ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

NON-TECHNICAL SUMMARY (NTS)

WAAD AL SHAMMAL WIND ENERGY PARK – 500 MW

TABLE OF CONTENTS

Contents

EXECUTIVE SUMMARY

ECOLOGICAL AND ENVIRONMENTAL SENSITIVITY

The Project site is located within the boundaries of King Salman Royal Protected Area which has a total area of 130,700 km^2 and includes within its boundaries three environmentally protected areas: Harrat Al Harrah Environmentally Protected Area located approximately 4 km to the south of the site; At-Tubayq at approximately 130 km to the southeast of the site and Al-Khunfah Protected Area which at 245 km south of the site. Vegetation in the Project area is limited in density. No wild mammal species were observed on site. One common bird species was recorded in the Project area and both species are classified as LC on the IUCN Red List.

ENVIRONMENTAL ASSESSMENT

An ESIA should assist in ensuring environmentally and socially sound management of the Project during its entire lifetime (