuta*), Dunlin (*Calidris alpina*), Common Ringed Plover (*Charadrius hiaticula*) and Curlew (*Numenius arquata*) along with gulls and terns. Along the northern and eastern shores, a nest of a Golden Eagle (*Aquila chrysaetos*) and Egyptian Vulture were

[18] BirdLife International (2023) Important Bird Area factsheet: Sarykamysh lake and surrounding Ustyurt Plateau. Downloaded from http://datazone.birdlife.org/site/factsheet/29791on 20/06/2023.

recorded along with an individual Steppe Eagle (*Aquila nipalensis*). A possible nest of Saker Falcon was also noted as well as individual European Roller (*Coracias garrulus*).

World Heritage Site – Cold Winter Deserts of Turan

The Cold Winter Deserts of Turan World Heritage Site is made up of multiple compartments within Uzbekistan, Kazakhstan and Turkmenistan. Within Uzbekistan and in the vicinity of the Project, five compartments are located as shown on the figure below:

- Compartment 11 - Saigachy
- Compartment 12 – Saigachy-Beleuli
- Compartment 13- Saigachy-Duana
- Compartment 14- Siagachy-Zhideyli
- Compartment 15 – Southern Ustyurt

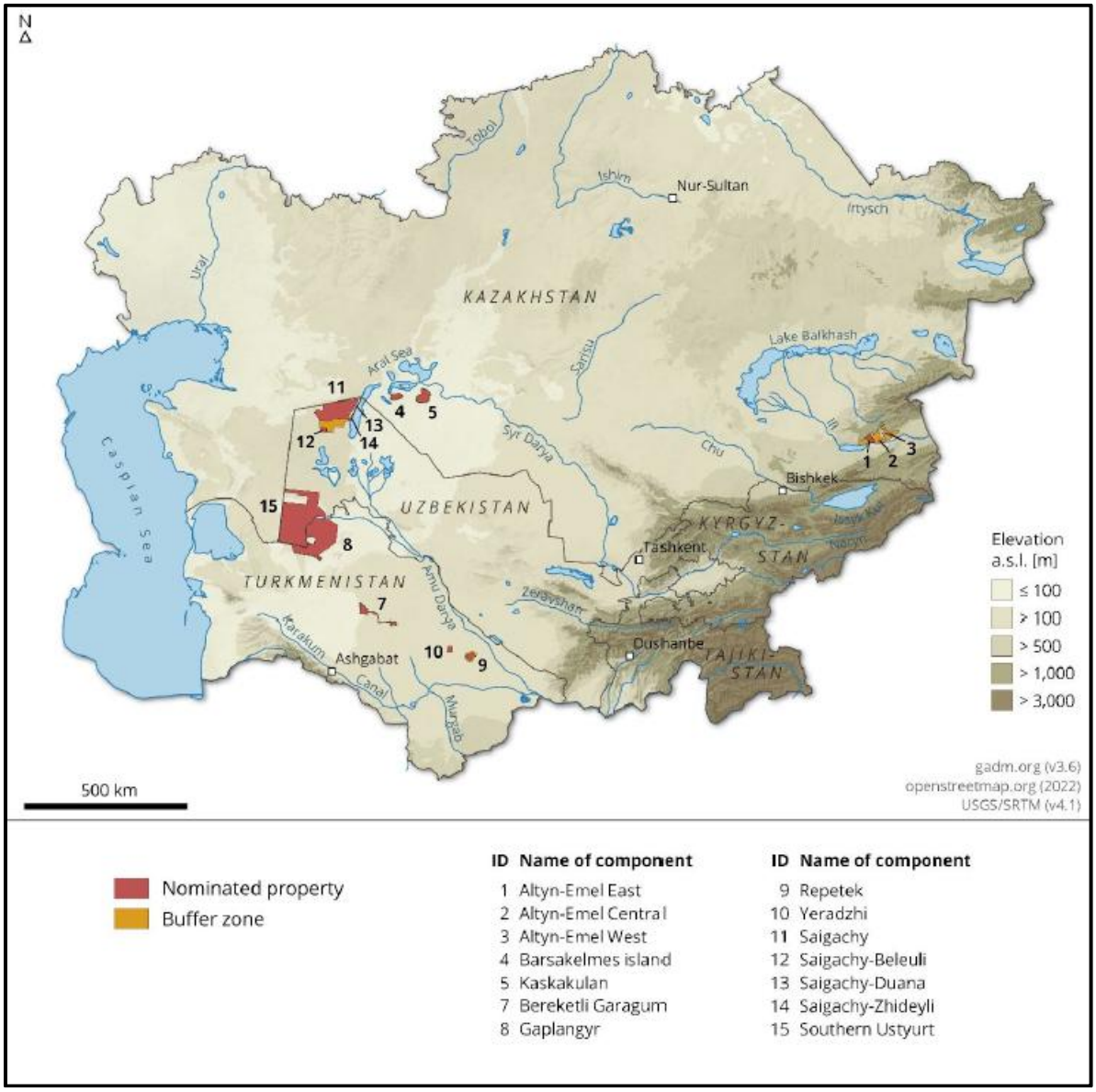


Figure 51: Overview Map About Compartments of the Cold Winter Deserts of Turam

The reasons for the nomination of the World Heritage Site are due to its Outstanding Universal Values (OUVs). Information regarding the OUVs is taken from the 'Draft Statement of Outstanding Universal Value[19].' The Cold Winter Deserts of Turan is designated under Criterion (ix) and (x) as follows:

- Important Species of Plant
- Overlaps with KBAs and IBAs
- Globally Threatened Mammals
    - Kulan (*Equus hemionus kulan*)
    - Goitered Gazelle (*Gazella subgutturosa*)

[19] UNECO Nomination Text, IUCN Text and WHS Management Plan; https://whc.unesco.org/en/list/1693/

- Urial (*Ovis vignei arkal*)
- Saiga (*Saiga tatarica*)
- As well as Honey Badger (*Mellivora capensis*) (northern extreme of global range), Caracal (*Caracal caracal*), Sand Cat (*Felis margarita*) and Marbled Polecat (*Vormela peregusna*)

- Migratory Birds
- Resident MacQueen's (*Chlamydotis macqueenii*) and Great Bustard (*Otis tarda*)
- Herpetofauna including Desert Monitor (*Varanus griseus*) and Central Asian Tortoise (*Testudo horsfieldii*).

For the South Ustyurt (Component 15) which is the closest part of the WHS to the windfarm AoI, the UNESCO nomination text states that the OUVs for the Component includes Kulan, Urial, Honey Badger, bats and other mammals (e.g. cats), White-headed Duck, Egyptian Vulture and the chinks of Sarygamysh Lake. This document as well as the Management Plan for Component 15 does not include Saiga or measures to manage the site for Saiga.

The revised layout of the Wind Farm is outside of the 10 km buffer of Component 15 of the World Heritage Site / South Ustyurt National Park. All other components of the WHS are significantly further than 10 km from the Wind Farm site.

Species of Conservation Concern

The table below shows the species of global conservation concern (IUCN Critically Endangered, Endangered and Vulnerable) considered to be present within the 50 km IBAT search area.

Table 31: Species of Global Conservation Concern

Species		IUCN Category
Common Name	**Scientific Name**	
Saiga**	*Saiga tatarica*	NT
Sociable Lapwing	*Vanellus gregarius*	CR
White-headed Duck	*Oxyura leucocephala*	EN
Pallas's Fish-eagle	*Haliaeetus leucoryphus*	EN
Egyptian Vulture	*Neophron percnopterus*	EN
Saker Falcon	*Falco cherrug*	EN
Eurasian Carp	*Cyprinus carpio*	VU
Depressed River Mussel	*Pseudanodonta complanata*	VU
Bulatmai Barbel	*Luciobarbus capito*	VU
Lesser White-fronted Goose	*Anser erythropus*	VU
Yellow-eyed Pigeon	*Columba eversmanni*	VU
Greater Spotted Eagle	*Clanga clanga*	VU
Eastern Imperial Eagle	*Aquila heliaca*	VU
Cheetah***	*Acinonyx jubatus*	VU
Goitered Gazelle	*Gazella subgutturosa*	VU
Marbled Polecat	*Vormela peregusna*	VU
European Turtle Dove	*Streptopelia turtur*	VU
Great Bustard*	*Otis tarda*	EN
MacQueen's Bustard	*Chlamydotis macqueenii*	VU
Urial	*Ovis vignei*	VU

* Great Bustard has been reassessed as Endangered (IUCN 2023 updated list)

**Saiga has been reassessed as Near-threatened (IUCN 2023 updated list)

*** Cheetah is extinct in Uzbekistan

(ii) Scoping Site Visit

In April 2023 the 'E&S Team' and particularly Turnstone Ecology completed a 14-day Scoping Visit to the Project AoI as well as visiting the adjacent Sudoche Lake, Northern Part of the Assake-Audan Depression IBA and Sarykamysh Lake IBA.

During the Scoping Survey all bird Vantage Points (VPs) were visited and viewsheds verified, static bat detectors were set-up and placed around the site and Turnstone Ecology also undertook training sessions in the use of SM4BAT detectors and data management. All of the selected transects were also driven. Any baseline survey data collected as part of the scoping visit has been used within this assessment.

(iii) Habitats and Flora

Methods

The field surveys to record habitats, flora and vegetation were undertaken over two field visits to the Project AoI completed between 3rd and 7th April 2023 (spring survey) and between June 28th to July 6th 2023 (summer survey) by experienced in-country botanists. A survey protocol was devised by Turnstone Ecology and the surveys consisted of traditional survey transects across the whole of the Project area in addition to which the structure of plant communities was studied on 2x2 m sample plots (quadrats). All plant species present within each quadrat were recorded (including their abundance and % of cover), in particular, threatened species, weeds and invasive species. For each sample plot, photographs of the landscape and plants were taken using a digital camera. During the spring surveys a total of 50 quadrat plots were surveyed along with transects across the AoI and in the summer surveys, 81 quadrats were surveyed along with transect surveys. It is acknowledged that the level of baseline survey effort is limited in its extent however due to the relative homogeny of the dominant habitats present within the AoI, this is not considered a material constraint to the assessment of likely construction and operational impacts. As indicated below the survey and habitat condition scoring methodology for pre-construction surveys (and continued monitoring surveys) has been subject to significant revision.

The vegetation communities were identified on the basis of composition of dominant species in accordance with four-volume "Vegetation cover of Uzbekistan" (1971–1984) and the International Code of Phytosociological Nomenclature (2019).

Herbarium specimens of each plant species present within the Project area were collected and identified in the National Herbarium of Uzbekistan (TASH) using Bresser Advance ICD 10x-160x zoom stereo-microscope and special literature, including "Conspectus Florae Asiae Mediae" (1963–1993), "Flora of Uzbekistan" (1941–1963, 2016, 2017, 2019, 2022), "Flora of USSR" (1934–1964), "An identification guide of vascular plants of the Karakalpakia" (Bondarenko, 1964), "An illustrated identification guide of vascular plants of the Karakalpakia and Xorazm" (Korovina et al., 1982, 1983) and the herbarium collections of TASH, and a summary check-list of the flora was compiled. Species in the checklist are arranged in alphabetic order of their scientific names. Families are given in accordance with the APG system (APG IV, 2016). The accepted scientific names of plant species are given according to the new edition of the "Flora of Uzbekistan" (2016, 2017, 2019, 2022) and global taxonomic databases Plants of the World Online

(www.powo.science.kew.org) and Global Biodiversity Information Facility (www.gbif.org), Russian names are given according "Conspectus Florae Asiae Mediae" (1963–1993), English names (if exist) are given according Global Biodiversity Information Facility (www.gbif.org) and the IUCN Red List (www.iucnredlist.org).

Relevant publications and online databases (Nikitin, 1983; IUCN/ISSG, 2014; CABI, 2017; Sennikov et al., 2018) were used for identification of alien species, while the Red Data Book of Uzbekistan (1984, 1998, 2006, 2009, 2019) and the IUCN Red List (www.iucnredlist.org) were used for identification of threatened species. The results of the survey were used to categorize the habitats present as Modified or Natural and a Condition Score was determined based on the parameters set out in the table below. Habitat condition scores were used to inform preliminary net loss / gain calculations. The condition scores attributed during surveys completed to inform the ESIA, as well as the condition score methodology, has been subject to significant change and this is detailed in full in the Project BMP.

Table 32: Calculation of Habitat Condition Scores

Habitat	Condition Rating	Condition Score	Summary
Site Habitat Definition	Habitat Lost	0.0	Habitat that is irreversibly damaged. For example, by concrete, roads, hard standing quarrying etc. Habitat indicator species are not present
	Very Poor	0.2	Habitat that has been significantly damaged by anthropogenic factors (e.g. agriculture / construction / vehicle). Low number of species present, 10 % of expected coverage for the habitat type present, presence of invasive / non-native species. Habitat indicator species are rare.
	Poor	0.4	Poor quality habitat. Some evidence of anthropogenic factors (e.g. presence of herders or livestock droppings). Low plant species composition and 25% of expected vegetation coverage for the habitat type present. Very low rates of invasive /non-native species. Habitat indicator species are occasional.
	Moderate	0.6	Habitat is improved from Poor but still not supporting a diverse community of plants and coverage 40 – 60% of the expected vegetation coverage for the habitat type present. Invasive / non-native species absent. Habitat indicator species frequent.
	Good	0.8	Site supports a more diverse community of plants with a good 60 - 80% of the expected vegetation coverage for the habitat type present. Habitat indicator species are abundant.
	Very good	1.0	Represents the best quality habitat in the region. 80 – 100% of the amount of plant cover expected for the habitat type present. Habitat indicator species are dominant.

Dominant, Abundant, Frequent, Occasional and Rare are taken from the DAFOR scale which is a quantitative measurement of the abundance of plant species within the quadrats.

The above methods and habitat condition assessment metric was used for the baseline biodiversity surveys and subsequent assessment of likely ecological impacts of the Project.

Extensive work has been completed to update the survey methodology and habitat condition assessment metric for the pre-construction surveys. The revised methods and metric are presented in the Biodiversity Management Plan (BMP) as these revised methods were used for the pre-construction surveys which were completed in May / June 2024. The results of these pre-construction surveys will be used in the Project BMP and BAP and will be used to inform the no-net-loss calculations for natural habitats that are impacted.

Results

During the spring 2023 surveys a total of eleven plant species were recorded across the Project AoI (check table below) and during the summer 2023 surveys a total of 84 plant species were recorded (check table that follows).

Table 33: Results of Spring 2023 Survey

Species Scientific Name	% plants in studied quadrat	UZB Red book	IUCN list sp
Alyssum turkestanicum Regel & Schmalh.	11,30%	No	No
Astragalus sp.	16,24%	No	No
Anabasis eriopoda (Schrenk) Paulsen	25,03%	No	No
Artemisia terrae-albae Krasch.	48,29%	No	No
Atraphaxis spinosa L.	43,35%	No	No
Caragana grandiflora (M. Bieb.) DC.	13,68%	No	No
Ephedra lomatolepis Schrenk	31,66%	No	No
Eremopyrum bonaepartis (Spreng.) Nevski.	13,77%	No	No
Lagochilus acutilobus (Ledeb.) Fisch. Fisch. & C. A. Mey.	17,59%	No	No
Onosma staminea Ledeb.	10,06%	No	No
Haplophyllum versicolor Fisch. & C.A. Mey.	17,05%	No	No

Table 34: Results of Summer 2023 Survey

Species	Family	life form (habit)	Endemism	number of records (quadrats)	occurrence rate (% of quadrats)	native status	quarantine status	UZB Red book	IUCN Red List	CITES
Aeluropus littoralis (Gouan.) Parl.	*Poaceae*	perennial		1	1.23	native	no	no	LC	no
Alhagi pseudalhagi (M. Bieb.) Desv	*Fabaceae*	perennial		3	3.70	native	no	no	no	no
Allium sabulosum Steven ex Bunge	*Amaryllidaceae*	perennial		2	2.47	native	no	no	no	no
Amberboa turanica Iljin	*Asteraceae*	annual		1	1.23	native	no	no	no	no
Anabasis cretacea Pall.	*Amaranthaceae*	subshrub		17	20.99	native	no	no	no	no
Anabasis eriopoda (Schrenk) Paulsen	*Amaranthaceae*	subshrub		15	18.52	native	no	no	no	no
Arnebia decumbens (Vent.) Coss. & M. Král.	*Boraginaceae*	annual		1	1.23	native	no	no	no	no
Artemisia terrae-albae Krasch.	*Asteraceae*	subshrub		55	67.90	native	no	no	no	no
Asparagus breslerianus Schult. & Schult. f.	*Asparagaceae*	perennial		5	6.17	native	no	no	no	no
Astragalus commixtus Bunge	*Fabaceae*	annual		6	7.41	native	no	no	no	no
Astragalus erioceras Fisch. & C.A. Mey.	*Fabaceae*	perennial	endemic to Central Asian deserts	4	4.94	native	no	no	no	no
Atraphaxis spinosa L.	*Polygonaceae*	shrub		29	35.8	native	no	no	no	no
Atriplex dimorphostegia Kar. & Kir.	*Amaranthaceae*	annual		2	2.47	native	no	no	no	no
Bassia eriantha (Fisch. & C.A. Mey.) Kuntze	*Amaranthaceae*	annual		2	2.47	native	no	no	no	no
Bassia prostrata (L.) Beck	*Amaranthaceae*	subshrub		1	1.23	native	no	no	no	no
Capparis spinosa L.	*Capparaceae*	perennial		6	7.41	native	no	no	LC	no
Caragana grandiflora (M. Bieb.) DC.	*Fabaceae*	shrub		1	1.23	native	no	no	no	no
Caroxylon orientale (S.G.Gmel.) Tzvelev	*Amaranthaceae*	subshrub		30	37.04	native	no	no	no	no
Ceratocarpus arenarius L.	*Amaranthaceae*	annual		6	7.41	native	no	no	no	no
Chaenorhinum spicatum Korovin ex Popov	*Plantaginaceae*	annual		1	1.23	native	no	no	no	no
Citharelloma lehmannii Bunge	*Brassicaceae*	annual		4	4.94	native	no	no	no	no
Cleome fimbriata Vicary	*Cleomaceae*	annual		1	1.23	native	no	no	no	no
Climacoptera lanata (Pall.) Botsch.	*Amaranthaceae*	annual		2	2.47	native	no	no	no	no

Species	Family	life form (habit)	Endemism	number of records (quadrats)	occurrence rate (% of quadrats)	native status	quarantine status	UZB Red book	IUCN Red List	CITES
Clypeola jonthlaspi L.	*Brassicaceae*	annual		4	4.94	native	no	no	no	no
Convolvulus fruticosus Pall.	*Convolvulaceae*	subshrub		20	24.69	native	no	no	no	no
Cuminum setifolium (Boiss.) Koso-Pol.	*Apiaceae*	annual		4	4.94	native	no	no	no	no
Cuscuta campestris Yunck.	*Convolvulaceae*	parasite		1	1.23	alien	quarantine weed	no	no	no
Cuscuta epithymum (L.) L.	*Convolvulaceae*	parasite		2	2.47	Prob native	quarantine weed	no	no	no
Cynanchum acutum subsp. sibiricum (Willd.) Rech.f.	*Apocynaceae*	liana, perennial		1	1.23	native	no	no	LC	no
Ephedra distachya L.	*Ephedraceae*	dwarf shrub		11	13.58	native	no	no	LC	no
Epilasia hemilasia (Bunge) C.B. Clarke	*Asteraceae*	annual		3	3.70	native	no	no	no	no
Eremopyrum orientale (L.) Jaub. & Spach	*Poaceae*	annual		30	37.04	native	no	no	no	no
Euphorbia inderiensis Less ex Kar. & Kir.	*Euphorbiaceae*	annual		1	1.23	native	no	no	no	no
Ferula dubjanskyi Korovin ex Pavlov	*Apiaceae*	perennial		4	4.94	native	no	no	no	no
Frankenia pulverulenta L.	*Frankeniaceae*	annual		1	1.23	native	no	no	no	no
Glycyrrhiza triphylla Fisch. & C.A. Mey. (G. erythrocarpa (Vass.) M.N. Abdull.)	*Fabaceae*	perennial		1	1.23	native	no	no	no	no
Goldbachia pendula Botsch.	*Brassicaceae*	annual		1	1.23	native	no	no	no	no
Gypsophila diffusa Fisch. & C.A.Mey. ex Rupr.	*Caryophyllaceae*	perennial		6	7.41	native	no	no	no	no
Halocnemum strobilaceum (Pall.) M. Bieb.	*Amaranthaceae*	subshrub		38	46.91	native	no	no	no	no
Halothamnus glaucus (M. Bieb.) Botsch.	*Amaranthaceae*	subshrub		11	13.58	native	no	no	no	no
Haloxylon ammodendron (C.A.Mey.) Bunge ex Fenzl	*Amaranthaceae*	small tree or shrub		4	4.94	native	no	no	no	no
Haplophyllum bungei Trautv.	*Rutaceae*	perennial		11	13.58	native	no	no	no	no

Species	Family	life form (habit)	Endemism	number of records (quadrats)	occurrence rate (% of quadrats)	native status	quarantine status	UZB Red book	IUCN Red List	CITES
Haplophyllum ramosissimum (Paulsen) Vved.	*Rutaceae*	perennial	endemic to Central Asian deserts	9	11.11	native	no	no	no	no
Heteroderis pusilla (Boiss.) Boiss.	*Asteraceae*	annual		1	1.23	native	no	no	no	no
Hyoscyamus pusillus L.	*Solanaceae*	annual		10	12.34	native	no	no	no	no
Inula multicaulis Fisch. & C.A. Mey.	*Asteraceae*	perennial	endemic to Central Asian deserts	10	12.34	native	no	no	no	no
Iris songarica Schrenk ex Fisch. & C.A.Mey.	*Iridaceae*	perennial		2	2.47	native	no	no	no	no
Jurinea persimilis Iljin	*Asteraceae*	perennial	endemic to Central Asian deserts	1	1.23	native	no	no	no	no
Karelinia caspia (Pall.) Less.	*Asteraceae*	perennial		1	1.23	native	no	no	no	no
Lachnoloma lehmannii Bunge	*Asteraceae*	annual		1	1.23	native	no	no	no	no
Lactuca undulata Ledeb.	*Asteraceae*	annual		1	1.23	native	no	no	no	no
Lagochilus acutilobus (Ledeb.) Fisch. & C.A.Mey.	*Lamiaceae*	perennial	endemic to Central Asian deserts	18	22.22	native	no	no	no	no
Lappula semiglabra (Ledeb.) Gürke	*Boraginaceae*	annual		2	2.47	native	no	no	no	no
Lappula spinocarpos (Forssk.) Asch. ex Kuntze	*Boraginaceae*	annual		38	46.91	native	no	no	no	no
Limonium suffruticosum (L.) Kuntze	*Plumbaginaceae*	subshrub		1	1.23	native	no	no	no	no
Lomelosia rhodantha (Kar. & Kir.) Soják (Scabiosa rhodantha Kar. & Kir.)	*Caprifoliaceae*	annual		2	2.47	native	no	no	no	no
Matthiola tatarica (Pall.) DC.	*Brassicaceae*	perennial		2	2.47	native	no	no	no	no
Nonea caspica (Willd.) G. Don	*Boraginaceae*	annual		3	3.70	native	no	no	no	no
Onosma staminea Ledeb.	*Boraginaceae*	perennial		6	7.41	native	no	no	no	no

Species	Family	life form (habit)	Endemism	number of records (quadrats)	occurrence rate (% of quadrats)	native status	quarantine status	UZB Red book	IUCN Red List	CITES
Orobanche cumana Wallr.	*Orobanchaceae*	parasite		6	7.41	native	no	no	no	no
Paracaryum intermedium (Fresen.) Lipsky	*Boraginaceae*	annual		13	16.05	native	no	no	no	no
Peganum harmala L.	*Nitrariaceae*	perennial		1	1.23	native	no	no	no	no
Phragmites australis (Cav.) Trin. ex Steud.	*Poaceae*	perennial		1	1.23	native	no	no	no	no
Plantago lagocephala Bunge	*Plantaginaceae*	annual		14	17.28	native	no	no	no	no
Plantago minuta Pall.	*Plantaginaceae*	annual		4	4.94	native	no	no	no	no
Puccinellia dolicholepis (V.I.Krecz.) Pavlov	*Poaceae*	perennial		8	9.88	native	no	no	no	no
Ranunculus platyspermus Fisch. ex. DC.	*Ranunculaceae*	perennial		1	1.23	native	no	no	no	no
Rhaponticum repens (L.) Hidalgo (Acroptilon repens (L.) DC.)	*Asteraceae*	perennial		1	1.23	native	quarantine weed	no	no	no
Rheum tataricum L.	*Polygonaceae*	perennial		1	1.23	native	no	no	no	no
Rosa persica Michx. ex Juss.	*Rosaceae*	subshrub		9	11.11	native	no	no	no	no
Senecio subdentatus Ledeb.	*Asteraceae*	annual		2	2.47	native	no	no	no	no
Sisymbrium subspinescens Bunge	*Brassicaceae*	perennial		1	1.23	native	no	no	no	no
Strigosella intermedia (C.A.Mey.) Botsch.	*Brassicaceae*	annual		2	2.47	native	no	no	no	no
Strigosella scorpioides (Bunge) Botsch.	*Brassicaceae*	annual		1	1.23	native	no	no	no	no
Takhtajaniantha pusilla (Pall) Nazarova.	*Asteraceae*	annual		1	1.23	native	no	no	no	no
Tamarix ramosissima Ledeb.	*Tamaricaceae*	shrub		2	2.47	native	no	no	LC	no
Trigonella arcuata C.A. Mey.	*Fabaceae*	annual		4	4.94	native	no	no	no	no
Trigonella stellata Forssk.	*Fabaceae*	annual		2	2.47	native	no	no	no	no
Zygophyllum oxianum Boriss.	*Zygophyllaceae*	perennial		1	1.23	native	no	no	no	no
Zygophyllum pinnatum Cham.	*Zygophyllaceae*	perennial		17	20.99	native	no	no	no	no
Zygophyllum turcomanicum Fisch. ex. Bunge	*Zygophyllaceae*	perennial	endemic to Central Asian deserts	12	14.81	native	no	no	no	no

Species	Family	life form (habit)	Endemism	number of records (quadrats)	occurrence rate (% of quadrats)	native status	quarantine status	UZB Red book	IUCN Red List	CITES
Stipa hohenackeriana Trin. & Rupr.	*Poaceae*	perennial		outside quadrats		native	no	no	no	no
Salsola arbusculiformis Drobow	*Amaranthaceae*	shrub		outside quadrats		native	no	no	no	no
Xylosalsola arbuscula (Pall.) Tzvelev	*Amaranthaceae*	shrub		outside quadrats		native	no	no	no	no

During the summer 2023 surveys 84 plant species of 30 families and 73 genera were recorded (81 species of them were recorded within quadrats and 3 species outside quadrats). Among them, one species is a small tree (Black Saxaul), six species are shrubs, ten subshrubs, 30 species are perennial herbs, 34 annuals, and three species are parasites. Leading families are Amaranthaceae (13 species), Boraginaceae (13), Asteraceae (12 species), Fabaceae (8) and Poaceae (5). Families Convolvulaceae, Plantaginaceae and Zygophyllaceae are represented with 3 species each; Apiaceae, Polygonaceae and Rutaceae includes 2 species, and remaining 19 families are represented with single species. Small stands of Black Saxaul are also scattered sporadically across the AoI, with some denser areas of Saxaul scrub located along small gullies in the center and eastern parts of the AoI.

No species that are listed on the IUCN Red List as Critically Endangered, Endangered, Vulnerable or Near Threatened were recorded during the spring and summer 2023 surveys. In addition, no species listed on the UzRDB were recorded.

Three species were recorded in the summer 2023 surveys that are included on the Uzbekistan list of 'quarantine' weeds (*Rhaponticum repens* (L.) Hidalgo (*Acroptilon repens* (L.) DC.), *Cuscuta campestris* Yunck. and *Cuscuta epithymum*) and of these C*uscuta campestris*, is a non-native species and is potentially invasive.

All other plant species recorded over the two survey visits are native and typical for the flora of the Ustyurt Plateau and Central Asian deserts and no endemic (range-restricted) species were recorded. Six species which are regionally endemic to Central Asian Deserts were recorded and these are:

- Astragalus erioceras Fisch. & C.A. Mey.;
- Haplophyllum ramosissimum (Paulsen) Vved.;
- Inula multicaulis Fisch. & C.A.Mey.;
- Jurinea persimilis Iljin;
- Lagochilus acutilobus (Ledeb.) Fisch. & C. A. Mey.; and
- Zygophyllum turcomanicum Fisch. ex. Bunge.

The habitats within the Project area are natural habitats and belong to the Type 8 (Desert) and Sub-type 8.2 (Temperate Desert) according to IUCN Habitats Classification Scheme, or Stony (gypsum) Desert, according to National Strategy of Biodiversity Conservation. The landscape is represented with almost flat, slightly inclined and undulating plains, and gently sloping hills, dissected with numerous shallow dry erosion gullies, small saline depressions, and small plots of takyrs (periodically inundated loamy depressions with very sparse vegetation). The soils are gypsaceous and sometimes saline loamy or stony gray-brown desert soils. Habitats across the AoI are considered to be natural habitats in accordance with IFC PS6.

The vegetation of the Project area is represented with sagebrush, Halocnemum-Anabasis-saltwort-sagebrush, Anabasis-saltwort-sagebrush and saltwort-sagebrush communities, sometimes with solitary trees of Black Saxaul (*Haloxylon ammodendron* (C.A.Mey.) Bunge) or shrubs (*Atraphaxis spinosa* L., *Caragana grandiflora* (M. Bieb.) DC.). These associations belong to the type Gypsophyta (vegetation of gypsum, or stony deserts). The main dominant species are sagebrush (*Artemisia terrae-albae* Krasch.) and perennial saltworts (Anabasis eriopoda (Schrenk) Paulsen, *A. cretacea* Pall., *Caroxylon orientale* (S.G.Gmel.) Tzvelev, *Halocnemum strobilaceum* (Pall.) M.Bieb.), forming a monotonous greyish-green aspect. Subdominants are *Atraphaxis spinosa* L., *Halothamnus glaucus* (M. Bieb.) Botsch., *Convolvulus*

fruticosus Pall., *Ephedra distachya* L. Other species, as Tamarisk (*Tamarix ramosissima* Ledeb.), Camel Thorn (*Alhagi pseudalhagi* (M. Bieb.) Desv.), annual saltworts (*Bassia eriantha* (Fisch. & C.A. Mey.) Kuntze, *Ceratocarpus arenarius* L., *Climacoptera lanata* (Pall.) Botsch.), *Lagochilus acutilobus* (Ledeb.) Fisch. & C.A.Mey., species of family Boraginaceae and Brassicaceae, genera Astragalus, Trigonella, Haplophyllum and Zygophyllum, grasses (Aeluropus littoralis (Gouan.) Parl., Eremopyrum orientale (L.) Jaub. & Spach, Phragmites australis (Cav.) Trin. ex Steud., *Puccinellia dolicholepis* (V.I.Krecz.) Pavlov), occur sporadically, and their abundance is low. Additionally, 3 species were recorded outside quadrats – *Salsola arbusculiformis* Drobow, *Xylosalsola arbuscula* (Pall.) Tzvelev, and *Stipa hohenackeriana* Trin. & Rupr.

The vegetation coverage across the AoI is sparse (mostly with typically 20–30 % cover or less, rarely 40–50 %). Plants are scattered or occur in patches, or sometimes form an interrupted canopy, and the diversity of species is rather low (2 to 12 species per sample quadrat), however this is typical of vegetation within gypsum deserts. Taking into account above mentioned habitat condition scores, the habitats of the Project area can be assessed as natural habitat of good quality with a score of 0.8 as it consists of typical habitat for the Ustyurt Plateau and supports a typical vegetation community with relatively low abundance of weed / non-native species and sparse vegetation coverage.

There are also areas of very degraded habitats across the Project AoI and in these areas the habitats would be assessed as being Modified and would be Condition Score 0.0 (habitat lost), or 0.2 (very poor). These habitat areas are associated with existing vehicle tracks and areas where blasting has been completed for geological exploration (this issue is discussed further under “Section 9”). In addition the habitats within the Ustyurt are under pressure from degradation from the drying of the Aral Sea resulting in salt and other airborne deposits settling over the whole of the Ustyurt[20]. The upper soil layer is very fragile and once lost the likelihood of habitat recovery is very low and the modification of the habitat and poor condition is further exacerbated by continuous erosion both natural (wind and rain) and unnatural (repeated vehicle movements). This is especially true of the Project’s haul road which will follow the wide (up to 50m in places) and deeply rutted existing vehicle track from Kirkkiz to the Project AoI. There are also regularly used vehicle tracks crossing the Project AoI and, in these areas, habitat has also been lost as well as in areas of previous geological exploration or areas of compacted soil.

The habitats present on the site are not listed as Annex 1 or Priority Habitats and as such are not considered as Critical Habitat. On-site habitats are good condition natural habitats which are assessed as being of medium Sensitivity. Areas where habitats have been modified and heavily degraded (lost) are assessed as being of Low to Negligible Sensitivity.

[20] Transformation of vegetative cover on the Ustyurt Plateau of Central Asia as a consequence of the Aral Sea shrinkage. Adilov Bekzod, 2021

Figure 52: Anabasis-saltwort-sagebrush community (Artemisia terrae-albae Krasch., Anabasis eriopoda (Schrenk) Paulsen, A. cretacea Pall., Caroxylon orientale (S.G.Gmel.) Tzvelev)

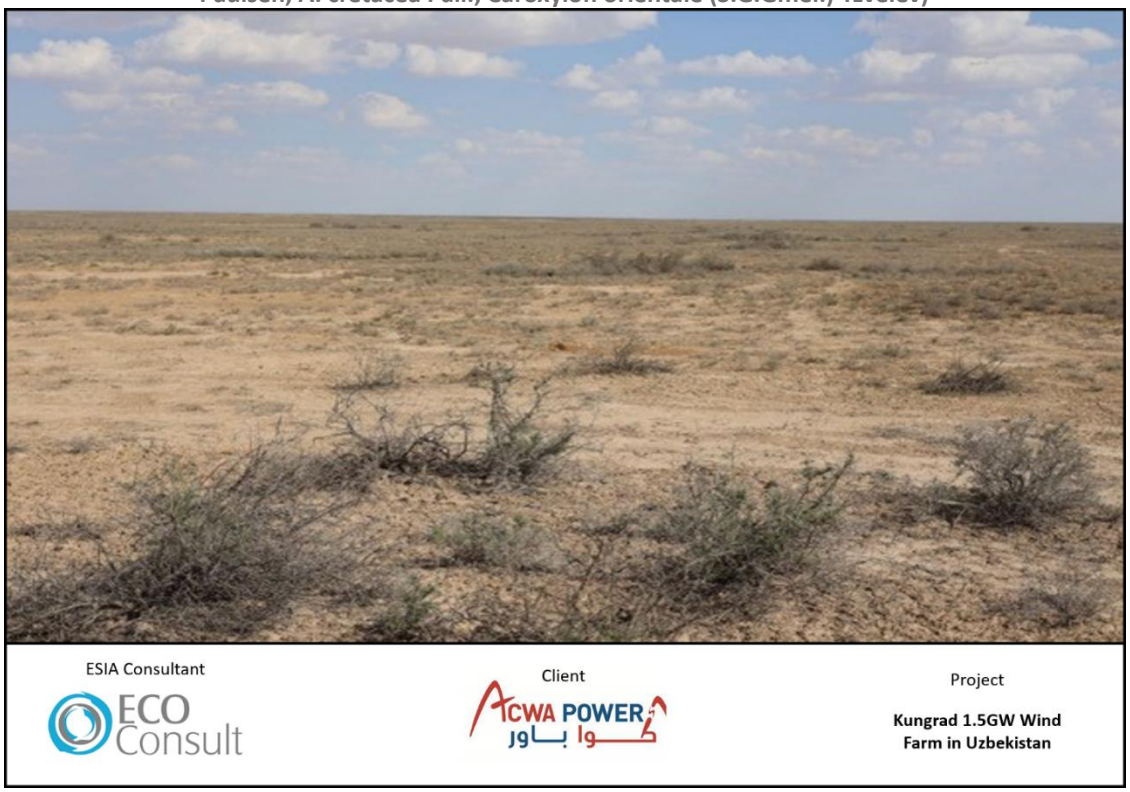


Figure 53: Saltwort-sagebrush community (Artemisia terrae-albae Krasch., Caroxylon orientale (S.G.Gmel.) Tzvelev) with Atraphaxis spinosa L.

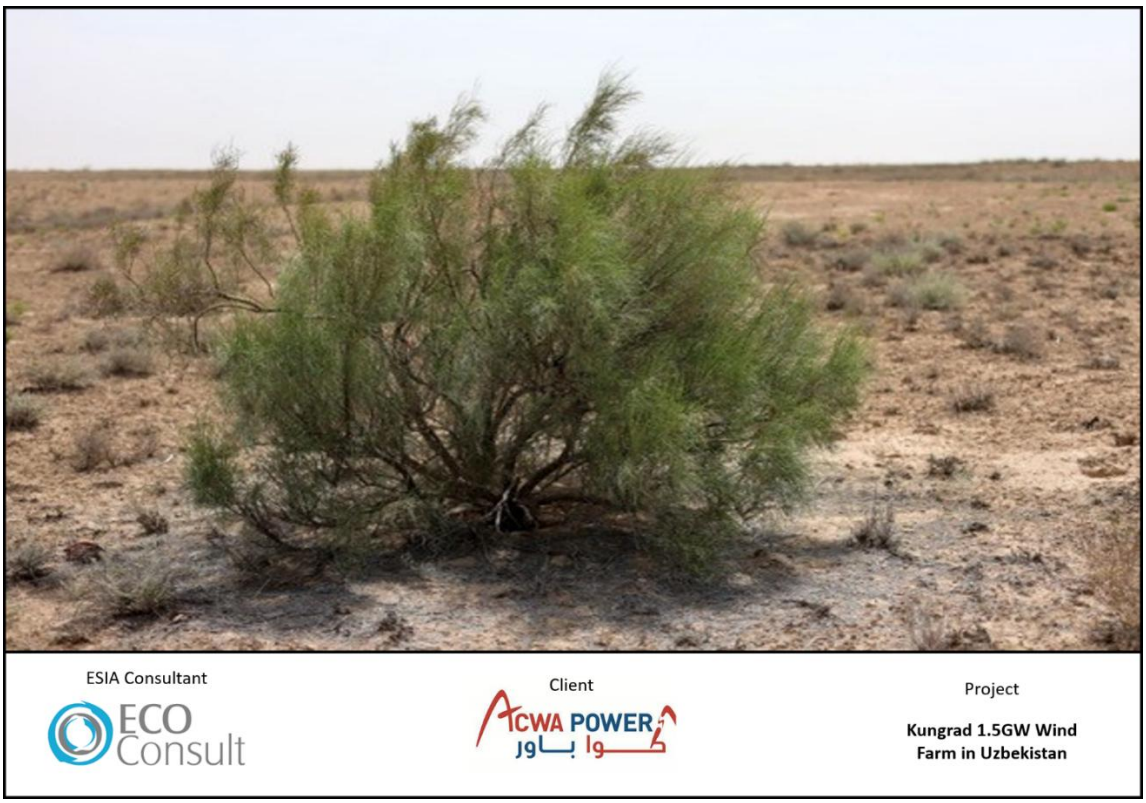


Figure 54: Solitary tree of Black Saxaul (Haloxylon ammodendron (C.A.Mey.) Bunge) among the gypsum desert

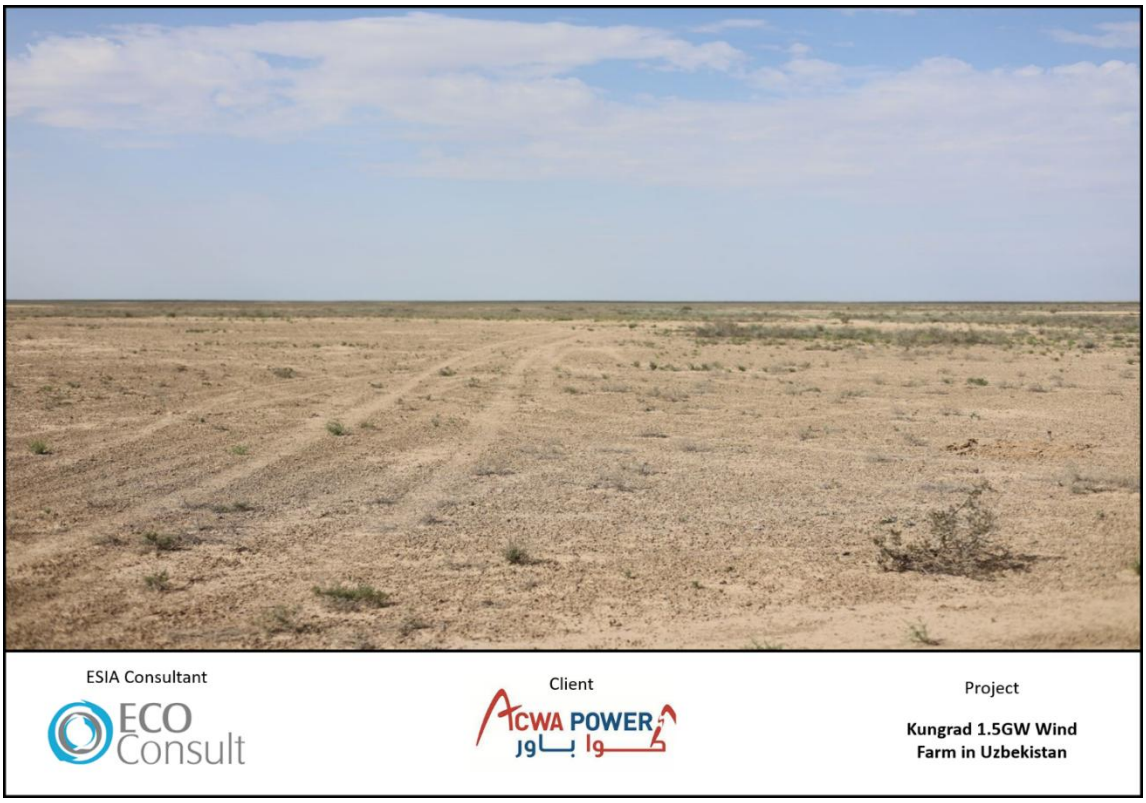


Figure 55: Takyr (periodically inundated loamy depressions with very sparse vegetation

Figure 56: Takyr (periodically inundated loamy depressions with very sparse vegetation

Figure 57: White saltwort (Xylosalsola arbuscula (Pall.) Tzvelev)

Figure 58: Vehicle tracks modified (lost) habitat within the Project AoI

Figure 59: Vehicle tracks modified (lost) habitat along track from Kirkkiz to site

(iv) Reptiles and Amphibians

Methods

Field studies were carried out according to generally accepted zoological methods for identifying species composition. The following methodological guidelines were used in the survey: L. G. Dinesman, M. L. Kaletskaya (1978), V. M. Makeev, A. T. Bozhansky (1988) and N. N. Shcherbak (1989), D. A. Bondarenko, Chelintsev, (1996).

The field research methodology reflects the following aspects:

- Species composition in the study area;
- Distribution across habitats; and
- Daily and seasonal changes in activity.

Thus, the method of quantitative assessment was based on the ecology of the species under consideration, landscape and geographical conditions, season, and type of work.

The quantitative assessment of reptiles was mainly based on the transect survey, although some point counts were completed. The transect method consists of counting individuals along a fixed long line (transect), with surveyors recording on both sides of the transect. All individuals encountered on the transect are registered and the distance is measured between the transect axis and each individual. The results obtained are used to calculate the density of recorded reptiles.

The reptile's population density (D) was calculated using the following formula (Bondarenko, Chelintsev, 1996):

$$\boldsymbol{D = \frac{n}{2LB}}$$

where ***n*** – number of animal individuals recorded on the transect; ***L*** – length of the transect; ***B*** – formula to calculate an effective width of the survey strip:

$$\boldsymbol{B = W(0,79F + 0,21F^4)}$$

where ***W*** – width of the limited strip on both sides of the transect axis; ***F:***

$$\boldsymbol{F = \frac{2y}{W}}$$

The recording of the distance of animals recorded and the transect excludes underestimation of the population density of the reptiles caused by a decrease in their detectability in remote parts of the survey strip, regardless of the degree of its limitation (Bondarenko and Chelintsev, 1996).

The abundance of the reptiles in habitats was estimated using the following population density scale for one/ha (Kuzyakin, 1962): 0.1 – 0.9 – rare, 1.0 – 9.9 – common, 10.0 and higher – abundant.

Two surveys were completed across the Project AoI to record populations of reptiles:

- Spring Survey - 13th to 16th April 2023, and
- Summer Survey – 20th to 24th June 2023.

The spring surveys were however conducted under sub-optimal conditions with very low (-3^{0}c) night-time temperatures and low (+6^{0}c) daytime temperatures. As a result of this it was not possible to estimate

spring population density of reptiles within the Project AoI. A total of 38.3 km of transects were walked / driven, along with additional drives around the site. However, during the summer surveys the weather conditions were ideal and population estimates could be calculated. Due to the poor spring conditions additional reptile transects were completed at the Vantage Points (VP) to increase the survey coverage across Project AoI such that accurate population estimates of reptiles' present could be calculated. A total of 36 summer transect surveys were conducted at the Project Site, with a total length of 67.8 km (check figure below). Tortoises were active across the Project AoI until the end of July 2023 possibly as a result of delaying aestivation due to summer rains and lower spring temperatures. Additional records of reptiles present on the site were returned as incidental sightings from the ornithological survey team when they were conducting VP and transect surveys.

Surveys completed in late spring / early summer, when tortoises and other reptiles were active were able to reliably inform population density estimates across the AoI. Surveys were undertaken at an appropriate time of year and day to be able to record species that may be present. Out of a total of 16 species possibly present in the project area, 11 species were recorded.

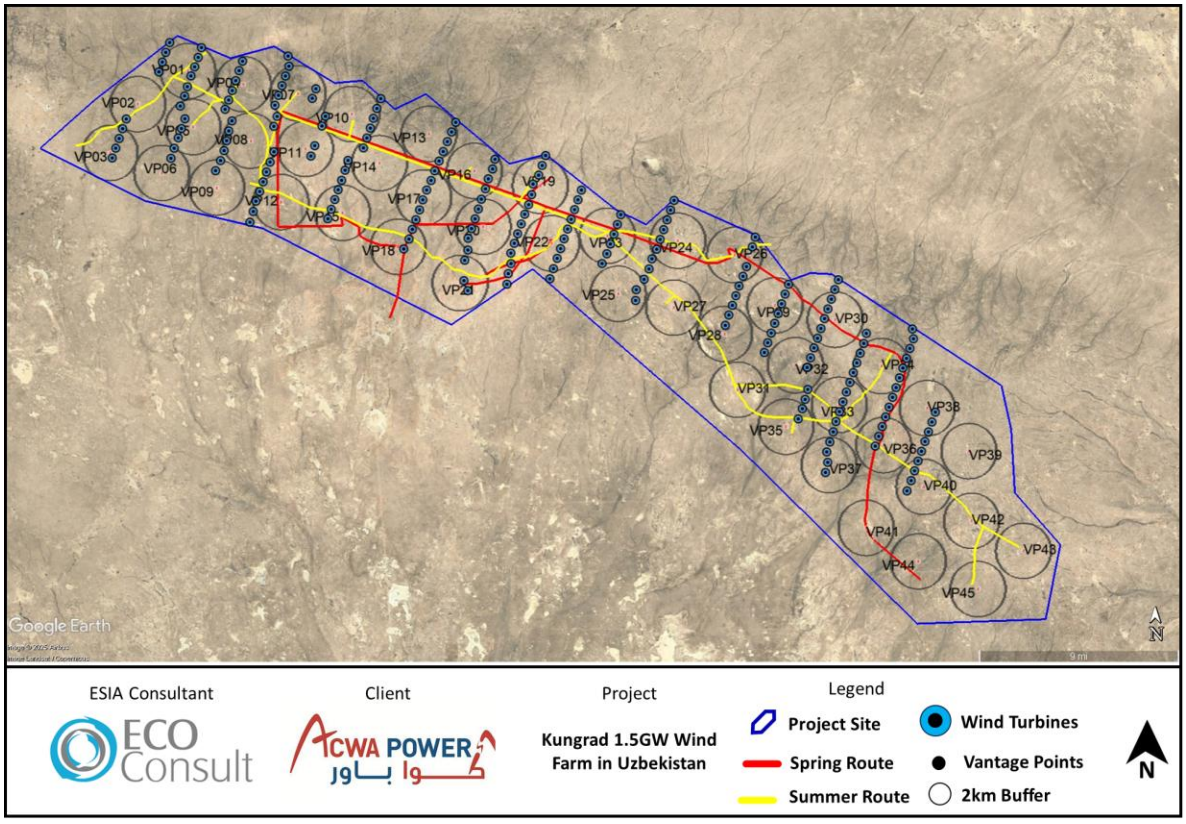


Figure 60: Reptile Survey Transects – Spring Routes Blue, Summer Routes Yellow

Results

The results of the reptile surveys completed in Spring and Summer 2023 are shown in the table below and are summarized below.

In general, the composition of the herpetofauna within the Project AoI is typical of the Ustyurt Plateau and the site supports fairly low densities of common and widespread species. Five species of reptile were recorded during the sub-optimal surveys completed in Spring 2023 and eleven species were recorded during optimal conditions during the Summer 2023 surveys. Of the species recorded, one is of international conservation concern:

- Central Asian Tortoise (*Testudo horsfieldii*) – IUCN: Vulnerable

Of the species of reptile recorded within the Project AoI, three are of national conservation importance and are included on the Uzbekistan Red Data Book. These are:

- Central Asian Tortoise (*Testudo horsfieldii*) – UzRDB: Vulnerable (2), declining
- Desert Sand Boa (*Eyrx miliaris*) – UzRDB: Near Threatened (3)
- Blotched Rat-snake (*Elaphe sauromates*) – UzRDB: Vulnerable, Naturally Rare

The density of Central Asian Tortoise across the Project AoI is relatively low with population densities considered to be no greater than 0.3 individuals/hectare.

There are no habitats within the Project AoI suitable for amphibians and as such amphibians were not recorded during the survey effort. As such amphibians are therefore not discussed further in this report.

Table 35: Results of the Spring and Summer Reptile Surveys

Common Name	Scientific Name	Present		Population Density+	Abundance	Conservation Status		
		Spring	Summer			IUCN	UzRDB	CITES
Family *Testudinidae* (Tortoises)								
Central Asian Tortoise	*Testudo horsfieldii*	Y	Y	0.17 / 0.3	Widespread	VU	2 (VU)	II
Family *Gekkonidae* (Geckos)								
Caspian Even-fingered Gecko	*Alsophylax pipiens*	N	Y	7.02 (VP23 only – 7 inds)	Common where present but very patchy distribution	-	-	-
Transcaspian bent-toed Gecko	*Mediodactylus russowi*	N	Y	3.1 (VP19 only – 2 inds)	Uncommon Very patchy distribution	-	-	-
Caspian Bent-Toed Gecko	*Tenuidactylus caspius*	N	Y	3.61 / 6.1	Widespread / Common	-	-	-
Family *Agamidae* (Agamas)								
Steppe Agama	*Trapelus sanguinolentus*	Y	Y	1.8 / 6.9	Widespread / Common	-	-	-
Sunwatcher Toad-headed Agama	*Phrynocephalus helioscopus*	Y	Y	4.7 / 6.1	Widespread / Common	-	-	-
Family *Lacertidae* (True Lizards)								
Steppe Racerunner	*Eremias arguta arguta*	Y	Y	0.7 (VP33 only – 1 ind)	Uncommon, very patchy distribution	-	-	-
Rapid Lizard	*Eremias velox*	Y	Y	1.99 / 3.1	Widespread / Common	-	-	-
Family *Boidae* (Boas)								
Desert Sand Boa	*Eryx miliaris*	N	Y	0.4 (VP27 only – 1 ind)	Uncommon, very patchy distribution	-	3 (NT)	II
Family *Colubridae* (Colubrid Snakes)								
Sand Racer	*Psammophis lineolatus*	N	Y	0.54 / 0.6	Uncommon, very patchy distribution	-	-	-
Blotched Rat-snake	*Elaphe sauromates*	N	Y	0.28 / 0.3	Uncommon, very patchy distribution	-	2(VU:R)	-

[+] - Population densities (individuals/hectare) shown; firstly, Average Density and secondly Peak Density from the Summer 2023 survey.

Notes: UzRDB – species/subspecies listed in the Red Data Book of Uzbekistan (2019) (2 (VU) – vulnerable; 2 (VU:D) – vulnerable, declining; 3 (NT) – near-threatened); IUCN – species included in the Red List of the International Union for Conservation of Nature (EN – endangered; VU - vulnerable); CITES I, II – species listed in the appendices (I, II) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora

(v) Mammals (excluding bats)

Methods

Two surveys were undertaken by in-country mammal specialists in 2023, the first between 30th March and 3rd April 2023 and the second between 1st and 6th August 2023. The terrestrial mammals survey included a full walkover/drive of the Project AoI during which time any signs of mammals including scat, footprints, direct observations, burrows, or other signs was recorded in full. Where mammals of international or national conservation concern were recorded, they were mapped, and their location recorded on to a GPS device.

In addition to transect surveys, 50 camera traps were deployed across the site in February 2023 and were left in situ until the 28th of March. 30 camera traps were then deployed at the end of April 2023 and remained on site until the end of October 2023. The results of the camera trapping up to the end of July 2023 are included in this Section. The locations of the camera traps are shown on the figures below and cameras were deployed at the Vantage Points (VPs) during the first deployment and during the second deployment the locations were changed so that they were overlooking prominent landscape features that were likely to be regularly used by mammals within the AoI (e.g. gully, high points). The memory cards and batteries in the camera traps were managed by the Ornithological Survey Team.

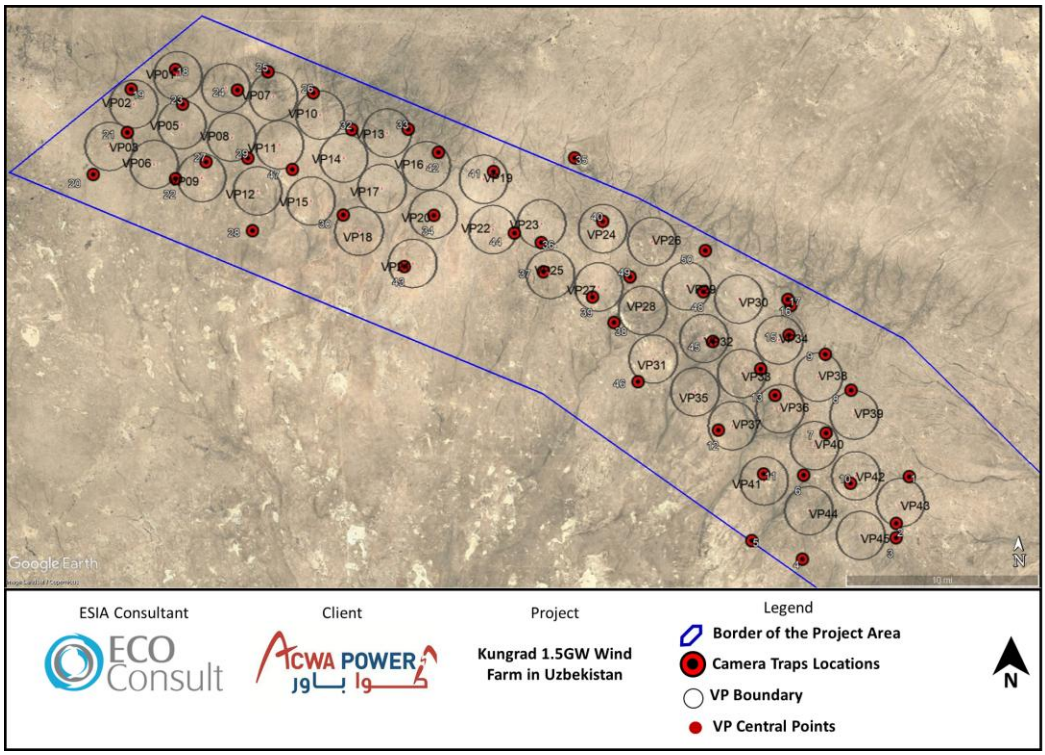


Figure 61: Location of Camera Traps – First Deployment (February to March 2023)

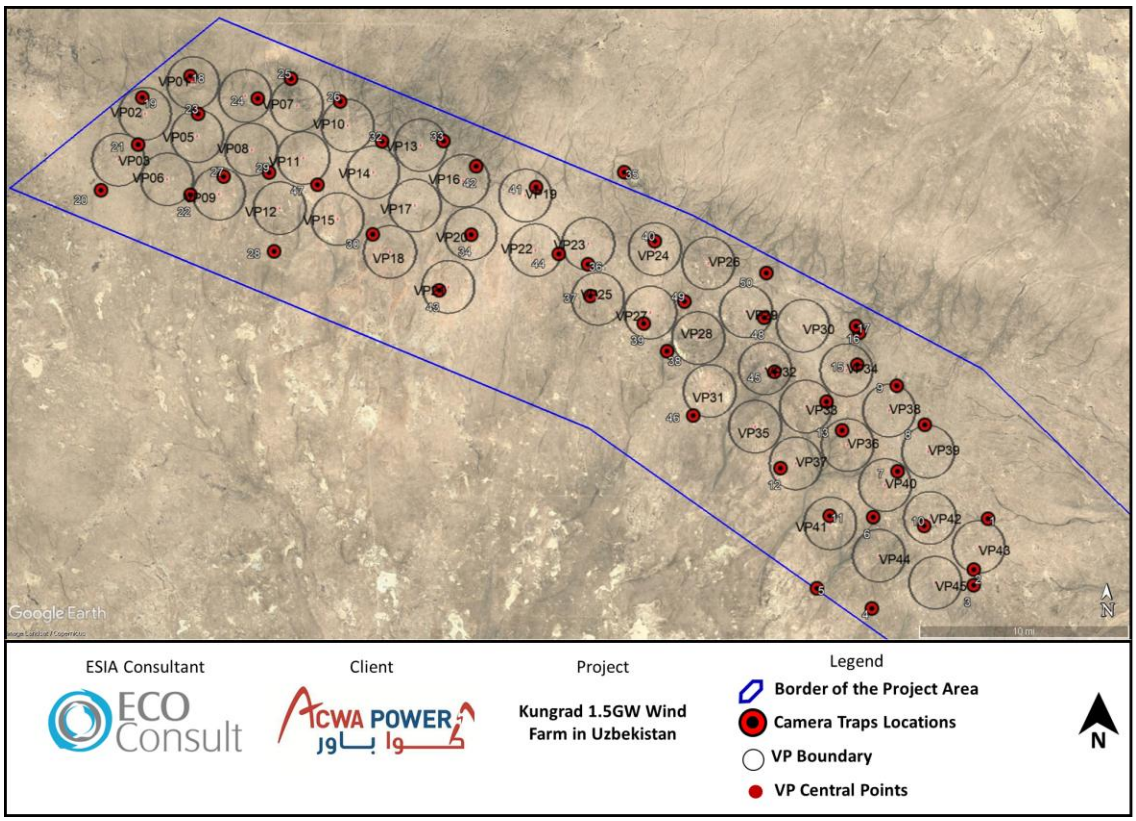


Figure 62: Location of Camera Traps – Second Deployment (April to October 2023)

Further to these surveys, the Ornithological Survey Team recorded all incidental sightings of mammals seen whilst undertaking the avifauna surveys and also completed population size class counts of mammals at each of the VPs. This was completed by undertaking 500m x 500m quadrat surveys from each of the 45 Vantage Points. Count estimates of colonies (gerbil sp.) and towns (Mole-voles), as well as individual burrows (jerboas, Red Fox and Corsac Fox) were recorded. Registrations of Tolai Hare, foxes and Goitered Gazelle were recorded, where encountered. The ornithological survey team have been on site from January to November 2023 and as such it is considered that any more mobile species (e.g. Goitered Gazelle) would have been recorded if they were present on the Project site.

Separate work was carried out on the analysis of species according to the composition of Eurasian Eagle Owl pellets.

The results field surveys are shown in the table below.

Table 36: Results of the 2023 Mammal Survey, Incidental Survey, Eagle Owl Pellet Analysis and Camera Trap Survey

Common Name	Scientific Name	Survey Type				Field Notes	Conservation Status		
		Field	Incidental	Pellet	Camera		IUCN	UZRDB	CITES
Long-eared Hedgehog	*Hemiechinus auritus*	Y	Y	Y	N	Widespread and common throughout AoI	LC	-	-
Brandt's Hedgehog	*Hemiechinus hypomelas*	Y	Y	Y	N	Two skins found	LC	3 (NT)	-
Piebald Shrew	*Diplomesodon pulchellum*	N	N	Y	N	One lower jaw in owl pellet, not recorded on survey	LC	-	-
Yellow Ground Squirrel	*Spermophilus fulvus*	Y	Y	N	N	Widespread and common throughout AoI	LC	-	-
Great Gerbil	*Rhombomys opimus*	Y	N	N	N	Burrows only recorded, 90% of colonies were uninhabited, not found in pellets	LC	-	-
Libyan Gerbil	*Meriones libycus*	Y	Y	Y	N	Burrows only recorded and small number of bones in pellets, very low numbers (indicating a dry year in 2021-2022)	LC	-	-
Midday Gerbil	*Meriones meridianus*	Y	Y	Y	N	Both adult and young bones in pellets, colonies recorded. Large population	LC	-	-
Severtzov's Jerboa	*Allactaga severtzovi*	Y	N	N	N	Only one hole seen, not occupied	LC	-	-
Great Jerboa	*Allactaga major*	Y	N	Y	N	Single burrow recorded and bones recorded in pellets. Patchy distribution	LC	-	-
Small Five-toed Jerboa	*Allactaga elater*	Y	Y	Y	N	Holes found across the AoI and bones in pellets	LC	-	-
Northern Three-toed Jerboa	*Dipus sagitta*	Y	N	N	N	Single hole recorded at VP15	LC	-	-
Dwarf Fat-tailed Jerboa	*Pygeretmus pumilio*	N	N	Y	N	Only recorded in pellets. Widespread across Ustyurt	LC	-	-
Mole Vole	*Ellobius talpinus*	Y	Y	Y	N	Widespread across AoI within all VPs. Bones in pellets	LC	-	-

Common Name	Scientific Name	Survey Type				Field Notes	Conservation Status		
		Field	Incidental	Pellet	Camera		IUCN	UZRDB	CITES
Grey Hamster	*Cricetulus migratorius*	Y	Y	Y	N	Widespread across AoI. Bones in pellets	LC	-	-
Tolai Hare	*Lepus tolai*	Y	Y	Y	Y	Widespread and common across AoI. Regularly encountered during surveys. Bones in pellets	LC	-	-
Fox	*Vulpes vulpes*	Y	Y	N	Y	Abundant and widespread across AoI	LC	-	-
Corsac Fox	*Vulpes corsak*	Y	N	N	N	Uncommon, burrows noted along with pug marks	LC	2 (VU:D)	-
Caracal	*Caracal caracal*	N	N	N	Y	Not recorded on field survey, up to three individuals recorded on camera traps in the northern part of the AoI. ~	LC	CR	Cites I
Marbled Polecat	*Vormella pereguzna*	Y	N	N	N	Tracks recorded at VP40. This species uses the burrows of *Spermophilus fulvus*	VU	2 (VU:D)	-
Honey Badger	*Millivora capensis*	Y	Y	N	Y	Burrows at VP 19 and 20 as well as at 43.06344, 56.28244 (1.3km south of AoI boundary). Recorded very sporadically on camera traps. Likely between 4 and 8 individuals within the AoI.	LC	1 (CR)	-
Goitered Gazelle	*Gazella subgutturosa*	N	Y	N	Y	Rare within Uzbekistan and severe recent declines. Single adult (possibly calving female) recorded at VP45, April 2023.Dung, tracks, bones and horns recorded sporadically. Camera traps recorded individuals or small herds (up to three animals) on the western and eastern edges of the AoI. Sporadic records over survey period.	VU	2 (VU:D)	Cites II, CMS II

Common Name	Scientific Name	Survey Type				Field Notes	Conservation Status		
		Field	Incidental	Pellet	Camera		IUCN	UZRDB	CITES
Saiga[21]	*Saiga tatarica*	N	N	N	N	Considered recently extinct from AoI. Horn found at VP27 (approx. 3 to 5 years old) humerus at VP42 (5 to 7 years old)	NT	1 (CR)	Cites II, MoU CMS, CMS II

[21] The southern part of the Ustyurt Plateau includes Karabaur which was historically inhabited by Saiga which migrated from the north part of its historic range. However, the number of Saiga in Uzbekistan has been steadily declining (E.J. Milner-Gulland et al., 2020). The last mass migration to the south was noted in 2004/2005 (Bykova et al., 2010). After this, the animals did not migrate deeply to south of Uzbekistan (Bykova, Esipov, 2011; 2015; Bykova et al., 2018). Most likely, the remaining individuals were killed by poachers and died from natural reasons. The latest Saiga records in Karabaur and the adjacent territories of Southern Ustyurt refer to 2012-2013 (Karabaur, Shakhpakhty, Asake-Audan Depression, Lake Sarykamysh) (Cadastre of rare and endangered animal species of the Republic of Karakalpakstan. Ed. by E.A. Bykova (in press). In the opinion of the mammal experts the South Ustyurt Saiga population is now extinct. Single individuals may enter from the territory of Kazakhstan (pers.comm. by Maksim Mitropolsky, 2023), but a stable group does not exist more.

Discussion of Notable Records

Honey Badger (*Mellivora capensis*) – IUCN LC, UzRDB CR

Within Uzbekistan, this species is only found within the central and southern parts of the Ustyurt Plateau, however records are rare. Five Honey Badger holes were found at VP19 (3 holes) and VP20 (2 holes) as well as another hole 1.3 km south of the Project AoI.

Honey Badger was recorded seven times during the camera trap surveys with distribution within the northern and eastern parts of the Project AoI (check figure below).

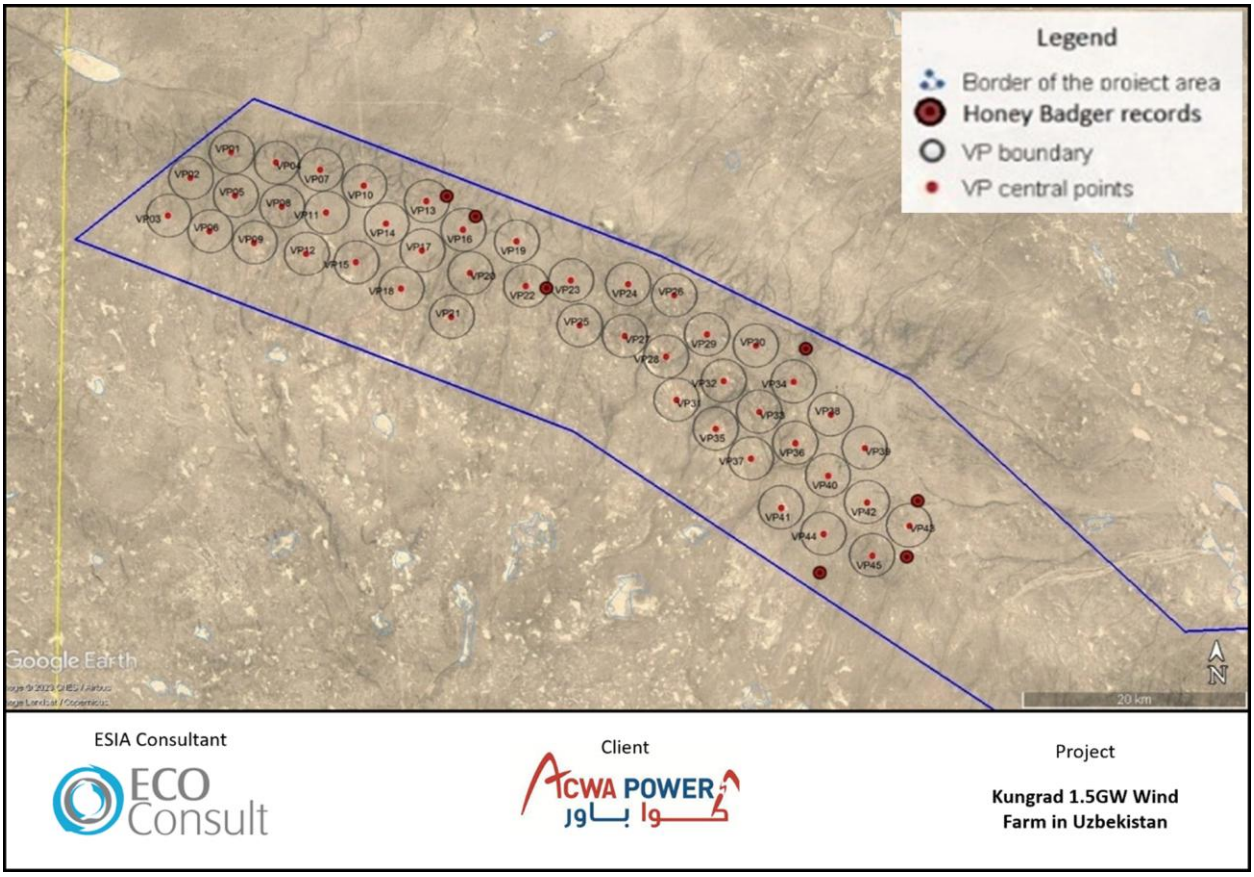


Figure 63: Location of Honey Badger Camera Trap Records

Figure 64: Honey badger Camera Trap Pictures

Saiga (*Saiga tatarica*) – IUCN CR, UzRDB CR

Due to significant increases in population, this species has been recently downgraded by the IUCN from Critically Endangered to Near Threatened. Recent population counts (2015-2022) of this species are included in the table below.

Table 37: Saiga numbers in 2015-2022. (Ustyurt population are transboundary)

Year	Population size, heads (extrapolation)			
	Ural	Ustyurt*	Betpakdala	Total
2015	51 700	1 270	242 500	295 470
2016	70 200	1 900	36 200	108 300
2017	98 200	2 700	51 700	152 600
2018	135 000	3 700	76 400	215 100
2019	217 000	5 900	111 500	334 400
2020			-	-
2021	545 000	12 000	290 000	842 000
2022	801 000	28 000	489,000 (467,000 aerial census and 22,00 Eastern grouping)	1,318,000

*Due to low numbers (up to 2022) in the Ustyurt population, undercounting was possible

There are no recent records from within the Project AoI and this species has not been recorded, other than one old bone and one old horn, from surveys completed to date. It is noted, as above, that single individuals may rarely enter from the territory of Kazakhstan (pers.comm. by Maksim Mitropolsky, 2023), but a stable group does not exist more. This species has suffered significant recent population declines as a result of severe winter conditions, viral infection and also suffers significant poaching losses. In addition, it has suffered significant disruption to traditional migration routes as a result of cross-border fencing, existing infrastructure (i.e. roads, railway lines and pipelines) and disturbance from increased human activity (e.g. geological exploration).

This species is considered to be absent from the Project AoI. Within Uzbekistan currently the only viable population of Saiga living in Uzbekistan is found on the island of Vozrozhdeniye (Peoples Trust for Endangered Species, 2018[22]), within the Aral Sea. Due to shrinking of the sea the island is no longer an island but a peninsula.

The Project AoI is no longer used by this species during its migration mainly as a result of previous population crashes and the installation of a border fence. Recent distribution of Saiga in Uzbekistan is limited to northern Uzbekistan in the region of the Saigachi Nature Reserve to the west of the Aral Sea, although historically and in extremely cold winters animals would occasionally migrate through to Turkmenistan (first and second figure below) and migration to the southern part of the plateau, including into Turkmenistan only rarely occurred and only in extreme cold winters. Normal migration routes are shown on the third and fourth figures below for 2015 and 2013 (prior to the installation of the border fence) respectively[23].

[22] PTES 2018.

[23] Saiga Crossing Options Guidelines and Recommendations to Mitigate Barrier Effects of Border Fencing and Railroad Corridors on Saiga Antelope in Kazakhstan. Kirk Olson

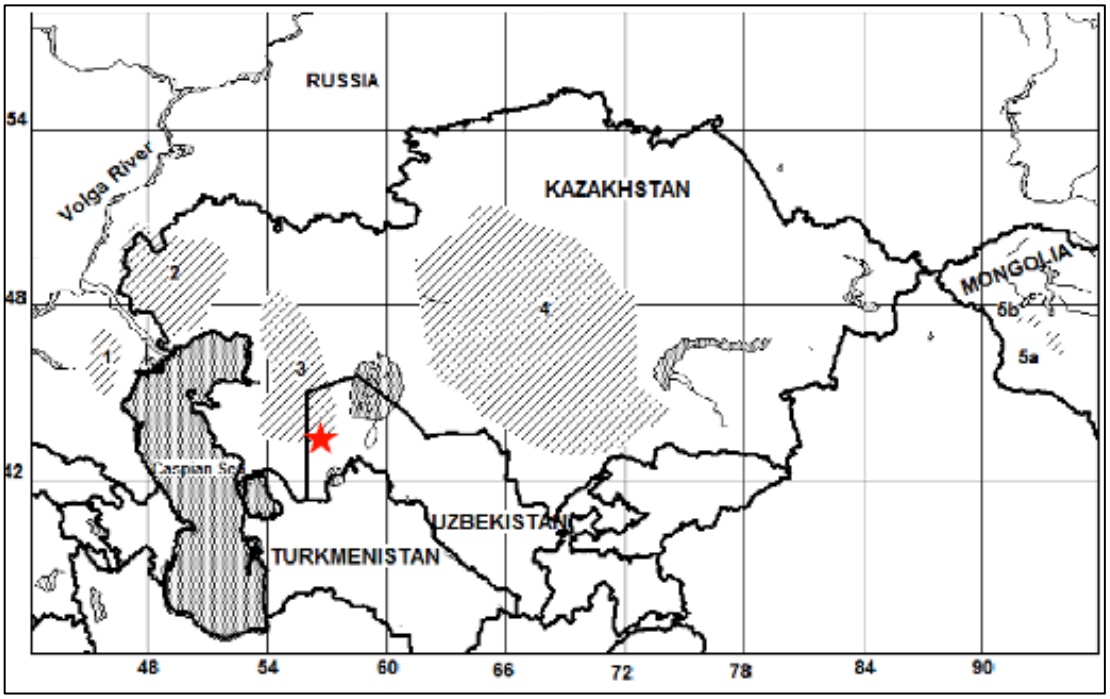


Figure 65: Global saiga antelope distribution within Kazakhstan, Uzbekistan, Mongolia, and Russia (Kalmykia) (Bekenov & Milner-Gulland 1998) (approximate Project location shown as red star)

Figure 66: Approximate range of the Ustyurt (A) and Betpak-Dala (B) Saiga populations 2013 (approximate Project location shown as red star)

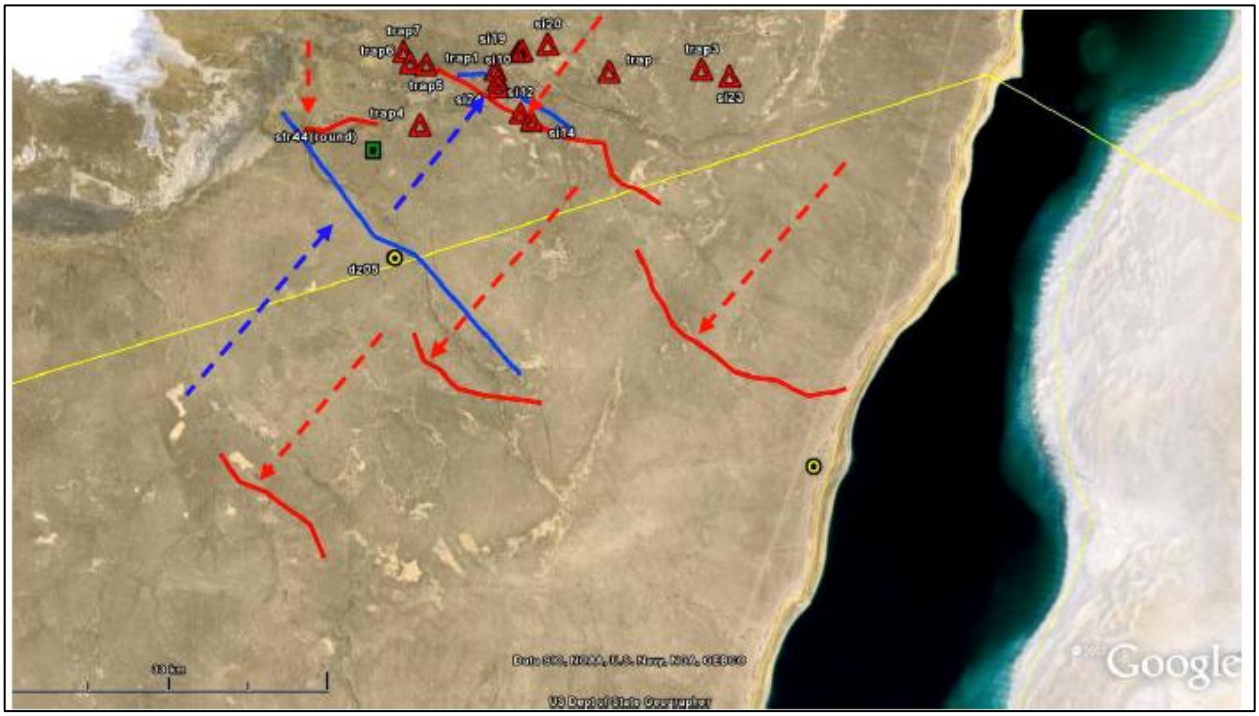


Figure 67: Probable direction of autumn (red arrows) and spring (blue arrows) Saiga migration in Uzbekistan and adjacent regions of Kazakhstan 2015

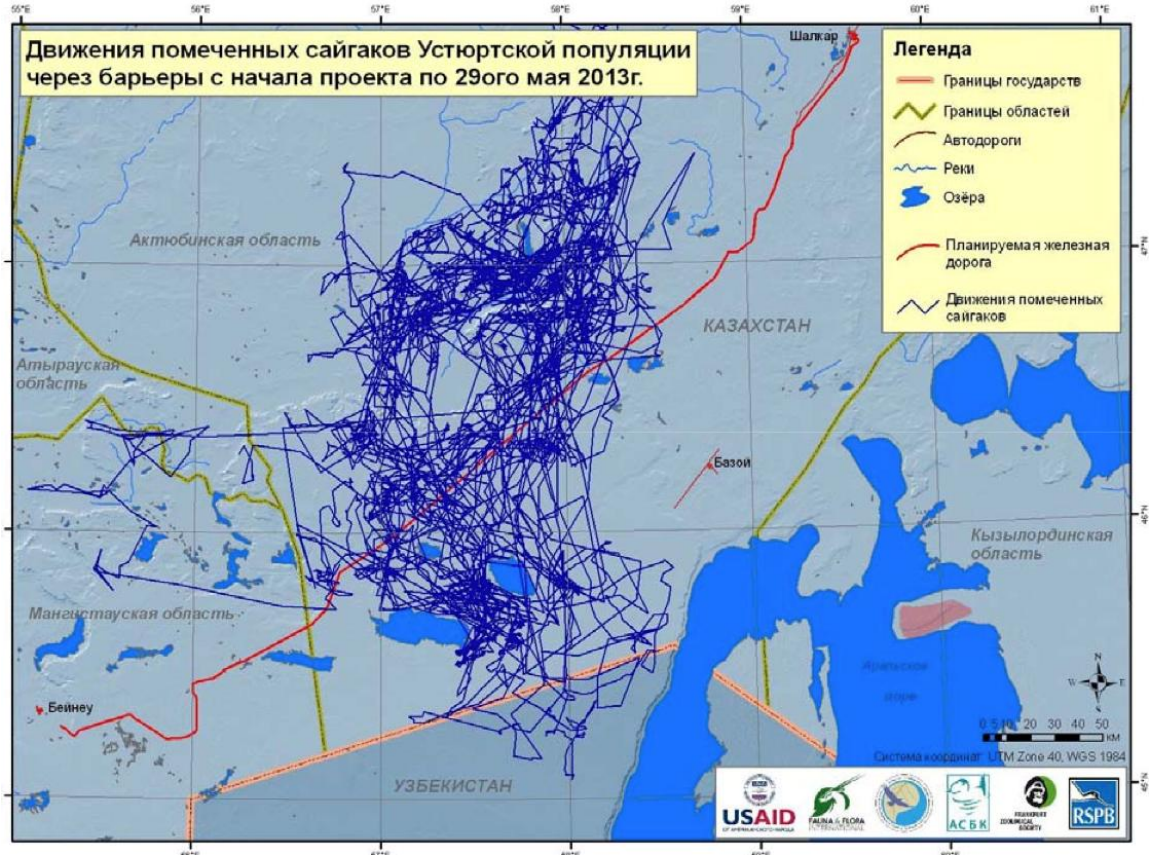


Figure 68: Movement tracks of saiga fitted with GPS tracking devices within the Ustyurt saiga range prior to the construction of the border fence 2013

Goitered Gazelle (*Gazella subgutturosa*) – IUCN VU, UzRDB VU:D

This species is found throughout the Ustyurt Plateau, however, is considered to be nationally rare and there have been significant declines in the national population over recent years as a result of poaching and habitat loss, which are the two main threats to this species. The population within the Ustyurt Plateau is considered to be around 500 animals. The Project AoI is however sub-optimal for this species, mainly due to the lack of permanent water sources. Small numbers were however recorded on the camera traps on the western and eastern edges of the AoI and an adult was recorded during the avifauna surveys along with evidence of presence (dung, horns, tracks etc.) during the mammal surveys. The location of camera trap records is shown on figures below.

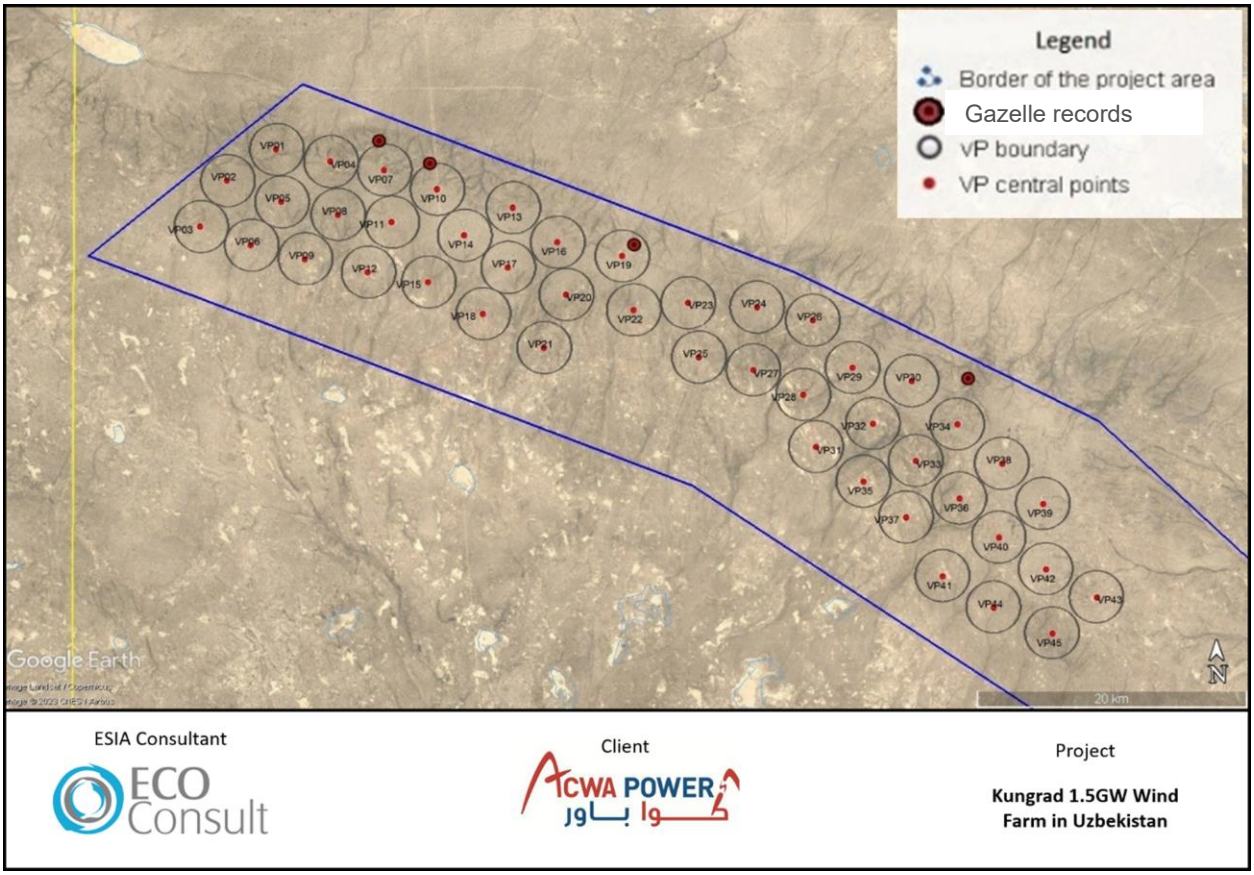


Figure 69: Goitered Gazelle records by camera traps

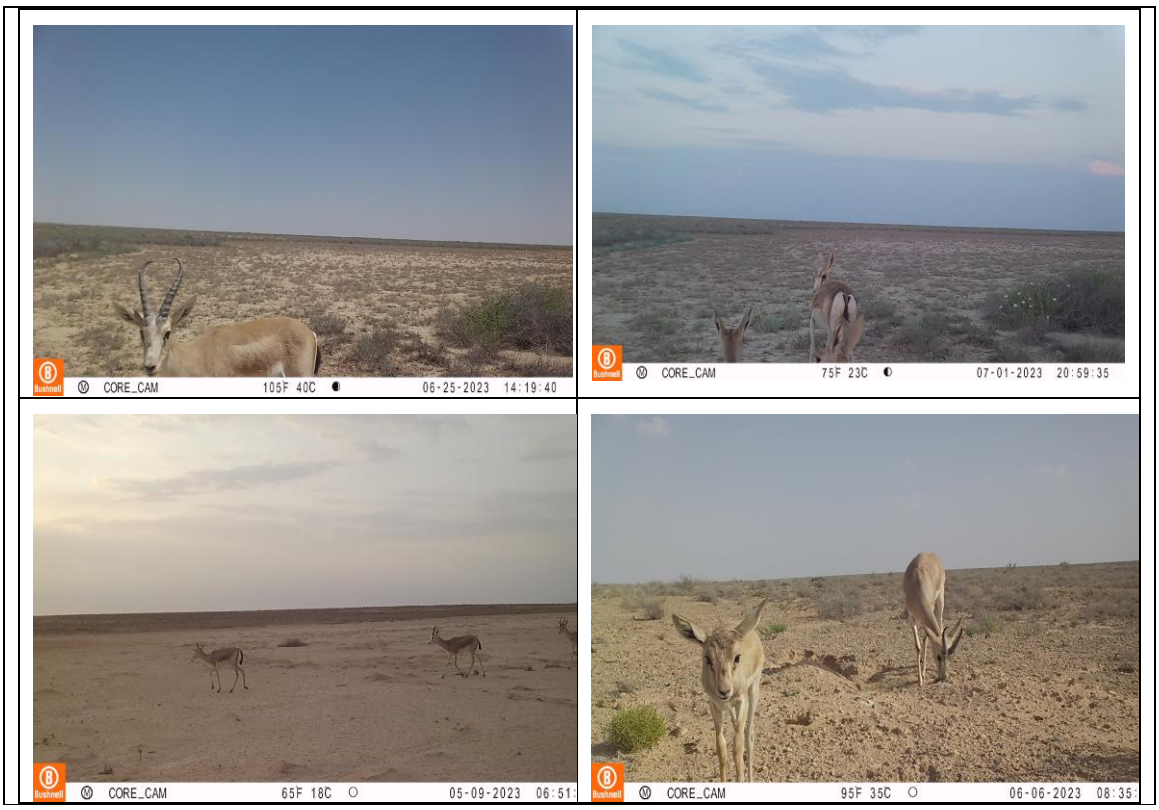


Figure 70: Goitered Gazelle Camera Trap Pictures

Caracal (*Caracal caracal*) – IUCN LC (global, regional status unclear), UzRDB CR

This species is rare in Uzbekistan and is only found in the western parts of the country. According to the IUCN, within Central Asia population density of this species is likely to be low which makes it extremely vulnerable to local extinction. Caracal was only recorded during the camera trapping surveys with four registrations between March and May 2023. Based on analysis of the camera trap data records were from areas of rougher terrain which could offer shelter; however den locations have not been recorded. The location of the registrations of this species within the AoI is shown on figure below.

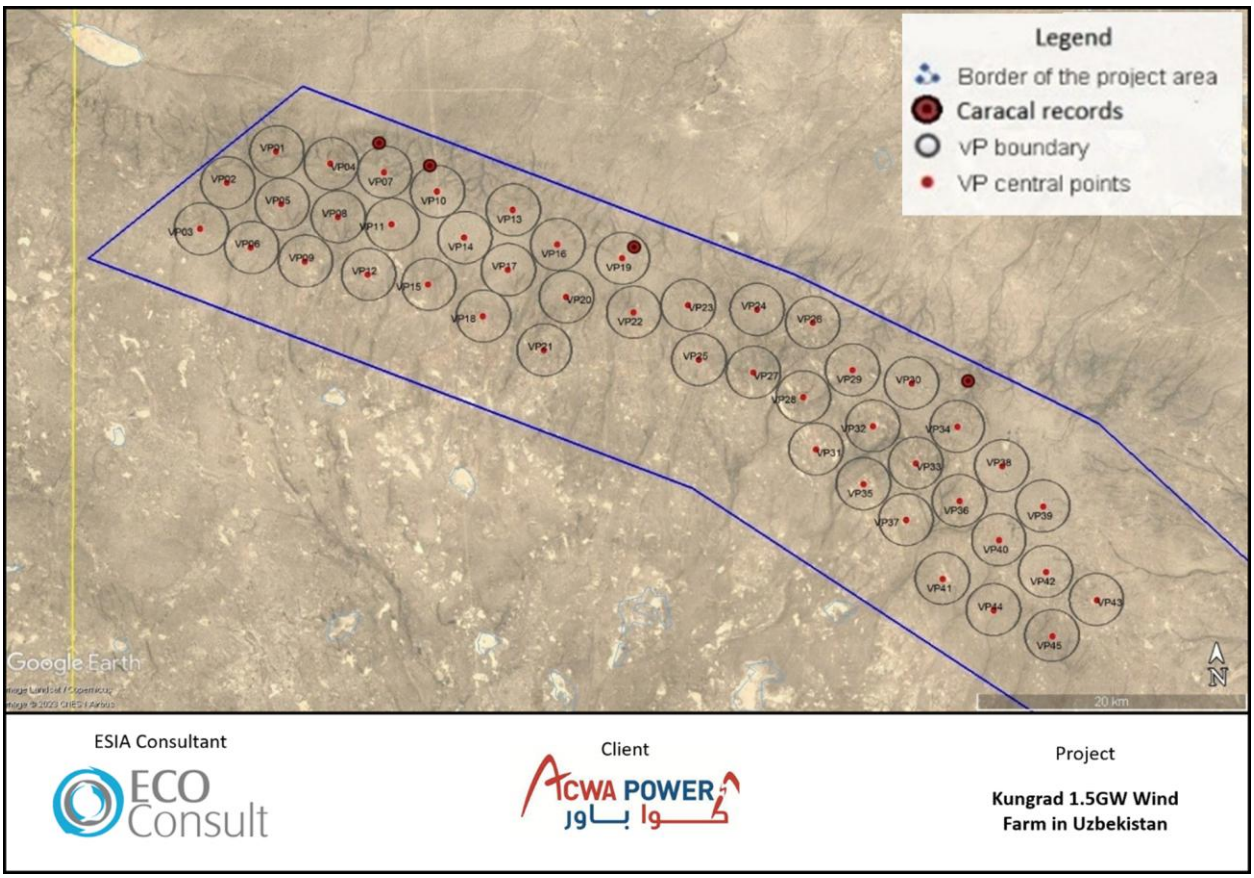
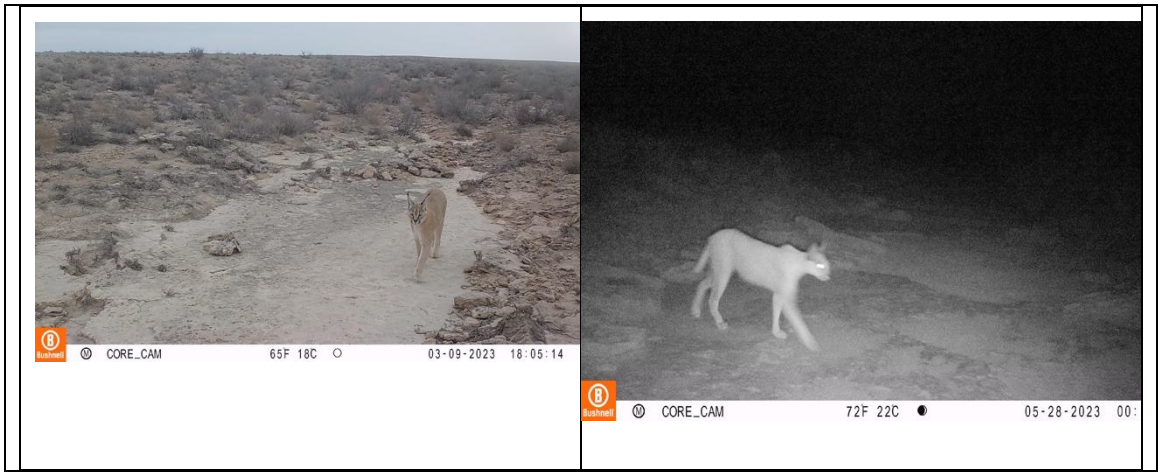


Figure 71: Caracal Records by Camera Traps



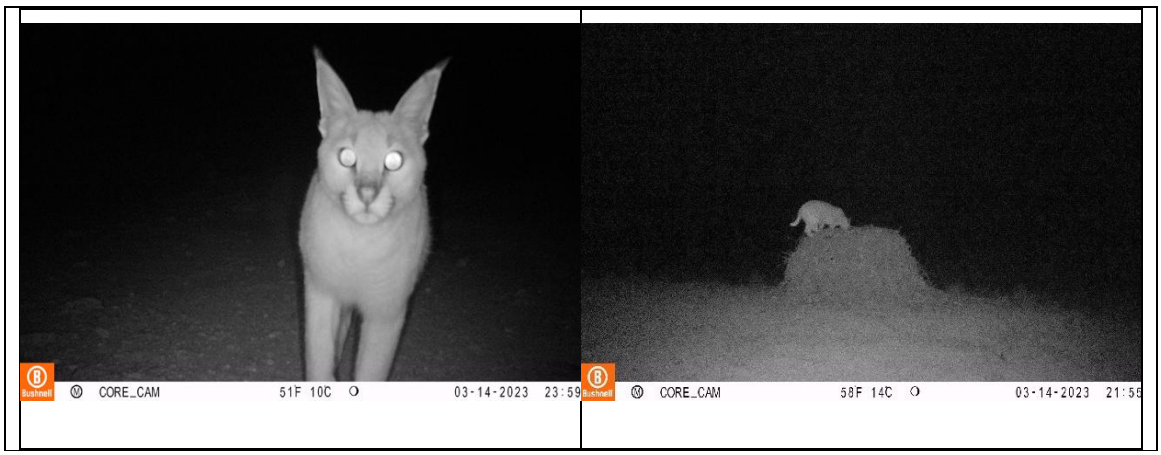


Figure 72: Caracal Camera Trap Pictures

(vi) Bats

Methods

Bat surveys consisted of Nocturnal Acoustic Survey along with a search for suitable roosting features within the Project AoI. Due to the size of the Project AoI and the difficulty moving around the site, especially at night, bat transect surveys were not undertaken and it is considered that the use of static detectors would give robust data pertaining to the bat species present within the AoI, along with a reasonable estimation of the amount of flight activity.

Thirty-five Wildlife Acoustic SM4BAT detectors were deployed at 28 ground locations and seven 'at-height' locations, as shown on figure below. The survey protocol adapts methods protocols set out in guidelines published by NatureScot 2021 (formerly Scottish Natural Heritage) and Eurobats Publication 6, 2015. Fixed point locations were selected at the avifauna survey Vantage Points as the ornithological survey team were responsible for managing the bat detectors. At height detectors have been placed at the seven met masts present within the Project area and give a good east-west coverage and the microphones were installed at a height of 50m.

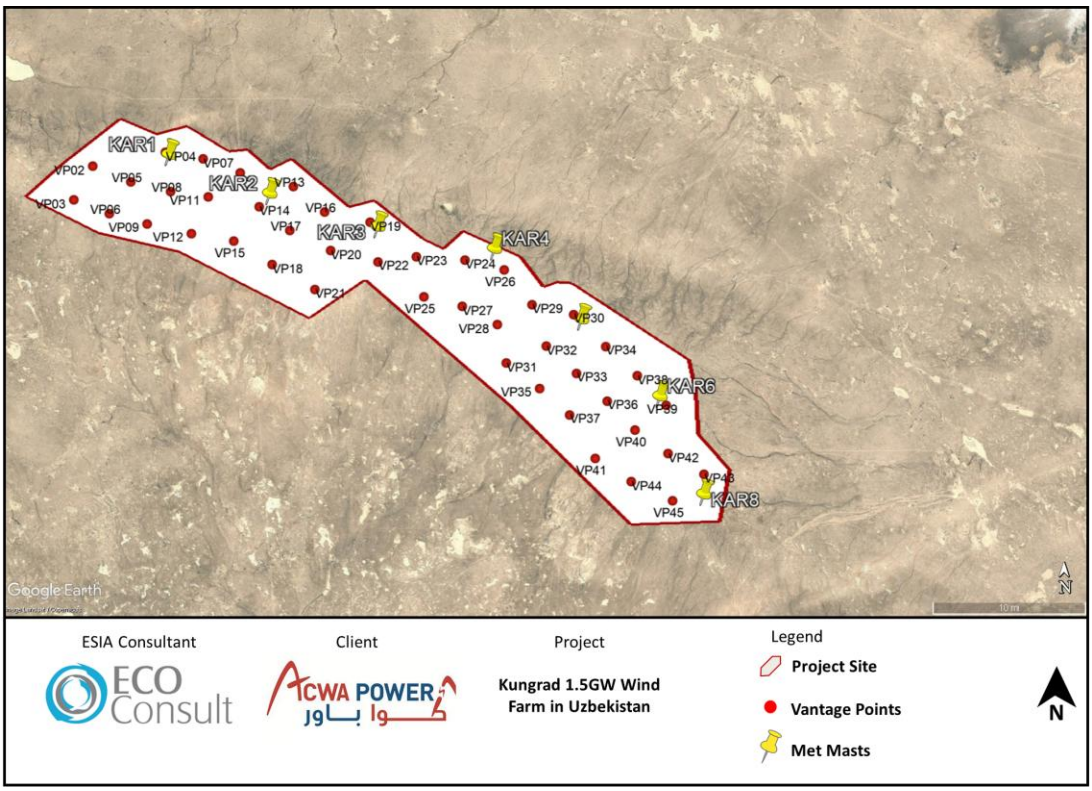


Figure 73: Location of Static Bat Detectors (red dots – ground location, yellow pins – at height)

The static detectors were deployed during the Turnstone Ecology Scoping Visit in April 2023 and were continually recording until early November 2023. The detectors were programmed to start recording 30 minutes before sunset until 30 minutes after sunrise. Data was downloaded approximately once per month and batteries changed as necessary.

The ground detectors were dug into the ground to reduce the likelihood of theft with just the microphone protruding from the ground at a height of approximately 30 – 50cm (figure below)

Figure 74: SM4BAT microphone

None of the detectors have been stolen however some of the microphone cables were damaged by mammals nibbling through the cables and six of the deployed detectors have not recorded any data or have only recorded some data. The total amount of recording nights completed to date, and corresponding size of data files collected are shown on the tables below.

Table 38: Total Number of Recording Nights and Number of Data Files (April to August)

Installation location	Number of detectors	Recording Nights	Files	Size, Gb
Met Masts	7	402	16125	37,1
Viewpoints	28	1634	22782	58,2
Total:	35	2036	38907	95,3

Table 39: Recording Nights and Data by At Height Detector

Met Mast	Start date	End date	Nights	Files	Size, Gb	Notes

1st Period						
1 (KAR 1)	20.04.2023					No data
2 (KAR 2)	20.04.2023	19.05.2023	29	1295	2,83	
3 (KAR 3)	20.04.2023	19.05.2023	29	891	1,88	
4 (KAR 4)	21.04.2023	20.05.2023	29	2443	5,6	
5 (KAR 5. 7.06.23)	20.04.2023	10.05.2023	19	601	1,3	
6 (KAR 6. 7.06.23)	20.04.2023	22.05.2023	32	976	2,04	
8 (KAR 8)	20.04.2023	24.05.2023	34	4245	9,4	
2 - Period						
1 (KAR 1)	21.05.2023	30.06.2023	40	369	0,9	
2 (KAR 2)	20.05.2023	29.06.2023	39	169	0,3	
3 (KAR 3)	20.05.2023	28.06.2023	39	1095	2,51	
4 (KAR 4)	22.05.2023	24.06.2023	35	3414	9,16	
5 (KAR 5. 7.06.23)	22.05.2023	30.06.2023	39	282	0,5	
6 (KAR 6. 7.06.23)	24.05.2023	28.06.2023	37	166	0,3	
8 (KAR 8)	402	25.05.2023	1	179	0,4	

Table 40: Recording Nights and Data by Ground Detector (Period 1) (April to May)

№ VP	Start date	End date	Days	Files	Size, Gb	Notes
1	21.04.2023	24.05.2023	33	351	0,8	
3	19.04.2023	20.05.2023	31	2265	5,65	
5	25.04.2023	18.05.2023	23	538	1,11	
7	23.04.2023	20.05.2023	27	461	1	
9	26.04.2023	20.05.2023	24	847	1,85	
11	27.04.2023	21.05.2023	24	438	1	
13	20.04.2023	21.05.2023	31	1105	2,4	
15			0	0	0	No data
16	20.04.2023	24.05.2023	34	210	0,5	
18	20.04.2023	24.05.2023	34	216	0,5	
19	20.04.2023	20.05.2023	30	309	0,7	
20	25.04.2023	24.05.2023	29	200	0,4	
21	19.04.2023	24.05.2023	35	341	0,7	
22	21.04.2023	24.05.2023	33	874	1,95	
23	26.04.2023	24.05.2023	28	590	1,26	
25	27.04.2023	20.05.2023	23	573	1,26	
26	22.04.2023	02.05.2023	10	211	0,5	
28			0	0	0	No data
30	21.04.2023	21.05.2023	30	965	2,03	
31	20.04.2023	22.05.2023	32	568	1,21	
34	26.04.2023	21.05.2023	25	277	0,6	
35	22.04.2023	22.05.2023	30	882	1,91	
37	26.04.2023	23.05.2023	27	763	1,65	
40			0	0	0	
41	02.05.2023	23.05.2023	21	501	1,06	
43	28.04.2023	22.05.2023	24	174	0,4	
44	21.04.2023	23.05.2023	32	1046	2,19	
45	21.04.2023	21.05.2023	30	378	0,8	
Total:			700	15083	33,43	

Table 41: Recording Nights and Data by Ground Detector (Period 2) (May – July)

№ VP	Start date	End date	Days	Files	Size, Gb	Notes
1	27.05.2023	05.07.2023	39	55	0,3	
3	21.05.2023	03.07.2023	43	740	1,94	
5	20.05.2023	28.06.2023	39	219	0,5	
7	22.05.2023	06.07.2023	45	79	0,2	
9	20.05.2023	17.06.2023	28	469	1,06	
11						the cable to the microphone is damaged
13	21.05.2023	13.06.2023	23	101	0,2	
15	21.05.2023	02.07.2023	42	2059	8,85	
16	25.05.2023	14.06.2023	20	12	0,03	
18	25.05.2023	30.06.2023	36	78	0,2	
19	21.05.2023	29.06.2023	39	698	2,01	
20	26.05.2023	05.07.2023	40	440	1,79	
21	25.05.2023	01.07.2023	37	396	1,49	
22	24.05.2023	03.07.2023	40	475	1,3	
23	26.05.2023	01.07.2023	36	112	0,4	
25	22.05.2023	02.07.2023	41	78	0,2	
26						No data
28	22.05.2023	02.07.2023	41	433	0,9	
30	22.05.2023	01.07.2023	40	54	0,1	
31	22.05.2023	29.06.2023	38	58	0,1	
34	23.05.2023	05.07.2023	43	237	1,04	
35	22.05.2023	01.07.2023	40	258	0,6	
37	23.05.2023	26.06.2023	34	148	0,3	
40	23.05.2023	04.07.2023	42	132	0,4	
41	23.05.2023	01.07.2023	39	70	0,1	
43	24.05.2023	30.05.2023	6	5	0,02	No data
44	23.05.2023	15.06.2023	23	131	0,2	
45	24.05.2023	03.07.2023	40	162	0,5	
Total:			934	7699	24,73	

Table 42: Number of Recorded Files (Period 3 July to August)

Installation location	Number of detectors	Files
Met Masts	7	326
Viewpoints (ground-based detectors)	28	2961
Total:	35	3287

During June, July and August the number of recording nights and corresponding files were significantly reduced, and this is likely due to the extremely high temperatures on the Kungrad WF site which affected the recorders.

Results

According to the literature data on bats of Uzbekistan (Bogdanov, 1953; Benda et al., 2011; Gritsina et al., 2013) and arid ecosystems, nine species of bats are most likely to inhabit Karakalpakstan Project area (table below): *Rhinolophus bocharicus, Eptesicus bottae, Eptesicus gobiensis, Eptesicus serotinus, Hypsugo savii, Myotis davidii, Nyctalus noctula, Pipistrellus pipistrellus,* and *Vespertilio murinus*.

Table 43: Bat Species Most Likely to Occur in the Project AoI

Species	IUCN Red List	UzRDB (2019)	Basic flight information (estimated flight height; presence of migrations)	Level of collision risk (Rodrigues et al., 2015)
Rhinolophus bocharicus	LC	Not Listed	Most likely, R. bocharicus is a sedentary species, foraging low from the ground (like other horseshoe bats (Bogdanov, 1953; Rodrigues et al., 2015)).	low
Eptesicus bottae	LC	Not Listed	E. bottae ranks among small- to medium-sized bats hunting its prey mostly in a slow hawking flight (Benda et al., 2012); probably sedentary.	medium
Eptesicus gobiensis	LC	Not Listed	no data	medium
Eptesicus serotinus	LC	Not Listed	Medium height (Roemer et al., 2017); usually sedentary (Dietz, Kiefer, 2016)	medium
Hypsugo savii	LC	Not Listed	Medium height (Roemer et al., 2017); no data on migration (Dietz, Kiefer, 2016)	high
Myotis davidii	LC	Not Listed	Low height (Roemer et al., 2017); probably sedentary	low
Nyctalus noctula	LC	Not Listed	High height (Roemer et al., 2017); migrate (Dietz, Kiefer, 2016)	high
Pipistrellus pipistrellus	LC	Not Listed	Medium height (Roemer et al., 2017; Wellig et al., 2018); sedentary (Bogdanov, 1953; Dietz, Kiefer, 2016)	high
Vespertilio murinus	LC	Not Listed	High height (Roemer et al., 2017); usually migrate (Dietz, Kiefer, 2016)	high

A further eleven species are known to occur within Uzbekistan and neighboring countries and have the potential to occur within the Project AoI (Benda et al., 2011; Benda et al., 2012; Dietz, Kiefer, 2016): These are Rhinolophus ferrumequinum, Rhinolophus hipposideros, Plecotus sp. (Gritsina et al., 2013), Myotis bucharensis, Myotis emarginatus, Myotis blythii, Myotis capaccinii, Barbastella caspica, Pipistrellus kuhlii, Otonycteris leucophaea, Tadarida teniotis. Species with the potential to occur within the Project AoI along with their relevant conservation statuses are shown in table below. Estimated collision risk is also included below and is based on flight characteristics by genera as set out in Eurobats Publication 6 (Ridrigues et al. 2015).

Table 44: Bat Species with Potential to Occur in the Project AoI

Species	IUCN Red List	UzRDB (2019)	Basic flight information (estimated flight height; presence of migrations)	Level of collision risk (Rodrigues et al., 2015)
Rhinolophus ferrumequinum	LC	Not Listed	Low height (Roemer et al., 2017); sedentary (Dietz, Kiefer, 2016)	low
Rhinolophus hipposideros	LC	Vulnerable, declining 2(VU:D)	Low height (Roemer et al., 2017); sedentary (Dietz, Kiefer, 2016)	low

Species	IUCN Red List	UzRDB (2019)	Basic flight information (estimated flight height; presence of migrations)	Level of collision risk (Rodrigues et al., 2015)
Plecotus sp. (Gritsina et al., 2013)	?[24]	Not Listed	Low height (Roemer et al., 2017); sedentary	low
Myotis bucharensis	DD (data deficient)	Critically Endangered 1(CR)	Low height (Roemer et al., 2017); probably sedentary	low
Myotis emarginatus	LC	Not Listed	Low height (Roemer et al., 2017); sedentary (Dietz, Kiefer, 2016)	low
Myotis blythii	LC	Not Listed	Low height (Wellig et al., 2018); sedentary (Dietz, Kiefer, 2016)	low
Myotis capaccinii (?)[25]	VU	Not Listed	Low height; short to middle-range migrant (Dietz, Kiefer, 2016)	low
Barbastella caspica (Barbastella leucomelas)	LC	Not Listed	Probably low height; probably sedentary	medium
Pipistrellus kuhlii	LC	Not Listed	Low height (Roemer et al., 2017); sedentary (Dietz, Kiefer, 2016)	high
Otonycteris leucophaea[26]	DD	Vulnerable, naturally rare 2(VU: R)	Low height (Benda et al., 2012), probably sedentary	unknown
Tadarida teniotis	LC	Vulnerable, naturally rare 2(VU: R)	High height (Wellig et al., 2018); no seasonal migration, foraging area up to 100 km distant from summer roost (Dietz, Kiefer, 2016)	high

The Project AoI consists of flat open desert with generally fairly low suitability for bats due to the lack of suitable roosting features within the AoI and also lack of permanent waterbodies. In terms of roosting two bunker structures were located outside of the AoI and it is possible that they support roosting bats and apart from these features there are no other obvious features within the AoI or within the vicinity of the Project site. There are no buildings or trees within the AoI nor are there bridges, culverts or wells which could support roosting bats.

During the spring, summer and autumn, up to five species of bats have been recorded at the windfarm area and only infrequently. *Eptesicus species* - Serotine (*Eptesicus serotinus*) and Ognev's Serotine (*Eptesicus ognevi*) are currently not clearly separated by their call parameters. An *Eptesicus species (one of the two noted above)* was recorded 1,222 times in spring from across the whole wind farm and on all 35 bat detectors and 103 times in summer from the whole wind farm on 25 of the ground level detectors

24 The taxonomy of long-eared bats is still poorly developed for Uzbekistan. Previously, it believed that one species lived in all of Eurasia, but later the several species of long-eared bats were identified. Maria Gritsina, et.al. indicated Plecotus sp. as a long-eared sp.but which on is still unknown. More research is required. The question mark states that it is unknown what species of long-eared bat it is.

25 The habitat of Myotis capaccinii is very remote from Uzbekistan. But one recording it was indicated for Uzbekistan. A question mark given in the sense that it is not yet known what kind of species it was in reality.

26 Otonycteris hemprichi does not inhabit Uzbekistan (Benda et al., 2011). It was indicated for Uzbekistan in the 20th century (Bogdanov, 1953), when the species Otonycteris hemprichi and Otonycteris leucophaea were not distinguished. Only Otonycteris leucophaea lives in Uzbekistan according to the modern concepts of taxonomists. From a formal point of view, this is a different species. Most likely, the authors of the essays in the Red Book of Uzbekistan (2019), have not being familiar with modern data (for example, Benda et al., 2011), and wrote down an "outdated" name that currently refers to other animals found, for example, in Iran (Benda et al., 2012). Both of these species are found in Iran.

only. Kuhl's Pipistrelle was only recorded twice (e.g. two passes) in the spring. Soprano Pipistrelle and Noctule bat were very occasionally recorded in the Autumn surveys.

The below data is the output from the regional bat expert who undertook the analysis of the recorded bat calls. It is acknowledged that whilst the results are not presented in a consistent format, they do clearly show that significant levels of bat activity were not recorded in any season.

Table 45: Calls per Night from Ground-based Detectors (Period 1 and 2)

№ VP	Calls	Nights	Calls/night	№ VP	Calls	Nights	Calls/night
VP 1	41	37	1.1	VP 23	48	33	1.5
VP 3	48	41	1.2	VP 25	54	32	1.7
VP 5	30	34	0.9	VP 26	16	10	1.6
VP 7	33	36	0.9	VP 28	1	9	0.1
VP 9	47	35	1.3	VP 30	39	39	1.0
VP 11	23	24	1.0	VP 31	38	41	0.9
VP 13	47	41	1.1	VP 34	36	33	1.1
VP 15	7	10	0.7	VP 35	50	39	1.3
VP 16	36	40	0.9	VP 37	47	42	1.1
VP 18	42	40	1.1	VP 40	3	8	0.4
VP 19	37	40	0.9	VP 41	33	29	1.1
VP 20	24	34	0.7	VP 43	24	30	0.8
VP 21	40	41	1.0	VP 44	39	40	1.0
VP 22	39	40	1.0	VP 45	30	37	0.8
Total					952	915	1.0

Table 46: Calls per Night from Met Mast Detectors (Period 1 and 2)

№ VP	Calls	Nights	Calls/night
KAR 1	23	39	0.6
KAR 2	36	39	0.9
KAR 3	86	40	2.2
KAR 4	28	41	0.7
KAR 5	20	28	0.7
KAR 6	40	41	1.0
KAR 8	37	34	1.1
Total	270	262	1.0

Table 47: Calls per Night from Met Mast Detectors (Period 3)

Date	Calls	Detectors with bat calls	Calls/detector
01.06.2023	21	14	1.5
02.06.2023	20	11	1.8
03.06.2023	5	3	1.7

Date	Calls	Detectors with bat calls	Calls/detector
04.06.2023	8	7	1.1
05.06.2023	8	7	1.1
06.06.2023	2	2	1.0
07.06.2023	2	2	1.0
08.06.2023	9	8	1.1
09.06.2023	15	10	1.5
10.06.2023	1	1	1.0
16.06.2023	1	1	1.0
24.06.2023	1	1	1.0
25.06.2023	1	1	1.0
11.07.2023	1	1	1.0
20.07.2023	1	1	1.0
08.08.2023	1	1	1.0
09.08.2023	1	1	1.0
22.08.2023	2	1	2.0
23.08.2023	1	1	1.0
27.08.2023	1	1	1.0
31.08.2023	1	1	1.0
Total:	103		1.2

As can be seen from the data, bat activity across the site was very low during all recording periods with bat passes by detector or calls per night being generally less than 2 calls per night (Periods 1 and 2) and on average 1 calls/detector during Period 3. It is therefore concluded that bat activity at the Kungrad WF site is minimal likely as a result of very low habitat suitability and lack of available roosting habitat.

Results from the autumn surveys are shown in the table below.

Table 48: Bat Calls Recorded by Detectors at Viewpoints (ground-based) and Met Masts

Dates (five days)	Masts-based detectors			Grounds-based detectors		
	detector* nights	Bat calls	Bat calls/detector* nights	detector* nights	Bat calls	Bat calls/detector* nights
September 6-10	12	158	**13,2**	56	59	1,1
September 11-15	28	377	**13,5**	115	597	**5,2**
September 16-20	30	251	**8,4**	119	361	**3,0**
September 21-25	30	147	**4,9**	124	577	**4,7**
September 26-30	26	34	1,3	121	159	1,3
October 1-5	17	2	0,1	115	14	0,1
October 6-10	14	1	0,1	114	4	0,0
October 11-15	4	0	0,0	98	4	0,0
October 16-20	1	0	0,0	75	8	0,1
October 21-25	13	5	0,4	64	1	0,0
October 26-30	21	0	0,0	85	1	0,0

October 31-November 5	25	0	0,0	87	1	0,0
November 6-10	19	0	0,0	89	0	0,0
Total:	240	975	4,1	1262	1786	1,4

Table 49: Bat Calls Recorded by Detectors at Met Masts

Met Mast	Nights	Calls of				Bat calls/night
		Eptesicus sp.	*Pipistrellus kuhlii*	*Pipistrellus pygmaeus*	*Nyctalus noctula*	
KAR 1	40	70	0	0	0	1,8
KAR 2	25	65	0	0	0	2,6
KAR 3	40	295	0	1	3	7,4
KAR 4	54	163	0	0	0	3,0
KAR 6	35	219	1	0	1	6,3
KAR 8	46	166	1	0	0	3,6
Total:	240	978	2	1	4	4,1

Table 50: Bat Calls Recorded by Detectors at Viewpoints (ground-based)

№ VP	Nights	Calls of				Bat calls/night
		Eptesicus sp.	*Pipistrellus kuhlii*	*Pipistrellus pygmaeus*	*Nyctalus noctula*	
VP 1	63	70	0	0	0	1,1
VP 3	63	63	0	0	0	1,0
VP 5	42	57	0	0	0	1,4
VP 7	43	55	0	0	0	1,3
VP 9	60	74	0	0	0	1,2
VP 11	25	48	0	0	0	1,9
VP 13	50	46	1	0	0	0,9
VP 15	42	45	0	0	0	1,1
VP 16	31	13	0	0	0	0,4
VP 18	33	7	0	0	0	0,2
VP 19	64	90	0	0	0	1,4
VP 20	57	83	1	0	0	1,5
VP 21	58	60	0	0	0	1,0
VP 22	7	28	0	0	0	4,0
VP 23	47	64	0	0	0	1,4
VP 25	61	82	0	0	0	1,3
VP 26	23	39	0	0	0	1,7
VP 28	63	73	1	0	0	1,2
VP 30	60	85	0	0	0	1,4
VP 31	37	90	2	0	1	2,4
VP 34	20	82	0	0	0	4,1
VP 35	57	73	0	0	0	1,3

VP 37	61	71	1	0	0	1,2
VP 40	42	83	0	0	0	2,0
VP 41	42	75	1	0	2	1,8
VP 43	41	85	0	0	0	2,1
VP 44	23	58	0	0	0	2,5
VP 45	47	87	0	0	0	1,9
Total:	1262	1786	7	0	3	1,4

The number of bat calls increased greatly in early September and by the end of September dropped to almost zero values and this is considered likely to be bats migrating from summer habitats to wintering sites south and south-west of the wind farm site. The number of bat calls recorded at meteorological masts (at height) at this time is more than twice the number of bat calls recorded by ground-based detectors, which is also indicative of migratory flight behavior.

All bat species recorded at the WF are all classified as Least concern on the IUCN red list and are not considered threatened or included in the UzRDB.

(vii) Invertebrates

Methods

Surveys for invertebrates were completed in late April 2023 and also in June with each survey effort lasting five days. During each survey the four-bird survey transects were used to sample the invertebrate fauna across the site along with additional random sampling (e.g. at the camp) to provide survey information from habitats that are representative of the Project AoI.

Methodologies used for the survey followed those as written by Kirichenko (1951) and Golub et al. (1980). Surveyors used an entomological net with a diameter of 30 cm and a depth of 80 cm as well as using light traps and screen traps. The materials were collected from 6 AM to 6 PM during the day and from 9 PM to 11 PM at night. The samples were preserved in 96% ethanol and analyzed using an MBS-109 microscope. Surveyors identified the species using key books by Khamraev (2012), Davletschina et al. (1979), relevant scientific articles as well as consultation with external experts.

Results

Table 51: List of invertebrates in project site, their status, abundance, distribution and populations trends

No.	Scientific Name	IUCN/UzRDB	Status	Abundance /distribution
1.	*Hemilepistus (Desertellio) fedtschenkoi* (Uljanin, 1875)	Not included	Common	Widespread
2.	*Galeodes caspius* Birula, 1890	Not included	Common	Widespread
3.	*Lycosa singoriensis* (Laxmann, 1770)	Not included	Common	widespread
4.	*Steatoda paykulliana* (Walckenaer, 1806)	Not included	Local	Rare
5.	*Anomalobuthus rickmersi* Kraepelin, 1900	Not included	Common	Widespread

No.	Scientific Name	IUCN/UzRDB	Status	Abundance /distribution
6.	*Platycnemis pennipes* Pallas, 1771	**LC** (IUCN)	Common	Numerous widespread
7.	*Pantala flavescens* Fabricius, 1798	**LC** (IUCN)	Local	Rare
8.	*Anax parthenope* Selys, 1839	**LC** (IUCN)	Local	Rare
9.	*Anacanthotermes turkestanicus* (Jacobson, 1905)	Not included	Common	Numerous widespread
10.	*Sceptrophasma bituberculatum* (Redtenbacher, 1889)	Not included	Local	Rare
11.	*Sphingonotus rubescens* (Walker, 1870)	Not included	Common	Widespread
12.	*Sphingonotus nebulosus* (Fischer von Waldheim, 1846)	Not included	Common	Widespread
13.	*Calliptamus italicus subsp. italicus* (Linnaeus, 1758)	Not included	Common	Widespread
14.	*Dericorys tibialis* (Pallas, 1773)	**NT** (IUCN)	Common	Widespread
15.	*Melanogryllus desertus* (Pallas, 1771)	Not included	Common	Widespread
16.	*Stictopleurus punctatonervosus* (Goeze, 1778)	Not included	Common	Widespread
17.	*Cyphogenia gibba* Fisch, 1820	Not included	Local	Common
18.	*Lasiostola pubescens* (Pallas, 1781)	Not included	Local	Rare
19.	*Blaps holconata* Fisch, 1822	Not included	Common	Widespread
20.	*Cephalota (Taenidia) schrenkii* (Gebler, 1841)	Not included	Common	Rare
21.	*Lebia turkestanica* Jedlicka, 1966	Not included	Local	Rare
22.	*Pentodon dubius* Ballion, 1870	Not included	Common	Widespread
23.	*Mylabris undecimpunctata* Fischer von Waldheim, 1842	Not included	Local	Rare
24.	*Julodis variolaris* (Pallas, 1773)	Not included	Common	Widespread
25.	*Hyles livornica* Esper, 1780	Not included	Local	Rare
26.	*Vanessa cardui* (Linnaeus, 1758)	**LC** (IUCN)	Common	Quite numerous
27.	*Pieris rapae* (Linnaeus, 1758)	Not included	Rare	Locally distributed
28.	*Heliothis peltigera* (Denis & Schiffermüller) 1775	Not included	Common	Widespread
29.	*Anarta stigmosa* (Christoph, 1887)	Not included	Local	Locally distributed
30.	*Paravespa quadricolor* (Moravitz, 1885)	Not included	Local	Rare
31.	*Onychopterocheilus fausti* (Moravitz, 1873)	Not included	Local	Rare
32.	*Stizus koenigi* F.Morawitz, 1888	Not included	Local	Rare
33.	*Prionyx viduatus* (Christ, 1791)	Not included	Local	Rare
34.	*Messor aralocaspius* Ruzsky, 1902	Not included	Common	Widespread
35.	*Apoclea helvipes* Loew, 1873	Not included	Common	Widespread

No species of national or international conservation concern were recorded within the Project AoI and no species considered to be range-restricted, endemic or near-endemic were recorded. The invertebrate

assemblage is considered typical for the Ustyurt Plateau and the habitats present within the AoI and are of negligible sensitivity.

(viii) Avifauna

Methods

Bird surveys have been completed in order to quantify the impact of the Project on key Avifauna species to subsequently inform final turbine layout, to develop additional mitigation (e.g. turbine shut down, habitat/species management plan) and to form the baseline for any future required supplementary surveys and operational monitoring. Survey information has also been used to inform a Collision Risk Model.

Bird surveys have been undertaken involving Vantage Point (VP) surveys, transects, raptor nest searches, and, where necessary, specialist surveys. The following surveys have been undertaken through the year:

- Winter Bird Surveys – January to March 2023.
- Spring Migration VP surveys – 18th March to 1st June 2023.
- Summer VP surveys – 1st June to 15th August 2023.
- Autumn Migration VP surveys – 15th August to 15th November 2023.
- Transect surveys – four transect surveys to be completed once every two weeks throughout the survey period (18th March to 15th November 2023). These surveys were also completed in the breeding bird season accounting for breeding bird activity across the site.
- MacQueen's Bustard (*Chlamydotis macqueenii*), Great Bustard (*Otis tarda*), Sociable Lapwing (*Vanellus gregarious*) and Pin-tailed Sandgrouse (*Pterocles alchata*) surveys – March 18th to 23rd May 2023.
- Raptor Nest searches – March, April and May 2023.

The protocol for surveys at VPs followed the methodology developed by Scottish Natural Heritage "Survey Methods for Use in Assessing the Impacts of Onshore Wind farms on Bird Communities" (2005, and most recently updated in 2017). Surveys were undertaken from two-person 360^0 VPs and observers were present on site for the whole of the spring and autumn migration periods. There were no reductions in the accepted GIIP survey protocol and the minimum number of hours per VP in each of the survey seasons was achieved. It should also be noted that due to the high number of vantage points required to undertake a comprehensive and robust survey in line with GIIP there was continuous presence of the field teams in the winter, spring and autumn periods. As such any additional important activity (e.g. breeding / lekking bustards, breeding raptors) would have been encountered as the surveyors regularly moved around the Project site.

Wind farms present four main potential risks to birds:

- Direct habitat loss and disturbance through construction of wind farm infrastructure;

- Displacement (sometimes called indirect habitat loss) if birds avoid the wind farm and its surrounding area due to turbine construction and operation. Displacement may also include barrier effects in which birds are deterred from using normal routes to feeding or roosting grounds;
- Death through collision or interaction with turbine blades and other infrastructure (i.e. collision risk).
- Death through collision or electrocution associated with transmission lines (these impacts are discussed in the OHTL ESIA)

For each of these four risks, detailed knowledge of bird distribution and flight activity is necessary in order to predict the potential effects of the wind farm on birds.

Vantage Point (VP) Survey

Background

Vantage Point survey is designed to quantify the level of flight activity and the distribution of birds over the survey area. Its primary purpose is to provide input data for the Collision Risk Model (CRM), which is used to inform the Collision Risk Assessment (CRA) to predict likely mortalities from collision with operational turbines. Data can also be used to provide an overview of bird usage of the site to further inform an assessment of the likely impacts of habitat loss, disturbance, displacement and barrier impacts.

Surveyors

A team of suitably experienced ornithologists undertook the surveys and were able to identify all birds seen and heard within the Project AoI. During the surveys they used the following equipment:

- Field survey sheets;
- Weatherproof Clipboard;
- At least two stopwatches / timer watches;
- Compass / GPS unit;
- Binoculars (at least 8x magnification);
- Telescope (minimum 60mm x 25 magnification) with tripod;
- Radios / walkie-talkies; and
- Digital camera

VP Selection

Forty-five (paired) Vantage Points were selected for use during the winter bird survey campaign completed from January to mid-March 2023. The same Vantage Points were used from mid-March until mid-November 2023 and the location of the Vantage Points is shown in the figure below.

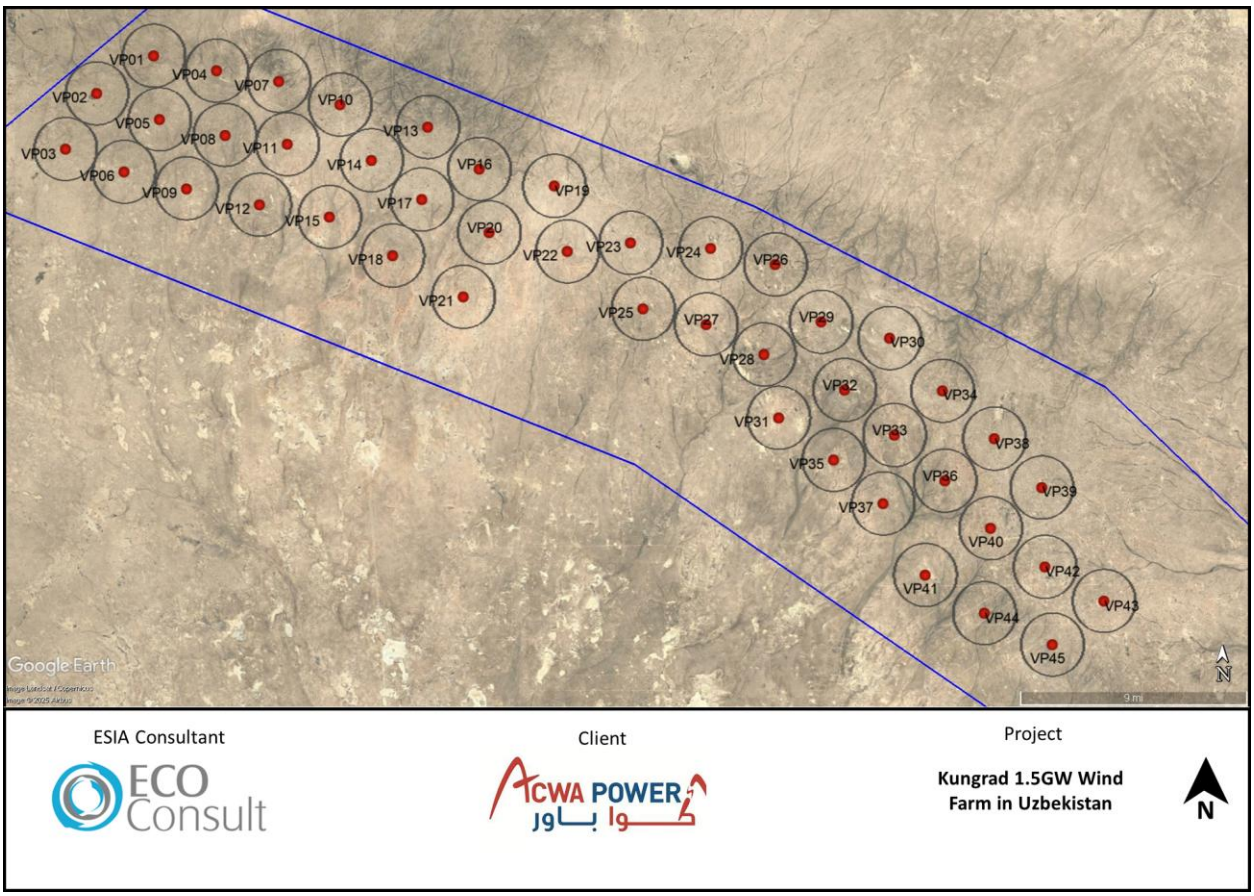


Figure 75: Location of Vantage Points

Vantage Point surveys were undertaken by three teams of two people with each team positioned at a single Vantage Point such that each observer was recording all bird activity within a 180° arc. Each Vantage Point session lasted three hours, so that the observers did not become fatigued and bird activity is recorded in full. Vantage Point surveys were not completed at times of reduced visibility (e.g. fog or heavy rain) and any surveys that were missed were completed on alternative days.

VP Survey Recording

During each VP survey, two recording methods are used to record data: focal bird sampling for Target Species; and activity summaries for Secondary Species.

Target Species and Secondary Species

Target species (shown below) represent the species of greatest sensitivity and/or conservation concern and these species were the primary focus of the surveys.

The Target Species (Tier 1) list is based upon current knowledge and was based on the one used for the 2023 winter bird survey effort (taken from Juru Energy 2023 Bird Monitoring Plan). It should be noted however that for the winter bird surveys species such as Common Kestrel and Long-legged Buzzard were considered as Tier 2 species and full flight information (including at risk flight seconds) was not recorded. The Collision Risk Model and subsequent assessment have considered this and average flight times that were recorded for Common Kestrel and Long-legged Buzzard recorded in the spring and summer periods were used as a proxy for the assessment of collision risk for at risk flights recorded in the winter survey

period. No Harrier species (considered Tier 2 in the winter period) were recorded in the winter period at risk height.

Table 52: Target (Tier 1) Species[27]

Latin name	English name	IUCN status	Uzbek status	Notes on Likely Occurrence/Risk
Oxyura leucocephala	White-headed Duck	EN	EN	Rare migrant in Sarykamysh lake. Recorded in 2010 (Ten et al, 2012)
Pelecanus onocrotalus	Great White Pelican	LC	VU:D	Common migrant in Sarykamysh lake (Ten, 2017)
Pelecanus crispus	Dalmatian Pelican	NT	EN	Common migrant in Sarykamysh lake. Observed in 2010. (Ten et al, 2012)
Plegadis falcinellus	Glossy Ibis	LC	VU	Common migrant in Sarykamysh lake (Ten, 2017)
Platalea leucorodia	Eurasian Spoonbill	LC	VU	Common migrant in Sarykamysh lake (Ten, 2017)
Aquila nipalensis	Steppe Eagle	EN	VU	Common migrant and rare breeding species. In May and September 2017 observed on project area (Ten, 2017
Aquila chrysaetos	Golden Eagle	LC	VU	Common breeding species in Ustyurt (Ten, 2017)
Aquila heliaca	Imperial Eagle	VU	VU	Common migrant. In May 2017 observed on project area (Ten, 2017)
Neophron percnopterus	Egyptian Vulture	EN	VU	Common nesting species in cliffs of Chink (Ten, 2017)
Aquila clanga	Greater Spotted Eagle	VU	VU	Common migrant (Ten, 2017)
Falco cherrug	Saker Falcon	EN	EN	Common nesting species in cliffs of Chink (Ten, 2017)
Aegypius monachus	Cinereous Vulture	NT	NT	Rare breeding in the Southern Ustyurt (Ten, 2017)
Circaetus gallicus	Short-toed Snake- Eagle	LC	VU	Rare migrating bird. 1 bird was recorded near Barsakelmes (Mitropolskiy, 2012)
Haliaeetus albicilla	White-tailed Eagle	LC	VU	Common migrant and wintering in Sarykamysh lake (Ten, 2017)

27 Karakalpakstan 1.5 GW Windfarm: BIRD MONITORING WORKPLAN AND SURVEY PROPOCOL. 2023 Juru Energy 2023

Latin name	English name	IUCN status	Uzbek status	Notes on Likely Occurrence/Risk
Pandion haliaetus	Osprey	LC	VU	Common migrant in Sarykamysh lake (Ten et al, 2012)
Circus aeruginosus	Eurasian Marsh-Harrier	LC	LC	Fairly common in Sarykamysh lake (Ten, 2017)
Circus cyaneus	Hen Harrier	LC	LC	Common migrating species in region (Ten, 2017)
Circus macrourus	Pallid Harrier	NT	NT	Common migrating species in region (Ten, 2017)
Accipiter nisus	Eurasian Sparrowhawk	LC	LC	Common migrating species in region (Ten, 2017)
Buteo rufinus	Long-legged Buzzard	LC	LC	Fairly common in region (Ten, 2017)
Buteo buteo vulpinus	Common (Steppe) Buzzard	LC	LC	Common migrating species in region (Ten, 2017)
Milvus migrans	Black Kite	LC	LC	Common migrating species in region (Ten, 2017)
Falco tinnunculus	Common Kestrel	LC	LC	Common in region (Ten, 2017)
Falco naumanni	Lesser Kestrel	LC	NT	Recorded neat Chink of Ustyurt (Ten, 2017)
Tetrax tetrax	Little Bustard	NT	VU	Rare migrant in Ustyurt Observed in 2010. (Ten et al, 2012)
Otis tarda	Great Bustard	EN	CR	Rare migrant. The footprints were recorded in May 2017 at Kaplankyr depression (Ten, 2017)
Chlamydotis macqueenii	MacQueen's Bustard	VU	VU	Rare nesting and migration species in project area (Burnside oral comm., Ten, 2017) sensitive to displacement, as well as collision

Latin name	English name	IUCN status	Uzbek status	Notes on Likely Occurrence/Risk
Limosa limosa	Black-tailed Godwit	NT	VU	Common migrant in Sarykamysh lake (Ten, 2017)
Limosa lapponica	Bar-tailed Godwit	NT	LC	Rare migrant in Sarykamysh lake9
Numenius arquata	Eurasian Curlew	NT	VU	Common migrant in Sarykamysh lake (Ten, 2017)
Calidris ferruginea	Curlew Sandpiper	NT	LC	Common migrant and summering in Sarykamysh lake (Ten, 2017)
Glareola nordmanni	Black-winged Pratincole	NT	VU	Rare migrant in Sarykamysh lake (Mitropolskiy, 2012)
Larus ichthyaetus	Pallas's Gull	LC	VU	Common migrant in Sarykamysh lake (Ten, 2017)
Pterocles alchata	Pin-tailed Sandgrouse	LC	VU	Common breeding species and numerous migrants in the region (Ten, 2017)
Syrrhaptes paradoxus	Pallas's Sandgrouse	LC	LC	Common breeding species and migrant in the region (Ten et al, 2012)

Focal Bird Sampling

The area in view was scanned until a Target Species was detected at which point it is followed until it ceases flying or is lost from view.

The time the target bird was detected, and the flight duration were recorded and the route the bird followed was plotted in the field onto the maps. The bird's flight height is estimated at the time of detection and then at 15 second intervals thereafter.

Flight heights were recorded in height bands, i.e. below the rotor- swept area, the rotor-swept area and above the rotor-swept area, allowing for observer error. Height bands are as follows:

- 0 – 15m
- 15 – 30m
- 30 – 200m
- 200 – 240m
- 240m+ (with notes on flight height)

Data Recording Methods

Data for Target Species was recorded on to survey forms and mapped onto field maps specific to each Vantage Point and the following information was recorded:

- The location of the VP used.
- Date of survey.
- Surveyor name.
- Start and End time of the VP session.
- Flight lines of target species
- Reference number of each flight line corresponding to that on the form.
- Species
- Age / sex (if known)
- Estimation of flight height
- Duration of at-risk flight

The data from the Vantage Point surveys has been collated on to seasonal Excel workbooks and the data used to inform the Collision Risk Model and subsequent assessment.

Transect Survey

Transect Surveys (with point counts) was undertaken during the Spring, Summer and autumn survey seasons.

Four transects were selected and these are shown on figure below. Each transect is approximately 17 km long and was driven twice per month. On each transect survey a point count survey was completed every 1 km and the surveyor scanned for a minimum of 15 minutes up to 500m from the point count location and all birds seen / heard were recorded in full.

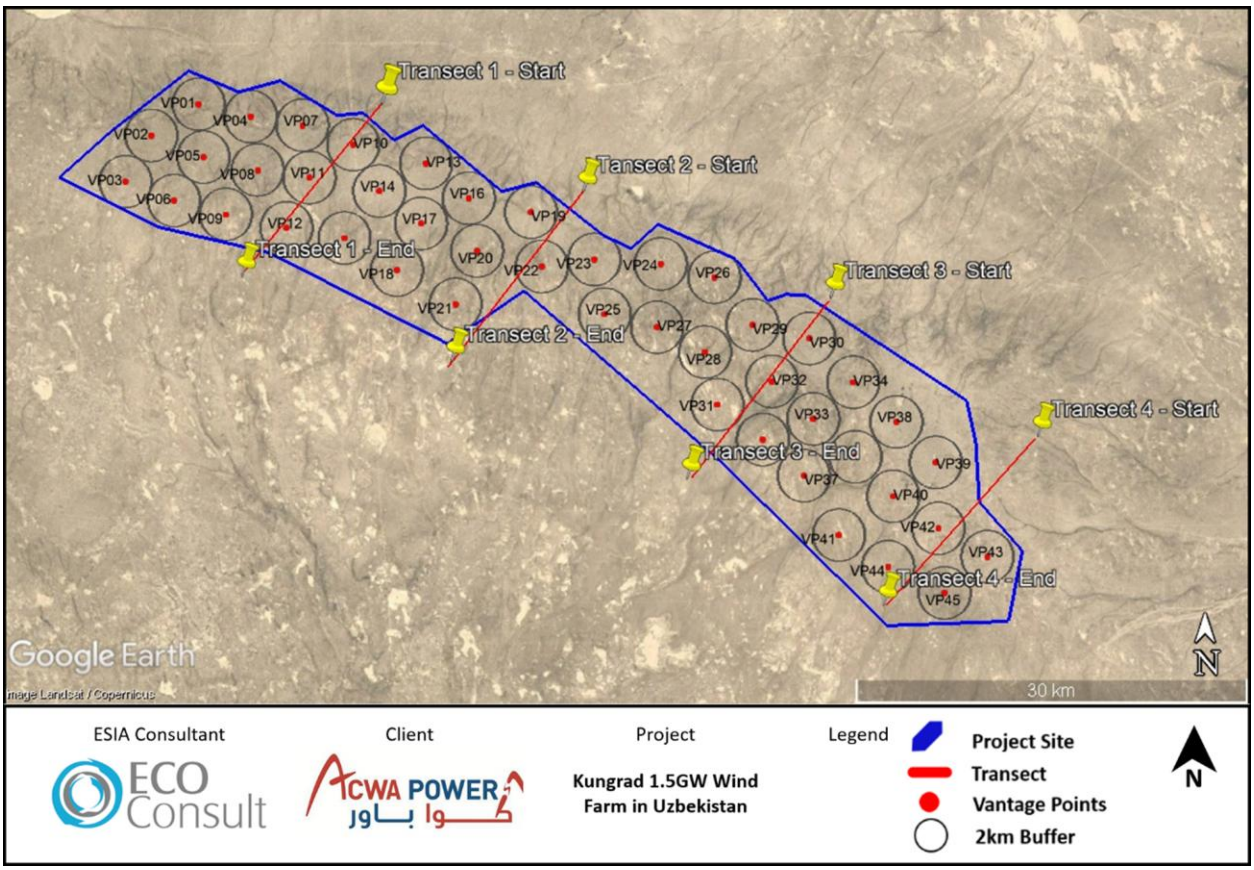


Figure 76: Location of Bird Survey Transects

MacQueen's Bustard and Other Species of Conservation Concern

Specialized surveys for breeding MacQueen's Bustard or migrating Great Bustard and Sociable Lapwing. These surveys would have been completed where MacQueen's Bustard, Great Bustard or Sociable Lapwing were recorded on other surveys (including incidental sightings) and would have involved additional point count or transect sampling to record species activity in full (including breeding activity). Sociable Lapwing and Great Bustard were not recorded on any survey and MacQueen's Bustard were only recorded infrequently and when observed no nesting / lekking activity was recorded thus negating the need for additional survey.

Raptor Nest Searches

The purpose of raptor nest surveys was to survey the AoI and up to 10 km buffer to accurately record the breeding locations of raptors.

The potential list of breeding raptors in the AoI and buffer area is as follows:

- Steppe Eagle (IUCN EN, UzRDB:VU)
- Imperial Eagle (IUCN and UzRDB VU)
- Saker Falcon (IUCN and UzRDB EN)
- Egyptian Vulture (IUCN and UzRDB EN)
- Cinereous Vulture (IUCN and UzRDB VU)

- Common Kestrel (IUCN and UzRDB LC)
- Lesser Kestrel (IUCN LC, UzRDB NT)
- Golden Eagle (IUCN LC, UzRDB VU)
- Long-legged Buzzard (IUCN and UzRDB LC)
- Eagle Owl (IUCN LC)
- Little Owl (IUCN LC)

The breeding season of these species starts in February / March and continues up to August. Typical nesting substrates for most of these species include cliffs or bluffs, saxaul bushes, karst sinkholes or caves, OHTL poles, or abandoned buildings or other human structures. All of these types of features are very rare within or absent from the AoI and buffer zone and therefore raptor nesting activity is expected to be extremely limited. Nonetheless, in this environment, Steppe Eagles may nest on the ground, and harriers are frequently ground nesters, hence the raptor nest search effort included comprehensive searching for the typical (non-ground) nesting substrates, plus limited and selective searching for ground nests of key species (based on observations of birds engaged in behaviors indicative of nesting activity).

Results

General

A minimum of 36 hours Vantage Point observation was completed at each Vantage Point in Winter, Spring, Summer and Autumn resulting in a cumulative total of 12,960 hours observation over the four survey seasons.

The results from the Winter, Spring Migration, Summer and Autumn survey periods are presented in the following sections.

Winter Bird Surveys

During the winter season, 46 bird species were recorded during Vantage Point monitoring, including six species with elevated IUCN status, and seven with national protected status. These were:

- Mute Swan (UzRDB NT),
- White-tailed Sea-eagle (UzRDB VU),
- Pallid Harrier (IUCN and UzRDB VU),
- Greater Spotted Eagle (IUCN and UzRDB VU),
- Steppe Eagle (IUCN EN and UzRDB VU),
- Eastern Imperial Eagle (IUCN and UzRDB VU),
- Golden Eagle (UzRDB VU),
- Northern Lapwing (IUCN NT),
- Pallas's Gull (UzRDB VU), and

- Pin-tailed Sandgrouse (UzRDB VU).

Spring Migration Surveys

During the Spring Migration Surveys a total of 80 species were recorded as a result of the Vantage Point and transect surveys as well as those species recorded as incidental sightings (e.g. travelling between VPs or to and from the surveyor's camp). Registrations of note during the Spring Migration Surveys include the following species of conservation concern:

- Golden Eagle (UzRDB VU)
- Eastern Imperial Eagle (IUCN and UzRDB VU)
- Steppe Eagle (IUCN EN and UzRDB VU),
- MacQueen's Bustard (IUCN VU and UzRDB VU)
- Short-toed Eagle (IUCN LC and UzRDB VU)
- Pallid Harrier (IUCN and UzRDB NT),
- Lesser Kestrel (UzRDB NT),
- Pallas's Fish Eagle (IUCN EN)

Summer Surveys

A total of 54 species were recorded during the summer bird surveys. Of these only five were 'target' species of the VP surveys and these were Golden Eagle, Steppe Eagle, Long-legged Buzzard, MacQueen's Bustard and Egyptian Vulture. Recorded activity during the summer period was very low when compared to winter and spring.

The table below provides a summary of Vantage Point Data for the winter, spring, summer and autumn surveys and includes details of relevant species conservation status, total number of individuals recorded, and total number of at-risk flights recorded.

Table 53: Results of Winter, Spring, Summer and Autumn Vantage Point Surveys – Notable Species or Registrations

Common Name	Scientific Name	IUCN	UzRDB	Winter		Spring		Summer		Autumn	
				Tot Recorded	Tot at Risk Flights	Tot Recorded	Tot at Risk Flights	Tot Recorded	Tot at Risk Flights	Tot Recorded	Tot at Risk Flights
Northern Goshawk	*Accipiter gentilis*	LC	N/A	0	0	0	0	0	0	2	0
Eurasian Sparrowhawk	*Accipiter nisus*	LC	N/A	0	0	0	0	0	0	17	5
Cinereous Vulture	*Aegypius monachus*	NT	NT	0	0	0	0	0	0	20	12
Golden Eagle	*Aquila chrysaetos*	LC	VU:R	25	15	1 (out)	1 (out)	1	0	39	8
Eastern Imperial Eagle	*Aquila heliaca*	VU	VU:D	10	7	1	1	0	0	164	72
Steppe Eagle	*Aquila nipalensis*	EN	VU:D	404	202	27	20	7	4	558	198
Eurasian Eagle Owl	*Bubu bubo*	LC	N/A	0	0	0	0	0	0	2	0
Common (Steppe) Buzzard	*Buteo buteo vulpinus*	LC	N/A	0	0	1	0	0	0	1	1
Long-legged Buzzard	*Buteo rufinus*	LC	LC	11	5	35	28	26	20	42	27
MacQueen's Bustard	*Chlamydotis macqueenii*	VU	VU:D	0	0	6	3	8	3	21	5
Short-toed Eagle	*Circaetus gallicus*	LC	VU:D	0	0	1	1	0	0	0	0
Greater Spotted Eagle	*Clanga clanga*	VU	VU:R	3	2	0	0	0	0	0	0
Western Marsh Harrier	*Circus aeruginosus*	LC	LC	0	0	2	2	0	0	4	3
Hen Harrier	*Circus cyaneus*	LC	LC	4	0	12	0	0	0	17	2
Pallid Harrier	*Circus macrourus*	NT	NT	1	0	14	9	0	0	25	7
Montagu's Harrier	*Circus pygargus*	LC	LC	0	0	1	0	0	0	7	6
Mute Swan	*Cygnus olor*	LC	NT	2	0	0	0	0	0	0	0
Merlin	*Falco columbarius*	LC	LC	5	0	0	0	0	0	11	1
Lesser Kestrel	*Falco naumanni*	LC	NT	0	0	2	1	0	0	13	10
Eurasian Hobby	*Falco subbuteo*	LC	LC	0	0	1	0	0	0	3	1
Common Kestrel	*Falco tinnunculus*	LC	LC	1	1	33	17	0	0	90	57
Black-winged Pratincole	*Glareola nordmanni*	NT	VU	0	0	20	8	0	0	0	0
White-tailed Eagle	*Haliaeetus albicilla*	LC	VU:R	3	1	0	0	0	0	1	0

Common Name	Scientific Name	IUCN	UzRDB	Winter		Spring		Summer		Autumn	
				Tot Recorded	Tot at Risk Flights	Tot Recorded	Tot at Risk Flights	Tot Recorded	Tot at Risk Flights	Tot Recorded	Tot at Risk Flights
Pallas's Fish Eagle	*Haliaeetus leucoryphus*	EN	-	0	0	1	1	0	0	0	0
Booted Eagle	*Hieraaetus pennatus*	LC	VU	0	0	0	0	0	0	1	1
Pallas's Gull	*Ichthyaetus ichthyaetus*	LC	VU:D	1	0	0	0	0	0	0	0
Egyptian Vulture	*Neophron percnopterus*	EN	VU:D	0	0	0	0	1	1	0	0
Black Kite	*Milvus migrans*	LC	LC	3	3	13	1	0	0	18	17
Honey Buzzard	*Pernis apivorus*	LC	-	0	0	0	0	0	0	6	5
Pin-tailed Sandgrouse	*Pterocles alchata*	LC	VU:D	21	3	0	0	0	0	50	0
Black-bellied Sandgrouse	*Pterocles orientalis*	LC	LC	0	0	20	20	0	0	834	378
Pallas's Sandgrouse	*Syrrhaptes paradoxus*	LC	LC	10,686	1,484	0	0	0	0	405	192
Northern Lapwing	*Vanellus vanellus*	NT	LC	3	0	0	0	0	0	0	0

Table 54: Combined (Yearly) Counts of Notable Species and Records and Number of at-Risk Flights Recorded by Species

Common Name	Scientific Name	IUCN	UzRDB	Combined Totals (Year)	
				Tot Recorded	Tot at Risk Flights
Northern Goshawk	*Accipiter gentilis*	LC	N/A	2	0
Eurasian Sparrowhawk	*Accipiter nisus*	LC	N/A	17	5
Cinereous Vulture	*Aegypius monachus*	NT	NT	20	12
Golden Eagle	*Aquila chrysaetos*	LC	VU:R	66	24
Eastern Imperial Eagle	*Aquila heliaca*	VU	VU:D	175	80
Steppe Eagle	*Aquila nipalensis*	EN	VU:D	996	424
Eurasian Eagle Owl	*Bubu bubo*	LC	N/A	2	0
Common (Steppe) Buzzard	*Buteo buteo vulpinus*	LC	N/A	2	1
Long-legged Buzzard	*Buteo rufinus*	LC	LC	114	80
MacQueen's Bustard	*Chlamydotis macqueenii*	VU	VU:D	35	11
Short-toed Eagle	*Circaetus gallicus*	LC	VU:D	1	1
Greater Spotted Eagle	*Clanga clanga*	VU	VU:R	3	2
Western Marsh Harrier	*Circus aeruginosus*	LC	LC	6	5
Hen Harrier	*Circus cyaneus*	LC	LC	33	2
Pallid Harrier	*Circus macrourus*	NT	NT	40	16
Montagu's Harrier	*Circus pygargus*	LC	LC	8	6
Mute Swan	*Cygnus olor*	LC	NT	2	0
Merlin	*Falco columbarius*	LC	LC	16	1
Lesser Kestrel	*Falco naumanni*	LC	NT	15	11
Eurasian Hobby	*Falco subbuteo*	LC	LC	4	1
Common Kestrel	*Falco tinnunculus*	LC	LC	124	75
Black-winged Pratincole	*Glareola nordmanni*	NT	VU	20	8
White-tailed Eagle	*Haliaeetus albicilla*	LC	VU:R	4	1
Pallas's Fish Eagle	*Haliaeetus leucoryphus*	EN	-	1	1
Booted Eagle	*Hieraaetus pennatus*	LC	VU	1	1
Pallas's Gull	*Ichthyaetus ichthyaetus*	LC	VU:D	1	0
Egyptian Vulture	*Neophron percnopterus*	EN	VU:D	1	1
Black Kite	*Milvus migrans*	LC	LC	34	21
Honey Buzzard	*Pernis apivorus*	LC		6	5
Pin-tailed Sandgrouse	*Pterocles alchata*	LC	VU:D	71	3
Black-bellied Sandgrouse	*Pterocles orientalis*	LC	LC	854	398
Pallas's Sandgrouse	*Syrrhaptes paradoxus*	LC	LC	11091	1676
Northern Lapwing	*Vanellus vanellus*	NT	LC	3	0

Summary of Notable Records from Vantage Point Survey, Transect Surveys, and Camera Trapping Surveys

The following section provides a summary of registrations of species of national or international conservation concern recorded during the Winter, Spring, Summer and Autumn Migration Vantage Point Surveys.

Mute Swan (UzRDB NT)

Two birds recorded during the Winter surveys only. Not at-risk flight seconds recorded.

White-tailed Sea-eagle (UzRDB VU)

Three individual birds recorded during the Winter surveys with one at-risk flight registered. This species regularly occurs in Uzbekistan, generally in the Aral Sea region and the wintering population is considered to be between 300 and 400 individuals. Regularly occurs on migration however is a very rare breeding species. Not recorded in the Spring Migration season. A single bird was recorded on the Autumn Migration surveys however this flight was above rotor swept area.

Pallid Harrier (IUCN and UzRDB NT)

1 individual recorded in the Winter season (not at-risk height) and 14 individuals recorded during the Spring Migration surveys with nine flights registered at-risk height. 40 individuals were also recorded during the Autumn Migration surveys, with 16 of these flights registered at risk height.

Greater Spotted Eagle (IUCN and UzRDB VU)

Only recorded during the Winter bird surveys and registrations are likely to be of early migrating birds or birds that may have over-wintered within Uzbekistan. Three individuals were recorded with two at-risk flights registered.

Steppe Eagle (IUCN EN and UzRDB VU)

Significantly more Steppe Eagles were recorded during the Winter surveys than on the Spring Migration surveys, indicating that 'spring' migratory movement for this species through the Project AoI occurs earlier in the 'migration season,' in February and March (displayed in Figure 77 below). A total of 404 individuals were recorded in the Winter season with a significant peak in movements between the 10th and 14th March when 358 individuals were recorded. Of the 404 individuals recorded, 202 were at risk height.

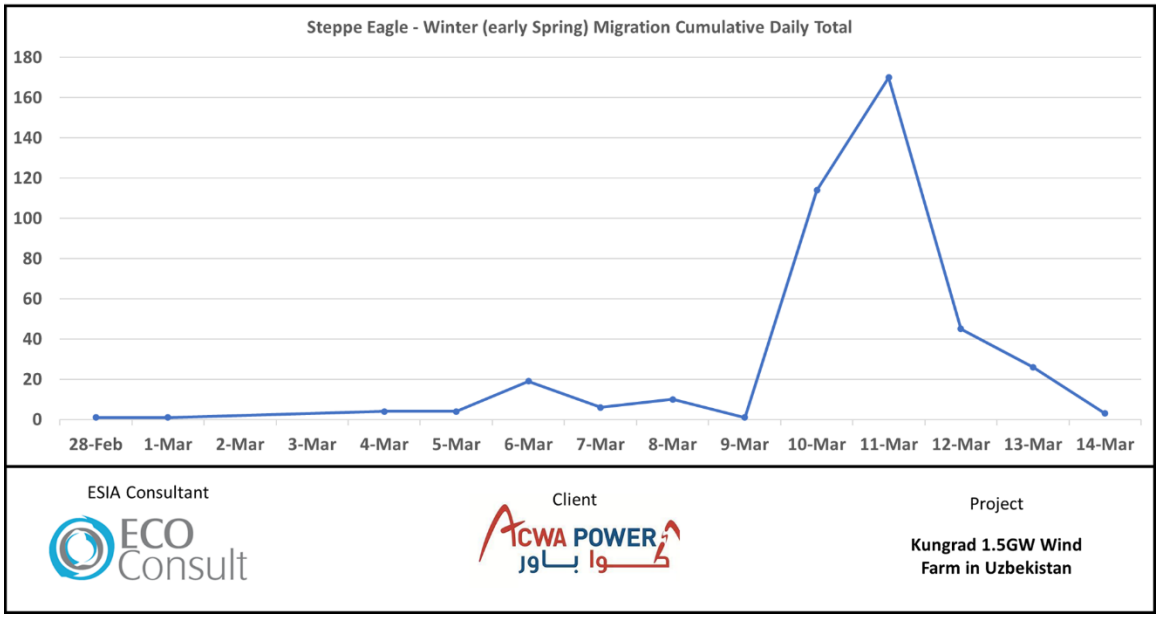


Figure 77: Cumulative Daily Totals – Steppe Eagle Winter Survey Period

There were 31 recorded flights in the breeding bird season, and these are likely to be of locally breeding birds, as there was one active nest of this species within the AoI in 2023. Seven flights were recorded

during the summer surveys with four at risk flights registered. Spring / summer activity of this species is considered to be minimal.

During the Autumn migration surveys at total of 558 individuals were recorded with a total of 198 birds recorded at risk height. There was a significant peak of migration in October (displayed in Figure 78) with the majority of the autumn records being recorded between the 13th and 15th October when 359 flights were recorded. There was also a smaller peak in activity on the 14th of September when 60 individuals were recorded.

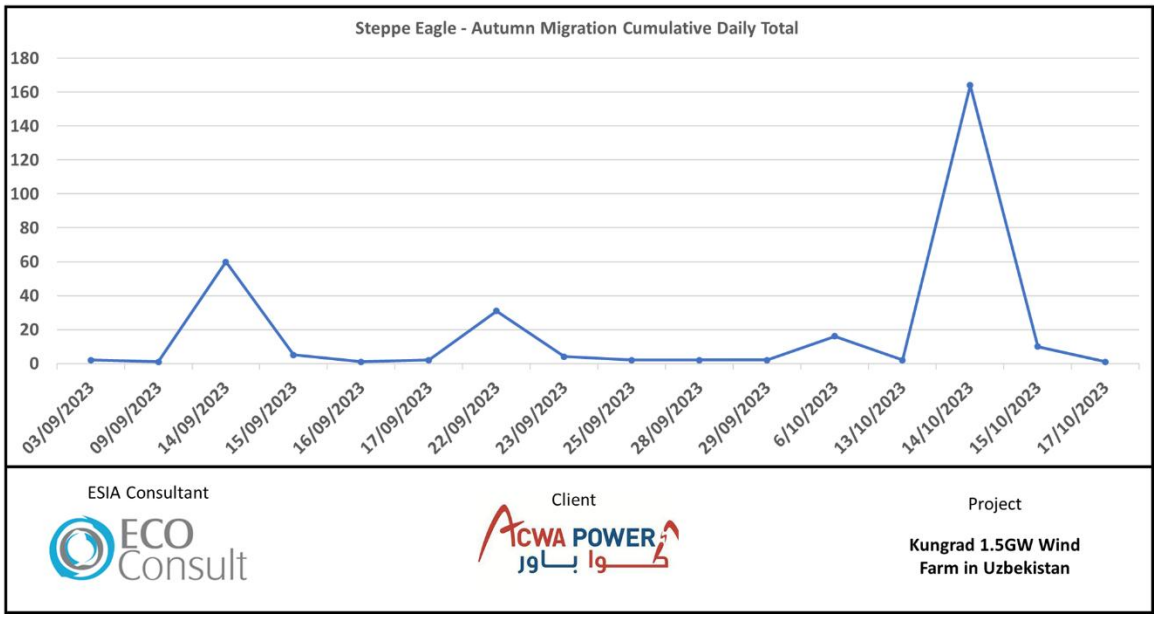


Figure 78: Cumulative Daily Totals – Steppe Eagle Autumn Migration Survey Period

Eastern Imperial Eagle (IUCN and UzRDB VU)

Recorded in the Winter (10 individuals), Spring Migration (1 individual) and Autumn Migration (164 individuals) survey seasons and it is likely that all individuals recorded where migrating through the Ustyurt Plateau. Of the birds recorded in the autumn surveys, 72 individuals were recorded at risk height. As shown on the graph below there was a peak in movement on the 14th of October 2023, with a smaller spike in migratory behavior towards the end of October.

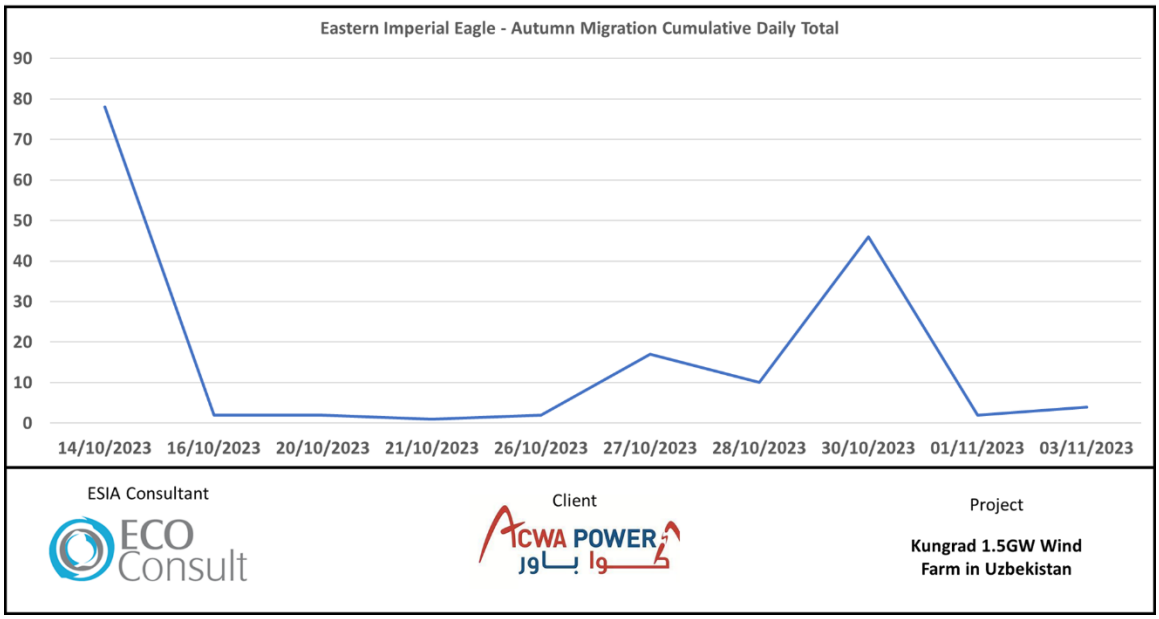


Figure 79: Cumulative Daily Totals – Eastern Imperial Eagle Autumn Migration Survey Period

Golden Eagle (UzRDB VU)

Recorded in both the Winter (25 individuals), Spring Migration (1 individual), Summer (1 individual) and Autumn Migration (39 individuals) survey seasons and it is likely that all individuals recorded where migrating through the Ustyurt Plateau. This species did not breed in the vicinity to the wind farm however one active nest was recorded on the shores of Sarykamysh Lake IBA by Turnstone Ecology in April 2023.

Pallas's Gull (UzRDB VU)

A single registration of a single bird in the Winter bird surveys.

Pin-tailed Sandgrouse (UzRDB VU)

A total of 23 individuals were recorded flying through the Project AoI during the Winter bird surveys. Of these, only three flights were recorded at-risk height. In Autumn 2023 a total of 50 individuals were recorded flying through the wind farm and of these none were at risk height.

Pallas's Sandgrouse (IUCN and UzRDB LC)

During the winter bird survey period a total of 10,686 individual Pallas's Sandgrouse were recorded flying through the wind farm and approximately 14% of these were at-risk height. 405 birds were recorded during the Autumn migration surveys and of these 192 were recorded at risk height. This is a species of Least Concern (IUCN and UzRDB) and are a fast flying and highly mobile species. It is not considered further in this assessment.

MacQueen's Bustard (IUCN VU and UzRDB VU)

No MacQueen's Bustard were recorded during the winter period. A total of six birds were recorded during the Spring Migration Vantage Point surveys and of these only three were at-risk height. This level of low flight activity in the spring mirrored general recorded activity across the AoI during the survey period. This species was encountered very sporadically during the transects surveys or registered as incidental sightings and where encountered only individual birds were observed (check table below). A single bird was also recorded on one occasion on the camera traps deployed within the AoI.

MacQueen's Bustard are not considered to have bred within the Project AoI as no evidence of breeding (e.g. lekking, or presence of chicks) was recorded during the spring surveys. Surveyors were present on site for the entire breeding period and due to the size of the survey team (three teams of two observers) and number of surveys being completed daily, site coverage was very good. VPs covered the vast majority of the site and each VP would have been subject to survey every five days and observers were driving from camp to the VPs and between VPs daily. In addition, transects were completed every two weeks during the breeding bird season.

Consultation with John Burnside (refer to "Section 6.3") concluded that the Project area is unlikely to support breeding MacQueen's Bustard, based on habitat suitability, and that this species has not previously been recorded breeding within the area of the wind farm. Breeding in north-western Uzbekistan is likely limited to areas of habitat to the west of the Aral Sea.

Breeding is however still possible and cannot be ruled out entirely due to cryptic and secretive behaviors however should breeding occur in the AoI it will be in very low densities (based on historical range and low habitat suitability).

Table 55: Registration of MacQueen's Bustard during the Spring Migration Period

Date	VP Number	
24/03/2023	VP-7	
26/03/2023	VP-30	
05/04/2023	-	
10/04/2023	-	
11/04/2023	VP-45	
13/04/2023	VP-20	
26/04/2023	-	
27/04/2023	-	
29/04/2023	VP-18	
17/05/2023	VP-17	

There were 6 spring records (3 at risk height), 8 individuals (3 at risk height) recorded in the Summer and 21 autumn records (5 at risk height) recorded in the Autumn Migration Vantage Point surveys. In addition, a small flock of five birds was also recorded during the transect surveys completed during the Autumn Migration surveys.

MacQueen's Bustard are being released in the northern part of the Ustyurt Plateau (outside of the Project AoI), with birds thought to be from Kazakhstan.

Based on consultations undertaken (refer to "Section 6.3.1"), it was indicated that there are release programs for the MacQueen's Bustards into Karakalpakstan. MacQueen's Bustard release programs are undertaken mainly the International Fund for Houbara Conservation in Abu Dhabi (OAE) and brought to the framework of the partnership between Ministry of Ecology, Environmental Protection and Climate Change. In addition, Falcon Hunting Solutions (private sector company) is involved in organizing hunting expeditions in Karakalpakstan for the bustards in Uzbekistan by Arab state royalty who use a private civil airport within the area.

Based on consultations it was indicated that no activities (release programs or hunting expeditions) are undertaken within the Project specific area. However, no further details were provided on specific inquiries stating that it is confidential information.

The national population is considered to be approximately 4,000 breeding adults (global population of 69,000) and as such it is clear from the survey data collected in winter, spring, summer and autumn that the Project AoI is not of significance, at any geographic scale for this species (both wild or released birds).

Short-toed Eagle (IUCN:LC and UzRDB VU:D)

Single individuals recorded on both the Winter and Spring Migration bird surveys. Neither flight was recorded at risk height.

Pallas's Fish Eagle (IUCN EN)

A single bird was recorded during the Spring Migration surveys.

Egyptian Vulture (IUCN EN and UzRDB VU)

Single bird seen flying through the wind farm during the summer surveys.

Booted Eagle (IUCN LC and UzRDB VU)

A single individual was recorded (at risk height) during the Autumn Migration surveys.

Cinereous Vulture (IUCN NT and UzRDB NT)

20 individuals (12 at risk height) recorded during the Autumn Migration surveys.

Notable Incidental Records (*e.g.* not during VP or transect surveys)

Incidental records of note recorded during the Spring Migration period include:

- Cinereous Vulture (IUCN NT and UzRDB NT) – one registration of two birds seen on the ground on the 26th April 2023 and a single bird was recorded on the camera trap near VP38 on the 10th of March 2023.
- Eurasian Griffon Vulture (IUCN LC and UzRDB VU) – one registration of a single bird seen on the ground on the 26th April with the two Cinereous Vultures. Not recorded during the Vantage Point surveys.
- White-tailed Eagle (IUCN LC and UzRDB VU) – one recorded on a camera trap near VP28 on the 13th of March 2023.
- Eagle Owl – a dead Eagle Owl was found under the low voltage power line running through the Project AoI on the 12th of April 2023. Individual birds were seen occasionally across the site during the survey period including one adult bird recorded during the Turnstone Ecology field visit.
- Eagle Owl Pellet Analysis – the following species were recorded from analysis of Eagle Owl pellets that were collected from across the Project area; Great Bittern, Glossy Ibis, Common Shelduck, Common Teal, Common Quail, Black-headed Gull, Common Kingfisher, Kentish Plover, Jack Snipe, White-tailed Lapwing, Black-winged Stilt, Eurasian Collared Dove, Eurasian Hoopoe, and Eurasian Wryneck. The prey items were likely taken as prey species transited across the site from water bodies in the Ustyurt Plateau or those were migrating through the site / utilizing terrestrial habitats.

Nesting Raptor Surveys

A single active nest of Steppe Eagle was identified within the Project AoI however despite laying two eggs, the nest failed mid-way through the season and the bird abandoned the nest. The reasons for abandonment are unknown however it is possible that the nest was predated by Caracal as there is a camera trap picture of a Caracal visiting the nest in the early spring period. The nest was constructed on the ground and given its size is obviously a regularly used nesting location that had been used for a number of years. A further three abandoned / damaged nests considered to be Steppe Eagle nests were located within the Project AoI (refer to table and figure below).

Table 56: Coordinates of Active and Abandoned Steppe Eagle Nests in the Project Area

Number	Active status of nest
1	Destroyed old nest (collapsed)
2	Active eagle nest. they had 2 eggs, but nest failed in 2023
3	Old raptor nest on the tomb (considered to be Steppe Eagle)
4	Old raptor nest on the ground (considered to be Steppe Eagle)

A total of 57 Long-legged Buzzard nests were recorded in the Project AoI and breeding raptor survey areas however of these only seven were active in 2023 (Table below). The majority of the 57 nests found were former nests that were irreparably damaged or the bushes they were constructed on had fallen over and are unlikely to be used in the future.

Table 57: Coordinates of Active Long-legged Buzzard Nests in the Project Area

Number	Active status of nest
1	Active nest with 3 eggs
2	Active nest with 2 eggs
3	Active nest with two chicks
4	Active nest with two eggs, 1 chick hatched
5	Active nest with three eggs
6	Active nesting, chicks/eggs not recorded
7	Active nest with two chicks

An old Eagle Owl nest was found near to VP27; however, this species is not considered to have bred within the AoI during the 2023 season.

Breeding Bird Surveys

The breeding bird assemblage, not including Steppe Eagle and Long-legged Buzzard consists of a very small assemblage of common and widespread passerine species of low conservation concern including Greater Short-toed Lark and Turkmenistan Short-toed Lark. Greater Sand plover was also confirmed as breeding with an estimated population of up to nine breeding pairs identified across the AoI. It is considered that recent droughts within the Ustyurt Plateau have likely reduced the suitability of the AoI for this species. In addition, the general lack of taller vegetation and general sparsely vegetated site likely limits the breeding bird assemblage. Excluding raptors, the breeding bird assemblage is of negligible sensitivity.

Bird Migration

Bird migration was recorded over the wind farm site in both the winter-spring and autumn migration seasons as indicated in the summary provided below (for raptor species and MacQueens' Bustard). General migratory movement in the autumn was to the south and south-west, over the wind farm, over a

range of flight heights although on the days where most migration activity was recorded birds were generally flying over 250m.

A summary of general flight direction in the autumn is shown on the figures below. Data collected during the winter surveys, including some early spring passage was done using a different methodology and as such flight direction is not easily discernible and is not included.

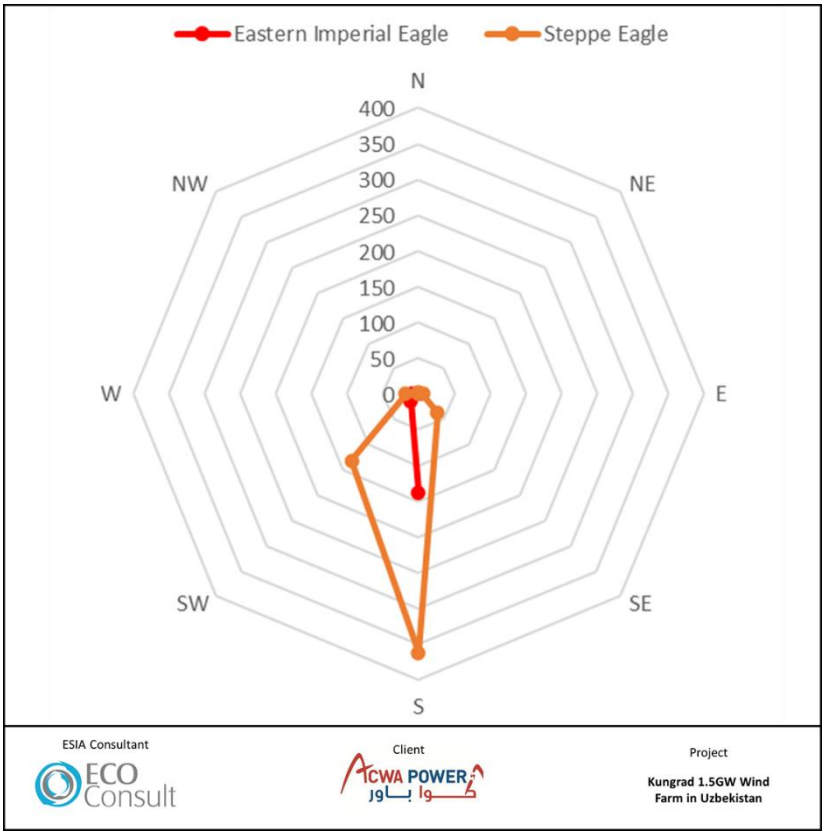


Figure 80: Main Migratory Direction of Steppe Eagle and Eastern Imperial Eagle in the Autumn 2023

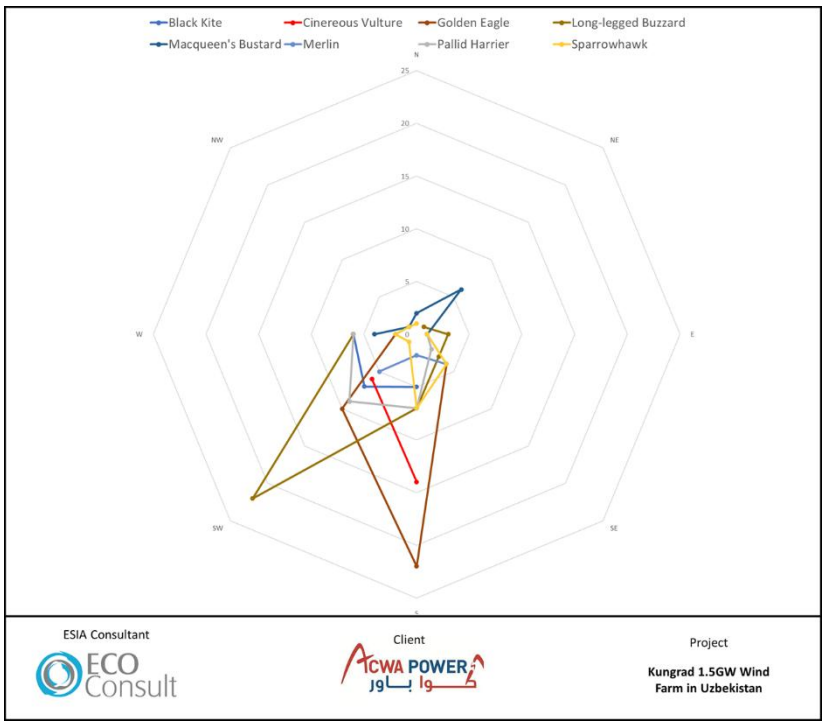


Figure 81: Main Migratory Direction of Other Species with registration of 11 – 50 individuals

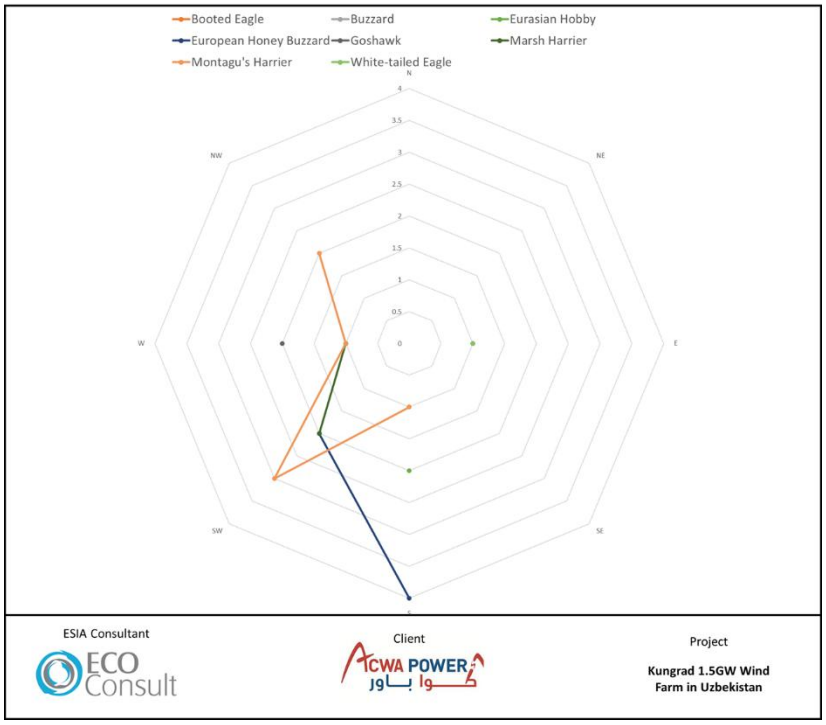


Figure 82: Main Migratory Direction of Other Species with registrations of less than 10 individuals

(ix) <u>Sensitive Receptors</u>

A table is provided below which details the sensitivities of the receptors recorded within the Project AoI that may be impacted by the construction and operation of the proposed wind farm and will therefore be considered within the impact assessment.

Any species recorded during surveys, but which are not listed in the sensitive receptor table are considered to be of Low/lower value.

- Impacts on Low/Lower value species are expected to be of low to medium magnitude and are therefore not significant; and
- Mitigation for higher value receptors will also alleviate impacts on these lower value receptors.

Therefore, these Low/lower value species have not been listed out in detail and the impact assessment section will not include assessments on these receptors.

Species identified as Priority Biodiversity Features (PBFs) in the Critical Habitats Assessment (CHA) are also included in the table below.

Table 58: Summary of Sensitive Receptors Species

Receptor	Conservation Status		Justification	PBF (Yes or No)	Sensitivity
	IUCN	UZBDB			
Natural Habitat	-	-	Natural Habitat – Type 8 Desert, sub-type 8.2 Temperate Desert (IUCN Habitats Classification) or Stoney (Gypsum) Desert (National Classification). This habitat is not listed in Annex I or included as a Priority Habitat. Good condition natural habitat dominates the Project AoI. No plant species present of international or national conservation concern and no endemic or range-restricted species considered to be present (based on surveys completed to date and in-country expert opinion). CH screening did not identify IUCN plants within range of the Project Area; however, it is possible that such species could be present given broad habitat / flora surveys completed to inform ESIA and should pre-clearance / pre-construction surveys find presence of IUCN VU/EN/CR or RR plant species, appropriate mitigations will be completed Areas of modified or highly degraded natural habitat (irrecoverably lost) this is the dominant habitat along the access road from Kirkkiz. Existing access tracks crisscross the Project site and in these areas that habitat is also considered highly degraded natural habitat.	Yes	Low to Medium
Central Asian Tortoise	VU	VU	Present across the AoI in low population density. Species is IUCN and UzRDB VU	Yes	High
Desert Sand Boa	LC	VU	Present across the AoI in very low densities. Species in not included on the IUCN Red List and is UzRDB VU only	No	Medium
Blotched Rat-snake	LC	VU	Present across the AoI in very low densities. Species in not included on the IUCN Red List and is UzRDB VU only	No	Medium
Brandt's Hedgehog	LC	NT	Two skins found indicating presence in AoI in low density. UzRDB NT species only	No	Medium
Corsac Fox	LC	VU	Individual burrows noted along with pug marks indicating presence in low densities. UzRDB VU species only.	No	Medium
Marbled Polecat	VU	VU	Single hole of this species located within VP40 viewshed. Presence confirmed in very low density in AoI. IUCN and UzRDB VU species.	Yes	High
Honey Badger	LC	CR	Two active burrows within AoI and additional single burrow 1.3 km south of AoI. Likely between 4 and 8 individuals and possible nationally important population within the AoI. IUCN LC but UzRDB CR	Yes	High

Caracal	LC	CR	No den sites identified however individuals recorded on the camera traps. Possibly up to three individuals present along the northern edge of the AoI. IUCN LC but UzRDB CR.	Yes	High
Goitered Gazelle	VU	VU	Recorded sporadically on the camera traps and one individual seen as an incidental sighting. Population within AoI between 20 and 25 individuals. A nationally rare species that is both IUCN and UzRDB VU.	Yes	High
Saiga	NT	CR	Not recorded during survey effort including camera trapping, dedicated mammal surveys or as an incidental sighting by the bird observers. Considered to be absent from the Wind Farm AoI. Review of historical range across the Ustyurt does not indicate AoI or South Ustyurt NP / Component 15 of the WHS are of historical significance for this species, however occasionally used during severely cold winters. Currently, even if population expansion continues, existing barriers restrict migration to the north of the project AoI.	Yes (if present)	High (if present)
Bats			Site support two possibly five bat species in very low densities, none of which are of global or in-country conservation concern. Some of these species have elevated collision. It is however considered that the site is of low suitability for bats due to the general characteristics of the habitats present as well as lack of suitable roosting sites and this is reflected with very low recorded activity in spring and summer. There is only one suitable structure within the AoI that could support roosting bats (a bunker along an existing transmission line running north to south through the AoI between VP 15 and 18. The site does not support large trees and does not support geological features (e.g. cliffs, rock faces) or other features (e.g. wells) that could support roosting bats. Increased bat activity was recorded in September indicating that the site is subject to autumn migration movements of bats.	No	Low to Medium
Sociable Lapwing	CR	VU	A widespread species within Uzbekistan during spring and autumn migration periods. Not recorded on the Wind Farm surveys, however migration through the AoI is likely, discussed further in the CHA document.	Yes	High
White-headed Duck	EN	EN	Breeding, passage and wintering species in Uzbekistan and known to occur in adjacent IBA and non-IBA wetlands. Not recorded on the Wind Farm surveys, however migration through the AoI is likely. Discussed further in the CHA document and CH is triggered for wintering / passage populations.	No (CH)	High
Steppe Eagle	EN	VU	431 individuals recorded in the winter and spring survey seasons. Confirmed as a nesting species within the AoI with one confirmed nest (unsuccessful attempt in 2023). Seven individuals recorded during the summer survey period. 558 individuals recorded during the autumn migration period. IUCN EN and UzRDB VU.	Yes	High

Pallas's Fish Eagle	EN	EN	Single bird seen on spring migration and just in airspace above the project. IUCN EN	Yes	High
Egyptian Vulture	EN	VU:D	Single bird seen (at risk height) in the summer season. No suitable nesting habitat within the Project AoI.	Yes	High
Cinereous Vulture	NT	NT	20 birds recorded on autumn migration	No	Yes
Saker Falcon	EN	NT	Approximately 70 breeding pairs in Uzbekistan however breeding habitat is not present within the Project AoI (e.g. cliff faces, chinks). Migration through the AoI is likely discussed further in the CHA document.	Yes	High
Lesser White-fronted Goose	VU	VU	Wintering and passage species within Uzbekistan within plainland water reservoirs of the Amu Darya and Syr Darya river basins including Lake Dengizkul. Wintering is irregular and populations fluctuate between 200 and 2,000 individuals. Migration through the AoI is likely discussed further in the CHA document.	Yes	High
Common Pochard	VU	-	Widely distributed species with large global population and known to occur in adjacent IBA and non-IBA wetlands. Migration through the AoI is likely discussed further in the CHA document.	Yes	High
Yellow-eyed Pigeon	VU	VU	A nesting and migratory mosaically distributed species. Migration through the AoI is likely and breeding possible.	Yes	High
Eastern Imperial Eagle	VU	VU:D	A total of 11 registered flights in winter and spring and birds on migration above the AoI. 164 individuals recorded in the autumn migration period IUCN and UzRDB VU	Yes	High
Greater-spotted Eagle	VU	VU:R	Three individual birds recorded in the winter bird season of birds migrating over the AoI. IUCN and UzRDB VU	Yes	High
European Turtle Dove	VU	VU	Widely distributed species with large global population. Migration through the AoI is likely, discussed further in the CHA document.	Yes	High
Great Bustard	EN	CR	Formerly a breeding species within Uzbekistan, however current status is as a wintering species and usually in colder winters only. Migration through and overwintering in the WF AoI is however unlikely, discussed further in the CHA document.	Yes	High
MacQueen's Bustard	VU	VU	Recorded in low numbers in the Wind Farm AoI and considered very unlikely to have bred in the AoI in 2023, and no recent historical records of breeding in AoI (John Burnside, pers comm.). Low habitat suitability within the AoI, although breeding may be possible but in very low population densities. Likely migration through the Project AoI, discussed further in the CHA document and Critical Habitat triggered under Criterion 3.	No (CH)	High
Pallid Harrier	NT	NT	Fourteen birds recorded in spring and 25 in the autumn migration periods. IUCN and UzRDB NT	No	Medium

White-tailed Eagle	LC	VU:R	Three birds seen during the Winter Vantage Points, and one in the autumn and an additional single individual on the camera traps. UzRDB VU only	No	Medium
Pallas's Gull	LC	VU:D	Single individual bird seen during the Winter Vantage Point surveys. UzRDB VU only	No	Medium
Pin-tailed Sandgrouse	LC	VU:D	Only recorded in the winter with total of 21 birds observed. UzRDB VU only	No	Medium
Northern Lapwing	NT		Three birds seen during winter bird surveys. IUCN NT and not listed on UzRDB	No	Medium
Red-Crested Pochard	LC	-	Breeding, passage and wintering species in Uzbekistan and known to occur in adjacent IBA and non-IBA wetlands. Not recorded on the Wind Farm surveys, however migration through the AoI is likely. Discussed further in the CHA document and CH is triggered for wintering / passage populations.	No (CH)	Low

11.2 Assessment of Impacts

This section identifies and assesses the anticipated impacts from the Project activities on identified sensitive ecological receptors during the construction and operation phase. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

Impact assessment summary tables are relevant, however for some impacts the assessment is provided within the accompanying text and where impact significance is clear (e.g. similar impacts affecting multiple receptors), no table has been provided to avoid significant levels of repetition.

All mitigation measures contained in this section will be included in a Project specific construction Biodiversity Management Plan (BMP) (and referenced in the Biodiversity Action Plan (BAP)) which will also include details of pre-clearance, pre-construction, and during-construction monitoring. **This BMP (and BAP) will be provided as a standalone document.**

Both documents will be live documents however the BMP will initially include all of the below mitigation and monitoring requirements to be undertaken during the construction and operation of the wind farm facility.

In accordance with the BMP, the Developer will be required to appoint a full-time Biodiversity Manager that will be responsible for oversight, audit, assessment and evaluation of data to ensure that the measures set out in the ESIA and BMP are completed in full during all phases of the Project implementation.

The EPC Contractor will be required to employ a full-time Biodiversity Manager to work on the Project and they will be responsible for the day-to-day monitoring, management and implementation of the measures specified in the ESIA / BMP throughout the construction phase of the Project. The EPC Biodiversity Manager will employ a team of appropriate specialists (to include but not limited to avifauna specialists, mammal specialists, etc.) to undertake the construction phase surveys and monitoring and will ensure timely reporting in line with the requirements set out in the ESIA and BMP.

Similarly, during operation, the O&M Contractor will also be required to appoint a full time biodiversity manager supported by specialists.

11.2.1 Potential Impacts during the Construction Phase

Habitat Loss, Fragmentation and Degradation

Site clearance and subsequent construction activities will result in the direct loss of areas of natural habitats over the full construction footprint of the Project including internal site roads, turbine bases, crane pads, substations, and permanent site structures (e.g. offices). Natural habitats are valued as being of Low to Medium sensitivity. There is also likely to be temporary habitat loss and degradation of habitats as a result of temporary lay-down areas and other temporary facilities (e.g. worker accommodation) as well as cabling and communication routes.

Habitat loss associated with the access road from Kirkkiz to the site will affect areas of highly degraded (irrecoverably lost) natural habitat or modified habitat. The existing access track will be upgraded to an access road. Existing tracks within the wind farm AoI have also been mapped and internal access roads will be constructed on to the existing network of tracks across the wind farm AoI (as discussed previously under “Section 4.1.1”). Actual loss of natural habitat will therefore be very minor.

The total project boundary (concession area) is 950 km^2 or 95,000ha. The project footprint including the access road will be 6.49 km^2 or 649ha, which equates to 0.9% of the total project area being affected by the proposed works.

Table 59: Habitat Areas being Affected by Construction

Component	Footprint	Duration	Description
Turbines	1.06km^2/ 106ha	Permanent	This includes the footprint for the foundation and the crane pad area for each of the 204 turbines. Typically, each crane pad is around 4,500m^2 in area, whereas each foundation typically consists of a circular footing of 24m diameter
Access Road	0.92km^2 / 96ha	Permanent	This includes a total length of 120km and width of 8m.
Substation and Warehouse and Storage Facilities	0.24km^2/ 24ha	Permanent	Footprint for each substation, warehouse, building facilities and BESS component is around 0.0812km*2*. The Project has 3 internal substations.
Trenches for MV cables and communication cables	0.48km^2 / 48ha	Temporary	This includes MV cables (total length of 152 km and width of 0.7m) and telecommunication cables (total length of 322km and width of 1.15m
Internal Road Networks	3.6km^2 / 360ha	Permanent	This includes the road network with a total length of 240km and a width of 15m.
Temporary Facilities	0.145km^2 / 14.5ha	Temporary	This includes site offices, laydown areas, batching plant, and worker camp. Those will be located within Project boundary.
Total Project Footprint	6.49km^2 / 649ha	Mix	
Total Project Site Boundary Area	**950 km^2/ 95,000ha**	-	**Project footprint is around 0.9% of the total boundary of the Project area**

For the purpose of habitat loss calculations, it has been assumed that 30% of the internal road network will be constructed in areas of good condition natural habitat, which will be permanently lost. The remaining 70% will be constructed in areas of existing tracks where the habitat is modified (very poor) or has already been permanently lost. Turbines are likely to be in areas of natural habitat as will storage, substations, laydown areas and warehouse facilities and will result in the loss of good natural habitat. Cable routes will be excavated adjacent to roads and will also result in the temporary loss habitat which has been estimated as being 30% natural habitat and 70% of modified or lost habitat. In the table below temporary habitat loss is shown italics and permanent habitat loss is indicated in bold. Habitat Hectares = sum of area (hectares) multiplied by habitat condition score.

Component	Footprint	Habitat Score	Habitat Hectares
Turbines	**1.06km^2/ 106ha**	**Natural 0.8**	**84.8**
Substation and Warehouse and Storage Facilities	**0.24km^2/ 24ha**	**Natural 0.8**	**19.2**
Trenches for MV cables and communication cables	*0.48km^2 / 48ha*	*Natural 0.8*	*11.52*
		Modified 0.2	6.72
Road Networks (access roads and internal roads)	**2.4km^2 / 240ha**	**Natural 0.8**	**57.6**
		Modified 0.2	**33.6**

Therefore, a total of 195.2 habitat hectares will be permanently lost and 18.24 habitat hectares will be temporarily lost. Therefore, a loss of 213.44 habitat hectares will occur, of which 173.12habitat hectares is likely to be good condition natural habitat (condition score 0.8) and 40.32 hectares poor quality (condition score 0.2) modified habitat or degraded natural habitat (existing tracks). For the purpose of the habitat hectares lost the area of temporary loss has been considered permanent as a result of reduction in habitat quality in areas temporarily affected by the works. Habitat condition scores and calculations of loss / gain will be updated in the BMP, based on the results of the modified pre-construction surveys.

Construction Phase – Habitats		
Type	Negative	
Duration	Short-to medium term	Limited to construction. Construction phased over four years however some areas (e.g. laydown, batching plant) will be impacted throughout this period so impacts assessed as being short- to medium-term
Magnitude	Low to Medium	Direct habitat loss will only impact those areas subject to construction activities.
Reversibility	Both	Permanent habitat loss is irreversible, temporary habitat loss is reversible
Sensitivity	Medium	Areas of natural habitat are of medium sensitivity however large areas of poorer quality modified habitat (low to negligible sensitivity) will also be affected
Likelihood	High	Habitat loss is certain
Frequency	Rare	Habitat loss will occur once in any area, once lost / impacted it can't be impacted again
Timing	Not Relevant	For the duration of construction phase
Extent	Low	Impact will occur in the Project footprint only
Significance	**Minor to Moderate**	

Mitigation Measures

The following mitigation measures will be employed to reduce the significance of habitat loss, fragmentation, and degradation during the construction (habitat clearance, levelling or any other works) period. Mitigation measures are largely based on avoidance of impact through selection of the working areas to favor areas of degraded natural habitat or those areas where habitats have been modified. Where impacts cannot be avoided the following will be completed

- All site workers will undertake a Project induction before working on site. The induction will include a comprehensive biodiversity element where the baseline ecological value and sensitivity of the site will be discussed.
- Prior to construction works (habitat clearance, levelling or any other works) , working areas will be clearly demarked so that site workers fully understand the working area. Encroachment into areas outside of agreed working areas will be prohibited and working areas will be subject to regular check by the EPC Contractor to check enforcement of working areas.
- Prior to clearance of vegetation, pre-clearance surveys will be undertaken by a suitably qualified ecologist, and these are fully detailed in the Project BMP. Vegetation survey methods and habitat condition assessment metrics have been updated.
- The project will result in the permanent loss of 195.2 habitat hectares. Mitigation will be undertaken in all areas of the site subject to temporary habitat loss in the form of habitat rehabilitation /

restoration. Temporary habitat loss totals 18.24 habitat hectares and if all of this area (48ha in total) is restored to a condition score of 0.4 then a total of 9.6 habitat hectares will be created.

- The above are considered mitigation measures to be implemented for such impacts. However, with this, the Project will not meet the requirements of no net loss of natural habitat and therefore off setting will be required. Such requirements are discussed further in "Section 11.4".

Direct Impacts on Sensitive Receptors (Habitats and Flora) – Non-native Species and Introduced Flora

It is possible that non-native or introduced flora could be imported into the AoI on vehicles or within any imported material. The impacts of non-native and introduced flora could potentially be significant in absence of any mitigation as these species could become established and out-compete native flora.

In addition, three species listed on the national quarantine list were identified during the botanical assessment and these are *Cuscuta campestris* (non-native), *Cuscuta epithymum* (probably native) and *Rhaponticum repens* (native). Construction works could improve conditions for these species, and it is possible earth moving could increase the distribution of these species across the AoI.

Impacts associated with non-native, invasive or introduced flora could result in long-term negative impacts, irreversible (if allowed to become established).

Construction Phase – Direct Impacts on Sensitive Receptors (Habitats and Flora) – Non-native Species and Introduced Flora		
Type	Negative	
Duration	Short-to Long Term	If non-native species become established impacts could be longer term
Magnitude	Medium	Potential change to natural habitat and species composition across the Project AoI
Reversibility	Reversible	Invasive species can be controlled, if identified
Sensitivity	Medium	Areas of natural habitat are of medium sensitivity
Likelihood	Low to Medium	Introduction of invasive non-native species is possible, but not certain
Frequency	Periodic	During Construction
Timing	Not Relevant	For the duration of construction phase
Extent	Medium	If established within the Project footprint it is possible that invasive species could spread to wider areas
Significance	**Moderate**	

Mitigation Measures

- Each and every vehicle, prior to coming to the site will be subject to a full clean down at a storage / plant yard so that is effectively clean. On arrival at the Project area (i.e. from yard to area) vehicle will go into a wheel-cleaning facility that will be established before entry into the access road (e.g. near Kirkkiz). At the facility, the vehicle will run over a rumble strip to shake any loose debris from the tires. The vehicle will then be subject to a visual inspection and if necessary compressed air will be used to remove any other loose dirt debris.

- Once on site most vehicles and equipment will be on site for the duration of the construction period. Should any vehicle leave the leave area, it should undergo the same procedure above before entry into the access road.

- Regular site walkover surveys throughout the construction period by a suitably qualified botanist to check to the presence and abundance of non-native or invasive species. In case such areas are identified, Areas of non-native or invasive species will be mapped and a program of mechanical control will be completed over the construction period in order to remove these species from the AoI. Chemical control will be avoided however, if necessary, will be used but in accordance with national and international guidelines as well as proper risk assessment and will only be used with prior approval of the Lenders.
- Extensive pre-construction surveys are being completed to update the baseline habitat information, including habitat condition scores and presence of non-native species. The results of these surveys will be used against which to assess the results of post-construction monitoring surveys.

Direct Impacts on Sensitive Receptors (Vertebrates) - Site Clearance and Earthworks

As well as impacts to habitats it is near-certain that site preparation works and construction activities will negative impact sensitive ecological receptors (e.g. reptiles, mammals, breeding birds) as a result of direct mortality.

Central Asian Tortoise (PBF, IUCN and UzRDB VU) are likely to be particularly exposed to impacts during construction as they are cryptic and slow-moving. In addition, their life cycle means that they will be particularly exposed to construction related mortality. Central Asian Tortoise are only typically active for 8 – 12 weeks per year, in the Spring, after which they enter a period of summer aestivation followed, in most years, by winter hibernation. In some years, with warm autumn temperatures, there may be a second period of activity, but this is sometimes very short-lived and very hard to predict. Unmitigated impacts on Central Asian Tortoise could potentially be medium-term and irreversible (e.g. loss of a generation of breeding animals or a period of lower recruitment due to loss of eggs).

Construction Phase – Direct Mortality Central Asian Tortoise		
Type	Negative	
Duration	Short to medium term	Impacts in localized areas during construction would be short term however impacts over the whole construction period could be medium term
Magnitude	Medium	Potential mortality could reduce population size and viability within the Project footprint
Reversibility	Irreversible	Mortality of Central Asian Tortoise will be permanent
Sensitivity	High	IUCN VU
Likelihood	High	Mortality is certain without mitigation
Frequency	Periodic	During Construction
Timing	Not Relevant	For the duration of construction phase and in all seasons
Extent	Low	Impact will occur in the Project footprint only
Significance	**Moderate**	

Two other species of reptile; Desert Sand Boa and Blotched Rat-snake (both UzRDB VU) are receptors of medium sensitivity and are also exposed to similar impacts during construction. Both species are more active during the year and the magnitude of likely impacts are slightly less than for Central Asian Tortoise.

Construction Phase – Direct Mortality Desert Sand Boa and Blotched Rat-snake		
Type	Negative	
Duration	Short to medium term	Impacts in localized areas during construction would be short term however impacts over the whole construction period could be medium term

Magnitude	Medium	Potential mortality could reduce population size and viability within the Project footprint
Reversibility	Irreversible	Mortality of reptiles will be permanent
Sensitivity	Medium	UzRBD VU
Likelihood	High	Mortality is certain without mitigation
Frequency	Periodic	During Construction
Timing	Not Relevant	For the duration of construction phase and in all seasons
Extent	Low	Impact will occur in the Project footprint only
Significance	**Moderate**	

Ground clearance and earthworks are also very likely to negatively impact lower sensitivity nesting birds (passerines and Greater Sandplover) through direct mortality of adult birds as well as loss of nests, eggs and chicks. The lower sensitivity nesting bird assemblage is not of conservation importance and therefore sensitivity is low, and impacts are likely to be short-term (1 year in each phase of the project) and reversible (generally higher fecundity species).

Construction Phase – Direct Mortality lower sensitivity Nesting Birds (passerines / waders)		
Type	Negative	
Duration	Short to medium term	Impacts in localized areas during construction would be short term however impacts over the whole construction period could be medium term
Magnitude	Medium	Potential mortality could reduce population size within the Project footprint
Reversibility	Irreversible	Direct mortality of adults very unlikely but loss of nests, eggs and chicks would be irreversible
Sensitivity	Low	Receptors are not of elevated international or national conservation concern. High fecundity species
Likelihood	High	Unmitigated loss of nests and chicks is certain
Frequency	Periodic	During Construction
Timing	March to July, annually throughout construction	Impacts during the breeding season only throughout construction period
Extent	Low	Impact will occur in the Project footprint only
Significance	**Minor**	

Ground clearance and earthworks could also potentially result in disturbance to breeding MacQueen's Bustard as well as destruction of nests and eggs. It is however not thought, based on the 2023 surveys, that this species is breeding in the AoI and as such impacts on this species are very unlikely to negatively affect significant populations of this species. Consultation with John Burnside (refer to "Section 6") confirmed that the wind farm AoI is unlikely to be used by breeding MacQueen's Bustard as this species. Breeding records of this species in NW Uzbekistan are limited to areas to the west of the Aral Sea and the main breeding range for MacQueen's Bustard in Uzbekistan is the Kyzyl-Kum Desert which is outside wind farm AoI.

Construction Phase – Direct Mortality MacQueen's Bustard		
Type	Negative	
Duration	Short to medium term	Impacts in localized areas during construction would be short term however impacts over the whole construction period could be medium term
Magnitude	Low	Species unlikely to breed in the AoI due to low habitat suitability, absence of recent historical records of

		breeding in AoI and lack of records during 2023 surveys. Breeding is however possible and cannot be ruled out entirely but any breeding densities would be very low and as such any direct impacts during construction are very unlikely to affect significant populations of this species
Reversibility	Irreversible	Direct mortality of adults very unlikely but loss of nests, eggs and chicks would be irreversible
Sensitivity	High	IUCN Vulnerable and CH qualifying species (migration)
Likelihood	Low	Considered to be absent and if present in very low densities so likelihood of impact is low
Frequency	Periodic	During Construction
Timing	March to July, annually throughout construction	Impacts during the breeding season only throughout construction period
Extent	Low	Impact will occur in the Project footprint only
Significance	**Minor**	

Ground and tree-nesting raptors (Steppe Eagle and Long-legged Buzzard) are of high and low sensitivity respectively and unmitigated impacts are near-certain to be negative with, at worst, major levels of significance. Impacts will include loss of breeding habitat (nesting sites) and a reduction in quality of adjacent foraging habitats. Impacts are likely to be short-term (1 year in each phase of the project) and reversible (long-lived species). Impacts on Steppe Eagle are presented in the table below and significance of impacts on Long-legged Buzzard (low sensitivity) will be lower. Other species of birds of lower sensitivity that nest in trees or on the ground could be potentially negatively affected by habitat loss and disturbance however impacts are likely to be short-term (single breeding season) and not significant due to their conservation status and high rates of fecundity.

Construction Phase – Direct Mortality, Loss of Nesting Sites and Reduction in Habitat Quality – Raptors (Steppe Eagle)		
Type	Negative	
Duration	Short Term to Long Term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is also phased so direct impacts in limited working areas during the construction phase. Longer term impacts are possible as a result in reduction in habitat quality affecting foraging areas although nesting sites will be unaffected.
Magnitude	High	Suitable nesting sites are very limited within the AoI so loss of nesting sites is very unlikely, although if lost magnitude would be high
Reversibility	Irreversible	Direct mortality of adults very unlikely but loss of nests, eggs and chicks would be irreversible
Sensitivity	High	IUCN EN
Likelihood	High	Reduced habitat quality is certain to occur
Frequency	Periodic	During Construction / nesting season
Timing	March/April to June / July, annually throughout construction	Impacts during the breeding season only throughout construction period however longer-term impacts may persist as a result of reduction in habitat quality
Extent	Low	Impact will occur in the Project footprint only

Significance	**Major**

Terrestrial mammals could also be impacted as a result of habitat clearance works resulting in direct mortality of small mammals (e.g. rodents, ground-squirrel) as well as larger species including Marbled Polecat (IUCN: VU) as well as Honey Badger and Caracal which are both high sensitivity species (UzRDB CR). Impacts to high sensitivity receptors shown in the table below and significance of receptors of lower sensitivity will be lower (e.g. Corsac Fox).

Direct mortality of Goitered Gazelle, Saiga and other large ungulates is considered to be highly unlikely.

Construction Phase – Direct Mortality and Reduction in Habitat Quality – Mammals (Honey Badger, Caracal and Marbled Polecat)		
Type	Negative	
Duration	Short Term to Long Term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is also phased so direct impacts in limited working areas during the construction phase. Longer term impacts as a result of reduction in habitat quality (operational impacts)
Magnitude	High	Number of burrows are very limited within the AoI so loss of such sites is very unlikely, although if lost magnitude would be high
Reversibility	Irreversible	Mortality of individuals would be permanent loss
Sensitivity	High	Honey Badger and Caracal UZRDB CR, Marbled Polecat IUCN and UZRDB VU
Likelihood	High	Reduced habitat quality is certain to occur
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months
Extent	Low	Impact will occur in the Project footprint only
Significance	**Major**	

Mitigation Measures

A summary of measures to avoid and mitigate for direct impacts on sensitive vertebrate receptors is included below. These measures are included (and expanded upon) in the pre-construction and Construction Biodiversity Management Plan.

- All site workers will undertake a Project induction before working on site. The induction will include a comprehensive biodiversity element where the baseline ecological value and sensitivity of the receptors within the AoI will be discussed.
- Prior to construction works (habitat clearance, levelling or any other works), working areas will be clearly demarked so that site workers fully understand the working area. Working areas will be marked using orange netting fencing (or similar). Encroachment into areas outside of agreed working areas will be prohibited and working areas will be subject to regular check by the EPC Contractor and Developer's Biodiversity Team to check enforcement of working areas.
- Working areas should avoid trees / shrubs as these are likely, due to their sporadic distribution across the AoI to be of importance to breeding birds (e.g., passerines, raptors).
- An exclusion zone of 500m will be incorporated around the Honey Badger burrows and single Marbled Polecat hole within the AoI.

- Construction (habitat clearance, levelling, or any other works) is programmed to start in Q4:2024 with works starting on the access road. Construction (habitat clearance, levelling, or any other works) within the wind farm area will commence in Q2 2025. Pre-clearance works will include the following:

  - Pre-clearance walkover surveys across the site to target for the presence of Marbled Polecat, Corsac Fox, Honey Badger, and Caracal, including at previously known holes or areas of activity. Where presence identified, additional surveys will be completed to check for activity and or confirm species present. If burrows are not in active use, they will be checked by a mammal specialist and carefully destroyed (excavated with a machine/digger) with supervision of a mammal specialist. If burrows are found to be in active use further avoidance and mitigation is required. Exclusion zones (of 500m) will be set up so that work can continue but avoid the burrow. If this is not possible the work in these areas will be delayed and no access will be allowed in these buffer zones until it can be proven the animals have moved on and are not active at that site, naturally and of their own accord. Once these periods are over the burrow will be monitored and destroyed as above. Walkover surveys will be undertaken in Q2 2024 and Pre-construction checks will also be undertaken within 4 weeks prior to construction (habitat clearance, levelling or any other works) starting.

  - If Goitered Gazelle are recorded during these surveys as well as during pre-construction surveys buffer zones of up to 1km will be applied if it is shown that they are calving. These buffer zones are likely to be temporary as the mothers and young calves will move out of working areas / disturbance zones soon after birthing.

  - Pre-clearance surveys and translocation will be completed for Central Asian Tortoise, Desert Sand Boa and Blotched Rat-snake prior to commencement of construction activities (habitat clearance, levelling or any other works) in any given area with a tentative suggested approach below (however this will depend on actual Project timeline which is to be identified by the EPC Contractor).

    - Translocation works will commence in Q2 2024 along the access road as well as in areas that will be subject to works at any point in 2024 up to Q2 2025.

    - Along the access road any animals found during the spring season of 2024 will be captured, tortoises will be microchipped, a scute notch applied and health checked and moved approximately 2 km from the route of the access road (avoiding the areas of the proposed Kungrad OHTL). Animals caught after 2024 will not be microchipped as this is no longer supported by the MoE and they will be discretely marked in line with measures included in the Project BMP.

    - Animals will be moved to areas of suitable habitat and will be distributed evenly and in areas adjacent to where they were found. This will therefore not impact on the likely foraging territory of any Honey Badgers present within areas that will be subject to translocation.

    - Exclusion fencing will be used within the wind farm AoI in laydown, workers accommodation areas/site offices and batching plants. The fenced areas will be subject to translocation with any animals caught subject to microchipping and health checking. Animals will be moved out of the fenced areas.

- The fence will be constructed from small-gauge mesh (with holes 1cm x 1cm) and will be dug to a depth of 30cm and will be approximately 60cm tall and securely attached to wooden posts. The wooden posts will be on the inside of the fenced area.

- A 'tortoise / animal guard' will be installed by the EPC Contractor at the entrance to each fenced area. General maintenance of the guard should be completed quarterly (e.g. four times a year) and one of these checks should be in March/April (e.g. immediately prior to the tortoise active season). The tortoise guards will have trenches at both ends with graded escape ramps, that allow animals to move outside of the exclusion fencing. These will be checked daily for trapped animals.

- Animals within the project area that will be subject to construction activities habitat clearance, levelling or any other works) prior to 2025 will also be subject to translocation with animals moved outside of working areas. Burrows within these working areas will also be checked during the active season and they will be blocked / destroyed.

- In 2023, marking of captured animals will ONLY include a microchipping and a small scute notch that will identify the animal as one caught and microchipped. No paints or other obvious marking will be applied to captured tortoises that could make them potentially more vulnerable to predation. Unique scute marks/notches will be applied to animals caught and removed in subsequent years.

- Animals will be moved to areas of suitable habitat and will be distributed evenly and in areas adjacent to where they were found. This will therefore not impact on the likely foraging territory of any Honey Badgers present within areas that will be subject to translocation.

- Translocation will be completed throughout the spring 'active season' so that the population along the access road is significantly reduced, thus reducing the likelihood of animals aestivating and hibernating along the access road. The erosion caused by regular vehicle movements has increased the suitability of roadside habitats for aestivating and hibernating tortoise due to access to softer sub-soil and as such during the translocation exercise all burrows that could potentially support tortoises (they have a characteristic shape) will be fully investigated using an endoscope. All burrows will be destroyed / blocked once confirmed they are free of tortoises. Translocation efforts will only take place during the tortoise active season and will cease as soon as aestivating behavior is recorded. Only active animals will be translocated.

- If occupied burrows are found after the active season, then the burrows will be clearly marked (using colored flags) and the working areas adjusted to avoid direct impacts on aestivating / hibernating tortoise.

- In the event that a tortoise is accidentally dug up or disturbed during works in periods of inactivity (i.e. aestivation / hibernation) then they will be carefully transported to a temporary holding facility that will be set up by the project. Transportation to a suitable holding facility will be undertaken by a suitably trained ecologist / species specialist. The holding facility will be operational for accidental findings of tortoises during construction. The holding facility is one that is already operational and is located in Tashkent. Any animals that are taken to the holding facility will be returned to the Project site in the next active season.

- The mitigation strategy has been devised such that it is not anticipated that a significant number of tortoises will be held temporarily.
- In 2025 the eastern part of the wind farm will be subject to spring walkovers to search for and capture tortoises within all marked working areas, including a buffer of up to 200m from the works area. Any animals caught will be marked on the scute as 2025 animals and moved further to the east, approximately 2 km. All works areas will be subject to searches prior to land being cleared / levelled and if burrows are located, they will be checked, dug out / destroyed by hand.
- The same process will occur in 2026 in the central area and animals will be moved to the already constructed eastern area, and in 2027 where animals will be moved from the western area to the central area.
- At the end of construction in 2028 a repeat tortoise survey will be completed across the whole of the wind farm AoI (including the 2025 receptor site) and animals will be moved back to where they were originally found (all animals will be scute marked in the year of capture). By the end of 2028 it is considered that the tortoise population across the wind farm AoI will be similar to that prior to construction. Repeat surveys will be completed in Year 1, 3 and 5 post-construction to ensure population levels across the project site are comparable to baseline population levels. Where encountered during all pre-clearance and pre-construction surveys Desert Sand Boa and Blotched Rat-snake will be caught and moved away from construction zone. All other species of reptile on the site are highly mobile species and are likely to move out of construction zones during the active season. Any mortality of other species of reptile is certain to not be significant due to their favorable conservation status.

- An exclusion zone of 2 km from the active and abandoned Steppe Eagle nest and 500m from all active Long-legged Buzzard nests has been factored into the design of the scheme and it is certain that there will not be a loss of active nesting sites for breeding raptors. A repeat breeding raptor nesting survey will be completed in 2024 and any active new nests will be marked on to a constraints map and exclusion zones (the same to those previously stated) applied during the construction period. The buffer zone for Long-legged Buzzard is considered appropriate as this is based on buffer zone guidance published by NatureScot[28] which sets displacement distances of between 100 and 200m for Common Buzzard and is based on forest dwelling birds. Additional distances have been added to this buffer zone as the Long-legged Buzzard is nesting in a very open habitat. 500m is considered appropriate for a species which is listed as IUCN LC and one that is not included on the UzRDB.
- Construction is due to start in Q4 2024 so construction related impacts are not anticipated in the 2024 breeding season and construction is likely to be under way at the commencement of the breeding bird season 2025 and as such it is unlikely that sensitive species of ground nesting birds (e.g. Greater Sandplover) will start to breed in areas subject to construction works

  It is possible that small, ground-nesting birds could nest within or very close to construction areas and nests could therefore be abandoned (disturbance) or destroyed. Where nests are lost any impact would be negligible, short-term (one breeding season only) and the species potentially affected are not of elevated international or national conservation concern. For this reason, no additional mitigations or exclusion zones will be applied for commonly occurring ground (or tree)

[28] https://www.nature.scot/doc/disturbance-distances-selected-scottish-bird-species-naturescot-guidance

nesting species. Mitigations need to be realistic, and it is not realistic that site infrastructure or the construction of a turbine will be delayed for up to three months for an active nest of a commonly occurring bird of no particular conservation concern, especially where there is no in-country legal protection for such species.

- In the unlikely event that MacQueen's Bustard are recorded breeding in the project AoI a buffer of 1km will be applied around lekking sites and 750m around active nests. These buffer zones are based on a range of scientific data however no definitive distance exists for this particular species for specific project activities. The buffer distances are therefore a reasonable and pragmatic buffer that have been applied by lenders of similar projects in Uzbekistan (e.g. Bash WF). Once hatched, chicks are mobile so construction buffers can be lifted.

Direct Impacts on Sensitive Receptors (Mammals and Birds) – Habitat Fragmentation and Barrier Impact

Barrier impacts on birds during construction are not expected as site wide infrastructure, including the access road are considered unlikely to significantly impact avifauna.

Regarding mammals, the main cause of barrier impacts in large mammals, especially in ungulates, is the presence of linear features within the landscape and this is more apparent in open landscapes. Of all the linear infrastructure types, roads are among the more common and most problematic for large ungulates (CMS Guidelines[29]), especially where there are fences or roadside ditches/banks/bunds. In the absence of these features, disturbance impacts of roads including people and vehicles can limit or even prevent movements of animals across the road.

Studies in North America have shown that traffic volumes of > 2,000 vehicles/ day can have a barrier effect on wildlife[30], becoming "strong to complete barriers" at volumes of >4,000 vehicles/day[31]. A "functional" barrier to wild ungulates (meaning, some individuals cross but not enough to prevent loss of functional ecological and genetic connectivity), is likely to be reached at much lower traffic volumes for species in Central Asia, where wild animals have a much clearer view of long stretches of road and are very wary of vehicles due to hunting pressure and harassment[32] .Exact predictions of expected traffic flow along the access road are not available yet and will be determined by the EPC Contractor when preparing the Traffic and Transport Plan but it is expected (see 14.2.6) that traffic volumes will be significantly less than 2,000 vehicles per day and have been estimated at peak flow during construction to be in the region of a maximum of 600 vehicles per day and far less during operation.

In construction zones traffic volumes are again expected to be small however continuous construction activity will likely cause small zones of increased disturbance however these impacts will be localized, and any animals will be able to avoid these areas without significant impacts.

Fences, including border fencing, are also problematic as they create physical barriers to movement and are likely resulting in significantly lower migratory movements of large ungulates including Saiga into Uzbekistan from Kazakhstan.

Surveys completed to inform the ESIA did not record significant numbers of large mammals (ungulates) within the Project AoI. Small numbers of Goitered Gazelle were irregularly recorded within the Project AoI and little evidence of previous activity of Saiga was recorded. Kulan are not present in the AoI and have

[29] Guidelines for Addressing the Impact of Linear Infrastructure on Large Migratory Mammals in Central Asia. CMS 2015
[30] Sawyer and Rudd 2005, Clevenger and Huijser 2011
[31] Mueller and Berthoud 1997
[32] Huisjer et al., 2013

recently been re-introduced into Uzbekistan, at least 65 km north-east of the closest project component. Urial are certain to not occur in the Project AoI as habitats present are not suitable for this species. Additional information regarding the impacts of the wind farm on ungulates is presented in a separate section (11.2.2 - Direct and Indirect Impacts on Sensitive Receptors (Mammals and Birds) – Habitat Fragmentation and Barrier Impact) which discusses the impacts on the World Heritage Site and its OUVs.

The Project AoI will not be widely fenced (fences around sub-stations, offices etc. and these areas likely to be avoided by sensitive receptors due to increased human activity), and no fences are planned to run adjacent to the access road from Kirkkiz. In addition, the access road from Kirkkiz as well as internal site roads will not be 'banked' and are therefore unlikely to act as barriers to movement. Vehicle numbers (e.g., vehicles per hour) will be low and again traffic volumes are not considered to be potentially significant. Therefore, it is considered that there will be no barriers to free movement of mammals across the AoI during construction or operation.

Construction Phase –Direct Impacts on Sensitive Receptors (Vertebrates and Birds) – Habitat Fragmentation and Barrier Impact		
Type	Negative	
Duration	Medium Term	Construction phased over four years so impacts assessed as medium term as impacts of access and site roads and construction zones will persist over this time frame and are not localized to working areas.
Magnitude	High	Barrier impacts and disruption to migration of animals through the WF AoI would be of high magnitude
Reversibility	Both	Some habituation is possible however permanent barriers to movements could result in permanent impacts
Sensitivity	High	Vertebrates of high sensitivity
Likelihood	Low	No Saiga recorded in the AoI and limited evidence of recent activity. Low numbers of infrequent Goitered Gazelle and low populations of other vertebrates (e.g. Honey Badger, Caracal)
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months
Extent	High	Potential for impacts over a wide area if barrier impact exists
Significance	**Major**	

Mitigation and Monitoring Measures

The majority of impacts are being avoided through design of the roads that do not include banks, ditches or fences. Site wide fencing will not be widely installed. Predicted traffic volumes are unlikely to be significant and will not create effective barriers to movements of herds of ungulates or other mammals.

Both the Developer and EPC Contractor Biodiversity Managers will ensure that the site is continually monitored throughout construction, along with chance find procedures. If large herds of ungulates are recorded in the Project AoI or in the vicinity of the AoI working areas may need to be modified or works programs updated to ensure that any animals can move through the Project area.

Direct Impacts on Sensitive Receptors (Vertebrates) – Vehicle Collisions

Vehicle related collision is possible for all vertebrate species present within the Project's AoI and this will result in direct mortality on receptors of low to high sensitivity. Any such impact would be negative, long-term and irreversible and would be of medium to high magnitude and therefore of moderate to major significance (depending on the receptor killed).

Larger mammals including Goitered Gazelle are more likely to disperse away from construction areas due to their sensitivity to disturbance and thus the risk of collision with vehicles will be small. Honey Badger and Caracal are mostly nocturnal and as such the likelihood of collision is significantly reduced, as night-time driving banned or if required very limited. Small mammals and slower moving species such as Central Asian Tortoise, Desert Sand Boa and Blotched Rat-snake are at higher risk of collision with vehicles and machinery. Small, mobile, nidifugous chicks (e.g. MacQueen's Bustard) could also be at risk of collision with vehicles when crossing roads.

It is possible that carcasses on the road could attract scavenging animals, including birds of prey which in turn would increase their risk of collision with vehicles and machinery.

Construction Phase – Direct Impacts on Sensitive Receptors (Vertebrates) – Vehicle Collisions		
Type	Negative	
Duration	Medium-Term	Throughout construction period, which is likely to be approximately 4 years,
Magnitude	High	Burrow sites are very limited within the AoI so loss of such sites is very unlikely, although if lost magnitude would be high
Reversibility	Irreversible	Mortality of individuals would be permanent loss
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Medium	Direct mortality of sensitive receptors is possible
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months
Extent	Low	Impact will occur in the Project footprint only
Significance	**Minor to Major**	Dependent on receptor affected

Mitigation Measures

- Appropriate speed limits will be enforced on access road (60km/h), internal road network and working areas (40km/h).
- Signage (e.g. a large board) will be installed at the start of the access road informing all drivers of the speed limits on the access road as well as those within the wind farm area. A similar large sign will be installed at the site compound / worker's camp. Signage will be written in local language, English and the language spoken by the majority of site workers.
- Speed limit signs will be installed every 1km along the access road reminding drivers of the speed limit. Speed limit signs will be installed within the site compound / workers camp and at regular intervals around the site (e.g., on internal site roads).
- Speed limits will also be communicated at the site induction as well as the possibility of reduction in speed limits during the construction period. Any changes in speed limits will be clearly communicated to all staff and evidence of such communication kept.
- Speed limits will be enforced by the installation of GPS units in all EPC Contractor vehicles (e.g. cars and worker / equipment transport) and all Developer vehicles that will utilize the access road (and wider internal road network). Data will be analyzed monthly by the EPC Contractor and Developer data will also be analyzed monthly by the Developer Biodiversity Manager. Records of these checks

will be kept and reported as well as being included in the annual reports. Any driver caught breaking the speed limit will be subject to disciplinary procedures including fines.

- In addition to GPS units regular random speed checks (using a radar gun or similar) will be competed monthly by the EPC Contractor and all vehicles (including non-project vehicles) will be checked. Vehicles breaking the speed limit will be stopped and the drivers will be informed of the correct speed limits. If the vehicle breaking the speed limit is a project vehicle disciplinary action including fines will be applied.
- The results of monitoring, including audit of GPS data, will be included in annual reports.
- Speed limits on the access road and internal site roads will be reduced to 20 km/h (daytime) and 10 km/h (night-time) during the breeding bird season if MacQueen's Bustard are recorded nesting. Changes in speed limits will be enforced through updated signage and speed checks will be regularly completed in these areas. Speed limit changes will be enforced 2.5 km either side of any confirmed nesting location of this species (*e.g*. a 5 km zone of reduced speed limits in proximity to nesting MacQueen's Bustard).
- A ban of driving at night will be enforced however if necessary due to unforeseen circumstances or being strictly necessary (e.g. forecast low wind speeds for blade installation) the speed limit will be reduced to 40 km/h on the access road and to 20 km/h on any internal roads.
- Ban against off-road driving at all times of the day
- Regular checks of the road for carcasses and if found these will be moved to at last 50m from the road to reduce the likelihood of hitting scavengers, including birds of prey.
- An incidental / chance find procedure will be included in the BMP so that all workers report any road collisions so that any such incident can be investigated in full.
- Ensure that no open water bodies are created on the site which could potentially attract sensitive receptors on to the site which would in turn increase the potential for wildlife: vehicle conflict.

Refer to "Section 14.2.6" for additional details on impacts and mitigations on traffic and transport.

Direct Impacts on Sensitive Receptors (Habitats, Vertebrates) – Poaching, Collection etc.

It is possible that site worker may poach or take plants and animals from the site, either for firewood, as food (e.g. hares, eggs), as a trophy (Goitered Gazelle, Honey Badger, Caracal) to sell (Central Asian Tortoise, other reptiles or small mammals) or persecution (e.g. snakes, large carnivores).

Any of the identified receptor are potentially at risk from this long-term, irreversible negative impact. The likelihood of this occurring is low to medium and the magnitude of this impact ranges from Low to High depending on the receptor affected.

Construction Phase – Direct Impacts on Sensitive Receptors (Habitats, Vertebrates) – Poaching, Collection etc.		
Type	Negative	
Duration	Medium Term	Throughout construction period which is likely to be approximately 4 years
Magnitude	Low to High	Dependent on receptor affected

Reversibility	Irreversible	Mortality of individuals would be permanent loss
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Unlikely to occur
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months
Extent	Medium to High	Possible for site workers or poachers could access a wider area around the wind farm due to increased accessibility as a result of the access road
Significance	**Moderate to Major**	Dependent on receptor affected

Mitigation Measures

- The Project will enforce strict controls on hunting, gathering, poaching and otherwise disturbing flora and fauna within the Project AoI. Any breaches of this ban will be strictly enforced, and any workers found in breach of this control measure will be subject to disciplinary procedures which will entail instant dismissal where species of international conservation concern (IUNC CR/EN/VU) or high in-country conservation concern (UzRDB CR/EN) are affected. For more common species a formal warning will be issued, followed by dismissal if the offence is repeated.
- The ban on hunting etc. will be included in the site induction along with discussions about the sanctions for breaches of this control measure (and this will be further clarified by Developer / EPC Contractor).
- The EPC Contractor Biodiversity Manager will undertake monthly checks (walkovers) of the workers compound and any evidence of poaching will be fully investigated and reported in full.
- A chance find procedure will be implemented should any site worker find a wild animal, especially one that has become a nuisance (e.g. scavenger in the works camp, presence of small mammals in worker accommodation, presence of snake or scorpion on the works site) and the EPC Contractor will arrange for an appropriately qualified person to capture and relocate. Where scavengers have been identified within the works site additional housekeeping measures may be required.
- Specialists will be present on site to record species prior to and during the start of the construction work. The EPC contractor is to prepare a chance finds procedure prior to further works commencing in Q4 2024 and will be provided/updated for all subsequent work/years, which will be agreed with the Lenders 6 months in advance of the work commencing.
- The Project will employ two ‘rangers’ who will regularly patrol the wind farm AoI and wider area to ensure that poaching/ hunting activities are not undertaken by either workers or other individuals. The wind farm ‘rangers’ will work closely with relevant authorities.

Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Disturbance

The presence of site workers and machinery can result in disturbance related impacts to all terrestrial ecological receptors present within the AoI. These impacts are not certain, and the magnitude of such impacts will vary depending on the sensitivity of each receptor to disturbance. For example, disturbance distances for large and more secretive or nocturnal species such as Honey Badger, Caracal and Goitered Gazelle are likely to be significantly greater than for smaller mammals, Central Asian Tortoise, and other species of reptiles. The significance of any such disturbance impacts is likely to range from Low to Moderate / Major, depending on the sensitivity of the affected receptor. The duration of impact will also

likely vary from very short-term (e.g. running away from a vehicle using the access road), too short to medium term in areas adjacent to construction areas or worker accommodation. It is likely that any disturbance impacts, irrespective of duration will be reversible once the disturbance event has passed.

Construction Phase – Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Disturbance		
Type	Negative	
Duration	Short to Medium Term	Throughout construction period which is likely to be approximately 4 years however disturbance could also be very short-term (e.g. move away from a vehicle)
Magnitude	Low to High	Dependent on receptor affected
Reversibility	Reversible	Impact likely to be reversible once disturbance event has passed and disturbance events likely to be localized and will cease on completion of construction activities.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Impacts are not certain to occur or be significant.
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months
Extent	Low	Likely to occur within the Project AoI or only in immediately adjacent habitats.
Significance	**Moderate to Major**	Dependent on receptor affected

Mitigation Measures

- Site wide induction to include information regarding disturbance of ecological receptors.
- Chance find procedure to report sightings of potentially sensitive receptor (e.g. Goitered Gazelle, MacQueen's Bustard) and investigation of any such sightings by the EPC Contractor in order that additional buffer areas can be agreed, where necessary.
- Continual monitoring of the site by the EPC Ecologist and Wind Farm Rangers to record sensitive receptors and any such information will be passed on to the EPC Contractor and buffer / exclusion zones would be updated.
- Ensure that no open water bodies are created on the site which could potentially attract sensitive receptors on to the site which would in turn increase the potential for disturbance of sensitive receptors.

Direct and Indirect Impacts on Sensitive Receptors – Reduced Air Quality / Dust

The soil across the AoI is very fragile and the AoI is very dusty. It is likely that constructed related disturbance to upper soil layers will likely increase the amount of dust in the air which in turn could result in negative impacts on plants and vertebrate receptors. In addition, air pollution from site vehicles could also result in negative impacts on valued receptors. These impacts are possible, short-term and reversible and are considered to be of minor to moderate significance.

Construction Phase – Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Reduced Air Quality / Dust		
Type	Negative	
Duration	Medium-term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is

		also phased so direct impacts in limited working areas during the construction phase.
Magnitude	Low to Medium	Dependent on receptor affected
Reversibility	Reversible	Impact likely to be reversible once construction activities have finished.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Impacts are not certain to occur or be significant.
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months
Extent	Medium	Impacts within Project AoI but dust and pollution could affect areas within 2 km of Project activities. Any indirect impacts are certain to not affect the South Ustyurt NP and UNESCO WHS which will be at least 10 km from the closest works.
Significance	**Minor to Moderate**	Dependent on receptor affected

Mitigation Measures

- Speed limits will be altered on access road and site roads if dust is a significant issue. This will be based on monitoring by the EPC Biodiversity Manager.
- Vehicles will be properly maintained to reduce emissions.
- Emissions from the batching plant will be monitored in line with control plans to minimize air pollution

Refer to "Section 13" for additional details on impacts and mitigations on air quality.

Direct Impacts on Sensitive Receptors (Vertebrates) – Noise and Vibration

Noise as a result of construction can result in direct impacts on valued ecological receptors (vertebrates) due to acoustic masking, disturbance and displacement thereby reducing survivorship and reproductive success. It is also possible that blasting maybe required during construction, although this is yet to be determined by the EPC Contractor. The following mitigations will be applied however will be updated in the Construction BAP when working methods have been confirmed.

Any impacts are likely to be short- to medium term (for the duration of construction) and reversible. The magnitude of impact ranges from low to medium and is likely to be of minor to moderate significance.

Construction Phase – Direct Impacts on Sensitive Receptors (Vertebrates) – Noise and Vibration		
Type	Negative	
Duration	Short-term to Medium Term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is also phased so direct impacts in limited working areas during the construction phase.
Magnitude	Low to Medium	Dependent on receptor affected
Reversibility	Reversible	Impact likely to be reversible once construction activities have finished.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Impacts are not certain to occur
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months

Extent	Medium	Impacts within Project AoI but noise and vibration could affect areas within 2 km of Project activities. Any indirect impacts are certain to not affect the South Ustyurt NP and UNESCO WHS which will be at least 10 km from the closest works.
Significance	**Minor to Moderate**	Dependent on receptor affected

Mitigation Measures

- Vehicles will be properly maintained to reduce noise emissions.
- No work within buffer zones around sensitive receptors during breeding seasons (February to August) and no works in buffer zones around active mammal burrows. Maintain buffer zones around MacQueen's Bustard, Steppe Eagle and Long-legged Buzzard nests and known locations of Honey Badger, Caracal, Marbled Polecat and Corsac Fox. Buffer zones to be applied if Goitered Gazelle (and Saiga) are recorded in the AoI during construction.
- Use of available technology and management practices with construction methodologies to reduce noise and vibration.
- Regular monitoring of noise and vibration levels within works compounds and works areas and apply corrective measures as necessary. Quarterly noise monitoring will be undertaken.

Refer to "Section 13" for additional details on impacts and mitigations on noise quality.

Direct Impacts on Sensitive Receptors (Vertebrates) – Lighting

Lighting could potentially result in negative impacts of a range of ecological receptors including those of high sensitivity such as Honey Badger, Caracal, Marbled Polecat and Goitered Gazelle. In addition, lighting could impact foraging and migration routes for bats.

Any impacts are likely to be short- to medium term (for the duration of construction) and reversible. The magnitude of impact ranges from low to medium and is likely to be of minor to moderate significance.

Construction Phase – Direct Impacts on Sensitive Receptors (Vertebrates) – Lighting		
Type	Negative	
Duration	Short-to Medium-term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is also phased so direct impacts in limited working areas during the construction phase. Impacts associated with the worker compounds and offices could occur throughout the construction phase and are considered medium-term.
Magnitude	Low to Medium	Dependent on receptor affected
Reversibility	Reversible	Impact likely to be reversible once construction activities have finished.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Impacts are not certain to occur
Frequency	Periodic	During Construction

Timing	N/A	Impacts possible at night and in months, although more likely in spring, autumn and winter (i.e. shorter day lengths)
Extent	Low	Lighting will not be extensively used (if at all) and as such any impact would be very localized and within the Project AoI only.
Significance	**Minor to Moderate**	Dependent on receptor affected

Mitigation Measures

- Night-time working will be limited and only completed when strictly necessary. Some night-time working may however be required (e.g. turbine installation is influenced by wind conditions which may be better at night) but any such work would be limited and not permanent or regular (over extended periods). Any lighting required for such activities will be low UV intensity lighting and will be shielded to reduce light spill. Night-time working will be monitored to ensure minimal impacts (e.g. looking for grounded birds) and if significant impacts are identified, night-time working will be banned.
- Where lighting is required within worker compounds, site offices etc. ensure that any lighting is shielded and protected, and lights angled downwards to reduce light-spill and glare. Low UV intensity lighting should also be used, where possible, to further reduce light spill.
- For external security lights PIR trigger units should be used and these should be timed to automatically switch off after five minutes.
- No lighting will be installed along the access road from Kirkkiz.

Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Littering, Waste Management

Unmitigated it is possible that poor waste management could result in the proliferation of litter across the Project AoI including plastic containers, plastic bags and glass. This waste could result is negative impacts to sensitive receptors through ingestion or entanglement. Any such impact could be long-term and irreversible, and the significance of this impact would be minor to moderate depending on the receptor effected.

In addition, poor management of other solid wastes, including food waste could result in the presence of pest species such as rats and mice, which could outcompete wild rodents and feral cats and dogs which could increase the risk of predation of wild rodents and other prey species (e.g. Tolai Hare, , reptiles, ground nesting birds, and MacQueen's Bustard). It is reported in the UzRDB that disturbance by feral dogs is one of the main threats to Honey Badger.

Construction Phase – Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Littering, Waste Management		
Type	Negative	
Duration	Short-to Medium-term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is also phased so direct impacts in limited working areas during the construction phase. Impacts associated with the worker compounds and offices could occur throughout the construction phase and are considered medium-term.

Magnitude	Low to Medium	Dependent on receptor affected
Reversibility	Reversible	Impact likely to be reversible once construction activities have finished.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Impacts are not certain to occur
Frequency	Periodic	During Construction
Timing	N/A	Impacts possible in all months during construction activities.
Extent	Medium	Impacts within Project AoI but possible wind-blown litter / waste could affect areas within 2 km of Project activities. Any direct / indirect impacts are certain to not affect the South Ustyurt NP and UNESCO WHS which will be at least 10 km from the closest works.
Significance	**Minor to Moderate**	Dependent on receptor affected

Mitigation Measures

- Waste Management will be included in the Site Induction so that all site workers understand their responsibilities to maintaining a clean and tidy site. Where possible all materials than can be recycled will be.
- Zero tolerance to littering on the works site and within the worker compound. This zero-tolerance approach should also be applied to smoking and workers must use appropriate smoking areas (supplied with 'butt bins') at all times, even when on construction sites. Litter must not be thrown out of vehicle windows when driving to and from or around the site.
- Daily inspections of working areas and worker compound should be completed, and corrective actions applied, where necessary.
- Additional mitigation measures for pest species, including feral cats and dogs are included below.

Refer to "Section 10.2.2" for additional details on impacts and mitigations on waste management.

Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Pest Species

As discussed above it is possible that pest species become established within the Project as a result of increased littering or poor waste management as well as the propensity of certain species (e.g. rats, cats and dogs) to associate with human habitation.

An increase in pest species could result in long-term negative impacts on wild animals through direct and indirect competition for food resources, direct mortality through predation, and direct impacts as result of disturbance impacts. Such impacts could be reversible or irreversible, will be between low to high magnitude and as such significance will vary from minor to major depending on the receptor being affected.

Construction Phase – Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Pest Species		
Type	Negative	
Duration	Short-to Medium-term	Limited to construction. Construction phased over four years so impacts assessed as short-term. Construction is also phased so direct impacts in limited working areas

		during the construction phase. Impacts associated with the worker compounds and offices could occur throughout the construction phase and are considered medium-term.
Magnitude	Low to High	Dependent on receptor affected
Reversibility	Reversible or irreversible	During construction period only however pest species could persist within the Project AoI after construction.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low to Medium	Impacts are not certain to occur
Frequency	Periodic	During Construction and possibly post-construction if pest species become established.
Timing	N/A	Impacts possible in all months during construction activities.
Extent	Low to Medium	Dependent on pest species
Significance	**Minor to Major**	Dependent on receptor affected

Mitigation Measures

- Where pest species are identified the EPC Contractor Biodiversity Manager will be notified and an appropriate course of action taken. For small mammal pest's live traps will be used, in order to reduce the risk of by-catch. Poison baits should be avoided, unless it can be certain that non-target species will be affected, and any such use should be in accordance with national and international best practice. If poison baits are to be used it must be certain that any poisoned animal cannot move out on to the wider AoI to reduce the risk of natural predators eating poisoned animals.
- Where feral cats and dogs are identified the EPC Contractor Biodiversity Manager must be notified and efforts made to catch these animals and transport them to appropriate animal shelters away from the site. Guard dogs for the works site (e.g. security for site offices, workers accommodation) must not be used. These measures are in place to ensure no direct or indirect impacts to Honey Badger, Caracal, large ungulates and other smaller mammals (e.g. Marbled Polecat, Corsac Fox and Tolai Hare etc.) using the Project AoI.

Direct and Indirect Impacts on Sensitive Receptors (Birds) – Collision and Electrocution from LVDL

The operation of temporary LVDL is likely to have an impact on birds as they are proven mortality factor for migratory and soaring birds. In most cases, impacts from over-head powerlines lead to severe injuries or immediate death. In case of collision accidents, birds crash at high flight speed into cables or wires. The resulting injuries vary widely and are comparable to traumata caused by collisions with cars. Electrocution harms mostly birds sitting on the live components or having ground contact. Birds that perch or nest on pylons can be electrocuted by causing a short circuit, either by touching two live wires, or a live and an earthed component.

Direct and Indirect Impacts on Sensitive Receptors (Birds) – Collision and Electrocution with LVDL		
Type	Negative	
Duration	Medium-Term	During construction period only after which line will be dismantled
Magnitude	High	Predicting the likely collision with LVDL is very difficult and whilst some species it may be lower (based on natural avoidance) even low levels of predicted collisions may exceed PBR thresholds. This issue is

		discussed further in section below on impacts with turbines.
Reversibility	Reversible	Given that LDVL will be dismantled upon completion of construction activities
Sensitivity	Low to High	This will depend upon receptor impacted or affected (e.g. Steppe Eagle fatality is considered high sensitivity while a lark would be low due to their conservation status). This issue is discussed further in section below on impacts with turbines.
Likelihood	Low	Due to minimal migratory and resident bird activity expected in the area. This issue is discussed further in section below on impacts with turbines.
Frequency	Periodic to Frequent	Could happen at any time but expected especially during periods of migratory behavior
Timing	N/A	Impacts possible in all months but more significant during migration periods
Extent	High	Potential for impacts over a wide area if mortality affects trans-continental migrants
Significance	**Minor to Major**	

Mitigation Measures

Mitigation is being installed to reduce the impact of the LVDL on migrating birds including birds of prey, waterbirds, other large soaring birds. Bird Flight Diverters (BFDs) are to be installed along the entire length of the LVDL on the Optical Ground Overhead Wire (OPGW). The BFDs installed will be ones that glow or light up at night and are dynamic (e.g. move with the wind) to increase visibility for diurnal and nocturnal migrants (e.g. FireFly diverters). The Project Developer and EPC Contractor is committed to installing diverters that meet the required long-term guarantee and specifications that are equal to FireFly diverters. Installation of OPGW and attached BFDs will be completed at the same time (within 1 week). BFDs will be installed to the manufacturer's guidance and assessment of the OHTL, taking into consideration number and spacing, at a minimum of 1 every 10m.

The installation of BFDs will need to be recorded by the EPC Biodiversity Manager and these checks need to be included in the annual reports. BFDs should be checked every 6 months before the spring and autumn migration seasons so that they are in place and operational for higher risk periods. Any damaged or defective BFDs will need to be replaced within 2 months of being reported as faulty.

In addition to the above, EPC Contractor will ensure appropriate design of LVDL and provision of adequate insulation of live parts to ensure electrocution risks are mitigated. This will include as part of the design elimination of upper conductors, and lower conductors to be suspended from the cross arm by insulators. In addition, any jumper cables (e.g., at crossings/turning points) above the height of cross arms will be insulated.

Monitoring will be completed during the construction phase to monitor actual levels of mortality. Monitoring will be completed along the whole LVDL and the program of monitoring will include carcass searching, searcher efficiency trials and carcass persistence trials. The results of the fatality monitoring will be used to inform a GenEst Analysis. Monitoring will follow the latest international best practice including the recently published PCFM Handbook (EBRD, IFC, KFW 2023).

Should mortality remain a significant residual impact, off-setting will be required. An off-set plan is outlined in the section below. Full offset plan will be detailed in the Biodiversity Action Plan.

11.2.2 Potential Impacts during the Operation Phase

Direct and Indirect Impacts on Sensitive Receptors (Mammals and Birds) – Habitat Fragmentation and Barrier Impact

The Project AoI is located on a broad migration front and is not considered to be a bottleneck site and as such any impacts associated within the barrier effect is unlikely to be significant. The Project AoI is largely flat or gently undulating and as such birds will be able to naturally avoid the turbines by making minor adjustments to their flight paths and they will not be forced into major changes or forced to fly over landscape features that would greatly increase energy expenditure (e.g. forced over a large waterbody or mountains).

The final turbine layout is for a maximum of 204 WTGs, and they have been arranged in lines in a north-east to south-west arrangement, which follows the predominant flight direction of birds migrating across the site (e.g. to the north / north-east in spring and to the south / south-west in the autumn). Each line of turbines is separated by at least 2 km and the gaps between each 500MW sub-project (Kungrad 1, and Kungrad 2, and Kungrad 2 and Kungrad 3) are 5.45 km and 6.5 km respectively. This will result in regular lines of turbine free space across the wind farm which could reduce barrier impacts for migrating birds.

Regarding mammals, especially in ungulates, the main cause of barrier impacts is the presence of linear features within the landscape and this is more apparent in open landscapes. Of all the linear infrastructure types, roads are among the more common and most problematic for large ungulates (CMS Guidelines[33]), especially where there are fences or roadside ditches/banks/bunds. In the absence of these features, disturbance impacts of roads including people and vehicles can limit or even prevent movements of animals across the road.

Studies in North America have shown that traffic volumes of > 2,000 vehicles/ day can have a barrier effect on wildlife[34], becoming “strong to complete barriers” at volumes of >4,000 vehicles/day[35]. A “functional” barrier to wild ungulates (meaning, some individuals cross but not enough to prevent loss of functional ecological and genetic connectivity), is likely to be reached at much lower traffic volumes for species in Central Asia, where wild animals have a much clearer view of long stretches of road and are very wary of vehicles due to hunting pressure and harassment[36]. Exact predictions of expected traffic flow along the access road are not available yet and will be determined by the O&M Contractor when preparing the Traffic and Transport Plan but it is expected that traffic volumes will be significantly less than 2,000 vehicles per day and indeed will be significantly less than during construction periods which are expected to be no more than 600 vehicles per day (traffic details are discussed later in “Section 14.1.6”). Where essential maintenance operations are required, this will occur in very limited areas and as such disturbance impacts, including potential barrier impacts will be very localized and any animals will be able to easily avoid these areas without significant disruption to movements. The Wind Farm Rangers and O&M Team will undertake continual monitoring of the Project AoI and if large herds of ungulates are recorded the program of operational works may need to be modified in order to avoid breeding / calving seasons and or sensitive parts of the site (e.g. parts of the site where these animals are present).

Site wide fencing is not proposed, and no fencing or ditches will be constructed adjacent to the access or site roads. No roads will be banked which could reduce sightlines and prevent movement of animals across them.

[33] Guidelines for Addressing the Impact of Linear Infrastructure on Large Migratory Mammals in Central Asia. CMS 2015
[34] Sawyer and Rudd 2005, Clevenger and Huijser 2011
[35] Mueller and Berthoud 1997
[36] Huisjer et al., 2013

Wind turbines could also act as a potential barrier to movement of ungulates through the landscape, although this is not widely studied in Saiga or Goitered Gazelle and information regarding potential barrier impacts and successful mitigation options have been sourced from similar species (e.g. Tibetan antelope (*Pantholops hodgsonii*)) or species which inhabit similar open (steppe grassland) habitats (e.g. Pronghorn (*Antilocapra americana*)). Studies in North America[37] [38] have shown that whilst Pronghorn migration persists through wind farm areas in the short term, multiple aspects of behaviour and migration are affected (e.g. increased transit speed through wind farms, avoidance of some areas during spring / autumn), which leads to concern that long-term viability of migration routes through wind farms may be impacted. These studies have also shown more significant impacts on animal movement are a result of construction activities or in areas of high-quality wintering or calving habitats. Other projects (e.g. gas and oil exploration) have been shown to have more significant operational disturbance impacts as a result of increased human activity.

There are currently no large trans-border movements of Saiga from Kazakhstan into Uzbekistan, mainly as a result of existing border fences. If the recommendations of various conservation groups under the guise of the CMS (e.g. removal or modification of border fences) are successful at increasing Saiga numbers in Uzbekistan it is unlikely (based on historical range maps) that the wind farm site will be subject to regular, significant migrations of Saiga. Goitered Gazelle in Ustyurt Plateau are not present in large numbers and any increases in population and migratory movements would require significant conservation efforts.

The actual impacts of operational wind farms on ungulates have not been subject to exhaustive study and there are no definitive or accepted displacement / disturbance distances for operational wind farms. It is possible that the Kungrad 1, 2 and 3 wind farms will result in significant and persistent barrier impacts to ungulates however the actual severity of this impact is questionable given the relatively low populations of Goitered Gazelle and historical presence of Saiga within the Project site. The turbine layout has accounted for a north to south arrangement of WTGs with at least 2.5 km spacings between the rows of turbines. Spacings between other rows, including between each 500MW sub-project (Kungrad 1 and Kungrad 2 and Kungrad 2 and Kungrad 3 are much larger - up to 6.5 km. There will also be a gap of approximately 9.5km from the closest WTG and the border fence to the west of the wind farm AoI, so movement through and to the west of the wind farm may still be possible.

The critical factor in determining the severity of likely impacts is habitat suitability and avoidance of key habitat areas (e.g. for calving or high-quality foraging habitats). The wind farm area is not sited in core areas of high-quality habitat as evidenced from the results of surveys completed on the site, as well as a review of historical distribution data.

It was announced at the 2024 CMS COP in Samarkand that future conservation measures within the Ustyurt Plateau could include the possible re-introduction of Cheetah. This plan however is not considered relevant to the assessment of likely ecological impacts of this wind farm development as these plans are in very early stages of development with no realistic idea of potential release sites etc. The current situation within the wind farm AoI of very low numbers of ungulates renders the site unsuitable for potential reintroduction of an apex predator and it is assumed (based on current ungulate populations) that release sites are more likely to be in the Saigachi Nature Reserve / northern components of the WHS Cold Winter Deserts of Turan as this area is more likely to support suitable populations of prey species (based on current populations of ungulates), although this will be very dependent on other conservation measures such as removal / modification to border fences etc., although we are still waiting for a response from WWF whom were contacted for this purpose (refer to “Section 6.3” for additional details on stakeholder consultations). Even if Cheetah are successfully re-introduced into Uzbekistan and this is far

[37] Wind-energy development alters pronghorn migration at multiple scales, Megan C. Milligan, 2023
[38] Variable effects of wind-energy development on seasonal habitat selection of pronghorn, Megan C. Milligan, 2021

from certain based on previous feasibility studies completed in Turkmenistan[39], it is considered very unlikely that this would occur outside of any designated site and considerable works will be required before any such introduction was attempted. It is therefore near-certain that this species would not occur within the vicinity of the Wind Farm AoI during the 25-year operational lifespan of the Project.

Therefore, it is considered that there will be no permanent barriers to free movement of mammals across the AoI.

Operation Phase – Direct Impacts on Sensitive Receptors (Vertebrates and Birds) – Habitat Fragmentation and Barrier Impact		
Type	Negative	
Duration	Long-Term	Potential impact throughout the operation of the wind farm
Magnitude	Low to High	Dependent on receptor affected
Reversibility	Both	Barrier impact could persist throughout operation, although a degree of habituation is also possible.
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low	Impacts are not certain to occur and project design to limit barrier impacts
Frequency	Periodic	During operation, especially during periods of migratory behavior
Timing	N/A	Impacts possible in all months but more significant during migration periods
Extent	High	Potential for impacts over a wide area if barrier impact exists
Significance	**Minor to Major**	Dependent on receptor affected

Mitigation Measures

- Whilst minor to major impacts are predicted in the table above this is a result of the assessment methodology, and negative impacts are considered unlikely for the reasons set out above the table (e.g. movement of ungulates through operation wind farms, no site-wide fencing, roads not banked, light traffic volumes, wide corridors of turbine free space within the wind farm and western corridor between WTGs and the border fence). Additional mitigation is therefore not suggested, although monitoring will be completed.

Direct Impacts on Sensitive Receptors (Birds) – Collision with Turbines

Collision Risk Modelling Methodology

Collision Risk Modelling (CRM) is ultimately completed to further inform the magnitude (extent) of collision impacts on bird populations recorded flying within the proposed Wind Farm area. The collision risk model used in this assessment has been developed by Scottish Natural Heritage (SNH) and the British

[39] Breitenmoser U. 2002. Feasibility study on cheetah re-introduction in Turkmenistan. Cat News:13-15.

Wind Energy Association (BWEA) and has been accepted as representative of industry best practice.[40,41,42] In depth details of the model are given in the cited publications but a brief description is provided below.

The model runs as a two-stage process. Firstly, the risk is calculated assuming that flight patterns and behaviors are unaffected by the presence of the WTGs i.e. that no avoidance action is taken. This is essentially a mechanistic calculation, with the collision risk calculated as the product of (i) the probability of a bird flying through the rotor swept area, and (ii) the probability of a bird colliding if it does so. This probability is then multiplied by the estimated numbers of bird movements through the WTG rotors at the risk height (i.e. the height of the rotating rotor blades) in order to estimate the theoretical numbers at risk of collision if they take no avoiding action.

A bird is simplified in shape to flying cross with length, wingspan, and speed, and always flying perpendicularly towards the rotor. A bird may be 'gliding' i.e. with the arms of the cross fixed, or 'flapping' i.e. with the arms of the cross flapping so as to occupy a space similar to that of a spinning top, with the length of the bird being the axis of spin. 'Gliding' flight has a marginally lower collision risk than 'flapping' flight – notably for passage at points level with the rotor hub, where the wings lie parallel with potentially colliding blades. However, the difference is rarely sufficient to warrant detailed consideration of different bird behaviors. As a 'worst case' scenario, all flight data entered into the collision risk model is set to 'flapping' flight.

The second stage of the collision risk model incorporates the probability that the birds, rather than flying blindly into the WTGs, will actually take a degree of avoiding action. The avoidance rates stated below have been applied to the Collision Risk Model and were taken from the most recent NatureScot / SNH guidelines[43] that advises that the default avoidance rates for all species is 98% with the exception of a small number of species. Where rates differed from the 'default' rate these were informed by latest guidelines and a comprehensive literature review, interpreted with species- and site-specific information. Where published information for avoidance rates is not available (e.g. Steppe Eagle, Eastern Imperial Eagle) we used the same avoidance rates for species with similar shape, size, behavior and flight morphology (e.g. Golden Eagle)

Golden Eagle is considered to have a moderately higher avoidance rate of 99%, based on the size and flight characteristics Steppe Eagle is also considered to have the same avoidance rates. Common Kestrel and Lesser Kestrel are considered to have a relatively low avoidance rate of 95%. Recent published literature [44] [45] [46] based on research at operational wind farms in the UK, Europe and the United States, indicates that the above approach is likely to be conservative and accordingly alternative realistic figures are also presented. The risk of collision of White-tailed Eagle has been extensively studied at the Smøla Wind Farm in coastal Norway, and such we used an avoidance rate of 95% as SNH. We also used these same parameter values for Pallas's Fish Eagle and Vulture species. Therefore, the following avoidance rates have been applied:

[40] Percival *et al*. (1999)
[41] Band *et al*. (2005) Developing field and analytical methods to assess avian collision risk at wind farms. In De Lucas, M., Janss, G. and Ferrer, M., eds. *Birds and Wind Power*. www.quercus.pt
[42] Scottish Natural Heritage (2014) https://www.nature.scot/wind-farm-impacts-birds-flight-speeds-and-biometrics-collision-risk-modelling
[43] Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model: SNH (July 2017)
[44] Vasilakis, D. P., Whitfield, D. P., Schindler, S., Poirazidis, K. S., & Kati, V. (2016). Reconciling endangered species conservation with wind farm development: Cinereous vultures (Aegypius monachus) in south-eastern Europe. Biological Conservation, 196, 10–17
[45] Whitfield, D. P. & M. Madders. (2006a). Deriving collision avoidance rates for Red Kites (Milvus milvus). Natural Research Information Note 3. Banchory, UK.
[46] Whitfield, D. P. (2009). Collision avoidance of golden eagles at wind farms under the 'Band' collision risk model. Report to Scottish Natural Heritage. Natural Research. Ltd. Banchory, UK

- Aquila Eagles and Buzzards – 99%
- White-tailed and Pallas's Fish Eagle and Vultures – 95%
- Common and Lesser Kestrels and MacQueen's Bustard – 95%
- Other species (e.g. Harriers) – 98%

Once the avoidance rate is incorporated, the model then predicts the likely number of annual collisions of each particular species.

The number of predicted collisions (i.e. the extent) is then assessed against the total local, national or international populations as appropriate to ascertain the magnitude and hence significance of any impacts along with fatality thresholds for these priority species as appropriate.

Collision Risk Model Input Data

The Collision Risk Model requires data relating to the species of birds occurring at the proposed Project and data on the type and specification of the proposed WTGs.

Collision Risk Modelling (CRM) (and subsequent Collision Risk Assessment (CRA)) has been completed based on the final 204-wind turbine layout with a 141 m hub height, 182 m rotor diameter and tip height of 232 m as presented in this ESIA.

The rotation period is variable dependent upon wind speed and its rated speed used in the CRM was taken from its technical specification brochure. The blade pitch is also variable depending on wind speed, however the worst case of 90^0 was used in the CRM.

Parameters specific to the Project and survey include the area of the Project, the mean day length during the survey period and the number of day's activity over the length of the survey period.

Bird Size and Flight Speed

The biometric data, including body size, wing length, as well as flight speed used in the collision risk model has been taken from various sources[47] [48] [49] [50]and was populated with correct data prior to running the CRM. Details for each species are given in the table below.

Table 60: CRM biometric data input

Common Name	Scientific Name	WingSpanAvg (m)	LengthAvg (m)	FlightSpeed (meters/second)
Cinereous Vulture	*Aegypius monachus*	2.72	1.05	10
Egyptian Vulture	*Neophron percnopterus*	1.7	0.65	11.1
Pallas's Fish Eagle	*Haliaeetus leucoryphus*	1.975	0.785	13.6
White-tailed Eagle	*Haliaeetus albicilla*	2.2	0.8	13.6
Steppe Eagle	*Aquila nipalensis*	1.9	0.75	12
Golden Eagle	*Aquila chrysaetos*	2.12	0.815	11.9
Eastern Imperial Eagle	*Aquila heliaca*	1.98	0.77	11.7
Great Spotted Eagle	*Clanga clanga*	1.68	0.68	11.7

[47] Bird body size data from: The complete birds of the Western Palearctic Cramp (1998)
[48] Flight speed data from: A dictionary of birds. Campbell and Lack (1985)
[49] Bird Guide: Collins (2001)
[50] Birds of the western palearctic / BTO fact sheets

Booted Eagle	*Hieraaetus pennatus*	1.22	0.46	13.3
European Honey Buzzard	*Pernis apivorus*	1.425	0.56	12.5
Long-legged Buzzard	*Buteo rufinus*	1.37	0.58	13.3
Black Kite	*Milvus migrans*	1.42	0.53	11.7
Pallid Harrier	*Circus macrourus*	1.08	0.44	9.6
Western Marsh Harrier	*Circus aeruginosus*	1.225	0.52	11.2
Montagu's Harrier	*Circus pygargus*	1.13	0.45	8.4
Hen Harrier	*Circus cyaneus*	1.1	0.48	9.1
European Sparrowhawk	*Accipiter nisus*	0.625	0.33	11.3
Common Kestrel	*Falco tinnunculus*	0.75	0.335	12.75
Lesser Kestrel	*Falco naumanni*	0.75	0.335	12.75
Hobby	*Falco subbuteo*	0.87	0.33	11.3
Merlin	*Falco columbarius*	0.56	0.275	12.1
Macqueen's Bustard	*Chlamydotis macqueenii*	1.4	0.65	16

Bird Flight Activity and Flight Height

Data on bird flight activity through the proposed Project area and on the proportion of those birds flying at rotor height are taken from the field surveys completed by in-country ornithologists between January and early November (e.g. winter, spring, summer and autumn seasons).

Data relating to birds flying above or below the blade swept area was not included in the collision risk analysis. It is important to note that, to ensure a precautionary approach to the assessment, buffers around the blade tip reach were implemented, both above and below the predicted swept area.

Flight data was not collected for Long-legged Buzzard and Common Kestrel during the winter surveys as these were, at the time of the survey considered to be Tier 2 species and as such, such data was not collected for them. An average flight time through the VP from the spring and summer surveys for these two species was applied to winter registrations of birds recorded flying with the risk window.

The results of the CRM are shown on the table below, along with a cumulative prediction for combined winter, spring summer and autumn collisions (i.e. predicted annual collisions using the previously stated avoidance rates).

Results of Collision Risk Assessment

The following table shows the results of the Collision Risk Model for at-risk species recorded flying through the wind farm during the winter, spring, summer and autumn survey seasons.

Table 61: CRM Output

Common Name	Scientific Name	Conservation Status		Collisions per Season				Cumulative
		IUCN	UZBDB	Winter	Spring	Summer	Autumn	
Cinereous Vulture	*Aegypius monachus*	NT	NT				0.136	0.136
Egyptian Vulture	*Neophron percnopterus*	EN	VU			0.003		0.003
Pallas's Fish Eagle	*Haliaeetus leucoryphus*	EN	-		0.009			0.009
White-tailed Eagle	*Haliaeetus albicilla*	LC	VU	0.003				0.003
Steppe Eagle	*Aquila nipalensis*	EN	VU:D	0.099	0.031	0.004	0.295	0.429

Common Name	Scientific Name	Conservation Status		Collisions per Season				Cumulative
		IUCN	UZBDB	Winter	Spring	Summer	Autumn	
Golden Eagle	*Aquila chrysaetos*	LC	VU:R	0.011			0.016	0.028
Eastern Imperial Eagle	*Aquila heliaca*	VU	VU:D	0.004	0.001		0.133	0.138
Greater-spotted Eagle	*Clanga clanga*	VU	VU	0.002				0.002
Booted Eagle	*Hieraaetus pennatus*	LC	VU				0.001	0.001
European Honey Buzzard	*Pernis apivorus*	LC	-				0.008	0.008
Long-legged Buzzard	*Buteo rufinus*	LC	-	0.003	0.017	0.011	0.048	0.080
Black Kite	*Milvus migrans*	LC	-	0.004	0.001		0.055	0.060
Pallid Harrier	*Circus macrourus*	NT	NT		0.004		0.013	0.017
Western Marsh Harrier	*Circus aeruginosus*	LC	-		0.004		0.004	0.007
Montagu's Harrier	*Circus pygargus*	LC	-				0.004	0.004
Hen Harrier	*Circus cyaneus*	LC	-				0.001	0.001
European Sparrowhawk	*Accipiter nisus*	LC	-				0.011	0.011
Common Kestrel	*Falco tinnunculus*	LC	-	0.002	0.040		0.301	0.344
Lesser Kestrel	*Falco naumanni*	LC	NT		0.002		0.035	0.037
Hobby	*Falco subbuteo*	LC	-				0.001	0.001
Merlin	*Falco columbarius*	LC	-				0.001	0.001
MacQueen's Bustard	*Chlamydotis macqueenii*	VU	VU:D		0.007	0.004	0.015	0.026

Collision Risk Assessment – Discussion

General

The Birdlife International AviStep Sensitivity Tool for Energy Planning was updated to include Uzbekistan in October 2024 and the sensitivity mapping is shown on the figure below. Kungrad 1, 2 and 3 wind farm site is in an area that is considered to be of moderate sensitivity for onshore wind energy projects. Moderate sensitivity is classified by Birdlife International as follows '*development is considered to pose a moderate risk to bird populations. However, comprehensive site-level assessment is necessary to confirm this level of risk.*'

A comprehensive site-level assessment has been undertaken for the Kungrad 1, 2 and 3 wind farm projects and the risk posed by the operational WTGs is fully assessed below.

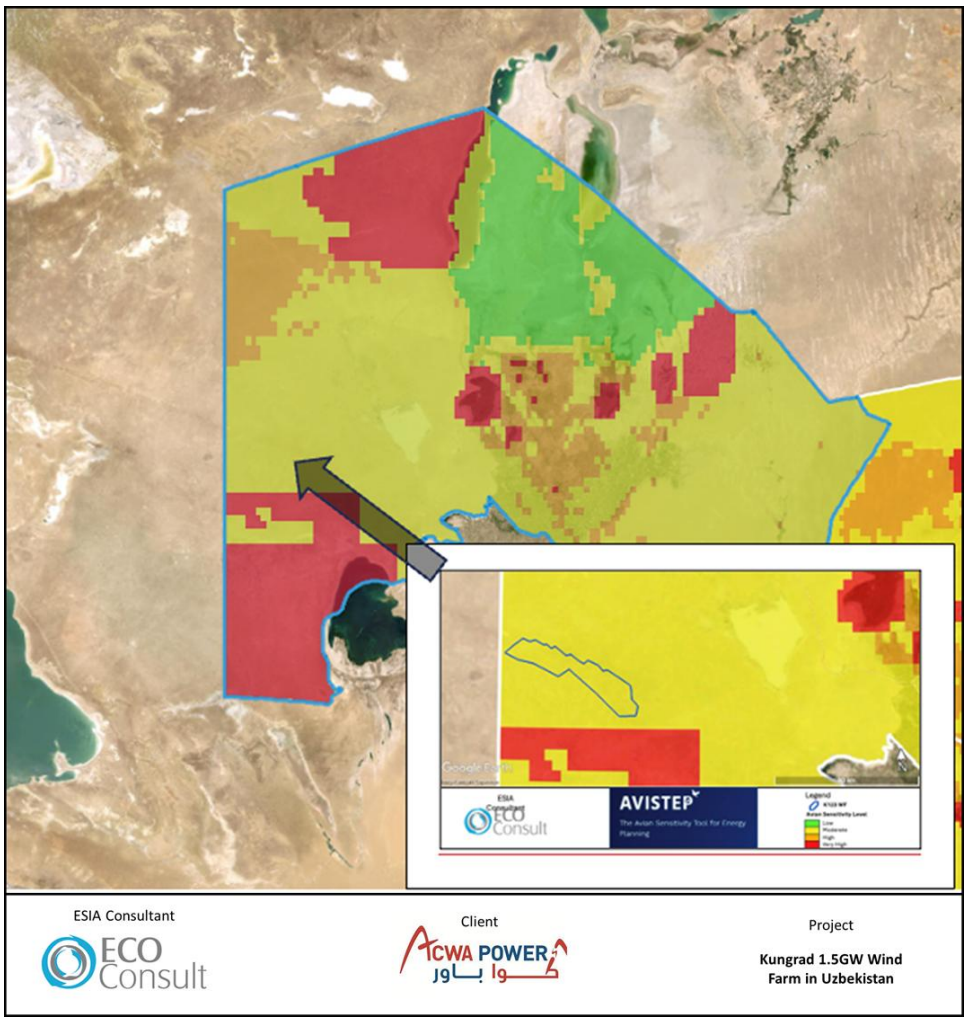


Figure 83: AviStep Sensitivity Mapping (Birdlife International) for NW Uzbekistan

Steppe Eagle

Steppe Eagle is predicted to have an annual mortality rate of 0.429 birds per year which would equate to approximately 10.7 birds over the lifetime of the Project.

The global population of Steppe Eagle is declining and is currently estimated to be between 50,000 and 75,000 mature individuals (IUCN Red List) and the population in central Asia has been estimated to be between at least 22,000 and 35,500 pairs (BirdLife Datazone). Steppe Eagle is a rare breeding bird within the Ustyurt Plateau and a single pair is known to breed (although unsuccessfully in 2023) with the Project AoI. and it is considered that the migratory population through Uzbekistan is approximately 1,500 individuals[51], although this is likely to be an under estimate.

Significantly more fight activity was recorded during the late winter survey and early spring surveys. After mid-April activity of Steppe Eagle had reduced to occasional movements through the AoI, presumably by the locally breeding pair. Recorded activity in the summer period was minimal and this is likely as a result of the failed nesting attempt. Activity significantly increased in the autumn period with two 'spikes' in activity; one in mid-September (14th: 60 birds) and the other in mid-October (13th – 15th: 330 birds). During the Autumn migration season only 35% of recorded flights were at risk height.

[51] 5 Capitals, Bash WF PBR Analysis

Therefore, the majority of activity of this species is migration over the Project AoI and birds were (apart from the breeding pair) generally not settling within the AoI as foraging resources are generally very low and there are no major attractants (e.g. shepherds, livestock and carcass dumps) within the AoI. In addition, the landscape is flat and open with no geographic features actively funneling birds towards or within the Project site. It is therefore very likely that natural avoidance behaviors will be high. In addition, turbines have now been arranged in lines that generally follow the flight activity of migrating birds' over the site. Gaps are present between these lines with a minimum of 2.5 km between each line.

Blade patterning, displayed in figure below is in accordance with the BirdLife South Africa Blade Patterning Guidelines (2024) will also be utilized to reduce collision risk of sensitive raptor species. Research into the effectiveness of blade patterning to date is limited, but at the Smøla wind farm in Norway it has had a 100% reduction of fatalities of White-tailed Eagle (and 72% reduction of fatalities for all species), and in on-going research at the Hopefield wind farm in South Africa it has had an 87% reduction in fatalities of all species (including raptors such as harriers, buzzards, kites and kestrels). Other currently unpublished studies are also indicating a reduction of fatalities. Although these are different species in different scenarios, they are all raptors with similar vision and it is anticipated that blade patterning will have a similar positive effect for this Project.

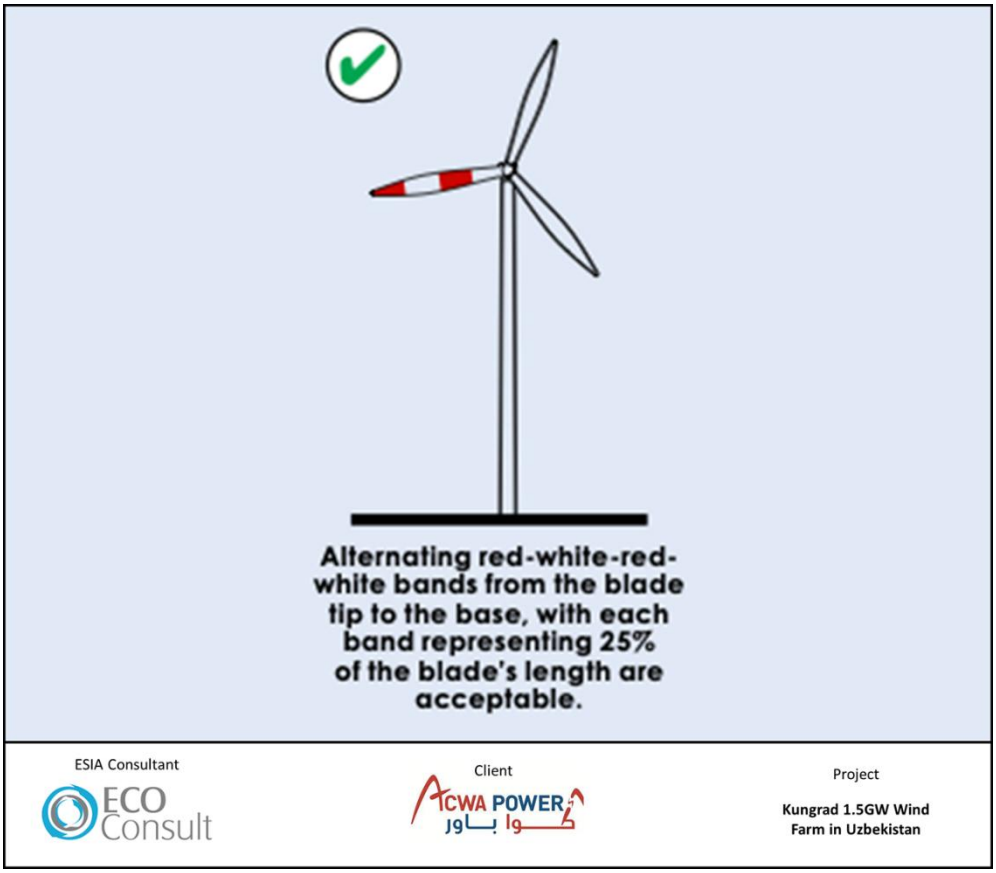


Figure 84: Type of Blade Patterning to be used at the Kungrad Wind Farm

Recent PBR analysis[52] for this species in Uzbekistan indicated that 'take' limits of this species is zero and as such the predicted level of mortality of approximately 1 bird every 2 years is significant and these impacts would be permanent and irreversible. Post-construction fatality monitoring will be required for at least the first three years of operation and an adaptive management approach to additional mitigation will

[52] Bash 500MW & Bash 52MW Wind Farms Republic of Uzbekistan Potential Biological Removal Analysis. Juru and 5 Capitals, November 2023

be applied. Offsets may also be required and these are accounted for in the off-set strategy proposed for the Project.

Golden Eagle

Predicted annual mortality of this species is 0.028 collisions per year and this will result in less than one collision over the lifetime of the project. Golden Eagle is an IUCN LC species and is listed as Vulnerable on the UzRDB

Recent PBR analysis for Golden Eagle in Uzbekistan indicated that 'take' limits of this species is zero and as any collision would be significant and any such impact would be permanent and irreversible. That said the likelihood of collisions occurring are unlikely based on predicted collisions of 0.028 per year and collisions are likely to be lower based on information presented in Steppe Eagle.

Post-construction fatality monitoring will be required for at least the first three years of operation and an adaptive management approach to additional mitigation will be applied. Offsets may also be required and these are accounted for in the off-set strategy proposed for the Project.

Eastern Imperial Eagle

Predicted annual mortality of this species is 0.138 collisions per year and this will result in 3.45 collisions over the lifetime of the project. Eastern Imperial Eagle is an IUCN VU species and is listed as Vulnerable on the UzRDB

Recent PBR analysis for Eastern Imperial Eagle in Uzbekistan indicated that 'take' limits of this species is zero and as any collision would be significant and any such impact would be permanent and irreversible. That said the likelihood of collisions occurring is low based on predicted collisions of 0.138 per year and collisions are likely to be lower based on information presented in Steppe Eagle.

Post-construction fatality monitoring will be required for at least the first three years of operation and an adaptive management approach to additional mitigation will be applied. Offsets may also be required and these are accounted for in the off-set strategy proposed for the Project.

Cinereous Vulture

Predicted mortality of this species is 0.136 birds per year or approximately 3.4 birds over the lifetime of the Project. Birds were only recorded flying over the site in the Autumn migration period with no flights recorded in the other seasons, although there was an incidental spring record of four birds on the ground (with a single Eurasian Griffon Vulture) during a period of very strong winds. There are no attractants present within the Project site (e.g. livestock, large herds of ungulates) and the Project area is flat and open with no geographic features actively funneling birds towards or within the Project site. It is therefore very likely that natural avoidance behaviors will be high.

Cinereous Vulture is an IUCN and UzRDB Near-threatened (NT) species and recent PBR analysis for this species in Uzbekistan indicated that 'take' limits of this species is zero and as such the predicted level of mortality is significant and these impacts would be permanent and irreversible. That said the likelihood of collisions occurring is low based on predicted collisions of 0.136 per year and collisions are likely to be lower based on information above.

Post-construction fatality monitoring will be required for at least the first three years of operation and an adaptive management approach to additional mitigation will be applied. Offsets may also be required and these are accounted for in the off-set strategy proposed for the Project.

Long-legged Buzzard and Black Kite

Predicted mortality of these species is approximately 1.5 to 2 collisions over the 25-year period of the Project. None of these species are of significant global conservation concern and mortality at this level is near-certain to not result in significant long-term impacts on either of these species.

Other Species

All of the other species included in the table above have predicted mortality of less than one bird over the 25-year lifetime of the Project and this would result in very minor negative impacts that would not be significant. Levels of predicted mortality of other species, including MacQueen's Bustard are well below in-country PBR thresholds and are therefore not considered significant. Other species not included in the table had a negligible number of flights at risk height or CRM output.

Potential Biological Removal (PBR) fatality based thresholds that were calculated for the Bash and Djenkeldy wind farms[53] have been used for this assessment. However, some of the species that will potentially be impacted by the Kungrad projects were not included in the existing analysis and some assumptions are made. For example, some species not included in the PBR analysis have relatively large population sizes and would have a higher PBR threshold and therefore the very low predicted CRM outputs would not equal or exceed the PBR threshold. In the existing analysis and this assessment, for any species that the PBR is 0, any one fatality will breach the threshold of significance. A full and up to date project specific PBR analysis will be undertaken for all species that could be impacted by the project and will include PBR based fatality thresholds for those species not already assessed in the cited analysis. The PBR analysis will be undertaken as part of the Collision Risk Management Plan (CRMP) and Adaptive Management Plan (AMP) which will be submitted and approved by lenders 6 months prior to any impacts from line stringing (or turbine operation).

Operation Phase – Direct and Indirect Impacts on Sensitive Receptors (Birds) – Collision with Turbines		
Type	Negative	
Duration	Long-term	During operation period (25 years)
Magnitude	High	CRM results indicate low levels of predicted collisions for sensitive species but some may exceed PBR thresholds.
Reversibility	Irreversible	Mortality would be permanent and irreversible
Sensitivity	Low to High	Dependent on receptor impacted
Likelihood	Low	Avoidance rates likely to be higher than used in CRM and also arrangement of turbines in lines NE-SW resulting in corridors of turbine free space
Frequency	Periodic	During operation, especially during periods of migratory behavior
Timing	N/A	Impacts possible in all months but more significant during migration periods
Extent	High	Potential for impacts over a wide area if mortality affects trans-continental migrants
Significance	**Minor to Major**	Dependent on receptor affected

Mitigation Measures

[53] 5 Capitals, Bash WF PBR Analysis, 2023

- Based on the outputs and results of the CRM as well as the results of the surveys completed to date upfront mitigation including observer- or technology-led Shut Down on Demand ***is not considered cost-efficient/commensurate to predicted impact***. This conclusion also takes in to account likely high rates of natural avoidance, flat open terrain and no 'funneling' landscape features, distances between turbines (turbine free corridors), turbine arrangement (following predominant flight direction), likely reduction in collision as a result of blade painting, flight dynamics of birds migrating over the Project area. Foraging and roosting behaviors have not been observed within the Project site and the site does not support significant attractants (e.g. shepherds, carcass dumps, livestock farms). Flight activity across the site is limited to migrating birds that are present in very narrow peaks of activity in spring and autumn.

- Operational monitoring will be completed for at least the first three years of operation (so if clusters are commissioned before others are constructed, each turbine or cluster of turbines will have a minimum of three years PCFM surveys), to monitor actual levels of mortality. Post construction fatality monitoring will be completed at all of the turbines and the program of post construction monitoring will include carcass searching, searcher efficiency trials and carcass persistence trials. The results of the post-construction fatality monitoring will be used to inform a GenEst Analysis. Post-construction monitoring will follow the latest international best practice including the recently published PCFM Handbook (EBRD, IFC, KFW 2023). Full details of the PCFM Protocol will be included in an Operational BMP document.

- An adaptive management strategy will be developed (in line with the PCFM Handbook), and additional mitigation will be undertaken where necessary. If significant impacts are recorded targeted SDOD during key spring and autumn migration periods would be triggered and these would be completed. Significant impact would clearly include any mortality of Steppe Eagle, Eastern Imperial Eagle and Golden Eagle and Cinereous Vulture as PBR thresholds for these species are zero.

- Adaptive management options for other species would be undertaken including targeted SDOD, if the results of the post-construction fatality monitoring indicate higher than predicted mortality, especially in relation to species of elevated conservation concern. (e.g. Pallas's Fish Eagle, White-tailed Eagle, Golden Eagle, Eastern Imperial Eagle, Greater-spotted Eagle, Booted Eagle and Saker Falcon).

- Adaptive management could include undertaking specific observer-led shut down programs if PCFM surveys indicate particular peak periods of bird activity through the AoI (e.g. specific windows of higher migratory activity, specific meteorological conditions causing spikes in bird activity at particular times of the year). Technology-led shut-down on demand could also be retrofitted within the AoI if actual mortality is significantly higher than predicted or if observer led SDOD is not shown to be fully effective (e.g. at reducing Steppe and Golden Eagle collisions to zero).

- On completion of the three-year post-construction fatality monitoring a decision will be taken to continue or cease this survey effort or reduce it to specific times of the year. Cessation or modification of the PCFM surveys will only be completed with prior agreement with the Lenders. If monitoring is ceased site workers will continue to record any carcasses they find, and this information will be passed on to the Project team.

- A chance find procedure will be implemented and any carcasses seen by site workers will be reported to the O&M Biodiversity Manager so that they can investigate. In addition, any prey species carcasses found within the Project site will be removed to reduce the likelihood of scavenging birds landing within the Project site.

- It is also possible that with increased access to the site that changes in the amount of grazing activity within the AoI will occur over time and this will be monitored by the O&M Contractor Biodiversity Manager / Wind Farm Rangers as this could potentially change activity patterns of raptors and possibly vultures (Cinereous and Griffon Vulture recorded once as incidental sightings in Spring and migrating Cinereous Vulture recorded in the autumn) over time. Grazing will however be banned from within the WF AoI and this will be monitored by full time Project Ranger staff.
- Wider conservation efforts within the NP and UNESCO sites as well as measures undertaken under CMS obligations (e.g. removal or changes to border fences, additional reintroduction of ungulates etc.) could also increase the amount of natural prey within the wind farm AoI and this in turn could make the site more attractive to birds of prey and vultures. The Wind Farm Rangers will monitor the numbers of ungulates across the site and a program of carcass removal will be undertaken if necessary.

Direct Impacts on Sensitive Receptors (Bats) – Collision with Turbines

Bats are known to suffer negative impacts from wind turbines both through direct contact with turbine blades and through barotrauma and resulting mortality. Certain species are known to be more negatively affected by turbine due to their flight heights and behaviors.

Data from the bat detectors has been analyzed and it is considered that at least four bat species (IUCN LC species) are present across the wind farm. Recorded bat activity is however low and this is likely due to poor habitat suitability and lack of available roosting sites within the Project AoI. The risk to bats is considered to be low and the magnitude of any impact is low (based on species conservation status). To that end upfront mitigation for bats is not recommended however the PCFM Year 1 program will include weekly searches, in line with latest GIIP, at the wind farm so that bat carcasses are more likely to be encountered and the impact of mortality on bats can be fully understood. Decreases in search frequency (e.g. once every 20 to 30 days) in Years 2 and beyond will be agreed with the Lenders prior to changing the PCFM protocols. In addition to the PCFM program, static detectors will be deployed at active turbines (both ground-based and at height) to further understand the use of the site by foraging, commuting and migrating bats.

Adaptive management of the turbines will be considered if mortality is higher than the PBR Thresholds for the species recorded during the PCFM surveys. PBR Thresholds have been calculated using the Frick et al. 2026 Framework[54]. For all species present at the Kungrad Wind Farm Site surrogate occupancy densities for Northern Serotine (*Cnephaeus nilssonii*) have been used to reflect the relative low densities of bats recorded during the surveys. PBF thresholds are included in the table below, along with the total number of calls by species recorded by the at height and ground-based bat detectors.

	Eptesicus sp.	***Pipistrellus kuhlii***	***Pipistrellus pygmaeus***	***Nyctalus noctula***
At Height	978	2	1	4
Ground Based	1786	7	0	3
Total	2764	9	1	7
PBR Threshold	45 / 22	22	22	22

[54] Frick, W.F., Whitby, M., Wilson, D., MacEwan, K.L., Hulka, S., Akre, K.L. and O'Mara, M.T. (2026) 'A global decision framework for reducing bat fatalities at wind energy facilities', *Ecological Solutions and Evidence*. Available at: https://doi.org/10.1002/2688-8319.70189

* - Depending on species (*Eptesicus serotinus* = 45, *Eptesicus ognevi* = 22)

Operation Phase – Direct Impacts on Sensitive Receptors (Bats) – Collision with Turbines		
Type	Negative	
Duration	Long-term	During operation period (25 years)
Magnitude	Low	Dependent on receptor affected
Reversibility	Irreversible	Mortality would be permanent and irreversible
Sensitivity	Low	Bat species on site are not of conservation concern (national or international)
Likelihood	Low	Minimal bat activity recorded across the site. Only up to five species recorded in low numbers.
Frequency	Periodic	During operation, especially during periods of migratory behavior
Timing	N/A	Impacts possible in all months but more significant during migration periods (e.g. autumn migration)
Extent	High	Potential for impacts over a wider area as mortality likely to affect bats migrating through the site
Significance	**Minor / Not Significant**	

Mitigation Measures

- Based on the survey outputs and conservation status of the bat species' present within the Project site, upfront mitigation including turbine curtailment ***is not considered cost-efficient/commensurate to predicted impact***.
- Operational monitoring will be completed for at least the first three years of operation (so if clusters are commissioned before others are constructed, each turbine or cluster of turbines will have a minimum of three years PCFM surveys), to monitor actual levels of mortality. Post construction fatality monitoring will be completed at all of the turbines and the program of post construction monitoring will include carcass searching, searcher efficiency trials and carcass persistence trials. Searcher frequency, in at least the first year, will be weekly. The results of the post-construction fatality monitoring will be used to inform a GenEst Analysis. Post-construction monitoring will follow the latest international best practice including the recently published PCFM Handbook (EBRD, IFC, KFW 2023). Full details of the PCFM Protocol will be included in an Operational BMP document.
- Bat detector surveys will also be completed for the first three years of operation in order to record levels of bat activity across the site and use this data in combination with the results of the PCFM to ascertain high-risk periods. Data from detector survey and PCFM will be used to inform the adaptive management.
- Adaptive management of the turbines (e.g. curtailment) will be considered if mortality is higher than the PBR Thresholds for the species recorded during the PCFM surveys. PBR thresholds are given above, and adaptive management will likely be based on season and temporal curtailment of the turbines during period of highest bat activity / recorded mortality. Curtailment triggers to be determined during PCFM campaign but will be based on increasing the cut-in wind speed for turbine operation or blanket curtailment during periods of highest activity.

Indirect Impacts on Sensitive Receptors (terrestrial mammals and breeding / resident birds) – Disturbance

During the operation of the wind farm disturbance impacts are likely to be very minor as the site will not be subject to regular activity other than occasional vehicle movements and maintenance operations around the site, including turbine locations. Certain species including Honey Badger, Caracal, Goitered Gazelle and MacQueen's Bustard are likely to be more susceptible to such impacts as a result of their natural behaviors. It is possible other receptors including breeding Greater Sandplover, breeding passerines and other mammals (e.g. Tolai Hare) may experience disturbance impacts during the operation of the wind farm. Any such impact will have to be very short-term (for the duration of the disturbance impact), in limited areas (around works site) and reversible and are likely to only result in impacts of low to medium magnitude. The significance of operational disturbance is therefore considered to be minor to moderate depending on receptor affected..

Operation Phase – Indirect Impacts on Sensitive Receptors (terrestrial mammals and breeding / resident birds) – Disturbance		
Type	Negative	
Duration	Short-term but throughout operation	Impacts are short-term (i.e. disturbance event) but could occur over a long period of time (i.e. 25 years of operation)
Magnitude	Low to Medium	Dependent on receptor affected
Reversibility	Reversible	During operation. Disturbance events are reversible
Sensitivity	Low to High	Dependent on receptor affected
Likelihood	Low	Impacts are not certain to occur
Frequency	Periodic	During operation,
Timing	N/A	Impacts possible in all months
Extent	Low	Impacts limited in extent to areas where maintenance is being undertaken etc.
Significance	**Minor to Moderate**	

Mitigation Measures

- Ban on off-road driving, and if off-road driving is required a check of the working area should be completed by the Project's Ecologist.
- Speed limits to be enforced.
- Sensitive species are to be included in the site induction for all operational staff where additional control measures will be discussed including allowing animals to move around the site, not chasing after them in vehicles or approaching them on foot and what to do if they observe breeding birds within their works areas.
- If certain species (e.g. birds of prey or MacQueen's Bustard) are accidentally flushed during operation monitoring, staff should monitor the flight of the bird to check if they are struck by turbines.
- A chance find procedure will be implemented and any sensitive species seen by site workers will be reported to the O&M Contractor Biodiversity Manager.

Direct Impacts on Sensitive Receptors (Vertebrates) – Vehicle Collisions

Vehicle related collision is possible for all vertebrate species present within the Project's AoI and this will result in direct mortality on receptors of low to high sensitivity. Any such impact would be negative, long-term and irreversible and would be of medium to high magnitude and therefore of moderate to major significance (depending on the receptor killed).

Larger mammals including Goitered Gazelle are more likely to disperse away from operational working areas due to their sensitivity to disturbance and thus the risk of collision with vehicles will be small. Honey Badger and Caracal are mostly nocturnal and as such the likelihood of collision is significantly reduced as night-time driving during operation is very unlikely. Small mammals and slower moving species such as Central Asian Tortoise, Desert Sand Boa and Blotched Rat-snake are at higher risk of collision with vehicles and any machinery.

It is possible that carcasses on the road could attract scavenging animals, including birds of prey which in turn would increase their risk of collision with vehicles and machinery.

Operation Phase – Direct Impacts on Sensitive Receptors (Vertebrates) – Vehicle Collisions		
Type	Negative	
Duration	Long-term	During operation
Magnitude	Low to High	Dependent on receptor affected
Reversibility	Irreversible	Impact could result in death or injury to sensitive receptors
Sensitivity	Low to High	Dependent on receptor affected
Likelihood	Medium	Direct mortality of sensitive receptors is possible
Frequency	Rare	During operation,
Timing	N/A	Impacts possible in all months
Extent	Low	Impacts limited to Project AoI including access road
Significance	**Moderate to Major**	

Mitigation Measures

- Speed limits will be enforced by the O&M Contractor on all site roads. GPS units will be fitted to all O&M contractor vehicles as well as all Developer project vehicles, the data from which will be checked monthly and fines will be issued for breaches of the speed limit. Speed checks will also be completed at least monthly, and any non-project related vehicles will be stopped and the drivers reminded of the posted speed limits within the Project area. Speed checks and GPS checks will be recorded and reported and issued fines will also be reported.
- Regular signage will be installed along the site access roads and internal roads informing all drivers of the speed limit.
- A gated entrance will be staffed and any visitors or locals using the site roads will be informed of the speed limits and that there are regular checks of vehicle speeds.
- A ban of driving at night will be enforced and if necessary, the speed limit will be reduced to 40 km/h on the access road and to 20 km/h on any internal roads.
- Ban against off-road driving at all times of the day, and if necessary, the works area will be subject to a walkover by the O&M Contractor Biodiversity Manager.

- Regular checks of the road for carcasses and if found these will be moved to at last 50m from the road to reduce the likelihood of hitting scavengers, including birds of prey.
- An incidental / chance find procedure will be included in the BMP so that all workers report any road collisions so that any such incident can be investigated in full.

Refer to "Section 14.2.6" for additional details on impacts and mitigations on traffic and transport.

Direct Impacts on Sensitive Receptors (Vertebrates) – Lighting

Lighting could potentially result in negative impacts of a range of ecological receptors including those of high sensitivity such as Honey Badger, Caracal, Marbled Polecat and Goitered Gazelle. In addition, lighting could impact foraging and migration routes for bats.

Any impacts are likely to be short- to medium term and reversible. The magnitude of impact ranges from low to medium and is likely to be of minor to moderate significance.

Operation Phase – Direct Impacts on Sensitive Receptors (Vertebrates) – Lighting		
Type	Negative	
Duration	Variable	Impacts are short- to medium-term (i.e. lighting event) but could occur over a long period of time (i.e. 25 years of operation). Longer term impacts at operations base however other lighting events likely to be shorter to medium term (e.g. on site if required)
Magnitude	Low to Medium	Dependent on receptor affected
Reversibility	Reversible	During operation. Lighting events are reversible although lighting at site offices / compound would be permanent and irreversible during the operation phase
Sensitivity	Low to High	Dependent on receptor affected
Likelihood	Low to Medium	Impacts are not certain to occur
Frequency	Rare	During operation,
Timing	N/A	Impacts possible in all months
Extent	Low	Impacts limited to Project AoI
Significance	**Minor to Moderate**	

Mitigation Measures

- Site-wide lighting is not being implemented so any lighting impacts during operation will be very limited. Night-time working is not anticipated and will certainly not be a regular occurrence.
- Where lighting is required within worker compounds, site offices etc. ensure that any lighting is shielded and protected to reduce light-spill and glare. Low UV intensity lighting should also be used, where possible, to further reduce light spill.
- For external security lights PIR trigger units should be used and these should be timed to automatically switch off after five minutes.
- No lighting will be installed along the access road from Kirkkiz.
- Turbines will not be lit, and any aviation lights will be shielded to minimize visibility from ground level to reduce the attractiveness of lights to night flying insects which in turn could attract bats.

- Lighting above turbine doors will be PIR controlled and timed so that it switches off automatically after five minutes. Again, this measure will be implemented to reduce night-flying invertebrates in proximity to turbines.

Direct Impacts on Sensitive Receptors (Habitats and Flora) – Non-native Species and Introduced Flora

It is possible that non-native or introduced flora could be imported into the AoI on vehicles or within any imported soil material. The impacts of non-native and introduced flora could potentially be significant in absence of any mitigation as these species could become established and out-compete native flora.

In addition, three species listed on the national quarantine list were identified during the botanical assessment and these are *Cuscuta campestris* (non-native), *Cuscuta epithymum* (probably native) and *Rhaponticum repens* (native). Construction works could improve conditions for these species, and it is possible earth moving could increase the distribution of these species across the AoI.

Impacts associated with non-native, invasive or introduced flora could result in long-term negative impacts, irreversible (if allowed to become established) and moderate significance.

Operation Phase – Direct Impacts on Sensitive Receptors (Habitats and Flora) – Non-native Species and Introduced Flora		
Type	Negative	
Duration	Long Term	During operational phases of the project
Magnitude	Low to Medium	Potential change to natural habitat and species composition across the Project AoI.
Reversibility	Reversible	Invasive species can be controlled, if identified
Sensitivity	Low to Medium	Habitats are assessed as being of low to medium sensitivity
Likelihood	Low to Medium	Introduction of invasive non-native species is possible
Frequency	Rare	During operation,
Timing	N/A	Impacts possible in all months
Extent	Medium	Impacts limited to Project AoI
Significance	**Minor to Moderate**	

Mitigation Measures

- Post-construction monitoring will be completed across the AoI to record the presence and distribution of non-native and invasive plant species and a program of mechanical control will be completed over during the operation period to remove these species from the AoI. Chemical control will be avoided however, if necessary, will be used but in accordance with national and international guidelines and only following risk assessment and approval from the Lenders. The program of control will continue until the species are absent from the Project AoI. The results of ESIA surveys, pre-clearance, pre-construction and during construction surveys will be used to inform areas that will require monitoring for NNIS. If NNIS are more widely recorded the search area for such species will be increased.

- A program of regular monitoring will be completed with surveys completed annually for the first five years post-construction and also in Years 10, 15, 20 to survey for the presence of non-native and / or invasive species and relevant control of these species will be completed, where necessary.

Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Pest Species

It is possible that pest species become established within the Project as a result of increased littering or poor waste management as well as the propensity of certain species (e.g. rats, cats and dogs) to associate with human habitation.

An increase in pest species could result in long-term negative impacts on wild animals through direct and indirect competition for food resources, direct mortality through predation, and direct impacts as result of disturbance impacts. Such impacts could be reversible or irreversible, will be between low to medium magnitude and as such significance will vary from minor to moderate depending on the receptor being affected.

Operation Phase – Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Pest Species		
Type	Negative	
Duration	Long Term	During operational phases of the project
Magnitude	Low to Medium	Potential change to natural habitat and species composition across the Project AoI.
Reversibility	Reversible	Invasive species can be controlled, if identified
Sensitivity	Low to High	Dependent on receptor
Likelihood	Low to Medium	Introduction of invasive non-native species is possible
Frequency	Rare	During operation
Timing	N/A	Impacts possible in all months
Extent	Medium	Impacts limited to Project AoI but could also encroach into adjacent areas
Significance	**Minor to Moderate**	

Mitigation Measures

- Where pest species are identified, the O&M Contractor Biodiversity Manager will be notified, and an appropriate course of action taken. For small mammal pest's live traps will be used, to reduce the risk of by-catch. Poison baits should be avoided, unless it can be certain that non-target species will be affected, and any such use should be in accordance with national and international best practice. If poison baits are to be used it must be certain that any poisoned animal cannot move out on to the wider AoI to reduce the risk of natural predators eating poisoned animals.
- Where feral cats and dogs are identified the O&M Contractor Biodiversity Manager must be notified and efforts made to catch these animals and transport them to appropriate animal shelters away from the site. Guard dogs for the site offices (e.g. security for site offices, workers accommodation) must not be used. These measures are in place to ensure no direct or indirect impacts to Honey Badger as well as other mammal species of conservation concern.

11.3 Monitoring

Long term monitoring of the Project AoI will be completed as set out above and will include:

- Monitoring of mammal and herpetofauna assemblages across the AoI. Repeat of baseline surveys will be completed in Years 1, 3 and 5. Population densities recorded in Year 5 will be compared to baseline levels and if required additional work will be completed to ensure no net loss of PBF species and aim to achieve no net loss of all species.

- Walkover surveys for mammals will be completed throughout construction and in the first five years of operation to demonstrate continued use of the site by Marbled Polecat, Caracal Honey Badger and Corsac Fox. Camera traps will be used where necessary, although wide-scale / long-term camera trapping will not be completed.
- Breeding bird surveys will be completed in Years 1, 3 and 5 to record the breeding bird assemblage of the site. This will include raptor nest searching. Population densities recorded in Year 5 will be compared to baseline levels and if required additional work will be completed to ensure no net loss of PBF species and aim to achieve no net loss of all species.
- Post-construction fatality monitoring to be completed throughout the first three years of operation to record the actual impact of bird and bat collisions with the turbines. Additional surveys and or mitigation measures to be implemented as part of an Adaptive Management Strategy. Any changes to the PCFM protocol will be agreed with the Lenders.
- All of the above monitoring requirements will be included within Construction and Operational Biodiversity Action Plans which will include KPIs and a BMEP against which the results of the monitoring will be assessed.

11.4 Off Setting

Based on the impact assessment undertaken earlier, as discussed, the Project will require off setting measures. Identified below are the offsetting measures that the Developer has committed to, and which will be discussed in further details within the standalone BAP.

In addition to the mitigation measures already defined, the Project will implement offset measures during construction and operations to address residual impacts and thus achieve no net loss for priority biodiversity features, and for Natural and Critical Habitat. In particular, the Project will – in collaboration with relevant in-country stakeholders – support undergrounding of current or proposed Low Voltage Distribution Lines (LVDL), or removal of any such lines which are no longer necessary, within a priority area for MacQueen's Bustard in Bukhara Province. The detailed location, scale and schedule of this offset will be agreed in consultation with key stakeholders. While this offset is primarily targeted at MacQueen's Bustard, removal of LVDL in this area is likely to also have significant benefits to birds of prey by removing electrocution risks. Monitoring of current electrocution risks in the area would allow removal of LVDL to also function as an offset towards any unforeseen collisions of birds of prey with wind turbines. These offset measures are further detailed in the Project's Biodiversity Offset Plan (BOP).

The scale of offsets necessary has currently been estimated on a precautionary basis, using existing data on bustard collisions with powerlines near part of the Project OHTL route. This estimate will be refined during Project implementation via a program of Post Construction Fatality Monitoring (PCFM). That Program will not only enable refinement of offsets for MacQueen's Bustard but also identify the need for any other adaptive management of mitigation or offsets owing to unforeseen impacts. It will be developed for both turbines and powerlines following good international industry practice and carried out for an initial minimum 3-year period, but the actual timeframe will depend on fatality results. If PCFM indicates collisions of other Critical Habitat-qualifying bird or bat species with turbines to levels that exceed PBR-based fatality thresholds, additional mitigation or offset actions will be implemented as part of adaptive measurement as contained in the ESIA. Those may include operational controls (such as turbine curtailment or shut-down-on-demand during high-risk periods) or the enhancement of mitigation and offset measures.

12. ARCHEOLOGY AND CULTURAL HERITAGE

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to archaeology and cultural heritage. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

12.1 Assessment of Baseline Conditions

12.1.1 Methodology for Assessment

The baseline assessment of the Project site was based on a literature review, secondary data review and a field survey, each of which is discussed in further details below.

A. Literature Review

Literature review included a comprehensive review of archives, publications, and studies on previous archaeological and cultural heritage work and surveys undertaken in the area, and which are available through desktop review.

B. Stakeholder Consultation and Engagement

Stakeholder consultation and engagement activities were undertaken with key entities involved in archaeology and cultural management. This included the entities below. Refer to “Section 6.3.1” earlier for addition details.

- Ministry of Culture and Tourism of Uzbekistan / Agency of Cultural Heritage;
- Ministry of Culture and Tourism of Karakalpakstan / Department of Cultural Heritage of Karakalpakstan Republic; and
- Karakalpak Research Institute for the Human Sciences.

In addition, as part of the FGD undertaken with the local communities, specific discussions were undertaken in relation to cultural heritage sites within the Project area. Refer to “Section 6.3.2”.

C. Secondary Data Review

Prior to the archaeology and cultural heritage experts undertaking any site related surveys, a full and detailed review of up-to-date high-quality satellite images for the Project area was undertaken. Such satellite images were provided the Developer and were part of the topography study undertaken.

The objective was to identify any potential sites of interest within the entire Project footprint and boundary so that it can be inspected during the site survey.

D. Site Survey

Archeology and cultural heritage experts from the Karakalpak Research Institute for the Human Sciences under the Academy of Science undertook a detailed site survey for the Project area from 17 July 2023 until 15 October 2023.

The team consisted of the following members:

- *Toreniyazov A.*– Head of the Expeditionary Team;
- *Iskanderova A.J.* – Deputy Chair of the archeology department;
- *Yagodin V.V.*- Head of Unique Object Department;
- *Bekbuliev A.* – Senior Researcher;
- *Kudaybergenova G*. – Laboratory Assistant;
- *Allambergenova G.* – Laboratory Assistant;
- *Tashimova E.* – Laboratory Assistant;
- *Shirazova S.* – Laboratory Assistant; and
- *Paxratdinova D*. – Laboratory Assistant;

The survey was undertaken as follows:

- Detailed survey for the Project components which included the following:
  - Substation areas along with 2km buffer
  - All WTG location along with a 700m buffer
  - Access along with a 200m buffer on each side
  - Internal road network along with 500m buffer on each side
  - Internal OHTL network along with 500m buffer on each side

  Note: the above survey was undertaken for the preliminary layout available at the time of the survey (i.e. July 2023) and not the final layout provided within "Section 2".
- Due to huge area of the Project footprint, the remaining areas (i.e. areas outside of Project components but within the project footprint) were surveyed through a combination of: (i) transect methodology (with transects every 1-2km); and (ii) observations from elevation points with an inspection radius of 1 km. Both combinations were utilized to try to cover as much ground as possible within the Project area.

The objective of the field survey was to ascertain the presence of any surface archaeological or cultural heritage sites or remains. If any sites were noted the following was recorded:

- Sketch plans;
- Areas along with GPS coordinates;
- Photograph;

- Undertake an analysis to categorize the sites and archaeological features and assessing their significance;
- Identify whether the site can be relocated or removed and if so, identify requirements that should be undertaken and considered; and
- If site cannot be relocated / removed identify the requirements to be considered for Project design (e.g. buffer distances, fencing, etc.).

12.1.2 Results

A. Literature Review and Stakeholder Consultation and Engagement

Based on the outcomes of the stakeholder consultation activities it was indicated that the region of the Project in general was studied for many years through the Karakalpak Research Institute for the Human Sciences under the Academy of Science

However, due to many factors, the exact footprint of the Project site in specific has not been subjected to scientific research. In 2021, an archaeological expedition team conducted partial research on the territories of the Ustyurt Plateau, as a result of which a number of archaeological sites (settlements and burial sites) were recorded. Additional information about archaeological objects is found in the publication [Amirov et al., 2022. P. 113-130].

Based on the above, the following sites were recorded (none of which are located within the Project site itself).

Finally, the FGD with local communities indicated that there are no sacred or cultural heritage sites within the Project site or its vicinity.

Table 62: Archeological and Historical Sites

Point	Site / Coordinates	Distance to Site	Direction from Project Site
1	Arrow-shaped arrangement N43°16'11,44" E56°15'44,11"	2.82 km	N
2	Sarykamysh region arrow-shaped arrangement N42°19'40,31" E57°31'05,39"	76.8 km	SSW
3	Sarykamysh region arrow-shaped arrangement N42°18'59,60" E57°32'44,21"	79.2 km	SSW
4	Sarykamysh region arrow-shaped arrangement N42°18'10,38" E57°34'35,78"	82 km	SSW
5	Sarykamysh region arrow-shaped arrangement N42°16'42,82" E57°36'12,32"	85.5 km	SSW
6	Sarykamysh region arrow-shaped arrangement N42°14'25,24" E57°38'08,34"	90.4 km	SSW
7	Sarykamysh region arrow-shaped arrangement N42°12'39,68" E57°39'09,22"	93.8 km	SSW
8	Sarykamysh region arrow-shaped arrangement N42°10'15,22" E57°45'37,19"	103 km	SSW
9	arrow-shaped arrangement N42°10'18,51" E57°47'38,87"	104.5 km	SSW
10	Aksaymak burial ground N42°31'36,69" E57°55'52,29"	89.6 km	SW

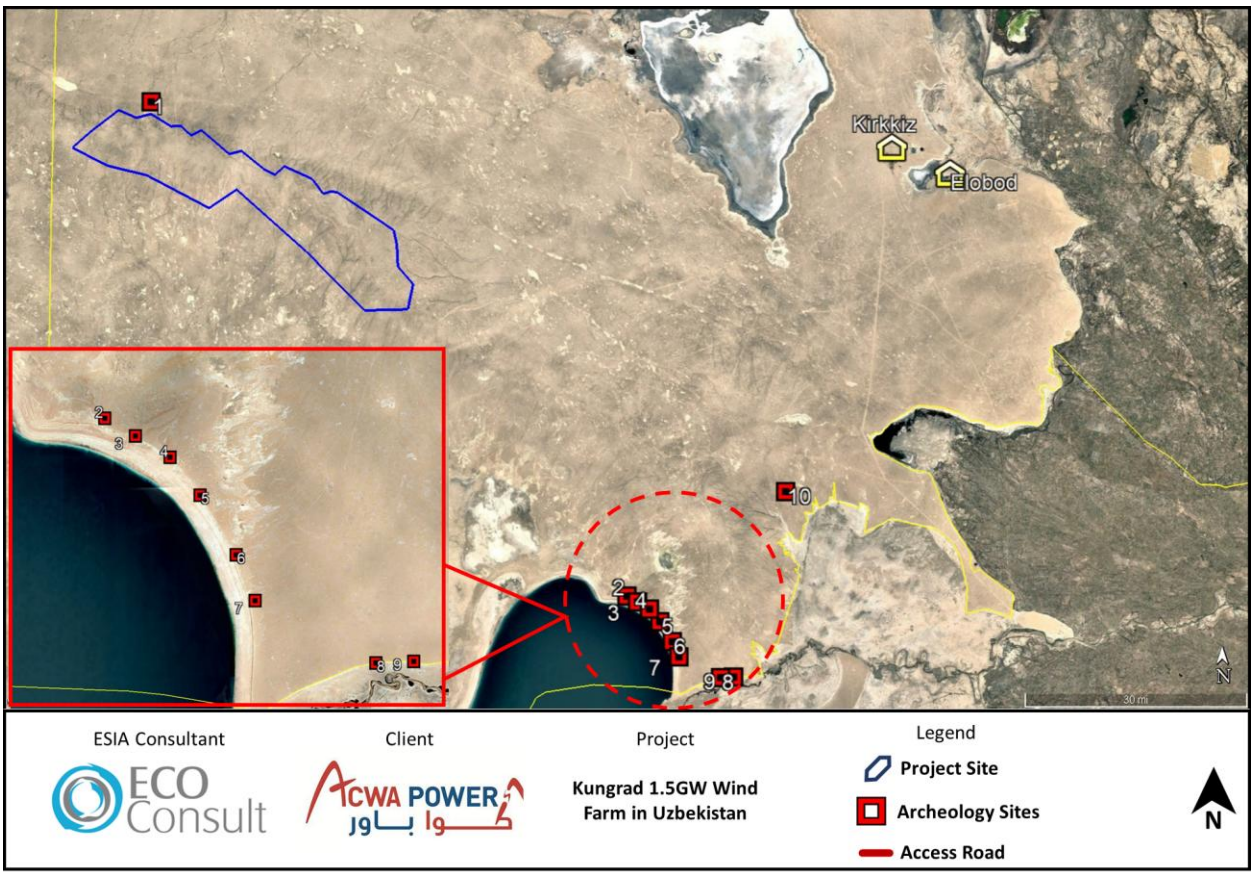


Figure 85: Project Site and Archeological Sites

B. Site Survey

The table below presents the key findings of the site survey undertaken for the Project site. In addition, the figure that follows presents the location of the sites within the Project area.

It is important to note that all sites recorded below have no touristic value or importance and are not considered unique nor key sites of archaeological or cultural heritage importance as such sites are found heavily within the area.

As noted in the table below, a total of 110 sites have been recorded within the Project area. A total of four (4) sites has their buffer area requirement (50m) located within Project footprints (either internal OHTL or internal road). Those are highlighted in blue in the table below.

Table 63: Outcomes of Archeology and Cultural Heritage Survey

Site	Coordinates	Area	Description and significance	Can the site be removed	Additional Requirements	Distance to Nearest Project Footprint (m)
Object 1	N42°56'27,8088" E57°00'32,0436"	4	Single burial. It is an object of burial culture of the XVIII-XIX centuries. Judging by the orientation of the burial and the tamgas on the stone gravestone, it belongs to the Kazakh clan Tabyn-shomishti.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 2	N42°56'54,5496" E56°58'37,0992"	100	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 3	N42°57'23,6769" E56°50'15,9153"	100	It is an object of burial culture of the XVIII-XIX centuries. Judging by the orientation of the burials and the tamgas on the stone headstone, the burial ground belongs to the Kazakh clan Tabyn-shomishti.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,278 m (underground cable)
Object 4	N43°01'07,2455" E56°39'56,2979"	150	It is an object of burial culture of the XVIII-XIX centuries. Judging by the orientation of the burials and the tamgas on the stone headstone, the burial ground belongs to the Kazakh clan Tabyn-shomishti.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	3,035 m (internal OHTL)
Object 5	N42°57'17,60" E56°36'21,54"	120	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Located outside of Project footprint.	The facility is located outside the field road and turbine construction.	Outside of Project footprint
Object 6	N43°04'12,49" E56°42'46,73	12	It is an object of the burial culture of the Muslim type.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	497 m (underground cable)

Object 7	N43°06'46,09" E56°40'15,26	90	It is an object of the burial culture of the Muslim type.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	118 m (internal road)
Object 8	N43°09'10,14" E56°28'08,82"	8	It is an object of the burial culture of the Muslim type.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	219 m (internal road)
Object 9	N43°05'10,78" E56°32'21,76"	12	It is an object of the burial culture of the Muslim type.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,420 m (internal OHTL)
Object 10	N43°05'05,11" E56°32'19,02"	200	It is an object of burial culture of the XVIII-XIX centuries. Judging by the orientation of the burials and the tamgas on the stone headstone, the burial ground belongs to the Kazakh clan Tabyn-shomishti.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	1,580 m (internal OHTL)
Object 11	N43°04'59,67" E56°30'15,82"	8	It is an object of the burial culture of the Muslim type.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 12	N43°04'04,89" E56°25'49,63"	30	It is an object of the burial culture of the Muslim type.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 13	N43°04'10,47" E56°24'55,01"	16	Single burial, barrow. It is an object of burial culture, possibly a burial mound, the chronological framework is not determined without excavation work	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,808 m (internal OHTL)
Object 14	N43°04'03,05" E56°24'42,39"	16	Single burial, barrow. It is an object of burial culture, possibly a burial mound, the chronological framework is not determined without excavation work	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	2,115 m (internal OHTL)
Object 15	N43°06'40,25" E56°24'48,95"	20	Single burial, barrow. It is an object of burial culture, possibly a burial mound, the chronological framework is not	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,375 m (internal road)

			determined without excavation work.			
Object 16	N43°07'36,74" E56°21'16,60"	140	A Burial ground, it is an object of burial culture of the XVIII-XIX centuries. Judging by the orientation of the burials and the tamgas on the stone headstone, the burial ground belongs to the Kazakh clan Tabyn-shomishti.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	2,154 m (internal road)
Object 17	N43°06'32,57" E56°20'27,00"	12	It is an object of the burial culture of the Muslim type. Single Burial ground.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	50 m (internal OHTL)
Object 18	N43°01'58,25" E58°04'46,61"	N/A	Settlement and dwelling	Yes, through excavation.	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	240 m (access road)
Object 19	N43°16'15,66" E56°15'36,86"	N/A	Arrow-shaped layout	Yes, through excavation.	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 20	N43° 8'36.34" E56°15'55.79"	16	It is an object of burial culture of the XVIII-XIX centuries. Judging by the orientation of the burials and the tamgas on the stone headstone, the burial ground belongs to the Kazakh clan Tabyn-shomishti.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,312 m (internal OHTL)
Object 21	N43°14'12.22" E56°16'44.95"	4	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 22	N43°13'27.39" E56°11'39.61"	170	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	196 m (internal road)
Object 23	N43°13'4.74" E56° 9'4.20"	5	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	195 m (underground cable)

Object 24	N43°11'39.76" E56° 6'21.73"	7	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,595 m (internal road)
Object 25	N42°55'8.82" E56°51'40.58"	50	It is an object of burial culture (burial ground). The object was partially destroyed under the influence of natural factors.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	5,368 m (WTG k1-9)
Object 26	N43°07'51.4524" E56°33'40.9248"	8	This object, unprocessed stone slabs forming sub-rectangular shapes, hints at burials. Muslim-type affiliation suggested by orientation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	277 m (internal road)
Object 27	N43°09'29.7612" E56°17'54.7656"	8	This object, a sub-rectangular burial with unprocessed stones, includes a Muslim-associated tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,669 m (WTG k3-10)
Object 28	N43°08'24.2268" E56°18'44.4060"	50	This object, a sub-rectangular burial with unprocessed stones, includes a Muslim-associated tombstone. Tentatively dated to late 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	42 m (underground cable)
Object 29	N43°07'44.1692" E56°19'51.0189"	30	Two child burials, unprocessed stones, tombstones. Muslim type. Tentative 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,575 m (internal road)
Object 30	N43°06'29.0160" E56°20'27.1824"	6	It is an object of Muslim burial culture	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	145 m (internal OHTL)
Object 31	N43°06'29.1420" E56°20'27.9492"	6	It is an object of Muslim burial culture	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	135 m (internal OHTL)
Object 32	N43°05'33.5616" E56°20'24.9972"	6	Perhaps an object of funerary culture is an object of funerary culture.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint

Object 33	N43°05'31.2864" E56°20'25.8612"	6	A This object, round burial with unprocessed stones, possibly destroyed. Muslim affiliation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 34	N43°04'18.0588", E56°20'35.3724	8	A This object, a single burial of unprocessed stone slabs, partially destroyed. Muslim type, dated 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 35	N43°04'13.0764" E56°20'37.9716"	6	This object, a single burial of unprocessed stone slabs, partially destroyed. Muslim type, dated 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 36	N43°04'00.5160" E56°20'20.9796"	6	This object, a single burial with a ramp of stone slabs, possibly lost tombstone. Tentatively dated to the 18th-19th centuries, Muslim type orientation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 37	N43°04'00.7824" E56°20'15.8676"	6	This object, a single burial with a ramp of untreated stones. Tentatively associated with 18th-19th-century burials.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 38	N43°04'00.5916" E56°20'15.8136"	8	Single burial, rectangular shape, untreated stone slabs, remnants of tombstone. Tentatively dated 18th-19th century, potential golden eagle nest.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	4,431 m (internal OHTL)
Object 39	N43°04'00.5140" E56°20'15.8180"	8	Two small burials, potentially for children. The exact dating of these burials remains undetermined.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	4,433 m (internal OHTL)
Object 40	N43°03'10.6668" E56°23'45.2292"	10	A round-shaped single burial, constructed with shapeless stones, lacks a tombstone. Orientation suggests Muslim affiliation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint

Object 41	N43°03'03.4992" E56°25'25.3956"	100	Lacking a tombstone, the burial's exact dating is unknown, with nearby objects resembling funerary culture mounds.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 42	N43°03'24.7248" E56°23'37.1868"	6	This object is a single child burial atop hill, shapeless stones, lacks tombstone, undetermined dating."	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 43	N43°08'39.0084" E56°15'40.2552"	8	This object, a single burial, features shapeless stone riprap, sub-rectangular, some slabs placed vertically.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,256 m (underground cable)
Object 44	N43°09'14.1732" E56°12'52.4736"	6	Possibly a single burial, this object is characterized by a round riprap of shapeless stones arranged in the form of a small tower. Lacking a tombstone, the exact dating of the burial remains undetermined	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,223 m (WTG k3-48)
Object 45	N43°12'31.1868" E56°07'09.9480"	6	This object, possibly a single burial, features a rounded mound of shapeless stones, lacking a tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,205 m (internal road)
Object 46	N43°13'09.8976" E56°10'15.4164"	6	This object: possible single burial, shapeless stones, small mound, challenging confirmation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	956 m (internal road)
Object 47	N43°13'08.8932" E56°10'18.2388"	6	The object is a single burial; without excavation work it is difficult to confirm this.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	884 m (internal road)
Object 48	N43°08'30.3864" E56°32'31.0848"	8	This object: possible small burial ground, two burials, shapeless stone slabs, lacking tombstone, deformation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	593 m (main OHTL)

Object 49	N43°09'35.5896" E56°31'02.0460"	8	This object: potential single burial, oval arrangement of shapeless stones, no tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,548 m (WTG k2-18)
Object 50	N43°10'04.4328" E56°30'49.2912"	8	This object is a possible single burial with an oval arrangement of shapeless stones, lacking a tombstone. The tombstone, if present, bears the Kazakh clan Adai's arrow sign, dating the burial to the 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project boundary
Object 51	N43°09'36.6876" E56°30'23.6772"	150	This object, among the largest on Karabaur ridge, includes 13 burials, dated 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	957 m (WTG k2-30)
Object 52	N43°06'45.7668" E56°28'24.4272"	4	This object, possibly a single burial, displays shapeless stone slabs, resembling a tower. Confirmation awaits excavation, and it lacks a tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	147 m (underground cable)
Object 53	N43°06'18.1368" E56°28'12.4356"	8	This object, largest on Karabaur ridge, single burial with vertical stones.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	37 m (internal road)
Object 54	N43°06'16.3332" E56°27'43.0812"	100	This object, features large oval burial outlined by vertical stones, two smaller children's graves, dating 18th-19th centuries.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	652 m (internal road)
Object 55	N43°07'01.0848" E56°26'19.7772"	4	Single burial, likely for a child, indicated by its small size.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	434 m (underground cable)
Object 56	N43°06'56.2284" E56°26'22.8948"	4	Single burial, likely for a child, indicated by its small size.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	480 m (underground cable)
Object 57	N43°06'56.6892" E56°26'23.0784"	8	This object, possible children's burials, includes Burial 1 with riprap destroyed naturally.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	484 m (underground cable)

			Burial 2 is challenging to determine, with uncertain dating.			
Object 58	N43°08'01.2984" E56°25'41.7288"	4	This object, a possible single burial, is challenging to determine functionally. The dating remains uncertain.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	782 m (internal road)
Object 59	N43°11'26.3364" E56°21'43.2180"	60	Three burials, two large, vertical slabs, third with Adai tamga.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,280 m (underground cable)
Object 60	N43°11'25.2276" E56°21'44.5104"	20	Two burials, one possibly child's, with horizontal slabs, tombstones, and clan tamga.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,319 m (underground cable)
Object 61	N43°05'30.2172" E56°19'21.6768"	4	This object, possibly a child's burial, is visually challenging to interpret.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 62	N43°05'26.7105" E56°19'19.9709"	2	This object, possibly a child's burial, presents visual challenges in interpretation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 63	N43°05'19.7160" E56°19'16.4640"	2	This object, possibly a burial, features challenging interpretation with stones in disarray.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 64	N43°05'20.0030" E56°19'18.9467"	2	This object, a possible single burial, challenges interpretation.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 65	N43°04'25.3776" E56°22'16.0464"	2	This object, possibly a single burial, features horizontal stones, lacking a tombstone, and surrounded by branches, possibly a bird's nest. The dating is uncertain.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 66	N43°04'16.7916" E56°22'16.8024"	2	It is an object of the burial culture	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 67	N43°04'14.8548" E56°22'16.5468"	2	It is an object of the burial culture.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint

Object 68	N43°02'18.9744" E56°31'40.7532"	16	This object, a single burial, features a collapsed oval grave without a tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 69	N43°01'45.9480" E56°40'01.9380"	4	This object, possibly a single burial, is visually challenging to determine function.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,860 m (internal OHTL)
Object 70	N43°00'56.7288", E56°45'07.5312"	4	The likelihood of a single burial is uncertain, with indications leaning towards it being a burial, making visual determination of another intended functional purpose challenging. The object is composed of horizontally placed stones forming a turret, and notably, lacks a tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	916 m (internal road)
Object 71	N43°00'31.7232", E56°47'43.9368"	4	Identifying a potential single burial as the object, likely a burial, makes it visually difficult to ascertain another intended functional purpose.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	624 m (internal road)
Object 72	N43°01'01.9560", E56°48'35.9712"	2	The status of a single burial ground is uncertain, with a prevailing likelihood that it serves as a burial, making visual determination challenging for alternative functions. The structure has suffered considerable destruction from natural factors, as evident from scattered stone slabs nearby.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	125 m (underground cable)
Object 73	N43°02'23.5464", E56°47'17.0376"	2	The potential identification of a single burial, however uncertain, with suggestions that it could be either a burial or another function. Visually determining its exact purpose	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	850 m (internal road)

			is challenging as it consists of horizontally placed stones, possibly in the form of a turret, but has been destroyed by natural factors, leaving stone fragments nearby. Additionally, the burial lacks a tombstone.			
Object 74	N43°01'44.5764", E56°49'52.4100"	12	A solitary burial features a grave lined with horizontally placed stone slabs; some of the stonework has collapsed around the burial. The tombstone has shifted from its original position, lying near the burial in the western part, and the ancestral tamga is absent.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,300 m (underground cable)
Object 75	N42°55'28.6184", E56°47'03.3408"	80	Situated on the summit of a small hillock, the burial Ground comprises of several burials, with the largest one featuring a round stone masonry burial structure and a triangulation tower at the center, possibly having modern origins. Nearby, smaller burials, potentially for children, are observed, characterized by rectangular shapes and graves made with shapeless stone slabs, lacking tombstones or with displaced ones.	Yes. through excavation	If it will not be removed a buffer zone of 100 m on from each side of the object is required to be maintained.	4,695 m (WTG k1-9)
Object 76	N42°55'30.7092", E56°48'19.2024"	2	The potential identification of a single burial is uncertain, with suggestions that it could be either a burial or a road sign. Visually determining its functional purpose is challenging as it consists of horizontally placed stones	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	3,775 m (WTG k1-9)

			forming a turret-like structure, which has been partially destroyed by natural factors, leaving stone fragments nearby, and lacks a tombstone.			
Object 77	N42°55'04.2888", E56°49'25.0680"	4	The potential identification of a single burial is challenging visually, given the difficulty in determining the object's functional purpose. It consists of a round cluster of horizontally placed stones and lacks a tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	4370 m (WTG k1-9)
Object 78	N42°55'01.3260", E56°52'15.3696"	2	The identification of a single burial is uncertain visually at present. The object appears to be a cluster of stones arranged horizontally, having lost its original shape due to destruction, and lacks a tombstone.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	6,050 m (WTG k1-9)
Object 79	N42°52'14.9088", E56°57'04.4820"	8	A single burial consists of stones arranged horizontally, including large boulders, and has lost its original shape due to destruction, with soil filling inside; notably, the tombstone is absent.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 80	N42°50'56.6880", E56°58'05.9664"	6	A single burial features a ground interment with a double stele at the head and feet, the latter being partially destroyed. Notably, ancestral tamgas are not documented on the tombstones, and the burial is covered with riprap and soil, with vegetation overgrowing the surface.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint

Object 81	N42°51'26.8236", E57°00'56.1060".	4	The group of single burials, situated atop a small low mound, consists of small ground burials with riprap construction. Notably, the absence or displacement of tombstones are observed, with the smallest burial potentially indicating a child's grave. The dating of the object remains uncertain.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 81.1	N42°51'25.1208", E57°00'56.5092".	4				
Object 81.2	N42°51'24.9516", E57°00'57.7368"	4				
Object 82	N42°52'53.5512", E57°00'16.8012".	4	The group of single burials includes three, situated on the summit of a low hill—comprising one large and two small burials—with riprap construction and soil covering. Tombstones are either missing or displaced from their original positions in these burials.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 82.1	N42°52'54.3504", E57°00'11.5236".	4				
Object 82.2	N42°52'50.7792", E57°00'18.4428".	4				
Object 83	N42°55'00.0012", E57°00'18.4428"	4	A solitary burial is composed of shapeless stone slabs arranged in a round formation, possibly resembling a small tower, but external factors have caused the upper stones to shift and fall, leaving fragments. Additionally, the object's design suggests a potential alternative function as a road sign.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 84	N42°55'04.8396", E57°00'17.8452"	4	A solitary burial is characterized by a round shape and a structure composed of shapeless stone slabs, distinct from other burials at the site due to the use of thinner stone slabs in the rockfill.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint

Object 85	N43°03'57.6612", E56°48'46.4256"	40	Situated on the edge of the mound, the burial ground includes several rectangular burials, three of which are large and feature steles at the head, while smaller burials, potentially for children, have steles at the feet, all exhibiting a Muslim orientation. Nearby, additional small burials, likely for children due to their size, are observed.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,168 m (WTG k1-10)
Object 86	N42°55'04.8396", E57°00'17.8452"	2	A solitary burial comprises a grouping of stone slabs, and the diminutive size of the object leads to the assumption that it is a burial for a child.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint
Object 87	N43°05'24.6336", E56°26'17.7720"	6	The arrangement of stone slabs suggests that the upper stones were placed later, evidenced by a pile of branches underneath, potentially indicating a bird's nest or another animal. Despite this, the object, determined to be man-made and not natural, is concluded not to be a burial based on the presented data.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	400 m (underground cable)
Object 88	N43°05'24.9936", E56°26'10.4784"	2	A solitary burial, constructed with stone slabs forming a roof-like structure by leaning against each other, contains a rodent burrow, with some slabs damaged by natural factors and fragments scattered nearby. Although visually challenging to determine its exact purpose, the small size of the object	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	247 m (underground cable)

			suggests a potential association with a child's burial.			
Object 89	N43°05'43.4112", E56°26'01.8636"	100	On the Karabaur ridge, a notable discovery involves a line of stone slabs or unprocessed stones arranged in a semi-circle. While this alignment could suggest boundary indications, the absence of archaeological finds nearby makes it visually challenging to determine the exact functional purpose of the object.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	295 m (underground cable)
Object 90	N43°07'10.9668", E56°25'01.0200"	2	A solitary burial, constructed with stone slabs forming a ceiling-like structure, reveals a rodent burrow inside, posing challenges in determining its exact purpose; however, its small size suggests a potential association with a child's burial.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,208 m (internal road)
Object 91	N43°07'11.5500", E56°24'59.9832"	4	A solitary burial, composed of stone slabs arranged to create a ceiling-like structure by leaning against each other, contains a rodent burrow, making it visually challenging to determine its exact functional purpose.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,230 m (internal road)
Object 92	N43°06'59.2272", E56°22'03.9828"	30	Situated at the hill's summit, a burial ground comprises three graves— one large and two small—constructed with riprap in an arbitrary shape, potentially indicating poor preservation. The Muslim-	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	707 m (WTG k2-69)

			oriented burials reveal a distinct design in the central large burial. The smaller size of the two burials suggests a possibility that they could be those of children.			
Object 93	N43°05'55.1544", E56°25'04.8432"	4	Situated on the edge of a large hill, a solitary burial consists of vertically stacked outer stone slabs forming a fence, while inside, horizontally placed slabs create a turret. The object's outline, shape, and location suggest a potential burial, but fragments near it imply natural factors have led to its destruction.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	921 m (internal road)
Object 94	N43°05'53.1096", E56°25'05.0124"	2	Positioned on the edge of a large hill, a solitary burial, consisting of haphazardly stacked stone slabs, is accompanied by several more single burials in the same hill. The visual difficulty in determining its exact purpose leads to a tentative designation as a burial, possibly a child's grave based on its small size, inferred from the outline, shape, and location of the object.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	921 m (internal road)
Object 95	N43°05'51.5544", E56°25'05.6712"	2	It is a singular burial, and similar to object 94.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	909 m (internal road)
Object 96	N43°05'49.1928", E56°25'08.9220"	4	A lone burial, suggests a potential rectangular shape based on the arrangement of stones, which may have stood vertically like a box or coffin,	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	840 m (internal road)

			although many slabs have shifted from their original positions.			
Object 97	N43°05'52.4904", E56°25'04.6668"	2	A solitary burial marks the final item among a series of single burials on the hill. The riprap arrangement of the burial appears disorderly, and the presence of a tombstone is undetermined.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	930 m (internal road)
Object 98	N43°05'01.4424", E56°24'41.7204"	4	A solitary burial, composed of stone slabs of diverse sizes and shapes, is positioned atop a large hill; subsequently, a second burial was found on the same hill with riprap stones forming a turret, part of which has fallen, leaving fragments near the burial site.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	428 m (internal OHTL)
Object 99	N43°04'57.8448", E56°24'37.4283"	4	Situated on the peak of a large hill, a solitary burial comprises stone slabs of varying sizes and shapes, forming a round shape, making it visually challenging to determine its exact function. However, the arrangement, shape, and location suggest a potential burial, and there is also an observed rodent burrow within the site.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	570 m (internal OHTL)
Object 100	N43°04'53.3460", E56°27'58.8600"	2	Situated atop a small mound, a lone burial shares an identical design with objects 94, 95, and 97, suggesting a potential association with a child's burial.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	258 m (internal OHTL)
Object 101	N43°04'09.1164", E56°35'27.4380"	80	Burial grounds belong to the Kazakh Tabyn-Shomishti clan, is situated atop a large hill and	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	111 m (internal OHTL)

			comprises four burials—two large and two small. The rectangular-shaped graves with a Muslim orientation have tombstones featuring the tamgas of the Kazakh Tabyna-Shomishti clan. Notably, the central burial distinguishes itself with horizontally laid, large, shapeless stone slabs for its fence, potentially indicating a family burial site.			
Object 102	N43°04'07.8276", E56°36'27.5508"	2	Situated on the edge of a large mound, a solitary burial shares a design identical to objects 94, 95, and 97, suggesting a potential association with a child's burial.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	217 m (internal OHTL)
Object 103	N43°03'51.0840", E56°36'28.6884"	2	Atop a small mound, a single burial exhibits a design identical to objects 94, 95, 97, and 102, potentially indicating it as a child's burial.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	101 m (internal OHTL)
Object 104	N43°02'25.2240", E56°37'45.3432"	4	Situated atop a small hill, a solitary burial comprises variously sized and shaped stone slabs arranged disorderly, forming a round shape. Though visually challenging to ascertain its exact function, the arrangement suggests it could possibly be a burial based on the outline, shape, and location of the stone slabs.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	1,896 m (internal OHTL)
Object 105	N42°58'22.8900", E56°42'53.1612"	2	Found atop a small mound, this solitary burial shares an identical design with objects 94, 95, 97, 102, and 103, with	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	2,724 m (internal road)

			visible rodent burrows. There's a tentative suggestion that it might be a child's burial.			
Object 106	N42°58'36.0120", E56°45'05.8572".	8	Situated atop a small hill, a lone burial consists of a cluster of differently sized and shaped stone slabs arranged horizontally, forming a burial structure resembling a rectangle. The absence or displacement of the tombstone is noted in the arrangement.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	5 m (underground cable)
Object 107	N42°56’26.1600”, E56°46’02.1936”	2	A single burial is situated atop a small mound, exhibiting a design identical to objects 94, 95, 97, 102, 103, and 105. There is a tentative suggestion that this object might be a child’s burial.	Yes. Through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	3,450 m (internal road)
Object 108	N43°00'56.7360", E56°45'07.6752".	2	Potentially a solitary burial atop a small mound, resembling designs of smaller burials, suggesting it might be a road sign. However, conclusive identification as a burial or road sign is challenging, and its dating remains undetermined.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	913 m (internal road)
Object 109	N43°04'08.0364", E56°41'42.3888	45	The burial site has three graves—two small and one large—all made of riprap. They're sub-rectangular with a Muslim orientation, lacking tombstones with tamgas. The large grave is distinctive in construction, with walls built from vertically positioned, large, shapeless stone slabs, some of which are damaged.	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	777 m (internal road)

Object 110	N43°02'29.9544" E56°19'47.9316"		It is an object of the burial culture	Yes. through excavation	If it will not be removed a buffer zone of 50 m on from each side of the object is required to be maintained.	Outside of Project footprint

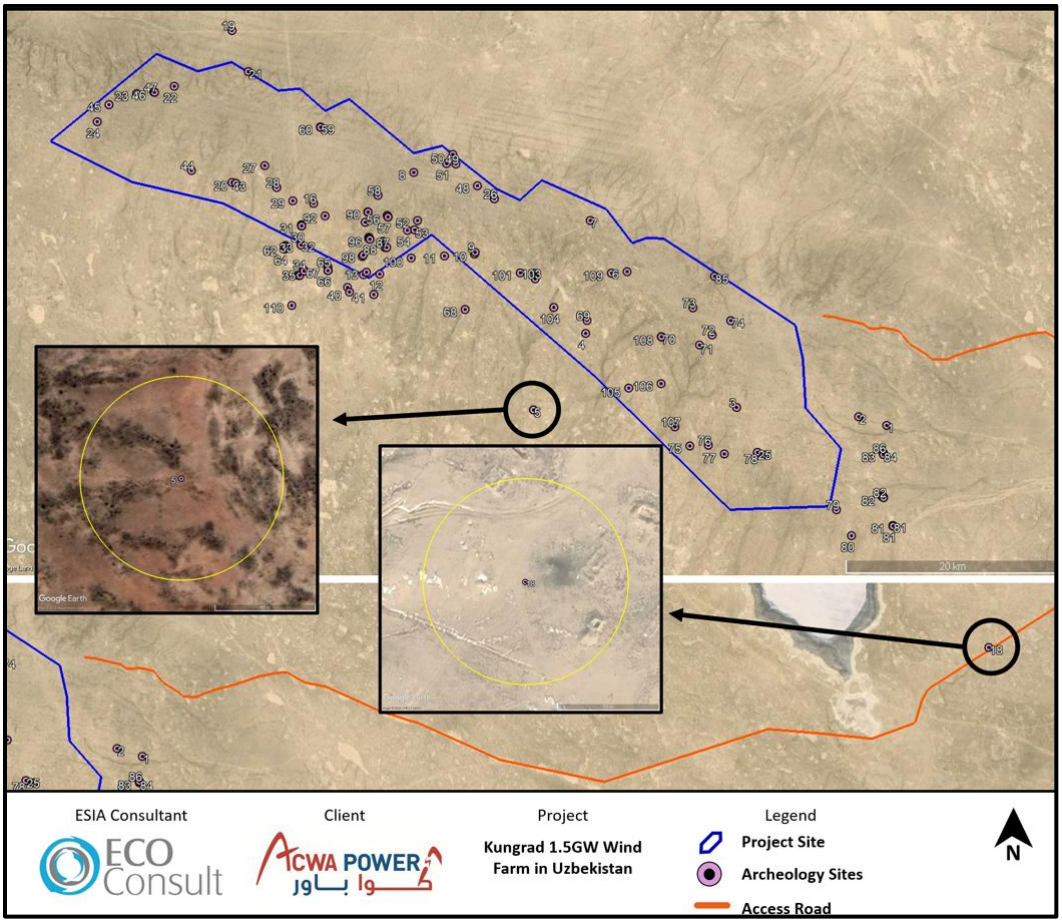


Figure 86: Archeology and Cultural Heritage

Figure 87: Sample of Burials Onsite

12.2 Assessment of Impacts

This section identifies and assesses the anticipated impacts from the Project activities on archeology and cultural heritage during the construction and operation phase. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

12.2.1 Potential Impacts during the Construction Phase

Site preparation activities which are to take place onsite by the EPC Contractor for installation of the wind turbines and the various Project components to include substation, transmission cables, access roads and internal road network, buildings, etc. are expected to include land clearing activities, levelling, excavation, grading, etc.

Although such activities are limited to the relatively small individual footprints of these facilities and the actual area of disturbance is relatively minimal, if such activities are improperly managed, they could damage or disturb archaeological remains present on the surface of the Project site. As noted earlier, there were several sites recorded within the Project area which are generally burial grounds.

In addition, there is a chance that throughout such construction activities, archaeological remains buried in the ground are discovered. Improper management (if such sites are discovered) could potentially disturb or damage such sites which could potentially be of importance.

Construction Phase		
Type	Negative	N/A
Duration	Medium-term	Limited to construction phase which is 42 months
Magnitude	High	Given that there are sites within the area and activities could damage these sites in inappropriately managed.
Reversibility	Irreversible	
Sensitivity	Medium	
Likelihood	Medium	No local community activity in the area
Frequency	Rare	Expected to occur on minimal occasions during construction phase
Timing	Not relevant	
Extent	Low	Limited to actual footprint of activities or recorded sites only
Significance	**Moderate**	

Mitigation Measures

The following identifies the mitigation measures to be applied by the EPC Contractor during the construction phase and which include:

- Ensure that final detailed design to be prepared by the EPC Contract completely avoids all sites recorded along with the buffer distance requirements.
- Due to the change between the preliminary layout and final layout of the Project components, a follow-up archaeological inspection for the final footprint areas should take place by an archeology and cultural heritage expert to verify that they are devoid of any sites.
- Any site located within 250 m from any Project component must be demarcated along with signage in English, Karakalpak, Russian indicating “Site of Archaeological / Cultural Heritage Importance – No Access Allowed”.

- Induction training and Toolbox Talks (TBT) should be delivered to all workers to: (i) emphasize the presence and location of the sites and their overall importance; and (ii) explain chance find procedures to ensure clarity when archaeological and cultural heritage finds are encountered on site.
- Driving will only be permitted on formal site roads and off-road driving is prohibited, unless it is driving within a working area (e.g. moving equipment or infrastructure around the site or for maintenance operations).
- Workers are only permitted within authorized working areas and moving to any offsite area is prohibited. This includes in particular movement into the sites recorded under any circumstances at any time of the day.
- Ensure all workers read, understand and sign the worker code of conduct which includes specific requirements related to such an issue and which include:

- Respect religious sentiments and customs and traditions of co-workers.
- Respect the local religious and/or traditional days of celebration and their restrictions.
- Respect the religious shrines and burial sites and practices of the local population.
- Do not disturb shrines and other religious monuments.
- Recognize that shrines and sacred sites may include trees, sheds, piles of pebbles, and piles of offerings.

- No worker may possess or withdraw any archaeological item or remains from the Project Area (to include above or below ground) such as ceremonial jars, pottery, or similar objects. If a worker were to find such a piece inside the Project, he/she shall immediately stop working and notify his supervisor to implement the chance find procedure.
- Throughout the construction phase, and as the case with any Project development that entails such construction activities, there is a chance that potential archaeological and/or cultural heritage remains above or underground might be discovered. It is expected that appropriate measures for such chance find procedures are implemented. Those mainly require that construction activities are halted, and the area fenced along with proper signage, while immediately notifying the Ministry of Culture and Tourism in Karakalpakstan. No additional work will be allowed before the Ministry of Culture and Tourism in Karakalpakstan assesses the found potential archaeological site and grants a clearance to resume the work. Construction activities can continue at other parts of the site if no potential archaeological remains were found. If found, same procedures above apply.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to <u>not significant.</u>

<u>Monitoring Requirements</u>

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor during the construction phase and which include:

- In the case that a suspected site is discovered, a report should be prepared that includes the following to be submitted to Developer and upon approval it is to be submitted to the Ministry of Culture and Tourism in Karakalpakstan:

  - Photo documentation of the site including photos for delineation markers and signage

- Location (GPS coordinates)
- Site estimate
- Topographical description
- Description of nature and conditions of the site

- After the Ministry of Culture and Tourism in Karakalpakstan concludes their assessment of the discovered site, the above report should be updated with the findings of the Ministry with supporting formal letters to include: (i) formal letter with mitigation to be implemented as required by the Ministry (if required and applicable); (ii) formal letter from the Ministry granting permission to commence with construction work within the discovered site.
- Submission of Induction Training records of workers that includes archeology and cultural heritage model.

12.2.2 Potential Impacts during the Operation Phase

Inappropriate operational activities by the Project Operator could damage or disturb archaeological and/or cultural heritage remains present on the surface of the Project site. As noted earlier, there were several sites recorded within the Project area which are generally burial grounds. This could include the following:

- Off-roading by O&M workers and driving into the sites;
- Workers walking by foot into the areas of the sites and intentionally or unintentionally disturbing the sites;
- Collection of items from the site; and
- Other as applicable

Operation Phase		
Type	Negative	N/A
Duration	Long-term	Throughout entire operational period
Magnitude	High	Given that there are sites within the area and activities could damage these sites in inappropriately managed.
Reversibility	Irreversible	
Sensitivity	Medium	
Likelihood	Medium	No local community activity in the area
Frequency	Rare	Expected to occur on minimal occasions during operation phase
Timing	Not relevant	
Extent	Low	Limited to actual recorded sites only
Significance	**Moderate**	

Mitigation Measures

The following identifies the mitigation measures to be applied by the Project Operator during the operation phase and which include:

- Induction training and Toolbox Talks (TBT) should be delivered to all workers to emphasize the presence and location of the sites and their overall importance.

- Driving will only be permitted on formal site roads and off-road driving is prohibited, unless it is driving within a working area (e.g. moving equipment or infrastructure around the site or for maintenance operations).
- Workers are only permitted within authorized working areas and moving to any offsite area is prohibited. This includes in particular movement into the sites recorded under any circumstances at any time of the day.
- Ensure all workers read, understand and sign the worker code of conduct which includes specific requirements related to such an issue and which include:

- Respect religious sentiments and customs and traditions of co-workers.
- Respect the local religious and/or traditional days of celebration and their restrictions.
- Respect the religious shrines and burial sites and practices of the local population.
- Do not disturb shrines and other religious monuments.
- Recognize that shrines and sacred sites may include trees, sheds, piles of pebbles, and piles of offerings.

- No worker may possess or withdraw any archaeological item or remains from the Project Area and from the sites recorded in specific (to include above or below ground) such as ceremonial jars, pottery, or similar objects.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor during the construction phase and which include:

- Submission of Induction Training records of workers that includes archeology and cultural heritage model.

13. AIR QUALITY AND NOISE

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to air quality and noise. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

13.1 Assessment of Baseline Conditions

The baseline assessment of the Project site was based on an air quality and noise monitoring program. Additional details are discussed below.

13.1.1 Methodology for Assessment

A. Selection of Parameters

Monitoring was undertaken for the following parameters: (i) gases to include Carbon monoxide (CO), Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2), (ii) Suspended Particulate Matter to include Particulate Matter smaller than 10.0 (PM10) and 2.5 microns (PM2.5) in diameter; and (iii) Noise Pressure Levels (NPL).

These parameters were selected based on the following rationale:

- Such parameters are likely to be present within the Project site given its characteristics and attributes. Suspended particulate matter is expected given the desert nature of the site. On the other hand, pollutants (such SO_2, NO_2,) are expected onsite but rather at minimal concentrations as the site is in a remote area; nevertheless, motor emissions particularly from vehicles passing casually through the site could be a source of such pollutants. Finally, noise levels are expected from the windy nature of the site and possibly casual vehicular movement.
- Such parameters are likely to be affected mainly during the Project's construction activities. All air pollutant parameters selected are expected to be slightly impacted and increase specifically during the Project's construction activities. Emissions from vehicles and machinery used onsite and their movement onsite will increase gaseous emissions, suspended particulate matter, as well as noise pressure levels.

It is worth noting that based on a scoping site visit undertaken by the 'E&S Team' for the Project site, no key sources of anthropogenic air/pollutant or noise emissions were noted.

B. Selection of Locations

To assess air quality and noise baseline conditions within the Project area, four (4) monitoring points were selected as shown in the figure below. The location of the monitoring points was equally distributed across the entire Project boundary.

Monitoring was undertaken for 24 hours at each point respectively (a total of 96 hours across the 4 points). The coordinates for the monitoring points and location are presented in the table and figure that follows.

Table 64: Location of Monitoring Points

Locations	Latitude	Longitude
M1	43.223736°	56.125451°
M2	43.143847°	56.414988°
M3	43.049138°	56.697336°
M4	42.895098°	56.949024°

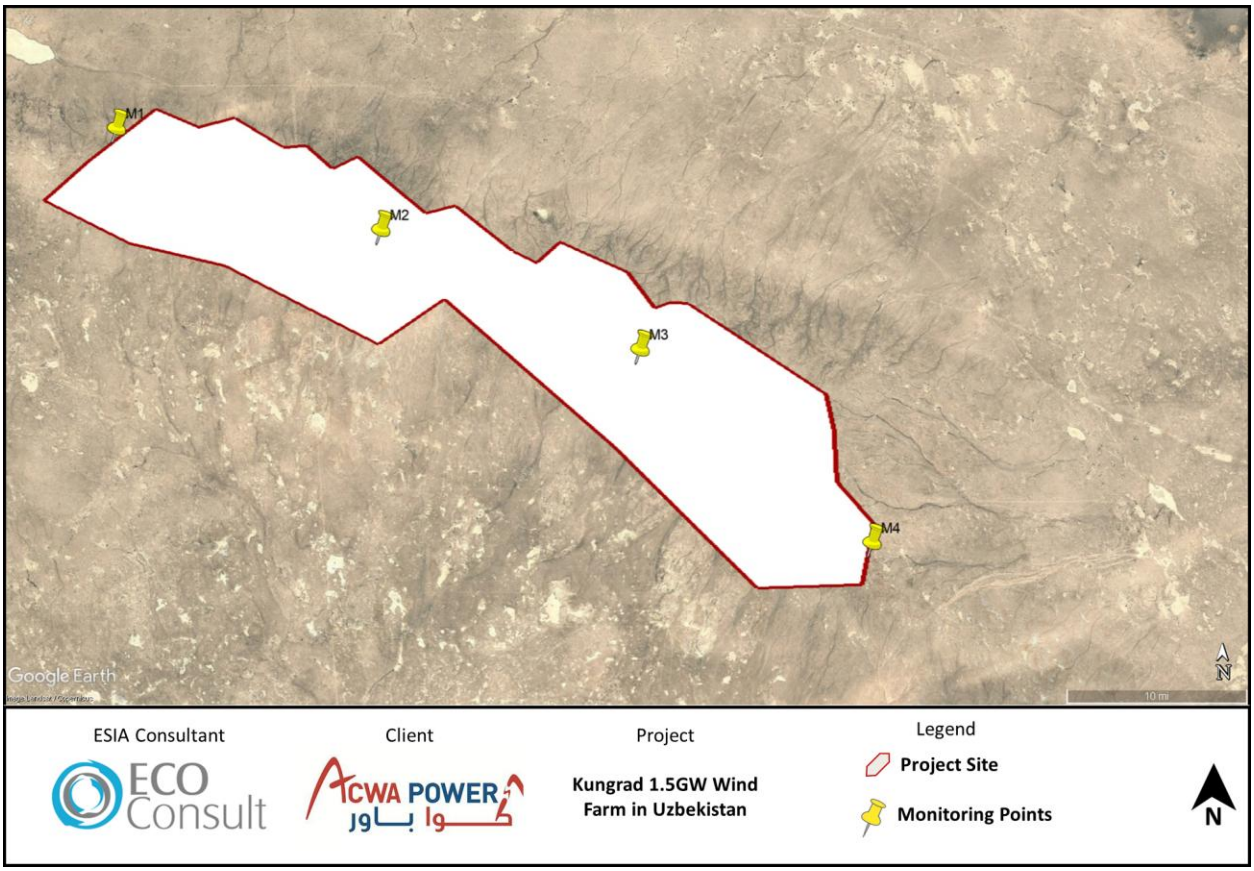


Figure 88: Location of Monitoring Points

C. ***Legislative Requirements***

With regards to air quality, the results of the measurements were compared to the national limits as set within "SanR&N RUz No. 0293-11 Sanitarian Rules and Norms List of Maximum Permissible Concentrations (MPC) of Pollutants in the Atmospheric Air of Populated Areas on the Territory of the Republic of Uzbekistan". The table below identifies the corresponding applicable national ambient air quality permissible limits.

Table 65: Applicable National Ambient Air Quality Permissible Limits

Number	Name of Substance	MPC, mg/m^3			
		Single	Daily allowance	Monthly	Annual
1	Nitrogen Dioxide	0.085	0.06	0.05	0.04
2	Sulfur Dioxide	0.5	0.2	0.1	0.05
3	Suspended Particles	0.5	0.35	0.2	0.15
4	PM_{10}	0.5	0.3	0.1	0.05
5	CO	5	4	3.5	3

With regards to noise, the results were compared to the national limits set in "SanR&N RUz No. 0267-09 Sanitarian Rules and Norms On admissible noise level into the living area, both inside and outside the buildings". This legislation sets out the acceptable noise levels for habitable areas both inside and outside of buildings in Uzbekistan as shown in the table below. However, the limits below are not really considered applicable for the Project given that there are no public buildings and residential areas within the site or its surrounding areas – in fact the closest residential areas as discussed earlier is more than 100km away. The legislation does not identify any noise limits for industrial activities or similar.

Table 66: Applicable National Permissible Limits for Noise

Location	Time	National Noise Standards LAeq in dBA
Noise levels in premises of residential, public buildings and on the territory of residential areas.	7am to 11pm	55
	11pm to 7am	45

In addition to the above, identified below are the limits as included within the IFC General EHS Guideline as well as the EU Ambient air quality standards, which are also considered appliable for this Project. Similar to rationale above, limits included for 'industrial' areas were used for comparison given the industrial nature of the site that includes gas exploration activities in general, which is set at 70dB(A) for both night and day.

Table 67: IFC and EU Limits for Noise and Air Quality

Parameter	(SO_2)	(PM_{10})	(PM2.5)	Noise
Maximum Permissible Limits IFC General ESH Guidelines	125 µg/m^3 (interim Target 1) 50 µg/m^3 (interim Target 2) 20 µg/m^3 (guideline)	150 µg/m^3(interim Target 1) 100 µg/m^3 (interim Target 2) 75 µg/m^3 (interim Target 3) 50 µg/m^3 (guideline)	75 µg/m^3(interim Target 1) 50 µg/m^3 (interim Target 2) 37.5 µg/m^3 (interim Target 3) 25 µg/m^3 (guideline)	70 LA_{eq}/dBA
EU Ambient AQ standards	350 µg/m3 (1 hour) 125 µg/m3 (24 hours)	50 µg/m3 (24 hours)	25 µg/m3 (Stage 1) 20 µg/m3 (Stage 2)	N/A

13.1.2 Results

The table below provides the outcomes of the air quality and noise monitoring program against the allowable limits under both local and international requirements.

As noted in the table below, the outcomes of the monitoring results are all within allowable limits to include both Uzbekistan limits as well as international limits. In terms of air quality, this is expected given the remote nature of the site and the lack of any key sources of anthropogenic air/pollutant. No key dust storms, or wind events were noted which would also explain the low results in relation to dust.

In terms of noise levels, this is also expected given the lack of any key sources of noise. In addition, wind levels were very low throughout the monitoring period and therefore would not have a key impact on noise levels.

Point	Pollutant					
	CO mg/m3	SO2 mg/m3	NO2 mg/m3	PM10 µg/m3	PM2.5 µg/m3	Noise dBA
M1	0.4	No detection	No detection	21	7	37
M2	0.5	No detection	No detection			38
M3	0.3	No detection	No detection			36
M4	0.3	No detection	No detection			38
Local limits	4	0.2	0.06	300	N/A	55 Day / 45 Night
EU Limits	N/A	0.125	N/A	50	20	
EHS Guideline	N/A	0.125	N/A	50	25	70

13.2 Assessment of Potential Impacts

This section identifies and assesses the anticipated impacts from the Project activities on air quality and noise during the construction phase. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

There are no anticipated impacts on air quality and noise during the operational phase. Note: impacts from noise during operation from the WTGs is discussed under community health and safety under "Section 15.5.2".

13.2.1 Potential Impacts during the Construction Phase on Air Quality and Noise

Site preparation activities which are to take place onsite by the EPC Contractor for installation of the wind turbines and the various Project components to include substation, transmission cables, access roads and internal road network, buildings, etc. are expected to include land clearing activities, levelling, excavation, grading, etc.

Although such activities are limited to the relatively small individual footprints of these facilities and the actual area of disturbance is relatively minimal, nevertheless such activities will likely result in an increased level of dust and particulate matter emissions, which in turn will directly and temporarily impact ambient air quality. If improperly managed, there is a risk of nuisance and health effects to construction workers onsite and to a lesser extent to the surrounding receptors from windblown dust.

It is important to note that the generation and dispersion of dust depends on weather conditions; dry conditions with high wind speeds would cause excessive dust generation, while wet conditions and low wind speeds wouldn't. Given the characteristics of the site (its arid desert nature with frequent dry/windy conditions) sand and salt storms are probable. However, this is not within the control of the EPC Contractor and hence impacts from such events are not within their responsibility.

In addition, construction activities will likely entail the use of vehicles, machinery and equipment (such as generators, compressors, etc.) which are expected to be a source of other pollutant emissions (such as SO_2, NO_2, etc.) which would also have minimal direct impacts on ambient air quality.

All the above activities will likely include the use of machinery and equipment such as generators, hammers, compressors, etc. and which are expected to be a source of noise and vibration generation

within the Project site and its surroundings. If improperly managed, there is risk of nuisance and health affects to construction workers onsite and to a lesser extent to the nearby surrounding receptors.

However, it is important to note as discussed in "Section 9" that there are no key receptors that are anticipated to be impacted from dust, noise and emissions. The closest receptor to the Project site would be a community settlement and which is located 110km from the Project site.

Construction Phase		
Type	Negative	
Duration	Medium-term	Limited to construction period only which is 42 months
Magnitude	Medium	Dust and noise will be noticeable but dispersed
Reversibility	Reversible	Baseline restored after completion of construction works
Sensitivity	Low	There are no sensitive receptors impacted
Likelihood	High	Limited to construction period only
Frequency	Frequently	Expected to occur regularly during construction phase
Timing	Not relevant	
Extent	Medium	Around 2km from active areas due to wind influence
Significance	**Minor**	

Mitigation Measures

The following identifies the mitigation measures to be applied by the EPC Contractor during the construction phase:

- Undertake dust and noise monitoring program (as discussed in further details below) to verify the dust and noise levels and to define and implement on a case-by-case basis measures and systems to maintain dust and noise levels within allowable limits. If dust or pollutant emissions were found to be excessive due to construction activities (i.e. higher than allowable limits) the source of such emissions should be identified, and adequate control measures must be implemented.
- Ensure that for activities associated with high dust and noise levels, workers are equipped with proper Personal Protective Equipment (PPE) to include dust masks, respirators (if required), and earmuffs.
- Apply basic dust control and suppression measures which could include:
  - Regular watering of roads for dust suppression. Only non-potable water will be used for such activities;
  - Proper planning of dust causing activities to take place simultaneously in order to reduce the dust incidents over the construction period;
  - Proper management of stockpiles and excavated material through appropriate enclosures and covers. This entails that it is of appropriate size to ensure entire coverage of the stockpile/excavated material, durable, ability to withstand exposure to weather conditions (heat, rain, and strong winds in particular;
  - Proper covering of trucks transporting aggregates and fine materials (e.g. through the use of tarpaulin);
  - Appropriate speed limits will be enforced on access road (60km/h), internal road network and working areas (40km/h).Where practical, compact the ground in areas that are heavily used by vehicles and machinery;

- Limit or suspend earthworks during extreme weather conditions (e.g. strong winds); and
- Ensure periodic washing of vehicles in order to remove any dusty material in a dedicated area.

- Ensure that vehicles and trucks comply with the limits for exhaust emissions. This will be through: (i) ensure all vehicles and trucks are equipped with a catalytic convertor; (ii) ensuring that all vehicles and trucks utilized onsite are properly licensed for operation with relevant authorities.
- Apply adequate general noise suppressing measures. This could include the use of well-maintained mufflers and noise suppressants for high noise generating equipment and machinery, developing a regular maintenance schedule of all vehicles, machinery and equipment.
- Develop a regular inspection and scheduled maintenance program for vehicles, machinery, and equipment to be used throughout the construction phase for early detection of issue to avoid unnecessary pollutant and noise emissions.
- Turn off any equipment, machine or vehicle not in use.
- For worker accommodation onsite the following will be undertaken: (i) the site will be appropriately sited at a sufficient distance (i.e. 2-3 km at least) from any construction related activities onsite; (ii) accommodation specifications will ensure that all opening (e.g. doors, windows) as well as façade is of suitable quality that would provide sufficient insulation from outside dust and noise. Other specifications and requirements for worker accommodation is provided in “Section 15.5.9”.

Following the implementation of these mitigation measures, the significance of the residual impact is categorized as <u>not significant.</u>

<u>Monitoring and Reporting Requirements</u>

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor during the construction phase and which include:

- Dust and noise monitoring should be undertaken on a quarterly basis during the construction phase at key points where active construction activities are undertaken. This will include at least one (1) monitoring point which represents activities undertaken. The monitoring should include TSP, PM10 and PM2.5 and noise levels. Results should be compared with national limits or IFC standards as included within the General EHS Guidelines or EU limits, whichever is more stringent.
- Reporting on number of air quality and noise monitoring programs undertaken.
- Reporting of any excessive levels of pollutants/dust and the measures taken to minimize the impact and prevent it from occurring again.
- Inspection on worker accommodation ensure proper siting and proper specifications for opening and façade.

14. INFRASTRUCTURE AND UTILITIES

This section first provides an assessment of baseline conditions within the Project site and surrounds in relation to infrastructure and utilities and then assesses the anticipated impacts from the Project throughout its various phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

14.1 Assessment of Baseline Conditions

This section discusses the methodology for the assessment of baseline conditions in relation to infrastructure and utilities and presents the outcomes and results of the assessment.

14.1.1 Methodology of Assessment

Assessment of baseline conditions was based on a site visit by the 'E&S Team' to the Project site and surrounding area from 1 August 2023 until 20 August 2023. The site visit aimed to identify any key visible infrastructure and utility elements within the Project site or surrounding areas (e.g., electricity infrastructure lines, water infrastructure lines, etc.).

Desktop review as well as consultations were undertaken with key governmental entities to better understand and characterize infrastructure and utility element services required for the Project development as discussed further throughout this section. This includes water supply, waste management services, traffic and transport, etc. The consultation activities were previously discussed in "Chapter 6" and are discussed again in the sections below as applicable and relevant.

14.1.2 Telecommunication, Radio and TV

As part of the site survey undertaken, no infrastructure elements in relation to telecommunications, radio or TV were noted within the Project area (e.g. broadcasting towers).

In addition, as noted within "Section 6.3.1", consultation activities were undertaken with the Ministry for Development of Information Technologies and Communication on the following:

- Obtain information on telecommunication broadcasting towers and Line of Sight (LoS) connections;
- Obtain information on TV and radio infrastructure and towers;
- Obtain any requirements on WTG project micro-siting; and
- Obtain any other requirements that should be considered for Project development.

Response has been provided that there are no infrastructure elements related to the above within the Project.

14.1.3 Civil and Military Aviation

As part of the site survey undertaken, no infrastructure elements in relation to civil and military aviation were noted within the Project area (e.g. radar systems).

In addition, as noted within "Section 6.3.1" consultation activities were undertaken with the following entities:

- Civil Aviation Administration; and
- Uzbekistan Air and Air Defense Forces.

Consultation was undertaken through submission of formal letters to the above entities on the following:

- Obtain information on any aviation infrastructure;
- Obtain any requirements on WTG project micro-siting; and
- Obtain any other requirements that should be considered for Project development.

The above entities will require obtaining a formal permit to implement standard requirements for wind farm developments such as navigational lighting.

14.1.4 Waste Management (Solid Waste, Wastewater and Hazardous Waste)

As discussed earlier within "Section 6.3.1" consultations were undertaken with State Unitary Enterprise to obtain information on municipal and construction waste disposal facilities, Wastewater Treatment Plants (WWTPs), and hazardous waste landfills. Results are presented below.

Municipal and Construction Waste Disposal Facilities

It is important to note that currently there are no landfills in Uzbekistan (including Karakalpakstan) that are constructed or operated according to international standards. The first proper solid waste landfill to meet international standards is currently being developed in Tashkent Region and is financed by the Asian Development Bank (ADB). This located around 1,000km from the Project site. This will include the construction of new sanitary landfills that meet EU requirements, waste sorting complexes, waste transfer points, as well as the purchase of specialized equipment and vehicles.

On the other hand, there are 197 landfills in Uzbekistan (as per description earlier none of which are according to international standards). Four (4) are located in Kungrad District and are all under the State Unitary Enterprise, while the fifth is for industrial establishments located near the Project site.

As discussed previously under "Section 10.2.2" a key requirement to be considered for the Project is recycling and reuse of waste. This is a key requirement given that with the Project's workforce there could be huge amounts of waste that could be recycled (e.g. plastic from water bottles supplied for drinking purposes). Table 70 below identifies further details on recycling companies operating in Karakalpakstan and coordination / engagement with such entities should be considered.

Table 68: Closest Landfill to the Project Site

Name	Distance to Project	Description
Kanli Landfill	170 km	Located in the territory of the Kanli Mahalla with an area of 15 hectares. Landfill is surrounded by corrugated steel and wire fences.

Karakalpakstan Landfill	300 km	Located in Karakalpakstan village with an area of 0.5 hectares and is unfenced.
Kirkkiz Landfill	100 km	Located in Kirkkiz with an area of 0.5 hectares and is unfenced.
Jasliq landfill	200 km	Located in Jasliq with an area of 0.5 hectares and is unfenced.
Uzkorgaz WWTP and Sodium plant landfills	100km	The Uzkorgaz landfill has an area of 50 hectares while the sodium plant has an area of 8 hectares. The EPC Contractor and Project Operator can negotiate with these plants the possibility of disposing wastewater at their facilities.

Wastewater Treatment Plants

The table below provides an overview of the closest Wastewater Treatment Plants (WWTPs) to the Project site. As noted below, it is most likely that the Project will rely on disposal at Nukus WWTP.

Table 69: Closest WWTPs to the Project Site

Name	Distance to Project	Description
Uzkorgaz WWTP and Sodium plant WWTP	100km	Those are WWTPs for the industrial facilities located in Elobod and Kirkkiz. No additional information could be obtained on design capacity and current capacity. The EPC Contractor and Project Operator can negotiate with these plants the possibility of disposing wastewater at their facilities.
Nukus WWTP	200 km	The WWTP includes complete biological treatment facilities with a design capacity of 65, 000 thousand m^3/day with an actual average daily flow of 15,000 m^3/day. The WWTP was put into operation in 1984. There are plans to undertake expansion and renovation for the existing WWTP as well as a complex sludge processing unit. The project will start in 2024 and will be completed by 2026. In case the first option is not available, this is the most likely WWTP to be used by the Project.
Takhiatash WWTP	200km	The WWTP has a design capacity of 7,600 m^3 / day and is not working and it just disposes wastewater without treatment. There are plans to construct a new WWTP within the area.

Hazardous Waste Landfill

There are no hazardous waste landfills in Uzbekistan. In general, disposal depends on the type of hazardous waste generated and for each type there are government authorized specialized companies that collect, process, recycle and/or manage such waste streams.

The key hazardous wastes expected to be generated from the Project are summarized below along with the key disposal method/entity for each.

Table 70: Disposal Methods for Hazardous Wastes

Hazardous / Solid	Containers	Plastic containers should be recycled by specialized companies involved in the production of pellets while metal containers can be sold for reuse or recycling at Uzmetkombinat.
	Paints / paint pots	Paints are handed over to specialized companies for recycling.
	Used spill kits and contaminated soils	This waste should be disposed by a specialized company involved in contaminated kits and soils. An example of such as company would be «Ecotibbiyot».

	Clinical	This waste should be disposed by a specialized company involved in clinical waste. An example of such as company would be «Ecotibbiyot».
	Batteries	Batteries are recycled by Uzvtortsvetmet
	Fluorescent tubes / bulbs	Should be passed for demercurization to specialized company – an example of such company is ASP Selta.
Hazardous / Liquid	Spent /excess lube oil	Oily waste can be processed only JV Uz-Prista LLC as per Presidential Decree №-1759 dated 22.05.2012
	Spent /excess hydraulic fluid	Oily waste can be processed only JV Uz-Prista LLC as per Presidential Decree №-1759 dated 22.05.2012
	Spent / excess solvents	This waste should be disposed by a specialized company involved in solvents. An example of such as company would be «Ecotibbiyot».
	Acids / alkalis solutions	This waste should be disposed by a specialized company involved in acids and alkalis solutions. An example of such as company would be «Ecotibbiyot».
	Paints	This waste should be disposed by a specialized company involved in paints waste. An example of such as company would be «Ecotibbiyot».
	Discarded chemicals	This waste should be disposed by a specialized company involved in chemicals. An example of such as company would be «Ecotibbiyot».

14.1.5 Water Resources

It is important to note that the section below is based on secondary data available through a desktop review on water supply and demands within Karakalpakstan in general and Kungrad District in specific.

In addition, as noted within “Section 14.2.5” later, the water requirements for the Project were estimated and provided to Ministry of Water Resources of Karakalpakstan / Kungrad Water Supply Department to confirm that they would be able to provide such requirements without impact existing resources or requirements.

Water Supply

This section provides an assessment of water resources relevant to the Project, drawing from a thorough examination of the "Quantity and Quality of Water for the year 2020" report by the CSO (2021).

Water supply in Uzbekistan, as highlighted in the "Climate Risk Country Profile: Uzbekistan" by the World Bank (2021), heavily relies on external sources. As of 2014, approximately 80% of Uzbekistan's water supply originates from beyond its borders, as it shares major rivers, including the Amu Darya, Syr Darya, and Zarafshan, with neighboring countries. This leaves less than 10% of Uzbekistan's water resources sourced internally.

Karakalpakstan boasts several significant bodies of water, including the Aral Sea and the Sudoche lake group, which connects to the Khodjakul-Karadjar lake group. Additionally, the region features various man-made reservoirs such as the Mezhdurechensk Reservoir, Makpalkol Lake, and the Maypost-Domalak system, along with the Muynak, Ribachiy, and Zhiltirbas bays. These water bodies are primarily located in the central part of the Amu Darya Delta and its right bank. Notably, all water reservoirs in Karakalpakstan are utilized for fisheries, with their water supply sustained by Amu Darya waters and recurrent drainage from irrigated fields.

Within the Lower Amu Darya Basin (LADB), situated in the administrative regions of Karakalpakstan and Khorazm in northern Uzbekistan, the total water supply can be categorized into three components: inflow

from the Amu Darya River, precipitation, and groundwater. It is important to note that data regarding groundwater is currently unavailable and has been estimated as part of the supply-demand balance. The total water supply in this region amounts to approximately **27,188 million cubic meters**, distributed among these various sources.

Table 71: Water Supply from LADB

Supply Source	Quantity (million m^3)	Percentage
Runoff	14,564.61	53.57%
Precipitation	12,623.38	46.43%

The table below presents the water coverage by centralized water supply and water sources in Kungrad Districts.

Table 72: Current Coverage Centralized Water Supply and Water Sources in Karakalpakstan

District	Population 2017	Domestic connections											Standpipe		Trucked water			Institutional		Commercial		Industrial	
		Connected to a centralized WS network			In-house connections																		
		Customers	Population	%	Metered			Not metered		Total in-house connections								Metered	Not metered	Metered	Not metered	Metered	Not metered
					Connections	Population	in % of total connections	Connections	Population	Customers	Population	%	Customers	Population	Customers	Population	In %						
Amudaryo	**185700**	**7850**	**41729**	**0.225**	**2972**	**17291**	**0.422**	**4064**	**19923**	**7036**	**37214**	**0.2**	**814**	**4515**	**3868**	**21277**	**0.115**	**37**		**136**		**3**	
Urban	35830	4135	22322	0.623	2196	12778	0.539	1877	9201	4073	21979	0.613	62	343				35	0	136	0	3	0
Rural	149870	3715	19407	0.129	776	4513	0.262	2187	10722	2963	15235	0.102	752	4172	3868	21277	0.142	2	0		0		0
Beruniy	**177200**	**9485**	**57828**	**0.326**	**5191**	**33874**	**0.596**	**3522**	**19793**	**8713**	**53667**	**0.303**	**772**	**4161**	**160**	**881**	**0.005**	**38**		**140**		**2**	
Urban	59482	4897	31207	0.525	4085	26659	0.845	749	4211	4834	30870	0.519	63	337				33	0	140	0	2	0
Rural	117718	4588	26621	0.226	1106	7215	0.285	2773	15582	3879	22797	0.194	709	3824	160	881	0.007	5	0		0		0
Nukus	**46100**	**3692**	**19969**	**0.433**	**2427**	**14982**	**0.759**	**770**	**2746**	**3197**	**17728**	**0.385**	**495**	**2241**	**430**	**2367**	**0.051**	**20**		**18**		**2**	
Urban	10123	1951	4815	0.476	1461	3026	0.766	446	1589	1907	4615	0.456	44	199				16	0	18	0	2	0
Rural	35977	1741	15154	0.421	966	11956	0.749	324	1157	1290	13113	0.364	451	2042	430	2367	0.066	4	0		0		0
Karauzyak	**50900**	**3829**	**17818**	**0.35**	**1547**	**9553**	**0.538**	**1326**	**3919**	**2873**	**13472**	**0.265**	**956**	**4346**	**492**	**2707**	**0.053**	**23**		**35**			
Urban	15259	1886	9528	0.624	1185	7318	0.659	614	1815	1799	9133	0.599	87	395				16	0	35	0	0	0
Rural	35641	1943	8290	0.233	362	2235	0.337	712	2104	1074	4339	0.122	869	3951	492	2707	0.076	7	0		0		0
Kungrad	**123600**	**14500**	**76628**	**0.62**	**5751**	**35021**	**0.549**	**4725**	**22155**	**10476**	**57176**	**0.463**	**4024**	**19452**	**71**	**388**	**0.003**	**56**		**184**		**15**	
Urban	66699	10270	55423	0.831	5136	31274	0.527	4603	21582	9739	52856	0.792	531	2568				50	0	183	0	14	0
Rural	56901	4230	21205	0.373	615	3747	0.835	122	573	737	4320	0.076	3493	16884	71	388	0.007	6	0	1	0	1	0
Muynak	**30200**	**2623**	**10491**	**0.347**	**728**	**3606**	**0.35**	**1354**	**4463**	**2082**	**8069**	**0.267**	**541**	**2422**	**1261**	**6935**	**0.23**	**29**		**29**		**3**	
Urban	13237	1967	7615	0.575	652	3227	0.339	1269	4182	1921	7409	0.56	46	206				26	0	0	0	3	0
Rural	16963	656	2876	0.17	76	379	0.473	85	281	161	660	0.039	495	2216	1261	6935	0.409	3	0	0	0		0
Total	**613700**	**41979**	**224463**	**36.6 %**	**18616**	**114327**	**54.2%**	**15761**	**72999**	**34377**	**187326**	**0.305**	**7602**	**37137**	**6282**	**34555**	**0.056**	**203**	**0**	**542**	**0**	**25**	**0**
Urban	200630	25106	130911	65.2 %	14715	84282	0.606	9558	42580	24273	126862	0.632	833	4049				176	0	512	0	24	0
Rural	413070	16873	93552	0.23	3901	30045	38.6%	6203	30419	10104	60464	0.146	6769	33088	6282	34555	0.084	27	0	1	0	1	0

Water Demand

In terms of water demand, the table below presents the general water demand in the Republic of Karakalpakstan including Kungrad District where the Project is located. The general water demand includes agricultural, household and industrial sectors. As seen in the figure below, the agricultural sector accounts for the majority of water demand in Uzbekistan in general. However, it is important to note that Uzbekistan is facing water crisis, specifically, Uzbekistan is currently grappling with a freshwater crisis, attributed to a combination of factors including drought, rapid population growth, and the shrinking of the Aral Sea. One of the region's most severely impacted by this crisis is Karakalpakstan in the northwest.

This predicament has had a significant effect on the region's primary economic sector, agriculture. Numerous rice and cotton plantations are no longer working, and pastures have become desiccated. The devastating drought from the previous year resulted in the abandonment of approximately 300,000 hectares of crops in the area. As a dire consequence, residents were compelled to consume subpar water quality, leading to an upsurge in diseases such as hepatitis and tuberculosis.

Table 73: Water Demand in Karakalpakstan

District	Water Demand (m^3/day)
Amudaryo District	20,044.48
Beruniy District	30,848.24
Karauzyak District	7,958.07
Muynak District	6,041.52
Nukus District	119,524.89
Kungrad District	27,457.45

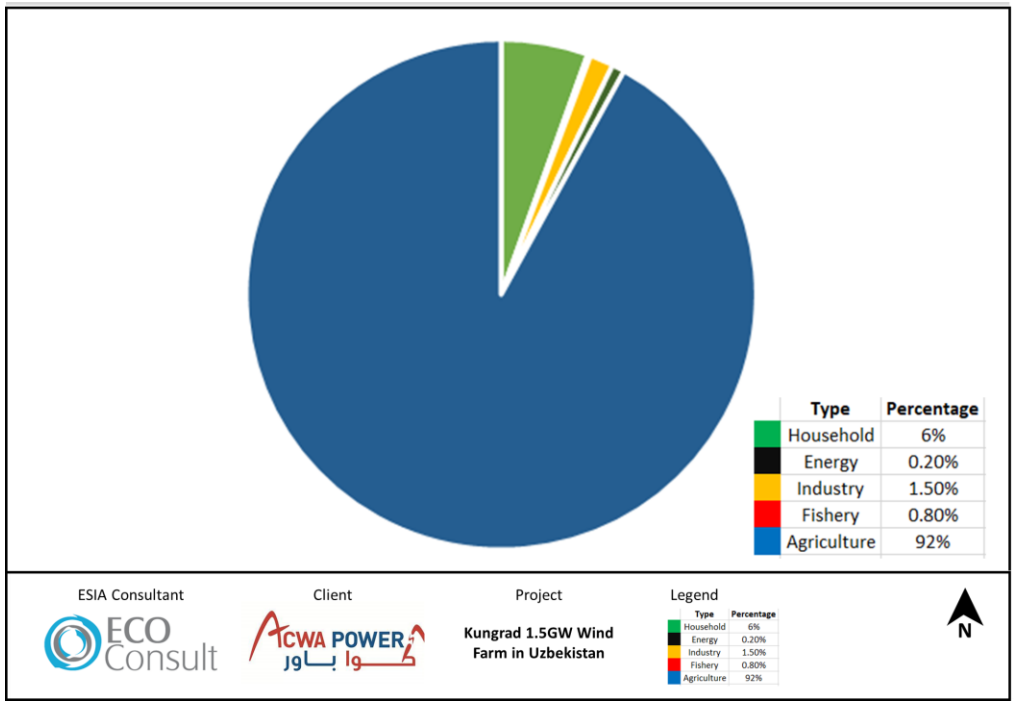


Figure 89: Water Demand Distribution in Uzbekistan

Overview of the Water Situation in Uzbekistan and in specific, in Karakalpakstan

Uzbekistan ranks 25th out of 164 countries on the World Resources Institute's list of the most water-stressed nations. The country faces a severe water shortage, particularly in regions like Karakalpakstan, where it could trigger a social and environmental crisis. The scarcity of water affects not only agriculture but also domestic use.

By 2030, the population of Uzbekistan is projected to approach 40 million people, leading to a 7-8 km^3 reduction in available water resources. This will exacerbate the current water shortage, increasing it from 13-14% to 44–46%, which will hinder the development of both agriculture and industries.

In 2018, Uzbekistan lost 469 million m^3 of freshwater, equivalent to 32% of the total drinking water produced, according to the World Bank. These substantial losses occur amid unfavorable predictions for future water supply in Central Asia, including Uzbekistan. By 2050, key water supply resources (Syr Darya river and Amu Darya River) are expected to be impacted with streamflow in the Syr Darya river basin expected to decrease by 2-5%, and in the Amu Darya River basin, the decline could be 10-15%, resulting in even more acute water shortages.

The Aral Sea crisis (discussed in further detail in “Section 19.9”) is not exclusive to Uzbekistan; it affects neighboring countries as well. Each year, 135-145 million tons of salt flow into the Amu Darya and the Syr Darya, equivalent to 17-20 tons per hectare of irrigated land. Between 1960 and 1990, the Aral Sea's annual river inflow dropped from 55 km^3 to 6-12 km^3, nearing zero in dry years. Currently, the sea level is decreasing at approximately 0.5 meters per year, with a surface area reduced to 32,000 km^2 and salinity levels exceeding 40 g/l and still rising.

The Aral Sea problem gained political significance in the late 1980s when Central Asian leaders established the International Fund for Saving the Aral Sea (IFAS) as the sole interstate coordination mechanism in Central Asia. However, cooperation has mainly been limited to the signing of general declarations and memoranda, with many initiatives in the 1990s remaining unimplemented.

Efforts to address the Aral Sea crisis face challenges, primarily because the sea spans the territories of Kazakhstan and Uzbekistan, making it an "inland sea" for these countries. Other Central Asian states are more focused on hydropower development and extensive agriculture. In October 2019, Uzbekistan proposed declaring the Aral Sea a zone for environmental innovation and technology, a matter discussed at the UN General Assembly in September 2020. Kazakhstan aims to preserve biodiversity in the northern part of the Aral Sea. Over the past three decades, international organizations have produced numerous policy briefs and recommendations, with UNDP programs addressing environmental issues in the Aral Sea region.

14.1.6 Traffic and Transport

Highway A380 is a major highway in Uzbekistan that starts from G‘uzor District in Qashqadaryo Region and ends in Kungrad District in Karakalpakstan, more specifically in the northwestern corner of Uzbekistan that borders with Kazakhstan. The total length of Highway A380 is around 1,200km as shown in the figure below.

Highway A380, particularly the Guzar-Bukhra-Nukus-Beyneu section, plays a crucial role in enhancing regional trade within the Central Asia Regional Economic Cooperation (CAREC) Corridor 2. Covering a distance of approximately 240 km, this highway connection between the Kungrad district in the Republic of Karakalpakstan and the Kazakh border is a vital trade route in the region. It efficiently links various

western Uzbekistan regions, including Kashkadarya, Bukhara, Khorazm, and Karakalpakstan, to the Caspian Sea port of Aktau in Kazakhstan. As a key transportation artery, the A380 corridor is poised to become increasingly vital for facilitating regional trade between Uzbekistan and Kazakhstan.

The proposed upgrading and widening of A380 highway align with the government's priority to enhance transportation infrastructure and revitalize this important trade route.

This highway will be the key highway that will be used to access the Project site for all of its transportation requirements.

As discussed in "Section 6.3.1", based on consultations with Ministry of Transport of Karakalpakstan / Kungrad District Road Use Unitary Enterprise, the following information was requested on Highway A380 but it was indicated that such information was not available.

- Theoretical road capacity;
- AM/PM traffic counts; and
- Road conditions.

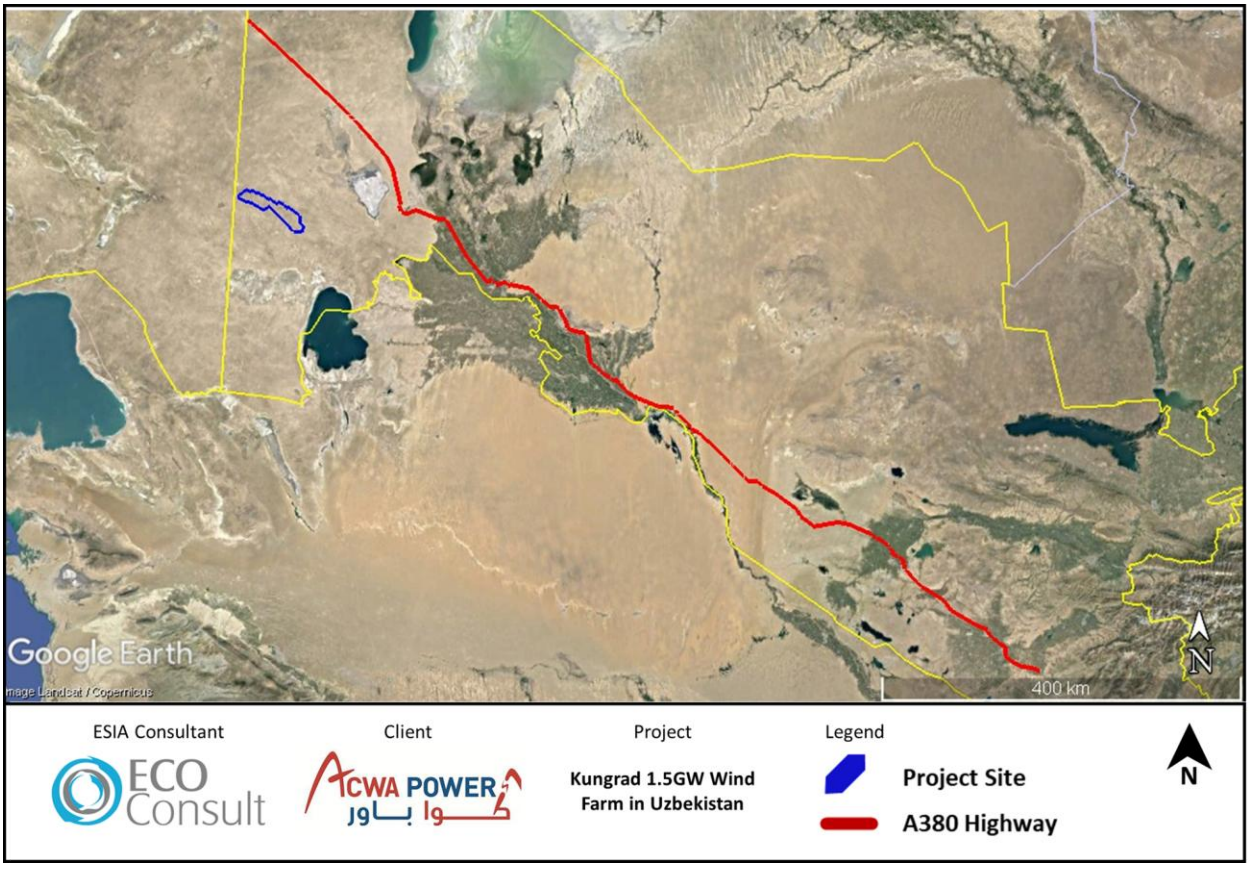


Figure 90: Project Site in Relation to Highway A380

14.1.7 Gas Infrastructure

Based on a site visit undertaken by the 'E&S Team' for the Project site, a gas pipeline (with a total length of 15km within the Project site) along with pumping station was noted as presented in the figure below.

In addition, several electricity towers and lines were noted but they are not in use and are not working. Those were also considered infrastructure elements for the gas pipeline.

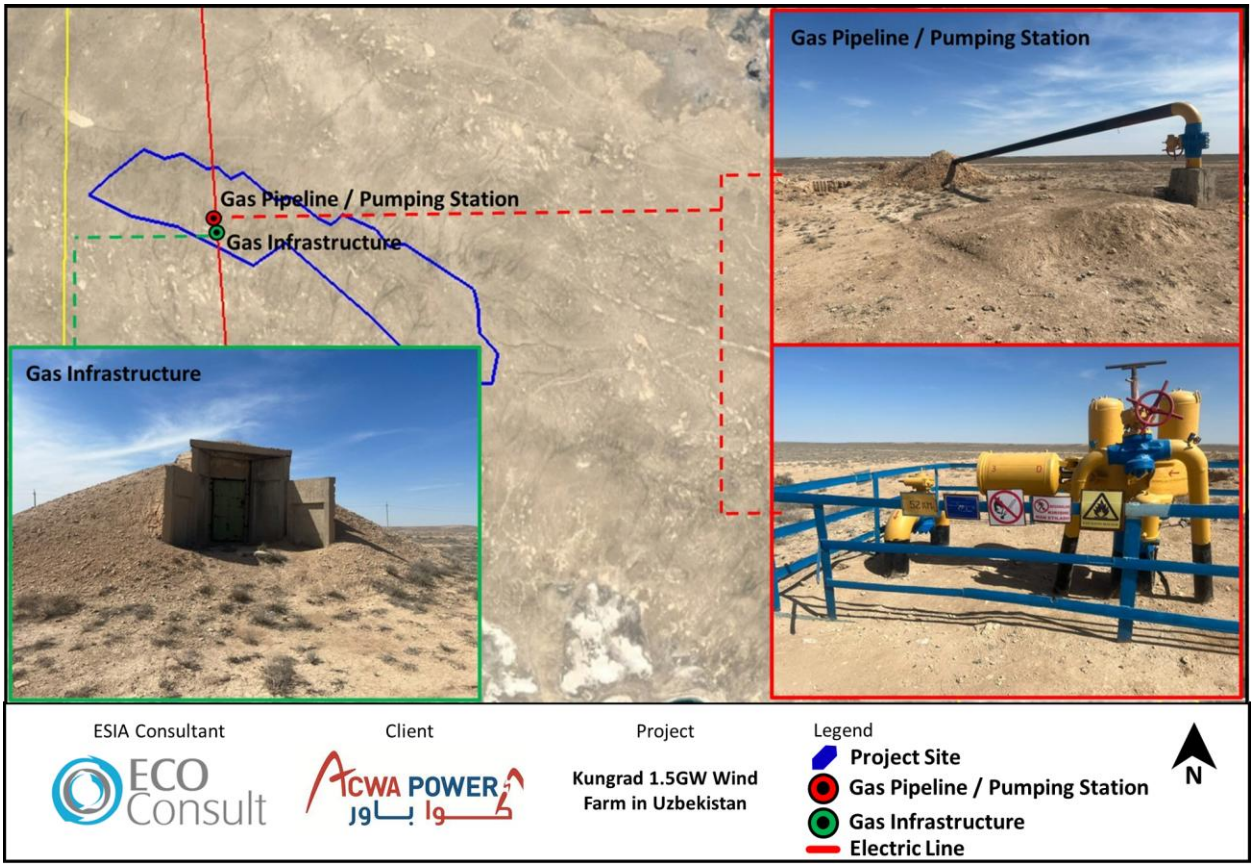


Figure 91: Gas Pipeline and Infrastructure Onsite

As noted earlier, several consultations were undertaken with governmental entities that included the following:

- Based on consultations with the Cadastral Office, the exact location of the pipeline and pumping stations were provided as presented in the figure above.
- Based on consultations with Cadastral Office and Kungrad District Khokimiyat no additional current or planned infrastructure and utility elements are onsite.
- Based on consultation with various entities as noted within “Section 6.3.1” earlier, it was confirmed again that there is a gas pipeline within the Project site that is operated by UrgenchtransGaz. This included: (i) Kungrad District Khokimiyat; (ii) Ustyurt Gas (Branch of Uzbekneftegas JSK); (iii) Gasprom International Limited; and (iv) UrgenchtransGaz.
- Consultations undertaken with UrgenchtransGaz (refer to “Section 6.3.1”) indicated the following:
  - The pipeline extends from the Shakhpakhty field to Karakalpakiya with a total length of 235 km;
  - The gas pipeline crosses the Project site and in particular points 6-7 and 28-29 with a diameter of 820mm;
  - A 250m protection zone in each direction is required to be maintained as part of the Project design; and

- Required official communication through formal letters to document all of the above and identify requirements that should be considered. A formal letter has been sent by the 'E&S Team" but still to date no response has been provided.

- Based on the consultations above it was indicated that the Shakhpakhty field, discovered in 1964, could be located in the southeastern part of the Project site. Further communication with the State Committee for Geology was requested to investigate this further.

- Consultations undertaken with the State Committee on Geology and Mineral Resources indicated that within the area there is an important territory allocated for perspective investment in hydrocarbon resources. For this reason, the Committee provided coordinates within which Project should be developed as presented in the figure below as it is within this area that surveys will not be carried out within next 30 years. As noted, the Project site is located within such an area, however there is a very small area that is located outside of this allowed area which should be taken into account as part of the design of the Project – this is likely to be due to coordinate shifting but anyhow this should be taken into account.

  In addition, during the scoping site visits undertaken by the 'E&S Team' (March 2023) small-scale and limited blasting activities were noted within the Project area in general. It was indicated that this was undertaken by the State Committee on Geology as part of exploration activities (although as noted earlier formal communication from the Committee indicated no activities within the Project area). After that and in May 2023 follow up communication was undertaken and the Committee who indicated in a formal letter that they are informed about the Project and therefore no further activities will be undertaken. The 'E&S Team' provided a follow up formal letter recently to the Committee to confirm that no further activities and works are to be planned within the Project area. Official response will be confirmed and verified once obtained and updated into the ESIA accordingly.

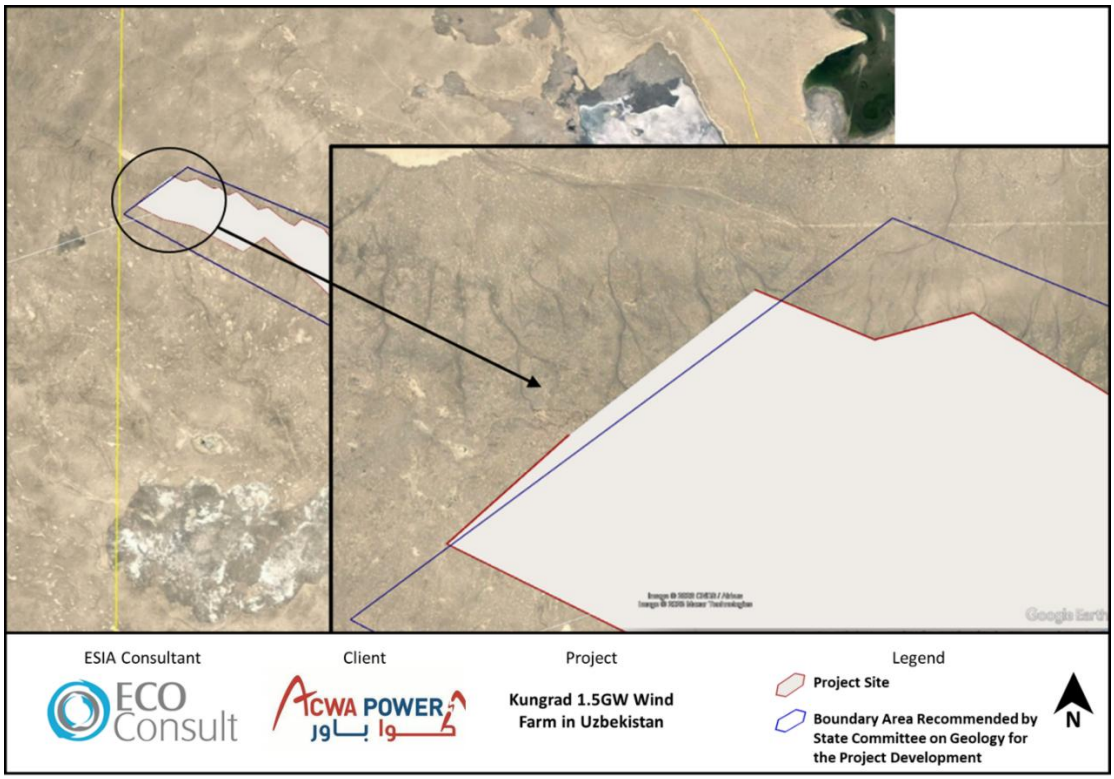


Figure 92: Overlap between Project Area State Committee on Geology Recommendation

14.2 Assessment of Potential Impacts

This section identifies the anticipated impacts on infrastructure and utilities from the Project throughout its various phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

14.2.1 Potential Impacts on Radio, TV and Telecommunication Infrastructure during Planning Phase

Inappropriate siting of Project components (turbines, roads, etc.) as well as overall management of construction activities (e.g. excavation activities) could damage and/or disturb the telecommunication, radio and TV fiber cable as well as the broadcasting towers.

In addition, inappropriate siting of WTGS, could disturb microwave connections between telecommunication, radio and TV broadcasting towers. There is an ellipsoid formed zone around the line of sight between two towers used for signal transmission. The radius of this called “Fresnel Zone” which increases with distance to the towers and has its maximum in the middle of the line of sight. This zone should be kept free of any obstacles to minimize interference of the radio signals. The extent of the zone depends on the following key factors:

- Position of the broadcasting towers;
- Distance between sender and receiver;
- Frequency of the transmitted signal;
- Height of sender and receiver;
- Turbine coordinates;
- Turbine hub height; and
- Rotor diameter of the turbine.

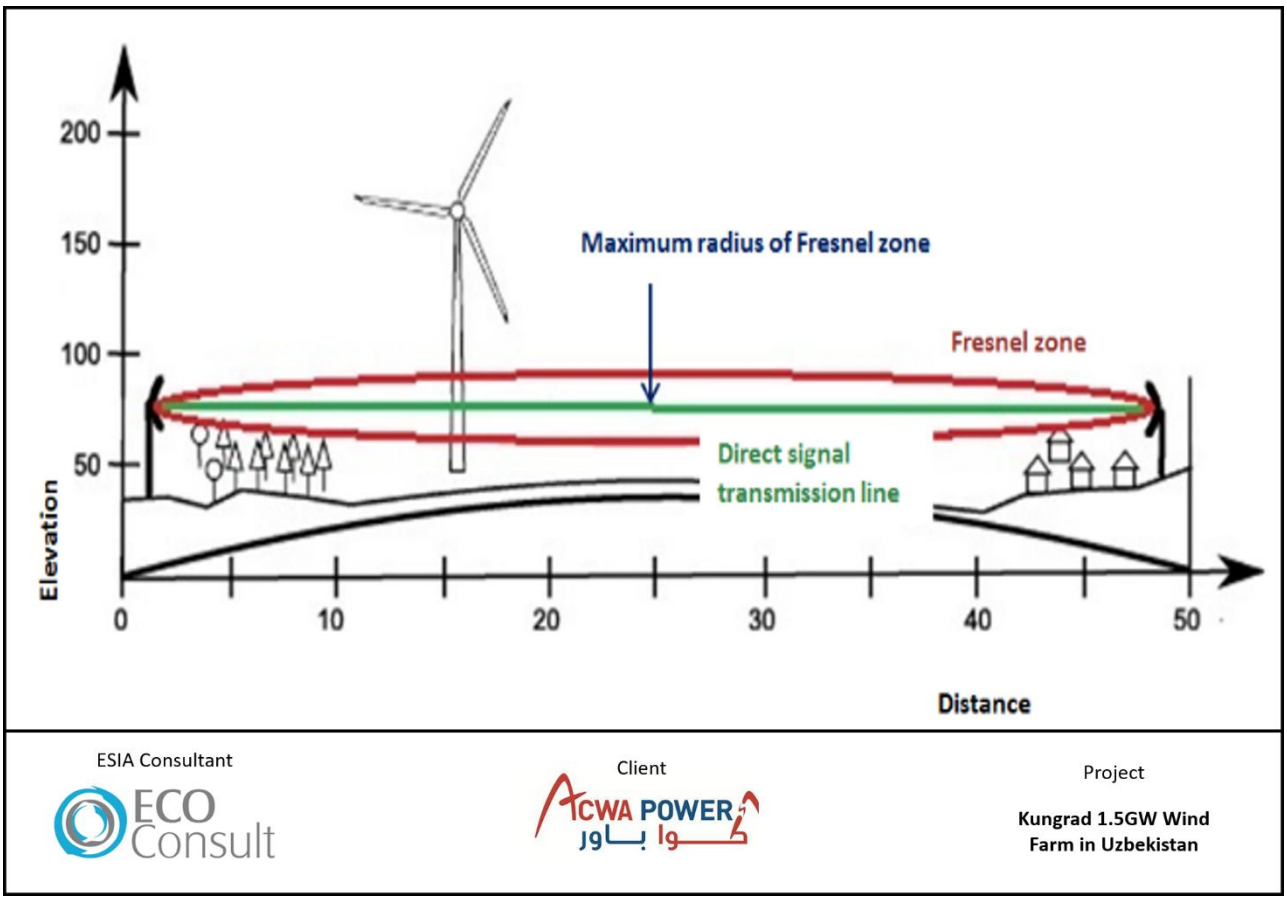


Figure 93: Fresnel Zone of Broadcasting Towers

However, as noted earlier, there are no infrastructure elements related to telecommunication, radio and TV that will be impacted. Based on the above, this impact is scoped out and there are no further requirements to be considered for the ESIA study.

14.2.2 Potential Impacts on Civil and Military Aviation during the Planning Phase

Any tall structure, such as wind turbines, could impact aircraft safety if located near airports or known flight paths and routes – to include both civil aviation as well as military aviation. In order to safeguard aerodromes and/or airports, and as a standard procedure for all wind farm development projects, formal communications must be established with the official governmental authorities responsible for the development of civil and military aviation safety and security.

There are additional requirements to be undertaken by the EPC Contractor related to visibility that should be considered during the planning phase such as painting of WTG blades, nautical lighting, etc. as well as issuing formal permits for the Project. Thos will be undertaken by the EPC Contractor once the final detailed design is available.

Based on the above, this impact is scoped out and there are no further requirements to be considered for the ESIA study.

14.2.3 Potential Impacts on Waste Utilities during the Construction and Operation Phases

The Project is expected to generate the following waste streams during the construction and operation phases, and which are provided in detail in the table that follows.

- Wastewater during construction and operation to include black water (sewage water from toilets and sanitation facilities) and grey water (from sinks, showers, etc.). Wastewater generated during operation is expected to be minimal and insignificant. Wastewater will be stored onsite though enclosed collection tanks and collected by licensed tankers from the Project to the closest WWTP.
- Solid waste during construction and operation will include construction waste (mainly during construction to include dirt, rocks, debris, etc.) as well as general municipal waste (such as food, paper, glass, bottles, plastic, etc.). Solid waste quantities generated are not expected to be significant and are likely to be easily handled by closest approved solid waste disposal facility.
- Hazardous waste during construction and operation from the will include routine waste generated from such activities to include spent oil, lubricants, paint cans, solvents, etc. Hazardous waste quantities generated are not expected to be significant and are likely to be easily handled by closest authorized facility.

The quantities of waste in the table below for the construction phase have been estimated from other wind farm developments in Uzbekistan.

Table 74: Type and Quantities of Waste Estimated for Construction Phase

Category	Type	Description	Quantities / Weight
Non-Hazardous / Solid	Plastic glass	Bottle, jars, etc.	15m^3
	Metal cans and tins	Drink and food cans	3m^3
	Ferrous material	Steel, gratings, sheet steel, beams, wire, etc.	10 ton
	Non-ferrous material	Aluminum, copper piping, etc.	3 ton
	Paper/cardboard/card from packaging	Packaging, printer paper, newspapers, magazines, etc.	5 m^3
	Plastic bottles	Drink bottles, cosmetic bottles, etc.	15 m^3
	Plastic packaging	Plastics, Styrofoam, etc.	30 m^3
	Domestic waste	Mixed wastes	1,000 m^3
	Textiles	Unwanted and uncontaminated clothes	12 m^3
	Wood from packaging	Pallets, crates, beams, general packaging, etc.	600 m^3
	Concrete	N/A	30 m^3
	Clinical	Medicines	3 m^3
		Total Non-Hazardous waste	**1,700 m^3 + 13 ton**
Hazardous / Solid	Containers	Container contaminated by original content (e.g. lube oil, hydraulic fluid, paints, solvents, etc.	6 m^3
	Paints / paint pots	N/A	3 m^3
	Used spill kits and contaminated soils	Absorbents, filter materials (including oil filters not otherwise specified), wiping clothes, protective clothing contaminated	2 m^3

		by dangerous substances and soil from remediation activities	
	Clinical	Offensive waste (e.g. outer wound / surgical dressing, pads, swab), sharp needles, drugs, containers used to dispose urine, bodily secretion, etc.	3 m^3
	Batteries	N/A	1 m^3
	Fluorescent tubes / bulbs	N/A	1 m^3
Hazardous / Liquid	Spent /excess lube oil	N/A	15 L
	Spent /excess hydraulic fluid	N/A	15 L
	Spent / excess solvents	Halogenated/non-halogenated	15 L
	Acids / alkalis solutions	From cleaning/maintenance	5 L
	Paints	Waste paint and varnish pots containing organic solvents or other dangerous substances	1 m^3
	Discarded chemicals	Discarded organic/ inorganic chemicals consisting of or containing dangerous substances	1 m^3
		Total Hazardous Waste	**18 m^3 + 50 L**
Wastewater	Black Water	Wastewater generated from sanitary facilities (i.e. toilets) as well as portable toilers	8,000 m^3
	Grey Water	Wastewater generated from sinks, showers, baths, canteens and laundry facilities	70,000 m^3
	Run-off Water	Water generated from impermeable surfaces (e.g. concrete paved areas)	4,500 m^3
	Other wastewater	This could be wastewater generated from equipment/vehicles washing, concrete washout, etc.	3,000 m^3
		Total Wastewater	**85,000 m^3**

However, it is likely that such entities will be able to handle the waste quantities and waste disposal requirements of the Project.

Construction Phase			**Operation Phase**		
Type	Negative	N/A	Type	Negative	N/A
Duration	Medium-term	Limited to construction phase which is 42 months	Duration	Long-Term	Throughout entire operational period
Magnitude	Medium	Given waste quantities above	Magnitude	Low	Given waste quantities during operation are minimal
Reversibility	Reversible	N/A	Reversibility	Reversible	N/A
Sensitivity	Medium	Given waste quantities above	Sensitivity	Medium	Given waste quantities during operation are minimal
Likelihood	High	Given nature of activities expected	Likelihood	High	Given nature of activities expected

Frequency	Periodic	Expected throughout entire construction activities	Frequency	Periodic	Expected throughout entire operational activities
Timing	Not relevant	Applicable throughout entire construction activities	Timing	Not relevant	Applicable throughout entire operational activities
Extent	High	Given impact is at final disposal facilities	Extent	High	Given impact is at final disposal facilities
Significance	**Moderate**	N/A	**Significance**	**Minor**	N/A

Following the implementation of the additional requirements highlighted throughout this section, the residual significance can be reduced to not significant.

Additional Requirements

The following identifies the additional requirements to be applied by the EPC Contractor during the construction phase and Project Operator during the operation phase respectively and which include:

- A Waste Management Plan shall be developed for the construction and operations phases - including, but not limited to: waste reduction strategies, recycling and reuse, and appropriate disposal methods, in line with the project standards. This should be part of the EPC Contractor and Project Operator ESMS as discussed in further details in "Section 21.2"
- Coordinate with the State Unitary Enterprise and obtain list of authorized contractors for collection of wastewater from the site to closest authorized wastewater treatment plant.
- Coordinate with State Unitary Enterprise for the collection of solid waste from the site to the closest authorized landfill (or obtain list of authorized private contractors).
- Coordinate with State Unitary Enterprise to obtain list of authorized contractors for collection of hazardous waste from the site to the closest approved facility for final disposal.

14.2.4 Potential Impacts on Hazardous Waste Disposal Utilities during Decommissioning Phase

Of particular importance is the disposal of the BESS at the end of their lifetime. During the decommissioning phase of the Project, and as a worst-case scenario disposal of the BESS will take place. BESS is classified as hazardous waste/E-waste.

As a worst-case scenario, the BESS will be disposed at a landfill and no recycling will take place. However, the prospects of BESS disposal and management is not clear at this stage, taking into account the Project timeline of 25 years.

Decommissioning Phase		
Type	Negative	Prospects of BESS disposal and management is not clear at this stage, taking into account the Project timeline of 25 years.
Duration	Short-term	
Magnitude	Low	
Reversibility	Reversible	
Sensitivity	Low	
Likelihood	High	
Frequency	Rare	
Timing	Not relevant	

Extent	Low	
Significance	**Not Significant**	

Additional Requirements

Given that at this stage there is a great deal of uncertainty at the decommissioning phase of the Project (with regards as to whom is the responsible party, prospects on waste disposal facilities in Uzbekistan, etc.), it is recommended that before any decommissioning activities take place a Disposal Plan for the BESS is prepared by the responsible entity undertaking decommissioning activities. The plan should consider the following options and compare the costs/benefits of each:

- Evaluate recycling options for E-waste, including the identification of appropriate licensed waste processing facilities for this type of waste within the country, if available.
- Cost estimation for recycling and collecting at the end of lifetime at least but not limited the following components:
  - Power Conversion System
  - Battery System
  - Electronic components
  - Electric components
  - Buildings and enclosures
  - Hazardous, toxic, ozone depleting and/or greenhouse gases
  - Hazardous and/or toxic liquids
  - Hazardous and/or toxic solid materials
- Provide suitable proof that the recycling concept is in compliance with Basel Convention. In addition, Project Operator should specifically state which materials will be recycled or disposed locally. If exported internationally, Project Operator should specify which materials will be exported and to which location.
- Include a written confirmation by the Original Equipment Manufacturer (OEM) of the BESS that the following works regarding the Battery System are included:
  - Check-up of the Battery System regarding safe transport
  - Decommissioning and disassembly
  - Safe packaging and transport to the designated recycling site
  - Recycling and disposal according to the state of the art of technology

Monitoring Measures

- Submission of Disposal Plan along with proof of coordination with the authorities discussed above for works required as part of the Study.

14.2.5 Potential Impacts on Water Resources during the Construction and Operation Phase

It is expected that the Project throughout the construction and operation phase will require water for potable usage (drinking, showering, etc.) and non-potable usage (e.g. cleaning of machinery and vehicles).

The tables below provide an estimate of the water requirements during the construction phase of the project as provided by a technical engineer on this Project. Sources of water consumption during the project execution will include as discussed earlier: (i) potable water; and (ii) non-potable water.

It is important to note that numbers below are based on estimations – actual generated quantities will be updated in the water management plan throughout the execution of the project.

Table 75: Total Water Requirements Summary

Type of Water	Quantity	Description
Total Potable	40,438 m^3	Assuming 130L per worker per day for the following uses: (i) drinking (5L); (ii) cooking (5L); (iii) bathing (55L); (iv) cloth washing (20L); (v) utensils washing (10L); (vi) flushing of water closets (30L); and (vii) cleaning of rooms (5L)
Total Non-Potable	64,000m^3	Estimated for onsite activities based on previous wind farm developments in Uzbekistan. Water required for dust suppression, concrete for batching plant (excluding tower manufacturing facility), firefighting, equipment and machinery washing, etc.
Tower manufacturing facility	67,600m^3	Water required for specifically production of the towers at the tower manufacturing facility (mainly for batching plant requirements).
Total for construction phase	**172,000 m3**	
	50% buffer	For any additional water not accounted in the above calculations, changes in actual water consumption on the ground, and / or other potential factors that could result in miscalculations or change in calculation.
	260,000m^3	
Total per month	**~6,000 m^3 / month**	

The water requirements throughout the construction phase will be required medium-term duration (for construction period only). As estimated, they are about 6,000m^3/month which is around the average annual water consumption of 6 hectare of agricultural land in Karakalpakstan[55]. Based on that, they are considered of medium magnitude.

In addition, water will be required during the operation phase and mainly for drinking and other personal use of onsite staff (a maximum of 80 personnel). Water requirements during the operational phase are not expected to be significant at all. This will include potable water requirements of around 8,500 L per day (accounting to 150L per worker per day) Therefore, total water requirements per year are expected to be around 4,000 m^3.

Although water requirements are considered of medium magnitude, the sensitivity is considered high mainly due to the water situation in Uzbekistan in general and Karakalpakstan in particular, as explained earlier under “Section 14.1.5” and are also discussed under “Section 19.9”.

[55] Assessment and forecast of water resources use in Uzbekistan (e3s-conferences.org)
This was also verified based on consultations with Deputy Minister of Water Resources of the Republic of Karakalpakstan it was indicated that average annual water consumption per 1 hectare in agriculture in Karakalpakstan is 11,200 m3.

As noted within "Section 6.3.1", consultations were undertaken with Ministry of Water Resources of Karakalpakstan / Kungrad Water Supply Department whom indicted that in general they will be able to supply water requirements of the Project (expected to be from Ama Darya River and through tankers to the site) but required details on water quantities.

However, a water resources assessment was undertaken by the E&S Team as part of the ESIA works. The assessment was undertaken based on the following:

- Site visit the Project site and surrounding areas to investigate potential sources of water supply.
- Stakeholder consultations and engagements with various entities as summarized below. The objective of such meetings was to collect secondary data as applicable, investigate potential sources of supply, verify ability of such sources to provide water requirements during construction and operation (based on expected quantities required), and others.
    - Deputy Minister of Water Resources of Karakalpakstan
    - Head of the Reclamation Expedition under the Ministry of Water Resources
    - Head of the Department of Irrigation System "Suenli"
    - Director of Kungrad Technical Water Supply Department under "UrgenchtransGaz"
    - Chief Hydrogeologist of Public Institution "O'zbekgidrogeologiya"
    - Deputy Head of "UrgenchtransGaz"
    - Head of Water Utility in Kungrad
    - Leading Specialist of Nature Reserves Department of the Ministry of Ecology, Environmental Protection and Climate Change
    - Water Specialist at Ministry of Ecology, Environmental Protection and Climate Change of Karakalpakstan
    - Head of Aral Hydrology Station of Geology Committee
    - Head Northwest Regional inspection of Geology Committee
    - Head of Shakhpakhty Plant

The water resources assessment concludes that there are four (4) potential options / sources for water supply of the Project. Those are discussed in further details below and in no particular order of priority. The final option / source of supply will depend on water quality, treatment requirements (if any) and logistics for supply.

Option 1 – Assake Audan Groundwater Well

This groundwater well is located on the south of the Karakalpak Ustyurt and within the Assake-Audan depression (coordinates: N 42.604617, E 56.280631) – around 53 km from the Project site. In the past the southern parts of the Assake-Audan and Sarykamysh depressions formed a common lake basin through which the Amu Darya flowed and where the Uzboy river began flowing into the Kaspiy. Currently this is a

deep depression with several artesian wells with brackish water. The wells were drilled during Soviet time for geological needs.

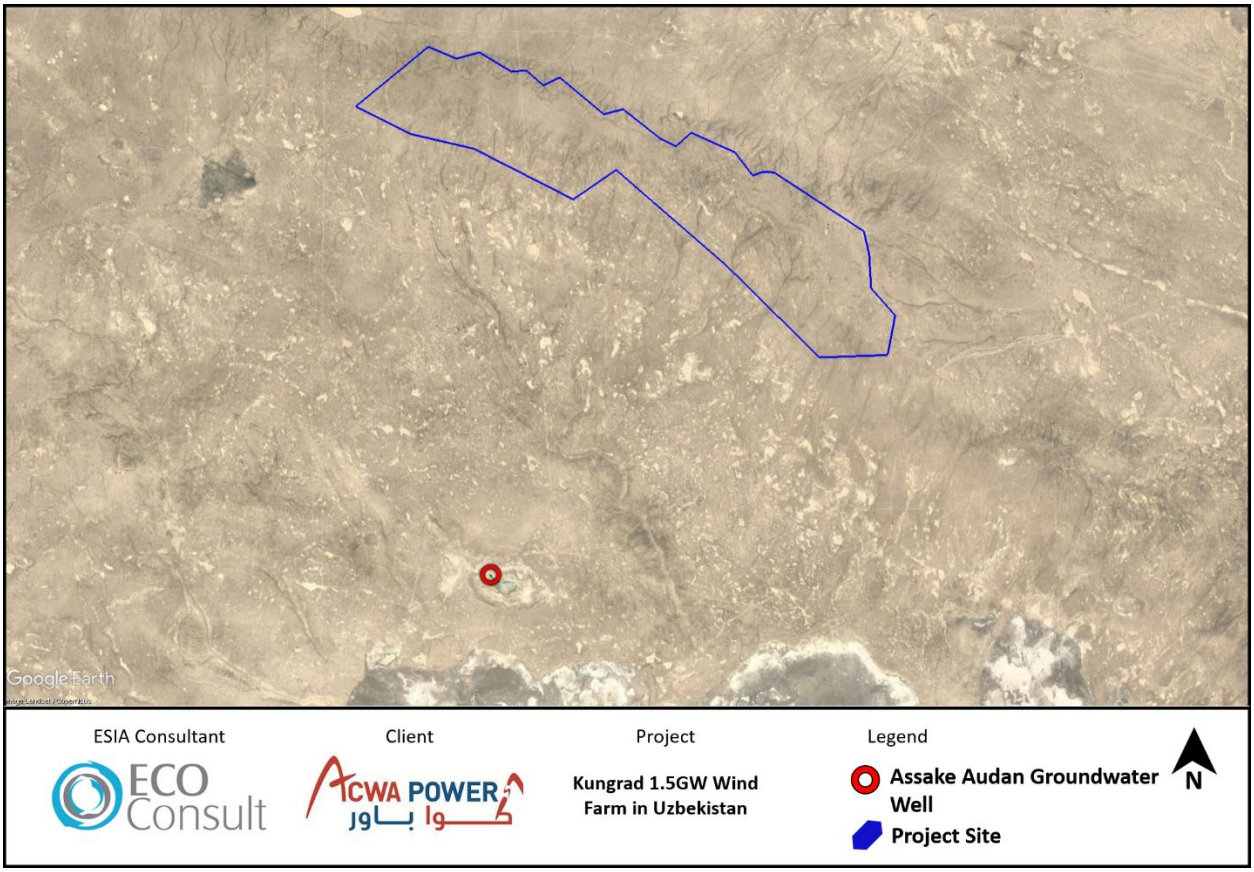


Figure 94: Assake Audan Groundwater Well with the Project Site Location

Nowadays the water is not used for any specific or formal purpose. The water output is about $2m^3$ / minute equivalent to around 80,000 m^3 / month.

However, as the water is not in use there was no information available on the water quality of the Assake Audan groundwater well.

Figure 95: Assake Audan Groundwater Well

Taking into account the water requirements for the construction phase (6,000m^3 / month) and the water supply from this source (80,000 m^3 / month) it is evident that such requirements can be easily met from this source as it represents around 8% only of the total supply of this source, given as explained earlier that this water source is currently under no formal use. Similarly, during the operation phase, the total water requirements (300m^3 / month) represent less than 1% of the total supply of this source.

The following are next steps to be undertaken by the EPC Contractor

- EPC must undertake water quality analysis to determine if water quality is considered suitable for Project requirements and if not determine the treatment requirements.
- EPC Contractor should investigate feasibility of logistical supply of water to the site (e.g., tankers).
- Based on the above and should it be feasible, EPC Contractor should apply for a permit to the Ministry of Mining Industry and Geology (MMIG) to use this water source. MMIG will undertake an analysis to ensure that the quantities are within the sustainable yield of the aquifer (otherwise they would not provide a permit).

Note: this option is no longer considered given that it will require additional assessments to ensure that it would not entail impacts on wildlife (which could consume water from such source) as well as impacts from accessibility (e.g. need to construct a road to access to this source).

Option 2 – Gurkurek Groundwater Well

This groundwater well (coordinates: N 43.36982, E 057.51638) is located around 68 km from the Project site. It is part of Protected Area territory that is managed by the Nature Reserves Department of the Ministry of Ecology, Environmental Protection and Climate Change. Water comes out like a spring from the ground and is considered to be very cold and very salty. The water output is about 10 liters per second / minute equivalent to around 25,000 m^3 / month and there is no formal use currently for this well.

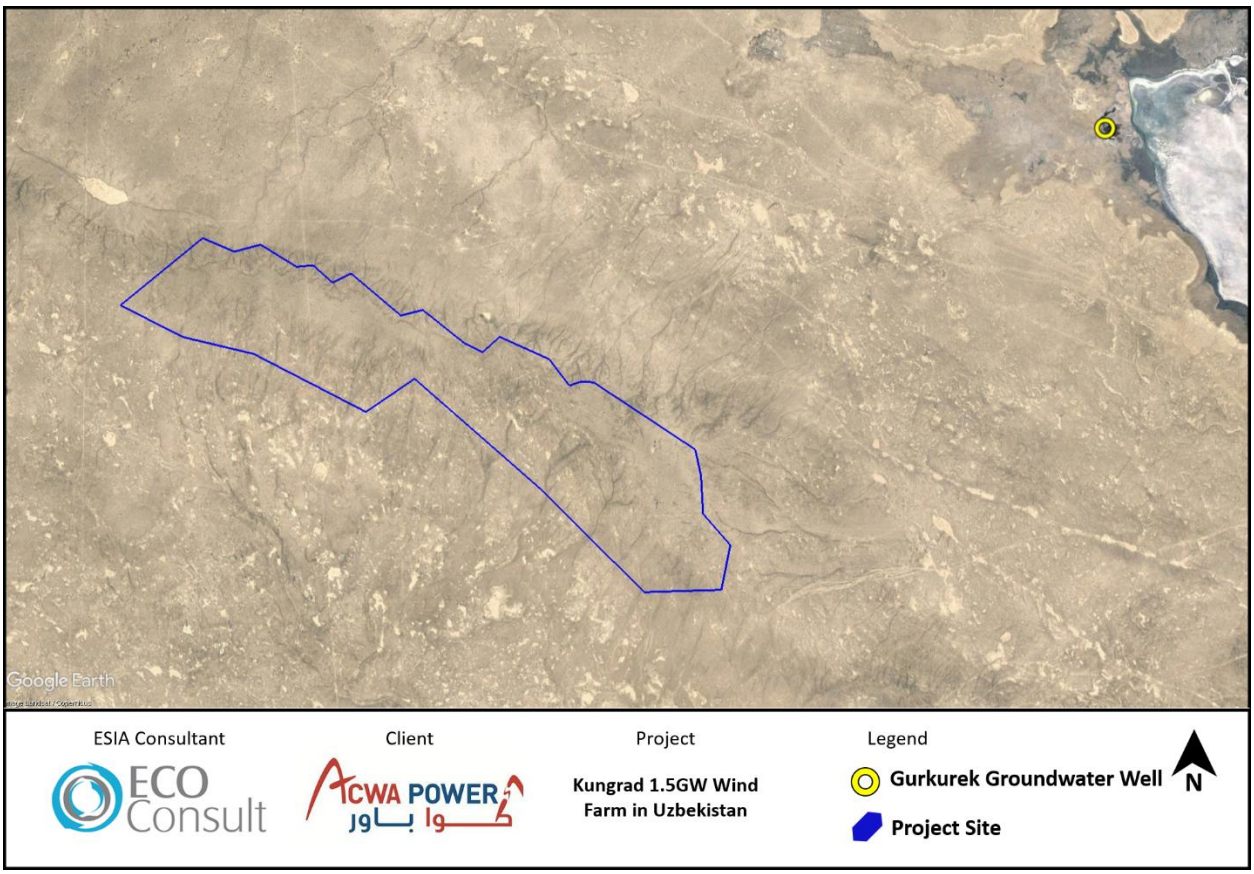


Figure 96: Gurkurek Groundwater Well location within the Project Site

Based on consultations with Nature Reserves representatives as well as Ministry representatives it was indicated that it is possible to allow the Project to use the water from this well – however they required that should this be the case and if a desalination system is installed that it is kept in the Nature Reserve after construction is completed so that they can benefit from it as well. Note: during the consultation, the water requirements as identified earlier were provided.

Figure 97: Gurkurek Groundwater Well

Taking into account the water requirements for the construction phase (6,000m^3 / month) and the water supply from this source (25,000 m^3 / month) it is evident that such requirements can be easily met from this source as it represents around 28% only of the total supply of this source, given as explained earlier that this water source is currently under no formal use. Similarly, during the operation phase, the total water requirements (300m^3 / month) represent 1% of the total supply of this source.

The following are next steps to be undertaken by the EPC Contractor

- EPC undertake water quality analysis to determine if water quality is considered suitable for Project requirement and if not determine the treatment requirements.
- EPC Contractor should investigate feasibility of logistical supply of water to the site (e.g. tankers).
- Based on the above and should it be feasible, EPC Contractor should apply for a permit to the Ministry of Mining Industry and Geology (MMIG) to use this water source. MMIG will undertake a study to ensure that the quantities are within the sustainable yield of the aquifer (otherwise they would not provide a permit).

Note: this option is no longer considered given that it will require additional assessments to ensure that it would not entail impacts on wildlife (which could consume water from such source) as well as impacts from accessibility (e.g. need to construct a road to access this source).

Option 3 – Department of Technical water supply under Urgench transgaz

Urgench transgaz has a 307-kilometer-long water pipe that runs from Kungrad and which abstracts water from the Amu Darya river via pumps, passing alongside the A380 highway supplying six (6) settlements along the road to include the local communities (as identified in "Section 2.2") as well as enterprises such as Uz-Kor Gas Chemical (Ustyurt Gas Chemical Complex) and Kungrad Soda Plant LLC JV. Figure below presents the location of these facilities and highway A380 where the pipeline runs.

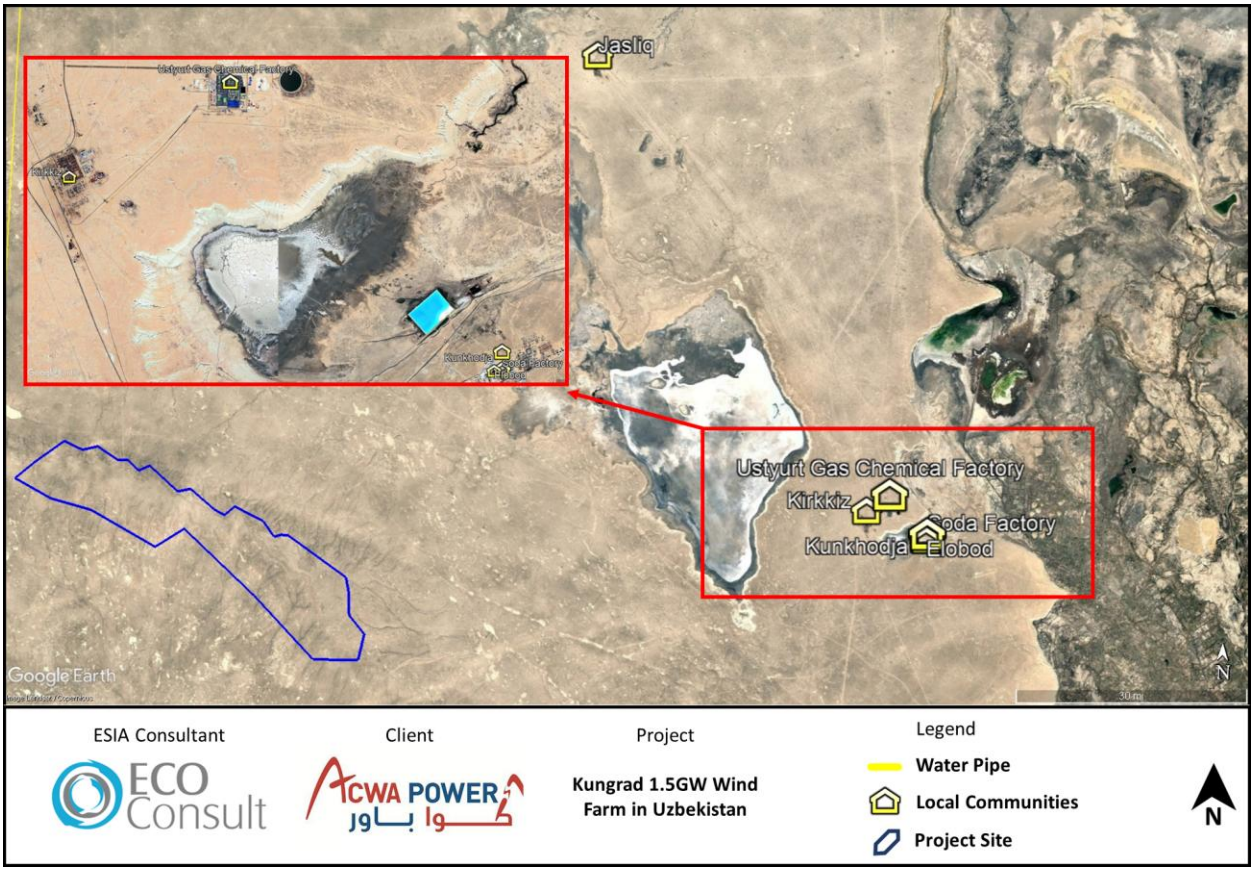


Figure 98: Water Supply under Urgench transgaz along the A380 highway

Based on consultations with representatives from **Urgench transgaz**, it was indicated that the pipeline is allowed to produce up to 90,000 m^3/day while currently its consumption is around 65-70,000 m^3/day (therefore there is an excess of around 20,000 m^3 / day). Based on such consultations it was also indicated that they will be able to provide the water requirements of the Project given that they are within the excess limits. Note: during the consultation, the water requirements as identified earlier were provided.

As noted earlier, the water requirements for the construction phase are estimated at 6,000m^3 / month while that during the operation phase is estimated at 300m^3 / month.

The following are next steps to be undertaken by the EPC Contractor

- EPC undertake should establish formal communication with UrgenchtransGaz and request to undertake a water quality analysis to determine if water quality is considered suitable for Project requirement and if not determine the treatment requirements.
- EPC Contractor should investigate feasibility of logistical supply of water to the site (e.g. tankers).
- EPC Contractor should verify that such water is not currently being used by any other formal or informal user.

- Based on the above and should it be feasible, EPC Contractor should enter into contractual arrangements with UrgenchtransGaz for water supply.

Option 4 – Onsite Groundwater Well

As noted earlier based on consultations with MMIG it was indicated that there are no site-specific studies available but groundwater depth within the site is expected to be between 70-300 m with salinity levels around 3-10 g/ml.

It is expected that if this option is undertaken, this will require the drilling a deep well and the construction of a small desalination system, with pumping equipment, reverse osmosis system, water storage tank, disinfection system and distribution piping.

The following are next steps to be undertaken by the EPC Contractor:

- EPC obtain permit from MMIG to drill an exploratory well to determine groundwater depth and groundwater quality.
- EPC to undertake water quality analysis to determine if water quality is considered suitable for Project requirement and if not determine the treatment requirements.
- EPC Contractor should investigate feasibility compared with other options identified, including ensuring (through engagement with Ministry of Industry and Geology and Ministry of Water Resources) that water withdrawals will not impact other potential existing water users within the aquifer.
- Based on the above and should it be feasible, EPC Contractor should apply for a permit to the Ministry of Mining Industry and Geology (MMIG) to use this water source. It is expected that MMIG will undertake a study to ensure that the quantities are within the sustainable yield of the aquifer (otherwise they would not provide a permit).

Construction Phase			**Operation Phase**		
Type	Negative		Type	Negative	
Duration	Medium-term	Relevant for construction period which is 42 months	Duration	Long-term	Relevant for operation period
Magnitude	Medium	Amounts of water required is considered medium level	Magnitude	Low	Amounts of water required is considered low level
Reversibility	Reversible	N/A	Reversibility	Reversible	N/A
Sensitivity	High	Given water situation in Karakalpakstan	Sensitivity	High	Given water situation in Karakalpakstan
Likelihood	High		Likelihood	High	
Frequency	Frequent	Due to continuous requirement for water supply	Frequency	Frequent	Due to continuous requirement for water supply
Timing	Not relevant		Timing	Not relevant	
Extent	High	Could impact all resources / users relying on such water	Extent	High	Could impact all resources / users relying on such water

		source which could be more than 10km away			source which could be more than 10km away
Significance	**Moderate**		**Significance**	**Minor**	

Additional Requirements

The following identifies additional requirements to be applied by the EPC Contractor and Project Operator during the construction and operation phase respectively and which include:

- Undertake feasibility assessment to determine the optimal water supply option for the Project based on the options provided earlier (Option 3 or Option 4) including ensuring no impacts on any potential existing water users. Based on the option selected, ensure all permits and requirements are obtained as applicable.
- Document water consumption of the Project during construction (monthly) and during operation (annually).
- Develop a water management plan for the construction and operation phase. The plan should emphasize on water conservation and efficiency such as the following in particular:
  - Utilizing the dry-cleaning methods wherever applicable;
  - Utilizing water saving fittings where applicable (taps, urinals, toilets, trigger guns, etc.);
  - Consider utilizing treated wastewater/grey water for dust suppression and any irrigation requirements as applicable;
  - Ensure that washing/cleaning activities (e.g. vehicle and equipment washing, toilets flushing/cleaning, etc.) are carried out using appropriate methods requiring low water consumption or dry (water-less) cleaning techniques where possible;
  - Awareness about resource efficiency, in particular concerning water use, shall be reinforced to all workers through signage and posters as appropriate; and
  - Undertake weekly inspections for potable and non-potable water storage tanks and water supply connections to ensure there are no leaks. If any are located, they will be fixed immediately.

14.2.6 Potential Impacts on Road Networks during the Construction Phase

1. Sources of Traffic

The principal sources of traffic generated by Project construction are listed as follows:

- ***Delivery of Equipment, Machinery and Materials:*** this will include vehicles that will be utilized for the delivery of equipment, machinery and materials to the Project site and that are required for the construction phase. This will include but not limited to: (i) haulage container trucks (to supply WTG components, inverters, transformers, etc.), (ii) site machinery required (excavators, rollers, etc.); (iii) construction material (e.g. aggregate, gravel, soil, etc.), and (iv) and other as applicable. Such vehicles will be using key national highways and roads from ports and other locations where such materials are sourced.

As the EPC Contractor has not been assigned yet, no details are available at this stage on the number of vehicles required for delivery of material and equipment, routes, sources of materials, etc. Therefore, for this figure the numbers have been estimated based on requirements/experiences for other wind farms in Uzbekistan.

Based on the above, the ***maximum at peak*** daily container delivery at peak is estimated at around 600 as noted within the table below (which is expected at peak months only).

WTG Components	20
Site Machinery	50
Construction Material	500
Total at peak per day	**~600**

- ***Transport of project workers***: as discussed earlier, no details are available at this stage on whether there will be onsite or offsite accommodation facilities for workers. However, given the remoteness of the site, it is highly likely that there will be offsite accommodation facilities. Nevertheless, it is expected that Project staff and local workers will be transported to and from the construction site by buses at least once per month. Taking into account the number of workers at peak (2,500 workers), and bus capacity (assuming 50 passengers), the daily transportation requirement would be **~2 buses per day at peak.**

- ***Service Contractors***: contractors assigned to provide regular services for the Project to include water tankers, wastewater haulers, hazardous waste haulers, food/catering suppliers, that will be through trucks and large vans.

  The daily maximum number of trucks at peak in relation to this can be estimated at 10 (assuming they all are onsite on the same day) to include water supply tankers, wastewater hauler, hazardous waste hauler and food supply/catering trucks.

- ***Other***: this will include other minor traffic and transportation requirements such as: (i) construction monitoring visits by entities (e.g. lenders, auditors, etc.); (ii) emergency response vehicles in case of an incident onsite (e.g. fire trucks, ambulance, etc.); (iii) other visitors to the site. Those will not generate additional traffic to the sire and can be considered negligible.

Summary of Peak Vehicle Numbers

The table below provides a summary of the peak maximum daily number of vehicles that could access the site during a single day. *However, it is important to note that the figure is based on peak numbers assuming all peak traffic requirements occur on the same day*. In reality, actual peak numbers are likely to be lower given that peak number of workers and peak delivery of materials is not expected to be on the same day or week.

Table 76: Summary of Peak Vehicles

Traffic Source	Maximum Number of Vehicles
Delivery Vehicles	~600
Buses	2
Service Contractors	10
Total per day at peak	**612**

2. Traffic Route

Wind turbines are manufactured in factories and transported to the installation site where they are assembled. Wind turbine components have big dimensions and weight, and their transport poses a challenge to the existing roads and infrastructure. The Project's wind turbine blades have a length of around 100m and are usually transported in one piece. Tower components can have a transport height of up to 5m. Nacelles are also usually transported in one piece and can have a weight of more than 70tons.

Components for wind energy projects are usually transported by sea from the manufacturing country to the nearest seaport and are then loaded in existing ports to trucks which maneuver their way through existing roads to the installation site.

Given the increasing size, weight, and length of components of the wind turbines, proper transportation and logistical solutions could be required for managing the heavy-load long-haul requirements. If improperly planned and managed, the trucks hauling the various heavy Project components may damage the existing roads, highways and bridges, utility lines (e.g. electricity lines), and could also be a public safety concern for other vehicles on the road.

A Traffic and Transport study was undertaken by the Developer to study the proposed routes in order to transport the Project's WTG to the Project site.

The main objective of this study is to analyze and assess the potential opportunities and capabilities within the currently viable transportation routes. This involves conducting a thorough examination of the terrestrial transportation pathways leading to the designated Project location. It also involves reviewing the existing infrastructure network along these routes, including but not limited to the areas relevant to the Project's scope. This examination seeks to identify the complete range of constraints and dimensional parameters that align with the operational requirements of oversized and overweight equipment. The constraints or obstacles include: (i) sharp turns; (ii) bridges; (iii) overpass bridges; (iv) railway overpass; (v) road signs; (vi) road width; and (vii) others. The figure below presents an example of the constraints that were considered.

To achieve these objectives, a series of systematic tasks were carried out in alignment with the predefined goals established by the Developer as follows:

- An exhaustive survey was conducted, encompassing the evaluation of land routes starting from the Khorgos border (Nur Zholy customs) and extending to the Project site.
- Subsequently, a detailed analysis was conducted, delving into the intricacies of the infrastructure environment along these designated routes.
- A comprehensive review was also undertaken, examining the potential use of the existing public road network for transporting out-of-gauge (OOG) cargo.
- The endeavor further included a meticulous examination of the technical documentation related to both the existing and planned facilities provided by the asset owners.
- The culmination of these efforts resulted in the development of a highly detailed technical report, which synthesizes the outcomes of these comprehensive endeavors.

Figure 99: Transport and Road's Constraints

The proposed transportation options that will be considered are provided in the figure below and further discussed.

Option 1: Nur Zholy Customs Post to Yallama Customs Post

The route starts from the Nur Zholy Customs Post in the People's Republic of China and passes through the Republic of Kazakhstan, then ends in Yallama Customs Post in Uzbekistan. The route passes through the territory of Almaty, Zhambyl, South Kazakhstan regions with a total distance of 1,430km. Based on the collected and analyzed materials along the surveyed route, the following key findings are deduced:

Under the specified transportation conditions outlined in the technical report, it is possible to safely pass a vehicle with overall dimensions of 85.00m x 5.00m x 5.00m.

When traversing bridge structures with a declared total mass of 124.00 tons, approval and permission from regulatory bodies such as the Transport Control Inspectorate and KazAvtoZhol JSC are mandatory.

The vehicle should travel at a maximum speed of 10 km/h in accordance with Decree No. 228 dated 04/24/2020.

The public roads along the route are currently in satisfactory condition, ensuring safe conditions for transporting oversized and heavy cargo.

To ensure the safe movement of oversized and heavy vehicles along the designated route, it is imperative to have both a PILOT cover car and a traffic police car for temporary traffic control and blocking of oncoming vehicles.

On ascents and descents along the route, careful consideration of suitable vehicles for cargo transport is essential, along with adherence to requirements for transporting oversized and heavy goods.

Safe passage of oversized and heavy transport cargo along the route necessitates strict adherence to measures outlined in the survey report and the following requirements:

- Deployment of two PILOT cover vehicles throughout the entire route.
- Coordination with traffic police for traffic blocking as specified in the technical report.
- Transporting goods only under favorable road and weather conditions (optimal visibility).
- Advance coordination and execution of installation and dismantling operations along the entire specified route.
- The special cargo platform carrying the cargo must be equipped with swing bridges to facilitate maneuvering on certain sections of the route.

Option 2: Yallama Customs Post to the Project Site

The route passes through the Regions of Tashkent, Syrdarya, Jizzakh, Samarkand, Navoiy, Bukhara, Khorazm and the Republic of Karakalpakstan in Uzbekistan with a total distance of 1,112km. Based on the collected and analyzed materials along the surveyed route, the following key findings are deduced:

Artificial Structures: When navigating artificial structures with a gross weight of 124.0 tons and an axial load of 8.7 tons, structural reinforcement or complete overhaul of load-bearing elements is required in accordance with the route survey's specifications.

Public Roads: Public roads along the route are generally in satisfactory condition, provided that cargo adheres to standard axle loads as per the regulations outlined in the Republic of Uzbekistan's RCM No. 342 dated December 26, 2011, and measures introduced for controlling vehicle weight and volume parameters, as per RCM No. 337 dated May 28, 2020.

Above-Ground Utilities and Structures: Above-ground air utilities and structures, Road Traffic Safety Inspectorate posts, some power lines, and telecommunication lines present obstacles due to their 4.5-meter height. Coordination with relevant ministries and departments, including National Electric Networks of Uzbekistan JSC and Regional Electric Networks JSC, is necessary to facilitate safe passage. Attention should also be given to gas pipelines, overhead signs, traffic lights, and other obstructions, which may require temporary disconnection.

Ascents and Descents: Appropriate vehicle selection and compliance with standards for transporting bulky and heavy goods are imperative for managing ascents and descents along the route.

For the safe transport of oversized and heavy cargo along this route, compliance with the following measures and requirements is essential:

- Selecting a road train with the required number of axles and calculated load distribution as recommended in the technical report.
- Executing necessary actions such as constructing bypasses, reinforcing bridge structures, temporarily suspending overhead power lines, and ensuring favorable road and weather conditions.
- Adhering to the "Rules for ensuring traffic safety during the transportation of oversized and heavy cargo by road" in accordance with the Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 342 dated December 26, 2011, and measures introduced for controlling vehicle weight and volume parameters per RCM No. 337 dated May 28, 2020.
- It is necessary to notify the territorial road maintenance organizations of the Committee for Highways in advance. This notification should include details about the planned route within the regions under their jurisdiction, highlighting the traffic plan for cargo accompaniment, obstacle elimination strategies, and solutions for the safe passage of heavy and oversized road trains.

Option 3: Shymkent to Beyneu

The route passes through the territory of Kyzylorda, Aktobe, South and west of Kazakhstan Regions with a total distance of 2,410km.

Based on the collected and analyzed materials along the surveyed route, the following key findings are deduced:

Under all specified transportation conditions outlined in the technical report, it is both possible and safe for a vehicle with overall dimensions of 85.00m x 5.00m x 5.00m to pass through.

Concerning bridge structures, when traversing these structures with a declared total mass of 124.00 tons, it is imperative that a special cargo platform, carrying the cargo, is equipped with swing bridges. These swing bridges are essential for maneuvering on specific sections of the route.

Option 4: Port Bautino to the Project Site

The route passes through Zhangildy, Shetpe, south and west of Kazakhstan Regions and then enters Uzbekistan through the northwestern border in Karakalpakstan en-route to Kungrad Region and the Project Site. The total distance of the route is 912km.

Based on the comprehensive collection and analysis of materials along the surveyed route, stretching from Port Bautino customs post to Tazhen at the Border of the Republic of Uzbekistan at Davut-Ata customs to the Project site, the following were deduced:

Under the specified transportation conditions outlined in the technical report, it is both possible and safe for a vehicle with overall dimensions of 85.00m x 5.00m x 5.00m to traverse this route.

Regarding bridge structures, when navigating these structures with a declared total mass of 124.00 tons, it is imperative that a special cargo platform carrying the cargo is equipped with swing bridges. These swing bridges are necessary for maneuvering on specific sections of the route.

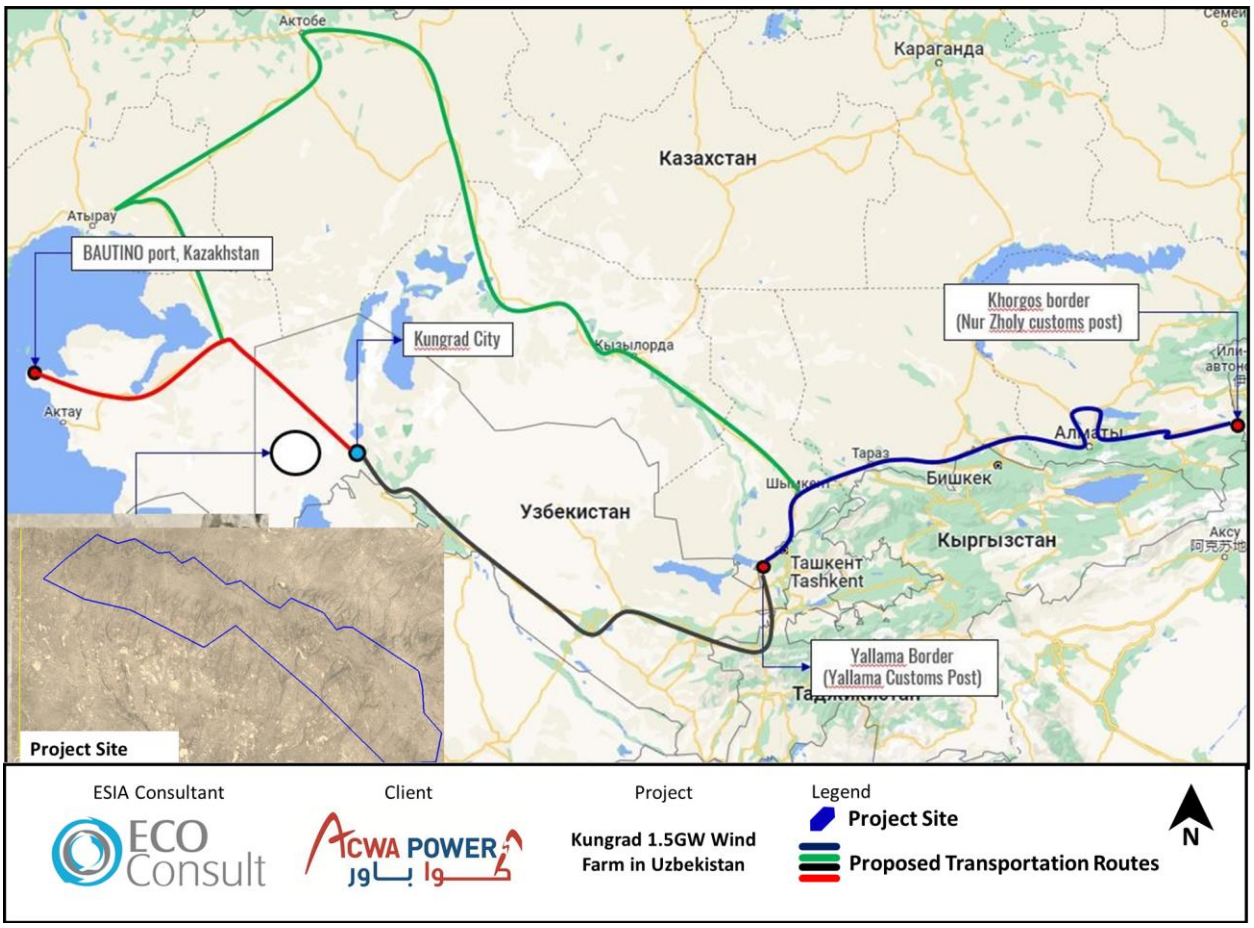


Figure 100: Proposed Transportation Routes

3. Impact Assessment on Traffic and Road Capacity

As discussed in "Section 6.3.1", based on consultations with Ministry of Transport of Karakalpakstan / Kungrad District Road Use Unitary Enterprise aimed to obtain the following information:

- Theoretical road capacity;
- AM/PM traffic counts; and
- Road conditions;

However, it was indicated that such information is not available.

Nevertheless, the Project's traffic requirements are expected to utilize as a worst-case scenario throughout all traffic routes to be utilized 1-lane highways which typically have a capacity of 2,000 equivalent vehicles per hour (as opposed to 2-lane highways which have a capacity of 3,500 equivalent vehicles per hour).

The table below presents the traffic requirement for the Project as established earlier compared to the 1-lane highway capacity. As noted, the entire Project traffic requirement will not result in an additional traffic of around 5%.

Table 77: Project and Existing Traffic

Traffic Source from Project	Maximum Number of Vehicles per day	Equivalent Vehicles*	Equivalent Vehicles per hour	Highway Capacity
Delivery Vehicles	600	3000	125	2,000
Buses	2	2		
Service Contractors	10	30		
Total	**612**	**3,000**		

Assuming half/single/double trucks equal to 2/3/5 equivalent vehicles respectively

Construction Phase		
Type	Negative	
Duration	Medium-term	Limited to construction period only which is 42 months
Magnitude	Medium	Given a 5% increase only in traffic
Reversibility	Reversible	Baseline restored after completion of construction works
Sensitivity	Medium	Given a 5% increase only in traffic
Likelihood	High	Limited to construction period only
Frequency	Frequent	Expected to occur continuously during construction phase
Timing	Not relevant	
Extent	Medium	Impacts could have an effect up to 5km radius
Significance	**Moderate**	

4. Impact Assessment on Health and Safety

Health and safety in relation to traffic and transport is mainly related to potential for accidents occurring on roads and highways which in turn could affect the health and safety of users on the roads, workers and others. Road accidents can derive from a number of causes, to include but not limited to the following:

- Violating traffic rules such as speed limits.
- Bad driving behavior such as overtakes, sudden lane changes, misuse of direction indicators, low level of attention, awareness condition of the driver and others.
- Road characteristics and conditions. There could be areas within highways utilized that have sections that are in poor conditions and require repairs repair such as potholes and uneven surfaces which gives rise to 'accident hotspots.
- Vehicle maintenance (brakes, suspensions, etc.).
- Weather conditions to include in particular: (i) sand and salt storms, (ii) windy conditions, (iii) extreme hot and cold weather, and (iv) conditions and low/high temperatures.
- Project components mainly related to abnormal loads (if applicable) which if inappropriately managed could entail health and safety risks on users on the roads.

Construction Phase		
Type	Negative	In extreme cases could entail permanent impacts (e.g. permanent disability) however such impacts are controlled through implementation of general best practice.
Duration	Medium term	
Magnitude	Low	
Reversibility	Reversible	

Sensitivity	High	
Likelihood	High	
Frequency	Frequent	
Timing	Not relevant	
Extent	Low	
Significance	**Minor**	

Mitigation Measures

The EPC Contractor and Project Operator are required to develop a Traffic and Transport Plan before commencement of any transportation activities to ensure that the transportation process is properly and adequately managed. The Plan must take into account the following:

- The plan must adhere to the relevant local legislations related to traffic and transport as discussed under the regulatory review section.
- As required within "Section 6.3.1" undertake consultation and engagement activities as part of preparation of this plan with the Ministry of Transport of Karakalpakstan / Logistics Center under the Road Use Unitary Enterprise and the General Department of Automobiles Roads of the Republic of Karakalpakstan to arrange for the logistics of the transportation requirements.
- Update traffic requirements of the Project as established within the ESIA related to materials, equipment, machinery, project workers, services, etc. where for each the number of vehicles, weight loads, schedule, route/duration and other as appropriate must be identified.
- Update and identify final traffic routes required.
- The Plan must update and identify the final traffic routes required for the Project. The plan must analyze and study the entire route for transportation of the Project components from the port till the Project site. The assessment must take into account worst case scenarios for transportation of Project components for blade lengths, tower sections, etc. The study must investigate any constraints which need to be considered along the highways leading to the Project site such as bridges, overhead utility cables, slants in roads, etc. and identify accommodations which need to be taken into account (bypasses, adjustments to roads, etc.).
- The Plan must also take into account consider the traffic and transportation schedule and requirements of other windfarm developments. This issue is discussed further in "Section 20".
- Identification of types of vehicles to be utilized.
- Identify in detail procedures for onsite management of traffic. This could include but not limited to: (i) optimization of internal traffic layout so that delivery and other vehicles will be able to access site easily; (ii) identification of requirements for controlling access to the site (e.g. security checkpoint, registration, etc.); (iii) providing appropriate lighting for roads and pedestrian walk and ensure they are segregated; (iv) utilization of appropriate and sufficient traffic signs onsite (e.g. speed limits); (v) barricading of open trenches and excavated pits; (vi) utilization of banksmen and flaggers and other.
- Identify procedures for transportation activities under extreme weather conditions including conditions for suspicion of activities to include in particular: (i) sand and salt storms, (ii) windy conditions, (iii) extreme hot and cold weather, and (iv) conditions and low/high temperatures.
- Identify requirements to be adhered to and enforced on all haulage suppliers such as licensing, driving instructions and code of conduct, speed limits, accident management, monitoring and reporting, etc.

- Identification of a code of conduct to be adhered to and enforced on all drivers in the Project.
- Identification of speed limits onsite and identification of all traffic signage requirement onsite.
- Identification of a procedure for management of onsite/offsite traffic accidents.
- Reflect the procedural actions for traffic management in: (i) induction training material; and (ii) repeated/refresher Toolbox Talks (TBT).
- Identify Key Performance Indicators (KPI) for implementation of plan.
- Identify roles and responsibilities for implementation of plan.
- Identify abnormal loads and obtain permits to carry these loads on highways.
- Ensure all vehicles are subject to a regular inspection / maintenance program.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator during the construction and operation phase and which include:

- Submission of Traffic and Transport Plan.
- Submit consultation records with Ministry of Transport of Karakalpakstan / Logistics Center under the Road Use Unitary Enterprise and the General Department of Automobiles Roads.
- Submit final detailed design of internal road networks.
- Submit signed code of conduct for all drivers.
- Submit TBT records.
- Submit abnormal load permits as applicable.
- Inspection, monitoring and reporting for all requirements within the plan as applicable
- Recording and documenting of any incidents of non-compliance with plan.
- Report all project related onsite/offsite traffic accidents and complaints. Report should identify the cause of accidents or complaints and corrective measures undertaken to ensure such incidents are not repeated again.

14.2.7 Potential Impacts on Gas Infrastructure during the Planning Phase

Improper planning and site selection of the Project components could damage/disturb existing pipeline and given its characteristics in such cases this could cause serious health and safety risks to workers. In addition, as discussed earlier in “Section 6.3.1” there were previously some geological exploration activities undertaken onsite that included blasting activities.

Planning Phase

Type	Negative	
Duration	Long-term	Relevant for construction and operation period
Magnitude	Medium	Impacts will be noticeable
Reversibility	Irreversible	As it could entail serious H&S risks
Sensitivity	High	Given that it could entail serious H&S risks to workers
Likelihood	Low	
Frequency	Rare	Limited to construction activities near or close to existing pipeline
Timing	Not relevant	
Extent	Medium	Impacts could entail effects up to 5km
Significance	**Moderate**	

Mitigation Measures

The following identifies the key mitigation measures that should be undertaken by the EPC Contractor during planning phase of the Project:

- As a first step, preliminary design of the Project should take into account a 250m buffer from all gas infrastructure onsite as required by UrgenchtransGaz.
- It is highly likely that the Project will require several point crossings over the pipeline to connect the various WTG and Project components. This should be incorporated as part of the detailed design. The detailed design must be submitted to UrgenchtransGaz review and approval.
- Obtain final and formal communication from State Committee on Geology and Mineral Resources that there will be no more exploration or blasting activities within the Project area.

As discussed in "Section 14.1.7" there is a small overall area between the Project footprint and the Committee's exploration area. Ensure that final Project boundary (including any Project components) is not placed within this area and ensure that final approval on this is obtained from the State Committee. The following identifies the key mitigation measures that should be undertaken by the EPC Contractor during construction phase of the Project:

- As part of induction training, it must be emphasized to all workers the presence of the gas pipeline within the Project site. It must also be emphasized that all transportation activities should be restricted to destinated roads and that it is strictly prohibited to approach the gas pipeline or its buffer area.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor during the planning phase and which include:

- Submission of formal letter from UrgenchtransGaz with approval of detailed design.
- Submission of formal letter from State Committee on Geology and Mineral Resources confirming no more exploration or blasting activities within the Project area and approval on final Project boundary.

15. SOCIOECONOMICS

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to socioeconomics. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

Note: as explained earlier, the EPC Contractor has yet to be selected and hence certain elements of the Project details are not yet known or finalized. Following selection, the EPC will provide such details (e.g. footprint and location of staff accommodation (camps), service provision, local recruitment targets, etc.).

The availability of the above information is not aligned with the ESIA submission timeline, the therefore such information should be included within the Project specific management system as discussed in further details under “Section 21.2”.

15.1 Purpose

A socioeconomic baseline provides a comprehensive understanding of the Project affected households social and economic conditions within the Project Area. This chapter describes the socioeconomic baseline conditions for the affected households, of the affected communities within the Project Area.

The socioeconomic baseline overview includes a description of the baseline data collection process, provides a detailed description of the socioeconomic conditions of the affected population, including income, employment, education, health and access to services, infrastructure, and vulnerability.

15.2 National Context and Project Location

15.2.1 National Context

Uzbekistan, officially referred to as the Republic of Uzbekistan, is a predominantly Islamic, land-locked country in the region of Central Asia. With a population of approximately 36 million people, it is the 40th most populous country in the world, whilst ranking 128th in terms of population density. According to the World Bank (World Bank, 2022), Uzbekistan has a Gross Domestic Product of approximately US$80 billion, with a GDP per capita of US$2,255, placing the country 147th in the ranking of GDP per capita.

Uzbekistan fell under Russian control in the 19th century and, following the end of Soviet rule in 1991, subsequently gained its independence. Since gaining independence, the country has diversified agricultural production while developing its mineral and petroleum export capacity and increasing its manufacturing base, although cotton remains a major part of its economy (CIA, 2023). The Asian Development Bank’s support for Uzbekistan in 2022 focused on reforms for the country’s transition towards an inclusive and market-driven economy (ADB, 2023). The ADB is closely aligned with Uzbekistan’s national development strategy and its priority areas:

- Governance and public administration reforms;
- Economic development, including structural reforms, strengthening private ownership and entrepreneurship, and improving transport and trade connectivity; and
- Social development.

Figure 101 below illustrates the GDP growth rate of Uzbekistan from 2021 until the forecasted rate of 2024. The GDP growth rate is expected to steadily decline since the 7.4% rate achieved in 2021, however, the 5.5% forecasted GDP growth rates of 2023 and 2024 are still higher than the forecasted global averages of 2.9% in 2023 and 2.7% in 2024 (OECD, 2023).

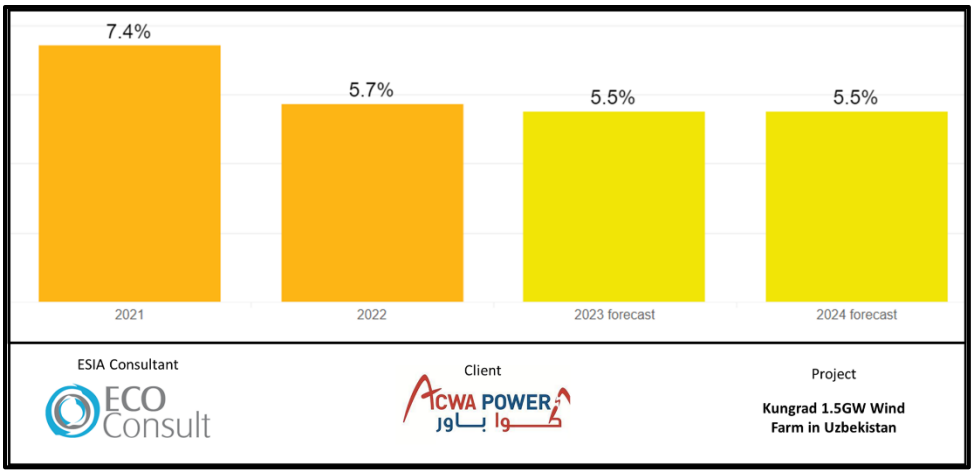


Figure 101: GDP Growth Rate of Uzbekistan (ADB, 2023)

15.2.2 Autonomous Republic of Karakalpakstan

Karakalpakstan, officially the Republic of Karakalpakstan, is an autonomous republic in the northwestern region of Uzbekistan. The republic has a population of approximately 2 million people, and the people are largely split between the ethnic groups of Uzbek or Karakalpak. Table 78 illustrates a comparison of the ethnic groups of Uzbekistan and Karakalpakstan.

Table 78: Ethnic Groups of Uzbekistan and Karakalpakstan

Ethnic Group	Uzbekistan	Karakalpakstan
	Percentage	Percentage
Uzbek	83.8%	40.4%
Tajik	4.8%	-
Kazakh	2.5%	15.4%
Russian	2.3%	-
Karakalpak	2.2%	37%
Tatar	1.5%	-
Other	2.9%	7.2%

Whilst the economy of the region used to be heavily dependent on fisheries in the Aral Sea, the contemporary economy of Karakalpakstan is predominantly based on agriculture. Cotton, rice and melons are important components of the agricultural base, with fruits such as plums, pears, grapes and apricots being important crops in the region.

The administrative setup of Karakalpakstan includes multiple levels of governance to ensure effective management and service provision within the region. At the highest level, Karakalpakstan is led by the Supreme Council (known as Jokori Kenes), which acts as the legislative body representing the interests of the population. The republic has its own constitution but follows all legislation of the Government of Uzbekistan. However, it shares veto power with Uzbekistan over decisions concerning its affairs.

The Supreme Council Chairman is the head of the Government including the Council of Ministers. All ministries within Uzbekistan are also present in Karakalpakstan. For example, there is a Ministry of Ecology, Environmental Protection, and Climate Change in Tashkent, and a Ministry of Ecology, Environmental Protection, and Climate Change for the Republic of Karakalpakstan.

Administratively, Karakalpakstan is divided into 14 Districts, known as "Rayons". Each District has a local administration (known as Khokimiyat) led by the Hokim (equivalent to a Governor). The Khokimiyat is responsible for the local governance, development, and implementation of government programs and initiatives at the district level. They are also responsible for municipal services such as water supply, waste management and other crucial services.

15.2.3 Aral Sea: Environmental, Health and Vulnerability Overview

The Aral Sea played an important role in the development of the economies of both Uzbekistan and the Republic of Karakalpakstan. The Aral Sea was a crucial factor in the region's productive sectors, in ensuring employment of the population, and in the formation of a sustainable social infrastructure. Fertile lands of the Amudarya and Syrdarya rivers' delta, as well as highly productive pastures provided jobs to tens of thousands of people in the field of livestock, poultry, and growing crops. Problems of the Aral Sea arose and took on alarming scales in the 1960s as a result of extreme regulation of the major transboundary rivers of the region - the Syrdarya and the Amudarya (UN Multi-Partner Human Security Trust Fund for the Aral Sea Region, 2023). Significant population growth, the scale of urbanization and intensive development of lands, construction of large hydrotechnical and irrigation facilities on the water-streams of the Aral Sea basin, without taking into account environmental consequences, were main factors of the Aral Sea's drying out.

Rise in Unemployment

The Aral Sea drying up has caused a complex set of environmental, socio-economic and demographic problems in the Aral Sea region and has resulted in several negative consequences. In the past, the Aral Sea was one of the richest fishing grounds in the world: the annual catch of fish in the reservoirs of the Aral Sea was approximately 30-35 thousand tons (UN Multi-Partner Human Security Trust Fund for the Aral Sea Region, 2023). More than 80 % of the inhabitants of the Aral Sea coast were engaged in the extraction, processing and transportation of fish and fish products. The loss of the fishing and transport potential of the sea resulted in the dismantling of industries such as fish processing and ship repair; tens of thousands of people became unemployed.

Health Issues

The most acute issue is the access of the population to high-quality drinking water. More than half of the population of the Aral Sea region, especially inhabitants of rural settlements, have to use insufficiently purified and highly mineralized water. According to official statistics, the provision of centralized water supply for apartments in the Republic of Karakalpakstan for 2006-2016 decreased from 71.3% to 66.6% (UN Multi-Partner Human Security Trust Fund for the Aral Sea Region, 2023).

Water pollution and a large volume of dust and salt rising up from the bottom of the dried Aral Sea have played a core role in the high rates of deceases, general and infant mortality, as well as high rates in a number of somatic diseases: anemia, kidney disease, gastrointestinal disturbances, an increase in the level of respiratory diseases, blood diseases, cholelithiasis, cardiovascular and oncological diseases.

Over the last decade, the infant mortality rate in the Republic of Karakalpakstan has exceeded the same indicators for the Republic of Uzbekistan by 13%, maternal mortality by 17% on average. The death rate from tuberculosis in the Republic of Karakalpakstan remains the highest in the country (19.4 cases per 100,000 population) and almost three times higher than the average for Uzbekistan (UN Multi-Partner Human Security Trust Fund for the Aral Sea Region, 2023).

Impact on Farmers in the Region

Salinization of soil by windborne salt caused by the drying of the Aral Sea is impacting crop health, with farmers flooding their fields at the beginning of each season to leach the salt from the upper layers prior to planting.

Sustainable agricultural development in Karakalpakstan depends mainly on the state of land and water resources. According to official estimates, half of the irrigated land is below the average, and over the past decade, agricultural land shrank by 177.1 thousand hectares. In general, the reduction of pastures and the decline in land productivity, the reduction in the area of vegetation, and the drying out of lakes have caused the loss of more than 100,000 jobs in various sectors of the economy in recent years.

According to the results of a survey conducted by the Institute for Social Research, findings revealed that the economic potential of the region, in particular the one of the Republic of Karakalpakstan, was ranked last in terms of its economic potential, agricultural production, and retail commodity turnover and penultimate in terms of its production of consumer goods. Thus, the total per capita income in Karakalpakstan is 1.4 times lower than the average for Uzbekistan. Karakalpakstan is ranked 12th among the 14 regions of the country by volume of products and services indicators, the number of small businesses, and exports per capita, which features the level of entrepreneurship development.

Ensuring food security in the Republic of Karakalpakstan has its own specific features related to the state of land and water resources, environmental challenges, the level of socio-economic development, access to transport, and the capacity of food markets. For approximately sixty percent of the households in the region, the affordability of food products is low. In most districts, households have private backyard plots where they grow vegetables, fruits and melons and keep cattle. The products produced on household plots are mainly consumed by the households themselves and only one-tenth of it is sold (UN Multi-Partner Human Security Trust Fund for the Aral Sea Region, 2023).

Interventions

Any impact of any intervention must be considered as being cumulative on top of being an existing disturbed, and worsening situation. All households in Karakalpakstan are defined as generally vulnerable. The drying up of the Aral Sea has caused the salinization of soils due to airborne salt from the Aral seabed, and airborne pesticides and herbicides in Karakalpakstan, with resulting health implications for residents of the region. Furthermore, irrigation water shortages are leading to increasingly challenging farming conditions, with resulting impacts on income and food security in the area. Accordingly, all project-affected parties in Karakalpakstan have inherent vulnerability due to these existing and worsening harsh environmental conditions. See section 8.3 for a full breakdown of vulnerable households and interventions.

15.3 Household Survey Findings

This section is based on detailed socio-economic baseline that was undertaken within Karakalpakstan as part of the Livelihood Restoration Plan (LRP) that was undertaken for the OHTL component. Please refer to the LRP for additional details on the socio-economic baseline. Therefore, such socio-economic conditions are considered to be in general representative as well for the local communities considered for the Wind Farm as identified earlier within "Section 2.2".

The objective of this section is to provide additional socioeconomic information and context and supplement the analysis undertaken under "Section 15.4" previously.

15.3.1 Population and Demographic Characteristics

The households that were interviewed for the socio-economic surveys were located in several separate districts, with the majority of the households being located within the Kanlykul and Nukus Districts of Karakalpakstan. Table 79 illustrates the geographical makeup of the interviewed households.

Table 79: Location of Interviewed Households

District	Count	Percentage
Nukus	46	48%
Kanlykul	50	52%
Grand Total	96	100

Figure 102 provides an illustration of the age distribution of the household members that were identified in the socio-economic survey. It shows that the affected population is a young population, with 71.2% of the household members interviewed in Karakalpakstan being under the age of 40. The most frequently occurring age demographic is the 0-9 range, with 23.14% of the total household members interviewed falling in this category. Regarding the highest and lowest ages identified in the survey population, there are two household members born in 2023 and have not reached their first birthday yet, whilst the oldest household member identified was 79 years old. Of the Households interviewed, the household members are made up of 300 females and 312 males.

In 2017, the median age of the population of Karakalpakstan was 27.7, whilst nationwide in Uzbekistan, the median age was 28.5, illustrating a lower average age within Karakalpakstan. This translates into the Project area, with 71.2% of surveyed household members within the Project area being under the age of 40 years old. This indicates the youthfulness of the household members.

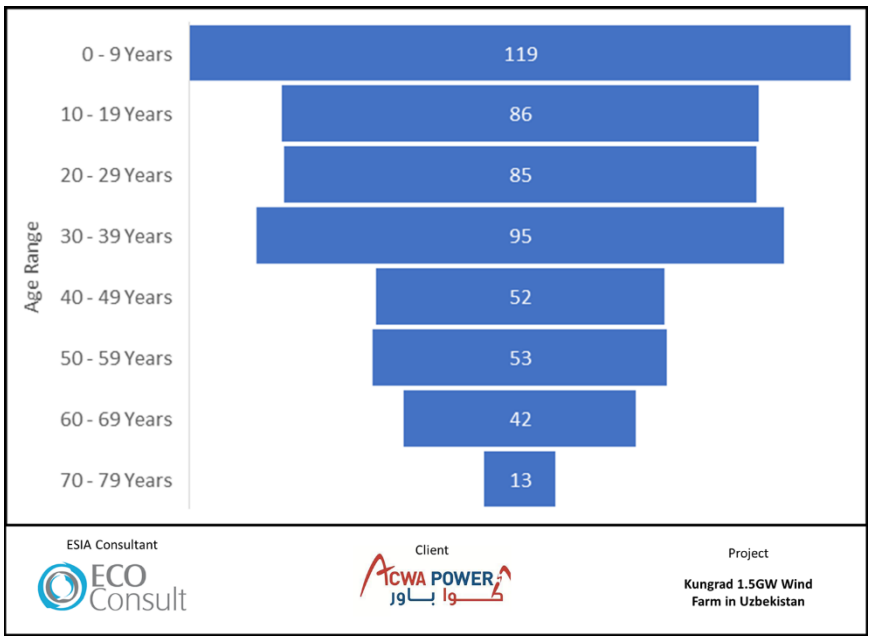


Figure 102: Age Range of Household Members

Table 80: Age Range of Household Members

Age Range	Count	Percent
0 - 9 Years	119	22%
10 - 19 Years	86	16%
20 - 29 Years	85	16%
30 - 39 Years	95	17%
40 - 49 Years	52	10%
50 - 59 Years	53	10%
60 - 69 Years	42	8%
70 - 79 Years	13	2%
Grand Total	545	100%

The breakdown of age from a district perspective can be seen in Table 81 below. Statistically, the district with the youngest population is Kanlykul , with an average age of 28.15 years old. The district with the oldest population is Nukus, with an average age of 30.17 years old.

Table 81: Age per District

District	0-9 Y/o	10-19 Y/o	20-29 Y/o	30-39 Y/o	40-49 Y/o	50-59 Y/o	60-69 Y/o	70-79 Y/o	Average
Kanlykul	77	29	54	38	21	32	24	3	28.15
Nukus	49	53	35	51	29	24	17	9	30.17
Total	126	82	89	89	50	56	41	12	

Of the project-affected people interviewed, 52.3% of the project-affect population are made up of males, with there being 285 males and 260 females.

Table 82 below indicates the household distribution per district, with 96 household heads having been identified. Of the household heads interviewed, 100% identified their religion as Islam.

Table 82: Surveyed Household Distribution per District

District	HH Head	HH Members	Average per HH	Spouse of HH	Son/Daughter
Kanlykul	46	228	5	43	87
Nukus	50	221	4,46	44	114
Total	**96**	**449**	**4,73**	**87**	**201**

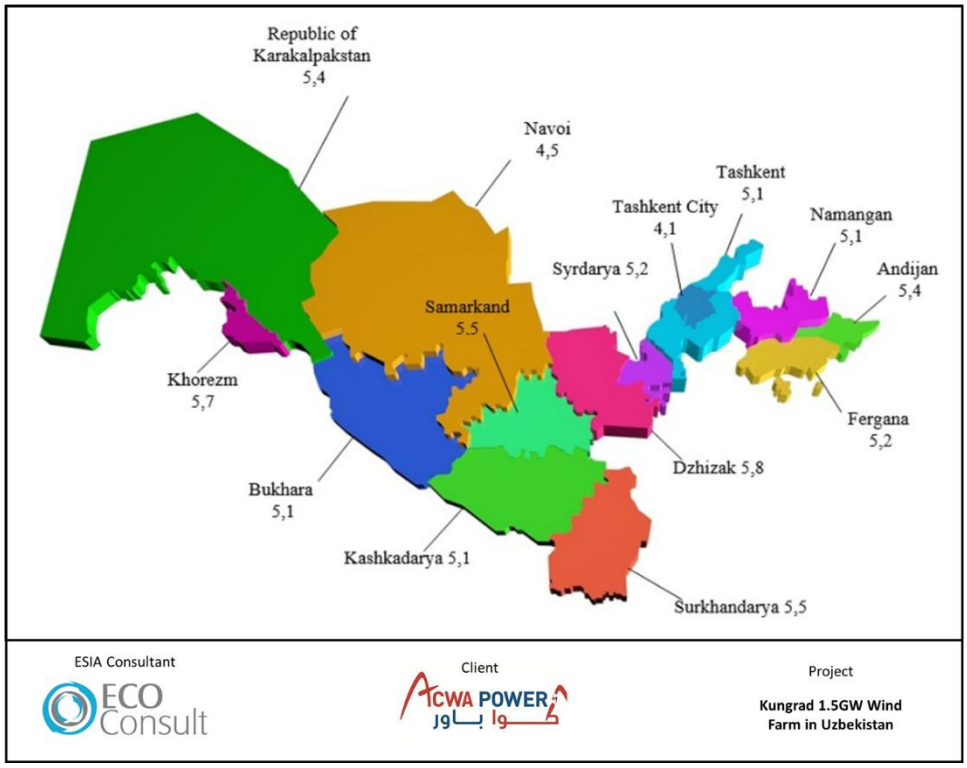


Figure 103: Average Number of Household Members in Uzbekistan's regions

Figure above illustrates a breakdown of the average number of household members per region in Uzbekistan (Statistics Agency Uzbekistan, 2020). The average number of household members per household in Karakalpakstan was 4.73 whilst the average number of household members per household in the Project area was 5.34 which illustrates a household average in Karakalpakstan slightly lower than the rest of the Project area.

Table below provides data on the ethnicity, language, and religion that the household heads identify with. Karakalpak is the most common ethnic in the districts of Kanlykul and Nukus, whilst the household heads in Zhondor identify as Uzbek. A similar pattern can be seen regarding the selection of the household heads primary language, with the household heads in the districts of Kanlykul and Nukus predominantly speaking Karakalpak, whilst in Zhondor, the most spoken language is Uzbek. All household heads indicated that they follow Islam.

Table 83: Ethnicity, Language and Religion - Household Head

ID	Ethnicity			Language			Religion
District	Karakalpak	Uzbek	Kazakh	Karakalpak	Uzbek	Kazakh	Islam
Kanlykul	97%	3%		97%	3%		100%
Nukus	75%	15%	10%	80%	11%	9%	100%

The marital status of the household members is detailed in Table 84. Most households that were interviewed indicated that they are married.

Table 84: Marital Status

District	Married	Single	Widowed	Divorced
Kanlykul	56.72%	41.45%	1.45%	0.36%
Nukus	54.1%	43.65%	1.19%	1.19%

Health

Table below indicates the household members that suffer from some form of disability or chronic illnesses. Of the household members who have indicated that they have a chronic illness or physical mobility issue, four of those identified are the heads of their respective households. Those that selected the 'Other' option for this question have indicated that they have illnesses such as anemia, diabetes, hypertension, are bed ridden and one indicating that they did not feel comfortable revealing their issue.

Table 85: Disabilities and Chronic Illness

District	Chronic Illness	Physical Mobility	Sight	Intellectual Learning	Other	None	% of Members with a Disability
Kanlykul	6	2	3	0	3	264	5
Nukus	5	4	1	0	4	253	5,2

Education

School education is divided into two stages in Uzbekistan. The first stage includes nine years of compulsory schooling with the same programs all over Uzbekistan. The second stage (grade 10–11) covers education and vocational training after nine years. It includes general secondary education and specialized secondary education. Young people receive general secondary education while staying in school for the tenth and eleventh grades. Upon successful completion, they get a Certificate of Complete Secondary Education (University of Stirling, 2023).

Table below indicates the education level of the project affected population interviewed. The most popular choice of education identified is that of a secondary specialized vocation, with 216 household members finishing this level of education. Those who have selected the 'Other' option are still pupils in school, thus have not completed a secondary level of education yet.

Table 86: Education Levels

District	Finished preschool	Finished general secondary	Unfinished higher education	Finished secondary specialized vocational	Finished higher education	Other	None
Kanlykul	7.63%	2.54%	6.2%	0,4	13.1%	10.9%	19.63%
Nukus	2.9%	6.18%	5.1%	32.36%	22.54%	14.9%	13.45%

The table below indicates the education levels of the affected households through a gender lens. More women have finished a secondary specialized vocational education, whilst more men have completed higher education.

Table 87: Education Levels by Gender

Gender	Finished general secondary	Finished higher education	Finished preschool	Finished secondary specialized vocational	Unfinished higher education	Other	None
Male	4.93%	17.5%	5.9%	31.4%	8%	12.6%	18.5%
Female	5.4%	15.3%	5%	38.2%	5.9%	14.1%	15%

Literacy Rates

Table represents the literacy rates for the respective regions who partook in the socio-economic survey. The literacy rates have been filtered down to illustrate the literacy rates of those aged 6 years old and above.

Table 88: Literacy Rates

District	Able to Read	Not Able to Read	% Able to Read
Kanlykul	217	6	97%
Nukus	233	5	98%

Primary Occupations

The figure below illustrates the distribution of employment by economic activity throughout Uzbekistan. The largest employment sector is that of agriculture, forestry and fisheries; which also appears to be one of the largest employment sectors of the households within the Project area.

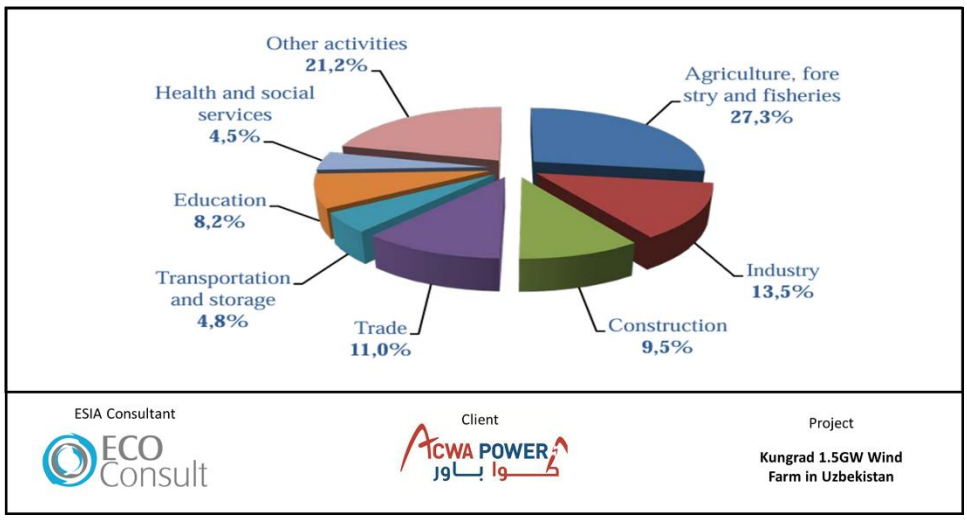


Figure 101: Distribution of Employment by Economic Activity

As per Table 89, commercial farming is the most popular primary occupation in the districts of Kanlykul and Nukus. The second most common primary livelihood activity, school,' illustrates that a large portion of the household members are still students. Regarding the indication of the 'Other' column, the primary occupations identified for this aspect of the primary occupation refers to pensioners, formal employment, kindergarten, students, plumbers, farm workers and teachers.

Table 89: Primary Occupation by District

District	Commercial Farming	General Labor	Housewife	Salaried Employment	Small Trading	School	Subsistence Farming	Too old or sick to work	Other	None
Kanlykul	17%	4%	9%	9%	1%	14%	2%	7%	14%	22%
Nukus	26%	3%	13%	4%	1%	20%	1%	3%	14%	14%

Table 90 illustrates the comparative analysis of the primary occupations of household members by gender.

Table 90: Primary Occupation by Gender

District	Commercial Farming	General Labor	Housewife	Salaried Employment	Small Trading	School	Subsistence Farming	Too old or sick to work	Other	None
Kanlykul	17%	4%	9%	9%	1%	14%	2%	7%	14%	22%
Nukus	26%	3%	13%	4%	1%	20%	1%	3%	14%	14%

Table 91 below illustrates the unemployment rates of the household members. This was calculated by analyzing the household members who are above the age of 18 within the Project area that have indicated

that they have no primary occupation. The breakdown of the unemployment rate of the household members from a gender perspective indicates that more men, with a rate of 60%, are unemployed than women. According to Macrotrends (2023), Uzbekistan's unemployment rate for 2022 was 6.01%, whilst Karakalpakstan's unemployment rate was last calculated to be 6%. The estimated unemployment rate for the Project affected area is approximately 4,8%, lower than both national and regional rates.

Table 91: Unemployment Rates per District

District	No Primary Occupation	% of District	Male	Female
Kanlykul	7	2	5	2
Nukus	12	4,5	6	6
Total	19	/	11	8

Employable Skills

Table 92 illustrates the different employable skills of household member across the districts. No employable skills are the most common answer most household members choosing this response. Regarding tangible employable skills, driving, cleaning and cooking were the most common choices amongst the household members.

Table 92: Employable Skills by District

Skills	Kanlykul	Nukus	Total
Administrative	1	3	4
Carpentry	2	1	3
Cleaning	40	28	68
Computers	12	41	53
Cooking	24	24	48
Driving	54	31	85
Electrical	2	4	6
Gardening	11	11	22
Mechanical	7	8	15
None	95	83	178
Other	2	6	8
Plumbing	2	6	8
Sewing	16	13	29
Heavy Equipment Operator		1	1
Total	**268**	**260**	**528**

Table 93 below provides a comparative analysis of employable skills by gender regarding the interviewed household members. There is a clear distinction of skills, with men predominantly focusing on technical skills such as computers and driving; whilst cleaning, cooking and sewing are the prominent skills of women.

Table 93: Employable Skills by Gender

Skills	Male	Female
Administrative	100%	
Carpentry	100%	

Cleaning	3%	97%
Computers	71%	29%
Cooking	2%	98%
Driving	98%	2%
Electrical	100%	
Gardening	85%	15%
Mechanical	100%	
None	50%	50%
Other	25%	75%
Plumbing	85%	15%
Sewing	4%	96%
Heavy Equipment Operator	100%	

Agriculture and Livestock

The table below illustrates that the most common livestock kept is that of sheep. Kanlykul has the highest quantity of sheep with 1,210 in the district. The second most livestock kept is cattle with a total of 813 heads of cattle across the districts; and Kanlykul keeping the most cattle statistically with 509 cattle.

Table 94: Livestock per District

District	Cattle	Chickens	Sheep	Donkeys	Horses	Goats	Camels	Total
Kanlykul	509	350	1210	7	74	84		2234
Nukus	304	255	505		129	90	110	1393
Total	813	605	1715	7	203	174	110	3627

Table 95 provides a breakdown on the income sources of the households in different districts. The most common income source is the sale of crops, with the Nukus District household heads predominantly engaging in this activity.

Table 95: Income Source per District

District	Crop Sales	Cotton	Casual Labor	Sale of Livestock	Employment	Sale of Vegetables	Sale of Fruit	None
Kanlykul	39	1	2	1				3
Nukus	45	3	2	1	3	1	1	
Total	84	4	4	2	3	1	1	3

Women livelihoods

The table below illustrates that the most common occupation of the men interviewed is that of commercial farming, with approximately (38%) primarily being commercial farmers.

Table 96: Primary Occupations by Gender

District	Commercial Farming	General Labor	Housewife	Salaried Employment	Small Trading	School	Subsistence Farming	Too old or sick	Other	None
Male	38%	6%	0%	6%	0%	19%	2%	3%	11%	25%
Female	4%	1%	11%	8%	1%	21%	1%	6%	17%	18%

Whilst female headed households have been identified and will be monitored, due to the impact being on commercial agriculture, and only impacting a minor % of the farmland, it is not possible to disaggregate gender impacts on the livelihoods of women within the Project Area. However, as with most livelihood restoration projects, women are not recorded as owners of assets and therefore have less control over the decisions regarding the use of compensation.

15.3.2 Vulnerable Groups

As discussed in detail in "Section 06.2.1" earlier, the table below reiterates the vulnerable groups and their relevant within the Project context. In addition, "Section 06.2.1" indicates how such vulnerable groups were consulted as part of the ESIA.

It is noted that there are no people living within the Project site or its surrounding areas. The nearest human settlements are over 100km from the Project site. As noted in Table 14 above, those settlements beyond the 100km are termed "local communities" and were considered for the purpose of current and future stakeholder engagements, including potential vulnerable groups as summarized in Table 15 below. However, such local communities are not expected to be impacted by the windfarm components of the Project as demonstrated throughout this ESIA.

Table 97: List of Vulnerable Groups and Their Relevance

Group	Relevance
Women groups	Could be considered vulnerable as cultural norms could limit their participation in the decision-making process in general that is related to the Project.
Disabled groups	Could be considered vulnerable groups mainly due to physical disability which could limit their access to information on the Project as well as participation in the decision-making process in general that is related to the Project.
Ethnic Minorities	Are defined as groups within a community which has different national or cultural traditions from the main population which could include language, religion, tribe, nationality, race or a combination thereof. Such groups are considered vulnerable as they could have difficulties in accessing social protection benefits as well as social development opportunities (e.g. employment) usually as a result of discrimination, economic and social disadvantage and others. Uzbeks make up the vast majority of the country's population (86.2%), with other communities such Tajiks, Kazakhs, Russians, Karakalpak, and Tatars making up the remaining 16.2%. Approximately 85% of the population is native Uzbek speakers, and the language is recognized as the sole official language. In addition, Russian is widely used in governmental and interethnic communication. Tajik, Kazakh, Tatar, and Kyrgyz are only some of the various ethnic languages spoken there. The majority of the population (about 88%) is Muslim, with the vast majority identifying as Sunni. There are 9% Eastern Orthodox Christians and 3% adherents to other faiths in the country.

	▪ Karakalpak are a Turkic ethnic group who live mostly in Karakalpakstan. They bring a distinct cultural identity, including their own language, to Uzbekistan's already varied population. Karakalpak are not the only people who call the Sovereign Republic of Karakalpakstan home; various other ethnic groups also call it their home. Despite being the majority ethnic group in Uzbekistan, Uzbeks are a sizable minority in Karakalpakstan, largely residing in cities. ▪ Kazakhs are a sizable minority among Uzbeks. They have deep cultural and historical ties to Kazakhstan, with whom they share a same language and bordering provinces like Tashkent and Surkhandarya. ▪ Russians are the largest Slavic ethnic group in Uzbekistan and have been present the longest. Tashkent, the country's capital and a major center of Russian influence, is home to a sizable population of Russian speakers. ▪ Tajiks represent Uzbekistan's second largest ethnic group. They are predominantly located around the borders, particularly in the provinces of Surkhandarya and Samarkand. The Tajik people have their own unique language and customs. ▪ Kyrgyz people in Uzbekistan are primarily concentrated in areas bordering Kyrgyzstan, such as the Fergana Valley. They have maintained their Kyrgyz cultural identity and language. Kyrgyz in Uzbekistan engage in various economic activities, including agriculture, livestock breeding, and handicrafts. As noted in "Section (ii)", the majority of the community ethnic composition is Uzbek, Karakalpak and Kazakh. There are other ethnic compositions that represent less than 1% that include Russian, Tajik, and Kyrgyz. However, all of these groups are part of the community since the Soviet Union era and are well integrated into the society and are not subject to any discrimination or economic/social disadvantage. As such these will not be considered as vulnerable groups.
People living in poverty / underprivileged communities	Could be considered vulnerable as their status could limit their access to information on the Project as well as participation in the decision-making process in general that is related to the Project.
The Aged	Could be considered vulnerable by limitations of access to participate in the Project related community decision-making process.
The Youth	Could be considered vulnerable due to their young adult, unmarried, non-asset owning status, yet likely to be savvier in 21st century technology than their elders but may be unable to contribute to Project related community decision-making process, which will affect their generation more than most.
Language	Specific groups within local communities might have difference languages. This could limit their access to information on the Project as well as participation in the decision-making process in general that is related to the Project.

15.3.3 Local Ethnic Groups

As discussed in detail in "Section 0" earlier, there are no key land use activities undertaken onsite by any specific local community group.

In addition, based on outcomes of FGD with local communities the ethnic composition was mainly Karakalpak, Uzbek, and Kazakh. There are other populations within the ethnic composition in these villages which represent less than 1% of the population and which include Russians, Tajiks, or Kyrgyz. However, all

of these groups are part of the community since the Soviet Union era and are well integrated into the society and are not subject to any discrimination or economic/social disadvantage.

15.3.4 Indigenous Peoples

A common consideration across the two main Project components of the windfarm and the OHTLs, is a consideration of potential impacts on Indigenous Peoples (IPs). This section is applicable to both components. It is noted however, that there is no human settlement or economic activities with the windfarm site or within a 100kms of that site. Consequently, there are no IPs that may be impacted by that component of the Project of this issue. Nevertheless, this section aim to undertake an analysis on IP within Karakalpakstan Region in general. The assessment is presented in this sub-section.

The architecture of international law and conventions on indigenous peoples is framed by the United Nations Declaration on the Rights of Indigenous Peoples, adopted by the General Assembly on 13 September 2007.[56] The multilateral international financial institutions such as the Asian Development Bank. the World Bank, the International Finance Corporation and the European Bank of Reconstruction and Development, have incorporated considerations of indigenous peoples into their performance standards and guidance to developers and practitioners addressing involuntary resettlement and its associated impacts on project affected people. In this project the ADB's requirements are the primary reference.

ADB Safeguard Requirement

The ADB's Safeguard Policy Statement Safeguard Requirement 3, Indigenous Peoples (SR 3), outlines the scope of application of this requirement. "For operational purposes, the term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

1) Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;

2) Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;

3) Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and

4) A distinct language, often different from the official language of the country or region."

The overall Project is located within the Republic of Karakalpakstan, which is an autonomous republic in the northwestern region of Uzbekistan. The republic has a population of approximately 2 million people, and the people are largely split between the ethnic groups of Uzbek or Karakalpak - Uzbek – 40.4 %; Karakalpak – 37 %; Kazakh – 15.4 %; other – 7.2 %. Within Uzbekistan as a whole, Uzbeks constitute 83.8 % and Karakalpaks 2.2 % of the population[57]

A first step is to determine whether or not there is an Indigenous population in Karakalpakstan in general and in the project sites and surrounding areas where they may be impacted by the Project (both the

[56]https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf
[57] Section 15.2.2 Autonomous Republic of Karakalpakstan in this Windfarm ESIA report.

windfarm and the OHTL components.) Note that if there are no indigenous People in Karakalpakstan then there will not be any within the Project area and surrounding areas.

To establish whether there were any indigenous groups in the Project area and context, regard was had to statements by specialist non-governmental organizations such as the World Rights Group International (WRGI). In its World Directory of Minorities and Indigenous Peoples, [58]WRGI notes that "according to official estimates updated in 2017, out of a total of 32.1 million people, the ethnic Uzbek majority totaled just over 26.9 million (83.8 per cent of the population) while ethnic Tajiks made up 1,544,700 (4.8 per cent).

Other sizable minorities include Kazakhs 803,400 (2.5 per cent), Russians 750,000 (2.3 per cent), Karakalpaks 708,800 (2.2 per cent), Kyrgyz 274,400 (0.9 per cent), Tatars 195,000 (0.6 per cent), Turkmens 192,000 (0.6 per cent), Koreans 176,900 (0.6 per cent) and Ukrainians 70,700 (0.2 per cent). Other minorities include Meskhetian Turks and Jews."

Karakalpaks are stated as being a minority group even in the Republic of Karakalpakstan: "Ethnic Karakalpaks represent about a third of Karakalpakstan's population, and a very slight proportion of the country's total population." WRGI notes that many of the minorities "such as Russians, Crimean Tatars" are recent migrants to the country. Hence not all minority ethnic group are indigenous.

It is important to note that the WRGI, in a section on Karakalpaks states "Because of a special autonomy arrangement granted to the Republic of Karakalpakstan, the Turkic-speaking Karakalpaks have in legal and practical terms much greater protection of their rights and in the use of their language."

The WRGI identifies the Karakalpaks as "native to the region" and "a threatened minority" people who have high levels of poverty and low levels of health. Their circumstances are mainly due to the "ecological catastrophe" of the reduction in the South Aral Sea by 90 %, dispersal of salts across the agricultural lands and local effects of climate change.

A second important source referenced in answering the question of whether there is an Indigenous population in Karakalpakstan is the social safeguards study undertaken for the Uzbekistan Surgil Natural Gas Chemicals project and issued as the Social Safeguards Audit Report dated January 2012. [59] It explores "the extent to which the Karakalpaks could be considered to meet the ADB definition of Indigenous Peoples (IPs) and therefore the potential for triggering ADB SR3 on IPs".

The Audit Report contains a review of the Karakalpak ethnic group against an assessment of the applicability of each of the characteristics of Indigenous Peoples as defined in SR 3 and quoted above. Its conclusions are summarized below:

1. Self-identification – "the Karakalpaks meet the defining ADB characteristic of cultural distinctiveness, whilst recognizing that that this cultural identity is not reflected in nationalist ambitions or segregation from other ethnic groups on a day-to-day basis. Although Karakalpaks are considered to be culturally distinct they are socio-economically integrated with other ethnic groups within Uzbek society." [60]

2. Collective attachment – "whilst the Karakalpaks do have a collective attachment to Karakalpakstan as a whole, and in some cases specific areas, this attachment does not translate into cultural practices and or pilgrimages to these areas away from their homes (which are largely in urban or semi-urban areas).

[58] https://minorityrights.org/country/uzbekistan/ (accessed online 17 December 2023)
[59] UZB: Surgil Natural Gas Chemicals Social Safeguards Audit Report January 2012. https://www.adb.org/sites/default/files/project-documents//44944-01-uzb-sa.pdf
[60] Section 3.2.1 Identification as Members of a Distinct Indigenous Cultural Group

Furthermore, Karakalpaks do not have a collective attachment to any of areas in the Project footprint. In conclusion, Karakalpaks are not thought to meet this characteristic of IPs in relation to this Project, and therefore the Project would not trigger ADB SR3 on the grounds of having impacts on the 'territories or natural or cultural resources' that Karakalpaks 'own, use, occupy or claim as their ancestral domain' (ADB SR3 Paragraph 9".) [61]

3. Separate customary cultural, economic, social, or political institutions – "the Karakalpaks are considered to share and participate in the same socioeconomic and governance institutions of mainstream society, within which a number of ethnic groups are politically and economically integrated in accordance with Soviet traditions. The clan and tribe is the distinctive socio-cultural institution of Karakalpaks, which has different practices from modern Uzbek society, the most notable of which is exogamy. However, other ethnic minorities in the project area, such as Kazakhs also share the practice of exogamy and it is not considered uncommon or unusual. Overall, it is concluded that the Karakalpaks do not meet this third defining characteristic of IPs. The one area where there could potentially be grounds for triggering SR3 in relation to the presence of this characteristic would be if the project would affect the socio-cultural institution of the tribe or the clan, however such potential impacts are not considered to be likely as a result of the Project." [62]

4. A distinct language – "Specialists consulted to inform this ESIA stated that having a separate language does differentiate the Karakalpaks from other ethnic groups and mainstream society, and that this language is used in day-to-day interactions between Karakalpaks.19 However Karakalpaks can all speak Uzbek and or Russian, and in some cases in urban areas they cannot speak Karakalpak." [63]

The overall conclusion of the Social Safeguards Audit Report is that "the Karakalpaks meet the fourth defining characteristic of ADB's definition of indigenous people as they have a distinct language that is different from the official language of the country. Karakalpaks meet the first and the fourth defining ADB characteristics of IPs in relation to having a distinct cultural identify and language respectively, however the project is not expected to affect either of these characteristics and therefore SR3 is not triggered on these grounds. In relation to the second defining ADB characteristic of collective attachment to geographically distinct territories in the project area; whilst Karakalpaks have a collective attachment to Karakalpakstan as a whole and to the homelands of their forefathers, they do not have a collective attachment to any specific area within Karakalpakstan. Therefore, overall, the Karakalpaks do not meet this defining characteristic.

Considering the third defining ADB characteristic, it is concluded that the Karakalpaks do not have separate economic or political institutions. They do have distinct socio-cultural and customary institutions in the form of the tribe and clan and the related practices, most notably of exogamy. However, the practice of exogamy is also shared by other members of society in the project area such as ethnic Kazakhs. The project is not expected to affect the tribe or clan structure, or the related socio-cultural practices, therefore SR3 will not be triggered on the grounds of this characteristic.

Overall, the Karakalpaks do not meet all four of the ADB's defining ADB characteristics of IPs as defined in paragraph 6 of SR3 and it is therefore concluded that they are not IPs according to the ADB definition." [64]

[61]Section 3.2.2 Collective Attachment to Geographically Distinct Habitats or Ancestral Territories
[62]Section 3.2.3 Separate Customary Cultural, Economic, Social, or Political Institutions
[63]Section 2.4 Distinct language that is Different from the Official Language of the Country or Region
[64]Section 3.2.5 Conclusion

The overall conclusion is that there are no indigenous groups within the Project sites and the surrounding areas. Consequently, it is concluded that the Windfarm components of the Project will not impact Indigenous People as defined under ADB Social Safeguards Policy SR 3.

15.4 Socioeconomic Conditions of Local Communities

Assessment of socio-economic conditions of local communities (as identified earlier under "Section 2.2" was based on the following approach:

- Collection of official socio-economic data available for the local communities from the Mahallas – this included Kirkkiz, Elobod, Jasliq, and Kungrad;
- As part of the FGDs undertaken with the local communities some additional socioeconomic data was collected through socioeconomic questionnaires the key topics below. The objective of this questionnaire was to complement to the extent possible the official socioeconomic data obtained from the Mahallas. As previously stated under "Section 6.3.2", the FGD was an open invitation session for any local community member to attend and therefore there was no sampling frequency per se.
  - Economic activities and livelihood strategies;
  - Population history
  - Quality of life;
  - Perceptions towards the project;
  - Infrastructure availability;
  - Gender roles, tasks and responsibilities;
  - Education; and
  - Vulnerable groups

The table below presents the overall socio-economic conditions for the local communities in accordance with the data sources discussed earlier.

Table 98: Socio-Economic Conditions for the Local Communities

Socio-Economic Indicator / Village	Elobod			Jasliq			Ozodlik			Kirkkiz		
Population	**General**	**Male**	**Female**	**General**	**Male**	**Female**	**General**	**Male**	**Female**	**General**	**Male**	**Female**
Age Groups	3455	1832	1623	4198	2130	2068	3498	2081	1417	4231	2752	1479
0-2	226	113	113	907	373	329	108	56	52	345	172	173
3-6	328	179	149	NA	NA	NA	211	115	96	400	205	195
7-13	573	262	311	NA	NA	NA	385	228	157	422	218	204
14-17	243	131	112	NA	NA	NA	287	154	133	132	70	62
18-30	702	373	329	NA	NA	NA	529	287	242	899	545	354
0-30	2072	1058	1014	NA	NA	NA	1520	840	680	2198	1210	988
31-45	979	519	460	NA	NA	NA	942	602	340	1599	1265	334
46-60	337	194	143	NA	NA	NA	871	540	331	343	229	114
61-70	61	38	23	NA	NA	NA	125	74	51	78	38	40
71-80	6	4	2	469	NA	NA	35	22	13	12	9	3
81-90	0	0	0	NA	NA	NA	5	3	2	1	1	0
Disabled People	36			63			72			36		
Population changes over the years	Population is growing due to young families and individuals moving from other regions for employment opportunities at the Kungrad Soda Plant.			The population of the community is growing mainly due to naturally high birth rates.			The population of the community is growing with many people moving from other districts (Kirov and Shimonayonay in particular)			The population of the community is growing mainly due to naturally high birth rates		

Socio-Economic Indicator / Village	Elobod	Jasliq	Ozodlik	Kirkkiz
Historical Key Events	The neighborhood was established after the "Kungrad Soda Plant" LLC JV was built.	Established on 29 August 1975 by governmental decision No. 564	Established in 1969 when a railway station was built.	Established when a railway station was built and later expanded when the main gas pipelines were developed.
Number of formal, waged employment	1987	489	905	2198
Key employment and Livelihood	Key employment is within the Kungrad Soda Plant and the railway station. Agriculture and pastoralism are considered minor activities within the local communities.	Key employment is within the railway station and compressor station for gas facilities. Agriculture and pastoralism are considered minor activities within local communities.	Key employment is within the railway station. Agriculture and pastoralism are considered minor activities within the local communities.	Key employment is within the railway station and gas facilities. Agriculture and pastoralism are considered minor activities within the local communities.
Unemployment rate	There are no specific unemployment rates for each village. Only statistics available are at the district level. For Kungrad District, latest statistic available is estimated at 9.4%			
Ethnic/tribal groups present in the community	Karakalpak and Uzbek. There are small number of other ethnic composition that are less than 1% that include Russians.	Kazak, Karakalpak, and Uzbek. There are small number of other ethnic composition that are less than 1% that include Russian, Tajik, and Kyrgyz.	Karakalpak, Uzbek and Kazakh. There are small number of other ethnic composition that are less than 1% that include Russians.	Karakalpak, Uzbek and Kazak. There are small number of other ethnic composition that are less than 1% that include Russians, Tajik and Kyrgyz.
Key Religions	Islam	Islam	Islam	Islam

Socio-Economic Indicator / Village	Elobod	Jasliq	Ozodlik	Kirkkiz
Sacred or cultural heritage sites within Project area	No	No	No	No
Key land uses within project area of surrounding (hunting, grazing, etc.)	No	No	No	No
Poverty Rate	There are no specific poverty rates for each village. Only statistics available are at the district level. For Kungrad District, latest statistic available is estimated at 14.1%			
Food or water security problems in the community	No	No	No	Yes (water)
Improvements or deteriorations in the identified problem over the last 5 years if applicable.	Better	Same	Better	Water shortage problem has started to increase
Community gathering place (e.g. public hall)	School No 52	School	City Councils Office Main Hall	School No 31
	Main Hall	Culture Hall		Main Hall
Health Centre	1	NA	NA	NA
Clinic	NA	NA	1	1
Hospital	1	Kungrad District Medical Association Branch	NA	1
Markets	6	1	1	NA

Socio-Economic Indicator / Village	Elobod	Jasliq	Ozodlik	Kirkkiz
Others	Sport Fields: 2 Library:1	NA	Library:3 Children's camp:1 Sports Ground:1	Cemetery: 1
Shop/stand/selling points	6	21	17	12
Bar/tavern selling alcohol	1	1	NA	2
Street food seller	3	3	NA	3
Restaurant	2	0	7	2
Tourism Lodge/Hotel	NA	1	NA	1
Services	Refueling points:1 Barber: 1 Hairdresser:1	Beauty salon: 3 Barbers:1 Bakery:3	Educational centers:4	Refueling points: 1 Hairdressers/Barbers: 2
Others	Pharmacy: 1	NA	Internet Club:1 Pharmacy: 1	After-School Educational Center: 1
Working in formal, waged employment	Men and Women	Men and Women	Men and Women	Men and Women
Running private businesses	Men and Women	Men and Women	Men and Women	Men and Women
Making decisions on household spending	Men and Women	Men and Women	Men and Women	Men and Women

Socio-Economic Indicator / Village		Elobod	Jasliq	Ozodlik	Kirkkiz
Formal, waged employment opportunities equally available to men and women?		Yes	No, there are two main organizations, the plant and the railway, However, opportunities for both genders are limited, with women having fewer chances than men.	Yes, the main workplace for the population in this area is the Kungrad Railway Organization; The nature of work there is considered suitable mostly for men. While educated women work in schools and hospitals, the uneducated ones engage in business and trade.	No, as it is hard for women to find jobs because they have lower education levels. Also, many jobs require prior work experience, which can be a problem for women returning from maternity leave.
Presence of women organizations in the community with names	**Name of the Organization**	Committee of Family and Women	Mahalla Community Union Women's Department	Neighborhood Women's Committee	Women's Committee
	Members of the Organization	1623 (every woman in the area)	2068 (every woman in the area)	1417 (every woman in the area)	1479 (every woman in the area)
Key Methods for Communication		Telegram channels; Word of mouth through Mahalla Community Union.	Telegram channels; Word of mouth through Mahalla Community Union.	Telegram channels; Word of mouth through Mahalla Community Union.	Telegram channels; Word of mouth through Mahalla Community Union.

Socio-Economic Indicator / Village	Elobod	Jasliq	Ozodlik	Kirkkiz
Main Development Challenges	- None reported	- Poor road quality - Severe shortage of medical staff, - Critical shortage of midwives, risking women's health during childbirth. - Inadequate ambulance services. - High youth unemployment. - Lack of essential community infrastructure like a mosque and sports center.	- Reliance on water from external sources and salinity of water resources within village - Airborne dust affecting daily life. - Extreme temperature variations (hot summers and cold winters). - Cost of medicine. - Absence of educational institutions	- Water shortage is a prominent issue in the village.
Key Expectations	- Local community is supportive of the Project. - Employment opportunities are the key expectations from this Project development, especially for women and youth. - Women are willing and want to be involved in job opportunities for the Project.	- Local community is supportive of the Project. - They believe they are considered far from the site and if in this case employment opportunities are relevant and could be available for them. Employment opportunities are the key expectations from this Project development, especially for youth. - They inquired if there will be community	- Local community is supportive of the Project. - Employment opportunities are the key expectations from this Project development. - Women are willing and want to be involved in job opportunities for the Project.	- Local community is supportive of the Project. - Employment opportunities are the key expectations from this Project development, especially for youth

Socio-Economic Indicator / Village	Elobod	Jasliq	Ozodlik	Kirkkiz
		development programs targeted to the local communities by the Developer.		
Key Issues	- Impacts on roads from heavy transportation of turbines to the Project site; - Impacts on dust from construction activities; - Updates on Project including when employment will start, and specialties required; - If transportation and facilities will be provided onsite due to remoteness of Project area (including those for women in particular).	- No issues were raised in particular as they believe they are very farm from the Project area for any potential impacts to be realized.	- Updates on Project including when employment will start, and specialties required; - Potential impacts from worker influx as based on another plant in the area this has caused in an increase in Sexually Transmitted Diseases (STDs) amongst females in the community.	- Impacts on road networks from Project related transportation activities -Impacts on soil layers during construction activities; - how can women groups in particular benefit from the Project given that Project area is in a very remote area for women in the community to go work there (females in this community do not work in places far from their living area).

15.5 Assessment of Potential Impacts

Employment and Procurement

15.5.1 Employment and Procurement Opportunities

Given the generic nature of the impacts on socio-economic development for both phases of the Project (construction and operation) those have been identified collectively throughout this section.

During the construction and operation phases, the Project is expected to create the following job opportunities:

- Around 2,200 job opportunity at peak during the construction phase for a duration of approximately 42 months. This will mainly include 600 skilled job opportunities (to include engineers, technicians, consultants, surveyors, etc.) and 1,600 semi-skilled and unskilled job opportunities (such as laborers, security personnel, housekeeping, etc.).
- Around 80 job opportunities during the operation phase for a duration of 20-25 years. This will include skilled job opportunities (such as engineers, technicians, administrative employees, etc.) and unskilled job opportunities (such as security personnel, drivers, etc.).

Taking the above into account, the Developer is aiming to hire local community members to the greatest extent possible throughout the construction and operation phase for skilled and unskilled jobs. The Developer is committed to adhering to transparent recruitment procedures which includes local community members.

However, the EPC Contractor and Project Operator have not been selected at this stage, and therefore there are no details available on the number of job opportunities targeted to local communities, type of jobs, duration, etc. In addition to the above, the local communities could also be engaged in procurements such as local contractors, local supply of equipment and machinery, cleaning services, etc.

Taking the above into account, the Developer is committed to ensuring that priority for job opportunities and procurement activities where relevant are targeted to the local communities.

The above could also entail other indirect positive benefits to the local community from increase in demand for local services, supplies, and businesses. This could include for example possible engagements for supplies and service providers (accommodation services, food, etc.). Such demands could improve the existing local economic activities and impact certain sectors, such as wholesale/retail trade.

Taking all of the above into account, this to some extent could contribute to enhancing the living environment for its inhabitants. The creation of job and procurement opportunities in specific is of crucial importance especially since, as discussed earlier, the local community in general suffers from high unemployment and poverty rates.

However, it is understood that the socio-economic development of the area is not hinged on a single project but rather on implementing collective and coordinated actions, including other development projects and investment within the area.

Nevertheless, proper planning and local community engagement from the start is crucial to understand issues and opportunities which in turn would enable the Project build true sustainable links which will bring maximum benefits to the local communities. Given the above, such impacts are anticipated to be *positive*.

However, it is important to note that there are potential for negative impacts in relation to employment and procurement from issues such as those identified below. Such issues could result in the creation of distrust and resentment between the local communities and the Developer, EPC Contractor and Project Operator. In extreme cases this could lead to other escalated events such as strikes, riots, blocking access roads to the Project site, or other incidents that are similar in nature.

- If local community engagement in relation to employment and procurement is not implemented properly, openly and in a transparent manner; or
- If expectations on number and amount of employment and procurement opportunities are not properly managed and addressed; or
- If procurement and employment is coming primarily from another region or abroad specifically for opportunities where local capacity is available.

Construction Phase			**Operation Phase**		
Type	Negative		Type	Negative	
Duration	Medium-term	Limited to construction which is 42 months	Duration	Long-term	During entire operation period
Magnitude	Medium	They could entail issues related to strikes and in worst-case scenario riots or blocking access to site.	Magnitude	Medium	They could entail issues related to strikes and in worst-case scenario riots or blocking access to site.
Reversibility	Reversible		Reversibility	Reversible	
Sensitivity	High		Sensitivity	High	
Likelihood	Medium	No local community activity in the area	Likelihood	Medium	No local community activity in the area
Frequency	Rare	Expected to occur in rare occasions	Frequency	Rare	Expected to occur in rare occasions
Timing	Not relevant		Timing	Not relevant	
Extent	Low	Relevant within community settlement as applicable	Extent	Low	Relevant within community settlement as applicable
Significance	**Major**		**Significance**	**Major**	

As the impacts discussed are mainly positive, no mitigation measures have been identified. This section provides recommendations which aim to enhance such positive impacts anticipated from the Project throughout the construction and operation phases to the greatest extent possible.

Therefore, it is recommended that the EPC Contractor and Project Operator undertake the following:

- Project Updates to local communities in accordance with identified measures in the Stakeholder Engagement Plan (SEP) which also includes measures related to management of local stakeholder expectations on jobs during both construction and operation phase. This should include the following in particular:
  - Undertake continuous and ongoing consultations (at least monthly) with local communities to: (i) manage expectations on employment and procurement opportunities for the Project; (ii) emphasize that job opportunities for this Project are huge and will be met throughout various entities that will include local communities, Districts and Regions; (iii) provides updates on Project implementation and overall schedule; and (iv) other as appropriate.
  - Provide updates on implementation of the local recruitment and procurement procedure to date (e.g. number of locals employed to date from each village as appropriate).

- As required by the local communities (refer to "Section 6.3.2") all communication / updates to the local communities should be provided through the following channels in particular: (i) Notifications and advertisements with Khokimiyat and Mahallas (including Mahalla Community Union); (ii) Telegram Channel; (iii) Youth Union of the Republic of Karakalpakstan; and (iv) Family and Women's Committee of the Republic of Karakalpakstan; (iv) Nannouz which forms the umbrella association for all NGOs in Karakalpakstan.

- Adopt and implement a Local Employment and Recruitment Procedure as part of the Labor and Working Conditions Management Plan (LWCMP) (refer to "Section 15.5.11"). The procedure must take into account the following:

  - As a first step, the procedure must undertake a comprehensive analysis of local skills and businesses availability and gaps within Karakalpakstan Region in order to make an informed approach when recruiting and procuring requirements locally. This should include in particular the youth.

  - Number of job and procurement opportunities targeted for local communities to include skilled and unskilled workers, (ii) details on how job and procurement opportunities will be announced; (iii) a selection process that is fair and transparent and provides equal opportunities for all including females; and (iv) order of priority with respect to employment and procurement subject to availability of qualifications and skills where the following order of priority can be considered: (i) local communities; (ii) Kungrad District; (iii) Karakalpakstan Region; and (iv) finally Uzbekistan.

  - As required by the local communities (refer to "Section 6.3.2") all communication / updates to the local communities should be provided through the following channels in particular: (i) Notifications and advertisements with Khokimiyat and Mahallas (including Mahalla Community Union); (ii) Telegram Channels; (iii) Youth Union of the Republic of Karakalpakstan; and (iv) Family and Women's Committee; and (v) Nannouz which forms the umbrella association for all NGOs in Karakalpakstan.

  - Based on the outcomes of the availability analysis above, consider undertaking a capacity building and training program for selected local community workforce members. This could be undertaken in coordination with key and prominent NGO's and/or research and academic institutions such as the National University of Karakalpakstan that already demonstrated interest in this aspect in particular (refer to "Section 6.3.2" earlier).

  - The local recruitment process will be conducted in an inclusive, fair, equitable and diverse manner, and it will be ensured that there is no bias or discrimination and will be open to all community members regardless of their class, race, color, gender, age, disability, civil status, etc.

  - Recruitment will be based on competency and skill.

  - Efforts and resources will be allocated to make sure that women are also fairly targeted and recruited and are provided opportunities for learning skills to participate equally as men.

  - Gender inclusive advertising will be identified, in consultation with female stakeholders (such as women's groups and CBOs) and will be utilized in the announcement of job opportunities.

  - Candidate selection (recruitment) will be conducted by a mixed-sex panel (comprising of at least two people). Candidate promotion selection will always be carried out by a gender diverse and balanced panel (more than one person and never by a single-sex panel). All candidates will be informed about this.

- It will be prohibited to terminate the contract of a female worker during her maternity leave.

- Considering implementing a Community Development Plan which aims to benefit the local communities to the greatest extent possible. It is recommended that a structured approach is developed for such a program that takes into account the community's needs and priority development projects which could benefit local communities (which logically should also take into account other factors such as allocated budget by the Developer, timeline for implementation of such projects, etc.).

- Stakeholder grievance mechanism should be implemented in relation to implementation of the requirements of the Stakeholder Engagement Plan (SEP) and the Local Employment and Recruitment Procedure. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator:

- Submission of stakeholder engagement log sheets that summarize local community engagement activities and their objectives for the reporting period along with evidence (e.g. photos of sessions or announcements). This should be submitted monthly during both construction and operation.

- Submission of local community employment and procurement register by area/district/region along with evidence for announcements and selection process. This should be undertaken on a monthly basis during construction and on a semi-annual basis during operation.

- Submission on an annual basis a summary of community development plans undertaken.

- Documentation of submitted grievances related to local community engagement or employment/procurement and measures undertaken to resolve such grievances. This should be submitted monthly during both construction and operation.

Community Health, Safety and Security

15.5.2 Impacts from Noise during Operation

Operating wind turbines will produce noise from mechanical and aerodynamic effects. This could be a source of disturbance and nuisance to noise sensitive receptors and could create a disturbing indoor environment.

As noted within "Section 9" there are no receptors within the Project site and surrounding areas that would classify as noise sensitive receptors.

For the purpose of clarity, the definition of receptor was followed as that defined within the "World Bank Group / IFC General EHS Guideline" (IFC, 2007). In accordance with the Guideline a receptor is defined as "*a point of reception or receptor may be defined as any point on the premises occupied by persons where extraneous noise and/or vibration are received. Examples of receptor locations may include: permanent or seasonal residences; hotels / motels; schools and daycares; hospitals and nursing homes; places of worship; and parks and campgrounds.*"

The closest noise sensitive receptor would be the closest community located 110km from the Project site.

Based on the above, this impact is scoped out and there are no further requirements to be considered for the ESIA study.

15.5.3 Impacts from Shadow Flicker during Operation

Operating wind turbines will produce shadow flicker which could be a source of disturbance and nuisance to the receptors and could create a disturbing indoor environment.

As noted within "Section 9" there are no receptors within the Project site and surrounding areas that would classify as shadow flicker sensitive receptors.

For the purpose of clarity, the definition of receptor was followed as that defined within the "World Bank Group / IFC General EHS Guideline" (IFC, 2007) as defined under section above.

The closest shadow flicker sensitive receptor would be the closest community located 110km from the Project site.

Based on the above, this impact is scoped out and there are no further requirements to be considered for the ESIA study.

15.5.4 Impacts from Balde and Ice Throws during Operation

Failure in rotor blade can result in the 'throwing' of the blade. In addition, snow idling on a blade can also result in ice throwing when operated. Blade and ice throw impacts from operating turbines entail public health and safety concerns on receptors.

As noted within "Section 9" there are no receptors within the Project site and surrounding areas that would classify as blade and ice throws sensitive receptors.

For the purpose of clarity, the definition of receptor was followed as that defined within the "World Bank Group / IFC EHS Guidelines for Wind Energy" (IFC, 2015) which is defined as "populated locations".

The closest populated location would be the closest community located 110km from the Project site.

Based on the above, this impact is scoped out and there are no further requirements to be considered for the ESIA study.

15.5.5 Potential Impacts from Trespassing of Unauthorized Personnel during Construction and Operation

Potential impacts during construction and operation phase are mainly limited to trespassing of unauthorized personnel from the local communities into the Project site which could result in potential risks from several hazards.

During construction this could include but not limited to the following:

- Falls within excavation areas;
- Electric shocks and thermal burns from electrical components and equipment;

- Roads and pedestrian accidents and injuries from internal traffic; and
- Exposure to chemicals and hazardous materials.

Similarly, during operation this could include but not limited to:

- Electric shocks and thermal burns from electrical components and equipment;
- Roads and pedestrian accidents and injuries from internal traffic;
- Fall from height (from access to WTG); and
- Other.

Construction Phase			**Operation Phase**		
Type	Negative		Type	Negative	
Duration	Medium-term	Limited to construction which is 42 months	Duration	Long-term	During entire operation period
Magnitude	Medium	Extreme cases they could entail permanent impacts	Magnitude	Medium	Extreme cases they could entail permanent impacts
Reversibility	Irreversible		Reversibility	Irreversible	
Sensitivity	Medium		Sensitivity	Medium	
Likelihood	Low	No local community activity in the area	Likelihood	Low	No local community activity in the area
Frequency	Rare	Expected to occur in rare occasions	Frequency	Rare	Expected to occur in rare occasions
Timing	Not relevant		Timing	Not relevant	
Extent	Low	Will have an effect on impacted area only	Extent	Low	Will have an effect on impacted area only
Significance	**Moderate**		**Significance**	**Moderate**	

Mitigation Measures

The EPC Contractor is responsible for preparing the detailed design for the Project. However, as discussed earlier the EPC Contractor has not yet been selected. Nevertheless, it is expected that as part of the detailed design the security measures to prevent unauthorized access to the Project site during both the construction and operation phase will be identified.

Those will be emphasized within a Security Management Plan (SMP) that will be prepared by the EPC Contractor and Project Operator. This is expected to include but not limited to the following measures:

- Security personnel will be used at the access points to control the entry and exit of people and continuous security patrols will be implemented.
- Storage areas and substation will be fenced off and will have signs with warning notices in English, Russian, Uzbek, and Karakalpak language.
- All WTGs will include a locking mechanism and will be locked when no O&M activities are undertaken.
- Warning signs indicating the presence of the Project along access roads to inform local people of the dangers posed by the Project in English, Russian, Uzbek, and Karakalpak language.
- The Stakeholder Engagement Plan (SEP) that will be implemented will include measures to engage with local communities to inform them about the start of construction works in advance, to educate them on the dangers inside the fenced-off area, and the danger of approaching construction works at other locations and emphasize importance of avoiding trespassing at all times.

- Stakeholder grievance mechanism should be implemented in relation to any grievances related to security incidents and/or security personnel code of conduct. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator:

- Reporting of any trespassing incidents and the measures undertaken in such cases to control the situation and prevent it from occurring again.
- Submission of stakeholder engagement log sheets that summarize local community engagement activities and their objectives for the reporting period along with evidence (e.g. photos of sessions or announcements). This should be submitted monthly during both construction and operation.
- Documentation of submitted grievances related to the SMP (if applicable) as part of the SEP and measures undertaken to resolve such grievances. This should be submitted monthly during construction and operation.

15.5.6 Potential Impacts from Security Personnel during Construction and Operation

There could be interactions between security guards and personnel of the Project with local communities. However, this is expected to be minimal given that distance of the Project site from the local communities – as noted earlier, the closest community is located 110km from the Project site.

Nevertheless, inappropriate management of security issues and incidents by security personnel towards local communities (e.g. overreaction, mistreatment, use of excessive force) could result in potential for conflict, resentment, distrust and escalation of events.

Construction Phase			**Operation Phase**		
Type	Negative		Type	Negative	
Duration	Medium-term	Limited to construction which is 42 months	Duration	Long-term	During entire operation period
Magnitude	Medium	Extreme cases they could entail permanent impacts	Magnitude	Medium	Extreme cases they could entail permanent impacts
Reversibility	Irreversible		Reversibility	Irreversible	
Sensitivity	Medium		Sensitivity	Medium	
Likelihood	Medium	No local community activity in the area	Likelihood	Medium	No local community activity in the area
Frequency	Rare	Expected to occur in rare occasions	Frequency	Rare	Expected to occur in rare occasions
Timing	Not relevant		Timing	Not relevant	
Extent	Low	Will have an effect on impacted area only	Extent	Low	Will have an effect on impacted area only
Significance	**Moderate**		**Significance**	**Moderate**	

Mitigation Measures

The Developer will be undertaking a Security Risk Assessment (SRA) to ensure that all likely threats have been accounted for (to include Project and communities) stemming from the project's presence and activities. This should include the identification of such risks, evaluation of their likelihood to occur, and assess their potential impacts and measures to reduce these risks. In addition, the SRA should identify details regarding relations with public security forces and requirements for private security as well and risks and recommendations for both of these issues.

Based on the SRA, the EPC Contractor and Project Operator is expected to prepare a Security Management Plan (SMP) to be implemented for the construction and operation phase of the Project.

The plan must identify appropriate measures for hiring, rules of conduct, training, equipping, and monitoring of unarmed security personnel to control and manage such issues. The plan must also adhere to IFC PS 4 (Community Health, Safety and Security), EBRD PR 4 (Health, Safety and Security) in relation to the security guards employed. This requires that the behavior for the security personnel is guided by the Voluntary Principles on Security and Human Rights in terms of hiring, rules of conduct, training, equipping and monitoring of such personnel. It also requires making reasonable inquiries to satisfy itself that those providing security measures are not implicated in past abuses, will ensure they are trained adequately in the use of force and appropriate conduct towards the workers and the local community. Force should only be used when strictly necessary, and to an extent proportional to the threat.

In addition, stakeholder grievance mechanism should be implemented in relation to any grievances related to security incidents and/or security personnel code of conduct. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.

Stakeholder engagement activities with local communities must provide information on security control requirements and measures implemented. Stakeholder engagement activities are provided in further details in the SEP.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and the Project Operator:

Inspection to ensure the implementation of the provisions of the Security Management Plan (SMP) and assess compliance with its requirements;

- Documentation of copies of clearance of security guards in past abuses.
- Documentation of signed code of conduct by security workers and associated disciplinary measures as applicable.
- Documentation of induction training modules and Toolbox Talks for security personnel to include training on use of force as well as Voluntary Principles on Security and Human Rights.
- Inspection, monitoring and reporting on required mitigation measures in the plan.
- Reporting on the following: (i) security related incidents/accidents; (ii) submitted grievances related to visibility (if applicable) as part of the SEP and measures undertaken to resolve such grievances. This should be submitted monthly during construction and operation. Submission of stakeholder

engagement log sheets that summarize local community engagement activities and their objectives for the reporting period along with evidence (e.g. photos of sessions or announcements). This should be submitted monthly during construction and operation.

15.5.7 Potential Impacts from Worker Influx during Construction

During the construction phase of the Project a maximum of 1,600 workers (at peak) that will be involved for a duration of approximately 42 months. As discussed earlier, at this point it is still unclear how many of these workers will be expatriates, Karakalpak, Uzbek, and/or from local communities and it is still unclear where accommodation of these works will take place (however as discussed earlier it is highly likely that there will be onsite accommodation given the distant location of the Project site).

Nevertheless, the influx of workforce to the area could result in certain community health, safety and security impacts which are discussed below.

Risk of Diseases

Influx of workers may introduce new reservoirs of diseases such as vector-related diseases, water-borne diseases, etc. In addition, there is also a risk of spreading communicable diseases, included sexually transmitted ones. The risk of catching or exchanging communicable diseases (e.g., Virus B, Virus C, and HIV/AIDS) and the lack of awareness on transmission disease can represent a high risk to workers and community health and safety.

Inappropriate Code of Conduct

Other risks from worker influx include inappropriate code of conduct by workers towards local communities which might result in hostilities and resentment. Such inappropriate conduct could include also disrespecting the traditional culture and social norms of the area and local communities.

Increase in Social Vices

Population influx could result in an increase of social vices including alcoholism, drug abuse, and others.

Increase in Competition for Public Services

The sudden increase in population due to the influx of workers and their families can put substantial pressure on existing local infrastructure, particularly water, electricity, and transportation systems. These services might not have been designed to handle such a rapid or substantial increase in use, leading to overloads and service disruptions.

Local Inflation of Prices

The arrival of a large labor force can drive up the demand for goods and services, potentially leading to higher local prices and displacing regular consumers in the local community.

Increased Risk of Crime

The influx of workers in communities could lead to a rise in criminal activities or create a feeling of insecurity among local residents. Potential issues may include theft, physical assaults, substance abuse, prostitution and human trafficking. The local police force might be unprepared to handle the surge in population and associated challenges.

Construction Phase		
Type	Negative	N/A
Duration	Medium-term	Limited to construction which is 42 months
Magnitude	Medium	Medium magnitude and sensitivity given that it could entail some impacts on local resources, spread of serious diseases which could impact community H&S, and other.
Reversibility	Reversible	
Sensitivity	Medium	
Likelihood	Medium	Accommodation likely to occur onsite due to distant location
Frequency	Frequent	Throughout entire construction phase
Timing	Not relevant	
Extent	Medium	Effects expected within 5km radius from impact
Significance	**Moderate**	

Mitigation Measures

As noted earlier in "Section 15.5.9" and "Section 15.5.11" the EPC Contractor will be required to prepare and submit a Worker Accommodation Plan (WAP) and a Labor and Working Conditions Management Plan (LWCMP).

The above plans should include specific sections on worker influx that should include the following measures:

- As discussed earlier it is highly likely that there will be onsite accommodation given the distant location of the Project site. However, should this not be the case it is recommended / preferred to manage workers in a centralized location / approach that are not located within local communities. If accommodation is to be located within local communities, then again it is highly recommended / preferred to manage in a centralized location / approach (e.g. within 1 apartment building or several located next to each other and not several apartments / hotels located in various dispersed areas).
- Medical examination programs. All workers must be subject to a preliminary medical examination before commencement of any job tasks in accordance with local applicable requirements. In addition, routine medical examination for worker (bi-annually) must be undertaken. Such medical examinations must be undertaken at certified centers. Copies of medical examination results of all workers must be retained onsite. Medical examinations should be consistent amongst all worker to ensure no discriminatory implication.
- Details and procedures for ensuring and maintaining hygienic conditions onsite at all times specifically related to the toilet and washing facilities, eating areas, etc. This should be applicable onsite and within worker accommodation.
- Development of a code of conduct and associated disciplinary procedures for workers which takes into account appropriate behaviors by workers at all times, religious customs, traditional cultures and social norms in the area. In addition, it must include specific requirements for social vices including gender-based violence, sexual harassment, alcoholism, drug abuse, etc.
- Induction training and self-awareness raising sessions on risks associated to the most common contagious diseases (e.g. influenza virus), communicable diseases, general measures for hygiene, code of conduct expected to be implemented and others as appropriate.
- Stakeholder grievance mechanism should be implemented in relation to any grievances related to worker influx. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.

- Stakeholder engagement activities with local communities must provide information on worker influx expected and measures that will be undertaken to control such impacts. Stakeholder engagement activities are provided in further details in the SEP.
- Investigate potential cumulative impacts on local communities where worker influx could occur taking into account timeline/schedule of other development projects. Refer to "Section 20" for additional details.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor:

Inspection to ensure the implementation of the above provisions and assess compliance with its requirements;

- Documentation of copies of medical examination results and approvals for workers.
- Inspection, monitoring and reporting on all mitigation measures included within the plan.
- Documentation of signed code of conduct by workers and associated disciplinary measures as applicable.
- Documentation of induction training modules and Toolbox Talks on hygiene and code of conduct expected to be implemented.
- Reporting on the following: (i) worker influx incidents/accidents; (ii) health conditions to include epidemic outbreaks, diseases or infections; and (iii)submitted grievances related to visibility (if applicable) as part of the SEP and measures undertaken to resolve such grievances. This should be done on a monthly basis.
- Submission of stakeholder engagement log sheets that summarize local community engagement activities and their objectives for the reporting period along with evidence (e.g. photos of sessions or announcements). This should be done on a monthly basis.

Worker Welfare, Health and Safety

15.5.8 Occupational Health and Safety Impacts during Construction and Operation

Throughout the construction and operation phase there will be generic occupational health and safety risks to workers, as working onsite increases the risk of injury or death due to accidents. The following risks are generally associated with wind farm development projects:

- Slips and falls;
- Working at heights;
- Working with powered and hand-held tools;
- Struck-by objects;

- Moving machineries;
- Working in confined spaces and excavations;
- Exposure to chemicals, hazardous or flammable materials and fire;
- Exposure to electric shocks and burns when touching live components;
- Covid-19 risks; and
- Of particular importance within the Project area are also:
  - Risks related to remoteness of the Project site (e.g. in case of a medical emergency);
  - Risks from sand and salt storms including windy conditions; and
  - Risks from extreme hot and cold weather and conditions and low/high temperatures.

Construction Phase			**Operation Phase**		
Type	Negative	In extreme cases could entail permanent impacts (e.g. permanent disability); however such impacts are controlled through implementation of general best practice.	Type	Negative	In extreme cases could entail permanent impacts (e.g. permanent disability) however such impacts are controlled through implementation of general best practice.
Duration	Medium-term		Duration	Long-term	
Magnitude	High		Magnitude	High	
Reversibility	Irreversible		Reversibility	Irreversible	
Sensitivity	High		Sensitivity	High	
Likelihood	Medium		Likelihood	Medium	
Frequency	Frequent		Frequency	Frequent	
Timing	Not relevant		Timing	Not relevant	
Extent	Low		Extent	Low	
Significance	**Major**		**Significance**	**Major**	

Mitigation Measures

Occupational Health and Safety Plan (OHSP)

The EPC Contractor has not been selected at this stage for the Project. However, at a later stage once selected, it is expected that an Occupational Health and Safety Plan (OHSP) is prepared and submitted regarding the Project's construction, installation and commissioning works as well as the general construction site operations. In addition, the Project Operator is expected to develop an OHSP tailored to the Project's operation phase.

The objective of the OHSP should be as follows:

- Prevent all occupational incidents to the greatest extent possible for all workers.
- Zero fatal accidents, injuries and lost time accidents.
- Zero occupational disease.
- Zero major incidents.
- Providing a place of work that is safe for workers and communities.
- Full compliance with legal and contractual requirements related to occupational health and safety.
- Maintain safe working areas and good housekeeping.

- The OHSP for the construction and operation phase should be Project and site specific and must take into account the national OHS legislation. In addition, it must also be compliant with international E&S standards and requirements to include in particular IFC PS2 (Labor and Working Conditions), EBRD PR 2 (Labor and Working Conditions) – all of which recognize the importance of avoiding or mitigating adverse health and safety impacts on workers and require the development of a project-specific health and safety plan that is in accordance with Good International Practice (GIP).

In general, the OHSP should address the following components:

- Risk assessment and job safety planning procedure.
- Permit to Work (PTW) system procedure.
- Lock Out/Tag Out (LOTO) Procedure.
- Site control occupational health and safety procedure to include requirements for: Personal Protective Equipment (PPE), requirements for site risks (fall protection, powered and hand tools, compressed air / gas cylinders, fire prevention, hot works, electrical works, material handling, machinery use and safety, excavation/concrete works/civil works, confined space activity, storage, medical requirements, and communicable disease management).
- Occupational health and safety signage requirements.
- WTG erection OHS procedure (building wind turbine platforms, assembly of anchor cage, loading and unloading material, installation of turbine components, signaling and fencing, material storage, preparation and mounding of tubular tower, nacelle preparation and installation, installation of drive train, preparation of hub, installation of blades, installation of high voltage cables).
- Identify OHS training requirements to include but not limited to induction training, specialized trainings, and other as appliable. Specialized trainings will be required for the following:

  - Safe rigging and lifting
  - Welding and Hot Works
  - Ladders and scaffolding
  - Electrical works
  - Fall protection
  - Lock-out/tag-out
  - Excavation
  - Hot Works
  - Power and Hand Tool Safety
  - Extreme weather conditions (e.g. sand and salt storms, windy conditions, hot and cold weather and conditions and low/high temperatures
  - Heat Stress
  - Permit to work
  - Defensive driving
  - Lifting and rigging safety
  - Banksman
  - Manual handling
  - Confined Spaces
  - Excavations
  - Working at heights

In addition, all workers that will be involved with the erection activities for the turbines will be required to undertake a third-party certified OHS training.

- Identify monitoring and reporting requirements.
- Identify roles and responsibilities of the personnel involved in implementation of the plan.
- Exposure and risk of transmission of COVID-19 throughout the workforce and measures to reduce such risks (e.g., awareness session on symptoms, isolation measures for confirmed cases, utilizing masks and sanitizers, social distancing where applicable, etc.).
- A worker grievance mechanism should be implemented and that should handle any grievances related to OHSP. Requirement for worker grievance mechanism is included within "Section 15.5.11" below.

The EPC Contractor and Project Operator are expected to adopt and implement the provisions of the OHSP throughout the Project construction and operation phase.

Emergency Preparedness and Response Plan (EPRP)

The EPC Contractor and Project Operator must submit a project and site-specific Emergency Preparedness and Response Plan (EPRP). The objective should be as follows:

- Identify emergency response procedure to be implemented with the objective of establishing a series of organization, operational and preventive measures in, which in turn will ensure the safety of workers and property within the specific Project site.
- The plan for the construction and operation phase should be Project and site specific. In general, the EPRP should address the following components:
  - Identify of a communication and management process with external authorities to include in particular firefighting services and health providers
  - Identify an emergency procedure and an onsite notification process
- Identify emergency control measures for key expected emergency incidents to include but not limited to fire, accidents, spillage, traffic accidents, natural disasters and other. Of particular importance within the Project area are also:
  - Risks related to remoteness of the Project site (e.g. in case of a medical emergency). This must include a comprehensive medical emergency response, including robust on-site infrastructure and a helicopter response to appropriate medical facilities in Karakalpakstan when required.
  - Risks from sand and salt storms including windy conditions.
  - Risks from extreme hot and cold weather and conditions and low/high temperatures.
  - BESS fire risk thermal runaway explosions and transport risks including risks from lithium-ion batteries
- Identify requirement for emergency kits.
- Identification of onsite assembly points.

- Identification of emergency signs.
- Identify training requirements to include but not limited to induction training, emergency responders training, and emergency drills.
- Identify monitoring and reporting requirements.
- Identify roles and responsibilities of the personnel involved in implementation of the plan.
- A worker grievance mechanism should be implemented and that should handle any grievances related to emergency preparedness and response. Requirement for worker grievance mechanism is included within "Section 15.5.11" below.

The EPC Contractor and Project Operator are expected to adopt and implement the provisions of the EPRP throughout the Project construction and operation phase.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator during the construction and operation phase:

Inspection to ensure the implementation of the provisions of the OHSP and assess compliance with its requirements;

- Inspections and audits on OHSP requirements identified earlier.
- Submission of training records.
- Submission of worker grievances related to OHSP and grievances close-out forms.
- Reporting on the following: (i) number of near misses per month; (ii) number of injuries per month; (iii) number of medical evacuations per month; (iv) number of working condition complaints per month; (v) lost working hours per month; (vi) number of working days since the last accident; (vii) number of HS audit/inspections; (viii) number of HS training/toolbox talks; (ix) number of HS meetings per month; (x) number of unsafe acts/conditions per month.

Inspection to ensure the implementation of the provisions of the EPRP and assess compliance with its requirements;

- Inspections and audits on EPRP requirements identified earlier.
- Submission of drill reports and TBT training records.
- Submission of worker grievances relate to EPR and grievances close-out forms.
- Reporting on the following: (i) number of emergency responders assigned with required certification; (ii) number of ambulances; (iii) number of clinics; (iv) number of fire extinguishers; (v) number of fire alarms; (vi) number of doctors / nurses; (vi) number of emergency drills conducted; (vii) number of emergency incidents triggered.

15.5.9 Worker Accommodation Impacts during Construction and Operation

In relation to worker accommodation, as discussed earlier the EPC Contractor and Project Operator have not been selected yet (nor any other sub-contractor which might be involved in the Project). Therefore, it is not clear at this point whether there will be any onsite accommodation for workers, or whether they will be accommodated at the closest villages/cities.

However, given the remoteness of the Project site and given that it is located 110km from the nearest village /city, it is highly likely that onsite worker accommodation will be developed for the construction and operation phase.

In general, inappropriate accommodation facilities entail impacts on worker welfare that could include but not limited to:

- Workers could be provided with accommodation facilities that do not meet basic services. This includes security arrangements, appropriate work temperature, safe food, drinking water, access to safe exit in emergency conditions, segregated toilets, washing facilities and sleeping areas for women and men, and access to means of communication with areas outside the project boundary.
- Disturbance issues arising from construction, including traffic (dust, noise and vibration).
- Workers could be provided with accommodation that does not account for social and cultural considerations, which would have major consequences for those affected.

There could also be other impacts on siting of the accommodation facilities such as involuntary resettlement issues (including physical and economical displacement) when the erecting of workers' accommodation (although highly unlikely given the Project location).

If workers are accommodated within local communities (although unlikely as discussed earlier), then there could be impacts related to:

- Workers' influx in the vicinity of a community may strain existing infrastructure, in particular the water and sanitation, electricity and transport systems.
- Impacts of workers on local medical, social, educational and recreational services and facilities.
- Community health and safety risks such as increased spread of communicable diseases, road accidents, increased traffic, etc.
- Community cohesion risks related to the presence of workers with different lifestyles or cultural backgrounds on the host community.
- Potential for increase in local prices, crime, prostitution or alcohol consumption.
- Inappropriate code of conduct by the workers with such local community members. This in turn could cause conflicts which if improperly managed could result in escalation of events potentially affecting the safety of workers. Such conduct could include:
  - Disrespect of local traditions and norms
  - Disrespect religious customs
  - Disrespect of community goodwill
  - Harassment

- Trespassing into nearby private properties and lands

Taking the above into account, the table below presents the overall impact assessment criteria.

Construction Phase			Operation Phase		
Type	Negative	Such impacts are controlled through implementation of general best practice.	Type	Negative	Such impacts are controlled through implementation of general best practice.
Duration	Medium-term		Duration	Short-term	
Magnitude	Medium		Magnitude	Medium	
Reversibility	Reversible		Reversibility	Reversible	
Sensitivity	Medium		Sensitivity	Medium	
Likelihood	Medium		Likelihood	Medium	
Frequency	Frequent		Frequency	Frequent	
Timing	Not relevant		Timing	Not relevant	
Extent	Medium		Extent	Medium	
Significance	**Moderate**		**Significance**	**Moderate**	

Mitigation Measures

The EPC Contractor and Project Operator must prepare a Worker Accommodation Plan (WAP). The objective of the plan is to identify the required management standards and specifications for accommodation that shall be met for the workforce.

The Plan must include the following components:

- Identify the workforce requirements including all subcontractor requirements.
- Identify workforce transportation requirements to/from accommodation facilities.
- Identify accommodation procedures to ensure that workers are provided with a decent accommodation which meets the basic workers' needs. In specific, onsite and/or offsite accommodation must be compliant with good international industry practices – mainly the "Workers' accommodation: process and standards" (EBRD/IFC Guidance Note, 2009). The document provides guidance notes on general living facilities, room facilities, medical facilities, management of accommodation units, etc.
- Worker accommodation must take into account climatic conditions of the area given the location (e.g. extreme heat and extreme cold) and it must be equipped with suitable measures such as air conditioning, heating, etc.
- The accommodation should consider the social and cultural backgrounds of the workers, providing spaces that respect cultural practices and promote social interaction in a positive manner. This includes considerations for gender segregation where culturally appropriate and facilities for religious practices.
- Accommodation facilities and specifications must take into account site-specific conditions to include in particular: (i) sand and salt storms, (ii) windy conditions, (iii) extreme hot and cold weather, and (iv) conditions and low/high temperatures.
- In relation gender requirement the following should be considered:

  - Separate sleeping rooms for men and women will be provided in shared accommodations;

  - Means of securing bedroom doors from inside and out will be provided; and

- Finally, female sanitary and toilet facilities will be kept separate from men.

- Identify housing rules and regulations including code of conduct.
- Identify training requirements.
- Identify monitoring and reporting requirements.
- Identify roles and responsibilities of the personnel involved in implementation of the plan.
- A worker grievance mechanism should be implemented and that should handle any grievances related to worker accommodation. Requirement for worker grievance mechanism is included within "Section 15.5.11" below.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator during the construction and operation phase:

Inspection on workers accommodation to ensure its compliance with the requirements of "EBRD/IFC's Guidance Note – Workers' accommodation: process and standards" to include the following.

- Inspections and audits on standards of worker accommodation to include but not limited to room/dormitory facilities sanitary and toilet facilities, canteen, cooking and laundry facilities, medical facilities, leisure and social facilities.
- Inspections and audits on management of workers' accommodation to include management of staff, health and safety, security, etc.
- Reporting on: (i) worker accommodation incidents/accidents; (ii) health conditions to include epidemic outbreaks, diseases or infections; and (iii) worker accommodation grievances and complaints.
- Submission of worker grievances and worker grievance close-out forms.

15.5.10 Potential Impacts from Blasting Activities

Although not yet confirmed, due to the geological conditions within the Project site, the foundation works for various Project components (such as turbine foundations) might require blasting activities.

If such activities are improperly managed, they could entail serious impacts on worker health and safety which could result in permanent disability, serious injuries or even death.

Construction Phase		
Type	Negative	In extreme cases could entail permanent impacts (e.g. permanent disability); however such impacts are controlled through implementation of general best practice.
Duration	Short-term	
Magnitude	Medium	
Reversibility	Irreversible	
Sensitivity	Medium	
Likelihood	Medium	

Frequency	Rare	
Timing	Not relevant	
Extent	Medium	
Significance	**Moderate**	

Mitigation Measures

The following identifies the mitigation measures that should be implemented by the EPC Contractor during the construction phase of the Project:

- A Blasting Method Statement will be developed prior to conducting the blasting.
- A blasting supervisor will be in place to coordinate with the shot-firer. Sirens will be sounded throughout the duration of the blasting and for 30 minutes after.
- Entrances to the blasting area will be blocked and no unauthorized personnel permitted to enter.
- Public access to construction areas will be restricted using a radial exclusion zone of 300m where blasting works are to take place. Security personnel will be used to ensure that no one except for authorized personnel are present within the exclusion zone to avoid them being hit by flying debris or injured from the inhalation of dust.
- Warning signs indicating the use of explosives for the purpose of blasting will be installed along access roads in the vicinity of the relevant WTGs where such works are taking place, to inform of the risks posed by such activities.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

- Submission of blasting method statement.
- Appointment of a blasting supervisor that will undertake inspections to ensure the above mitigations are implemented.

15.5.11 Worker Human Rights Impacts during Construction and Operation

Inappropriate management of the workforce during both the construction and operation phase could entail several human right risks and violations by employing entities such as the EPC Contractor and Project Operator. This could include but not limited to violations against core labor standards (e.g. engaging child workers, confiscation of passports of foreign workers, unsuitable working hours, and other),

One key impact / issue of concern is related to the distant Project location and the long-term location onsite for workers which could result in isolation of workers, and which could therefore entail key mental and physical health risks on the workers' and their overall wellbeing.

In addition, it is expected that the workforce will include a team from various backgrounds, ethnicities, nationalities and cultures. Therefore, there could be risks and impacts within the workforce related to discrimination, harassment, abuse and others based on ethnicities, cultures, and nationalities.

Please note that a standalone gender and human rights risk assessment has been undertaken for the Project which is presented in "Section 16". Please refer to the section for additional details.

Taking the above into account, the table below presents the overall impact assessment criteria.

Construction Phase			Operation Phase		
Type	Negative	Such impacts are controlled through implementation of general best practice.	Type	Negative	Such impacts are controlled through implementation of general best practice.
Duration	Medium-term		Duration	Long-term	
Magnitude	High		Magnitude	High	
Reversibility	Reversible		Reversibility	Reversible	
Sensitivity	High		Sensitivity	High	
Likelihood	High		Likelihood	High	
Frequency	Frequent		Frequency	Frequent	
Timing	Not relevant		Timing	Not relevant	
Extent	Low		Extent	Low	
Significance	**Major**		**Significance**	**Major**	

Mitigation Measures

The EPC Contractor and Project Operator are required to develop and implement a Labor and Working Conditions Management Plan (LWCMP). Objective will be as follows:

- Provide an overview of the labor use on the project throughout the construction phase.
- Provide a Human Resources (HR) policy.
- Identify an HR management procedure for the workforce that will ensure decent and humane working conditions, worker rights, and enhance constructive work floor relations. This should be guided by the Local Labor Law as well as the IFC PR 2 and EBRD PR 2 as well as the ILO Fundamental Labor Conventions covering the following in particular:
  - Ensuring all workers onsite are provided with a contract. Each worker will be provided with a signed copy of the contract and another copy will be retained with the HR Manager.
  - Providing reasonable working conditions and terms of employment to include but not limited to contract management, working hours, salaries/wages, annual and medical leaves, bereavement leaves, accommodation, etc.
  - Recognizing workers' rights to form and to join workers' organizations of their choosing and to bargain collectively without interference.
  - Prohibition of child labor within the workforce.
  - Overall management of young workers within the labor force. The recruitment of children under the age of 18 in illegal and hazardous work should be explicitly prohibited. However, if children between the ages of 15-18 are to be employed at any stage throughout the construction or operation stages, the following should apply: (I) an official letter with the approval of their parents or guardian should be provided; (ii) young workers must provide valid identification that presents proof of age at the recruitment stage; (iii) minor workers are not allowed to work onsite and are only allowed to work in the Project's worker camp; (iv) they are not to be employed in any kind of work which by its nature is likely to harm their health and safety or expose them to risks and hazards; and (v) in accordance with the Labor law, young workers shall not work for more than six hours a day, during which one or more break periods totaling not less than one hour shall be granted for meals and rest. They should not be made to work overtime hours or required to come

to work on weekends and official holidays. They shall not be made to work between 7:00 pm and 7:00 am.

- Prohibition of forced labor and human trafficking including confiscation of employees' passports.
- Non-discrimination throughout the entire work cycle in all its forms.
- Providing equal opportunities for all throughout procurement and employment opportunities including women groups.
- Overall management of daily workers, migrant workers and third-party workers.
- Given the expected long-term location onsite employment contracts must include regular off-site breaks for rest and relaxation.
- Ensure the following on wages: (i) wages to be determined on a case-by-case basis and must be must be fair and should meet the basic needs to maintain a safe and decent standard of living; (ii) must be established based on qualifications and competencies, professional experience, job responsibilities, and wages at equivalent positions; (iii) must be for work of equal value should be provided for female and male workers; and (iv) should not be below the nationally established minimum wage.
- Ensure the following on working hours: (i) in accordance with the Labor law, working hours should be set to a maximum of 40-hours a week over 5 or 6 days including at least one hour break every 4 hours; (ii) overtime is allowed with appropriate need, but in all cases, working hours should not exceed 10 per day; (iii) workers should have a 24-hour period of rest after 6 days of work; and (iv) all workers will be notified of their schedule for the weekly day's rest, working hours, break periods and any changes introduced to such a schedule.
- Ensure the following on leaves: (i) workers should be entitled to annual and sick leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the workers' contract; and (ii) workers should be entitled to annual and temporary disability leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the workers' contract.
- All workers should be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct should prohibit the following and which is subject to disciplinary action: (i) harassment, and abuse of any kind will not be tolerated; (ii) discrimination based on personal characteristics is prohibited to include but not limited to gender, race, nationality, ethnic, social and vulnerable people, religion or belief, disability, age, or sexual orientation.
- Ensure privacy and protection of workers is maintained at all times. This will include limiting access to the below data and information to the EPC Contractor HR Manager only.

- Contracts
- HR files and databases
- Payment register
- Worker grievance forms and registers
- Disciplinary action register

- This information will be properly handled and stored, saved online through password protected files, and in secured cabinets with a fitted lock in case of hardcopies.
- Identify a disciplinary procedure for the workforce to be implemented;
- Identify a worker welfare procedure related to drinking water, rest areas, sanitary facilities, changing rooms
- Identify a worker grievance procedure to manage all worker related complaints and grievances that should consider the following:
  - Outlining the measures for escalation of grievances by workers
- Identify training requirements related to the plan.
- Identify monitoring and reporting requirements related to the plan.
- Identify roles and responsibilities related to the plan.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator:

- Submit signed contracts for all workers once appointed.
- Submit signed worker code of conduct for all workers once appointed.
- Submit payment register on a monthly basis.
- Submit disciplinary action register on a monthly basis.
- Submit training and TBT records on a monthly basis.
- Submit worker grievance logs with close-out forms on a monthly basis.
- Undertake monitoring, inspection and reporting son all requirements of the plan on a monthly basis during construction and quarterly during operation.
- Reporting on: (it) total number of working hours / total overtime; (ii) % of workers receiving salary payment on time; (iii) % of workforce with written contract; (iv) % of workforce with age verification (child labor); (v) % of workforce above minimum wage; (vi) % of forced labor onsite verified; (vii) number of disciplinary actions issued; (viii) number of drinking water units; (ix) number of rest areas provided; and (x) number of sanitary facilities provided; and (xi) number of worker grievances submitted; (xii) number of outstanding grievances.

15.5.12 GBVH and SEAH Impacts to Workers and Community Members during Construction and Operation

Inappropriate management of the workforce (some of which could be from the local communities) during both the construction and operation phase could entail gender related issues such as Gender Based Violence and Harassment (GBVH) or Sexual Exploitation, Abuse and Harassment (SEAH).

In addition, inappropriate behavior of workforce within local community settlements could also entail similar risks and impacts. This could be related to worker accommodation within local communities (if applicable to the Project) or as part of worker time-off / leisure trips to local community areas.

Please note that a standalone gender and human rights risk assessment has been undertaken for the Project which presents such risks in further detail, and which is presented in "Section 16". Please refer to the section for additional details.

Taking the above into account, the table below presents the overall impact assessment criteria.

Construction Phase			**Operation Phase**		
Type	Negative	Such impacts are controlled through implementation of general best practice.	Type	Negative	Such impacts are controlled through implementation of general best practice.
Duration	Medium-term		Duration	Long-term	
Magnitude	Medium		Magnitude	Medium	
Reversibility	Irreversible		Reversibility	Irreversible	
Sensitivity	Medium		Sensitivity	Medium	
Likelihood	Medium		Likelihood	Medium	
Frequency	Frequent		Frequency	Frequent	
Timing	Not relevant		Timing	Not relevant	
Extent	Low		Extent	Low	
Significance	**Moderate**		**Significance**	**Moderate**	

Mitigation Measures

- The EPC Contractor and Project Operator are required to develop and implement a Labor and Working Conditions Management Plan (LWCMP). The Plan should include at a minimum the following: Safe transport will be provided to female and male workers, given the remote area of the Project. The codes of conduct, which prohibit gender-based violence, harassment and abuse, will apply to transportation modes.
- All workers should be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct should prohibit be subject to disciplinary action and should prohibit harassment, gender-based violence and abuse of any kind.
- All workers should be provided with a copy of the Gender Based Violence and Harassment (GBVH) Code of Conduct and will be required to sign it.
- Identify a worker welfare procedure related to drinking water, rest areas, sanitary facilities, changing rooms and others that should include take into account the following in particular:
  - Female sanitary, toilet facilities, and prayer rooms will be kept separate from men.
  - All such facilities will have lockable doors with adequate numbers provided.
  - Separate changing rooms and cabinets will be provided for men and women both of which have locking mechanisms.

- Identify a worker grievance procedure to manage all worker related complaints and grievances that should consider the following:
    - Prohibiting gender-based violence and harassment in the workplace and will outline that a suitably trained male and female person is designated to process grievances in which male / female workers might feel uncomfortable discussing with a person of the opposite sex. The grievance mechanism also includes a procedure to deal with Gender Based Violence and Harassment (GBVH) grievances.
- Stakeholder Grievance Mechanism as part of the SEP also includes a procedure for GBVH grievances. This should be implemented entirely to handle any grievances related to GBVH Please refer to the SEP for additional details.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the EPC Contractor and Project Operator:

- Submission of signed GBVH Code of Conduct for all workers.
- Undertake monitoring, inspection and reporting son all requirements of the plan on a monthly basis during construction and quarterly during operation.
- Documentation of submitted grievances related to GBVH and SEAH as part of the SEP and worker grievance mechanism and measures undertaken to resolve such grievances.

16. CLIMATE AND METEOROLOGY

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to climate and meteorology. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

16.1 Assessment of Baseline Conditions

16.1.1 Methodology for Assessment

The methodology was based on secondary data available through online resources on key climate and meteorology conditions. This includes temperature, wind speeds, humidity, rainfall, sand/snowstorms and other as applicable.

The assessment provided below is for Karakalpak stan which is considered representative of the Project site and the local communities.

16.1.2 Results

Temperature

The figure below presents the annual temperature variations in Karakalpak Stan based on historical information throughout the past 30 years. The "mean daily maximum temperature" (solid red line) presents the peak temperature on an average day each month, while the "mean daily minimum temperature" (solid blue line) presents the average minimum temperature.

As presented below, the hottest months are typically June – August, with averages reaching a maximum of 35°c. The coldest months are typically December – February with averages reaching a minimum of -4°C.

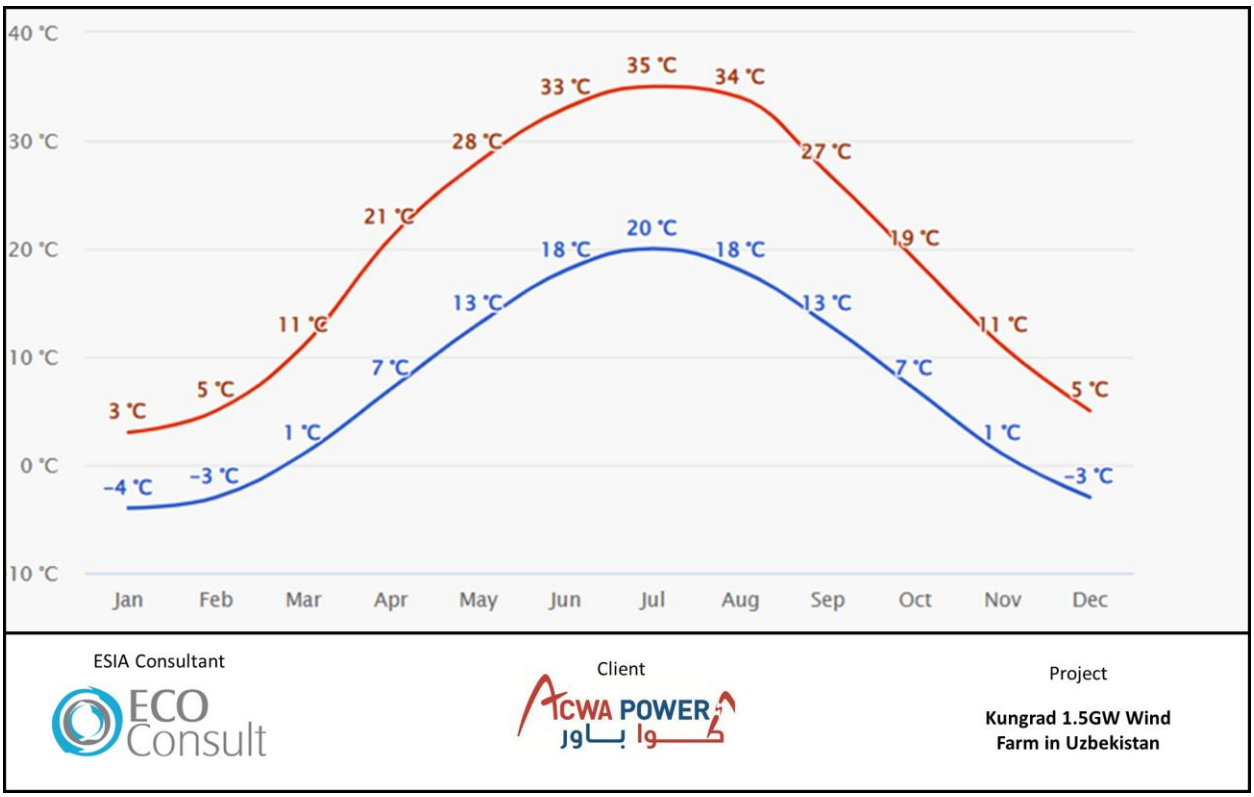


Figure 104: Average Monthly Maximum and Minimum Temperatures for the Past 30 Years

Wind Speed and Direction

The figure below presents the windspeed patterns across Karakalpakstan. As noted below, there is a distinct seasonal variation, with higher wind speeds prevalent during the winter months. January is the month with the highest wind speeds, ranging from a minimum of 14 km/h to a maximum of 29 km/h, with an average speed of 22 km/h.

The summer month of July experiences the lowest wind speeds, ranging from 7 km/h to 21 km/h (minimum and maximum, respectively), with an average wind speed of 14 km/h.

The figure that follows categorizes the months based on the frequency of different wind speeds, whereas noted only February and December witnessed speeds exceeding 61 km/h. Generally, wind speeds in Karakalpakstan predominantly fall within the range of 19 km/h to 38 km/h.

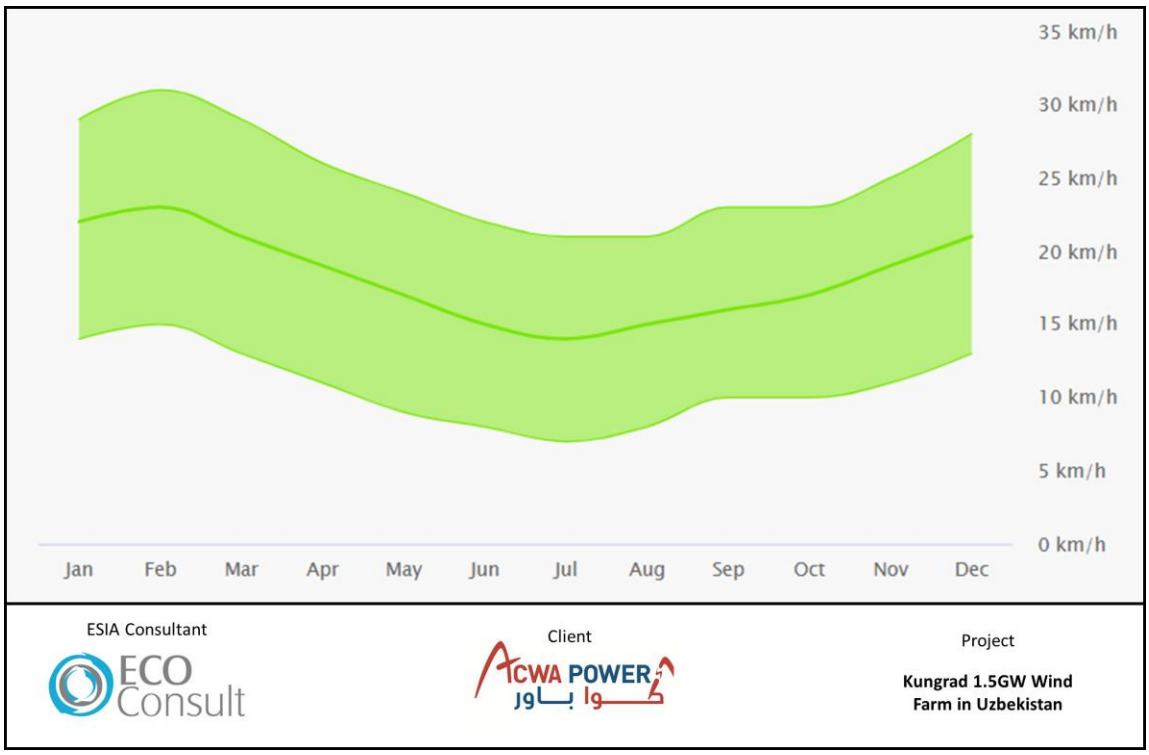


Figure 105: Average Monthly Wind Speeds for the Past 30 Years

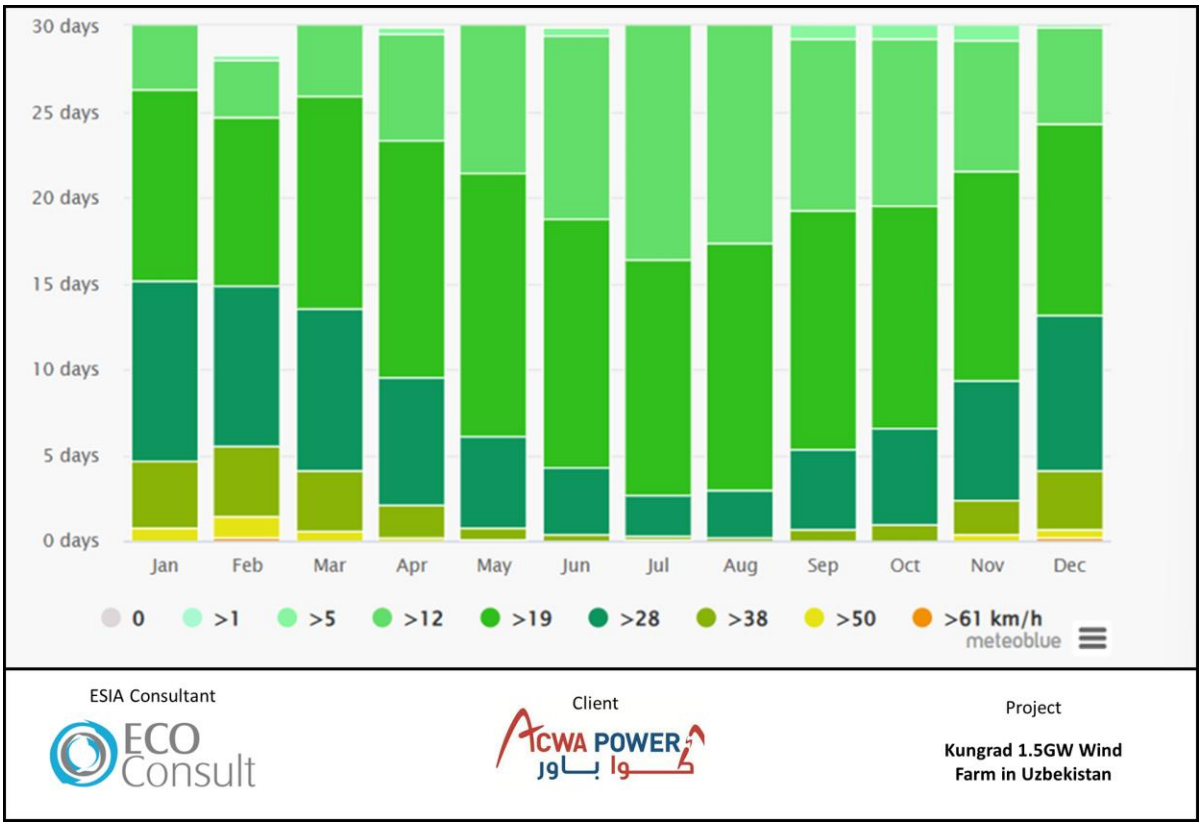


Figure 106: Wind Speed Patterns in Karakalpakstan Over the Past 30 Years

The figure below presents a wind rose with distinctive patterns in wind direction. The prevailing wind direction is predominantly from the north-northeast (NNE) to the east-northeast (ENE). Conversely, the sector with the least occurrence of wind direction spans from the south-southeast (SSE) to the north-northwest (NNW).

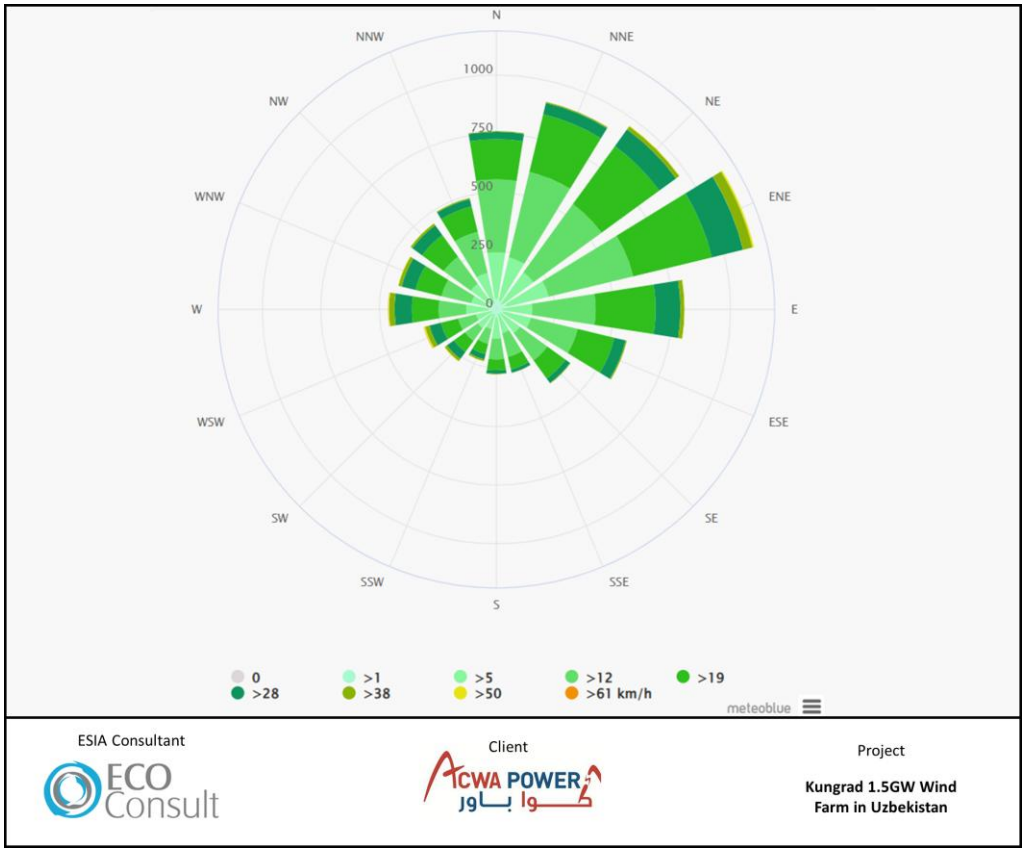


Figure 107: Wind Rose of Karakalpakstan

Rainfall

The figure below presents the amount of rainfall and number of rainy days across the year in Karakalpakstan. As noted, March has the highest number of rainy days (at around 5.5) as well as highest precipitation (at around 10-20mm). September has the lowest number of rainy days (at around 0.4) as well as lower precipitation (at around 2-5mm).

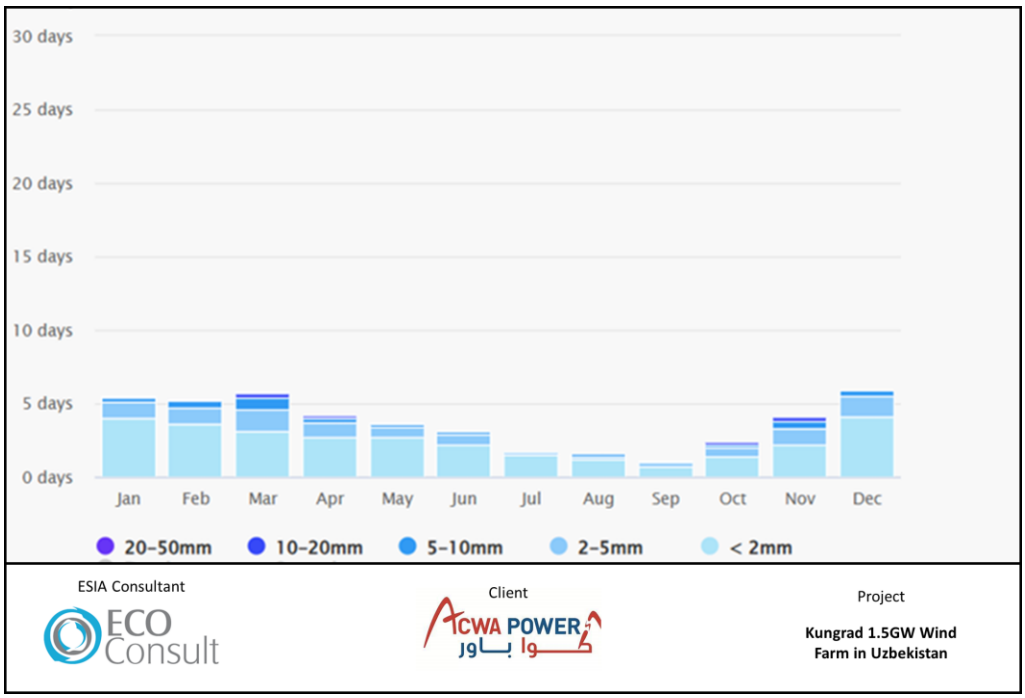


Figure 108: Average Monthly Rainfall Distribution in Karakalpakstan for the Past 30 Years

Snow days

The figure below presents the frequency of snow days in Karakalpakstan, indicating that snowfall occurs exclusively from November to March. Notably, February stands out with the highest number of snow days, reaching 2.4 days during that month.

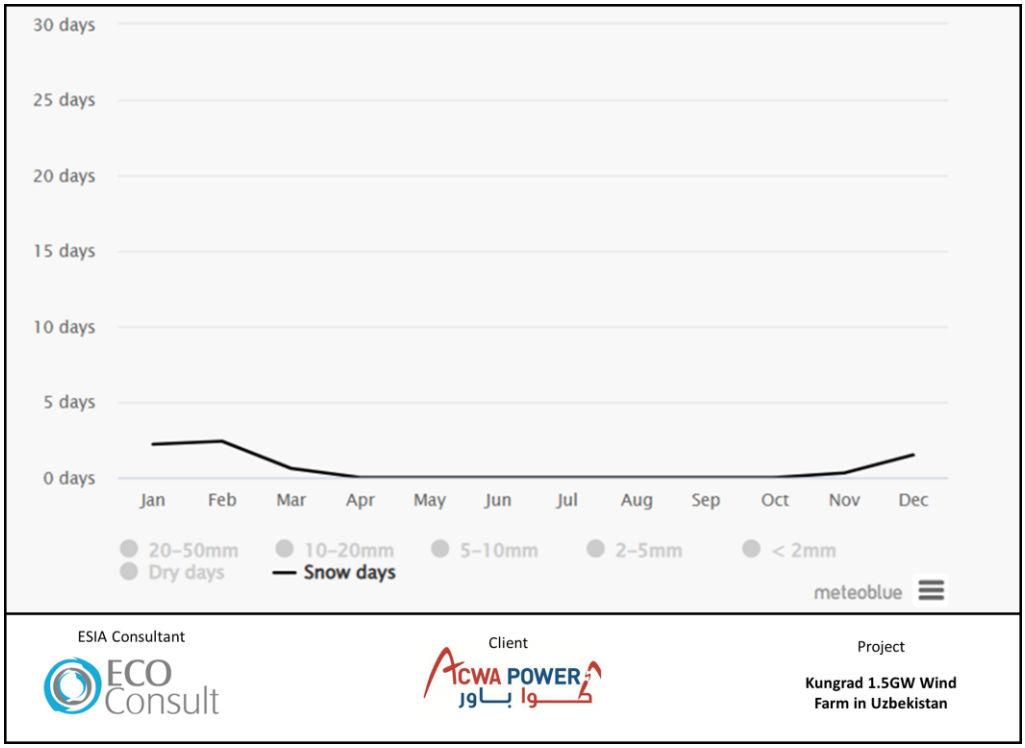


Figure 109: Snow Days in Karakalpakstan

Humidity

In Karakalpakstan, there is a seasonal fluctuation in average humidity levels. As shown in the table below, January registers the highest average humidity at 67%, highlighting a relatively more humid condition during winter. In contrast, May records the lowest average humidity at 25%, indicating drier conditions in spring. The data suggests a gradual rise in humidity from May onward, reaching its peak in November at 62%, followed by a decline in December. This pattern reflects the distinct humidity variations between winter and spring, with a subsequent increase and decrease in the later months of the year.

Table 99: Average Humidity Levels

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Humidity	67%	61%	47%	32%	25%	21%	22%	24%	28%	36%	50%	62%

Salt/ Dust storm

As outlined in the "Climate Risk Country Profile: Uzbekistan" by the World Bank in 2021, the anticipated consequences of diminishing glacial mass and river flow in the Amu Darya and Syr Darya basins, coupled with expected rises in average temperatures, are set to accelerate the desiccation of the Aral Sea. This phenomenon is foreseen to exacerbate desertification across the extensive land surrounding the Aral Sea, with winds carrying sand, dust, agricultural chemicals, and salt up to 300 km from the former seabed. Remote sensing data analysis reveals a 36% increase in the area of salt-affected soils between 2000 and 2008, contributing to the development of salt and dust storms.

The impact of these environmental transformations is particularly significant in Karakalpakstan, notably in its capital city, Nukus. The escalation of desertification, manifested through dust storms, has tangible implications for public health, specifically in relation to respiratory diseases. There is concern that the frequency of salt and dust storms may amplify in the coming decades as climate change continues to drive increased desertification and hasten the desiccation of the Aral Sea.

Heat/Cold waves

The frequency of heat waves in Uzbekistan varies across its territories, with the desert areas experiencing the highest risk due to maximum air temperature norms nearing 40 degrees Celsius. In these regions, the occurrence of heat waves poses a significant threat to human health. The number of days with high air temperatures serves as an index for assessing the likelihood of dangerous heat waves. In accordance with the criteria established by economic entities and design institutes, any instance where the air temperature exceeds or equals 10 degrees Celsius, irrespective of its duration, is considered a hazardous phenomenon in Uzbekistan.

Specifically, in Karakalpakstan, the frequency of days with air temperatures equal to or exceeding 40 degrees Celsius is primarily in the range of 5 to 10 days per year. This indicates a notable occurrence of high-temperature days in the region, emphasizing the potential risks associated with heat waves, particularly in the context of the established temperature threshold for identifying dangerous phenomena.

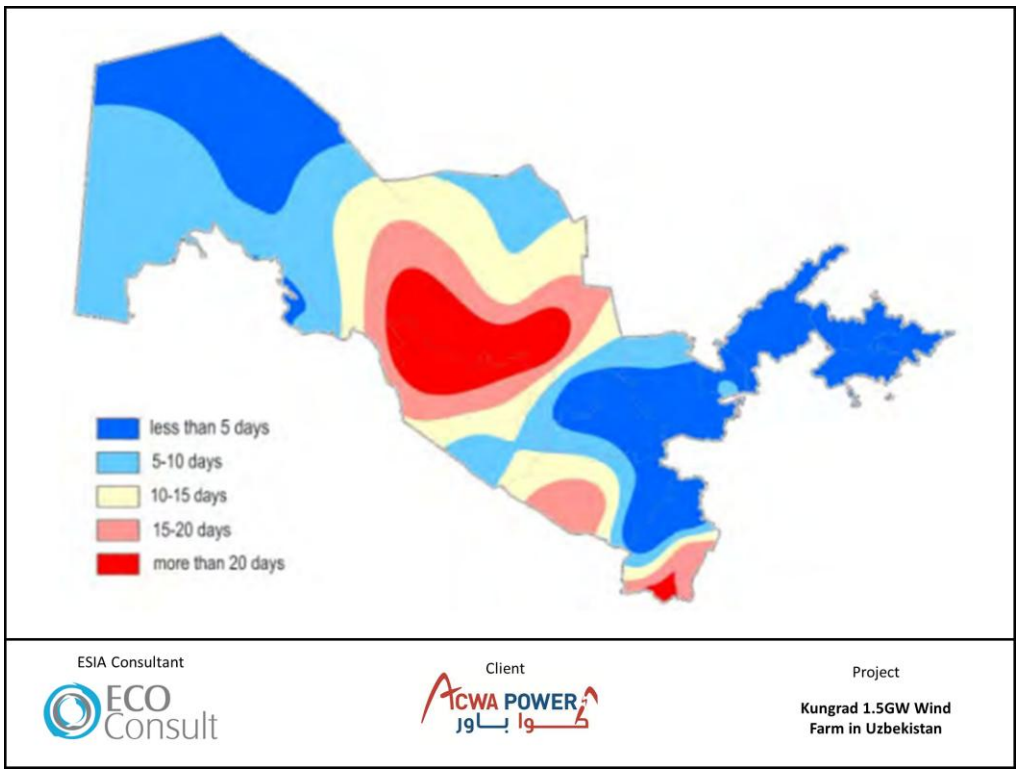


Figure 110: Number of Days with Temperatures Higher Than 40 Degrees Celsius in Uzbekistan

The figure below illustrates that the months characterized by temperatures surpassing 40 degrees Celsius are primarily from May through July. This observation suggests an anticipation of increased heatwave occurrences during these months, with particular emphasis on the month of July. The data indicates a heightened likelihood of extreme heat events, emphasizing the need for attention and preparedness during this period to mitigate potential adverse effects.

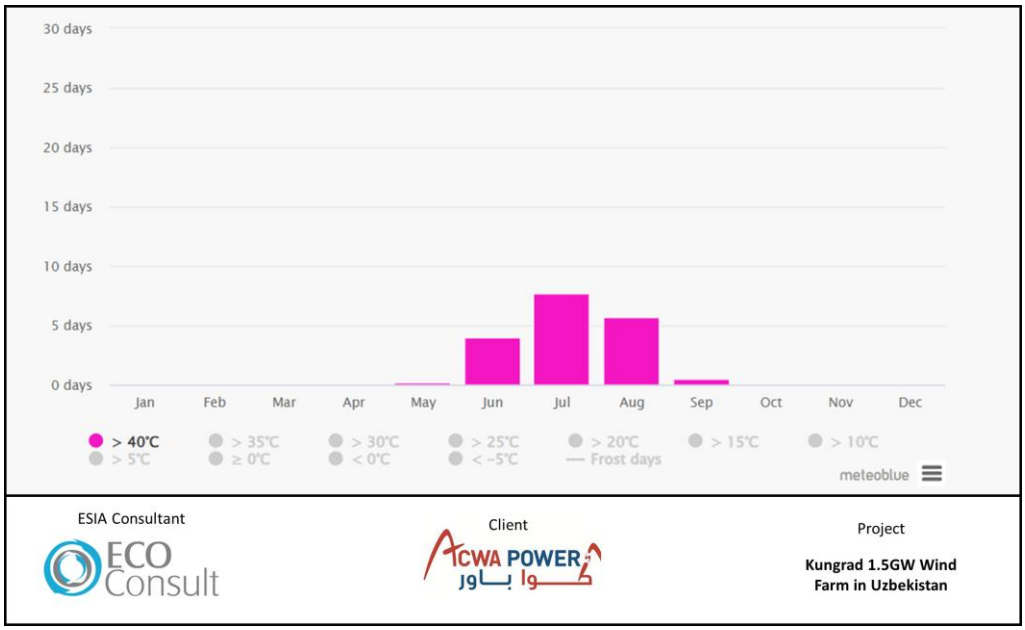


Figure 111: Months Characterized by Temperatures Surpassing 40 Degrees Celsius

According to the figure below, it can be seen that the number of cold days where the temperature falls below 0 degrees Celsius occur during the period between the months of November and March. Historically, the month of January has the greatest number of days with temperatures below 0 Degree Celsius averaging at 5 days for the past 30 years.

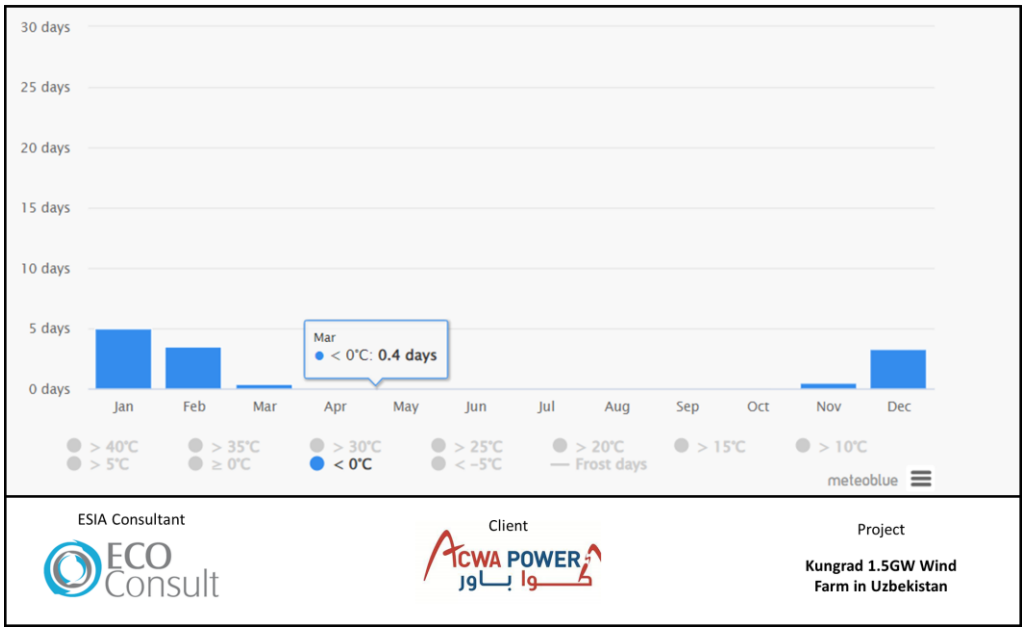


Figure 112: Number of Cold Days Below 0°C in Karakalpakstan

16.2 Assessment of Potential Impacts

This section discusses the potential impacts anticipated from the various Project phases to include the planning and construction phase and the operation phase. For each identified impact, a set of mitigation measures and monitoring requirements have been identified to eliminate the impact or reduce it to acceptable levels.

The key risks on climate and meteorology are related to the following:

- Impacts on occupational health and safety from onsite construction and operational works related to extreme climate conditions such as sandstorms, extreme heat, extreme cold, etc. Such risks have been previously assessed under “Section 15” and applicable mitigation and monitoring measures have been identified.
- Impacts on ensuring appropriate worker accommodation considering climatic conditions such as extreme heat, extreme cold, etc. Such risks have been previously assessed under “Section 15” and applicable mitigation and monitoring measures have been identified.
- Impacts on worker health and safety from transportation activities during construction and operation (e.g. worker transportation to/from local community areas, component transportation, etc.) related to extreme climate conditions such as sandstorms, snowstorms, etc. Such risks have been previously assessed under “Section 14.2.6” and applicable mitigation and monitoring measures have been identified.

Taking the above into account, there are no further requirements to be considered.

17. SUBCONTRACTOR AND SUPPLIER MANAGEMENT

This section provides an assessment of baseline conditions within the Project site and surrounds in relation to subcontractor and supplier management. The section then presents an assessment of potential impacts during the various Project phases. For each impact, a set of management measures (which could include mitigation measures, additional requirements, etc.) and monitoring measures have been identified to eliminate or reduce the impact to acceptable levels.

17.1 Assessment of Baseline Conditions

Subcontractors refer to any entity, whether international or local, appointed directly by the EPC Contractor or the Project Operator through contractual agreements to carry out construction or operation activities within the project area or provide specific services for the project. These services could encompass various tasks such as security, cleaning, water supply, waste collection, and more.

Suppliers, on the other hand, are entities appointed directly by the EPC Contractor or the Project Operator through contractual agreements to provide necessary products, including equipment, materials, or components, essential for the project's development. This could include but not limited to turbines, inverters, office furniture, etc.

As noted earlier, the EPC Contractor has not been appointed at this stage. Therefore, there is no information on the required subcontractor(s) and supplier(s) that will be appointed for this Project.

17.2 Assessment of Potential Impacts

Improper management of subcontractors could entail key E&S risks on the Project as identified throughout all previous sections earlier. Such risks could also cascade to the subcontractor's subcontractor. This could include but not limited to:

- Environmental risks such as for example inappropriate management of dust from construction activities which could impact air quality as discussed previously under "Section 13";
- Occupational health and safety risks such as for example inappropriate Personal Protective Equipment (PPE) which could lead to risk of injury or death as discussed previously under "Section 15.5.8";
- Other labor risks such as inappropriate management of worker accommodation or worker influx into local communities, or human rights risks and violations and other as discussed in "Section 15.5"; and
- Social risks such as for example inappropriate management of local recruitment and procurement opportunities as discussed previously under "Section 15.5.1".

In relation to suppliers, key risks are related to offsite risks and within the suppliers' premises. This most importantly includes human right abuses concerning workers and employees such as discrimination, child labor, forced labor and other similar violations.

Construction Phase			**Operation Phase**		
Type	Negative		Type	Negative	
Duration	Short-term	Limited to construction	Duration	Long-term	During entire operation period
Magnitude	Medium		Magnitude	Medium	
Reversibility	Reversible		Reversibility	Reversible	

Sensitivity	Medium	Contractors and suppliers could result in key E&S risks for the project.	Sensitivity	Medium	Contractors and suppliers could result in key E&S risks for the project.
Likelihood	High		Likelihood	High	
Frequency	Periodic		Frequency	Periodic	
Timing	Not relevant		Timing	Not relevant	
Extent	Low		Extent	Low	
Significance	**Moderate**		**Significance**	**Moderate**	

Mitigation Measures

The Developer is required to develop and implement a Subcontractor and Supplier Management Plan that must also be enforced on the second-tier subcontractors and suppliers as applicable. The objective will be as follows:

- Identify the key subcontractors and suppliers that will be involved in the Project.
- Subcontractor and Supplier Management Procedure to ensure that Environmental and Social (E&S) requirements are adhered to. This could include but not limited to the following:

a. Screening Process: during the tendering process the key E&S requirements applicable to the scope of work should be identified and included within the tender documents. This may include adherence to International Financial Institution (IFI) E&S requirements, national E&S regulations, ESIA and ESMS requirements and others. In addition, tenders will be required as part of the tender to specify how they intend to comply with such requirements as part of their scope of work.

   In the case there is no tendering process subcontractor/supplier will be required to respond to an E&S prequalification questionnaire and will be required to submit company HSSE policies.

   Finally, as part of the screening process, an online desktop review (including media research) on the list of companies bidding, their owners and shareholders on E&S reputational issues.

b. Selection Process: where selected subcontractor / supplier risks have been identified, Developer / EPC Contractor will assess these risks further with the subcontractor / supplier concerned to understand their capacity to avoid and manage such risks and to understand the controls the subcontractor / supplier has in place. This could include but not limited to: (i) submission of E&S policies and procedures as relevant for subcontractor / supplier (e.g. for suppliers' focus would be on human resources and labor policies and procedures), (ii) traceability, (iii) cascading E&S requirements, (iv) undertaking auditing protocols, etc. Where this is not possible, alternative suppliers will be sought.

c. Contractual Controls: Developer / EPC Contractor will put in place controls to avoid and manage potential risks. This will include but not limited to contractual controls, including corrective actions and exit mechanisms, to avoid and manage potential risks. This would depend on the level of risk identified and the leverage over the subcontractor / supplier concerned. Contractual controls could include but not limited to the following: (i) requirement to comply with IFI E&S requirements and national E&S requirement as applicable; (ii) requirements to comply with the project ESMS MS and associated manual; (iii) include clauses that enable the undertaking of inspections and/or audits to ensure compliance with the requirement above; (iv) include clauses allowing imposition of contractual penalties as applicable.

d. Proactive management and a system of contractor accountability.

Following the implementation of these mitigation measures, the significance of the residual impact can be reduced to not significant.

Monitoring and Reporting Requirements

The following identifies the monitoring and reporting requirements that must be adhered to by the Developer:

- Submission of a subcontractor and supplier management plan
- Submission of outcomes of screening processes for all selected subcontractors and suppliers (e.g. tender E&S requirements, reputational assessments).
- Submission of risk assessment for subcontractor / supplier selected and E&S controls for risks identified.
- Submission of E&S contractual controls.
- For all appointed subcontractors, detailed monitoring and reporting requirements are identified (e.g. inspections, audits) throughout the construction and operation phases. This is discussed in further details within the institutional arrangement requirements under “Section 21.1”.
- For suppliers Developer / EPC contractor will, depending on the risks associated with a supply plan, put in place monitoring approach including reports from suppliers, ad hoc audits, etc. to the extent this is feasible. Monitoring will seek to ensure compliance with the mitigation defined, and in cases of non-compliance, help define corrective actions with the supplier concerned. Developer / EPC Contractor will maintain appropriate records of its supply chain assessment and risk management. Where this is conducted by EPC contractors it will be reported to Developer on a regular basis.

18. HUMAN RIGHTS AND GENDER ASSESSMENT

This section is a gender and human rights risk assessment. The assessment was conducted in accordance with the following:

- Guidance Note: On Implementation of Human Rights Assessments Under the Equator Principles; and
- UN Guiding Principles on Business and Human Rights.[65]

The assessment includes the following:

- A high-level review of human rights and gender indicators at the national level.
- A Project-site specific context of socio-economic and development factors.
- An overview of the national labor law and the rights available to workers to identify possible gaps which may lead to labor violations. Gaps were reviewed and benchmarked against the International Bill of Human Rights and the eight ILO Core Labor Standards as outlined in EP4 Guidance Note.
- Based on the gaps identified, possible human rights risks are outlined and classified according to human rights categories and potentially impacted groups.
- Mitigation measures that are needed during the construction and operation phases.
- An overview of the Project's approach to access to remedy, including alignment of the Project's grievance mechanisms with the UNGP Principle 31 effectiveness criteria.

The scope of this assessment focuses on human rights risks most directly associated with the Project's labor force and worker–community interface, including labor rights, gender, and worker-centric civil and economic rights. Other categories of human rights risk identified during the ESIA process are addressed in the cross-referenced sections of the ESIA listed below, which together with this Section form the Project's overall human rights due diligence picture:

- Land rights, livelihood restoration, and economic displacement — addressed in the Project's Land Acquisition and Resettlement Plan (LRP), which sets out the entitlement framework, valuation methodology, and grievance procedures for project-affected persons.
- Community health, safety, and security — Section 15.5, including impacts of worker influx (Section 15.5.7), traffic and transport (Section 14), and security personnel conduct (Section 15.5).
- Gender-based violence and harassment (GBVH) addressed both in this Section (as a workplace risk) and in Section 15.5 (as a community-facing risk).
- Stakeholder engagement, information disclosure, and the Community Grievance Mechanism — Section 6 and the Project's Stakeholder Engagement Plan.
- Vulnerable groups and ethnic minorities — Section 15.4, including the analysis at Section 15.4.3 confirming that Indigenous Peoples within the meaning of ADB SPS SR3, IFC PS7, and EBRD PR7 are not present in the Project area.
- Cultural heritage rights — Section 12.

[65] Equator Principles, Guidance Note: On Implementation of Human Rights Assessments Under the Equator Principles.
The UN Working Group on Business and Human Rights, The UN Guiding Principles on Business and Human Rights: An Introduction.

18.1 Overview of Human Rights and Gender Context in Uzbekistan

This section provides a high-level overview of human rights and gender indicators in Uzbekistan with a focus on conditions in Karakalpakstan as available and relevant. The review draws on reliable sources such as the United Nations Development Program (UNDP), the World Bank, Amnesty International, the International Labor Organization (ILO) and Uzbekistan's national legislation.

18.1.1 Development Context

The Human Development Index (HDI) is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge, and a decent standard of living. Uzbekistan's HDI value for 2021 was 0.727 – positioning the country at 101 out of 191 countries. While still below the global median, Uzbekistan has continued a twenty-year trend of advancement in HDI value, from 0.686 in 2000.[66]

18.1.2 Political Change and Constitutional Reform

For 25 years after gaining independence in 1991 following the fall of the Soviet Union, Uzbekistan was led by President Islam Karimov. President Karimov's rule was characterized by stability and economic stagnation which were underpinned by repressions of political and civic freedoms, state control of land and resources including a policy of mandatory nationwide forced labor to support water-heavy cotton crops which shrank the Aral Sea, widespread corruption, and prickly relations with the double-land locked country's many neighbors.[67] After a quarter century of rule, the death of President Karimov in 2016 marked a significant time of change in Uzbekistan. Then Prime Minister Mirziyoyev was appointed as president, presenting himself as a reformer and supporter of human rights. In 2017, President Mirziyoyev launched an ambitious and unprecedented reform program aimed at building a private sector–driven, market-based economy. This entailed adopting the 2017-2021 Uzbekistan Development Strategy later continued with the 2022-2026 Uzbekistan Development Strategy which set more ambitious economic goals.[68] The strategy focused on reforms in five main areas: governance systems, judicial systems, economic development, social reforms, security, inter-ethnic harmony and religious tolerance.[69]

Following this platform, in June 2022, President Mirziyoyev announced plans to draft a new constitution which would amend some 65% of the existing constitution. Following a March 2023 referendum, the new constitution became effective on 01 May 2023. The most notable changes included enshrining numerous new human rights and political reforms including extending the presidential term from 5 to 7 years. From the government's side, a tagline for reforms has been "putting the citizen first" and has grown the section on rights and freedoms by 3.5 times across the domains of law, social guarantees, economy, politics, and culture. Perhaps the largest set of changes concern the rule of law.[70] The new constitution includes greater protections of privacy, presumption of innocence, the right to remain silent, increased burdens of proof, right to representation, abolition of the death penalty, and protections against prolonged arbitrary detainment. Further additions include protection against housing confiscation, reaffirmations of gender equality and prohibiting employment discrimination against mothers, guarantees of free secondary and

[66] UNDP, Human Development Index 2022.
[67] Eurasianet (2016), Uzbekistan: the life and legacy of Islam Karimov
[68] Eurasia Center (2022), Priorities for the New Uzbekistan Development Strategy 2022-2026
[69] The Tashkent Times, Uzbekistan's Development Strategy for 2017-2021 adopted following public consultation. (Article, 16 July 2023)
[70] Library of Congress (2023), Uzbekistan: new constitution takes effect

vocational education, protections for people with disabilities, measures to ease freedom of movement into neighboring countries, as well as protect and restore the Aral Sea. [71]

Despite the inclusion of a wide range of articles enshrining important human rights, the constitutional reform has also been heavily criticized internationally for increasing presidential powers and extending the presidential term in a way that, in practice, makes it possible for President Mirziyoyev to stay in power until 2037.[72][73] Indeed, on 09 July 2023, a special election was held in which President Mirziyoyev was granted a new seven year term, despite already being almost half way through his second (and what would have previously been his final) five year term.[74] While many were optimistic in 2016 that president Mirziyoyev would usher in a new era of increased democracy and political freedom in Uzbekistan, this move has been largely identified as a continuation of old authoritarian norms taken from the playbook of the Karimov period. [75]

Box 1: Spotlight on Karakalpakstan

The reform also saw opposition within the Karakalpakstan region. Initial draft of the new constitution released in 2022 removed existing clauses that established Karakalpakstan as a sovereign region and protecting the right of the region to succeed from Uzbekistan. In response, activists in Karakalpakstan organized peaceful protests in June of 2022.[76] While president Mirziyoyev quickly backtracked on the proposed changes and appointed a special commission to investigate the incident, more than a year later no report has been published. [77] Conversely, despite the right to discuss the sovereignty of Karakalpakstan being ostensibly enshrined in the constitution, trails of protesters remain ongoing. These proceedings have received international criticism for being show trials, eliciting public shows of mercy for and apologies from protesters. Notably, Dauletmurat Tajimuratov a Karakalpakstan lawyer/journalist seen as a lead organizer of the protests was sentenced to 16 years imprisonment,[78] despite video evidence of him encouraging protesters to remain peaceful and witnesses against him admitting having given false testimony.[79]

18.1.3 Political and Civil Rights

In 2023, Uzbekistan scored 12 out of 100 on the freedom house global freedom status scale. While Uzbekistan continues to rank among the least free nations globally, it has shown slow but consistent improvement since first scoring 3 out of 100 in 2017.[80]

Currently, political freedom in the country is extremely limited.[81] Opposition to the ruling party has been unable to develop in an environment that actively stifles political pluralism. Accordingly, Uzbek voters face no meaningful choice in both house and presidential elections, which have consistently been found not to be free and fair. Instead, networks of political elites and oligarchs hold the levers of government, which

[71] ConstitutionNet (2023), Uzbekistan's proposed constitutional overhaul: Charting a course towards liberal values in Central Asia
[72] During the constitutional reform process, it was announced that the new constitution would also act as a reset on President Mirziyoyev term limits. Despite being in the midst of his second 5-year term, he would now be eligible to serve two more seven-year terms.
[73] The Diplomat (2023), Old Trick in New Uzbekistan: Constitutional Reform and Popular Legitmacy
[74] Reuters (2023), Uzbek Leader holds early election to extend rule
[75] The Diplomat (2022), Constitutional Changes Ahead for Uzbekistan
[76] Foreign Policy (2022), Uzbekistan's Unrest Explained
[77] Radio Free Europe (2023), New Uzbek Constitution Paves Way for President to Stay until 2040, But What Else Changes?
[78] Radio Free Europe (2023), In Uzbekistan's Karakalpakstan, Trial over deadly unrest makes a 'hero' of its intended villain
[79] Radio Free Europe (2023), New Uzbek Constitution Paves Way for President to Stay until 2040, But What Else Changes?
[80] Freedom House (2023), Uzbekistan: Freedom in the World
[81] While formally a constitutional republic with presidential and parliamentary elections, the country was categorized as a consolidated authoritarian regime by Freedom House's Nations in Transit 2023 report.

are largely inaccessible to the average citizen. Despite some recent arrests of members of government for embezzlement and other charges, safeguards remain weak, and corruption remains rampant. [82]

Individual civil freedoms also face significant challenges in Uzbekistan including suppression of individual freedoms of speech, assembly, and religious expression, censorship and repression of free media and targeting of journalists, surveillance of and restrictions to internet use, and limits to independence in academia. [83] Violations of civil rights are exacerbated by a lack of due process and independent judiciary, as well as justice system with a history of violating right to counsel, utilizing torture, punishment by compulsory labor, and maintaining poor prison conditions.[84]

While efforts have been made since 2016 to address these issues, significant barriers remain. For example, torture has long been identified as an issue in Uzbek policing and security.[85] In 2016, Uzbekistan passed a law prohibiting torture followed by a 2017 decree barring courts from using evidence obtained through torture. However, in June 2020 data was released showing that of 757 cases investigated since the law's inception, only 33 had led to prosecution, with the government acknowledging that torture remains a serious problem.[86]

Further, despite constitutional guarantees, freedom of speech and press remains severely limited. Under President Mirziyoyev a modest loosening on control and censorship has led to a cautious emergence of some political and social discourse in domestic and social media. However, most continue to avoid direct criticism of the ruling party. While President Mirziyoyev initially released a number of journalists from prison upon taking office, and 2018 was the first year in recent Uzbek history with no recorded arrests of journalists, such arrests have not stopped entirely. Since 2016, journalists have continued to report harassment, interrogation, and warnings by security services for coverage of sensitive topics. In 2022, multiple journalists, including Karakalpak bloggers, were arrested and some sentenced to multi-year prison terms for anti-government reporting. [87] This included enforcement, for the first time, of a March 2021 amendment outlawing insults against the president. The right to privacy in Uzbekistan is limited both online and in person. Across the country, some 12,000 *mahalla* or neighborhood committees provide social services in the community, but also serve to varying degrees, as sources of information for government and law enforcement authorities on local residents.[88] [89]

18.1.4 Economic and Social Rights

The situation for social and economic rights in Uzbekistan is marked by both instances of progress and ongoing challenges. While Uzbekistan has shown some positive developments in areas like forced labor, freedom of movement, and academic freedom, significant challenges remain in the protection of housing rights and the operation of civil society organizations.

While the Uzbekistan's economic environment has seen reforms towards greater openness and modernization leading to increased economic growth in recent years, shortcomings in regulatory transparency, large informal sector, dominance of state banks, and weak rule of law continue to limit the economy.[90] This reality is underscored by the Heritage Foundation Index of Economic Freedom which ranks

[82] Freedom House (2023), Uzbekistan: Freedom in the World
[83] Freedom House (2023), Uzbekistan: Freedom in the World
[84] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[85] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[86] Eurasianet (2020), Uzbekistan scrambles to respond to torture death in police custody
[87] Freedom House (2023), Uzbekistan: Freedom in the World
[88] A March 2022 decree regionalized the mahalla system and gave greater powers of oversight and surveillance in the local community.
[89] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[90] Heritage Foundation (2023), Economic Freedom Index: Uzbekistan

Uzbekistan below the national average at 109th out of 176 countries, though showing consistent improvement from its 166th position in 2017.[91] State statistics indicate that the average national salary is around 300 USD per month[92] and 17% of people in Uzbekistan fell below the national poverty line in 2021. The national poverty line in Uzbekistan is defined as the minimum consumption expenditure index. In 2021, the minimum consumption expenditure was set at 440,000 Soms. Further, many families remain heavily reliant on remittances which make up just over 20% of national GDP. Some two million people from Uzbekistan are estimated to be working in Russia leaving many vulnerable to currency fluctuations and political developments impacting the Russian economy.[93]

Labor law (explored in detail below) has made important positive reforms in recent years. Most notable, Uzbekistan has made significant strides in combating forced and child labor, once hallmarks of the nation's large cotton industry which, until recently, operated on a system of compulsory labor that indentured nearly 2 million individuals each year.[94] Since 2016, the criminalization of repeated use of forced labor, elimination of the production quota system for cotton, and incentives for voluntary labor have effectively eliminated the practice from the cotton industry.[95] While this represents a significant accomplishment, reports suggest that forced labor may remain an issue in other sectors such as silk production. [96] Further, trafficking of individuals for forced labor and sex work continues to be a problem with Uzbekistan ranked as a tier 2[97] country in the US Department of State 2023 Trafficking in Persons report.[98]

While new articles have been adopted in the 2023 constitution to address housing rights, forced evictions have been a challenge in Uzbekistan linked to urban renewal campaigns. These evictions often occur without due process or adequate compensation and have disproportionately affected the most vulnerable groups such as women, children, persons with disabilities, and minorities. Numerous cases exemplify this issue, such as the forced eviction of Olga Abdullayeva and her family in Tashkent in 2021 to make way for a high-rise development, as well as the 2022 arrest of 44 farmers in Samarkand who complained of land seizures. [99]

18.1.5 Gender and Women's Rights

In Uzbekistan, the gender gap in the Human Development index is -.041, representing only a slightly higher gap than the global average of -.032.[100] Gender equality and women's rights are ostensibly supported by legal protections, but traditional norms and practices often create obstacles to their full realization. Under the 'Strategy for Achieving Gender Quality in Uzbekistan in 2020-2030'[101] and further enshrined in additional guarantees in the newly revised constitution, Uzbek law and policy guarantees the same legal status and rights to women as it does to men across health care, education, culture, and social protection domains. Legally, women permitted to own property, secure outside employment, obtain credit, and run

[91] Heritage Foundation (2023), Economic Freedom Index: Uzbekistan
[92] Radio Free Europe (2023), Between Migration and Low Wages: Can Uzbekistan solve its Poverty Problem?
[93] IOM (2022), Sanctions on Russia already hitting remittance-dependent countries in central Asia
[94] ILO (2022), Uzbek Cotton is free from systemic child labour and forced labour
[95] By 2018, the International Labor Organization (ILO) reported that approximately 93% of cotton workers were voluntarily employed in 2018, and in 2021, the Uzbek Forum for Human Rights found no systematic forced labor organized by state officials during the cotton harvest.
[96] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[97] Tier 2 countries are "Countries whose governments do not fully meet the TVPA's minimum standards but are making significant efforts to bring themselves into compliance with those standards."
[98] US Department of State (2023) Trafficking in Persons Report
[99] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[100] HDI for women is .703 compared to .744 for men. While education rates are relatively close with men expecting 12.6 years of education and women 12.4, the gap in economic participation is more significant, with GNI for men at 20,716 compared to 11,147 for women.
[101] Anchored in the principles of the UN Sustainable Development Goals, the strategy aims to promote gender equality, enhance women's access to higher education, and ensure women's freedom from violence.

businesses. However, these rights frequently clash with traditional views on women's roles, which can hinder women's efforts to exercise these rights, especially in regions with deeply held cultural norms. [102]

Professional opportunities for women remain constrained by both societal biases and legal restrictions. Women represent around half of Uzbekistan's population and hold 46% of total paid jobs.[103] However, women are predominantly found in lower-paying sectors such as education, healthcare, and social services,[104] whereas men dominate higher-paying technical fields. [105] Further, under the labor code, women in Uzbekistan are prohibited from working as in jobs with 'adverse working conditions' and in positions that require lifting over a maximum allowable weight. This disparity, dictated largely by gender norms, is more pronounced in rural areas due to the scarcity of formal jobs and a lack of requisite skills among women. [106] Across the country, women are disproportionately represented in unpaid work, making up 90% of people dedicated to unpaid childcare and housework.[107]

While equal rights are formally extended to men and women in areas like marriage and divorce, de facto disadvantages persist. Child marriage remains an issue in certain areas. The deeply entrenched problem of domestic violence and sexual harassment often goes unreported, with victims left with a lack of legal recourse and socially discouraged from pressing charges, and perpetrators rarely facing prosecution.[108] While it is illegal for a male supervisor to coerce a female subordinate into a sexual relationship, sexual harassment in a broader context is not explicitly outlawed. Similarly, rape is seldom reported or prosecuted, with no explicit legal prohibition of spousal rape.[109]

18.2 The Labor Code in Uzbekistan

Karakalpakstan labor law is dictated by Uzbek labor law, with certain rights and responsibilities given to the Karakalpakstan regional government to establish and enforce rights, entitlements, and provisions. The original Labor Code of the Republic of Uzbekistan was adopted on December 21, 1995, and entered into force on April 30, 1996. Twenty-seven years later, on October 28, 2022, the President of the Republic of Uzbekistan signed Law № ZRU-798 "On Approval of the Labor Code of the Republic of Uzbekistan" which replaced the 1996 law and has been in effect *since April 1, 2023.*[110] *The new constitution of Uzbekistan, which came into force in May 2023, also included additional measures related to labor law.*

The below table outlines the most relevant labor laws as well as applicable sections of 2023 Uzbekistan Constitution which underly Labor Rights in Karakalpakstan and compares these codes to established international benchmarks.

[102] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[103] ILO (2020), Women and the world of work in Uzbekistan.
[104] Women accounted for 76.5% of all employees in healthcare, welfare, and sports, and 75.6% of workers in education, culture, the arts, and sciences.
[105] Asian Development Bank (2018), Uzbekistan Country Gender Assessment
[106] Asian Development Bank (2018), Uzbekistan Country Gender Assessment
[107] ILO (2020), Women and the World of Work: Uzbekistan
[108] Freedom House (2023), Uzbekistan: Freedom in the World
[109] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[110] Azizov and Partners (2023), New edition of the Labor Code of the Republic of Uzbekistan

Table 100: Benchmarking National Legislation Against International Standards

Question	Yes/No	Relevant articles from Law № ZRU-798 and other laws	Non-technical summary of Uzbek law	International benchmark	Notable gap between Uzbek law (as written) and international benchmark
Is there a national minimum wage?	Yes	Labor Law Article 245	The minimum wage is set by the president, taking into account proposals developed by the Tripartite Commission on Social and Labor Issues. It is applied throughout Uzbekistan and is mandatory for all employers whether working hourly or monthly. Bonuses, overtime pay, and other incentives do not count towards the minimum wage.	Minimum Wage Fixing Recommendation, 1970. Minimum wage should be established as a social protection and designed to overcome poverty. It should consider the needs of workers and their families, current national wages, cost of living, social security, relative living standards, and other economic factors.	None
Are employment contracts commonly used?	Yes	Labor Law Articles 104-117	The 2023 Uzbek law added additional clarifications outlining what information should be included in different types of employment contracts, requiring that they be in line with international law, and prohibiting clauses that might allow forced labor, poor working conditions, and discrimination. A signed copy of the contract should be kept with each employee and employer.	Employment Relationship Recommendation, 2006 Countries should provide guidance for effectively establishing employment relationships. They should provide effective access to appropriate, speedy, inexpensive, fair, and efficient procedures for settling disputes and ensure that workers have the protections which they are due.	None
Can employers confiscate passports?		Constitution Article 34 Not specifically addressed in Labor Law	This is not specifically addressed in Uzbek labor law. However, article 34 of the 2023 constitution states that “The State bodies, organizations, citizens' self-governing bodies, and their officials shall have to allow everyone access to documents, resolutions, and other materials relating to their rights and legitimate interests.”	Abolition of Forced Labor Convention, 1957 (Ratified, 1997) Migrant Workers Convention, 1975 (Unratified) Workers must have access to their identity documents at all times and be free to leave the country.	Labor law does not explicitly prohibit employers from confiscating employees’ passports. While the constitution indicates that state bodies should allow everyone access to documents, it is not clear this applies to private employers.
Are workers entitled to	Yes	Labor Law Articles 189, 396,417,42b	Overtime is paid at least twice the amount of the normal wage. At the request of the	Hours of Work (Industry) Convention, 1919 (Unratified)	None

compensation for overtime?			employee, overtime work can be compensated with additional rest time corresponding to the time worked, in which case the overtime work is paid at the normal rate, and the rest time is not compensated.	The rate of pay for overtime should not be less than one and one-quarter times the regular rate.	
Are there established maximum working hours?	Yes	Labor Laws Articles 181 - 200	Normal hours of work may not exceed forty hours for a five- or six-day working week. For certain categories of employees reduced hours are mandatory (under 18, group I and II disabilities, unfavorable working conditions, care workers, one parent of a child under the age of 3). Overtime should not exceed four hours for two consecutive days and should not exceed 120 hours a year.	Forty-Hour Week Convention, 1935 (Ratified 1992) Reduction of Hours of Work Recommendation, 1962 Set 40-hour work week as the recommended standard. Weekly Rest (Industry) Convention, 1921 (Unratified) and Weekly Rest (Commerce and Offices) Convention, 1957 (Unratified) Workers should be entitled to an uninterrupted weekly rest period not less than 24 hours in each 7-day period.	None
Are workers entitled to daily breaks?	Yes	Labor Law Articles 204-206	Employees working more than four hours must have one break for rest and meals lasting from 30-120 minutes, which is not included in the working time. Employees may leave work during their break time. If the shift time exceeds 8 hours the employee must have two breaks. The duration of rest between shifts (the end of work and its beginning on the next day) cannot be less than 12 hours.	No ILO standard	N/A
Are workers entitled to annual leave?	Yes	Labor Law Articles 216-235	Minimum annual leave is 21 days per year after working 6 months. Some employees are entitled to more leave, based on age, work experience, disability, and category of employment. Leave may be divided into parts, but one part must be at least 14	Holidays with Pay Convention (Revised), 1970 (Ratified, 1992) At least three working weeks of annual paid holiday leave (not	None

			calendar days. Unused annual leave and labor holidays must be paid out upon termination.	including public holidays) for one year of service.	
Are workers entitled to weekends and public holidays?	Yes	Labor Law Articles 207-210, 263	Sunday is the common day off for both five- and six-day work weeks, unless other arrangements are necessary for the industry. There are 9 public holidays non-working days per year. If a day off coincides with the holiday, it is transferred to the next working day. Work on public holidays is prohibited with exceptions provided in article 209-210. Workers must be compensated at least double the normal rate for work on weekends and holidays.	No ILO standard	N/A
Are workers entitled to sick leave?	Yes	Labor Laws Articles 202, 229, 281, 460 Order of the Minister of Social Protection No. 21 on the Procedures for the Allocation and Payment of State Social Insurance Benefits.	Sick leave is not explicitly mentioned in the labor law but rather falls under the leave category of temporary disability. No allotment of days or level of payment is specified. However additional guidance is given to determine compensation if the illness or injury is occupational.	Medical Care and Sickness Benefits Convention, 1969 (Unratified) Sets out rules for protecting employees and providing care in case of sickness.	Sick leave is not specifically addressed in the Labor Law but instead falls under the more general category of temporary disability. No specific number of days is granted.
Are female employees entitled to maternity leave?	Yes	Articles 404-405	A woman is granted maternity leave of 70 calendar days before childbirth and 56 calendar days after childbirth with payment not less than 75% of the normal salary. Women are entitled to feeding breaks upon return to work. Employees who adopt a newborn are granted 56 calendar days after the adoption.	Maternity Protection Convention, (Ratified, 1992) Maternity Protection Convention, 2000 (Unratified) Provides for 14 weeks of maternity leave with cash benefit no less than two-thirds of her previous earnings, and breast-feeding breaks. Prohibits hazardous work for pregnant women	None

			Employees are not allowed to terminate employment contracts of a pregnant woman. At the mother's request, she may be granted leave to care for a child until they reach two years of age, with payment determined by the Cabinet of Ministers. A women may also be granted unpaid leave until the child reaches three.	and termination related to pregnancy, maternity leave, or return.	
Are male employees entitled to paternity leave?	Yes (if not taken by mother)	Article 405	At the end of 56-day period of maternity leave, one parent/carer (including fathers or other relatives) is entitled to leave to care for the child until they reach the age of 2 with payment benefits established by the Cabinet of Ministers and paid by social insurance benefits.	No ILO standard. However, paternity leave was identified as a "public good and collective responsibility" by a 2023 ILO report. In 2021 115 out of 185 countries surveyed by the ILO offer a right to paternity leave (9 days as a global average).	Paternity leave is not granted independent of or separate from maternity leave. However, leave is granted to one parent/care giver to care for the child until 2 years of age, which may be claimed by the father.
Are employees entitled to other types of leave?	Yes	Article 237-239	In addition to annual and maternal leave, Uzbek law also grants provisions for childcare leave, study leave, and creative holidays.	Paid Educational Leave Convention, 1974 (Unratified) Members agree to formulate a policy to promote granting paid educational leave for the purpose of training, general education, and trade union education.	None
Must a valid reason be given to lawfully terminate an employment contract?	Yes	Articles 155-174	Article 155 outlines valid reasons for termination. The following chapter 155-174 outlines lawful procedures for termination under different cases and different categories of contracts and employees. Illegally terminated employees are entitled to reinstatement, payment for forced time lost, and material damages. Severance for legally terminated employees is paid at the initiative of the employer.	Termination of Employment Convention, 1982 (Unratified) Establishes that a worker shall not be terminated unless there is a valid reason connected to their capacity or conduct or the operational requirements of the undertaking.	None

Does the law require employers to provide a safe and healthy working environment?	Yes	Labor Law Articles 319–336 (Labor Protection); Constitution Article 42	The Labor Code requires employers to ensure safe working conditions, conduct workplace risk assessments, provide personal protective equipment (PPE) at the employer's expense, deliver OHS induction and ongoing training, and investigate and report occupational accidents and diseases. Workers have the right to refuse work that poses an imminent threat to life or health without penalty. The State Labor Inspectorate is responsible for enforcement.	Occupational Safety and Health Convention, 1981 (Unratified). Requires a coherent national policy on OHS, employer duties to take preventive measures, worker participation, training, and health surveillance. Promotional Framework for Occupational Safety and Health Convention, 2006 (Ratified, 2021). Requires Members to promote continuous improvement in occupational safety and health through a national OSH program.	While Uzbekistan has ratified ILO C187 and the Labor Code provides a broad OHS framework, ILO C155 (which sets out detailed employer duties and worker participation requirements) remains unratified. In practice, enforcement is constrained by limited inspectorate capacity and the size of the informal economy. Risks are higher for subcontracted workers, workers in remote locations, and workers in sectors with a high prevalence of informal employment.
Are workers entitled to work injury benefit?	Yes	Article 319-336	Employers are obligated to compensate workers for harm to life or health of an employee done by labor injury or occupational disease. This can include one or more of a one-time allowance payment, monthly payments of lost wages, reimbursements for additional expenses. Amount of one-time payment cannot be lower than the annual salary. Monthly payments are determined as a percentage of the monthly wage, depending on the degree of loss of ability to work. Payments may be reduced in court if the employer is found not to be at fault, but the employer may not refuse to compensate for harm.	Workmen's compensation (agriculture) Convention, 1921 (Unratified) Establishes that nations should provide appropriate compensation for agricultural workers who suffer personal injury by accident arising from their employment. Occupational Safety and Health Convention, 1981 (Unratified) Promotional Framework for Occupational Safety and Health Convention, 2006 (Ratified, 2021) Establishes that nations should enforce safe and healthy working conditions.	None
Does the labor law prohibit discrimination ?	Yes	Articles 3-4, 244 Article 3 of the Law on	The law prohibits discrimination based on gender, age, race, nationality, language, social origin, property and civil status, place of residence, attitudes towards	Equal Remuneration Convention, 1951 (Ratified, 1992) Equal wages for men and women.	None

		Guarantees of Equal Rights and Opportunities for Women and Men in the Republic of Uzbekistan	religion, beliefs, membership in public associations, as well as circumstances not related to the professional qualities of employees and the results of their work. Article 244 prohibits wage discrimination. Article three of the equal rights law prohibits discrimination on the grounds of marital status, pregnancy, family obligations, as well as sexual harassment or wage discrimination. It also prohibits indirect discrimination where persons of one sex are placed in a less favorable adverse position through narratives of gender inequality in media, education, or culture.	Discrimination (Employment and Occupation) Convention, 1958 (Ratified, 1992)	
Does the law explicitly prohibit sexual harassment?	No	Not explicitly mentioned in labor law. Mentioned in the Law on Protection of Women from Harassment and Violence, 2019, Law on Strengthening Protection of Women and Children, 2023 and Art. 3 of the Law on Guarantees of Equal Rights & Opportunities for Women and Men in the Republic of Uzbekistan, 2019	The law on protection of women from harassment and violence defines and prohibits sexual, physical, economic, and psychological abuse, and provides women with resources and channels for recourse. In 2023, this law was strengthened with harsher penalties and additional articles addressing harassment. However, these laws do not make explicit mention of workplace harassment.	Violence and Harassment Convention, 2019 (Unratified) explicitly defines and prohibits sexual harassment in the workplace and defines measures to protect from, prevent, enforce measures, remedy, train, and raise awareness of sexual harassment related to labor.	Sexual Harassment in the workplace is not explicitly mentioned in the labor law. Accordingly, Uzbek labor law does not explicitly provide for the measures laid out in the Violence and Sexual Harassment Convention, 2019.

Is there a minimum age for employment?	Yes	Article 118	Employment is allowed from the age of 16. At the age of 15, students can be hired from secondary and vocational schools to perform light wok that does not harm their health and development or impede learning. In cultural, entertainment, media, and sports, employment contracts can be made with people under 15 years of age give parental consent and permission from the guardianship authority.	Minimum Age Convention, 1973 (Ratified, 2009) Encourages a 15 as the minimum age of work with exceptions for developing countries (14 as suggested age).	None
Are there special protections for workers under the age of 18?	Yes	Articles 411-422	Imposes restrictions such as limiting shift hours and total working hours to 36-hour work week between age 16-18 and 24-hour for 15-year-olds during free time, and half that during the academic year. It also prohibits harmful working conditions, mandates medical examinations, ensures equal wages, and allows for parents or the state to demand termination of employment if it threatens their life, health, security, or moral development.	Minimum Age Convention, 1973 (Ratified, 2009) Outlines special provisions for workers under the age of 18. Worst Forms of Child Labor Convention, 1999 (Ratified, 2008) Defines worst forms of child labor	None
Can workers join and form unions?	Yes	Article 21, 37 Law ORK-588 of 2020	Article 37 provides workers the right to voluntarily form and join unions and associations of workers for the purpose of representing and protection their rights and interests. In 2020, President Mirziyoyev signed a decree on union rights simplifying registration, allowing unions to inspect working conditions, and ending production quotas.	Right to Organize and Collective Bargaining Convention, 1949 (Ratified, 1992) Workers' Representative Convention, 1971 (ratified, 1997) Freedom of Association and Protection of the Right to Organize Convention, 1948 (Ratified, 2016)	While Uzbekistan has ratified numerous international treaties protecting the collective rights of workers, independent workers' unions have historically been repressed and remain extremely limited in the country.

Minimum Wage and Working Hours

While Uzbek labor law includes protections such as setting parameters for a living working minimum wage, a 40-hour work week, and social insurance programs to protect periods of leave in practice, gaps in these areas remain. In May 2023, the minimum wage in Uzbekistan was raised by 60,000 UZS to 980,000 UZS[111] (84 USD)[112] per month with another 10% increase scheduled in September, representing a steady trend of incremental increase over previous years. However, an ILO-UNICEF-World Bank report in 2020 found "poverty reduction and decent employment creation have lagged behind [Uzbekistan's] growth rates."[113] With economic growth not translating into poverty reduction, the minimum wage may not satisfy Uzbekistan's obligation to ensure decent living standards. Additionally, social security coverage is lacking, challenging living standards for the most vulnerable. A 2018 survey found that while almost everyone in the public sector is covered, 61% of women and 73% of men in the private sector lack coverage.[114] Social insurance is critical to accessing disability and unemployment pensions, and funding for childcare leave, and vocational training leave. Further, While Uzbek labor law mandates a 40-hour work week, in practice working hours may often exceed this limit. A survey on construction workers found a 50.6-hour work week to be the average with some respondents, especially in Karakalpakstan, reporting 60+ hour weeks. The report indicated that this is exacerbated by the high rates of informal work, which is estimated at 58%, close to the national average around 60%.[115]

Gender Discrimination and Harassment

Despite legal prohibitions on discrimination, gender inequality and discrimination against women remain widespread problems in Uzbekistan's labor force. The gender pay gap persists, with women overrepresented in the three lowest paid sectors (education, health, and social services) they earn 35% less on average than men as of 2018. In 2017 only 1.7% of management staff were women.[116] Further, in 2018, 41% of working women[117] were found to be in "vulnerable" employment – either self-employed without employees or working in unpaid roles for family.[118] Outdated attitudes about gender roles negatively impact women's employment opportunities. According to a 2020 ILO-Gallup survey, only 63% of men and 74% of women in Uzbekistan think it acceptable for women to work outside the home.[119] Some laws also remain discriminatory, including bans on women working in certain occupations[120]-prohibitions criticized by CEDAW as overly protective, discriminatory, and stereotype-based. For women who work, norms which place unpaid childcare and housework solely as the responsibility of women continue to create a double burden.

Protections for sexual harassment have historically been weak in Uzbekistan, with no mention of workplace harassment in labor laws and international organizing raising concerns about high rates of domestic violence and harassment in the country.[121] The long cultural tradition of seeing domestic violence and violence against women as a 'family matter' was, for decades, reflected in national legislation which remained vague and weak on the matter.[122] However, In recent years, following numerous high profile cases of violence against women, legislation has been passed to strengthened protections against such

[111] Kun.uz (2023) Salaries to Increase from May 1st
[112] Converted on XE.com in July 2023 Using 1 USD = 11.615 UZS
[113] ILO, World Bank, UNICEF (2020), An assessment of the social protection system in Uzbekistan
[114] ILO (2020), Women and the world of work in Uzbekistan.
[115] ILO (2021), Transition from Informal to Formal Employment Project in Uzbekistan
[116] ILO (2020), Women and the world of work in Uzbekistan.
[117] This figure was similar for men, at just over 39%
[118] ILO, World Bank, UNICEF (2020), An assessment of the social protection system in Uzbekistan
[119] ILO (2020), Gender and Youth Employment in CIS Countries
[120] Article 393 of the labor code
[121] IPHR (2022), Joint NGO Submission to CEDAW ahead of consideration of Uzbekistan's sixth periodic report
[122] The Diplomat (2022), A Cycle of Perpetual Violence for the Women of Uzbekistan

abuse.[123] In 2023, this law was strengthened by criminalizing offenses, implementing/increasing prison sentences for sexual violence and extending the length of protection orders. While these represent important steps, the effectiveness of implementation remains to be seen.

Other forms of discrimination

Uzbek law prohibits discrimination on the basis of disability and mandates reasonable accommodations in employment including reduced working hours and additional leave for certain types of disabilities. However, persons with disabilities continue to face substantial barriers to workforce participation. Employment rates remain low, undermined by issues like lack of accessibility and shortcomings in educational opportunities.[124] Complaints of discrimination based on ethnic groups are rare, and inflammatory ethnic statements are also prohibited by law. [125] Conversely, Uzbek law does not specifically prohibit discrimination based on sexual orientation, nor does it define or offer recourse for hate crimes or harassment based on orientation. Further, the country still maintains laws that criminalize same-sex relationships. Individuals with HIV are prohibited from certain types of work including in the medical and cosmetic sectors. [126]

Child and Forced Labor

Child and forced labor are formally prohibited, and Uzbekistan has made substantial gains in eradicating their use - most prominently in the annual cotton harvest where child and forced labor were longstanding and pervasive issues. Though systemic mobilization of children and forced laborers was eradicated from the cotton harvest by 2021, isolated cases still occur across the country as the economy adjusts away from the previously permissive environment.[127] Pursing recourse for such cases has been rare, and criminal liability has proven difficult to impose in practice, with prosecutions hampered by reliance on victim testimony. [128] It remains to be seen if stronger and more effective enforcement measures for individual cases will complement largescale efforts (such as in the cotton harvest) to fully eradicate child labor.

Access to Justice for Workers

While Uzbek labor laws provide for a wide range of rights and protections, in practice, access to justice to remedy violations remains constrained. Detailed data on specific types of labor cases is unavailable and therefore difficult to analyze. A 2017 UNDP report estimated that in the country of almost 35 million, courts in Uzbekistan review around 700 employment related disputes a year. The ILO reported that fear of losing their job and the relatively high cost of suits, are likely deterrent to seeking formal recourse.[129] However, generally, the International Court of Justice (ICJ) has found that the judiciary in Uzbekistan remains institutionally weak and that the independence of judiciary and judges is not adequately protected in law or in practice. This weakens the capacity of the system to provide effective access to justice and remedies for violations of economic rights.[130]

Occupational Health and Safety

[123] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan and Radio Free Europe (2023) Uzbek Authorities Cover Up Sexual Abuse of Teenage Girls in Foster Care. A notable incident occurred in 2021 in which three girls were forced by their foster mother to engage in sexual contact with two officials in exchange for food and furniture over a period of 10 months. While the foster mother was sentences to 5.5 years in prison, the officials were sentenced only 1.5years of "restricted freedom" limiting their ability to go out at night and travel.
[124] ILO, World Bank, UNICEF (2020), An assessment of the social protection system in Uzbekistan
[125] US Department of State 2022, Country Report on Human Rights Practices: Uzbekistan
[126] Human Rights Watch (2021), Uzbekistan, Events of 2021
[127] ILO (2022), 2021 third-party monitoring of child labor and forced labor during the cotton harvest in Uzbekistan
[128] ILO (2022), 2020 third-party monitoring of child labor and forced labor during the cotton harvest in Uzbekistan
[129] ILO (2021), Decent Work Country Programme for the Republic of Uzbekistan 2021-2025
[130] ICJ (2022), Submission to the UN Committee on Economic, Social, and Cultural Rights in Uzbekistan

The 2023 Labor Code consolidates labor protection requirements covering employer duties, risk assessment, PPE, training, and accident investigation, supported by Uzbekistan's 2021 ratification of ILO C187. However, ILO C155 — which sets the detailed international benchmark for employer OHS duties and worker participation — remains unratified, and implementation is uneven in practice, particularly in remote project locations, in subcontracting chains, and in the informal sector. These gaps inform the OHS risk rating presented in Section 18.3.

Effectiveness of Labor Unions

Under former President Islam Karimov, independent labor unions organized by-the-worker for-the-worker were not allowed to develop, continuing a legacy from Soviet times. Upon taking office in 2016 now President Mirziyoyev ratified the Freedom of Association and Protection of the Right to Organize Convention, 1948 and passed legislation creating a more permissive environment for unions. However, since the reforms, the country has seen the establishment of only one independent union - Halq Birligi, formed by cotton workers in the Syrdarya region, in 2021 - which has faced challenging concerns.[131]

Despite the new legal protections, members of Halq Birligi immediately began to report experiencing harassment, intimidation, and reprisals from local authorities, police, and company bosses. Furthermore, the union was quickly brought under the Federation of Trade Unions of Uzbekistan (FTUU), a parastatal body. While union representatives indicate that the move to the FTUU has helped them establish themselves, it has been criticized by others as a way for the government to increase control over the union's activities. Reports suggest ongoing cases of abrupt dismissals and withholding salaries of union members.[132] Accordingly, while Mirziyoyev's administration is making reforms on paper, the practical implementation appears extremely limited, and challenges persist for workers' rights and the formation of independent trade unions in Uzbekistan.

Employment in the Informal Sector

The informal economy remains substantial in Uzbekistan. According to the Ministry of Employment and Labor Relations, in 2020 13.23 million people were employed in the economy, with only 5.7 of those employed in the formal sector. The size informal economy was exacerbated by the impacts of COVID-19, during which time many workers lost jobs, and many Uzbek workers who had sought employment in other countries returned.[133] A 2019 World Bank report also found that informal barriers, opaque regulations, and a lack of protection for property rights also contribute to the informal economy. Informal workers remain largely unprotected, with regulatory gaps excluding them from legal safeguards and social security. Though the government has taken some steps, like tax registration exemptions, major gaps persist in the regulatory framework. More comprehensive measures are required to integrate these workers into the legal framework and realize their labor rights.[134]

[131] Radio Free Europe (2021), Celebrations over Uzbekistan's first independent union cut short by threats. harassment
[132] Eurasianet (2022) When will Uzbekistan get a truly independent trade union?
[133] ILO (2021), Transition from Informal to Formal Employment Project in Uzbekistan
[134] ILO, World Bank, UNICEF (2020), An assessment of the social protection system in Uzbekistan

18.3 Classification of Identified Human Rights Risks

In line with the UN Guiding Principles on Business and Human Rights (UNGPs)[135], the risks set out below have been assessed from the perspective of risk to rights-holders rather than risk to the Project, with potentially affected workers and communities as the central reference point. The Risk Level ratings reflect the UNGP factors for severity set out in the Commentary to Guiding Principle 14: the scale of the harm (its gravity), the scope of the harm (the number of individuals affected, including through Project supply and contracting chains), and its irremediable character (the difficulty of restoring affected persons to a situation equivalent to their state before the impact). Consistent with UNGP 24, severity has been treated as the determining factor for prioritization, with heightened weighting given to risks affecting groups at greater risk of vulnerability or marginalization (including women, young workers, persons with disabilities, and migrant or informally employed workers) and to risks where delayed response could render harm irremediable. Severity is understood here as a relative concept — established in relation to the other human rights risks identified for the Project — rather than against an external absolute scale.

The following table outlines potential project-related human rights risks that could impact various rights-holders' groups (i.e. workers and affected communities). These are the most commonly seen risks and are organized by the category of human rights to which they belong.

Table 101: Classification of Human Rights Risks

Rights category	Human Rights issues	Example of potential risk	Group impacted	Risk Level
Labor rights	**Right to accessing justice for labor violations:** Workers are entitled to accessible and reasonable mechanisms to seek recourse for violations without fear of retribution or termination. The judiciary in Uzbekistan lacks independence and issues of cost and fear of retribution can limit workers seeking to protect their rights.	Workers face a violation of their labor rights but do not have an accessible reasonable and fair mechanism for seeking justice and resolution.	Workers	Medium
Labor rights	**Fair wages:** Workers should receive equal remuneration for work of equal value. Remuneration should provide for a decent standard of living, covering basic needs, and	Hiring a contractor or third-party service provider that does not pay their workers a fair wage (cash-in-hand) sufficient to attain a standard of living that includes adequate food, clothing, and housing, depriving them and their families of achieving a basic standard of living.	Workers Local Community	Medium

[135] OHCHR (2011), Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework, Commentary to Guiding Principle 14.

	eliminating working poverty. While Uzbekistan has an established minimum wage, it has not kept up pace economic growth in the country. As of 2021 17% live below the national poverty line and 6.6% of the employed population make less than $1.90 per day. A wage gap persists, with women making 35% less than men.	Hiring a contractor or third-party service provider that does not pay all workers equal remuneration for work of equal value due to discrimination or favoritism. Inadequately surveying the wage market for similar work of similar value and distorting that market with inappropriate wage values to the detriment of workers and the community. Above risk is considered relevant in particular in relation to enforcement gaps and impacts on subcontracted workers.		
Labor rights	**Working hours:** Uzbek law sets a 40-hour work and double pay for overtime, in line with ILO recommendations for an adequate work-life balance and sufficient rest and leisure time. However, given the large size of the informal economy, there is some evidence to suggest that many sectors may normally operate much longer working hours, creating a culture of exceeding legal hours without adequate rest or compensation.	Hiring a manager, contractor, or third-party service that does not adhere to established maximum working hours and/or does not compensate workers for overtime work, harming workers' work-life balance and threatening workplace safety. Workers are required to live on site without adequate periods of leave, infringing on their right to spend time with families, rest, and/or engage in leisure. Lack of enforceability could raise this risk rating and this risk could be viewed as higher in practice.	Workers Workers families	Medium
Labor rights	**Right to rest:** Workers should have the right to rest when sick. While Uzbek labor law has robust allowances for annual, maternity, childcare, education, and creative leave, the provisions for sick leave fall under temporary disability are not as clearly outlined.	A worker falls ill and is unaware of their right to take sick leave. Afraid of losing their job, the worker endangers themselves and others at the workplace by coming to work.	Workers	Medium
Labor rights	**Right to organize and form unions:** Workers should be able to form unions to protect and advance their rights without discrimination or fear of reprisal. Despite recent reforms, the right to organize has	Workers opt to organize but are harassed, pressured, and face retribution from local and government officials threatening harm to their livelihoods and security. Some workers may be interested in organizing but face barriers such as lack of information and experience, derogatory opinions, and social pressure against organizing.	Workers	High

	historically been systematically repressed in Uzbekistan.			
Labor rights	**Forced labor and/or human trafficking:** All individuals should be free from servitude and severe economic exploitation such as in the trafficking of workers or debt bondage. As with child labor, Uzbekistan has made significant strides in eradicating systemic forced labor from the cotton sector and has legal protections against trafficking. However, following this historically permissive environment, cases of forced labor and trafficking continue to be reported in the country.	The Project unknowingly benefits from forced labor or human trafficking through its supply chain. A manager, contractor, or third-party service provider employs individuals under conditions of forced labor, such as those sent by the local community to work on the project against their will, or by putting workers in a position of debt.	Workers Local Community (other individuals under forced labor)	Medium
Labor rights	**Occupational health and safety:** Companies should provide and actively promote safe and healthy work conditions for workers. The remote nature of the project	Workers are exposed to harmful working and/or living conditions due to a lack of availability of water, food, electricity, first aid, and other necessities due to the remote location of the project site. Workers face physical harm during the commute to the Project site.	Workers	High
Civil and political rights	**Right to privacy:** Individuals have a right to be protected from arbitrary, unreasonable, or unlawful interference with their privacy. Uzbekistan has historically maintained surveillance of citizens, especially activists, collected from online activity and local authorities.	Local authorities approach the Project management and ask for personal records and information on workers beyond the information specified to be collected in employment contracts according to labor law.	Workers	Medium
Economic, social, and cultural	**Right to social insurance:** The state should provide protections for a range of issues such as inability to work due to illness and injury, unemployment support, and maternity leave. While these are	With the high prevalence of informal work in Uzbekistan, a contractor or third party may hire workers informally (or workers may want to work informally), which leaves workers largely unprotected and unable to contribute to and access social insurance, including sick, injury, maternity, or annual leave as well as unemployment benefits.	Workers	Medium

	included in Uzbek labor law, coverage is lacking. In the private sector 61% of women and 73% of men lacked social security coverage.			
Group Rights / Heightened Risk of Vulnerability	**Rights of Women:** Workers are entitled to a safe workplace free from sexual harassment. Despite recent legislation, Uzbekistan has longstanding issues of violence against women.	Sexual harassment occurring without being reported through any formal channels, remaining ongoing and unaddressed harming victims, and negatively impacting the work environment. Women workers report sexual harassment but are not provided with reasonable, accessible, and fair mechanisms to access justice and/or do not have adequate resources, support, or information to navigate the reporting and justice systems.	Workers	Medium
Group Rights / Heightened Risk of Vulnerability	**Child labor:** ILO standards set the minimum age for work at 15 and prohibit hazardous work for all persons under 18 years. Uzbekistan has made significant strides in eradicating systemic child labor from the cotton sector and has legal protections for workers under the age of 18. However, following this historically permissive environment, isolated cases of child labor continue to be reported in the country.	Contractors or third-party service providers hiring workers under the age of 18 and not providing adequate protections (reduced working hours, non-hazardous work, displaying labor rights…) thus harming the child. Discovering children laboring in hazardous conditions and failing to resolve the situation in a manner that considers the best interest of the child. For example, immediate dismissal of the child may put them at risk of further exploitation, threatening their standard of living or security of person.	Workers (children)	Low
Group Rights / Heightened Risk of Vulnerability	**Discrimination:** All individuals should be treated equally regardless of class, race, color, religion, gender, age, political or other beliefs, national or social origin, sexual orientation, disability, civil status, family background etc. While Uzbekistan has strong laws against many kinds of discrimination, it does not prohibit it based on sexual orientation and significant gaps	Workers are recruited, hired, advanced, and compensated based on social, familial, class, religious etc. connections to hiring managers thus creating discrimination against others of different origin, race, religion, ethnicity, family, class etc. Workers with disabilities, women, are not hired based on these characteristics, regardless of their experience, suitability, and capacity to perform the role.	Local Community	High

	persist for women and people with disabilities.			

Guidance Material: The Equator Principles Guidance Note on implementation of Human Rights Assessments Under the Equator Principles, September 2020

18.4 Mitigation Measures

Based on the classified human rights risks identified in the previous section, the following mitigation measures should be applied during the construction and operation phases of the Project. The below mitigation measures are applicable to the EPC Contractor, Project Operator and any involved subcontractor throughout the construction and operation phase.

Risks	Mitigation measures	Reference Section / Reference Plan
Right to Accessing Justice for Labor Violations: Workers are entitled to accessible and reasonable mechanisms to seek recourse for violations without fear of retribution or termination. The judiciary in Uzbekistan lacks independence and issues of cost and fear of retribution can limit workers seeking to protect their rights.	A worker grievance mechanism procedure will be implemented, outlining the measures for escalation of grievances by workers. Grievance mechanisms will be explained to all workers as part of their induction training and continuously as part of Toolbox Talks (TBT).	Refer to "Section 15.5.11" Worker Grievance Mechanism
Fair Wages: Workers should receive equal remuneration for work of equal value. Remuneration should provide for a decent standard of living, covering basic needs, and eliminating working poverty. While Uzbekistan has an established minimum wage, it has not kept up pace economic growth in the country. As of 2021 17% live below the national poverty line and 6.6% of the employed population make less than $1.90 per day. A wage gap persists, with women making 35% less than men.	Wages for each employee will be determined on a case-by-case basis. Wages must be fair and should meet the basic needs to maintain a safe and decent standard of living. Wages must be established based on qualifications and competencies, professional experience, job responsibilities, and wages at equivalent positions. Remuneration for work of equal value should be provided for female and male workers. Wages should not be below the nationally established minimum wage.	Refer to "Section 15.5.11" Labor & Working Conditions Management Plan
Working Hours: Uzbek law sets a 40-hour work and double pay for overtime, in line with ILO recommendations for an adequate work-life balance and sufficient rest and leisure time. However, given the large size of the informal economy, there is some evidence to suggest that many sectors may normally operate much longer working hours, creating a culture of exceeding legal hours without adequate rest or compensation.	According to the Labor law, working hours should be set to a maximum of 40 hours a week over 5 or 6 days including at least one hour break every 4 hours. Overtime is allowed with appropriate need, but in all cases, working hours should not exceed 10 per day. Workers should have a 24-hour period of rest after 6 days of work. All workers will be notified of their schedule for the weekly day's rest, working hours, break periods and any changes introduced to such a schedule.	Refer to "Section 15.5.11" Labor & Working Conditions Management Plan

Right to Rest: Workers should have the right to rest when sick. While Uzbek labor law has robust allowances for annual, maternity, childcare, education, and creative leave, there provisions for sick leave fall under temporary disability are not as clearly outlined.	Workers should be entitled to annual and temporary disability leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the workers' contract.	Refer to "Section 15.5.11" Labor & Working Conditions Management Plan
Right to Organize and Form Unions: Workers should be able to form unions to protect and advance their rights without discrimination or fear of reprisal. Despite recent reforms, the right to organize has historically been systematically repressed in Uzbekistan.	Workers have the right to form or join workers' organizations or unions of their choosing without interference and have the right to bargain collectively.	Refer to "Section 15.5.11" Labor & Working Conditions Management Plan
Forced Labor and/or Human Trafficking: All individuals should be free from servitude and severe economic exploitation such as in the trafficking of workers or debt bondage. As with child labor, Uzbekistan has made significant strides in eradicating systemic forced labor from the cotton sector and has legal protections against trafficking. However, following this historically permissive environment, cases of forced labor and trafficking continue to be reported in the country.	The Labor and Working Conditions Management Plan should explicitly prohibit forced labor and human trafficking. Confiscation of employees' passports should be explicitly prohibited.	Refer to "Section 15.5.11" Labor and Working Conditions Management Plan
Right to Privacy: Individuals have a right to be protected from arbitrary, unreasonable, or unlawful interference with their privacy. Uzbekistan has historically maintained surveillance of citizens, especially activists, collected from online activity and local authorities	The privacy and protection of workers will be maintained at all times. This will include limiting access to the below data and information to the EPC Contractor HR Manager only: ▪ Contracts ▪ HR files and databases ▪ Payment register ▪ Worker grievance forms and registers ▪ Disciplinary action register This information will be properly handled and stored, saved online through password protected files, and in secured cabinets with a fitted lock in case of hardcopies.	Refer to "Section 15.5.11" Labor and Working Conditions Management Plan
Right to Social Insurance: The state should provide protections for a range of issues such as inability to work due to illness and injury, unemployment support, and maternity leave. While these are included in Uzbek labor law,	All workers on site will be provided with a contract. Each worker will be provided with a signed copy of the contract and another copy will be retained with the HR Manager.	Refer to "Section 15.5.11" Labor and Working Conditions Management Plan

coverage is lacking. In the private sector 61% of women and 73% of men lacked social security coverage.	Workers should be entitled to annual and sick leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the workers' contract.	
Occupational health and safety: Companies should provide and actively promote safe and healthy work conditions for workers.	An Occupation Health and Safety Plan (OHSP) that is project and site specific will be developed that ensures the health and safety of all personnel and prevents accidents which may injure personnel or damage property. Requirements for worker influx should be developed and to take into account: i) medical examination program for workers; ii) procedures to maintain hygienic conditions onsite, iii) code of conduct for workers; iv) induction training and awareness requirements for risk diseases. Safe transport will be provided to female and male workers, given the remote area of the Project. The codes of conduct, which prohibit gender-based violence, harassment and abuse, will apply to transportation modes.	Refer to "Section 15.5.8" Occupational Health and Safety Plan Refer to "Section 15.5.9" and "Section 15.5.11" for worker influx requirements.
Rights of Women: Workers are entitled to a safe workplace free from sexual harassment. Despite recent legislation, Uzbekistan has longstanding issues of violence against women.	The Worker Grievance Mechanism will prohibit gender-based violence and harassment in the workplace and will outline that a suitably trained male and female person is designated to process grievances in which male / female workers might feel uncomfortable discussing with a person of the opposite sex. The grievance mechanism also includes a procedure to deal with GBVH grievances. Female sanitary, toilet facilities, and prayer rooms will be kept separate from men. All such facilities will have lockable doors with adequate numbers provided. Separate changing rooms and cabinets will be provided for men and women both of which have locking mechanisms. In case of hotel and apartments, separate sleeping rooms for men and women will be provided in shared accommodations Means of securing bedroom doors from inside and out will be provided. Finally, female sanitary and toilet facilities will be kept separate from men. Men and women will be provided with separate sleeping rooms/ dormitories. In addition, female sanitary and toilet facilities will be kept separate from men. All workers will be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct prohibits the following and which is subject to disciplinary action: (i) harassment, gender-based violence and abuse of any kind will not be tolerated; (ii) discrimination based on personal characteristics is prohibited to include but not limited to gender, race, nationality, ethnic, social and vulnerable people, religion or belief, disability, age, or sexual orientation.	Refer to "Section 15.5.9" and "Section 15.5.11" Labor & Working Conditions Management Plan Worker Accommodation Management Plan

	All workers will be provided with a copy of the Gender Based Violence and Harassment (GBVH) Code of Conduct and will be required to sign it. In the case body searches are required for security reasons, those will be gender sensitive (i.e. body searches on female workers / employees /visitors should be undertaken by female security officers and vice versa). Safe transport will be provided to female and male workers, given the remote area of the Project. The codes of conduct, which prohibit gender-based violence, harassment and abuse, will apply to transportation modes.	
Child labor: ILO standards set the minimum age for work at 15 and prohibit hazardous work for all persons under 18 years. Uzbekistan has made significant strides in eradicating systemic child labor from the cotton sector and has legal protections for workers under the age of 18. However, following this historically permissive environment, isolated cases of child labor continue to be reported in the country.	The Labor and Working Conditions Management Plan should explicitly prohibit the recruitment of children under the age of 18 in illegal and hazardous work. However, if children between the ages of 15-18 are to be employed at any stage throughout the construction or operation stages, the following should apply: An official letter with the approval of their parents or guardian should be provided. Young workers must provide valid identification that presents proof of age at the recruitment stage. Driver licenses are not admissible as proof of age. Minor workers are not allowed to work onsite and are only allowed to work in the Project's worker camp. They are not to be employed in any kind of work which by its nature is likely to harm their health and safety or expose them to risks and hazards. Hazardous jobs include but not limited to the following: ▪ Operating or supervising machines, apparatus, and equipment of substantial power ▪ Operating vehicles of any kind ▪ Exposure to petroleum products and/or hazardous materials of any kind ▪ Lifting, moving, or pushing heavy materials ▪ Work performed at heights ▪ Any underground works ▪ Other activities which entail exposure to dangerous or hazardous equipment, materials, or activities ▪ Other activities similar in nature to the above In accordance with the Labor law, young workers shall not work for more than six hours a day, during which one or more break periods totaling not less than one hour shall be granted for meals and rest. They should not be made to work overtime hours or required to come to work on weekends and official holidays. They shall not be made to work between 7:00 pm and 7:00 am.	Refer to "Section 15.5.11" Labor & Working Conditions Management Plan
Discrimination: All individuals should be treated equally regardless of class, race, color, religion, gender, age, political or other beliefs, national or social origin, sexual orientation, disability, civil	The local recruitment process will be conducted in an inclusive and diverse manner, which means job opportunities will be open to all community members regardless of their class, race, color, gender, age, disability, civil status etc. Recruitment will be based on competency and skill.	Refer to "Section 15.5.11"

status, family background etc. While Uzbekistan has strong laws against many kinds of discrimination, it does not prohibit it based on sexual orientation and significant gaps persist for women and people with disabilities.	Efforts and resources will be allocated to make sure that women are also fairly targeted and recruited and are provided opportunities for learning skills to participate equally as men. Gender inclusive advertising will be identified, in consultation with female stakeholders (such as women's groups and CBOs) and will be utilized in the announcement of job opportunities. Candidate selection (recruitment) will be conducted by a mixed-sex panel (comprising of at least two people). Candidate promotion selection will always be carried out by a gender diverse and balanced panel (more than one person and never by a single-sex panel). It will be prohibited to terminate the contract of a female worker during her maternity leave.	Labor & Working Conditions Management Plan

18.5 Access to Remedy

In addition to identifying and mitigating adverse human rights risks, the UNGPs (Pillar III, Guiding Principles 25–31) require that affected rights-holders have access to effective remedy where harm occurs. The Project will rely on two operational-level grievance mechanisms — a Worker Grievance Mechanism for the construction and operations workforce (including subcontracted workers), and a Community Grievance Mechanism for Affected Communities — both of which sit alongside, and do not impede access to, the judicial and administrative remedies available under Uzbek law.

Both mechanisms have been designed to align with the eight effectiveness criteria for non-judicial grievance mechanisms set out in UNGP Principle 31:

- Legitimate — administered in a manner that enables trust from workers and communities, with accountability for the fair conduct of grievance processes.
- Accessible — communicated to all rights-holder groups (including through induction training, Toolbox Talks, and community engagement activities), with adequate assistance for those who may face barriers such as language, literacy, remoteness, or fear of reprisal.
- Predictable — providing a clear written procedure with indicative timeframes for each stage and clarity on the types of process and outcome available, as well as means of monitoring implementation.
- Equitable — ensuring aggrieved parties have access to the information, advice, and expertise needed to engage on fair, informed, and respectful terms, including specific provisions for grievances raised by women, young workers, and other groups facing heightened vulnerability.

- Transparent — keeping parties informed of progress and reporting on mechanism performance to build confidence in its effectiveness.
- Rights-compatible — ensuring that outcomes and remedies are consistent with internationally recognized human rights, including those reflected in the International Bill of Human Rights and the ILO Core Labor Standards.
- A source of continuous learning — analyzing trends and patterns in grievances to identify systemic issues and to improve Project policies and practices.
- Based on engagement and dialogue — informed by consultation with stakeholder groups for whose use the mechanism is intended, with dialogue as the primary means of resolution.

Consistent with the UNGPs, the grievance mechanisms are designed to receive and address concerns from affected rights-holders without retribution, at no cost to the complainant, and without precluding access to judicial or other remedy. Particular attention has been given to gender-based violence and harassment (GBVH) grievances, including the designation of trained male and female focal points so that complainants are able to raise sensitive concerns with a person of their preference, and confidential handling of GBVH cases in line with survivor-centered principles. Detailed procedures, roles, and escalation pathways are set out in the Worker Grievance Mechanism (Section 15.5.11) and the Project's Stakeholder Engagement Plan.

19. CLIMATE CHANGE RISK ASSESSMENT

This section provides a high-level Climate Change Risk Assessment (CCRA) related to the Project development. The CCRA is guided by the "Guidance Note on Climate Change Risk Assessment" (EP, 2020).

The CCRA investigates the relevant climate-related 'Physical Risks' defined as risks resulting from climate change which are event driven (acute) or longer-term shifts (chronic) in climate patterns. Acute physical climate risks can include increased severity and frequency of droughts, storms, floods, heat waves and wildfires. Chronic physical climate risks can include sea level rise and longer-term temperature increase.

The CCRA does not include an assessment on 'Transition Risks' as indicated in the Guidance Note (which is only required for Projects with combined Scope 1 and Scope 2 emissions of more than 100,000 tons of CO_2 equivalent annually – which is considered irrelevant for this Project as discussed in the section below). Those are risks related to policy, legal, technology, reputation and market changes.

The key physical risks that have been investigated as part of the CCRA and which are relevant for the Project development include the following:

- Sea Level Rise and Riverine Floods;
- Urban Flash Floods;
- Temperature Increase and Heat Waves;
- Extreme Weather Events;
- Wildfires;
- Infectious Diseases; and
- Water Scarcity and Drought.

19.1 Project GHG Emissions

This section aims to provide a high-level estimation on the GHG emissions and avoidance rates from the Project activities.

One of the key positive impacts of the Project, as far as resource efficiency, is that it will be utilizing wind energy to produce electricity. The Project will be of an installed capacity of 1.5 GW that will contribute to the national grid and reach end users and help meet the increasing electricity demands throughout Uzbekistan – as opposed to meeting such increasing demands through conventional electricity production from thermal power plants.

The Project is expected to provide around 5,304 GWh of electricity per year and is expected to displace approximately 2.5 metric tons of CO_2 annually. This has been calculated based on statistics obtained from IFI Dataset of Default Grid Factors[136] (UNFCCC, 2021) which provided a CO_2 generation factor for electricity production in Uzbekistan, and which was estimated at 467 gCO2/kWh.

The International Financial Institution (IFI), under the Framework for a Harmonized Approach to Greenhouse Gas (GHG) Accounting, published the "GHG Accounting for Grid Connected Renewable Energy Projects" (IFI, 2019). The document states that construction emissions for renewable energy

[136] IFI Default Grid Factors 2021 v3.1 | UNFCCC

projects may be excluded, where forms of renewable energy are generally acknowledged to have low construction/lifecycle emissions.

Nevertheless, to put things into perspective, a research study "Assessing the Lifecycle Greenhouse Gas Emissions from Solar PV and Wind Energy: A Critical Meta-Survey" (Daniel Nugent, Benjamin K. Sovacool, 2013) screened an extensive number of lifecycle studies covering a broad range of wind and solar photovoltaic (PV) electricity generation technologies to identify 41 of the most relevant, recent, rigorous, original, and complete assessments so that the dynamics of their greenhouse gas (GHG) emissions profiles can be determined.

The study concludes that the average lifecycle greenhouse gas emissions for wind farms averaged around 35 g CO2-eq/kWh. The study estimates that around 70% of such emissions are attributed to material cultivation and fabrication (mining, extraction, processing, etc. of final products). Construction activities average 8.4 CO2-eq/kWh, while operational activities average 8.4 CO2-eq/kWh.

This figure above covers all on-site construction activities to include but not limited to transportation of materials, civil works and installation activities, processing of materials, fossil fuels burned in transporting and assembling the system, etc. Similarly, the figure for operation covers all activities to include maintenance, cleaning of modules, replacement of parts, etc.

Based on the above, for this Project, construction activities would amount to around 44,000 tons of CO2-eq, while operational activities would amount less than 44,000 tons of CO2-eq. Based on the amount displaced during operation as calculated above, such numbers are considered negligible (around 3% only).

19.2 Compatibility with Host Country Climate Change Commitments

Background on Climate Change and Uzbekistan's Commitments

Uzbekistan's journey with combating climate change started when they joined the United Nations Framework Convention on Climate Change (UNFCCC) on June 20, 1993. Following on that, Uzbekistan ratified the Kyoto Protocol on 12 October 1999 and ratified the Paris Agreement on 9 November 2018.

In accordance with the above, Uzbekistan prepared and submitted to date three (3) National Communications in accordance with the UNFCCC requirements and guidelines. The first was submitted in 1999 [137] and the Fourth National Communication is currently being prepared. The NC includes (but not limited to) a GHG inventory of Uzbekistan (for the period 1990 – 2017) and the current programs attempting to mitigate climate change at a national level. The NC serve as a continuation of the commitment from Uzbekistan towards the UNFCCC and highlights the progress to date achieved at a national level in reducing emissions through plans/policies or in developing mitigation measures through strategies and programs.

In addition, Uzbekistan submitted its Nationally Determined Contributions (NDCs) to the UNFCCC in October 2021. **The NDC identifies a target of reducing specific GHG per unit of GDP by 35% below 2010 levels by 2030.**

Building on the above, the Republic of Uzbekistan has developed the following national policies or strategies towards combating climate change. A summary of those available to date are provided below.

Table 102: Uzbekistan Policies and Strategies on Climate Change

Strategy	Key Summary

[137] Initial Communication of the Republic of Uzbekistan (unfccc.int)

Sector Driven National Adaptation Plan (NAP) to advance medium- and long-term adaptation planning in Uzbekistan	The Plan aims to address climate change adaptation by integrating it into the country's developmental planning and processes. To address the notable gap in terms of climate system adaptation with a specific focus on the provinces of Karakalpakstan, Bukhara, and Khorazm. The project responds to the urgent need for adaptation measures. It seeks to achieve three key outcomes: strengthening coordination for multi-sectoral adaptation planning, enhancing the evidence base for adaptation planning and prioritization, and developing an adaptation financing strategy. It aligns with Uzbekistan's National Strategy on Sustainable Development and places a strong emphasis on gender inclusiveness throughout the adaptation process.
Strategy for Transition of the Republic of Uzbekistan to a Green Economy for 2019-2030	Developed in accordance with Presidential Decree No. 4477 from October 4, 2019, the Strategy seeks sustainable economic growth by integrating green economy principles into structural reforms. Priorities include improving energy efficiency, using renewable energy sources, addressing climate change, and creating support mechanisms for the green economy. The strategy is being revised to align with Uzbekistan's increased NDC ambitions and decarbonization goals, with an extension until 2050.
National Sustainable Development Goals (SDGs) and targets until 2030	The Resolution of the Cabinet of Ministers No. 841, dated 20.10.2018, emphasizes the importance of integrating various indicators into Uzbekistan's strategy for achieving the National Sustainable Development Goals (SDGs) by 2030. Notably, progress in reducing CO_2 emissions, as measured by one of these indicators, must be a key component of Uzbekistan's Voluntary National Review on SDG progress. These National SDG indicators also encompass adaptation measures. For instance, there is a focus on increasing the resilience of vulnerable populations to climate change impacts, integrating climate responses into policies and development strategies, enhancing awareness and capacity for climate change mitigation and adaptation.
Action Strategy on Five Priority Areas for Development of the Republic of Uzbekistan in 2017- 2021" (UP-4947 dated 07.02.2017)	Provides for the reduction of the energy and resource intensity of the economy, widespread introduction of energy-saving technologies in production, increased use of renewable energy sources, which will help reduce GHG emissions; adoption of systemic measures to mitigate the adverse impact of global climate change and the drying up of the Aral Sea on agriculture development and livelihood of the population.
The Law "On the Use of Renewable Energy Sources" and the Law "On Public Private Partnership" adopted in 2019 in Uzbekistan	Their long-term development plans aim to reach a minimum of 25% of power generation from renewable energy sources (RES) by 2030. To achieve this, they plan to build new RES facilities with a combined capacity of 10 GW, including 5 GW of solar, 3 GW of wind, and 1.9 GW of hydropower plants. The focus in hydropower development is on harnessing the potential of small rivers, irrigation canals, reservoirs, and watercourses. In addition to these goals, it aims to increase the share of renewable energy to **25%** of total power generation, double energy efficiency relative to 2018 levels, and halve the energy intensity of GDP by 2030 as part of their mitigation targets.

Kungrad Wind Power Project Climate Change Related Permits

Aside from obtaining an environmental permit from the Ministry of Ecology, Environmental Protection, and Climate Change for Project implementation, which is based on the EIA study prepared, there are no change related permits or certification.

The Project is designed to generate 1.5GW through wind power technology that will be connected to the National Grid by a high voltage overhead transmission Line. ***This Project's implementation contributes to and is aligned with the key country programs, policies and strategies identified earlier.***

19.3 Sea Level Rise and Riverine Floods

The closest sea to the Project site is the Aral Sea located around 75km to the east. The closet river to the Project site is the Ama Daru River located around 200km to the east. Both are presented in the figure below along with the Project location.

Sea level rise and riverine flood risks are considered irrelevant for the Project due to the following:

- The Aral Sea began shrinking in the 1960s and largely dried up by the 2010s. This issue is discussed in further details in “Section 14.1.5”; and
- The Project site is located at an elevation gain of more than 200m from the Aral Sea and 600m from the Ama Daru River. Therefore, any expected rise attributed to climate change for both (although highly unlikely) cannot reach in general more than 50-70 m within the surrounding area due to the topographical conditions and elevation gains as noted in the figure below.

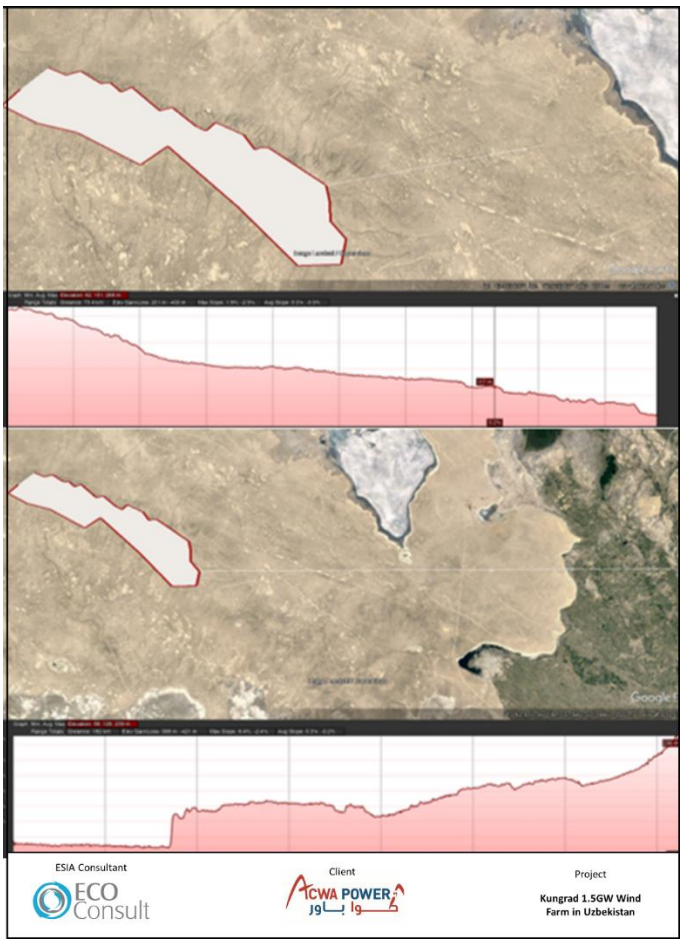


Figure 113: Elevation Change between Project Site and Aral Sea (up) and Ama Daru River (bottom)

19.4 Urban Floods

As discussed in “Section 10.2.1” earlier, the Developer undertook a flood risk assessment for the Project site. The assessment is provided as a standalone document. The assessment and flood model considered impacts related to climate change on flood risks. This was mainly based on incorporating the data/outcomes of a study titled "Stationary and Nonstationary Generalized Extreme Value Modelling of Extreme Precipitation Over a Mountainous Area under Climate Change". The study focused on predicting changes in precipitation levels due to influence of climate change, allowing for more accurate flow and flood risk predictions.

As noted in ""Section 10.2.1" the flood risk assessment concludes that there are no flood risks impacts relevant for the Project site.

Taking the above into account, urban flood risks are considered irrelevant for the Project site.

19.5 Temperature Increase and Heat Waves

The section below is provided from the "Climate Risk Country Profile: Uzbekistan" (World Bank, 2021). Analysis of data from the World Bank's Climate Change Knowledge Portal (CCKP) shows historical information on temperature in Uzbekistan from 1950 – 2020.

Based on the above, Uzbekistan is characterized with an average monthly temperature of 27.2°C in the hottest month (July), and with an average daily maximum of 35°C in many of the major cities. Winters are cold, with average monthly temperatures of −1°C to −3°C between December and February. The figure below presents the spatial variation of observed average annual temperature across Uzbekistan.

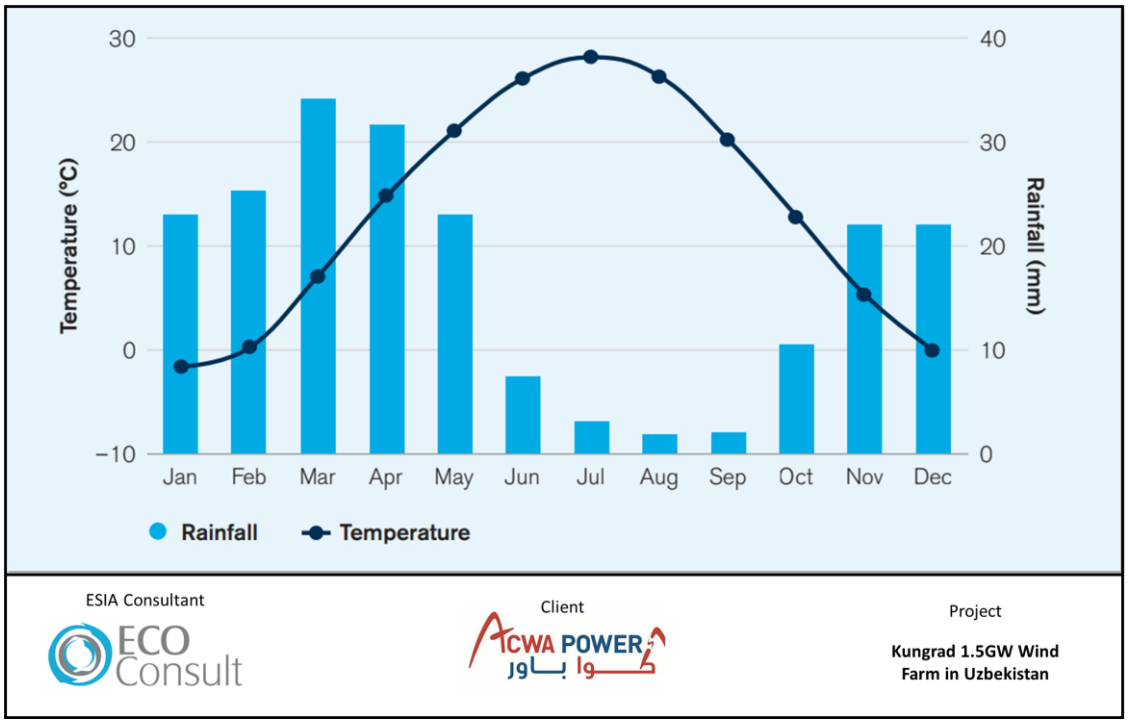


Figure 114:Average Monthly Temperature and Rainfall in Uzbekistan, 1991–2020

The figure below presents the mean temperature in Uzbekistan from 1950 – 2020. As noted below, average annual air temperatures have risen steadily and significantly in Uzbekistan over the past 70 years, with notable variation from year to year. From 1950 to 2013, temperatures rose at an average rate of 0.27°C per decade.

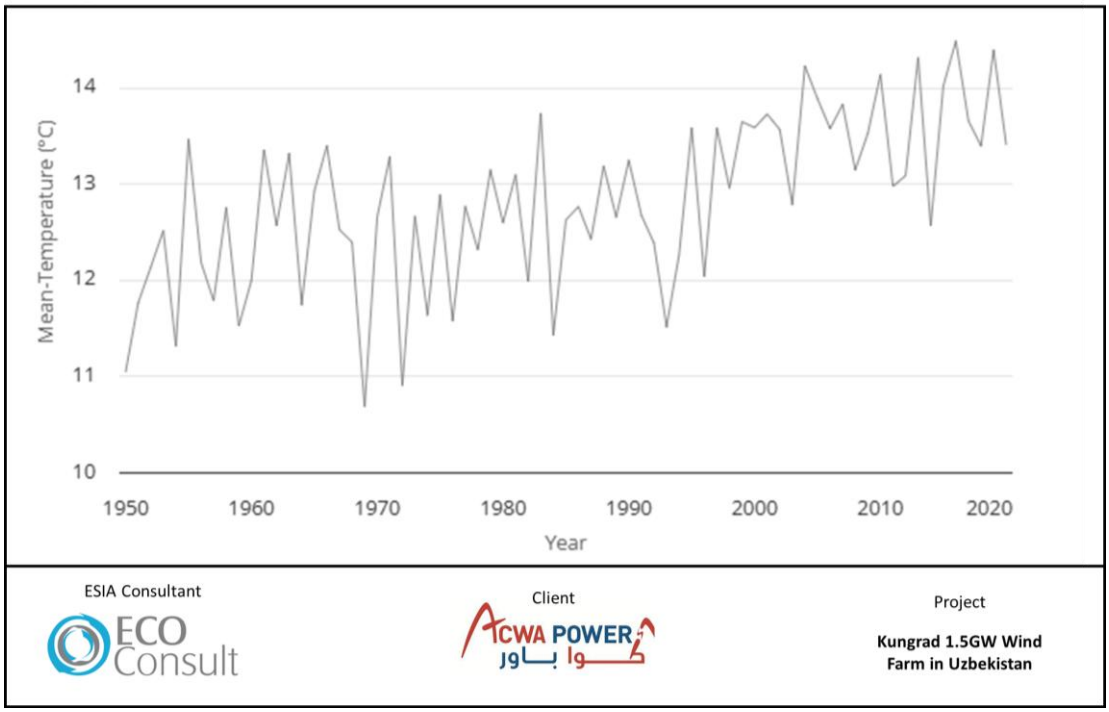


Figure 115: Mean Temperature in Uzbekistan (1950-2020)

The figures below from the Climate Change Knowledge Portal provide a projection of maximum and minimum temperature trends in Uzbekistan under the RCP 8.5 Ensemble (this particular projection scenario operates under the assumption of a business-as-usual approach, without the implementation of any climate change mitigation measures). In 2023, the average maximum temperature is projected to be 20.22°C, while the average minimum temperature is estimated to be 7.68°C. Based on the projections, in 2053 (which aligns with the Project operational period) the average maximum temperature is anticipated to rise to 22.15°C, and the mean minimum temperature is expected to increase to 9.50°C.

Figure 116: Project Maximum Temperature Increase (left) and Minimum Temperature Increase (Right)

The current median probability of a heat wave for Uzbekistan is around 2% (defined as a period of 3 or more days where the daily temperature is above the long-term 95th percentile of daily mean temperature). The frequency of heat waves has already risen, with the sharpest increase being observed in the northwestern areas surrounding the Aral Sea and the lower Amu Darya. This has led to a rise in the number of very hot days (>40°C).

The daily probability of a heatwave is projected to increase in Uzbekistan under all emissions pathways. This increase in heat wave probability is expected to occur as soon as the 2030s, even under the lowest emissions RCP2.6 pathway (this particular projection scenario operates under the assumption of strong emissions reduction with the implementation climate change mitigation measures). As shown in the figure below, the frequency of heatwaves increases significantly under all emissions pathways, and potentially doubles to over 100 days per year under the highest pathway (RCP8.5).

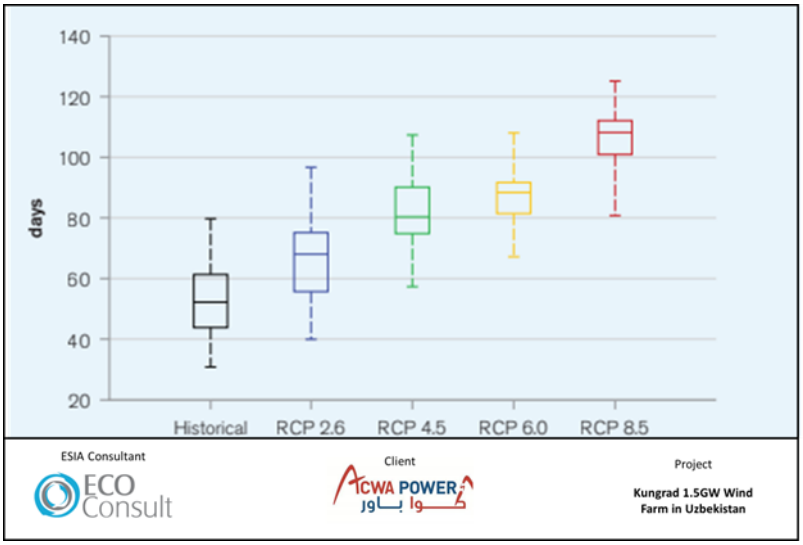


Figure 117: Historic (1986–2005) and Projected Annual Count of Days in which Temperatures Surpass 35°C

Finally, for Karakalpakstan, the Think Hazard tool indicates extreme heat as a medium risk hazard level as noted in the figure below.

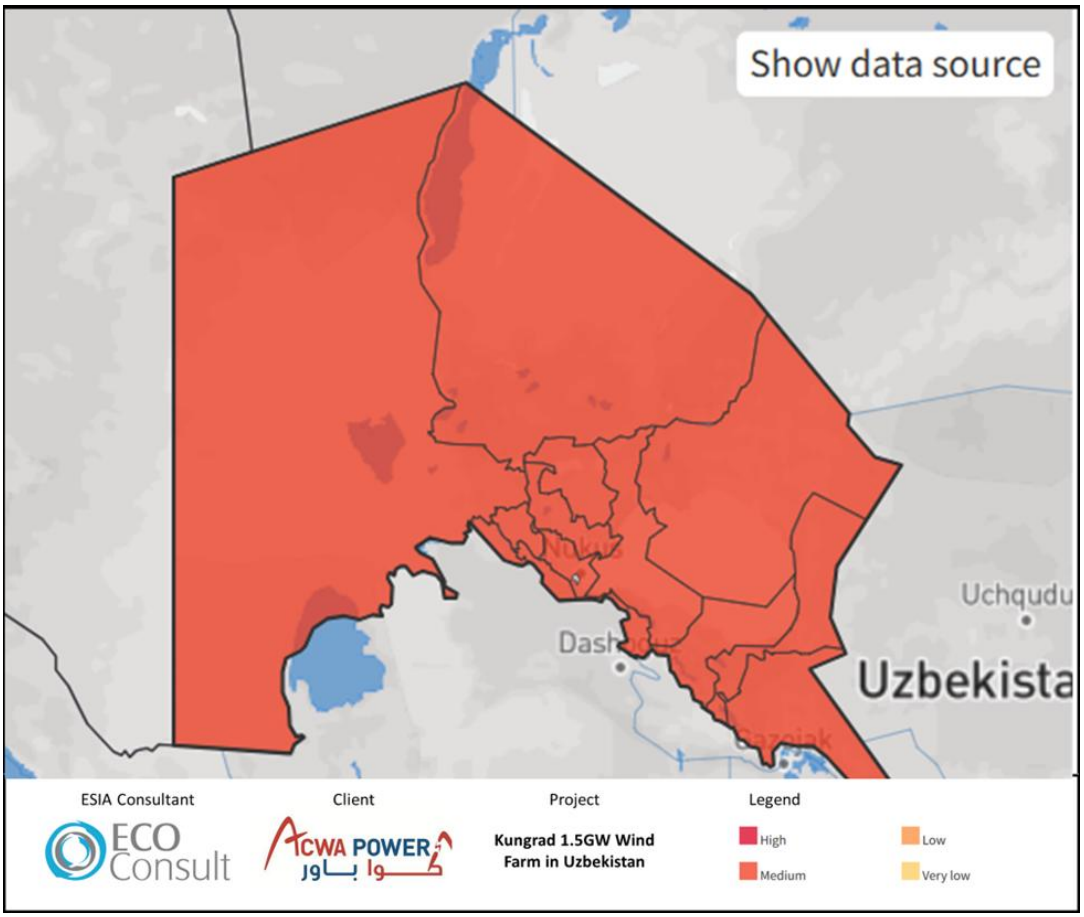


Figure 118: Think Hazard – Hazard Level for Karakalpakstan for Extreme Heat

Taking all of the above into account, Project site can be considered as **high risk from increasing temperatures and heatwaves**, which could adversely affect the Project through the following anticipated impacts, particularly on worker health and safety.

Damage to Assets and/or Impacts on Project Efficiency

High temperatures could damage or affect certain Project assets (e.g. cables, blades, etc.) and/or could affect generation capacity. It is assumed that such risks have been taken into account as part of the technical studies of the Project.

Impacts on Outdoor Workers/Laborers

Working in outdoor areas and exposure to high temperatures entails occupational health and safety risks on workers during the construction and operation phase. "Section 15.5.8" specifically mentions that the OHSP that is to be prepared for the construction and operation phase should take into account risks from working in sunny conditions and high temperatures. This could include measures such as the following;

- Avoid continuous exposure to the sun during the shift. Temporary shelter and similar protections will be defined and provided. Project should comply with limits to heat exposure during working hours;
- Exposed personnel have to wear protective clothing and cover the skin by means of long-sleeved, closely-woven shirts and long trousers;
- If considered necessary, exposed personnel have to use an SPF 30 or higher sunscreen, before going outdoors on skin exposed;
- Provide adequate amount of water per worker (it suggested to drink about 0.5 liters of water before work commencement, drink 1 to 2 cups of water every 20 minutes, for a total of 4 to 8 liters per day or 1 liter per hour);
- Reduce metabolic heat production (heat produced by the body): automation and mechanization of tasks minimize the need for heavy physical work and the resulting build-up of body heat;
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing;
- Define regular breaks in cool, shaded areas;
- Continuous weather monitoring for informed work scheduling; and
- Worker training on recognizing and responding to heat-related illnesses.

In addition, "Section 15.5.8" specifically mentions that the Emergency Preparedness and Response Plan should be developed by EPC Contractor and Project Operator which should include a section related to heat strokes.

19.6 Extreme Weather Events

Dust and Salt Storms

According to the "Climate Risk Country Profile: Uzbekistan" (World Bank, 2021), the projected reduction in glacial mass and river flow in the Amu Darya and Syr Darya basins along with increased average temperatures projected by the model ensemble (as discussed earlier) are likely to accelerate the desiccation of the Aral Sea. This in turn could hasten the process of desertification across the wide

area of land adjoining the Aral Sea, with winds carrying sand, dust, and salt up to 300 km from the former seabed (within the range of the Project site).

Analysis of remote sensing data for the Aral Sea area demonstrates that the area of salt-affected soils that feed the development of salt and dust storms expanded by 36% in the period 2000–2008. Dust storms affect 5.5 million people in Uzbekistan and their increasing frequency, driven by desertification, has been shown to pose a risk to public health in Uzbekistan such as respiratory disease. Such risks may increase in the coming decades, as climate change is likely to drive increased desertification and accelerate the desiccation of the Aral Sea, leading to more frequent dust and salt storms.

Taking the above into account, Uzbekistan is considered at a **medium risk from salt and dust storms**, which could adversely affect the Project through impacts on outdoor workers/laborers. Working in outdoor areas and exposure to salt and dust storm entails occupational health and safety risks on workers during the construction and operation phase. “Section 15.5.8” specifically mentions that an Emergency Preparedness and Response Plan should be developed by EPC Contractor and Project Operator which should include a section related to dust and salt storms that should consider the following:

- All outdoor activities shall be temporarily suspended during salt and dust storms;
- All workers must avoid staying in open areas and locate nearest shelter and take safe refuge;
- Disposable dust masks shall be distributed and worn by all personnel; and
- Depending on site conditions and expected forecast, all works onsite could be suspended.

Landslide

For Karakalpakstan, the Think Hazard tool indicates landslides as a low-risk hazard level as noted in the figure below. In addition, as required, detailed design of the Project will be considering seismic factors for the area that should be taken into account for design specifications. **Taking the above into account, such risks are considered low and there are no further requirements to be considered**.

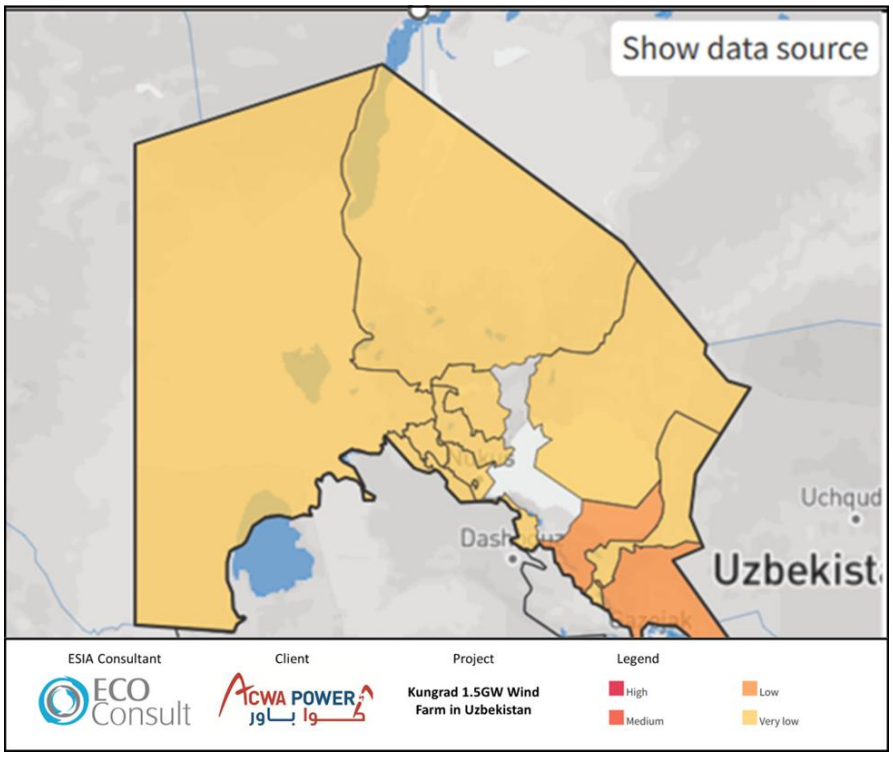


Figure 119:Think Hazard – Hazard Level for Karakalpakstan for Landslide

Earthquakes

For Karakalpakstan, the Think Hazard tool indicates earthquakes as a high-risk hazard level as noted in the figure below. In addition, this is line with outcomes presented earlier under "Section 10.1.1". In addition, as required, detailed design of the Project will be considering seismic factors for the area that should be taken into account for design specifications. **Taking the above into account, such risks are considered low and there are no further requirements to be considered**.

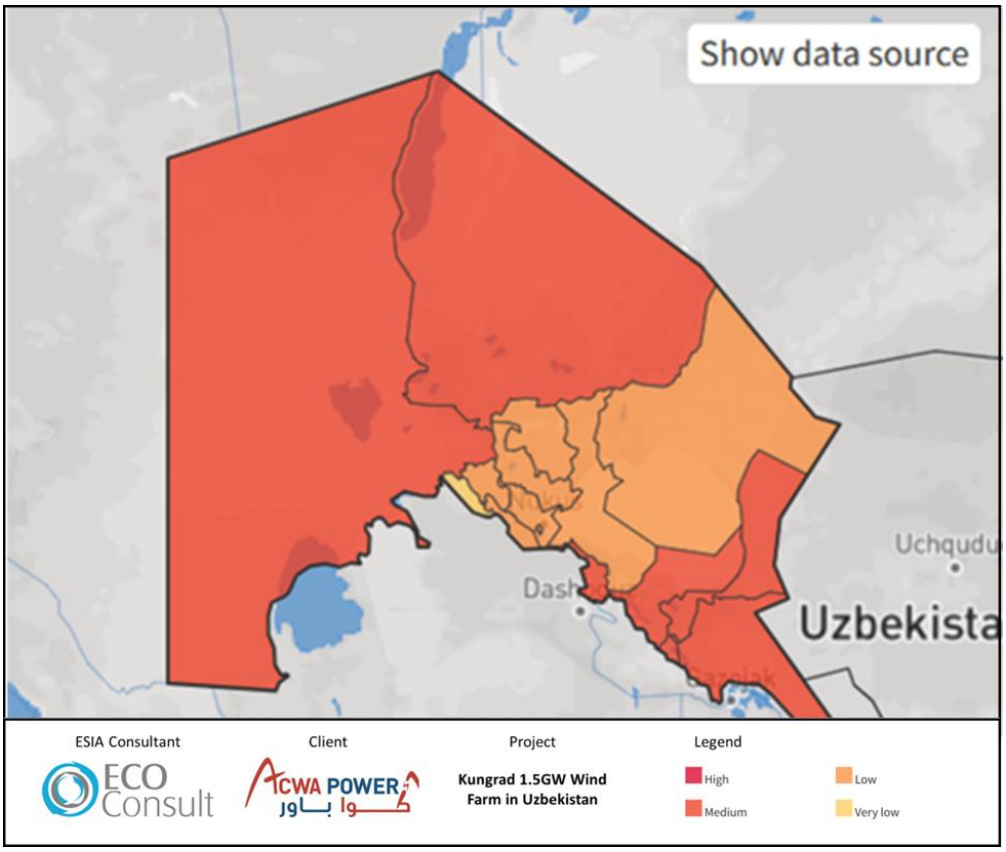


Figure 120:Think Hazard – Hazard Level for Karakalpakstan for Earthquakes

Other

Other known natural disasters are not considered relevant for the Project area such as tsunamis, volcanos, and cyclones. In addition, other extreme weather events have been assessed in other sections – this includes heat waves, flood risks, and sea level rise.

19.7 Wildfires

A wildfire is an unplanned, unwanted, uncontrolled fire in an area of combustible vegetation.

Lightning is the most common ignition source that causes the vast majority of wildfires. Climate change is undoubtedly the biggest trigger of extreme lightning storms. Warmer and longer summer heat up the land surface. This, coupled with an increase in carbon emissions, causes stronger updrafts that are more likely to produce more powerful and frequent lightning. A 2014 study estimates a 12% increase in the frequency of lightning strikes with every one-degree Celsius increase in temperature.

The increase in temperate and heat waves (as discussed earlier) is expected to correlate with increased risk of wildfire. For Karakalpakstan the Think Hazard tool indicates wildfires as a high-risk hazard level as noted in the figure below. Similarly, the “Climate Risk Country Profile: Uzbekistan” (World Bank, 2021) also indicates this as a high risk.

The Project site and its surrounding area is classified as a desert-like habitat with shrub vegetation as noted in the figure below, which could entail risk of wildfire to some extent, but which can be relatively controlled (unlike tree/forest habitats). Based on the area’s habitat, **such risks are considered as medium risk.**

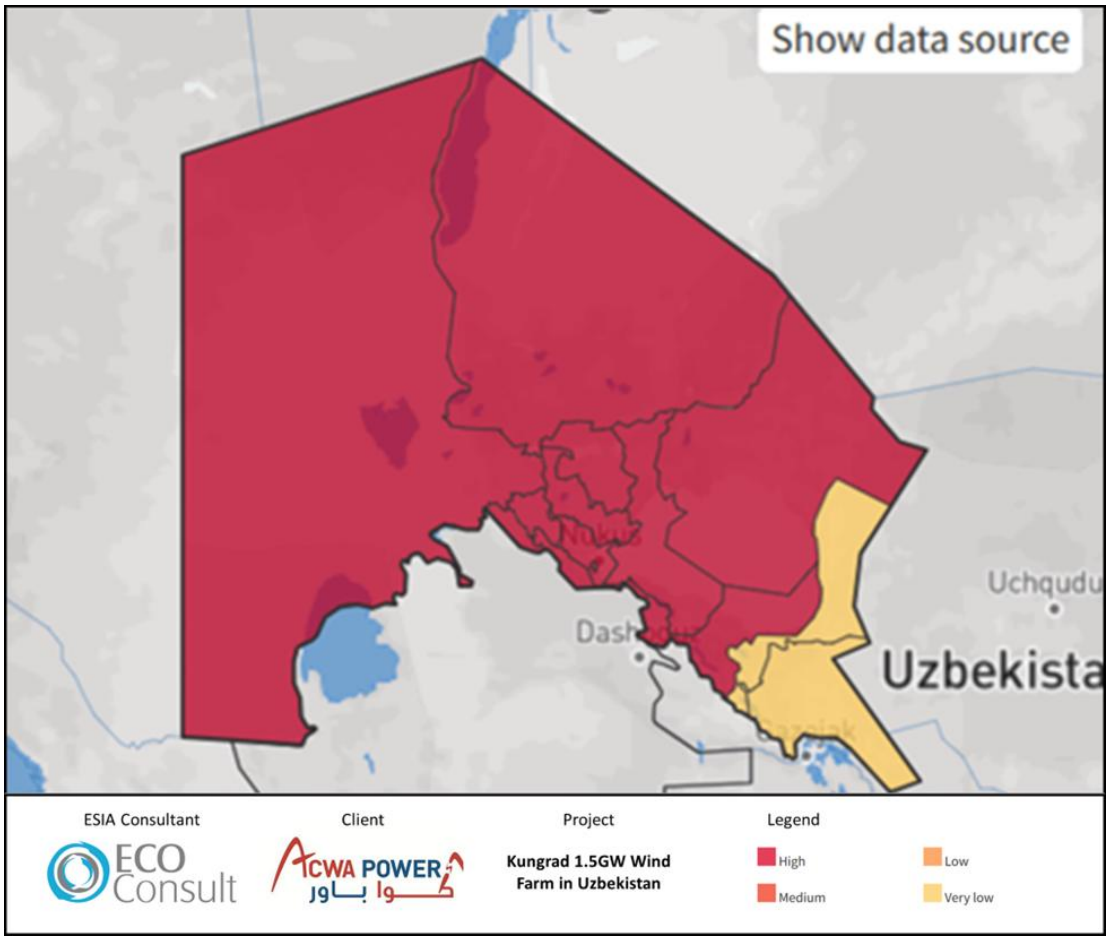


Figure 121: Think Hazard – Hazard Level for Karakalpakstan for Wildfires

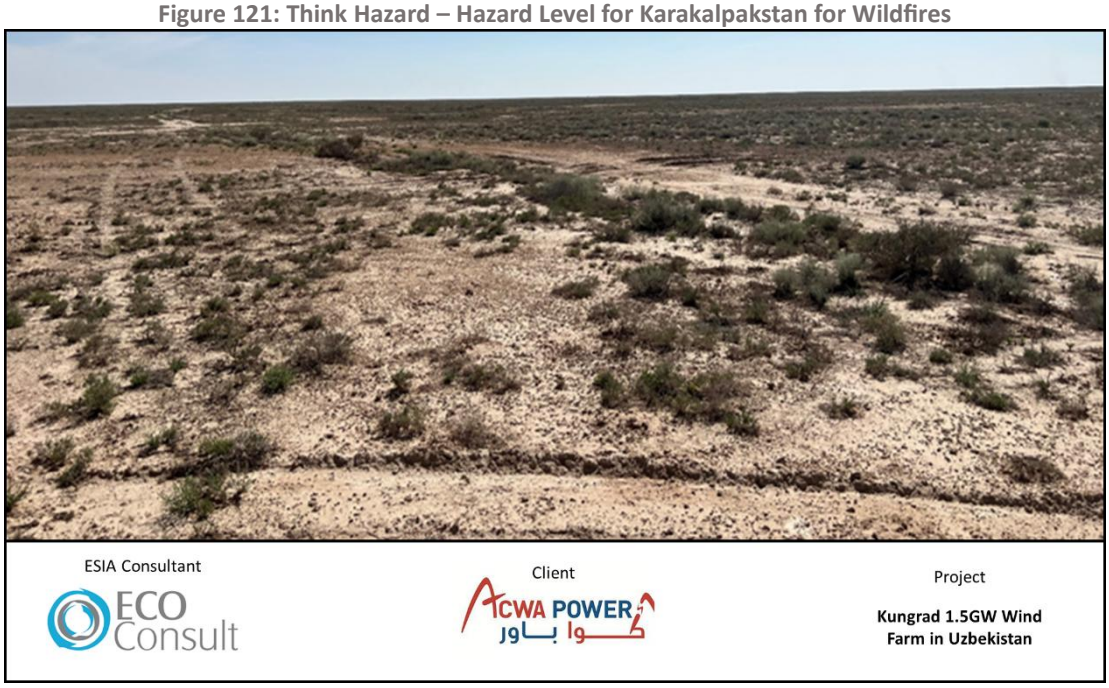


Figure 122: Project Habitat with Shrub Vegetation

"Section 15.5.8" specifically mentions that the Emergency Preparedness and Response Plan should be developed by EPC Contractor and Project Operator which should include a section related to fire risks that should consider the following:

- Identify requirements for firefighting equipment (e.g. fire extinguisher) throughout the entire Project site and in specific key areas such as but not limited to service vehicles, fuel storage area, generator area,
- Identify requirements for fire control to include but not limited to: (i) prohibiting any sources of uncontrolled fires such as campfires, smoking outside of designated areas, etc. (ii) keep away ignition sources and disconnect power supply from installations; (iii) worker shall ensure that other ignition sources are kept away of the fire; (iv) etc.
- Ensure availability of certified firefighters as part of the emergency responders onsite

19.8 Infectious Diseases

The table below presents the key communicable diseases in Uzbekistan to date which include both vaccine-and non-vaccine preventable diseases.

Table 103: Communicable Diseases in Uzbekistan

Vaccine-Preventable Diseases	
Routine Vaccines	Chickenpox (Varicella)
	Diphtheria-Tetanus-Pertussis
	Flu (influenza)
	Measles-Mumps-Rubella (MMR)
	Measles-Mumps-Rubella (MMR)Shingles
Other Vaccines	Covid-19
	Hepatitis A
	Hepatitis B
	Measles
	Rabies
	Typhoid
Non-Vaccine-Preventable Diseases	
Diseases Name	**Ways it spreads**
Leptospirosis	-Touching urine or other body fluids from an animal infected with leptospirosis -Swimming or wading in urine-contaminated fresh water, or contact with urine-contaminated mud -Drinking water or eating food contaminated with animal urine
Leishmaniasis	Sand fly bite
Hantavirus	Breathing in air or accidentally eating food contaminated with the urine, droppings, or saliva of infected rodents -Bite from an infected rodent -Less commonly, being around someone sick with hantavirus.
Tuberculosis (TB)	Breathing in TB bacteria that is in the air from an infected and contagious person coughing, speaking, or singing.

According to the "Climate Risk Country Profile: Uzbekistan" (World Bank, 2021), there is strong evidence of a relationship between higher temperatures and cases of food and water-borne disease in Uzbekistan. Acute intestinal infections are positively correlated with air temperature both in Tashkent and the country as a whole, whereas the incidence of bacterial dysentery is three times higher during summer months than at other times of the year.

This suggests that, in the absence of careful adaptation measures, the prevalence of enteric diseases in Uzbekistan is likely to rise in line with projected temperature increases. The increased temperatures that are projected by the model ensemble may create conditions more conducive to the spread of mosquito-borne diseases, increasing the risk of a resurgence of malaria and parasitic diseases such as leishmaniasis.

Respiratory disease is the most common cause of death among children younger than in Uzbekistan and 2010 evidence from Nukus, the capital city of the northwestern area of Karakalpakstan, shows a positive correlation between dust concentration in the air and cases of respiratory disease. The risk of this disease may increase in the coming decades, as climate change is likely to drive increased desertification and accelerate the desiccation of the Aral Sea, leading to more frequent dust storms.

Linking Climate Change to Disease Trends in Uzbekistan

- Climate change significantly exacerbates leptospirosis risks which can be excreted through infected animals' urine, as it leads to more frequent and intense rainfall and flooding events. Exposure to mud or stagnant water can lead to human-animal contact, while heavy rainfall transports leptospirosis into water bodies, especially during floods. These environmental changes increase the potential for disease outbreaks, making climate change a critical factor in the prevalence and impact of leptospirosis.[138]

- It also significantly amplifies the threat of leishmaniasis, a disease transmitted by sandflies, which affects both animals and humans due to Leishmania parasites. Rising temperatures altered precipitation patterns, and changes in humidity profoundly influence the behavior and ecology of sandfly vectors, intensifying the risk of disease transmission. As the climate warms, the prevalence of leishmaniasis is projected to increase, underscoring the critical role of climate change in the spread of vector-borne illnesses like leishmaniasis.[139]

- Climate change's impact on hantaviruses is complex. It could lead to more frequent outbreaks but also a decrease due to declining rodent populations. Changes in rodent distribution may introduce hantaviruses to new areas, creating new epidemiological dynamics. Continued research in areas like pathogenesis and diagnostics is crucial as hantaviruses remain a public health concern.[140]

- Climate change affects the prevalence and impact of tuberculosis, particularly in low and middle-income countries. It influences tuberculosis through various mechanisms, including temperature, humidity, and precipitation changes that affect host responses, Vitamin D distribution, UV radiation exposure, and malnutrition. Extreme climatic events, resulting in population displacement and larger susceptible populations, contribute to tuberculosis transmission and hinder diagnosis and treatment services. Overall, climate change is expected to increase susceptibility to tuberculosis by amplifying underlying risk factors, particularly in vulnerable regions.[141]

Taking the above into account, such risks are considered medium.

Nevertheless, as discussed in “Section 15.5.9” and 15.5.11” there are requirements that should be considered for worker influx which takes into account the following:

- Medical examination program. All workers must be subject to a preliminary medical examination before commencement of any job tasks in accordance with local applicable requirements. In addition, routine medical examination for workers (bi-annually) must be undertaken. Such medical examinations must be undertaken at certified centers. Copies of medical examination results of all workers must be retained onsite.

- Details and procedures for ensuring and maintaining hygienic conditions onsite at all times specifically related to toilet and washing facilities, eating areas, etc.

[138] Leptospirosis: risk factors and management challenges in developing countries - PMC (nih.gov)
[139] Impact of Climatic Factors on the Seasonal Fluctuation of Leishmaniasis Vectors in Central Morocco (Meknes Prefecture) - PMC (nih.gov)
[140] Hantaviruses and climate change (clinicalmicrobiologyandinfection.com)
[141] The impact of climate change on the risk factors for tuberculosis: A systematic review - PubMed (nih.gov)

- Induction training and awareness raising sessions on risks associated to the most common contagious diseases (e.g. influenza virus), communicable diseases, general measures for hygiene, code of conduct expected to be implemented and other as appropriate.
- Continuous monitoring with national health officials (e.g. Ministry of Health) and local authorities on updates on health situation within the district in specific and Uzbekistan in general (e.g. for any specific disease outbreaks and control measures to be implemented)
- Screening of expatriate workers for any potential infectious diseases (e.g. malaria)

It is recommended that a similar plan is also undertaken for the operation phase of the Project by the Project Operator.

19.9 Water Scarcity and Drought

The Aral Sea, once the fourth largest inland body of water in the world, served as a vital source of life, nourished by the snowmelt and precipitation from distant mountains. Its waters were harnessed to transform the surrounding desert into fertile farmland, primarily for cotton and other crops. However, the Soviet Union initiated a colossal water diversion project in the 1960s, with the ambitious goal of converting the arid plains of Kazakhstan, Uzbekistan, and Turkmenistan into agricultural lands. Tragically, this endeavor led to a devastating ecological collapse. Excessive irrigation from the region's two major rivers, the Syr Darya and the Amu Darya, triggered a catastrophic reduction in the Aral Sea's size. The once-unified lake split into fragmented bodies, the south Aral Sea splintering into eastern and western lobes. The repercussions were dire, encompassing the collapse of fisheries, the devastation of local communities, increasing salinity, pollution from agricultural chemicals, and the release of hazardous dust from the exposed lakebed, which posed serious threats to public health and soil quality.

Moreover, the impact of this disaster extends beyond the borders of Uzbekistan, affecting neighboring countries as well. Annually, a staggering 135-145 million tons of salt pour into the Amu Darya and the Syr Darya, equivalent to a staggering 17-20 tons per hectare of irrigated land. Between 1960 and 1990, the Aral Sea's annual river inflow dropped from 55 km^3 to a mere 6-12 km^3, nearly reaching zero during dry years. At present, the sea level is diminishing at a rate of approximately 0.5 meters per year, with its surface area reduced to a mere 32,000 km^2 and salinity levels surpassing 40 grams per liter and still on the rise.

Since the Amu Darya River is the main source of water in Kungrad District within which the Project is located, this disaster remains a main concern. A study called: “Glacier and runoff changes in the Rukhk catchment, upper Amu-Darya basin until 2050” used hydrological models (CMIP3) to estimate the effect of climate change on the glaciers that feed main tributary to the Amu Darya River. It is projected that temperature rises between 2.2°C and 3.1°C by the 2050s in mountainous areas of Tajikistan could lead to a loss in glacial mass of 36%–45%, relative to present levels, which would cause a slight reduction in the in-river flow by the 2050s, as the smaller glacial mass and increased evapotranspiration are partly offset by a faster glacial melt rate. Another study called:” The role of synoptic processes in mudflow formation in the piedmont areas of Uzbekistan” used the same model to estimate the impact of climate change on the Amu Darya River and related water supply by the 2050s. They project that by mid-century inflow into downstream areas could drop by 26%–35% for the Amu Darya, even as water demand rises in order to allow continued irrigation in the face of higher evaporation rates. This projection implies that by the 2050s there could be severe water shortages in the Amu Darya basins with 50% of their respective levels of demand being unmet.

Not only that, but also according “Climate Risk Country Profile: Uzbekistan” (World Bank, 2021), as of 2014, 80% of Uzbekistan’s water supply came from resources originating outside its borders.

Uzbekistan shares the major rivers of Central Asia (Amu, Darya, Syr Darya, and Zarafshan) with its neighbors; less than 10% of Uzbekistan's water resources originates in the country. This makes the country more vulnerable to increased upstream river regulation from other countries. In the absence of careful international coordination, the pressure on Uzbekistan's water resources may increase as climate change leads to a reduction in river runoff in the long-term.

Apart from climate change impacts on water supply as discussed above, another key issue is drought. Uzbekistan's arid climate and regular high temperatures make drought an increasingly regular occurrence. Three kinds of drought occur in the country: hydrological drought (water shortages from January to March due to low precipitation in the upper watershed of key rivers), meteorological drought (usually associated with a precipitation deficit, and typically occurring in spring or summer), and agricultural drought (a lack of moisture in the soil that inhibits crop growth). Hydrological drought has been occurring with increasing frequency and severity in the western areas of Uzbekistan in the past two decades, whereas the central and southern provinces have experienced the highest frequency of meteorological drought. The most severe drought of recent decades occurred in 2000 and 2001, and resulted in severe economic and social consequences. A study called: "Global Changes in Drought Conditions Under Different Levels of Warming" provides a global overview of changes in drought conditions under different warming scenarios. They project large increases in the duration and magnitude of droughts in Central Asia by the end of the 21st century under global warming levels of 1.5°C, 2.0°C and 3.0°C. Droughts of a magnitude that is extremely rare at present in Central Asia (100-year droughts: refers to a drought event that has a 1% chance of occurring in any given year based on historical climate data and statistical analysis) are projected to become 4 to 10 times more common under the same warming scenarios. The CCKP model ensemble suggests that the annual probability of experiencing a severe meteorological drought in Uzbekistan could increase significantly by the 2090s, under all but the lowest emissions pathway. Projections indicate that severe meteorological drought could occur in 58% of all years by the 2090s under RCP4.5 (this particular projection scenario operates under the assumption of moderate greenhouse gas emissions stabilization over the 21st century), whereas under RCP8.5 (this particular projection scenario operates under the assumption of a business-as-usual approach, without the implementation of any climate change mitigation measures) , severe drought is projected to occur in 87% of all years. While there is some variation regionally within Uzbekistan, risks generally increase westward. Under RCP8.5 (this particular projection scenario operates under the assumption of a business-as-usual approach, without the implementation of any climate change mitigation measures), by the 2090s, the Republic of Karakalpakstan is projected to experience severe drought in 95% of years. In effect, these projections describe a transition to a new regime of chronic meteorological drought.

Finally, and taking all of the above into account, for Karakalpakstan, the Think Hazard tool indicates water scarcity and drought as a high-risk hazard level as noted in the figure below.

Taking all of the above into account, **Project site can be considered as high risk for both the construction and operation phase of the Project.**

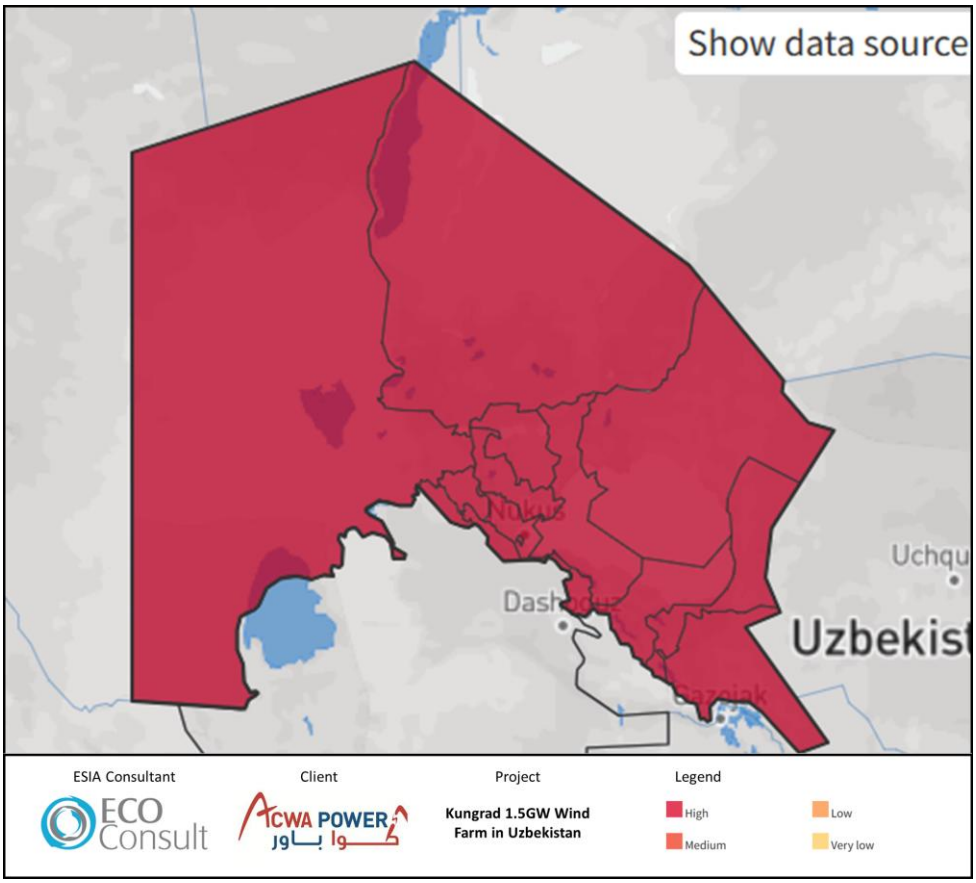


Figure 123:Think Hazard – Hazard Level for Karakalpakstan for Water Scarcity

Addressing the Challenges

Uzbekistan places significant emphasis on sustainable water management and the efficient utilization of its limited water resources. These efforts are crucial in addressing the ongoing water scarcity issue within the region while promoting socio-economic development.

The country is actively engaged in developing its irrigation system and enhancing water management infrastructure to ensure a consistent water supply for households and all sectors of the economy. However, challenges such as global climate change, population growth, and escalating water demand are exacerbating the water resource shortage, potentially hindering future development prospects.

To tackle these pressing challenges, Uzbekistan has formulated several interconnect and comprehensive strategies as noted within the table below. It aims to increase the climate resilience of its agriculture sector, ensure the sustainable use of water and land resources, and establish early warning and risk management systems for effective climate adaptation.

Table 104: Country Strategies Addressing Water Issues

Strategy	Key Summary
Strategy for Transition of the Republic of Uzbekistan to a Green Economy for 2019-2030	This strategy in water management is dedicated to improving water resource utilization and preventing salinization and land degradation. It focuses on the construction and reconstruction of hydraulic structures, widespread use of information and communication technologies, modernization and automation of water management facilities, adoption of energy-efficient and water-saving irrigation technologies, and mechanisms for sustainable water resource management
Water Sector Development Concept of Uzbekistan for 2020-	It is a comprehensive strategy aimed at addressing various critical objectives. These goals encompass meeting the rising water demands of the population, economic sectors, and the environment, ensuring the dependable and safe operation of water facilities, efficient management of water resources, enhancing

2030 (UP No. 5863 dated 30.10.2019):	the condition of irrigated lands, and attaining water security in the context of increasing water scarcity and global climate change. The concept places a particular emphasis on the irrigation sector, the reclamation state of irrigated lands which is vital due to agriculture being the primary water consumer. To achieve its objectives, the concept advocates for the adoption of outsourcing and public-private partnership principles in water management, involving the transfer of water management functions to water consumers and introducing market-oriented practices. It also prioritizes the improvement of on-farm irrigation and drainage networks through adaptable mechanisms tailored to local conditions. Moreover, it recommends reforms in state regulation within the water sector, establishing key institutions responsible for water management. Additionally, the concept stresses the implementation of integrated water resources management principles and plans to establish a National Centre for water accounting and coordination. Finally, it aligns its objectives with the State Program for the Development of the Aral Sea region, which targets challenges related to desertification, water and land management, and climate change adaptation, including initiatives such as afforestation and water management enhancements.
State Program for the Development of the Aral Sea Region (2017-2021): This	This program targets afforestation in the dried Aral Sea bottom, climate change adaptation, and water management improvements in South Karakalpakstan. It addresses issues such as land and water salinization, dust storms, and poor-quality drinking water.
South Karakalpakstan Water Resources Management Improvement Project:	This project aims to alleviate the challenges faced by the Karakalpakstan region due to the shrinking Aral Sea. It involves the modernization of irrigation networks, agriculture, and project management to enhance irrigation efficiency, boost agricultural productivity, and foster economic development
Sector driven National Adaptation Plan (NAP) to advance medium- and long-term adaptation planning in Uzbekistan	Phase 1 of this plan stresses the importance of improving coordination and building capacity for climate adaptation in Uzbekistan, particularly in managing water resources. It highlights the need to strengthen institutions like Uzhydromet and promote gender-inclusive coordination and capacity assessments. Furthermore, the document outlines steps to enhance evidence-based adaptation planning, with an implicit focus on water resources. This involves gathering climate data, conducting vulnerability assessments, and implementing economic analysis tools. Successful integration of climate considerations into planning and budgeting will enhance Uzbekistan's resilience to climate challenges. It focuses on developing an adaptation financing strategy, indirectly related to water resources. It involves stakeholder consultations, gender equality, and integrating climate adaptation into budgeting. This project could enhance water resource management in Uzbekistan.

As evident from the above, the Government is aware of such key challenges and is undertaking ongoing efforts to adopt and implement water resilience strategies for water management at the national level, that will include water supply and water demand. The Government is working on this through various national and regional entities such as the Ministry of Water Resources. Therefore, the above will directly and indirectly include Karakalpakstan Region and Kungrad District as well.

However, within the Project context, this underlines the importance of emphasizing water conservation and water efficiency. As discussed within "Section 14.2.5", the ESIA requires the following:

- Coordinate with Ministry of Water Resources of Karakalpakstan to secure the water requirements of the Project given that this is the official entity responsible for water supply. As discussed, water supply will most likely be through tankers whom in turn will source the water from the Amu Darya River
- Develop a water management plan for the construction and operation phase. The plan should emphasize on water conservation and efficiency such as the following in particular:

- Utilizing the dry-cleaning methods wherever applicable;
- Utilizing water saving fittings where applicable (taps, urinals, toilets, trigger guns, etc.);
- Consider utilizing treated wastewater/grey water for dust suppression and any irrigation requirements as applicable.
- Ensure that washing/cleaning activities (e.g. vehicle and equipment washing, toilets flushing/cleaning, etc.) are carried out using appropriate methods requiring low-water consumption or dry (water-less) cleaning techniques where possible.
- Awareness about resource efficiency, in particular concerning water use, shall be reinforced to all workers through signage and posters as appropriate.
- Undertake weekly inspections for potable and non-potable water storage tanks and water supply connections to ensure there are no leaks. If any are located, they will be fixed immediately.

20. ASSESSMENT OF CUMULATIVE IMPACTS

20.1 Cumulative Impact Assessment

The cumulative impact assessment presented within this section focuses on other similar projects (i.e. wind farms and associated OHTLs) within Uzbekistan. A number of existing and proposed future wind farm projects will occur which for the purpose of this assessment includes and which are also presented in the figure that follows:

- Kungrad 4 Wind Farm Project and OHTL
- Nukus Wind Farm
- Bash Wind Farm and OHTL
- Dzhankeldy Wind Farm and OHTL
- Zarafshan Wind Farm

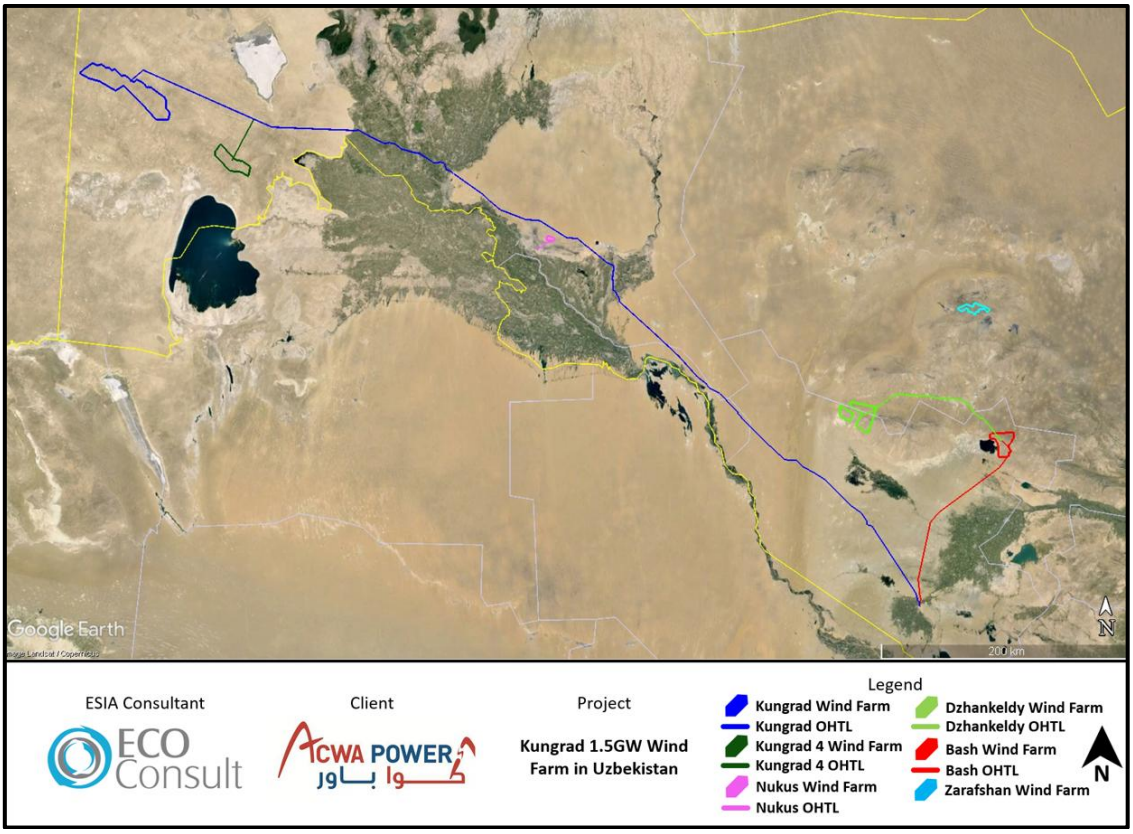


Figure 124: Wind Farm and OHTL Developments for Cumulative Assessment

The table below presents an analysis on cumulative impacts. As noted within the table below, the key issue to be investigated further is related to biodiversity for which an additional analysis has been undertaken within the section that follows.

E&S Attribute	Issue	Additional Requirement
Land Use	Land use impacts (physical and/or economical displacement) are considered project and site-specific. Therefore, cumulative impacts in this case are irrelevant.	None
Geology, Hydrology and Hydrogeology	Key impacts are related to flood risks, onsite waste management and erosion and sediment control. Such impacts are considered project and site-specific. In addition, given the distance of other projects, cumulative impacts are considered irrelevant.	None

Biodiversity	This is considered one of the key issues to be investigated further as part of the cumulative assessment. Refer to section below detailing the Rapid Cumulative Impact Assessment (RCIA) for Biodiversity.	Refer to section below.
Archeology and Cultural Heritage	This includes impacts on surface sites of importance and/or chance finds. Both impacts are considered Project and site-specific. Therefore, cumulative impacts in this case are irrelevant.	None
Air Quality and Noise	Key impacts from the Project are mainly related to dust and noise generation from construction activities. Such impacts are considered project and site-specific. In addition, given the distance of other projects cumulative impacts are considered irrelevant.	None
Infrastructure and Utilities	Water Resources. As part of the Wind Farm and OHTL ESIA study, a water availability assessment has been undertaken to determine the water source for this Project. None of the other projects (with the exception of possibly Kungrad 4) will rely on such identified water sources due to their distance from Project area, and therefore cumulative impacts are considered irrelevant.	Water resources availability assessment along with Kungrad 4 ESIA project has been considered and is provided below.
	Waste Utilities. As required in the Wind Farm and OHTL ESIA, consultations with State Unitary Enterprise are required for dispose of final waste streams generated from the project and ensure facilities are able to accept such waste streams (to include solid waste, wastewater and hazardous waste). It is expected that other projects will undertake such consultations and verifications for their project respectively.	None
	Traffic and Transport. As discussed within the WF and OHTL ESIA, no detailed information is available at this stage on specific and final routes that will be utilized for traffic and transportation for key activities (e.g. WTG transportation). Taking into account the traffic and scheduling of other projects, traffic and transportation requirements of other projects, cumulative impacts could be relevant.	Traffic and Transport Management Plan is required to be developed by the EPC Contractor prior to commencement of any transportation related activities to the Project. The detailed requirements of this plan is included within “Section 14.2.6”. The Plan includes requirement for consultations with governmental entities, identification of traffic routes, identification of traffic requirements, etc. In addition, it requires consideration of traffic and transport scheduling / requirements of the other identified development projects within this section.
Worker Welfare, Health and Safety	Key impacts from the Project are related to occupational health and safety, worker accommodation, and labor and working conditions of workforce. Such impacts are considered Project and site-specific. Therefore, cumulative impacts in this case are irrelevant.	None

Community Health, Safety and Security	Impacts from worker influx is not expected to be relevant given that the affected communities for other projects are likely to differ from those related to this Project. However, the exception to the above is Kungrad 4 (as it is possible that the same affected communities of Kungrad 123 WF will be that for Kungrad 4) and Bash OHTL particularly within the Bukhara region (given that both the Kungrad OHTL and Bash OHTL connect at the same end point).	Cumulative impacts related to worker influx must be taken into account and considered as part of the Kungrad 4 ESIA.
		Worker Accommodation Plan (WAP) and a Labor and Working Conditions Management Plan (LWCMP) is required to be developed by the EPC Contractor. The plans require specific measures to address worker influx as included within "Section 15.5.7" including cumulative impacts of the other identified development projects within this section (particularly Bash OHTL).
	Impacts from trespassing and interaction with security personnel are considered Project and site-specific. In addition, given the distance of other projects, cumulative impacts are considered irrelevant.	None
	Positive impacts related to local community engagement in employment and procurement opportunities and potential negative impacts related to distrust and resentment with the Developer. Such impacts are not expected to be relevant given that (with the exception of Kungrad 4) the affected communities for other projects are likely to differ from those related to this Project.	Cumulative impacts related to local community engagement must be taken into account and considered as part of the Kungrad 4 ESIA

As noted below, there are potential water sources that will be able to supply both projects taking into account cumulative impacts as previously discussed in "Section 14.2.5". It is important to reiterate that this accounts for cumulative impacts assuming both project's water peak requirements occur at the same time, which is not the case. However, the purpose of this analysis is to demonstrate that even under worst-case conditions, such effects are not considered critical.

Option	**Kungrad 4**		**Kungrad 1,2,3**		**Total (Kungrad 1,2,3 and 4)**		**Water Supply**
	Construction	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**	
Option 3 – water wells	80 m^3 / day	3 m^3 / day	200 m^3 / day	25 m^3 / day	**280 m^3 / day**	**28 m^3 / day**	Regulatory will provide permit if resources will not be able to supply such requirements and in this case Option

							4 will be required.
Option 4 – Urgench transgaz							20,000 m^3/ day available for project

20.2 Rapid Cumulative Impact Assessment for Biodiversity

As mentioned above, the Rapid Cumulative Impact Assessment (RCIA) for Biodiversity is for both the Kungrad 1, 2, 3 WF and the associated OHTL, as the two projects are intrinsically dependent on one another.

This RCIA has been conducted following principles and steps of the IFC's Good Practice Handbook on the Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets[142].

Spatial boundaries and Temporal boundaries / other developments

The spatial boundaries of the RCIA are large, considering the length of the OHTL, and based on the type of development and impacts of the proposed projects the RCIA focused on other similar projects (i.e. wind farms and associated OHTLs) that would impact VECs in similar ways. In particular, migratory species that are likely to encounter one or more of these projects over various years or possibly even in the same year.

A number of existing and proposed future wind farm projects will occur in a Direct Area of Influence (DAI) which for the purpose of this assessment includes and which are also presented in the figure that follows:

- Kungrad 4 Wind Farm Project and OHTL
- Nukus Wind Farm
- Bash Wind Farm and OHTL
- Dzhankeldy Wind Farm and OHTL
- Zarafshan Wind Farm

[142] IFC, Good Practice Handbook, 2013

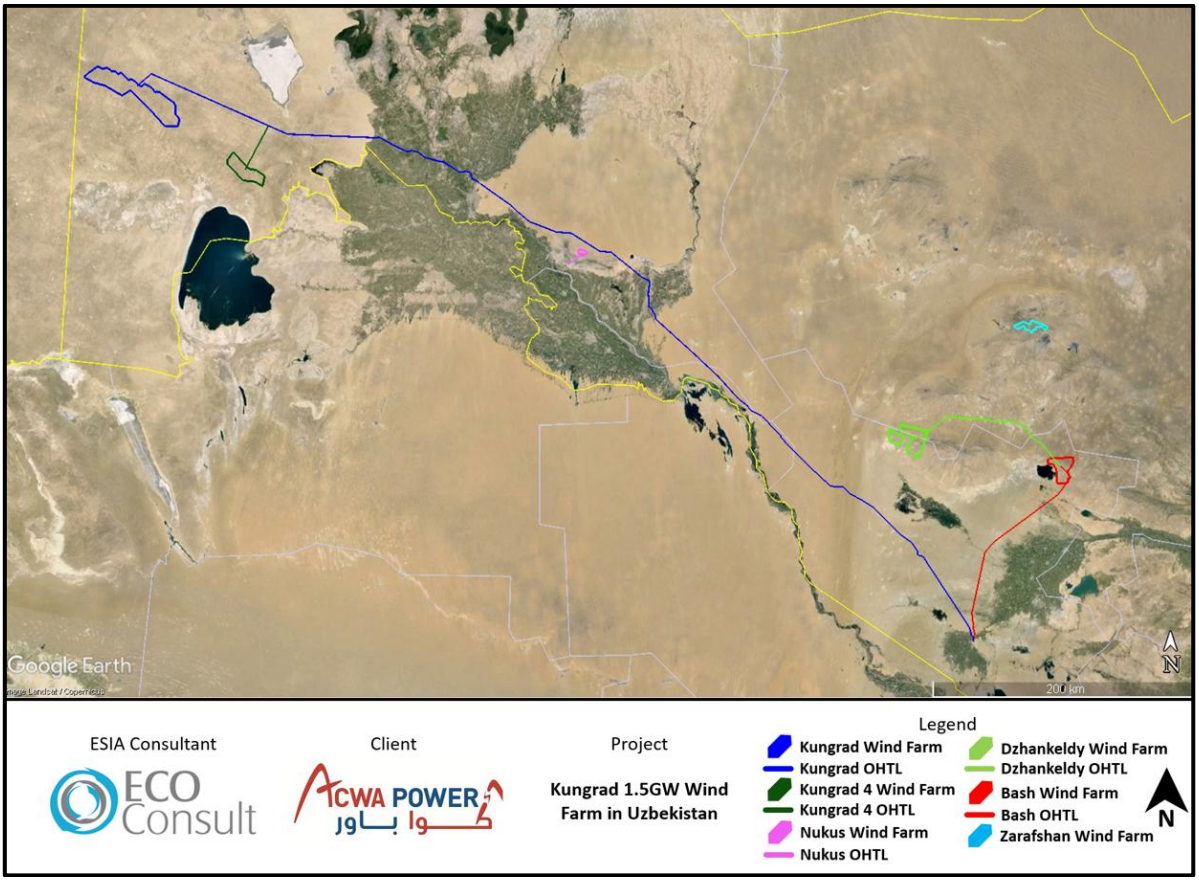


Figure 125: Wind Farm and OHTL Developments for Cumulative Assessment

The reason the above projects have been included in this assessment is that a number of Valued Environmental Components (VECs) are long distance migrants (e.g. trans-continental, trans-boundary populations) and as such the DAI must include all projects that they could potentially come in to contact with during their natural migrations within Uzbekistan. The cumulative assessment is therefore being undertaken on migrating birds, ungulates and bats.

The temporal boundaries are set as the time period of construction and the operational lifetime of the Kungrad 1,2,3 WF project. Expected to be 28 years, based on 3 years of construction and 25 years of operation. The operational lifetime of the OHTL is expected to be longer but is dependent on the operation of the WF (and the proposed Kungrad 4 WF).

VECs and Baseline Status of VECs

The ESIAs for the Kungrad 1,2,3 Wind Farm and the Kungrad OHTL have identified biodiversity VECs, which are detailed and discussed in the biodiversity sections (Section 10) of the ESIAs. Baseline status of the VECs are discussed in the ESIAs. These VECs are species that have been confirmed as exceeding criteria thresholds for Critical Habitat or Priority Biodiversity Features. For the purpose of RCIA the list of VECs has been refined to 17 species and bats as a group of species, that are typically long-range migratory species, most of which are trans-boundary species and that are more likely to be impacted by multiple projects or developments as discussed further below.

Receptor	Conservation Status		CH/PBF	Sensitivity
	IUCN	UZBDB		
Goitered Gazelle	VU	VU	Yes	High

Receptor	Conservation Status		CH/PBF	Sensitivity
	IUCN	UZBDB		
Saiga	NT	CR	PBF (if present)	High (if present)
Bats	-	-	-	Low to Medium
Sociable Lapwing	CR	VU	PBF	High
White-headed Duck	EN	EN	CH	High
Steppe Eagle	EN	VU	PBF	High
Pallas's Fish Eagle	EN	EN	PBF	High
Egyptian Vulture	EN	VU:D	PBF	High
Saker Falcon	EN	NT	PBF	High
Lesser White-fronted Goose	VU	VU	PBF	High
Common Pochard	VU	-	PBF	High
Yellow-eyed Pigeon	VU	VU	PBF	High
Eastern Imperial Eagle	VU	VU:D	PBF	High
Greater-spotted Eagle	VU	VU:R	PBF	High
European Turtle Dove	VU	VU	PBF	High
Great Bustard	EN	CR	PBF	High
MacQueen's Bustard	VU	VU	CH	High
Red-crested Pochard	LC	-	CH	Low

Terrestrial receptors including habitats, flora, and non-migrating fauna are discounted from this RCIA as they are unlikely to be significantly affected by other projects or developments (due to the relatively small footprints of the projects), distance from them to the Kungrad 1,2,3 project and differing development timelines/years.

The Kungrad 4 WF is the closest project to Kungrad 1,2,3 however this is 45 km south-east of the project and as such significant cumulative impacts on terrestrial VECs is unlikely as each project area will affect distinct assemblages of plants and non-migratory animals (e.g. animals won't be displaced by one project to another project area where they will be displaced again). In addition, habitat loss for each of these projects is minimal (e.g. small project footprints) and all projects will be undertaking habitat rehabilitation and restoration in line with commitments for no net loss of natural habitat and or as a compensatory measure (e.g. Bash and Dzhankeldy). None of the existing projects are predicting residual negative impacts on habitats or non-migratory terrestrial receptors during their construction and operational phases and as such the cumulative impact assessment must conclude that in combination construction and operational impacts on non-migratory terrestrial VECs will not be significant.

20.2.1 Potential Cumulative Impacts pre-mitigation

Barrier impact for Migratory Birds

In isolation wind farms may deter migratory birds that exhibit macro-scale avoidance behaviour and longer migratory movements can increase stress and lower survivorship of migrants that expend more energy to navigate around wind farms.

The impact assessment for each wind farm concludes that there will be no impact or negligible barrier impacts. The cumulative significance for Bash and Dzhankeldy wind farms together was assessed as Moderate to Major for Threatened bird species and Moderate for Non-threatened bird species.

For Kungrad 1,2,3 and all other projects in combination cumulative barrier effects are unlikely to cause significant effects on populations of migratory bird species, due to the sizeable distances between each of the projects. Therefore, barrier impacts are not assessed to pose a significant impact on migratory birds.

Wind Turbine Collision for Migrating Birds

The presence of multiple wind farms in the same migratory corridor may produce cumulative collision impacts, as migratory birds could pass through the multiple project areas during one year in different seasons or during multiple years.

The predicted rate of annual collision (from collision risk modelling) for bird species recorded at Kungrad 1,2,3 is shown in the table below, alongside the predicted rate of annual collision for the other wind farms (Kungrad 4 data is not currently available). Additionally, some other high-risk species that were recorded at other wind farms, but not recorded at Kungrad 1,2,3, are included as it is feasible for them to also migrate through the Kungrad 1,2,3 project area. This is shown alongside the cumulative predicted rate of collisions for all projects, the percentage of the cumulative total from Kungrad 1,2,3, and the PBR threshold for wind farms in Uzbekistan, as calculated for the BASH and Dzhankeldy wind farms[143]. Species with cumulative predicted rate of collisions that exceed the PBR threshold for wind farms in Uzbekistan are shown in bold.

Table 105: Annual Predicted Cumulative Avian Mortality

Common Name	K1,2,3	BASH and Dzhankeldy combined	Nukus	Zarafshan	Cumulative total	K1,2,3 % of cumulative total	PBR for Uzbekistan wind energy
Cinereous Vulture	**0.136**	**0.2205**	**-**	**0.825**	**1.1815**	**11.51**	**0#**
Egyptian Vulture	**0.003**	**0.1626**	**-**	**2.591**	**2.7566**	**0.11**	**0#**
Pallas's Fish Eagle	0.009	-	-	-	0.009	100.00	not assessed assumed 0#×
White-tailed Eagle	0.003	-	-	0.389	0.392	0.77	0#
Steppe Eagle	**0.429**	**0.232**	**0.00485**	**1.044**	**1.70985**	**25.09**	**0**
Golden Eagle	0.028	0.0995	-	0.49	0.6175	4.53	0#
Eastern Imperial Eagle	0.138	0.11059	0.00401	-	0.2526	54.63	0#
Greater-spotted Eagle	0.002	-	-	-	0.002	100.00	0#
Booted Eagle	0.001	-	-	0.183	0.184	0.54	0#
European Honey Buzzard	0.008	-	-	-	0.008	100.00	not assessed / assumed to be high and not met*×
Long-legged Buzzard	0.08	0.922	0.188	0.809	1.999	4.00	70
Black Kite	0.06	-	-	-	0.06	100.00	not assessed / assumed to

[143] 5 Capitals, Bash WF PBR Analysis, 2023

Common Name	K1,2,3	BASH and Dzhankeldy combined	Nukus	Zarafshan	Cumulative total	K1,2,3 % of cumulative total	PBR for Uzbekistan wind energy
							be high and not met* ˣ
Pallid Harrier	0.017	-	-	-	0.017	100.00	not assessed / assumed to be high and not met* ˣ
Western Marsh Harrier	0.007	0.677	0.242	-	0.926	0.76	750
Montagu's Harrier	0.004	-	-	-	0.004	100.00	not assessed / assumed to be high and not met* ˣ
Hen Harrier	0.001	1.304	0.108	0.211	1.624	0.06	93
European Sparrowhawk	0.011	0.19	-	-	0.201	5.47	312
Common Kestrel	0.344	-	5	1.796	7.14	4.82	580
Lesser Kestrel	0.037	-	-	0.099	0.136	27.21	36
Hobby	0.001	-	-	-	0.001	100.00	not assessed / assumed to be high and not met* ˣ
Merlin	0.001	-	-	-	0.001	100.00	not assessed / assumed to be high and not met* ˣ
MacQueen's Bustard	0.026	0.92489	-	-	0.95089	2.73	12
Eurasian Griffon	**-**	**0.03888**	**-**	**1.251**	**1.28988**	**0.00**	**0[#]**
Saker Falcon	-	0.0285	-	0.11	0.1385	0.00	0[#]
Common Buzzard	-	0.3225	0.033	0.133	0.4885	0.00	140
Rough-legged Buzzard	-	-	0.0733	-	0.0733	0.00	not assessed / assumed to be high and not met* ˣ
Common Crane	-	2.23	0.223	-	2.453	0.00	1,125

* These species were not included in the PBR analysis but have relatively large population sizes and the very low predicted CRM outputs would not equal or exceed the PBR threshold.

[#] For any species that the PBR is <1, any one fatality will breach the threshold of significance

ˣ A full and up to date project specific PBR analysis will be undertaken for all species that could be impacted by the project and will include PBR based fatality thresholds for those species not already assessed in the cited analysis - The PBR analysis will be undertaken as part of the Collision Risk Management Plan (CRMP) and Adaptive Management Plan (AMP) which will be submitted and approved by lenders 6 months prior to any impacts from line stringing (or turbine operation).

The cumulative impact of annual collision with turbines for birds is not significant for most species assessed against the PBR threshold for all wind projects in Uzbekistan. However, the predicted annual cumulative impacts for Cinereous Vulture, Egyptian Vulture, Steppe Eagle and Eurasian Griffon Vulture (although, note Griffon Vulture only recorded once at K1, 2 and 3[144]) do exceed the PBR threshold and, if realized, will be significant. The percentages of the predicted annual cumulative impact that Kungrad 1,2,3, would add for these species are 11.51% for Cinereous Vulture, 0.11% for Egyptian Vulture and

[144] one registration of a single bird seen on the ground on the 26th April with two Cinereous Vultures. Not recorded during the Vantage Point surveys/in flight.

25.09% for Steppe Eagle. The predicted annual collision risk for all of these species is most significant at Zarafshan WF, although Kungrad 1,2,3 would contribute a relatively large proportion of the overall predicted cumulative collision impact for Steppe Eagle.

Predicted annual collision of Pallas's Fish Eagle, White-tailed Eagle, Golden Eagle, Eastern Imperial Eagle, Greater-spotted Eagle, Booted Eagle, and Saker Falcon would also be significant in years where there is a collision event of a single bird, exceeding the PBR based fatality threshold of 0. The combined CRM output for these species does not however predict that this will be an annual event and specifically for Kungrad 1, 2 and 3 predicted collisions of these species is very unlikely. Collision in these species would therefore be monitored during the operation phase on all project sites (with data sharing between projects) and where collision is cumulatively significant additional mitigation and or off-setting (adaptive management) would be required and this will be detailed in the operational BMP/BAP.

The cumulative impact of annual collision with turbines for birds is not significant for most species assessed against the PBR threshold for all wind projects in Uzbekistan. However, the predicted annual cumulative impacts for Cinereous Vulture, Egyptian Vulture, Steppe Eagle and Eurasian Griffon Vulture (although, note Griffon Vulture only recorded once at K1, 2 and 3[145]) do exceed the PBR threshold and, if realized, will be significant. The percentages of the predicted annual cumulative impact that Kungrad 1,2,3, would add for these species are 11.51% for Cinereous Vulture, 0.11% for Egyptian Vulture and 25.09% for Steppe Eagle. The predicted annual collision risk for all of these species is most significant at Zarafshan WF, although Kungrad 1,2,3 would contribute a relatively large proportion of the overall predicted cumulative collision impact for Steppe Eagle.

Predicted annual collision of Pallas's Fish Eagle, White-tailed Eagle, Golden Eagle, Eastern Imperial Eagle, Greater-spotted Eagle, Booted Eagle, and Saker Falcon would also be significant in years where there is a collision event of a single bird. The combined CRM output for these species does not however predict that this will be an annual event and specifically for Kungrad 1, 2 and 3 predicted collisions of these species is very unlikely. Collision in these species would therefore be monitored during the operation phase on all project sites (with data sharing between projects) and where collision is cumulatively significant additional mitigation and or off-setting (adaptive management) would be required and this will be detailed in the operational BMP/BAP.

OHTL Collision for Migrating Birds

The Kungrad 1,2,3 OHTL is huge and spans half the width of Uzbekistan. Because of this the aforementioned projects have been considered within this assessment as each project could potentially impact the same populations of migratory birds. For example, birds migrating through Kungrad site are likely to move across the OHTL and could also possibly migrate through Kungrad 4. Additionally, birds that are moving across southern sections of the OHTL could then potentially cross Bash, Dzhankeldy Wind Farm and their associated OHTLs or Zarafshan Wind Farm.

Predicting the likely collision with OHTL is very difficult to quantify and whilst with some species it may be less of a risk (based on natural avoidance) collisions are inevitable with such large scale OHTLs crossing a migratory flyway. With threatened species with small or threatened populations, even low levels of predicted collisions are likely to exceed PBR thresholds for some species. Other species such as MacQueen's Bustard are very unlikely to naturally avoid OHTLs and a significant number of collisions is very likely and are very likely to exceed the PBR threshold.

[145] one registration of a single bird seen on the ground on the 26th April with two Cinereous Vultures. Not recorded during the Vantage Point surveys/in flight.

For individual project OHTLs, bird collisions have been assessed as a significant impact:

- Kungrad 1,2,3 – Major significance
- Nukus – Negligible to Major significance
- Bash and Dzhankeldy – Moderate to Major significance
- Zarafshan – only short sections of OHTL to connect to existing OHTL and no significant risk identified

The cumulative impact of all of the OHTLs can only be assessed as a Major significant impact, with collisions that will certainly exceed the PBR thresholds of some high sensitivity and high-risk species. The Kungrad 1,2,3 OHTL (being the longest and crossing a large portion of the migratory flyway) will certainly contribute the most towards that cumulative impact.

Barrier or Displacement for Migratory Mammals (ungulates)

Ungulates have been discussed in the Biodiversity Impact Assessment and it is very unlikely in-combination effects will result on mammals when taking into consideration the Kungrad 1,2,3 WF, Nukus, Bash, Dzhankeldy and Zarafshan Wind Farms, mainly due to the distribution of large ungulates within Uzbekistan and the sizeable distances between each of the projects.

It is possible that the Kungrad 1,2,3 and Kungrad 4 projects could affect similar populations of ungulates (Saiga and Goitered Gazelle) however, as discussed in the biodiversity chapter, surveys undertaken at Kungrad 1,2,3 did not record significant populations of Goitered Gazelle and Saiga were not recorded. Similar results are expected at the Kungrad 4 wind farm site as the habitats in both project areas are broadly similar.

The historic Saiga distributions in Uzbekistan (even before the Uzbek-Kazakh border fencing was erected) are in the north / west of the country and more recent records are limited to the Saigachi Nature Reserve or around the Aral Sea (e.g. well away from the two Kungrad wind farm Project areas). Saiga have not been recorded within the other Project areas, which are located outside of any historic ranges for this species. It is possible that wider conservation efforts will increase the amount of transborder movements of Saiga, as well as increasing populations of Goitered Gazelle within the Ustyurt Plateau, however it is unlikely that these projects will significantly change the populations of animals within the Project areas rapidly. The project sites are not located in optimal habitat areas for either species and are certainly not located in important wintering or calving habitat.

The distance between the Kungrad wind farm projects (approximately 45km) will allow movement between the wind farm areas and therefore barrier impacts are not assessed to pose a significant impact on migratory mammals.

Wind Turbine Collision for Migrating Bats

Many bat species and populations are known to migrate, although research and knowledge around bat migration in the region is relatively unknown. Of the five bat species confirmed at the Kungrad 1,2,3 project, one is known to be migratory *Nyctalus noctula* over long-distances and the others may be migratory or possibly only have local movements.

Bat populations impacted at the Kungrad 1,2,3 project is quite likely to also be impacted at the Kungrad 4 project during one year in different seasons or during multiple years. It is possible that some of the same long-distance migratory bat populations could also be impacted by the other wind farm projects

on migration during different years and that could cause significant cumulative impacts on those populations. However, this is unknown and it would be incredibly difficult to confirm or quantify the impact. Considering the sizeable distances between each of the projects it is thought to be unlikely. Therefore, the cumulative collision impacts are not assessed to pose a significant impact on migratory bats.

20.2.2 Management of Cumulative Impacts

Wind Turbine Collision for Migrating Birds

Zarafshan WF has committed to technology led SDOD due to the predicted collision impact significance of sensitive species. This is predicted to be very efficient and reduce the residual impact of collision for the project to virtually zero. This is alongside PCFM and adaptive management and if required offsetting to ensure no residual impacts. If the mitigation for Zarafshan is successful as predicted, the cumulative impacts for the projects will be reduced significantly.

Kungrad 1,2,3 (and the other WF projects) have all committed to measures to reduce predicted mortality (such as livestock management at Bash), PCFM and adaptive management (to include SDOD if required). If the mitigation for Kungrad 1,2,3 and the other projects is successful as predicted, the cumulative impacts for the projects will be reduced significantly.

Additionally, offsetting strategies for Kungrad 1,2,3 as discussed in “Section 11.4” will cause residual cumulative impacts to be reduced to negligible impacts and not significant.

OHTL Collision for Migrating Birds

The Kungrad OHTL project has committed to installing bird flight diverters along its entire length, that will be monitored and replaced as required. PCFM monitoring and adaptive management will be undertaken to confirm actual collision rates and further mitigation and offsetting will be undertaken as required.

Collision impacts for some species will therefore be reduced as BFDs are known to be effective at significantly reducing collision in most species. However, it is unlikely that the BFDs will have much of a benefit in reducing collisions for some species (i.e. bustards) so offsetting is proposed. Offsetting for bustards (that will offset impacts for other species too) has been previously discussed in in “Section 11.4”. Off-setting will be applied to ensure no net loss to these VECs.

The other projects have also committed to PCFM and adaptive management / offsets to ensure no residual impacts from the OHTLs. This includes installation of BFDs at all project OHTLs if required. Additionally, Bash wind farm has committed to a study into the effectiveness of BFDs to ensure the project, and future projects, can use the most effective BFDs to reduce collision impacts. Bash wind farm also has the offsetting strategy of releasing captive bred MacQueen’s Bustards to ensure no net loss.

All of this will ensure no residual cumulative impacts will remain and the cumulative impact will not be significant.

Wind Turbine Collision for Migrating Bats

Kungrad 1,2,3 (and the other WF projects) have all committed to PCFM and adaptive management (to include e.g. Turbine curtailment at low wind speeds or SDOD if required). If the mitigation for Kungrad

1,2,3 and the other projects is successful as predicted, the cumulative impacts on bats for the projects will be reduced significantly.

Therefore, residual cumulative impacts will be reduced to negligible impacts and not significant.

Conclusion

Although cumulative impacts can occur on biodiversity as a result of multiple projects within the DAI, all existing and future projects within the DAI will incorporate stringent mitigation measures and offsetting to ensure that all residual impacts are not significant, and where residual impacts remain off-setting will be undertaken.

21. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

This section presents the Environmental and Social Management Plan (ESMP) for the various Project phases and the overall requirements for the Environmental, Social, Health and Safety (ESHS) Management System (MS).

21.1 Institutional Framework and Procedure Arrangements

Generally, two main pillars govern the successful implementation of any Environmental and Social Management Plan (ESMP) as well as the Environmental, Social, Health and Safety Management System (ESHS-MS) for the project that will be developed at a later stage (as discussed in further details in below). These pillars include:

- Proper identification of roles and responsibilities for the entities involved; and
- Effective control of the process.

All management practices are interlinked, and this section describes how these two pillar criteria could be fulfilled, which in turn helps ensure that the overall objectives are met.

A standalone ESMS Manuel has been prepared and submitted that identified detailed requirements for institutional requirements and procedural arrangements. A summary is provided below but please refer to the ESMS Manuel for additional details.

Staffing Requirements

Defining roles and responsibilities of the involved entities identifies where and when each entity should be engaged, their degree of involvement, and the tasks expected of the entity. This in turn eliminates any overlap of jurisdiction or authority and ensures proper communication and effective management of ESMP and ESHS-MS components.

The table below identifies the staffing requirements that are expected for the Project. This should be expanded further in the ESHS Manual that is required as part of the ESHS-MS (as discussed in further details below). This should include an organizational structure that identifies the lines of authority and roles and responsibilities of all involved entities.

Table 106: Roles and Responsibilities of Entities Involved in ESMP

Project Role	Entity	Responsibilities	Staffing Requirements
Project Owner and Developer	ACWA Power	▪ Selection of EPC Contractor and Project Operator; ▪ Implement mitigation and monitoring requirements as applicable for such entity as detailed in the ESMP; and ▪ Ensure overall compliance of EPC Contractor and Project Operator with the requirements of the ESMP and ESHS MS.	▪ Appoint competent E&S Manager ▪ Appoint Social and Labor Manager ▪ Appoint Livelihood Restoration Manager ▪ Appoint a Community Liaison Officer (CLO) (male / female) ▪ Appoint Biodiversity Manager
EPC Contractor	TBD	▪ Appoint a competent HSE team; and ▪ Implement mitigation and monitoring requirements as detailed in the ESMP and ESHS MS requirements.	▪ Appoint onsite and full-time E&S Manager ▪ Appoint one E&S officer per 100 workers ▪ Appoint Community

			Liaison Officer(s) ▪ Appoint Biodiversity Manager with support team as required ▪ Appoint Emergency response team (doctor, nurse, firefighters, etc.)
Project Operator	TBD	▪ Appoint a competent HSE team; and ▪ Implement mitigation and monitoring requirements as detailed in the ESMP and ESHS MS requirements;	▪ For Project nature and duration, this requires an E&S Manager, but it could be off-site / corporate role with support from other onsite personnel
Ministry of Ecology, Environmental Protection, and Climate Change	Granting environmental clearance to the Project	▪ Undertake compliance monitoring	N/A
IFIs	TBD	▪ Appoint Lender Environmental and Social Advisor (LESA) to undertake monitoring on Developer, EPC Contractor and Project Operator to ensure compliance with IFI E&S requirements.	N/A
Owner's Engineer	TBD	▪ Support Developer in implantation of mitigation and monitoring requirements and compliance of EPC Contractor with E&S requirements	▪ Appoint competent E&S Officer to support Developer ESHS Manager

Training and Awareness

An ESHS training plan must be developed and maintained onsite which identifies the type of training that is required for each worker onsite. The plan will ensure that each worker is competent in relation to the tasks to be performed. In addition, signed attendance sheets and training material must be maintained onsite at all times. This should be completed by the EPC Contractor and Project Operator as applicable.

Training should include the following as applicable and as highlighted in the table that follows.

- Basic visitor ESHS induction training;
- Worker ESHS induction training for all workers onsite to include, for example EPC Contractor and subcontractor crew;
- Emergency response training for all workers onsite to include, for example EPC Contractor and subcontractor crew;
- Specialized training: there are other specific training requirements that must be adhered to, and which are related to specific topics as applicable. This includes for example specific training for Occupational Health and Safety (OHS), waste, drivers, security workers, etc..; and

- Toolbox Talks (TBT): regular TBT meetings must be undertaken with, for example, EPC Contractors respective crews and subcontractor crew. Topics and frequency are developed and distributed regularly.

Table 107: Training Elements

Training	EPC Contractor	Project Operator
Basic visitor HSE induction training	✓	✓
Worker HSE induction training	✓	✓
Emergency response training	✓	✓
Specialized training	✓	✓
Toolbox Talks (TBT)	✓	✓

Inspection and Monitoring

ESHS inspection and monitoring must be undertaken to ensure compliance of involved entities with the mitigation and monitoring requirements as detailed in the ESMP and ESHS-MS requirements. This should be completed by the Developer, EPC Contractor, and Project Operator as applicable.

Inspection and monitoring should include the following as applicable and as highlighted in the table that follows.

- Daily HSE inspection and monitoring at the site and preparation of a daily observation report stating therein the corrective measures on observed safety deficiencies, unsafe acts and conditions;
- Weekly site inspections to be carried out using the weekly site inspection checklists template based on requirements of the ESMP and ESHS-MS; and
- ESHS and Labor & Working conditions Audits to be undertaken by Developer on EPC Contractor to ensure compliance with ESMP requirement and ESHS-MS. ESHS and labor/working conditions audits should be undertaken quarterly during the construction phase and annually during the operation phase.

Table 108: Inspection and Monitoring Elements

Inspection and Monitoring	Developer	EPC Contractor	Project Operator
Daily HSE Inspection and Monitoring		✓	
Weekly Site Inspections		✓	✓
ESHS Audits	✓		
labor & working conditions Audits	✓		

Meetings

Regular ESHS meetings must be undertaken to discuss ESHS performance onsite, outstanding issues, key issues of concern and other as applicable. Signed attendance sheets and Minutes of Meeting (MoM) must be maintained onsite at all times. This should be completed by the Developer, EPC Contractor, and Project Operator as applicable.

Meetings should include the following as applicable and as highlighted in the table that follows.

- Weekly ESHS meetings
- Monthly ESHS meeting
- Quarterly management ESHS reviews

Table 109: Required Meetings

Meetings	Developer	EPC Contractor	Project Operator
Weekly ESHS Meetings		✓	✓
Monthly ESHS Meeting	✓	✓	✓
Quarterly Management HSE reviews	✓	✓	✓

Reporting

ESHS reporting will be required to summarize the following:

- Progress in implementing the ESMP and ESHS MS plans as required;
- Findings of the monitoring programs, with emphasis on any breaches of the control standards, action levels or standards of general site management;
- Outstanding incident report forms;
- Relevant changes or possible changes in legislation, regulations and international practices;
- Reporting on Key Performance Indicators (KPI);
- Grievances (worker and stakeholder); and
- Security incidents.

Reporting should be submitted to the Developer as applicable by the relevant entities as identified below.

Table 110: Reports

Reporting	EPC Contractor	Project Operator
Reporting	Monthly	Monthly

21.2 Environmental, Social, Health, and Safety Management System (ESHS-MS)

The ESIA is considered a key document in assessing and managing environmental and social risks related to the Project. The key output of the ESIA is the ESMP which aims to provide high level mitigations and requirements for managing the environmental and social risks anticipated from the Project.

Throughout the Project's construction and operation phase an Environmental, Social, Health, and Safety Management System (ESHS-MS) must be implemented by all relevant parties (i.e. Developer, EPC Contractor and Project Operator). The ESHS-MS must be project and site specific and must build on and take into account the requirements of the ESMP presented throughout this document.

Summarized below are the overall framework, structure and key requirements for the ESHS-MS for the key entities involved in the Project.

Developer

- ESIA including ESMP
- ESHS Manual that should include: (i) ESHS Policy; (ii) Human Resources Policy and Procedures; (iii) ESHS Organizational Structure and Responsibilities; (iv) ESHS Monitoring and Reporting Requirements; (v) ESHS Meeting Requirements; (Vi) ESHS Training Requirements.

- Stakeholder Engagement Plan (SEP) including stakeholder grievance mechanism;
- Critical Habitat Assessment (CHA);
- Subcontractor and Supplier Management Plan; and
- Biodiversity Management Plan (BMP) / Biodiversity Action Plan (BAP).

EPC Contractor

- ESIA including ESMP
- ESHS Manual (in line with Developer) that should include: (i) ESHS Policy; (ii) Human Resources Policy and Procedures; (iii) ESHS Organizational Structure and Responsibilities; (iv) ESHS Monitoring and Reporting Requirements; (v) ESHS Meeting Requirements; (Vi) ESHS Training Requirements.
- Water Management Plan
- Hazardous Material and Waste Management Plan
- Air Quality and Noise Management Plan
- Traffic and Transport Management Plan
- Occupational Health and Safety Plan
- Emergency Preparedness and Response Plan
- Security Management Plan
- Archeology Management Plan and Chance Find Procedure
- Worker Accommodation Plan
- Subcontractor and Supplier Management Plan
- Labor and Working Conditions Management Plan

Project Operator

- ESIA including ESMP
- ESHS Manual (in line with Developer) that should include: (i) ESHS Policy; (ii) Human Resources Policy and Procedures; (iii) ESHS Organizational Structure and Responsibilities; (iv) ESHS Monitoring and Reporting Requirements; (v) ESHS Meeting Requirements; (Vi) ESHS Training Requirements.
- Water Management Plan
- Hazardous Material and Waste Management Plan
- Occupational Health and Safety Plan
- Emergency Preparedness and Response Plan
- Security Management Plan
- Worker Accommodation Plan

- Labor and Working Conditions Management Plan
- Subcontractor and Supplier Management Plan

21.3 Other ESHS Requirements for Temporary Facilities

This section identifies ESHS requirements for the temporary facilities which were identified earlier under "Section 2.3.6" earlier.

21.3.1 Borrow Pits

Borrow pits will be used to provide fill materials such as gravel, sand, clay for various construction requirements such as base for road networks, foundations for WTGs, and other. EPC Contractor will only import Cement, sand, aggregates and stone from borrow pits that are approved and certified local sources. Official governmental certification and licenses will be maintained onsite at all times by the EPC Contractor for such quarries supplying such materials.

In addition, borrow pit locations are to be subject to a botanical assessment to ensure that they are free of non-native or invasive species.

In addition, borrow pits might require a local environmental permit (OVOS) from Ministry of Ecology. This is to be undertaken by the EPC Contractor.

21.3.2 Worker Camp Area

Due to the remoteness of the site, it is highly likely that Developer and EPC Contractor will establish a worker camp onsite for housing of various workers involved in the construction and operation phase of the Project. Requirements for worker camp area have been discussed previously under "Section 15.5.9".

21.3.3 Batching Plant

It is highly likely that a mobile concrete batching plant will be established within the Project footprint for preparation of the concrete to be used for foundation installation and other infrastructure requirements (e.g. substation, buildings, etc.). The EPC Contractor is required to prepare a batching plant procedure as part of the construction ESMS (discussed under "Section 21.2") earlier that should consider the following requirements:

- The batching plant will be sited at a sufficient distance (minimum 50m) from any identified watercourses within the Project site including wadi systems and drainage lines;
- Cement storage silos need to be fitted with equipment to minimize dust emissions from the silo – this shall include a reverse pulse Fabric Filter Dust Collector (FFDC) or other dust control technology with an equivalent or better performance;
- Raw materials shall be loaded into the concrete truck agitators by either a telescopic chute (preferred) or a flexible sleeve to prevent spillage;
- Ensure truck agitators are not overfilled at any point;
- Wheel-wash facilities shall be implemented into design to prevent contaminants from being tracked out of the site by trucks leaving the batch plant;

- Dust seals shall be incorporated into batch plant design;
- A lined and bunded concrete washout area will be provided within the batching plant compound to ensure containment of any wash out water;
- A suitable concrete or bitumen lined evaporation ponds to collect concrete washout within the batching plant will be constructed;
- Appropriate drainage and mitigation against siltation/pollution of existing watercourses/drains shall be provided within the batching plant compound;
- Cement, sand and aggregate delivered to the batching plant must be stored away from storm water drains and watercourses, within an enclosed area without exposure to the elements. All cement and concrete materials shall be stored on pallets and under cover;
- Temporary bunds placed downslope of the batch plant are recommended to prevent the migration of any spillages;
- Concrete batching shall not be performed on bare ground but on artificial surfaces;
- It is recommended that all surface water runoff from the batch plant be directed to surface drains and a lined settlement pond equipped with a mobile pump such that water can be reused as far as possible; and
- The concrete washout shall be covered with plastic sheeting at the end of each day and prior to rain events.

In addition, batching plant might require a local environmental permit (OVOS) from Ministry of Ecology. This is to be undertaken by the EPC Contractor.

21.4 Compilation of the Framework Environmental and Social Management Plan (ESMP)

The tables below present the ESMP for the: (i) planning and construction, and (ii) operation phase respectively and which include the following:

- The E&S attribute (e.g. air quality) that is likely to be impacted;
- A summary of the potential E&S impact and/or likely issue;
- The identified management measures that aim to eliminate and/or reduce the potential impact to acceptable levels. Management measures include mitigation actions, further requirements, additional studies, etc.;
- Monitoring actions to ensure that the identified mitigation measures are implemented. Monitoring actions include inspections, review of reports/plans, reporting, etc.;
- The frequency for implementing the monitoring actions, which include once continuously throughout the construction/operation period (depending on the mitigation measure identified this could include daily, weekly, or monthly), or upon occurrence of a certain issue;
- Parameters and location of monitoring actions as identified and applicable; and
- Responsible entity for implementing the mitigation measures and monitoring actions identified

Table 111: ESMP for the Planning Phase

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
Environmental planning	Additional local environmental requirement	Obtain an OVOS (local environmental permit) for other Project components for which details were not available at the ESIA stage – this includes (but not limited to) batching plant, LVDL, and burrow pits.	Additional requirement	Submit OVOS (environmental) approval	Not applicable	Once before commencement of construction activities.	EPC Contractor
Landscape and Visual	Impacts related to interaction of wind turbines within the overall landscape and visual character of the area including any potential sensitive visual receptors.	Consider to the extent possible painting turbines with non-reflective, matt finishes that blend better with the natural surroundings.	Mitigation	Submission of final detailed design	Not applicable	Once before commencement of construction activities.	EPC Contractor
		Use minimal or no lighting on the turbines unless required for aviation safety. Lighting can increase visibility and, therefore, the visual impact. Limit signage to what is necessary for safety and regulatory compliance.	Mitigation				
Geology, Hydrology and Hydrogeology	Construction activities could disturb soil, and result in erosion and runoff could result in siltation of surface water (during rain events)	Existing natural flows will be maintained where possible as part of the drainage system design and any change to the natural/pre-development surface water conditions within the site to be minimized to the extent possible.	Mitigation	Submission of final detailed design	Not applicable	Once before commencement of construction activities	EPC Contractor
		In terms of Road Design the following shall be considered; (i) All roads shall be graded and shaped appropriately, (ii) Provision of limiting access road gradients to reduce runoff-induced erosion, (iii) Provision of effective short-term measures for slope stabilization, sediment control and subsidence control, (iv) On steep sections of access road, transverse drains ('grips') will be constructed where appropriate in the surface layer of the road to divert any runoff off the road into swales/road side drains, (v) To reduce damage to soil and risks of soil erosion, the length and width of the on-site and off-site roads should be with the route optimized to reduce the need for cut-and-fill material. Run-off and erosion control features should be included in designs.					
Biodiversity	Direct Impacts on Sensitive Receptors (Vertebrates) - Site Clearance and Earthworks	An exclusion zone of 500m will be incorporated around the Honey Badger burrows and single Marbled Polecat hole within the AoI.	Mitigation	Submission of Detailed design	Not applicable	Once before commencement of construction	EPC Contractor
		An exclusion zone of 2 km from the active and abandoned Steppe Eagle nest and 500m from all active Long-legged Buzzard nests has been factored into the design of the scheme and it is certain that there will not be a loss of active nesting sites for breeding raptors.	Mitigation	Submission of Detailed design	Not applicable	Once before commencement of construction	EPC Contractor
		In The Project will implement offset measures during construction and operations to address residual impacts and thus achieve no net loss for priority biodiversity features, and for Natural and Critical Habitat. In particular, the Project will – in collaboration with the relevant stakeholders – support undergrounding of current or proposed Low Voltage Distribution Lines (LVDL), or removal of any such lines which are no longer necessary, within a priority area for MacQueen's Bustard in Bukhara Province. The detailed location, scale and schedule of this offset will be agreed in consultation with key stakeholders. While this offset is primarily targeted at MacQueen's Bustard, removal of LVDL in this area is likely to also have significant benefits to birds of prey by removing electrocution risks. Monitoring of current electrocution	Off-set	Refer to BAP	Refer to BAP	Once before commencement of construction	Developer

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		risks in the area would allow removal of LVDL to also function as an offset towards any unforeseen collisions of birds of prey with wind turbines. These offset measures are further detailed in the Project's Biodiversity Offset Plan (BOP). The scale of offsets necessary has currently been estimated on a precautionary basis, using existing data on bustard collisions with powerlines near part of the Project OHTL route. This estimate will be refined during Project implementation via a program of Post Construction Fatality Monitoring (PCFM). That Program will not only enable refinement of offsets for MacQueen's Bustard but also identify the need for any other adaptive management of mitigation or offsets owing to unforeseen impacts. It will be developed for both turbines and powerlines following good international industry practice and carried out for an initial minimum 3-year period, but the actual timeframe will depend on fatality results. If PCFM indicates collisions of other Critical Habitat-qualifying bird or bat species with turbines to levels that exceed PBR-based fatality thresholds, additional mitigation or offset actions will be implemented as part of adaptive measurement as contained in the ESIA. Those may include operational controls (such as turbine curtailment or shut-down-on-demand during high-risk periods) or the enhancement of mitigation and offset measures.					
Archaeology and Cultural Heritage	Improper management could potentially disturb or damage potential archaeological remains on the surface as well as some of which could be buried in the ground (if any).	Ensure that final detailed design to be prepared by the EPC Contract completely avoids all sites recorded along with the buffer distance requirements.	Mitigation	Submission of final detailed design	Not applicable	Once before commencement of construction	EPC Contractor
		Due to the change between the preliminary layout and final layout of the Project components, a follow-up archaeological inspection for the final footprint areas should take place by an archeology and cultural heritage expert to verify that they are devoid of any sites.	Mitigation	Submission of addendum survey report			
Infrastructure and Utilities	Civil / Military aviation protection	Coordinate and consult with the Civil Aviation Administration, Uzbekistan Air, and Air Défense Forces in order to obtain any other requirements that should be considered for Project development, specifically regarding visibility such as painting of WTG blades, nautical lighting, etc.	Additional Requirement	Submission of formal letter	Not applicable	Once before the commencement of construction	EPC Contractor
	Water Resources. Water requirements of the Project could entail constraints on existing users such as local communities or industrial establishments.	Undertake feasibility assessment to determine the optimal water supply option for the Project based on the options provided within the ESIA (Option 3 or Option 4) including ensuring no impacts on any potential existing water users. Based on the option selected, ensure all permits and requirements are obtained as applicable.	Additional Requirement	Submission of study Submission of permits	Not applicable	Once before the commencement of construction	EPC Contractor
	Improper planning and site selection of the Project could damage/disturb existing gas pipeline which would affect its operation, and it could also entail serious safety risks to workers.	The preliminary design of the Project should take into account a 250m buffer from all gas infrastructure onsite as required by UrgenchtransGaz.	Mitigation	Submission of formal letter from UrgenchtransGaz	Not applicable	Once before the commencement of construction	EPC Contractor
		It is highly likely that the Project will require several point crossings over the pipeline to connect the various WTG and Project components. This should be incorporated as part of					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		the detailed design. The detailed design must be submitted to UrgenchtransGaz review and approval.					
		Obtain final and formal communication from State Committee on Geology and Mineral Resources that there will be no more exploration or blasting activities within the Project area.	Mitigation	Submission of formal letter from State Committee on Geology and Mineral Resources	Not applicable	Once before the commencement of construction	
Community Health, Safety and Security	Project related security.	Prepare a Security Risk Assessment (SRA) to ensure that all likely threats have been accounted for.	Additional Requirement	Submit SRA	Not applicable	Once before commencement of construction	Developer

Table 112: ESMP for the Construction Phase

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
Landscape and Visual	Visual and landscape impacts due to presence of typical elements of a construction site such as equipment and machinery (e.g. cranes, excavators, etc.).	Ensure proper general housekeeping and personnel management measures are implemented which could include: (i) ensure the construction site is left in an orderly state at the end of each work day; (ii) to the greatest extent possible construction machinery, equipment, and vehicles that are not in use should be removed in a timely manner and kept in locations to reduce visual impacts to the area; (iii) to ensure proper storage, collection, and disposal of waste streams generated.	Mitigation	Visual inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	EPC Contractor
		Implementation of restoration and rehabilitation measures to restore the site's visual quality through, for example, re-contouring the land and removing temporary structures (e.g. batching plant).	Mitigation	Visual Inspections			
Geology, Hydrology and Hydrogeology	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Solid waste management</u>	Coordinate with State Unitary Enterprise for the collection of solid waste from the site to the municipal approved landfill or for recycling	Mitigation	Submit Contract	Not applicable	Once before commencement of construction	EPC Contractor
		Prohibit fly-dumping of any solid waste to the land	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Distribute appropriate number of properly contained litter bins and containers properly marked as "Municipal Waste."					
		Adhere to waste hierarchy principles with associated mitigation measures to include prevent, minimize, reuse, recycle, recover and dispose.					
		Distribute a sufficient number of properly contained containers clearly marked as "Construction Waste" for the dumping and disposal of construction waste.					
		Recycling measures must be implemented as follows: (i) separation and disposal of recyclables in a separate container (cardboard, paper, glass, metal, etc.); and (ii) separation and disposal of non-recyclable materials in a separate container (e.g. food waste). Each container must be clearly marked. In addition, ways to reduce construction waste must be undertaken by reusing materials (for example through recycling of concrete for road base coarse). This is a key requirement given that with the Project's workforce there could be huge amounts of waste that could be recycled.					
		Implement proper housekeeping practices on the construction site at all times.					
		Maintain records and manifests that indicate volume of waste generated onsite, collected by contractor, and disposed of at the landfill. The numbers within the records are to be consistent to ensure no illegal dumping at the site or other areas.	Mitigation	Submit manifests	Not applicable	Throughout entire construction period	
	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of	Coordinate with State Unitary Enterprise to hire a private contractor for the collection of wastewater from the site to the closest WWTP.	Mitigation	Submit contract	Not applicable	Once before commencement of construction	EPC Contractor
		Ensure that constructed septic tanks during construction are well contained and impermeable to prevent leakage of wastewater into soil.	Mitigation	Submit detailed design			

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
	waste and wastewater to surrounding environment, etc.). <u>Wastewater management</u>	Prohibit illegal disposal of wastewater to the land.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Ensure that septic tanks are emptied and collected by wastewater contractor at appropriate intervals to avoid overflowing.					
		Maintain records and manifests that indicate volume of wastewater generated onsite, collected by contractor, and disposed of at the WWTP. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas.	Mitigation	Submit manifests	Not applicable	Throughout construction period	
	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Hazardous waste management</u>	Hire approved private contractor for the collection of hazardous waste from the site to the approved hazardous waste disposal facilities.	Mitigation	Submit contract	Not applicable	Once before commencement of construction	EPC Contractor
		Ensure that hazardous waste is disposed in a dedicated area that is enclosed, of hard surface, with proper signage and suitable containers as per hazardous waste classifications and that they are labelled for each type of hazardous waste.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Ensure hazardous waste storage area is equipped with spill kit, fire extinguisher and anti-spillage trays and a hazardous waste inventory is available.					
		Prohibit illegal disposal of hazardous waste to the land.					
		Possibly contaminated water (e.g., runoff from paved areas) must be drained into appropriate facilities (such as sumps and pits). Contaminated drainage must be orderly disposed of as hazardous waste.					
		Ensure that containers are emptied and collected by the contractor at appropriate intervals to prevent overflowing.					
		Maintain records and manifests that indicate volume of hazardous waste generated onsite, collected by contractor, and disposed of at the hazardous waste disposal facilities.	Mitigation	Submit manifests	Not applicable	Throughout construction period	
	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Hazardous material management</u>	Ensuring any new support equipment does not contain Polychlorinated Biphenyl (PCBs) or Ozone Depleting Substances (ODSs) to avoid having hazardous wastes. This includes in particular the BESS and substation components.	Mitigation	Submission of Equipment Data Sheet for review and approval	Not applicable	Throughout the Construction period	EPC Contractor
		Ensure that hazardous materials are stored in an area that is of hard impermeable surface, flame-proof, accessible to authorized personnel only, locked when not in use, and prevents incompatible materials from coming in contact with one another.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Maintain a register of all hazardous materials used and accompanying MSDS must present at all times. Spilled material should be tracked and accounted for.					
		Incorporate dripping pans at machinery, equipment, and areas that are prone to contamination by leakage of hazardous materials (such as oil, fuel, etc.)					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Maintenance activities and other activities that pose a risk for hazardous material spillage (such as refueling) must take place at a suitable location (hard surface) with appropriate measures for trapping spilled material					
		Ensure that a minimum of 1,000 litters of general-purpose spill absorbent is available at hazardous material storage facility. Appropriate absorbents include zeolite, clay, peat and other products manufactured for this purpose.					
		If spillage on soil occurs, spill must be immediately contained, cleaned-up, and contaminated soil disposed as hazardous waste					
	Construction activities could disturb soil, and result in erosion and runoff could result in siltation of surface water (during rain events)	Scheduling to avoid construction activities during heavy rainfall periods (i.e., during the wet season) to the extent practical. In addition, this will include modifying or suspending activities during extreme rainfall and high winds to the extent practical.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	EPC Contractor
		Existing natural flows will be maintained where possible as part of the drainage system design and any change to the natural/pre-development surface water conditions within the site to be minimized to the extent possible.					
		Salvage and store topsoil and subsoil before areas are excavated, with topsoil stripped and stockpiled separately.					
		Place clear markers indicating stockpiling area of excavated materials to restrict equipment and personnel movement, thus limiting the physical disturbance to land and soils in adjacent areas.					
		Erect erosion control barriers around work sites during site preparation and construction to prevent silt runoff where applicable. This could include but not limited to silt fences, gravel bag berms, fiber rolls, or other similar applications.					
		Return surfaces disturbed during construction to their original (or better) condition to the greatest extent possible.					
		Specifically in terms of road design the following shall be considered; (i) All roads shall be graded and shaped appropriately; (ii) Provision of limiting access road gradients to reduce runoff-induced erosion; (iii) Provision of effective short-term measures for slope stabilization, sediment control and subsidence control; (iv) On steep sections of access road, transverse drains ('grips') will be constructed where appropriate in the surface layer of the road to divert any runoff off the road into swales/roadside drains; and, (v) To reduce damage to soil and risks of soil erosion, the length and width of the on-site and off-site roads should be with the route optimized to reduce the need for cut-and-fill material. Run-off and erosion control features should be included in designs.					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
Biodiversity	**Note: The below presents the mitigation and monitoring measures required for biodiversity as per the outcomes of the ESIA. However, a detailed and standalone Biodiversity Management Plan (BMP) is submitted which will expand on the mitigation and monitoring requirements included within the ESIA and highlighted below within this ESMP. Refer to the BMP for the full details on mitigation, monitoring and reporting requirements.**						
	Potential impacts of Habitat Loss, Fragmentation and Degradation during the Construction Phase.	All site workers will undertake a Project induction before working on site. The induction will include a comprehensive biodiversity element where the baseline ecological value and sensitivity of the site will be discussed.	Mitigation	Submit Induction Training Records Submit TBT records	At construction active areas	Throughout construction period	Developer / EPC Contractor
		Prior to construction works (habitat clearance, levelling or any other works), working areas will be clearly demarked so that site workers fully understand the working area. Encroachment into areas outside of agreed working areas will be prohibited and working areas will be subject to regular check by the EPC Contractor to check enforcement of working areas.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Prior to clearance of vegetation, pre-clearance surveys will be undertaken by a suitably qualified ecologist, and these are fully detailed in the Project BMP. Vegetation survey methods and habitat condition assessment metrics have been updated.	Mitigation	Submission of pre-clearance survey report	At construction active areas	Once before commencement of construction	
		The project will result in the permanent loss of 195.2 habitat hectares. Mitigation will be undertaken in all areas of the site subject to temporary habitat loss in the form of habitat rehabilitation / restoration. Temporary habitat loss totals 18.24 habitat hectares and if all of this area (48ha in total) is restored to a condition score of 0.4 then a total of 9.6 habitat hectares will be created.	Mitigation	Submission of habitat restoration plan Habitat and Flora monitoring within the AoI to measure the success of habitat rehabilitation work to reasonably demonstrate a net gain in Natural Habitat as well as to record the presence of invasive / non-native flora. Monitoring will be completed annually for the first five years and also in Years 10, 15, 20. Quadrat surveys will be completed, and the results compared to the baseline surveys completed to inform the ESIA as well as the more detailed pre-clearance surveys completed in 2024	Refer to BMP/BAP	Refer to BMP/BAP	
		Permanent habitat loss is 195.2 habitat hectares. The Project is therefore committed to habitat restoration works in areas of existing damaged and poor-quality habitats along the access road as well as within the wind farm boundary (e.g. where there are existing vehicle tracks). Habitats in these areas are assessed as having a condition score of 0.0 to 0.2. A total 1,125ha has been identified within the figure shown in “Section 11.4” along the access road as well as within the wind farm. At least 800ha will be restored to condition score 0.4 (from between 0.0 and 0.2 condition score) and this will ensure that the Project will result in at least no net loss and possibly a net gain in natural habitat. Habitat rehabilitation will be included in a habitat restoration plan which will be produced on completion of the pre-clearance surveys being undertaken in 2024. Habitat restoration will include grading of existing access tracks to remove deep ruts, seeding (with seeds collected from the AoI) and planting of shrubs and bushes (seeds or cuttings taken from the AoI). The Project will therefore develop a seed nursery where plants can be grown from seed for replanting in habitat rehabilitation areas. Despite the implementation of mitigation measures,	Off set				

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		the Project will not meet the no net loss requirement for natural habitat. Habitat offsetting will therefore be required, as describe in Section 11.4					
	Sensitive Receptors (Habitats and Flora) - Non-native Species and Introduced Flora	Each and every vehicle, prior to coming to the site will be subject to a full clean down at a storage / plant yard so that is effectively clean. On arrival at the Project area (i.e. from yard to area) vehicle will go into a wheel-cleaning facility that will be established before entering the area. Such facilities will be established before entry into the access road (e.g. near Kirkkiz). At the facility the vehicle will run over a rumble strip to shake any loose debris from the tires. The vehicle will then be subject to a visual inspection and if necessary compressed air will be used to remove any other loose dirt debris.	Mitigation	Visual Inspections / site walkovers	At washing facilities	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Once on site most vehicles and equipment will be on site for the duration of the construction period. Should any vehicle leave the leave area, it should undergo the same procedure above before entry into the access road.					
		Regular site walkover surveys throughout the construction period by a suitably qualified botanist to check to the presence and abundance of non-native or invasive species. In case such areas are identified, Areas of non-native or invasive species will be mapped and a program of mechanical control will be completed over the construction period in order to remove these species from the AoI. Chemical control will be avoided however, if necessary, will be used but in accordance with national and international guidelines as well as proper risk assessment and will only be used with prior approval of the Lenders.	Mitigation	Visual Inspections / site walkovers Submission of mechanical control program report (if triggered and required)	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Extensive pre-construction surveys are being completed to update the baseline habitat information, including habitat condition scores and presence of non-native species. The results of these surveys will be used against which to assess the results of post-construction monitoring surveys.	Mitigation	Submission of pre-construction survey report	At construction active areas	Once before commencement of construction	
	Direct Impacts on Sensitive Receptors (Vertebrates) - Site Clearance and Earthworks	All site workers will undertake a Project induction before working on site. The induction will include a comprehensive biodiversity element where the baseline ecological value and sensitivity of the receptors within the AoI will be discussed.	Mitigation	Submit Induction Training Records Submit TBT records	At construction active areas	Throughout construction period	
		Prior to construction works (habitat clearance, levelling or any other works), working areas will be clearly demarked so that site workers fully understand the working area. Working areas will be marked using orange netting fencing (or similar). Encroachment into areas outside of agreed working areas will be prohibited and working areas will be subject to regular check by the EPC Contractor and Developer's Biodiversity Team to check enforcement of working areas.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Working areas should avoid trees / shrubs as these are likely, due to their sporadic distribution across the AoI to be of importance to breeding birds (e.g., passerines, raptors).	Mitigation				
		An exclusion zone of 500m will be incorporated around the Honey Badger burrows and single Marbled Polecat hole within the AoI.	Mitigation				
		Construction (habitat clearance, levelling, or any other works) is programmed to start in Q4:2024 with works starting on the access road. Construction (habitat clearance, levelling, or any other works) within the wind farm area will commence in Q2 2025. Pre-clearance works will include the following: (i) Pre-clearance walkover surveys across the site to target for the presence of Marbled Polecat, Corsac Fox, Honey Badger, and Caracal, including at previously known holes or areas of activity. Where presence identified , additional surveys will be completed to check for activity and/or confirm species present. If burrows are not in active use, they will be checked by a mammal specialist and carefully destroyed (excavated with a machine/digger) with supervision of a mammal specialist. If burrows are found to be in active use further avoidance and mitigation is required. Exclusion zones (500m) will be set up so that work can continue but avoid the burrow. If this is not possible the work in these areas will be delayed and no access will be allowed in these buffer zones until it can be proven the animals have moved on and are not active at that site, naturally and of their own accord. Once these periods are over, the burrow will be monitored and destroyed as above. Walkover surveys will be undertaken in Q2 2024 and Pre-construction checks will also be undertaken within 4 weeks prior to construction (habitat clearance, levelling or any other works) starting; (ii) if Goitered Gazelle are recorded during these surveys as well as during pre-construction surveys buffer zones of up to 1km will be applied if it is shown that they are calving. These buffer zones are likely to be temporary as the mothers and young calves will move out of working areas / disturbance zones soon after birthing; (iii) Pre-clearance surveys and translocation will be completed for Central Asian Tortoise, Desert Sand Boa and Blotched Rat-snake prior to commencement of construction activities (habitat clearance, levelling or any other works) in any given area with a tentative suggested approach below (however this will depend on actual Project timeline which is to be identified by the EPC Contractor).	Mitigation	Refer to BMP for additional details. Some measures include: Submission of pre-clearance and translocation report Visual Inspections on exclusion zones	Refer to BMP for additional details. Some measures include: At construction active areas relevant for period of construction At identified exclusion zones	Once before commencement of construction Weekly site inspections	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		An exclusion zone of 2 km from the active and abandoned Steppe Eagle nest and 500m from all active Long-legged Buzzard nests has been factored into the design of the scheme and it is certain that there will not be a loss of active nesting sites for breeding raptors. A repeat breeding raptor nesting survey will be completed in 2024 and any active new nests will be marked on to a constraints map and exclusion zones (the same to those previously stated) applied during the construction period. The buffer zone for Long-legged Buzzard is considered appropriate as this is based on buffer zone guidance published by NatureScot[146] which sets displacement distances of between 100 and 200m for Common Buzzard and is based on forest dwelling birds. Additional distances have been added to this buffer zone as the Long-legged Buzzard is nesting in a very open habitat. 500m is considered appropriate for a species which is listed as IUCN LC and one that is not included on the UzRDB.					
		Construction is due to start in Q4 2024 so construction related impacts are not anticipated in the 2024 breeding season and construction is likely to be under way at the commencement of the breeding bird season 2025 and as such it is unlikely that sensitive species of ground nesting birds (e.g. Greater Sandplover) will start to breed in areas subject to construction works. It is possible that small, ground-nesting birds could nest within or very close to construction areas and nests could therefore be abandoned (disturbance) or destroyed. Where nests are lost any impact would be negligible, short-term (one breeding season only) and the species potentially affected are not of elevated international or national conservation concern. For this reason, no additional mitigations or exclusion zones will be applied for commonly occurring ground (or tree) nesting species. Mitigations need to be realistic, and it is not realistic that site infrastructure or the construction of a turbine will be delayed for up to three months for an active nest of a commonly occurring bird of no particular conservation concern, especially where there is no in-country legal protection for such species.					
		A repeat breeding raptor nesting survey will be completed in 2024 and any active new nests will be marked on to a constraints map and exclusion zones (the same to those previously stated) applied during the construction period.					

[146] https://www.nature.scot/doc/disturbance-distances-selected-scottish-bird-species-naturescot-guidance

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		In the unlikely event that MacQueen's Bustard are recorded breeding in the project AoI a buffer of 1km will be applied around lekking sites and 750m around active nests. These buffer zones are based on a range of scientific data however no definitive distance exists for this particular species for specific project activities. The buffer distances are therefore a reasonable and pragmatic buffer that have been applied by lenders of similar projects in Uzbekistan (e.g. Bash WF). Once hatched, chicks are mobile so construction buffers can be lifted.Once hatched, chicks are mobile so construction buffers can be lifted.					
	Direct Impacts on Sensitive Receptors (Mammals and Birds) – Habitat Fragmentation and Barrier Impact	Site should be continually monitored throughout construction, along with chance find procedures. If large herds of ungulates are recorded in the Project AoI or in the vicinity of the AoI working areas may need to be modified or works programs updated to ensure that any animals can move through the Project area The majority of impacts are being avoided through design of the roads that do not include banks, ditches or fences. Site wide fencing will not be widely installed. Predicted traffic volumes are unlikely to be significant and will not create effective barriers to movements of herds of ungulates or other mammals.	Mitigation	Visual Inspections Submission of updated working program (if required)	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		All entities throughout the Project will continually be monitored throughout construction, along with chance find procedures. If large herds of ungulates are recorded in the Project AoI or in the vicinity of the AoI working areas may need to be modified or works programs updated to ensure that any animals can move through the Project area. Both the Developer and EPC Contractor Biodiversity Managers will ensure that the site is continually monitored throughout construction, along with chance find procedures. If large herds of ungulates are recorded in the Project AoI or in the vicinity of the AoI working areas may need to be modified or works programs updated to ensure that any animals can move through the Project area.	Mitigation				
	Direct Impacts on Sensitive Receptors (Vertebrates) – Vehicle Collisions	Appropriate speed limits will be enforced on access road (60km/h (daytime), 40km/h (night-time)), internal road network and working areas (40km/h). (daytime, 20km/h (night-time)). Reduced speed limits at night and also where MacQueen's Bustards are shown to be breeding in proximity to roads / working areas (see below).	Mitigation	Speed and location tracking software / radar guns Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Signage (e.g., a large board) will be installed at the start of the access road informing all drivers of the speed limits on the access road as well as those within					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		the wind farm area. A similar large sign will be installed at the site compound / worker's camp. Signage will be written in local language, English and the language spoken by the majority of site workers.					
		Speed limit signs will be installed every 1km along the access road reminding drivers of the speed limit. Speed limit signs will be installed within the site compound / workers camp and at regular intervals around the site (e.g. on internal site roads).					
		Speed limits will also be communicated at the site induction as well as the possibility of reduction in speed limits during the construction period. Any changes in speed limits will be clearly communicated to all staff and evidence of such communication kept.					
		Speed limits will be enforced by the installation of GPS units in all EPC Contractor vehicles (e.g. cars and worker / equipment transport) and all Developer vehicles that will utilize the access road (and wider internal road network). Data will be analyzed monthly by the EPC Contractor and Developer data will also be analyzed monthly by the Developer Biodiversity Manager. Records of these checks will be kept and reported as well as being included in the annual reports. Any driver caught breaking the speed limit will be subject to disciplinary procedures including fines.					
		In addition to GPS units regular random speed checks (using a radar gun or similar) will be competed monthly by the EPC Contractor and all vehicles (including non-project vehicles) will be checked. Vehicles breaking the speed limit will be stopped and the drivers will be informed of the correct speed limits. If the vehicle breaking the speed limit is a project vehicle disciplinary action including fines will be applied.					
		The results of monitoring, including audit of GPS data, will be included in annual reports.					
		Regular random speed checks (using a radar gun or similar) will be competed monthly by the EPC Contractor and all vehicles (including non-project vehicles) will be checked. Vehicles breaking the speed limit will be stopped and the drivers will be informed of the correct speed limits. If the vehicle breaking the speed limit is a project vehicle disciplinary action including fines will be applied. The results of monitoring will be included in annual reports.					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Speed limits on the access road and internal site roads will be reduced to 20 km/h (daytime) and 10 km/h (night-time) during the breeding bird season if MacQueen's Bustard are recorded nesting. Changes in speed limits will be enforced through updated signage and speed checks will be regularly completed in these areas. Speed limit changes will be enforced 2.5 km either side of any confirmed nesting location of this species (e.g. a 5 km zone of reduced speed limits in proximity to nesting MacQueen's Bustard).	Mitigation	GPS trackers Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		A ban of driving at night will be enforced however if necessary due to unforeseen circumstances or being strictly necessary (e.g. forecast low wind speeds for blade installation) the speed limit will be reduced to 40 km/h on the access road and to 20 km/h on any internal roads.					
		Ban against off-road driving at all times of the day	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Regular checks of the road for carcasses and if found these will be moved to at last 50m from the road to reduce the likelihood of hitting scavengers, including birds of prey.					
		An incidental / chance find procedure will be included in the BMP so that all workers report any road collisions so that any such incident can be investigated in full.					
		Ensure that no open water bodies are created on the site which could potentially attract sensitive receptors on to the site which would in turn increase the potential for wildlife: vehicle conflict.					
	Direct Impacts on Sensitive Receptors (Habitats, Vertebrates) – Poaching, Collection etc.	The Project will enforce strict controls on hunting, gathering, poaching and otherwise disturbing flora and fauna within the Project AoI. Any breaches of this ban will be strictly enforced, and any workers found in breach of this control measure will be subject to disciplinary procedures which will entail instant dismissal where species of international conservation concern (IUNC CR/EN/VU) or high in-country conservation concern (UzRDB CR/EN) are affected. For more common species a formal warning will be issued, followed by dismissal if the offence is repeated.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		The ban on hunting etc. will be included in the site induction along with discussions about the sanctions for breaches of this control measure (and this will be further clarified by Developer / EPC Contractor).	Mitigation	Submit Induction Training Records Submit TBT records	At construction active areas	Throughout construction period	
		The EPC Contractor Biodiversity Manager will undertake monthly checks (walkovers) of the workers compound and any evidence of poaching will be fully investigated and reported in full.					
			Mitigation	Visual Inspections / site walkovers Submission of report (if triggered and required)	At construction active areas relevant for period of construction	Monthly ESHS reporting	EPC Contractor / Biodiversity Manager

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		A chance find procedure will be implemented should any site worker find a wild animal, especially one that has become a nuisance (e.g., scavenger in the works camp, presence of small mammals in worker accommodation, presence of snake or scorpion on the works site) and the EPC Contractor will arrange for an appropriately qualified person to capture and relocate. Where scavengers have been identified within the works site additional housekeeping measures may be required.	Mitigation	Submission of report	Not applicable	Throughout construction period	
		Specialists will be present on site to record species prior to and during the start of the construction work. The EPC contractor is to prepare a chance finds procedure prior to further works commencing in Q4 2024 and will be provided/updated for all subsequent work/years, which will be agreed with the Lenders 6 months in advance of the work commencing.	Mitigation	Submission of procedure	Not applicable	6 months in advance of work commencing each year	
		The Project will employ two 'rangers' who will regularly patrol the wind farm AoI and wider area to ensure that poaching/ hunting activities are not undertaken by either workers or other individuals. The wind farm 'rangers' will work closely with relevant authorities.	Mitigation	Visual Inspections	Wind farm area	Daily monitoring Monthly reporting	
	Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Disturbance	Site wide induction to include information regarding disturbance of ecological receptors.	Mitigation	Visual Inspections	At applicable area	Daily / weekly	
		Chance find procedure to report sightings of potentially sensitive receptor (e.g. Goitered Gazelle, MacQueen's Bustard) and investigation of any such sightings by the EPC Contractor in order that additional buffer areas can be agreed, where necessary.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Continual monitoring of the site by the EPC Ecologist and Wind Farm Rangers to record sensitive receptors and any such information will be passed on to the EPC Contractor and buffer / exclusion zones would be updated.					
		Ensure that no open water bodies are created on the site which could potentially attract sensitive receptors on to the site which would in turn increase the potential for disturbance of sensitive receptors					
	Direct and Indirect Impacts on Sensitive Receptors – Reduced Air Quality / Dust	Speed limits will be altered on access road and site roads if dust is a significant issue. This will be based on monitoring by the EPC Biodiversity Manager.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Vehicles will be properly maintained to reduce emissions.					
		Emissions from the batching plant will be monitored in line with control plans to minimize air pollution.					
	Direct Impacts on Sensitive Receptors (Vertebrates) – Noise and Vibration	Vehicles will be properly maintained to reduce noise emissions.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections	
		No work within buffer zones around sensitive receptors during breeding season (February to August) and no work in buffer areas around active					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		mammal burrows. Maintain buffer zones around MacQueen's Bustard, Steppe Eagle and Long-legged Buzzard nests and known locations of Honey Badger, Caracal, Marbled Polecat and Corsac Fox. Buffer zones to be applied if Goitered Gazelle (and Saiga) are recorded in the AoI during construction.				Monthly ESHS reporting	
		Use of available technology and management practices with construction methodologies to reduce noise and vibration.					
		Regular monitoring of noise and vibration levels within works compounds and works areas.	Mitigation	Noise monitoring program & submission of report	At applicable areas	Quarterly	
	Direct Impacts on Sensitive Receptors (Vertebrates) –Lighting	Night-time working will be limited and only completed when strictly necessary. Some night-time working may however be required (e.g. turbine installation is influenced by wind conditions which may be better at night) but any such work would be limited and not permanent or regular (over extended periods). Any lighting required for such activities will be low UV intensity lighting and will be shielded to reduce light spill. Night-time working will be monitored to ensure minimal impacts (e.g. looking for grounded birds) and if significant impacts are identified, night-time working will be banned.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Where lighting is required within worker compounds, site offices etc. ensure that any lighting is shielded and protected to reduce light-spill and glare. Low UV intensity lighting should also be used, where possible, to further reduce light spill.					
		For external security lights PIR trigger units should be used and these should be timed to automatically switch off after five minutes.					
		No lighting will be installed along the access road from Kirkkiz.					
	Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Littering, Waste Management	Waste Management will be included in the Site Induction so that all site workers understand their responsibilities to maintaining a clean and tidy site. Where possible all materials than can be recycled will be.	Mitigation	Submit Induction Training Records Submit TBT records	At construction active areas	Throughout construction period	
		Zero tolerance to littering on the works site and within the worker compound. This zero-tolerance approach should also be applied to smoking and workers must use appropriate smoking areas (supplied with 'butt bins') at all times, even when on construction sites. Litter must not be thrown out of vehicle windows when driving to and from or around the site.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Daily inspections of working areas and worker compound should be completed, and corrective actions applied, where necessary.					
		Additional mitigation measures for pest species, including feral cats and dogs are included below.	N/A	N/A	N/A	N/A	
	Pest Species	Where pest species are identified the EPC Contractor Biodiversity Manager will be notified and an appropriate course of action taken. For small mammal	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		pest's live traps will be used, in order to reduce the risk of by-catch. Poison baits should be avoided, unless it can be certain that non-target species will be affected, and any such use should be in accordance with national and international best practice. If poison baits are to be used it must be certain that any poisoned animal cannot move out on to the wider AoI to reduce the risk of natural predators eating poisoned animals.		Submission of pest control report		Weekly site inspections Monthly ESHS reporting	
		Where feral cats and dogs are identified the EPC Contractor Biodiversity Manager must be notified and efforts made to catch these animals and transport them to appropriate animal shelters away from the site. Guard dogs for the works site (e.g., security for site offices, workers accommodation) must not be used. These measures are in place to ensure no direct or indirect impacts to Honey Badger, Caracal, large ungulates and other smaller mammals (e.g. Marbled Polecat, Corsac Fox and Tolai Hare etc.) using the Project AoI.					
	Direct and Indirect Impacts on Sensitive Receptors (Birds) – Collision and Electrocution from LVDL	Bird Flight Diverters (BFDs) are to be installed along the entire length of the LVDL on the Optical Ground Overhead Wire (OPGW). The BFDs installed will be ones that glow or light up at night and are dynamic (e.g. move with the wind) to increase visibility for diurnal and nocturnal migrants (e.g. FireFly diverters). The Project Developer and EPC Contractor is committed to installing diverters that meet the required long-term guarantee and specifications that are equal to FireFly diverters. Installation of OPGW and attached BFDs will be completed at the same time (within 1 week). BFDs will be installed to the manufacturer's guidance and assessment of the OHTL, taking into consideration number and spacing, at a minimum of 1 every 10m. The installation of BFDs will need to be recorded by the EPC Contractor Biodiversity Manager and these checks need to be included in the annual reports. BFDs should be checked every 6 months before the spring and autumn migration seasons so that they are in place and operational for higher risk periods. Any damaged or defective BFDs will need to be replaced within 2 months of being reported as faulty.	Mitigation	Checks to be undertaken during stringing and repeated every 6 months to ensure BFDs are installed	BFDs on OPGW as per manufacturer's guidance	Throughout entire construction phase	Developer / EPC Contractor
		Ensure appropriate design of LVDL and provision of adequate insulation of live parts to ensure electrocution risks are mitigated. This will include as part of the design elimination of upper conductors, and lower conductors to be suspended from the cross arm by insulators. In addition, any jumper cables (e.g., at crossings/turning points) above the height of cross arms will be insulated.	Mitigation	Submission of detailed design	Submission of detailed design	Once; before commencement of construction activities	Developer /EPC Contractor

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Monitoring will be completed during the construction phase to monitor actual levels of mortality. Monitoring will be completed along the whole LVDL and the program of monitoring will include carcass searching, searcher efficiency trials and carcass persistence trials. The results of the fatality monitoring will be used to inform a GenEst Analysis. Monitoring will follow the latest international best practice including the recently published PCFM Handbook (EBRD, IFC, KFW 2023).	Mitigation	Submission of annual monitoring reports	Mortality along the entire LVDL	Continuous throughout the construction phase	Developer /EPC Contractor
		Should mortality remain a significant residual impact, off-setting will be required. An off-set plan is outlined in the section below. Full offset plan will be detailed in the Biodiversity Action Plan.	Off-set	Refer to BMP/BAP	Refer to BMP/BAP	Refer to BMP/BAP	Developer
Archaeology and Cultural Heritage	Improper management could potentially disturb or damage potential archaeological remains on the surface as well as some of which could be buried in the ground (if any).	Ensure that final detailed design to be prepared by the EPC Contract completely avoids all sites recorded along with the buffer distance requirements. Due to the change between the preliminary layout and final layout of the Project components, a follow-up archaeological inspection for the final footprint areas should take place by an archeology and cultural heritage expert to verify that they are devoid of any sites.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	EPC Contractor
		Any site located within 250 m from any Project component must be demarcated along with signage in English, Karakalpak, Russian indicating “Site of Archaeological / Cultural Heritage Importance – No Access Allowed”.					
		No worker may possess or withdraw any archaeological item or remains from the Project Area and from the sites recorded in specific (to include above or below ground) such as ceremonial jars, pottery, or similar objects					
		Driving will only be permitted on formal site roads and off-road driving is prohibited, unless it is driving within a working area (e.g. moving equipment or infrastructure around the site or for maintenance operations)					
		Workers are only permitted within authorized working areas and moving to any offsite area is prohibited. This includes in particular movement into the sites recorded under any circumstances at any time of the day					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Ensure all workers read, understand and sign the worker code of conduct which includes specific requirements related to such an issue and which include: (i) Respect religious sentiments and customs and traditions of co-workers, (ii) Respect the local religious and/or traditional days of celebration and their restrictions, (iii) Respect the religious shrines and burial sites and practices of the local population, (iv) Do not disturb shrines and other religious monuments, and (v) Recognize that shrines and sacred sites may include trees, sheds, piles of pebbles, and piles of offerings	Mitigation	Submission of signed worker code of conduct	Not applicable	Throughout entire construction phase	
		Induction training and Toolbox Talks (TBT) should be delivered to all workers to: (i) emphasize the presence and location of the sites and their overall importance and (ii) explain chance find procedures to ensure clarity when archaeological and cultural heritage finds are encountered on site.	Mitigation	Submission of Induction Training records	Not applicable	Throughout entire construction phase	
		There is a chance that potential archaeological and/or cultural heritage remains in the ground might be discovered. It is expected that appropriate measures for such chance find procedures are implemented. Those mainly require that construction activities be halted, and the area fenced along with proper signage, while immediately notifying the Ministry of Culture and Tourism in Karakalpakstan. No additional work will be allowed before the Ministry of Culture and Tourism in Karakalpakstan assesses the found potential archaeological site and grants a clearance to resume the work. Construction activities can continue at other parts of the site if no potential archaeological remains were found. If found, same procedures above apply.	Mitigation	A report submitted to the Developer and the Ministry of Culture and Tourism in Karakalpakstan.	N/A	Upon occurrence	Developer/ EPC Contractor
Air quality and Noise	Construction activities will likely result in an increased level of dust and particulate matter emissions as well as noise emission to surrounding environment which in turn will directly impact ambient air quality. This could entail indirect impacts on workers' health and safety.	If dust or pollutant emissions were found to be excessive due to construction activities, the source of such emissions should be identified, and adequate control measures must be implemented.	Mitigation	Dust and noise monitoring program Dust and Noise monitoring report	This will include at least one (1) monitoring point which represents activities undertaken. The monitoring should include TSP, PM10 and PM2.5 and noise levels. Results should be compared with national limits or IFC standards as included within the General EHS Guidelines or EU limits, whichever is more stringent	Quarterly	EPC Contractor
		Ensure that for activities associated with high dust and noise levels, workers are equipped with proper Personal Protective Equipment (PPE) to include dust masks, respirators (if required), and earmuffs.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Apply basic dust control and suppression measures which could include: (i) regular watering of roads for dust suppression; (ii) proper planning of dust causing activities to take place simultaneously in order to reduce the dust incidents over the construction period; (iii) proper management of stockpiles and excavated material (e.g. watering, containment,					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		covering, bundling); (iv) proper covering of trucks transporting aggregates and fine materials (e.g. through the use of tarpaulin); and (v) adhering to a speed limit of: (a) 60km/h at the main access road; (b) 40 km/h within the Project area; and (c) 10km/h within working areas; (vi) Where practical, compact the ground in areas that are heavily used by vehicles and machinery; (vii) Limit or suspend earthworks during extreme weather conditions; (viii) Ensure periodic washing of vehicles in order to remove any dusty material in a dedicated area.					
		Ensure that vehicles and trucks comply with the limits for exhaust emissions. This will be through: (i) ensure all vehicles and trucks are equipped with a catalytic convertor; (ii) ensuring that all vehicles and trucks utilized onsite are properly licensed for operation with relevant authorities.					
		Apply adequate general noise suppressing measures. This could include the use of well-maintained mufflers and noise suppressants for high noise generating equipment and machinery, and developing a regular maintenance schedule of all vehicles, machinery, and equipment.					
		Develop a regular inspection and scheduled maintenance program for vehicles, machinery, and equipment to be used throughout the construction phase for early detection of issue to avoid unnecessary pollutant and noise emissions					
		Turn off any equipment, machine or vehicle not in use					
		For worker accommodation onsite the following will be undertaken: (i) the site will be appropriately sited at a sufficient distance (i.e., 2-3 km at least) from any construction-related activities onsite; (ii) accommodation specifications will ensure that all opening (e.g., doors, windows) as well as façade is of suitable quality that would provide sufficient insulation from outside dust and noise.	Mitigation	Submission of detailed design	Not applicable	Once before commencement of construction	
Infrastructure and Utilities	Waste Utilities. Ensure that waste utilities will be able to handle the waste requirements that are generated from the Project	Develop a Waste Management Plan. The plan should include the following: waste reduction strategies, recycling and reuse, and appropriate disposal methods, in line with the Project standards, etc. This should be part of the EPC Contractor and Project Operator ESMS.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly water consumption reports	EPC Contractor
		Coordinate with the State Unitary Enterprise and obtain list of authorized contractors for collection of wastewater from the site to closest authorized wastewater treatment plant.	Additional Requirement	Submit formal communication letters from the relevant entities.	Not applicable	Once before commencement of construction	
		Coordinate with State Unitary Enterprise for the collection of solid waste from the site to the closest					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		authorized landfill (or obtain list of authorized private contractors).					
		Coordinate with State Unitary Enterprise to obtain list of authorized contractors for collection of hazardous waste from the site to the closest approved facility for final disposal.					
	Water Resources. Water requirements of the Project could entail constraints on existing users such as local communities or industrial establishments.	Document water consumption of the Project during construction.	Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly water consumption reports	
		Develop a water management plan. The plan should emphasize on water conservation and efficiency such as the following in particular: (i) Utilizing the dry-cleaning methods wherever applicable; (ii) Utilizing water saving fittings where applicable (taps, urinals, toilets, trigger guns, etc.); (iii) Consider utilizing treated wastewater/grey water for dust suppression and any irrigation requirements as applicable; (iv) Ensure that washing/cleaning activities (e.g. vehicle and equipment washing, toilets flushing/cleaning, etc.) are carried out using appropriate methods requiring low water consumption or dry (water-less) cleaning techniques where possible; (v) Awareness about resource efficiency, in particular concerning water use, shall be reinforced to all workers through signage and posters as appropriate; and (vi) Undertake weekly inspections for potable and non-potable water storage tanks and water supply connections to ensure there are no leaks. If any are located, they will be fixed immediately.					
	Traffic and Transport. Transportation requirements of the Project could affect level of service and capacity of existing highways and road networks. Traffic and Transport. Improper transportation activities could result in traffic related accidents on roads which in turn could affect the health and safety of users on the roads, workers and other.	Develop a Traffic and Transport Plan that must take into account the following: (i) local legislations related to traffic and transport; (ii) undertake consultation and engagement activities as part of preparation of this plan with the Ministry of Transport of Karakalpakstan / Logistics Center under the Road Use Unitary Enterprise and the General Department of Automobiles Roads of the Republic of Karakalpakstan to arrange for the logistics of the transportation requirements (iii) update traffic requirements of the Project related to materials, equipment, machinery, project workers, services, etc.; (iv) update and identify final traffic routes required; (v) update and identify the final traffic routes required for the Project. The plan must analyze and study the entire route for transportation of the Project components from the port till the Project site. The assessment must take into account worst case scenarios for transportation of Project components for blade lengths, tower sections, etc. The study must investigate any constraints which need to be considered along the highways leading to the Project site such as bridges, overhead utility cables, slants in roads, etc. and identify accommodations which need to be taken into	Additional requirement	Submit Traffic and Transport Plan	Not applicable	Once; before commencement of construction	EPC Contractor
			Additional requirement	Submit consultation record with Ministry of Transport of Karakalpakstan / Logistics Center under the Road Use Unitary Enterprise and the General Department of Automobiles Roads of the Republic of Karakalpakstan	Not applicable	Once; before commencement of construction	
			Additional requirement	Submit detailed design	Not applicable	Once; before commencement of construction	
			Mitigation	Submit signed code of conduct for drivers	Not applicable	Throughout entire construction period	
			Mitigation	Submit TBT records	Not applicable	Throughout entire construction period	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		account (bypasses, adjustments to roads, etc.); (vi) identification of types of vehicles to be utilized; (vii) identify in detail procedures for onsite management of traffic. This could include but not limited to: optimization of internal traffic layout so that delivery and other vehicles will be able to access site easily; identification of requirements for controlling access to the site (e.g. security checkpoint, registration, etc.); providing appropriate lighting for roads and pedestrian walk and ensure they are segregated; utilization of appropriate and sufficient traffic signs onsite (e.g. speed limits); barricading of open trenches and excavated pits; utilization of banksmen and flaggers and other; (viii) identify procedures for transportation activities under extreme weather conditions including conditions for suspicion of activities to include in particular: sand and salt storms, windy conditions, extreme hot and cold weather, and ,conditions and low/high temperatures; (viii) identify requirements to be adhered to and enforced on all haulage suppliers such as licensing, driving instructions and code of conduct, speed limits, accident management, monitoring and reporting, etc. (ix) identification of a code of conduct to be adhered to and enforced on all drivers in the Project; (x) identification of speed limits onsite and identification of all traffic signage requirement onsite (xi) identification of a procedure for management of onsite/offsite traffic accidents; (xii) reflect the procedural actions for traffic management in induction training material; and repeated/refresher Toolbox Talks (TBT); (xiii) identify Key Performance Indicators (KPI) for implementation of plan; (xiv) identify roles and responsibilities for implementation of plan; (xv) identify abnormal loads and obtain permits to carry these loads on highways; (xvi) ensure all vehicles are subject to a regular inspection / maintenance program.				Monthly ESHS reports (including traffic / transport KPIs)	
			Mitigation	Submit abnormal load permits	Not applicable	For all abnormal loads	
	Improper planning and site selection of the Project could damage/disturb existing gas pipeline which would affect its operation, and it could also entail serious safety risks to workers.	As part of induction training, it must be emphasized to all workers the presence of the gas pipeline within the Project site. It must also be emphasized that all transportation activities should be restricted to destinated roads and that it is strictly prohibited to approach the gas pipeline or its buffer area.	Mitigation	Submission of induction training records	Not applicable	Throughout entire construction period	EPC Contractor
Socioeconomics	Employment and Procurement. If: (i) local community engagement is not implemented properly; OR (ii) if priority on all employment and procurement opportunities are not provided to local communities; OR (iii) if expectations are not properly managed and addressed – this could result distrust and resentment with the Developer and might eventually	Project Updates to local communities in accordance with identified measures in the SEP which also includes measures related to management of local stakeholder expectations on jobs during the construction phase. This should include the following in particular: (1) undertake continuous and ongoing consultations (at least monthly) with local communities to: (i) manage expectations on employment and procurement opportunities for the	Additional requirement	Submission of stakeholder engagement log sheets	Not applicable	Monthly	Developer / EPC Contractor

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
	lead to other potential escalated events (e.g. demonstrations, blockage of access road, etc.).	Project; (ii) emphasize that job opportunities for this Project are huge and will be met throughout various entities that will include local communities, Districts and Regions; (iii) provides updates on Project implementation and overall schedule; and (iv) other as appropriate; (2) provide updates on implementation of the local recruitment and procurement procedure to date (e.g. number of locals employed to date from each village as appropriate); (3) As required by the local communities all communication / updates to the local communities should be provided through the following channels in particular: (i) Notifications and advertisements with Khokimiyat and Mahallas (including Mahalla Community Union); (ii) Telegram Channel; (iii) Youth Union of the Republic of Karakalpakstan; and (iv) Family and Women's Committee of the Republic of Karakalpakstan; (iv) Nannouz which forms the umbrella association for all NGOs in Karakalpakstan.					
		Adopt and implement a Local Employment and Recruitment Procedure as part of the Labor and Working Conditions Management Plan (LWCMP). The procedure must take into account the following: (1) comprehensive analysis of local skills and businesses availability and gaps within Karakalpakstan Region in order to make an informed approach when recruiting and procuring requirements locally. This should include in particular the youth. (2) (i) Number of job and procurement opportunities targeted for local communities to include skilled and unskilled workers, (ii) details on how job and procurement opportunities will be announced; (iii) a selection process that is fair and transparent and provides equal opportunities for all including females; and (iv) order of priority with respect to employment and procurement subject to availability of qualifications and skills where the following order of priority can be considered: local communities; Kungrad District; Karakalpakstan Region; and finally Uzbekistan. (3) as required by the local communities all communication / updates to the local communities should be provided through the following channels in particular: (i) Notifications and advertisements with Khokimiyat and Mahallas (including Mahalla Community Union); (ii) Telegram Channels; (iii) Youth Union of the Republic of Karakalpakstan; and (iv) Family and Women's Committee; and (v) Nannouz which forms the umbrella association for all NGOs in Karakalpakstan. (4) Based on the outcomes of the availability analysis above, consider undertaking a capacity building and training program for selected local community workforce members. This could be undertaken in coordination with key and prominent NGO's and/or research and academic institutions; (5) local	Additional requirement	Submission of Local Employment and Recruitment Procedure	Not applicable	Once; before commencement of construction	Developer / EPC Contractor
			Additional requirement	Submission of local community employment and procurement register by area/district/region along with evidence for announcements and selection process.	Not applicable	Monthly	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		recruitment process will be conducted in an inclusive, fair, equitable and diverse manner, and it will be ensured that there is no bias or discrimination and will be open to all community members regardless of their class, race, color, gender, age, disability, civil status, etc. (6) Recruitment will be based on competency and skill. (7) Efforts and resources will be allocated to make sure that women are also fairly targeted and recruited and are provided opportunities for learning skills to participate equally as men. (8) Gender inclusive advertising will be identified, in consultation with female stakeholders (such as women's groups and CBOs) and will be utilized in the announcement of job opportunities. (9) Candidate selection (recruitment) will be conducted by a mixed-sex panel (comprising of at least two people). Candidate promotion selection will always be carried out by a gender diverse and balanced panel (more than one person and never by a single-sex panel). All candidates will be informed about this. (10) It will be prohibited to terminate the contract of a female worker during her maternity leave.					
		Considering implementing a Community Development Plan which aims to benefit the local communities to the greatest extent possible. It is recommended that a structured approach is developed for such a program that takes into account the community's needs and priority development projects which could benefit local communities (which logically should also take into account other factors such as allocated budget by the Developer, timeline for implementation of such projects, etc.)	Additional requirement	Submission of community development plan	Not applicable	Once; during 1st year quarter of construction	Developer / EPC Contractor
			Additional requirement	Submission of community development plan update report	Not applicable	Annually	Developer / EPC Contractor
		Stakeholder grievance mechanism should be implemented in relation to implementation of the requirements of the Stakeholder Engagement Plan (SEP) and the Local Employment and Recruitment Procedure. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance log sheet Submission of grievance close-out forms	Not applicable	Monthly	Developer / EPC Contractor
	<u>Community Health, Safety and Security.</u> Trespassing of unauthorized personnel into construction active areas could result in health and safety impacts.	Prepare and submit a security Management Plan (SMP) that will include: (i) Security personnel will be used at the access points to control the entry and exit of people and continuous security patrols will be implemented; (ii) storage areas and substation will be fenced off and will have signs with warning notices in English, Russian, Uzbek, and Karakalpak language; (iii) all WTGs will include a locking mechanism and will be locked when no O&M activities are undertaken; (iv) warning signs indicating the presence of the Project along access roads to inform local people of the dangers posed by the Project in English, Russian, Uzbek, and Karakalpak language; and	Additional requirements	Submission of SMP	Not applicable	Once; before commencement of construction	EPC Contractor

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		The Stakeholder Engagement Plan (SEP) that will be implemented will include measures to engage with local communities to inform them about the start of construction works in advance, to educate them on the dangers inside the fenced-off area, and the danger of approaching construction works at other locations and emphasize importance of avoiding trespassing at all times. It should be noted that the project has also prepared and will implement a Livelihood Restoration Plan to mitigate the effects of economic displacement along the OHTL. The Windfarm site is however outside of the scope of the LRP given there were no identified impacts on land use as detailed in section 9.1.3.	Mitigation	Submission of stakeholder engagement log sheets	Not applicable	Monthly	
		Stakeholder grievance mechanism should be implemented in relation to implementation of the requirements of the SMP. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance log sheet Submission of grievance close-out forms	Not applicable	Monthly	
	Community Health, Safety and Security. Inappropriate management of security issues (e.g. conduct of security personnel) could result in health and safety issues for local communities.	Based on the SRA, a Security Management Plan (SMP) to be implemented. The plan must identify appropriate measures for hiring, rules of conduct, training, equipping, and monitoring of unarmed security personnel to control and manage such issues. The plan must also adhere to IFC PS 4 (Community Health, Safety and Security), EBRD PR 4 (Health, Safety and Security) in relation to the security guards employed. This requires that that the behavior for the security personnel is guided by the Voluntary Principles on Security and Human Rights in terms of hiring, rules of conduct, training, equipping and monitoring of such personnel. It also requires making reasonable inquiries to satisfy itself that those providing security measures are not implicated in past abuses, will ensure they are trained adequately in the use of force and appropriate conduct towards the workers and the local community. Force should only be used when strictly necessary, and to an extent proportional to the threat.	Additional requirement	Submission of SMP	Not applicable	Once; before commencement of construction	
			Mitigation	Submission copies of clearance of security guards in past abuses	Not applicable	Throughout entire construction period	
			Mitigation	Submission of signed code of conduct for security personnel	Not applicable	Throughout entire construction period	
			Mitigation	Submission of training and TBT records for security personnel on security rules of conduct, use of force, etc.	Not applicable	Throughout entire construction period	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including SMP KPIs)	
		Stakeholder engagement activities with local communities must provide information on security control requirements and measures implemented. Stakeholder engagement activities are provided in further details in the SEP.	Mitigation	Submission of stakeholder engagement log sheets	Not applicable	Monthly	
		Stakeholder grievance mechanism should be implemented in relation to any grievances related to security incidents and/or security personnel code of conduct. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance log sheet Submission of grievance close-out forms	Not applicable	Monthly	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
	Community Health, Safety and Security. Influx of huge number of workers to the area could result in community impacts such as pressure on infrastructure elements, increase in social vices, risk of spread of disease, and other.	Prepare and submit a Worker Accommodation Plan (WAP) and a Labor and Working Conditions Management Plan (LWCMP). The above plans should include specific sections on worker influx that should include the following measures: (i) As discussed earlier it is highly likely that there will be onsite accommodation given the distant location of the Project site. However, should this not be the case it is recommended / preferred to manage workers in a centralized location / approach that are not located within local communities. If accommodation is to be located within local communities, then again it is highly recommended / preferred to manage in a centralized location / approach (e.g. within 1 apartment building or several located next to each other and not several apartments / hotels located in various dispersed areas); (ii) Medical examination programs. All workers must be subject to a preliminary medical examination before commencement of any job tasks in accordance with local applicable requirements. In addition, routine medical examination for worker (bi-annually) must be undertaken. Such medical examinations must be undertaken at certified centers. Copies of medical examination results of all workers must be retained onsite. Medical examinations should be consistent amongst all worker to ensure no discriminatory implication; (iii) details and procedures for ensuring and maintaining hygienic conditions onsite at all times specifically related to the toilet and washing facilities, eating areas, etc. This should be applicable onsite and within worker accommodation; (iv) development of a code of conduct and associated disciplinary procedures for workers which takes into account appropriate behaviors by workers at all times, religious customs, traditional cultures and social norms in the area. In addition, it must include specific requirements for social vices including gender-based violence, sexual harassment, alcoholism, drug abuse, etc.; and (v) induction training and self-awareness raising sessions on risks associated to the most common contagious diseases (e.g. influenza virus), communicable diseases, general measures for hygiene, code of conduct expected to be implemented and other as appropriate.	Additional requirement	Submission of WAP and LWCMP	Not applicable	Once; before commencement of construction	
			Mitigation	Submission of medical examination records	Not applicable	Bi-annual	
			Mitigation	Submission of signed code of conduct and associated disciplinary measures	Not applicable	Throughout entire construction period	
			Mitigation	Submit induction training modules and Toolbox Talks on hygiene and code of conduct.	Not applicable	Throughout entire construction period	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including SMP KPIs)	
		Stakeholder engagement activities with local communities must provide information on worker influx expected and measures that will be undertaken to control such impacts. Stakeholder engagement activities are provided in further details in the SEP.	Mitigation	Submission of stakeholder engagement log sheets	Not applicable	Monthly	
		Stakeholder grievance mechanism should be implemented in relation to any grievances related to worker influx. Any grievances submitted should be	Mitigation	Submission of stakeholder grievance log sheet	Not applicable	Monthly	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.		Submission of grievance close-out forms			
	Worker Welfare, Health and Safety. Generic occupational health and safety risks to workers, as working onsite increases the risk of injury or death due to accidents	Prepare an Occupational Health and Safety Plan (OHSP). Adopt and implement the recommendations/provisions of the OHSP which includes: (i) Risk assessment and job safety planning procedure, (ii) PTW system procedure, (iii) LOTO procedure, (iv) Site control occupational health and safety procedure to include requirements for the following: personal Protective Equipment (PPE), requirements for site risks (fall protection, powered and hand tools, compressed air / gas cylinders, fire prevention, hot works, electrical works, material handling, machinery use and safety, excavation/concrete works/civil works, confined space activity, storage, medical requirements, and communicable disease management), (v) Occupational health and safety signage requirements, (vii) WTG erection OHS procedure, (viii) Identification of OHS training requirements, (ix) Identification of monitoring and reporting requirements, (x) Identification of roles and responsibilities, and (xi) Identification of measures to reduce the risk of COVID-19 exposure and transmission.	Mitigation	Submit OHSP	Not applicable	Once before commencement of construction	
			Mitigation	Submission of OHS training records	Not applicable	Throughout construction period	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including OHSP KPIs)	
		Prepare an Emergency Preparedness and Response Plan (EPRP) which should include: (i) communication and management process, (ii) onsite notification process, (iii) emergency response procedure, (iv) emergency control measures to include but not limited to fire, accidents, spillage, traffic accidents, natural disasters and other. In addition, of particular importance within the Project area are also risks related to remoteness of the Project site (e.g. in case of a medical emergency), risks from sand and salt storms including windy conditions, risks from extreme hot and cold weather and conditions and low/high temperatures, (v) requirements for emergency kits, (vi) onsite assembly points, (vii) emergency signs, (viii) training requirements, (ix) monitoring and reporting requirements, and (x) roles and responsibilities of the personnel involved in implementation of the plan	Mitigation	Submit EPRP	Not applicable	Once before commencement of construction	
			Mitigation	Submission of EPRP drills and EPRP TBT records	Not applicable	Throughout construction period	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including EPRP KPIs)	
		Establish a comprehensive medical emergency response, including robust on-site infrastructure and a helicopter response to appropriate medical facilities in Karakalpakstan when required.	Mitigation	Submit detailed design	Not applicable	Once before commencement of construction	
		A worker grievance mechanism should be implemented and that should handle any grievances related to OHSP.	Mitigation	Submit worker grievance sheet along with grievance close-out forms	Not applicable	Monthly	
	Worker Welfare, Health and Safety. Inappropriate accommodation facilities for workers will entail impacts on worker	Prepare a Worker Accommodation Plan (WAP) that must include the following components: (i) identify the workforce requirements including all	Additional requirement	Submit WAP	Not applicable	Once; before commencement of construction	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
	welfare as well as their overall health and safety.	subcontractor requirements; (ii) identify workforce transportation requirements to/from accommodation facilities; (iii) identify accommodation procedures to ensure that workers are provided with a decent accommodation which meets the basic worker's needs. In specific, onsite and/or offsite accommodation must be compliant with good international industry practices – mainly the "Workers' accommodation: process and standards" (EBRD/IFC Guidance Note, 2009). The document provides guidance notes on general living facilities, room facilities, medical facilities, management of accommodation units, etc.; (iv) worker accommodation must take into account climatic conditions of the area given the location (e.g. extreme heat and extreme cold) and it must be equipped with suitable measures such as air conditioning, heating, etc. (v) accommodation should consider the social and cultural backgrounds of the workers, providing spaces that respect cultural practices and promote social interaction in a positive manner. This includes considerations for gender segregation where culturally appropriate and facilities for religious practices (vi) accommodation facilities and specifications must take into account site-specific conditions to include in particular: (1) sand and salt storms, (2) windy conditions, (3) extreme hot and cold weather, and (4) conditions and low/high temperatures; (v) in relation gender requirement the following should be considered: (1) separate sleeping rooms for men and women will be provided in shared accommodations; (2) means of securing bedroom doors from inside and out will be provided; and (3) finally, female sanitary and toilet facilities will be kept separate from men; (v) identify housing rules and regulations including code of conduct; (vi) identify training requirements; (vii) identify monitoring and reporting requirements; and(viii) identify roles and responsibilities of the personnel involved in implementation of the plan.	Mitigation	Submit detailed design for accommodation	Not applicable	Once; before commencement of construction	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly Audits Monthly ESHS reports (including WAP KPIs)	
		A worker grievance mechanism should be implemented and that should handle any grievances related to WAP.	Mitigation	Submit worker grievance sheet along with grievance close-out forms	Not applicable	Monthly	
	<u>Worker Welfare, Health and Safety.</u> Potential impacts on worker health and safety related to blasting activities should they be undertaken onsite.	A Blasting Method Statement will be developed prior to conducting the blasting.	Mitigation	Submission of Blasting Method Statement	Not applicable	Prior to commencement of any blasting activity	
		A blasting supervisor will be in place to coordinate with the shot-firer. Sirens will be sounded throughout the duration of the blasting and for 30 minutes after.	Mitigation	Submission of CV	All applicable areas	Prior to commencement of any blasting activity	
		Entrances to the blasting area will be blocked and no unauthorized personnel permitted to enter.	Mitigation	Visual Inspections	At blasting active areas relevant for period of construction	Daily HSE monitoring	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Public access to construction areas will be restricted using a radial exclusion zone of 300m where blasting works are to take place. Security personnel will be used to ensure that no one except for authorized personnel are present within the exclusion zone to avoid them being hit by flying debris or injured from the inhalation of dust.				Weekly site inspections Monthly ESHS reports	
		Warning signs indicating the use of explosives for the purpose of blasting will be installed along access roads in the vicinity of the relevant WTGs where such works are taking place, to inform of the risks posed by such activities.					
	Worker Welfare, Health and Safety. Inappropriate management of the workforce could entail human rights violations (e.g. engaging child workers, confiscation of passports of foreign workers, unacceptable working hours, and others).	Prepare and submit a Labor and Working Conditions Management Plan (LWCMP) that should include: (1) an overview of the labor use on the project throughout the construction phase; (2) Human Resources (HR) policy; (3) identify an HR management procedure for the workforce that will ensure decent and humane working conditions, worker rights, and enhance constructive work floor relations. This should be guided by the Local Labor Law as well as the IFC PR 2 and EBRD PR 2 as well as the ILO Fundamental Labor Conventions covering the following in particular: (i) ensuring all workers onsite are provided with a contract. Each worker will be provided with a signed copy of the contract and another copy will be retained with the HR Manager.; (ii) providing reasonable working conditions and terms of employment to include but not limited to contract management, working hours, salaries/wages, annual and medical leaves, bereavement leaves, accommodation, etc. (iii) recognizing workers' rights to form and to join workers' organizations of their choosing and to bargain collectively without interference; (iv) prohibition of child labor within the workforce; (v) overall management of young workers within the labor force. The recruitment of children under the age of 18 in illegal and hazardous work should be explicitly prohibited. However, if children between the ages of 15-18 are to be employed at any stage throughout the construction stages, the following should apply: (a) an official letter with the approval of their parents or guardian should be provided; (b) young workers must provide valid identification that presents proof of age at the recruitment stage; (c) minor workers are not allowed to work onsite and are only allowed to work in the Project's worker camp; (d) they are not to be employed in any kind of work which by its nature is likely to harm their health and safety or expose them to risks and hazards; and (e) in accordance with the Labor law, young workers shall not work for more than six hours a day, during which one or more break periods totaling not less than one hour shall be	Additional Requirement	Submit LWCMP	Not applicable	Throughout entire construction period	
			Mitigation	Submit signed contracts for all workers			
			Mitigation	Submit signed worker code of conduct for all workers			
			Mitigation	Submit payment register			
			Mitigation	Submit disciplinary action register			
			Mitigation	Submit training and TBT records			
			Mitigation	Submit worker grievance logs with close-out forms			
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly Audits Monthly ESHS reports (including KPIs for LWCMP)	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		granted for meals and rest. They shall not be made to work overtime hours or required to come to work on weekends and official holidays. They shall not be made to work between 7:00 pm and 7:00 am. (vi) prohibition of forced labor and human trafficking including confiscation of employees' passports; (vii) non-discrimination throughout the entire work cycle in all its forms; (viii) providing equal opportunities for all throughout procurement and employment opportunities including women groups; (ix) overall management of daily workers, migrant workers and third-party workers; (x) given the expected long-term location onsite employment contracts must include regular off-site breaks for rest and relaxation; (xi) ensure the following on wages: (a) wages to be determined on a case-by-case basis and must be must be fair and should meet the basic needs to maintain a safe and decent standard of living; (b) must be established based on qualifications and competencies, professional experience, job responsibilities, and wages at equivalent positions; (c) must be for work of equal value should be provided for female and male workers; and (d) should not be below the nationally established minimum wage. (xii) ensure the following on working hours: (a) in accordance with the Labor law, working hours should be set to a maximum of 40-hours a week over 5 or 6 days including at least one hour break every 4 hours; (b) overtime is allowed with appropriate need, but in all cases, working hours should not exceed 10 per day; (c) workers should have a 24-hour period of rest after 6 days of work; and (d) all workers will be notified of their schedule for the weekly day's rest, working hours, break periods and any changes introduced to such a schedule. (xiii) ensure the following on leaves: (a) workers should be entitled to annual and sick leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the worker's contract; and (b) workers should be entitled to annual and temporary disability leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the worker's contract; (xiv) all workers should be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct should prohibit the following and which is subject to disciplinary action: (a) harassment, and abuse of any kind will not be tolerated; (b) discrimination based on personal characteristics is prohibited to include but not limited to gender, race, nationality, ethnic, social and vulnerable people, religion or belief, disability, age, or sexual orientation. (xv) ensure privacy and protection of workers is maintained at all times. This will include limiting access to the below data and information to the EPC					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Contractor HR Manager only; (4) Contracts; (5) HR files and databases; (6) Payment register; (7) worker grievance forms and registers; (8) disciplinary action register; (9) ensure information is properly handled and stored, saved online through password protected files, and in secured cabinets with a fitted lock in case of hardcopies; (10) identify a disciplinary procedure for the workforce to be implemented; (11) identify a worker welfare procedure related to drinking water, rest areas, sanitary facilities, changing rooms; (12) identify a worker grievance procedure to manage all worker related complaints and grievances that should outline the measures for escalation of grievances by workers; (13) identify training requirements related to the plan; (14) identify monitoring and reporting requirements related to the plan; and (15) identify roles and responsibilities related to the plan.					
	Community and Worker Health and Safety. Inappropriate management of the workforce (which could be from the local community) as well as inappropriate conduct of workers within local community areas could entail gender related risk and impacts such as Gender based violence, and harassment (GBVH) or Sexual Exploitation, abuse, and harassment (SEBH)	Develop and implement a Labor and Working Conditions Management Plan (LWCMP). The Plan should include at a minimum the following: (1) safe transport will be provided to female and male workers, given the remote area of the Project. The codes of conduct, which prohibit gender-based violence, harassment and abuse, will apply to transportation modes; (2) all workers should be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct should prohibit be subject to disciplinary action and should prohibit harassment, gender-based violence and abuse of any kind; (3) all workers should be provided with a copy of the Gender Based Violence and Harassment (GBVH) Code of Conduct and will be required to sign it; (4) identify a worker welfare procedure related to drinking water, rest areas, sanitary facilities, changing rooms and other that should include take into account the following in particular: (i) female sanitary, toilet facilities, and prayer rooms will be kept separate from men; (ii) all such facilities will have lockable doors with adequate numbers provided; (iii) separate changing rooms and cabinets will be provided for men and women both of which have locking mechanisms.	Additional requirement	Submit LWCMP	Not applicable	Once; before commencement of construction	
			Mitigation	Submit signed GBVH Code of conduct for all workers	Not applicable	Throughout construction period	
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Quarterly Audits Monthly ESHS reports (including KPIs for LWCMP)	
		Identify a worker grievance procedure to manage all worker related complaints and grievances that should consider the following: (i) prohibiting gender-based violence and harassment in the workplace and will outline that a suitably trained male and female person is designated to process grievances in which male / female workers might feel uncomfortable discussing with a person of the opposite sex. The grievance mechanism also includes a procedure to deal with Gender Based Violence and Harassment (GBVH) grievances.	Mitigation	Submission of worker grievance logs with close-out forms	Not applicable	Monthly	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Stakeholder Grievance Mechanism as part of the SEP also includes a procedure for GBVH grievances. This should be implemented entirely to handle any grievances related to GBVH Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance logs with close-out forms	Not applicable	Monthly	
Subcontractor and Supplier Management	Improper management of subcontractors and supplier poses risks of major environmental impacts, human right abuses, criminal abuses or other	Develop a Subcontractor and Supplier Management Plan which should: (i) identify the key subcontractors and suppliers that will be involved, (ii) identify a screening process where during the tendering process the key E&S requirements should be identified and included within the tender documents. This may include adherence to International Financial Institution (IFI) E&S requirements, national E&S regulations, ESIA and ESMS requirements and other. In addition, tenders will be required as part of the tender to specify how they intend to comply with such requirements as part of their scope of work. In the case there is no tendering process subcontractor/supplier will be required to respond to an E&S prequalification questionnaire and will be required to submit company HSSE policies. Finally, as part of the screening process, an online desktop review (including media research) on the list of companies bidding, their owners and shareholders on E&S reputational issues; (ii) selection process where selected subcontractor / supplier risks have been identified, Developer / EPC Contractor will assess these risks further with the subcontractor / supplier concerned to understand their capacity to avoid and manage such risks and to understand the controls the subcontractor / supplier has in place. This could include but not limited to submission of E&S policies and procedures as relevant for subcontractor / supplier (e.g. for supplier's focus would be on human resources and labor policies and procedures), traceability, cascading E&S requirements, undertaking auditing protocols, etc. Where this is not possible, alternative suppliers will be sought; (iii) contractual control will put in place controls to avoid and manage potential risks. This will include but not limited to contractual controls, including corrective actions and exit mechanisms, to avoid and manage potential risks. This would depend on the level of risk identified and the leverage over the subcontractor / supplier concerned. Contractual controls could include but not limited to the following: requirement to comply with IFI E&S requirements and national E&S requirement as applicable; requirements to comply with the project ESMS MS and associated manual; include clauses that enable the undertaking of inspections and/or audits to ensure compliance with the requirement above; include clauses allowing imposition of contractual penalties as applicable; (iv) proactive management and a system of contractor accountability.	Mitigation	Submit Subcontractor and Supplier Management Plan	Not applicable	Once before commencement of construction	Developer / EPC Contractor
			Mitigation	Submission of outcomes of screening processes for all selected subcontractors and suppliers (e.g. tender E&S requirements, reputational assessments)	Not applicable	Throughout entire construction period	
			Mitigation	Submission of risk assessment for subcontractor / supplier selected and E&S controls for risks identified	Not applicable	Throughout entire construction period	
			Mitigation	Submission of E&S contractual controls	Not applicable	Throughout entire construction period	
			Mitigation	For subcontractors - Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Quarterly Audits Monthly ESHS reports (including KPIs for SSMP)	
			Mitigation	For suppliers and depending on the risks associated with a supply plan, put in place monitoring approach including reports from suppliers, ad hoc audits, etc. to the extent this is feasible. Monitoring will seek to ensure compliance with the mitigation defined, and in cases of non-compliance, help define corrective actions with the supplier concerned. Developer / EPC Contractor will maintain appropriate records of its supply chain assessment and risk management. Where this is conducted by EPC contractors it will be reported to Developer on a regular basis	Off-site	Throughout entire construction period	

Note: all 'operational phase' mitigation actions identified within the ESMP below apply whenever any group of turbines is commissioned, not just when all have been commissioned. This is critical to note given that Project commissioning will be undertaken in phases as noted earlier in "Section 2.5".

Table 113: ESMP for the Operation Phase

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
Landscape and Visual	Impacts related to interaction of wind turbines within the overall landscape and visual character of the area including any potential sensitive visual receptors.	In the case grievances are received from South Ustyurt National Park operators in relation to turbine visibility, consider planting native vegetation or trees around the wind farm to screen the view of the turbines from certain vantage points. Create buffer zones of natural or landscaped features to help blend the wind farm into the landscape; OR In line with the above, consider coordinating with South Ustyurt National Park operators to create designated public viewing areas or platforms where people can appreciate the wind farm from a distance and learn about renewable energy.	Mitigation	Submission of grievance log sheets and grievance close-out forms as per SEP Visual Inspections	Not applicable	Throughout entire operational period	Project Operator
		Use minimal or no lighting on the turbines unless required for aviation safety. Lighting can increase visibility and, therefore, the visual impact. Limit signage to what is necessary for safety and regulatory compliance.					
Geology, Hydrology, and Hydrogeology	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Solid waste management</u>	Coordinate with State Unitary Enterprise for the collection of solid waste from the site to the municipal approved landfill or for recycling	Mitigation	Submit contract	Not applicable	Once before commencement of operation	Project Operator
		Prohibit fly-dumping of any solid waste to the land	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Distribute appropriate number of properly contained litter bins and containers properly marked as "Municipal Waste"					
		Adhere to waste hierarchy principles with associated mitigation measures to include prevent, minimize, reuse, recycle, recover and dispose					
		Implement proper housekeeping practices onsite at all times					
		Maintain records and manifests that indicate volume of waste generated onsite, collected by contractor, and disposed of at the landfill. The numbers within the records are to be consistent to ensure no illegal dumping at the site or other areas	Mitigation	Submit manifests	Not applicable	Throughout operational period	
	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Wastewater management</u>	Coordinate with State Unitary Enterprise to hire a private contractor for the collection of wastewater from the site to the closest WWTP	Mitigation	Submit contract	Not applicable	Once before commencement of operation	
		Maintain records and manifests that indicate volume of wastewater generated onsite, collected by contractor, and disposed of at the WWTP. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas	Mitigation	Submit manifests	Not applicable	Throughout operational period	
		Prohibit illegal disposal of wastewater to the land	Mitigation	Visual Inspections			

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Ensure that septic tanks are emptied and collected by wastewater contractor at appropriate intervals to avoid overflowing			Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Hazardous waste management</u>	Coordinate and hire a private contractor for the collection of hazardous waste from the site to the approved hazardous waste disposal facilities	Mitigation	Submit contract	Not applicable	Once before commencement of operation	
		Ensure that hazardous waste is disposed in a dedicated area that is enclosed; roofed and of hard surface; with proper signage and suitable containers as per hazardous waste classifications and that they are labelled for each type of hazardous waste	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Ensure hazardous waste storage area is equipped with spill kit, fire extinguisher and anti-spillage trays and a hazardous waste inventory is available					
		Prohibit illegal disposal of hazardous waste to the land					
		Possibly contaminated water (e.g. runoff from paved areas) must be drained into appropriate facilities (such as sumps and pits). Contaminated drainage must be orderly disposed of as hazardous waste					
		Ensure that containers are emptied and collected by the contractor at appropriate intervals to prevent overflowing					
		Maintain records and manifests that indicate volume of hazardous waste generated onsite, collected by contractor, and disposed of at the hazardous waste disposal facilities. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas					
	Risk of soil and groundwater contamination during the various construction activities from improper housekeeping activities (e.g. spillage of hazardous material, random discharge of waste and wastewater to surrounding environment, etc.). <u>Hazardous Material Management</u>	Ensuring any new support equipment does not contain Polychlorinated Biphenyl (PCBs) or Ozone Depleting Substances (ODSs) to avoid having hazardous wastes. This includes in particular the BESS and substation components	Mitigation	Review of Data Sheet	Not applicable	Throughout operational period	
		Ensure that hazardous materials are stored in proper areas and in a location where they cannot reach the land in case of accidental spillage. This includes storage facilities that are of hard impermeable surface, with a hard roof, flame-proof, accessible to authorized personnel only, locked when not in use, and prevents incompatible materials from coming in contact with one another	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Maintain a register of all hazardous materials used and accompanying Material Safety Data Sheet (MSDS) must present at all times. Spilled material should be tracked and accounted for					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Incorporate dripping pans at machinery, equipment, and areas that are prone to contamination by leakage of hazardous materials (such as oil, fuel, etc.)					
		Maintenance of all equipment and machinery used onsite. Maintenance activities and other activities that pose a risk for hazardous material spillage (such as refueling) must take place at a suitable location (hard surface) with appropriate measures for trapping spilled material					
		Ensure that a minimum of 1,000 liters of general-purpose spill absorbent is available at hazardous material storage facility. Appropriate absorbents include zeolite, clay, peat and other products manufactured for this purpose					
		If spillage on soil occurs, spill must be immediately contained, cleaned-up, and contaminated soil disposed as hazardous waste					
Biodiversity	**Note: The below presents the mitigation and monitoring measures required for biodiversity as per the outcomes of the ESIA. However, a detailed and standalone Biodiversity Management Plan (BMP) is submitted which will expand on the mitigation and monitoring requirements included within the ESIA and highlighted below within this ESMP. Refer to the BMP for the full details on mitigation, monitoring and reporting requirements.**						
	Direct and Indirect Impacts on Sensitive Receptors (Mammals and Birds) – Habitat Fragmentation and Barrier Impact	Whilst minor to major impacts are predicted in the table above this is a result of the assessment methodology, and negative impacts are considered unlikely for the reasons set out (e.g. movement of ungulates through operation wind farms, no site-wide fencing, roads not banked, light traffic volumes, wide corridors of turbine free space within the wind farm and western corridor between WTGs and the border fence). Additional mitigation is therefore not suggested, although monitoring will be completed.					
	Direct Impacts on Sensitive Receptors (Birds) – Collision with Turbines	Operational monitoring will be completed for at least the first three years of operation (so if clusters are commissioned before others are constructed, each turbine or cluster of turbines will have a minimum of three years PCFM surveys), to monitor actual levels of mortality. Post construction fatality monitoring will be completed at all of the turbines and the program of post construction monitoring will include carcass searching, searcher efficiency trials and carcass persistence trials. The results of the post-construction fatality monitoring will be used to inform a GenEst Analysis. Post-construction monitoring will follow the latest international best practice including the recently published PCFM Handbook (EBRD, IFC, KFW 2023). Full details of the PCFM Protocol will be included in an Operational BMP document.	Mitigation	Refer to BMP	Refer to BMP	At least first 3 years of operation after which to be discussed and agreed with lenders	Developer / Project Operator

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		An adaptive management strategy will be developed (in line with the PCFM Handbook), and additional mitigation will be undertaken where necessary. If significant impacts are recorded targeted SDOD during key spring and autumn migration periods would be triggered and these would be completed. Significant impact would clearly include any mortality of Steppe Eagle, Eastern Imperial Eagle and Golden Eagle and Cinereous Vulture as PBR thresholds for these species are zero.	Mitigation	Refer to BMP	Refer to BMP	Upon occurrence to be discussed and agreed with lenders	
		Adaptive management options for other species would be undertaken including targeted SDOD, if the results of the post-construction fatality monitoring indicate higher than predicted mortality, especially in relation to species of elevated conservation concern (e.g. Pallas's Fish Eagle, White-tailed Eagle, Golden Eagle, Eastern Imperial Eagle, Greater-spotted Eagle, Booted Eagle and Saker Falcon).	Adaptive management	Refer to BMP	Refer to BMP	Upon occurrence to be discussed and agreed with lenders	
		Adaptive management could include undertaking specific observer-led shut down programs if PCFM surveys indicate particular peak periods of bird activity through the AoI (e.g. specific windows of higher migratory activity, specific meteorological conditions causing spikes in bird activity at particular times of the year). Technology-led shut-down on demand could also be retrofitted within the AoI if actual mortality is significantly higher than predicted or if observer led SDOD is not shown to be fully effective (e.g. at reducing Steppe and Golden Eagle collisions to zero).	Adaptive management	Refer to BMP	Refer to BMP	Upon occurrence to be discussed and agreed with lenders	
		In The Project will implement offset measures during construction and operations to address residual impacts and thus achieve no net loss for priority biodiversity features, and for Natural and Critical Habitat. In particular, the Project will – in collaboration with the relevant stakeholders – support undergrounding of current or proposed Low Voltage Distribution Lines (LVDL), or removal of any such lines which are no longer necessary, within a priority area for MacQueen's Bustard in Bukhara Province. The detailed location, scale and schedule of this offset will be agreed in consultation with key stakeholders. While this offset is primarily targeted at MacQueen's Bustard, removal of LVDL in this area is likely to also have significant benefits to birds of prey by removing electrocution risks. Monitoring of current electrocution risks in the area would allow removal of LVDL to also function as an offset towards any unforeseen collisions of birds of prey with wind turbines. These offset measures are	Off-set	Refer to BMP	Refer to BMP	To be discussed and agreed with lenders	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		further detailed in the Project's Biodiversity Offset Plan (BOP). The scale of offsets necessary has currently been estimated on a precautionary basis, using existing data on bustard collisions with powerlines near part of the Project OHTL route. This estimate will be refined during Project implementation via a program of Post Construction Fatality Monitoring (PCFM). That Program will not only enable refinement of offsets for MacQueen's Bustard but also identify the need for any other adaptive management of mitigation or offsets owing to unforeseen impacts. It will be developed for both turbines and powerlines following good international industry practice and carried out for an initial minimum 3-year period, but the actual timeframe will depend on fatality results. If PCFM indicates collisions of other Critical Habitat-qualifying bird or bat species with turbines to levels that exceed PBR-based fatality thresholds, additional mitigation or offset actions will be implemented as part of adaptive measurement as contained in the ESIA. Those may include operational controls (such as turbine curtailment or shut-down-on-demand during high-risk periods) or the enhancement of mitigation and offset measures.					
		On the completion of the three-year post-construction fatality monitoring a decision will be taken to continue or cease this survey effort or reduce it to specific times of the year. Cessation or modification of the PCFM surveys will only be completed with prior agreement with the Lenders. If monitoring is ceased site workers will continue to record any carcasses they find and this information will be passed on to the Project team.	Mitigation	Refer to BMP	Refer to BMP	To be discussed and agreed with lenders	
		A chance find procedure will be implemented and any carcasses seen by site workers will be reported to the O&M Biodiversity Manager so that they can investigate. In addition, any prey species carcasses found on within the site will be removed to reduce the likelihood of scavenging birds landing within the Project site.	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		It is also possible that with increased access to the site that changes in the amount of grazing activity within the AoI will occur over time and this will be monitored by the O&M Contractor Biodiversity Manager / Wind Farm Rangers as this could potentially change activity patterns of raptors and possibly vultures (Cinereous and Griffon Vulture recorded once as incidental sightings in Spring and migrating Cinereous Vulture recorded in the	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		autumn) over time. Grazing will however be banned from within the WF AoI and this will be monitored by full time Project Ranger staff.					
		Wider conservation efforts within the NP and UNESCO sites as well as measures undertaken under CMS obligations (e.g. removal or changes to border fences, additional reintroduction of ungulates etc.) could also increase the amount of natural prey within the wind farm AoI and this in turn could make the site more attractive to birds of prey and vultures. The Wind Farm Rangers will monitor the numbers of ungulates across the site and a program of carcass removal will be undertaken if necessary.	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
	Direct Impacts on Sensitive Receptors (Bats) – Collision with Turbines	Operational monitoring will be completed for at least the first three years of operation (so if clusters are commissioned before others are constructed, each turbine or cluster of turbines will have a minimum of three years PCFM surveys), to monitor actual levels of mortality. Post construction fatality monitoring will be completed at all of the turbines and the program of post construction monitoring will include carcass searching, searcher efficiency trials and carcass persistence trials. Searcher frequency, in at least the first year, will be weekly. The results of the post-construction fatality monitoring will be used to inform a GenEst Analysis. Post-construction monitoring will follow the latest international best practice including the recently published PCFM Handbook (EBRD, IFC, KFW 2023). Full details of the PCFM Protocol will be included in an Operational BMP document.	Mitigation	Refer to BMP	Refer to BMP	At least first three years of operation after which to be discussed and agreed with lenders	
		Bat detector surveys will also be completed for the first three years of operation in order to record levels of bat activity across the site and use this data in combination with the results of the PCFM to ascertain high-risk periods. Data from detector survey and PCFM will be used to inform the adaptive management.					
		Adaptive management of the turbines (e.g. curtailment) will be considered if mortality is higher than the PBR Thresholds for the species recorded during the PCFM surveys. PBR thresholds are given above, and adaptive management will likely be based on season and temporal curtailment of the turbines during period of highest bat activity / recorded mortality. Curtailment triggers to be determined during PCFM campaign but will be based on increasing the cut-in wind speed for turbine operation or blanket curtailment during periods of highest activity.					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
	Indirect Impacts on Sensitive Receptors (terrestrial mammals and breeding / resident birds) – Disturbance	Ban on off-road driving, and if off-road driving is required a check of the working area should be completed by the Project's Ecologist.	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Speed limits to be enforced.					
		A chance find procedure will be implemented and any sensitive species seen by site workers will be reported to the O&M Contractor Biodiversity Manager					
		If certain species (e.g. birds of prey or MacQueen's Bustard) are accidentally flushed during operation monitoring, staff should monitor the flight of the bird to check if they are struck by turbines	Mitigation	Submission of flight details	Not applicable	Throughout operation period	
		Sensitive species are to be included in the site induction for all operational staff where additional control measures will be discussed including allowing animals to move around the site, not chasing after them in vehicles or approaching them on foot and what to do if they observe breeding birds within their works areas	Mitigation	Submit Induction Training Records Submit TBT records	Not applicable	Throughout operation period	
	Direct Impacts on Sensitive Receptors (Vertebrates) – Vehicle Collisions	Speed limits will be enforced by the O&M Contractor on all site roads. GPS units will be fitted to all O&M contractor vehicles as well as all Developer project vehicles, the data from which will be checked monthly and fines will be issued for breaches of the speed limit. Speed checks will also be completed at least monthly, and any non-project related vehicles will be stopped and the drivers reminded of the posted speed limits within the Project area. Speed checks and GPS checks will be recorded and reported and issued fines will also be reported.	Mitigation	GPS trackers Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Regular signage will be installed along the site access roads and internal roads informing all drivers of the speed limit					
		A gated entrance will be staffed and any visitors or locals using the site roads will be informed of the speed limits and that there are regular checks of vehicle speeds					
		A ban on driving at night will be enforced and if necessary the speed limit will be reduced to 40 km/h on the access road and to 20 km/h on any internal roads.					
		Ban against off-road driving at all times of the day, and if necessary, the works area will be subject to a walkover by the O&M Contractor Biodiversity Manager					
		Regular checks of the road for carcasses and if found these will be moved to at last 50m from the road to reduce the likelihood of hitting scavengers, including birds of prey					
		An incidental / chance find procedure will be included in the Biodiversity Management Plan					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		(BMP) so that all workers report any road collisions so that any such incident can be investigated in full					
	Direct Impacts on Sensitive Receptors (Vertebrates) – Lighting	Site-wide lighting is not being implemented so any lighting impacts during operation will be very limited. Night-time working is not anticipated and will certainly not be a regular occurrence.	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Where lighting is required within worker compounds, site offices etc. ensure that any lighting is shielded and protected to reduce light-spill and glare. Low UV intensity lighting should also be used, where possible, to further reduce light spill.					
		For external security lights PIR trigger units should be used and these should be timed to automatically switch off after five minutes.					
		No lighting will be installed along the access road from Kirkkiz.					
		Turbines will not be lit and any aviation lights will be shielded to minimize visibility from ground level to reduce the attractiveness of lights to night flying insects which in turn could attract bats.					
		Lighting above turbine doors will be PIR controlled and timed so that it switches off automatically after five minutes. Again, this measure will be implemented to reduce night-flying invertebrates in proximity to turbines.					
	Direct Impacts on Sensitive Receptors (Habitats and Flora) – Non-native Species and Introduced Flora	Post-construction monitoring will be completed across the AoI to record the presence and distribution of non-native and invasive plant species and a program of mechanical control will be completed over during the operation period to remove these species from the AoI. Chemical control will be avoided however, if necessary, will be used but in accordance with national and international guidelines and only following risk assessment and approval from the Lenders. The program of control will continue until the species are absent from the Project AoI. The results of ESIA surveys, pre-clearance, pre-construction and during construction surveys will be used to inform areas that will require monitoring for NNIS. If NNIS are more widely recorded the search area for such species will be increased.	Mitigation	Submission of post-construction monitoring report Submission of control report (if triggered)	Entire project footprint	Years 1, 2, 5, 10, 15	
		A program of regular monitoring will be completed with surveys completed annually for the first five years post-construction and also in Years 10, 14, 20 to survey for the presence of non-native and / or invasive species and relevant control of these species will be completed, where necessary.	Mitigation	Submission of survey report			
	Direct and Indirect Impacts on Sensitive Receptors (Vertebrates) – Pest Species	Where pest species are identified, the O&M Contractor Biodiversity Manager will be notified, and an appropriate course of action taken. For small mammal pest's live traps will be used, to	Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		reduce the risk of by-catch. Poison baits should be avoided, unless it can be certain that non-target species will be affected, and any such use should be in accordance with national and international best practice. If poison baits are to be used it must be certain that any poisoned animal cannot move out on to the wider AoI to reduce the risk of natural predators eating poisoned animals.		Submission of pest control report		Weekly site inspections Monthly ESHS reporting	
		Where feral cats and dogs are identified the O&M Contractor / Ecologist must be notified and efforts made to catch these animals and transport them to appropriate animal shelters away from the site. Guard dogs for the site offices (e.g. security for site offices, workers accommodation) must not be used. These measures are in place to ensure no direct or indirect impacts to Honey Badger as well as other mammal species of conservation concern.					
	Other	Monitoring of mammal and herpetofauna assemblages across the AoI. Repeat of baseline surveys will be completed in Years 1, 3 and 5. Population densities recorded in Year 5 will be compared to baseline levels and if required additional work will be completed to ensure no net loss of PBF species and aim to achieve no net loss of all species.	Mitigation	Submission of monitoring report	Entire project footprint	First 5 years of operation as applicable	Developer / Project Operator
		Walkover surveys for mammals will be completed throughout construction and in the first five years of operation to demonstrate continued use of the site by Marbled Polecat, Caracal Honey Badger and Corsac Fox. Camera traps will be used where necessary, although wide-scale / long-term camera trapping will not be completed.					
		Breeding bird surveys will be completed in Years 1, 3 and 5 to record the breeding bird assemblage of the site. This will include raptor nest searching. Population densities recorded in Year 5 will be compared to baseline levels and if required additional work will be completed to ensure no net loss of PBF species and aim to achieve no net loss of all species.					
		Post-construction fatality monitoring to be completed throughout the first three years of operation to record the actual impact of bird and bat collisions with the turbines. Additional surveys and or mitigation measures to be implemented as part of an Adaptive Management Strategy. Any changes to the PCFM protocol will be agreed with the Lenders.	Mitigation	Submission of monitoring report	Entire project footprint	First 3 years of operation as applicable	
		All of the above monitoring requirements will be included within Construction and Operational BAPs which will include KPIs and a BMEP against which the results of the monitoring will be assessed.					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Funding of a Wind Farm Ranger service who will be responsible for patrolling the wind farm (and access road). The Project will commit to two full-time rangers who will be employed for the lifetime of the Project, including during the construction period. The rangers will be responsible for ensuring site-wide speed limits are enforced, ensure that there is no poaching (including taking of tortoise) within the wind farm area and to ensure that the wind farm area (and areas adjacent to the access road) remain free from grazing animals. The rangers will work closely with local law enforcement. Rangers will also be responsible for recording any human/wildlife conflict (including road collisions) and to ensure any large carcasses are removed from the WF Project area to reduce potential scavenging behavior by bird species of conservation concern which in turn could increase the likelihood of collision with the operational turbines.	Off-set	Submission of contract	Entire project footprint	Throughout entire operational period	
Archeology and Cultural Heritage	Improper management could potentially disturb or damage potential archaeological remains recorded on the surface.	Induction training and Toolbox Talks (TBT) should be delivered to all workers to emphasize the presence and location of the sites and their overall importance	Mitigation	Submission of Induction Training records	Not applicable	Once before commencement of operation	Project Operator
		Ensure all workers read, understand and sign the worker code of conduct which includes specific requirements related to such an issue and which include: (i) Respect religious sentiments and customs and traditions of co-workers, (ii) Respect the local religious and/or traditional days of celebration and their restrictions, (iii) Respect the religious shrines and burial sites and practices of the local population, (iv) Do not disturb shrines and other religious monuments, and (v) Recognize that shrines and sacred sites may include trees, sheds, piles of pebbles, and piles of offerings	Mitigation	Submission of signed code of conduct	Not applicable	Throughout entire operational period	
		Driving will only be permitted on formal site roads and off-road driving is prohibited, unless it is driving within a working area (e.g. moving equipment or infrastructure around the site or for maintenance operations)	Mitigation	Visual Inspections	Entire Project footprint area as applicable	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting	
		Workers are only permitted within authorized working areas and moving to any offsite area is prohibited. This includes in particular movement into the sites recorded under any circumstances at any time of the day					
		No worker may possess or withdraw any archaeological item or remains from the Project Area and from the sites recorded in specific (to include above or below ground) such as ceremonial jars, pottery, or similar objects					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
Infrastructure and Utilities	Waste Utilities. Ensure that waste utilities will be able to handle the waste requirements that are generated from the Project.	Develop a Waste Management Plan. The plan should include the following: waste reduction strategies, recycling and reuse, appropriate disposal methods, in line with the Project standards, etc. This should be part of the EPC Contractor and Project Operator ESMS.	Mitigation	Visual Inspections	Entire Project footprint area as applicable	Daily HSE monitoring Weekly site inspections Monthly water consumption reports	Project Operator
		Coordinate with the State Unitary Enterprise and obtain list of authorized contractors for collection of wastewater from the site to closest authorized wastewater treatment plant	Additional requirement	Submit formal communication letter with relevant entities	Not applicable	Once before commencement of operation	Project Operator
		Coordinate with State Unitary Enterprise for the collection of solid waste from the site to the closest authorized landfill (or obtain list of authorized private contractors)					
		Coordinate with State Unitary Enterprise to obtain list of authorized contractors for collection of hazardous waste from the site to the closest approved facility for final disposal					
	Water Resources. Water requirements of the Project could entail constraints on existing users such as local communities or industrial establishments	Document water consumption of the Project during operation.	Mitigation	Visual Inspections	Entire Project footprint area as applicable	Daily HSE monitoring Weekly site inspections Monthly ESHS reporting Monthly water consumption reports	Project Operator
		Develop a water management plan. The plan should emphasize on water conservation and efficiency such as the following in particular: (i) Utilizing the dry-cleaning methods wherever applicable; (ii) Utilizing water saving fittings where applicable (taps, urinals, toilets, trigger guns, etc.); (iii) Consider utilizing treated wastewater/grey water for any irrigation requirements as applicable; (iv) Ensure that washing/cleaning activities (e.g. vehicle and equipment washing, toilets flushing/cleaning, etc.) are carried out using appropriate methods requiring low water consumption or dry (water-less) cleaning techniques where possible; (v) Awareness about resource efficiency, in particular concerning water use, shall be reinforced to all workers through signage and posters as appropriate; and (vi) Undertake weekly inspections for potable and non-potable water storage tanks and water supply connections to ensure there are no leaks. If any are located, they will be fixed immediately.					
	Traffic and Transport. Transportation requirements of the Project could affect level of service and capacity of existing highways and road networks. Traffic and Transport. Improper transportation activities could result in traffic related accidents on roads which in turn could affect the health and safety of users on the roads, workers and other.	Develop a Traffic and Transport Plan that must take into account the following: (i) local legislations related to traffic and transport; (ii) update traffic requirements of the Project related to materials, equipment, machinery, project workers, services, etc.; (iii) update and identify final traffic routes required; (iv) identification of types of vehicles to be utilized; (v) identify in detail procedures for	Additional requirement	Submit Traffic and Transport Plan	Not applicable	Once; before commencement of operation	Project Operator
			Additional requirement	Submit detailed design	Not applicable	Once; before commencement of operation	
			Mitigation	Submit signed code of conduct for drivers	Not applicable	Throughout entire operation period	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		onsite management of traffic. This could include but not limited to: optimization of internal traffic layout so that delivery and other vehicles will be able to access site easily; identification of requirements for controlling access to the site (e.g. security checkpoint, registration, etc.); providing appropriate lighting for roads and pedestrian walk and ensure they are segregated; utilization of appropriate and sufficient traffic signs onsite (e.g. speed limits); and other; (v) identify procedures for transportation activities under extreme weather conditions including conditions for suspicion of activities to include in particular: sand and salt storms, windy conditions, extreme hot and cold weather, and, conditions and low/high temperatures; (vi) identify requirements to be adhered to and enforced on all haulage suppliers such as licensing, driving instructions and code of conduct, speed limits, accident management, monitoring and reporting, etc. (vii) identification of a code of conduct to be adhered to and enforced on all drivers in the Project; (viii) identification of speed limits onsite and identification of all traffic signage requirement onsite (ix) identification of a procedure for management of onsite/offsite traffic accidents; (x) reflect the procedural actions for traffic management in induction training material; and repeated/refresher Toolbox Talks (TBT); (xi) identify Key Performance Indicators (KPI) for implementation of plan; (xii) identify roles and responsibilities for implementation of plan; (xiii) identify abnormal loads and obtain permits to carry these loads on highways; (xiv) ensure all vehicles are subject to a regular inspection / maintenance program.	Mitigation	Submit TBT records	Not applicable	Throughout entire operation period	
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including traffic / transport KPIs)	
			Mitigation	Submit abnormal load permits	Not applicable	For all abnormal loads	
Socioeconomics	<u>Employment and Procurement.</u> If: (i) local community engagement is not implemented properly; OR (ii) if priority on all employment and procurement opportunities are not provided to local communities; OR (iii) if expectations are not properly managed and addressed – this could result in distrust and resentment with the Developer and might eventually lead to other potential escalated events (e.g. demonstrations, blockage of access road, etc.) .	Project Updates to local communities in accordance with identified measures in the SEP which also includes measures related to management of local stakeholder expectations on jobs during operation phase. This should include the following in particular: (1) undertake continuous and ongoing consultations (at least quarterly) with local communities to: (i) manage expectations on employment and procurement opportunities for the Project; (ii) emphasize that job opportunities for this Project will be met throughout various entities that will include local communities, Districts and Regions; (iii) provides updates on Project implementation and overall schedule; and (iv) other as appropriate; (2) provide updates on implementation of the local recruitment and procurement procedure to date (e.g. number of locals employed to date from each village as appropriate); (3) As required by the local	Additional requirement	Submission of stakeholder engagement log sheets	Not applicable	Quarterly	Developer / Project Operator

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		communities all communication / updates to the local communities should be provided through the following channels in particular: (i) Notifications and advertisements with Khokimiyat and Mahallas (including Mahalla Community Union); (ii) Telegram Channel; (iii) Youth Union of the Republic of Karakalpakstan; and (iv) Family and Women's Committee of the Republic of Karakalpakstan; (iv) Nannouz which forms the umbrella association for all NGOs in Karakalpakstan.					
		Adopt and implement a Local Employment and Recruitment Procedure as part of the Labor and Working Conditions Management Plan (LWCMP). The procedure must take into account the following: (1) comprehensive analysis of local skills and businesses availability and gaps within Karakalpakstan Region in order to make an informed approach when recruiting and procuring requirements locally. This should include in particular the youth. (2) (i) Number of job and procurement opportunities targeted for local communities to include skilled and unskilled workers, (ii) details on how job and procurement opportunities will be announced; (iii) a selection process that is fair and transparent and provides equal opportunities for all including females; and (iv) order of priority with respect to employment and procurement subject to availability of qualifications and skills where the following order of priority can be considered: local communities; Kungrad District; Karakalpakstan Region; and finally Uzbekistan. (3) as required by the local communities all communication / updates to the local communities should be provided through the following channels in particular: (i) Notifications and advertisements with Khokimiyat and Mahallas (including Mahalla Community Union); (ii) Telegram Channels; (iii) Youth Union of the Republic of Karakalpakstan; and (iv) Family and Women's Committee; and (v) Nannouz which forms the umbrella association for all NGOs in Karakalpakstan. (4) Based on the outcomes of the availability analysis above, consider undertaking a capacity building and training program for selected local community workforce members. This could be undertaken in coordination with key and prominent NGO's and/or research and academic institutions; (5) local recruitment process will be conducted in an inclusive, fair, equitable and diverse manner, and it will be ensured that there is no bias or discrimination and will be open to all community members regardless of their class, race, color, gender, age, disability, civil status, etc. (6) Recruitment will be based on competency and	Additional requirement	Submission of Local Employment and Recruitment Procedure	Not applicable	Once; before commencement of construction	
			Additional requirement	Submission of local community employment and procurement register by area/district/region along with evidence for announcements and selection process.	Not applicable	Semi-annual	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		skill. (7) Efforts and resources will be allocated to make sure that women are also fairly targeted and recruited and are provided opportunities for learning skills to participate equally as men. (8) Gender inclusive advertising will be identified, in consultation with female stakeholders (such as women's groups and CBOs) and will be utilized in the announcement of job opportunities. (9) Candidate selection (recruitment) will be conducted by a mixed-sex panel (comprising of at least two people). Candidate promotion selection will always be carried out by a gender diverse and balanced panel (more than one person and never by a single-sex panel). All candidates will be informed about this. (10) It will be prohibited to terminate the contract of a female worker during her maternity leave.					
		Considering implementing a Community Development Plan which aims to benefit the local communities to the greatest extent possible. It is recommended that a structured approach is developed for such a program that takes into account the community's needs and priority development projects which could benefit local communities (which logically should also take into account other factors such as allocated budget by the Developer, timeline for implementation of such projects, etc.)	Additional requirement	Submission of community development plan	Not applicable	Once; during 1st year quarter of operation	
			Additional requirement	Submission of community development plan update report	Not applicable	Annually	
		Stakeholder grievance mechanism should be implemented in relation to implementation of the requirements of the Stakeholder Engagement Plan (SEP) and the Local Employment and Recruitment Procedure. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance log sheet Submission of grievance close-out forms	Not applicable	Monthly	
	Community Health, Safety and Security. Trespassing of unauthorized personnel into Project area could result in health and safety impacts.	Prepare and submit a security Management Plan (SMP) that will include: (i) Security personnel will be used at the access points to control the entry and exit of people and continuous security patrols will be implemented; (ii) storage areas and substation will be fenced off and will have signs with warning notices in English, Russian, Uzbek, and Karakalpak language; (iii) all WTGs will include a locking mechanism and will be locked when no O&M activities are undertaken; (iv) warning signs indicating the presence of the Project along access roads to inform local people of the dangers posed by the Project in English, Russian, Uzbek, and Karakalpak language; and	Additional requirements	Submission of SMP	Not applicable	Once; before commencement of operation	Project Operator
		The Stakeholder Engagement Plan (SEP) that will be implemented will include measures to engage with local communities to inform them about the	Mitigation	Submission of stakeholder engagement log sheets	Not applicable	Quarterly	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		start of operational works in advance, to educate them on the dangers inside the fenced-off area, and the danger of approaching works at other locations, and emphasize importance of avoiding trespassing at all times.					
		Stakeholder grievance mechanism should be implemented in relation to implementation of the requirements of the SMP. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance log sheet Submission of grievance close-out forms	Not applicable	Monthly	
	Community Health, Safety and Security. Inappropriate management of security issues (e.g. conduct of security personnel) could result in health and safety issues for local communities. towards the local communities.	Based on the SRA, a Security Management Plan (SMP) to be implemented. The plan must identify appropriate measures for hiring, rules of conduct, training, equipping, and monitoring of unarmed security personnel to control and manage such issues. The plan must also adhere to IFC PS 4 (Community Health, Safety and Security), EBRD PR 4 (Health, Safety and Security) in relation to the security guards employed. This requires that that the behavior for the security personnel is guided by the Voluntary Principles on Security and Human Rights in terms of hiring, rules of conduct, training, equipping and monitoring of such personnel. It also requires making reasonable inquiries to satisfy itself that those providing security measures are not implicated in past abuses, will ensure they are trained adequately in the use of force and appropriate conduct towards the workers and the local community. Force should only be used when strictly necessary, and to an extent proportional to the threat.	Additional requirement	Submission of SMP	Not applicable	Once; before commencement of construction	
			Mitigation	Submission copies of clearance of security guards in past abuses	Not applicable	Throughout entire operation period	
			Mitigation	Submission of signed code of conduct for security personnel	Not applicable	Throughout entire operation period	
			Mitigation	Submission of training and TBT records for security personnel on security rules of conduct, use of force, etc.	Not applicable	Throughout entire operation period	
			Mitigation	Visual Inspections	At construction active areas relevant for period of construction	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including SMP KPIs)	
		Stakeholder engagement activities with local communities must provide information on security control requirements and measures implemented. Stakeholder engagement activities are provided in further details in the SEP.	Mitigation	Submission of stakeholder engagement log sheets	Not applicable	Monthly	
		Stakeholder grievance mechanism should be implemented in relation to any grievances related to security incidents and/or security personnel code of conduct. Any grievances submitted should be handled fully in accordance with the mechanism that is included within the SEP. Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance log sheet Submission of grievance close-out forms	Not applicable	Monthly	
	Worker Welfare, Health and Safety. Generic occupational health and safety risks to workers, as working onsite increases the risk of injury or death due to accidents	Prepare an Occupational Health and Safety Plan (OHSP). Adopt and implement the recommendations/provisions of the OHSP which includes: (i) Risk assessment and job safety planning procedure, (ii) PTW system procedure, (iii) LOTO procedure, (iv) Site control occupational health and safety procedure to include requirements for personal Protective Equipment (PPE), requirements for site risks, etc., (v)	Mitigation	Submit OHSP	Not applicable	Once before operation of construction	
			Mitigation	Submission of OHS training records	Not applicable	Throughout operation period	
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		Occupational health and safety signage requirements, (vii) Identification of OHS training requirements, (viii) Identification of monitoring and reporting requirements, (ix) Identification of roles and responsibilities, and (x) Identification of measures to reduce the risk of COVID-19 exposure and transmission.				Weekly site inspections Monthly ESHS reports (including OHSP KPIs)	
		Prepare an Emergency Preparedness and Response Plan (EPRP) which should include: (i) communication and management process, (ii) emergency procedure and an onsite notification process (iii) emergency response procedure, (iv) emergency control measures to include but not limited to fire, accidents, spillage, traffic accidents, natural disasters and other. In addition, of particular importance within the Project area are also risks related to remoteness of the Project site (e.g. in case of a medical emergency), risks from sand and salt storms including windy conditions, risks from extreme hot and cold weather and conditions and low/high temperatures, (v) requirements for emergency kits, (vi) onsite assembly points, (vii) emergency signs, (viii) training requirements, (ix) monitoring and reporting requirements, and (x) roles and responsibilities of the personnel involved in implementation of the plan	Mitigation	Submit EPRP	Not applicable	Once before commencement of operation	
			Mitigation	Submission of EPRP drills and EPRP TBT records	Not applicable	Throughout operation period	
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including EPRP KPIs)	
		Establish a comprehensive medical emergency response, including robust on-site infrastructure and a helicopter response to appropriate medical facilities in Karakalpakstan when required.	Mitigation	Submit detailed design	Not applicable	Once before commencement of operation	
		A worker grievance mechanism should be implemented and that should handle any grievances related to OHSP.	Mitigation	Submit worker grievance sheet along with grievance close-out forms	Not applicable	Monthly	
	Worker Welfare, Health and Safety. Inappropriate accommodation facilities for workers will entail impacts on worker welfare as well as their overall health and safety.	Prepare a Worker Accommodation Plan (WAP) that must include the following components: (i) identify the workforce requirements including all subcontractor requirements; (ii) identify workforce transportation requirements to/from accommodation facilities; (iii) identify accommodation procedures to ensure that workers are provided with a decent accommodation which meets the basic worker's needs. In specific, onsite and/or offsite accommodation must be compliant with good international industry practices – mainly the "Workers' accommodation: process and standards" (EBRD/IFC Guidance Note, 2009). The document provides guidance notes on general living facilities, room facilities, medical facilities, management of accommodation units, etc.; (iv) worker accommodation must take into account climatic conditions of the area given the location	Additional requirement	Submit WAP	Not applicable	Once before commencement of operation	
			Mitigation	Submit detailed design for accommodation	Not applicable	Once before commencement of operation	
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Monthly ESHS reports (including WAP KPIs)	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		(e.g. extreme heat and extreme cold) and it must be equipped with suitable measures such as air conditioning, heating, etc. (v) accommodation should consider the social and cultural backgrounds of the workers, providing spaces that respect cultural practices and promote social interaction in a positive manner. This includes considerations for gender segregation where culturally appropriate and facilities for religious practices (vi) accommodation facilities and specifications must take into account site-specific conditions to include in particular: (1) sand and salt storms, (2) windy conditions, (3) extreme hot and cold weather, and (4) conditions and low/high temperatures; (v) in relation gender requirement the following should be considered: (1) separate sleeping rooms for men and women will be provided in shared accommodations; (2) means of securing bedroom doors from inside and out will be provided; and (3) finally, female sanitary and toilet facilities will be kept separate from men; (v) identify housing rules and regulations including code of conduct; (vi) identify training requirements; (vii) identify monitoring and reporting requirements; and(viii) identify roles and responsibilities of the personnel involved in implementation of the plan.					
		A worker grievance mechanism should be implemented and that should handle any grievances related to WAP.	Mitigation	Submit worker grievance sheet along with grievance close-out forms	Not applicable	Monthly	
	<u>Worker Welfare, Health and Safety.</u> Inappropriate management of the workforce could entail human rights violations (e.g. engaging child workers, confiscation of passports of foreign workers, unacceptable working hours, and others).	Prepare and submit a Labor and Working Conditions Management Plan (LWCMP) that should include: (1) an overview of the labor use on the project throughout the operation phase; (2) Human Resources (HR) policy; (3) identify an HR management procedure for the workforce that will ensure decent and humane working conditions, worker rights, and enhance constructive work floor relations. This should be guided by the Local Labor Law as well as the IFC PR 2 and EBRD PR 2 as well as the ILO Fundamental Labor Conventions covering the following in particular: (i) ensuring all workers onsite are provided with a contract. Each worker will be provided with a signed copy of the contract and another copy will be retained with the HR Manager.; (ii) providing reasonable working conditions and terms of employment to include but not limited to contract management, working hours, salaries/wages, annual and medical leaves, bereavement leaves, accommodation, etc. (iii) recognizing workers' rights to form and to join workers' organizations of their choosing and to bargain collectively without interference; (iv)	Additional Requirement	Submit LWCMP	Not applicable	Once; before commencement of operation	
			Mitigation	Submit signed contracts for all workers			
			Mitigation	Submit signed worker code of conduct for all workers			
			Mitigation	Submit payment register			
			Mitigation	Submit disciplinary action register			
			Mitigation	Submit training and TBT records			
			Mitigation	Submit worker grievance logs with close-out forms			
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Quarterly Audits Monthly ESHS reports (including KPIs for LWCMP)	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		prohibition of child labor within the workforce; (v) overall management of young workers within the labor force. The recruitment of children under the age of 18 in illegal and hazardous work should be explicitly prohibited. However, if children between the ages of 15-18 are to be employed at any stage, the following should apply: (a) an official letter with the approval of their parents or guardian should be provided; (b) young workers must provide valid identification that presents proof of age at the recruitment stage; (c) minor workers are not allowed to work onsite and are only allowed to work in the Project's worker camp; (d) they are not to be employed in any kind of work which by its nature is likely to harm their health and safety or expose them to risks and hazards; and (e) in accordance with the Labor law, young workers shall not work for more than six hours a day, during which one or more break periods totaling not less than one hour shall be granted for meals and rest. They shall not be made to work overtime hours or required to come to work on weekends and official holidays. They shall not be made to work between 7:00 pm and 7:00 am. (vi) prohibition of forced labor and human trafficking including confiscation of employees' passports; (vii) non-discrimination throughout the entire work cycle in all its forms; (viii) providing equal opportunities for all throughout procurement and employment opportunities including women groups; (ix) overall management of daily workers, migrant workers and third-party workers; (x) given the expected long-term location onsite employment contracts must include regular off-site breaks for rest and relaxation; (xi) ensure the following on wages: (a) wages to be determined on a case-by-case basis and must be must be fair and should meet the basic needs to maintain a safe and decent standard of living; (b) must be established based on qualifications and competencies, professional experience, job responsibilities, and wages at equivalent positions; (c) must be for work of equal value should be provided for female and male workers; and (d) should not be below the nationally established minimum wage. (xii) ensure the following on working hours: (a) in accordance with the Labor law, working hours should be set to a maximum of 40-hours a week over 5 or 6 days including at least one hour break every 4 hours; (b) overtime is allowed with appropriate need, but in all cases, working hours should not exceed 10 per day; (b) workers should have a 24-hour period of rest after 6 days of work; and (b) all workers will be notified of their schedule for the weekly day's rest,					

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		working hours, break periods and any changes introduced to such a schedule. (xiii) ensure the following on leaves: (a) workers should be entitled to annual and sick leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the worker's contract; and (b) workers should be entitled to annual and temporary disability leaves as well as any other social benefits as stipulated in the Labor law. These will be included in the worker's contract; (xiv) all workers should be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct should prohibit the following and which is subject to disciplinary action: (a) harassment, and abuse of any kind will not be tolerated; (b) discrimination based on personal characteristics is prohibited to include but not limited to gender, race, nationality, ethnic, social and vulnerable people, religion or belief, disability, age, or sexual orientation. (xv) ensure privacy and protection of workers is maintained at all times. This will include limiting access to the below data and information to the EPC Contractor HR Manager only; (4) Contracts; (5) HR files and databases; (6) Payment register; (7) identify a disciplinary procedure for the workforce to be implemented; (8) identify a worker welfare procedure related to drinking water, rest areas, sanitary facilities, changing rooms; (9) identify a worker grievance procedure to manage all worker related complaints and grievances that should outline the measures for escalation of grievances by workers; (10) identify training requirements related to the plan; (11) identify monitoring and reporting requirements related to the plan; and (12) identify roles and responsibilities related to the plan.					
	Community and Worker Health and Safety –Inappropriate management of the workforce (which could be from the local community) as well as inappropriate conduct of workers within local community areas could entail gender related risk and impacts such as Gender based violence, and harassment (GBVH) or Sexual Exploitation, abuse, and harassment (SEBH)	Develop and implement a Labor and Working Conditions Management Plan (LWCMP). The Plan should include at a minimum the following: (1) safe transport will be provided to female and male workers, given the remote area of the Project. The codes of conduct, which prohibit gender-based violence, harassment and abuse, will apply to transportation modes. (2) all workers should be required to read and sign a Worker Code of Conduct which will be explained verbally. The code of conduct should prohibit be subject to disciplinary action and should prohibit harassment, gender-based violence and abuse of any kind; (3) all workers should be provided with a copy of the Gender Based Violence and Harassment (GBVH) Code of Conduct and will be required to sign it; (4) identify a worker welfare	Additional requirement	Submit LWCMP	Not applicable	Once; before commencement of operation	
			Mitigation	Submit signed GBVH Code of conduct for all workers	Not applicable	Throughout operation period	
			Mitigation	Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Quarterly Audits Monthly ESHS reports (including KPIs for LWCMP)	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		procedure related to drinking water, rest areas, sanitary facilities, changing rooms and other that should include take into account the following in particular: (i) female sanitary, toilet facilities, and prayer rooms will be kept separate from men; (ii) all such facilities will have lockable doors with adequate numbers provided; (iii) separate changing rooms and cabinets will be provided for men and women both of which have locking mechanisms.					
		Identify a worker grievance procedure to manage all worker related complaints and grievances that should consider the following: (i) prohibiting gender-based violence and harassment in the workplace and will outline that a suitably trained male and female person is designated to process grievances in which male / female workers might feel uncomfortable discussing with a person of the opposite sex. The grievance mechanism also includes a procedure to deal with Gender Based Violence and Harassment (GBVH) grievances.	Mitigation	Submission of worker grievance logs with close-out forms	Not applicable	Monthly	
		Stakeholder Grievance Mechanism as part of the SEP also includes a procedure for GBVH grievances. This should be implemented entirely to handle any grievances related to GBVH Please refer to the SEP for additional details.	Mitigation	Submission of stakeholder grievance logs with close-out forms	Not applicable	Monthly	
Subcontractor and Supplier Management	Improper management of subcontractors and supplier poses risks of major environmental impacts, human right abuses, criminal abuses or other	Develop a Subcontractor and Supplier Management Plan which should: (i) identify the key subcontractors and suppliers that will be involved, (ii) identify a screening process where during the tendering process the key E&S requirements should be identified and included within the tender documents. This may include adherence to International Financial Institution (IFI) E&S requirements, national E&S regulations, ESIA and ESMS requirements and other. In addition, tenders will be required as part of the tender to specify how they intend to comply with such requirements as part of their scope of work. In the case there is no tendering process subcontractor/supplier will be required to respond to an E&S prequalification questionnaire and will be required to submit company HSSE policies. Finally, as part of the screening process, an online desktop review (including media research) on the list of companies bidding, their owners and shareholders on E&S reputational issues; (ii) selection process where selected subcontractor / supplier risks have been identified, Developer / Operator will assess these risks further with the subcontractor / supplier concerned to understand their capacity to avoid and manage such risks and to understand the controls the subcontractor /	Mitigation	Submit Subcontractor and Supplier Management Plan	Not applicable	Once before commencement of operation	Developer / Operator
			Mitigation	Submission of outcomes of screening processes for all selected subcontractors and suppliers (e.g. tender E&S requirements, reputational assessments)	Not applicable	Throughout entire operation period	
			Mitigation	Submission of risk assessment for subcontractor / supplier selected and E&S controls for risks identified	Not applicable	Throughout entire operation period	
			Mitigation	Submission of E&S contractual controls	Not applicable	Throughout entire operation period	
			Mitigation	For subcontractors - Visual Inspections	Entire project footprint	Daily HSE monitoring Weekly site inspections Quarterly Audits Monthly ESHS reports (including KPIs for SSMP)	
			Mitigation	For suppliers and depending on the risks associated with a supply plan, put in place monitoring approach including reports from suppliers, ad hoc audits, etc.	Off-site	Throughout entire operation period	

Environmental Attribute	Potential Impact	Management Action (mitigations, additional requirements, additional studies, compensation measures, etc.)	Type of Action	Monitoring & Reporting Action	Parameters to be monitored / location	Frequency	Responsible Entity
		supplier has in place. This could include but not limited to submission of E&S policies and procedures as relevant for subcontractor / supplier (e.g. for supplier's focus would be on human resources and labor policies and procedures), traceability, cascading E&S requirements, undertaking auditing protocols, etc. Where this is not possible, alternative suppliers will be sought; (iii) contractual control will put in place controls to avoid and manage potential risks. This will include but not limited to contractual controls, including corrective actions and exit mechanisms, to avoid and manage potential risks. This would depend on the level of risk identified and the leverage over the subcontractor / supplier concerned. Contractual controls could include but not limited to the following: requirement to comply with IFI E&S requirements and national E&S requirement as applicable; requirements to comply with the project ESMS MS and associated manual; include clauses that enable the undertaking of inspections and/or audits to ensure compliance with the requirement above; include clauses allowing imposition of contractual penalties as applicable; (iv) proactive management and a system of contractor accountability.		to the extent this is feasible. Monitoring will seek to ensure compliance with the mitigation defined, and in cases of non-compliance, help define corrective actions with the supplier concerned. Developer / Operator will maintain appropriate records of its supply chain assessment and risk management. Where this is conducted by Operator it will be reported to Developer on a regular basis.			

22. PROJECT CATEGORIZATION

The table below presents the definition of Project categorization based on ADB's Safeguard Policy statemen (SPS) (20009).

Table 114: Definition of Project Categorization under International E&S Standards and Requirements

Policy and Principle	Categorization
ADB's Safeguard Policy Statement (SPS) (2009)	Category A. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required
	Category B. A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
	Category C. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

The section below discusses the Project categorization as applicable for each safeguard. This analysis will be considered applicable for both the windfarm project and the OHTL.

- Safeguard Requirements 1: Environment
- Safeguard Requirements 2: Involuntary Resettlement
- Safeguard Requirements 3: Indigenous Peoples

22.1 Safeguard Requirements 1: Environment

Due to the biodiversity considerations below, the **Project meets the definition of Category A from the perspective of Environment.**

- The Project triggers critical habitat for the following species MacQueen's Bustard (*Chlamydotis macqueenii*), White-headed Duck (*Oxyura leucocephala*) and Red-crested Pochard (*Netta rufina*).
- The Project could affect raptor species as a result of collision with operational Wind Turbine Generators (WTGs) and OHTL as well as mortality associated with electrocution with live parts of the transmission lines. The project falls within a broad migration front that is used by many raptor species of conservation concern. The Collision Risk Modelling (CRM) does not predict high levels of mortality for any species however for some species (*e.g.* Steppe Eagle (*Aquila nipalensis*), Golden Eagle (*A. chrysaetos*) and Eastern Imperial Eagle (*A. heliaca*)) the levels of predicted mortality, if realized, could be significant due to their elevated (national or international or both) conservation status and low 'take limit' as set out in the Potential Biological Removal Study. To that end an offset strategy is likely to be required to off-set any losses at the Kungrad WF as well as possible negative impacts associated with the OHTL.

- The Project could also affect migration routes of terrestrial mammals, specifically those that undertake short, medium and longer-distance migration through the Ustyurt Plateau (e.g. Saiga (*Saiga tatarica*) and Goitered Gazelle (*Gazella subgutturosa*). The magnitude of these impacts is largely unstudied however current research indicates that some negative impacts may result from operational wind farms and that migration routes could alter. The site is not considered to be important habitat for migratory mammals (e.g as a stopover / congregatory site) nor is it an important calving or breeding (mating) site. Currently Saiga within the Ustyurt Plateau are rare due to issues with border fences along their transborder migration routes and Goitered Gazelle are present in low numbers and are widespread across the Ustyurt Plateau. It is however possible that the windfarm will result in significant and persistent barrier impacts to ungulates however the actual severity of this impact is questionable given the relatively low populations of Goitered Gazelle and historical presence of Saiga within the Project site. Should conservation measures increase the populations of either species within the Ustyurt, any impacts to migratory movements through the Ustyurt will likely remain unknown and mitigation to reduce any such impacts difficult to achieve. Nevertheless, continual monitoring will be completed throughout the operational phase to record ungulate use of the site and surrounding Ustyurt Plateau.

- There are key and adverse potential impacts from the OHTL in particular on the MacQueen's Bustard to include:

    - MacQueen's Bustard is listed as Vulnerable (VU) on the global IUCN redlist[147] as well as the Uzbekistan Red Data Book[148].

    - Roughly 85% of the global population of MacQueen's Bustard migrates semi-annually across the proposed path of the OHTL.

    - The easternmost 127 km of the proposed OHTL passes through this species' core breeding range in the Bukhara region of Uzbekistan's Kyzylkum Desert.

    - The mitigation of potential impacts to the MacQueen's Bustard from the Project's OHTL is made more challenging by several known aspects of MacQueen's Bustard biology that heighten the potential for adverse impact, or reduce the effectiveness of available mitigation measures, as follows:

        - MacQueen's Bustard is known to collide with transmission and distribution lines, and the consensus among world-leading bustard science and conservation experts is that alongside hunting pressure, OHTL collisions is one of the most significant anthropogenic impacts contributing to this species' worldwide population decline. *Thus, the Project has the potential to generate serious adverse impacts on* MacQueen's Bustard.

        - At present, none of the currently available Bird Flight Diverters (BFD) have been proven to be effective at reducing OHTL collision rates for MacQueen's Bustard or any other species of bustard[149]. There are some hypotheses, some of which are currently being tested, and there are some innovative new technologies under development, but at present, there is no basis in data to assume any mitigative effect of any currently available BFD for reducing

[147] https://www.iucnredlist.org/species/22733562/205364424 accessed 19 August, 2024
[148] Uzbekistan Red Data book. 2019. Vol.2. Animals. Tashkent: Chinor ENK
[149] Silva JP, Marques AT, Bernardino J, Allinson T, Andryushchenko Y, Dutta S, Kessler M, Martins RC, Moreira F, Pallett J, Pretorius MD, Scott HA, Shaw JM, Collar NJ (2022). The effects of powerlines on bustards: how best to mitigate, how best to monitor?. Bird Conservation International, 1–14 https://doi.org/10.1017/S0959270922000314

MacQueen's Bustard collision rates with OHTL[150]. *Thus, the mitigative effect of installing BFD on the Project's OHTL is limited.*

- The impact is high, and the reduction of impact through avoidance/minimization measures is low, thus there is a potentially very large amount of residual impact that must be mitigated through offsets.

Other impacts from the Project, in general, are considered standard impacts that can be effectively controlled through proper mitigation, management and monitoring measures. This includes impacts related to waste management, hazardous material management, pollution prevention, resource conservation, occupational health and safety, etc. Other impacts were also properly studied and it is concluded that no impacts are relevant or proper mitigation and monitoring measures were identified. This includes:

- Community health and safety. No key impacts in relation to noise, shadow flicker, blade throws, EMF, etc. Other impacts have been identified and adequate preventive measures and requirements for further plans have been included – this includes issues such as worker influx, security management, emergency planning, etc.
- Physical cultural resource: a survey identified a number of archaeology and cultural heritage resources within the Project site. Proper buffer areas were incorporated into the design to account for those as well as additional mitigations were identified. Requirement for chance finds were also included.

22.2 Safeguard Requirements 2: Involuntary Resettlement

The project meets the definition of Category B from the perspective of land acquisition and livelihood restoration for the following reasons:

- Although the OHTL is large-scale, and the estimated number of partially economically displaced small-scale commercial and informal farming households is 232, and state institution landowners is estimated at 39, the scale of the permanent impact on agriculture is very small, and the scale and duration of the temporary impact on agriculture is small. This estimate is based on extrapolation of 25% sample of valuation data, and interpolation and extrapolation of cadastral data.
- The permanent land acquisition and livelihood impacts are site specific, limited to the tower base footprints, and have been minimized by avoiding arable areas. Permanent impact on agricultural land constitutes an estimated 0.06% of total arable land. Towers will be micro-sited to minimize impact on farmers irrigation infrastructure. The permanent impact on buildings and trees within the right of way is minimal, due to careful routing.
- The temporary land acquisition impacts are site specific and short term, limited to narrow strips required for construction of the towers and cabling. Temporary livelihood impacts based on one season of lost crop during construction, are calculated to be 1.2% of total arable land. Temporary impacts will be further reduced through careful timing of the cabling to avoid agricultural growing seasons. The larger servitude covers a maximum combined 5.3% of the total farmland. However,

[150] We note that in spite of this limitation, the KWEP is committing to installing BFD on 100% of the Project's OHL, using whichever BFD available at the time of construction is considered by experts to have the greatest potential for reducing HB collision with the OHL. This mitigation measure is expected to render impact minimization benefits to other potentially affected species (e.g. cranes, pelicans, waterfowl), even if the benefits of this mitigation to HB are unknown and potentially as low as zero.

access will be granted after completion of the construction phase. Consequently, long-term livelihoods restrictions are substantially minimized.

ADB defines a project as a Category A project due to significant economic impact if more than 200 individual persons have more than 10% of their livelihood impacted by a project. Analysis of surveyed properties covered in the Preliminary Valuation Study shows that the land access or restriction impacts are not significant (See Table below) and no persons fall within this definition. The highest impact of 7 to 7.9% of total land, would be felt by only 3% of affected farmers. There is no evidence to suggest that any farmer would lose more than 8% of their land, and therefore it is concluded that the project remain a Category B project.

Table 22115: Affected Lease holding by % of temporary land losses during the construction phase

% of Total Land Loss	Estimated affected lease holding by % Loss	
	Est. Number	Percent
<1	49	21%
1 to 2.9	128	55%
3 to 4.9	31	13%
5 to 6.9	17	7%
7 to 7.9	7	3%
>8	**0**	0%
Total	**232**	100%

Redundancy of permanent and temporary farm employees will be minimal due to low and short-term impacts on agriculture and mitigated by payment of compensation for lost production and obtaining agreement by the farmer to maintain normal staff levels using the compensation provided.

Physical displacement impacts are expected to be zero. To date, all possible physically displaced structures were identified, and ground truth checked by the company during routing of the OHTL, and no physical displacement has yet been identified along the OHTL route.

The land owned by public institutions is predominantly desert land and largely unutilized except for livestock grazing over much larger areas. The permanent and temporary impact will be insignificant on the grazing use of desert land.

The displacement impact on existing public linear infrastructure, graves, archaeological sites, and other non-building point infrastructure will be avoided through micro-siting of towers.

Pre-existing vulnerabilities of project-affected communities have been caused by the Aral Sea disaster and resulting water shortages, salinity, poor air quality, and extreme weather conditions, but due to the very low displacement impact, it is unlikely that these will be placed at additional risk because of the project. Nonetheless, vulnerable households will be identified and where required, special measures defined.

The scoping study found that no indigenous peoples will be impacted, and the 37% socio-economic baseline sample undertaken at the time of drafting the Land Access and Compensation Plan supports this conclusion with no indigenous peoples identified.

22.3 Safeguard Requirements 3: Indigenous Peoples

The international law and conventions on indigenous peoples are to be found in conventions, social performance standards and guidelines of the UN. ADB, IFC, EBRD and similar institutions.

These instruments have been reviewed and no specific indigenous peoples have been identified as being present in the project context or impacted area. ADB's Safeguard Requirement 3, requires the Social Impact Assessment stage of a project, to screen and confirm whether or not there are likely to be project impacts on Indigenous people. As part of the ESIA, an assessment was undertaken to determine whether there are Indigenous Peoples in Uzbekistan in general and Karakalpakstan Region in specific. The assessment concluded that there are no indigenous groups in the country. Furthermore, the socio-economic and the asset inventory baseline surveys and stakeholder engagements did not identify indigenous peoples in the Project area.

Consequently, no "Special Considerations for Indigenous Peoples" as specified under the ADB's Safeguard Policy Statement, June 2009 are required.

Therefore, project categorization is not applicable for safeguard requirements 3.

23. ANNEXES

23.1 Annex 1 – Detailed Regulatory Review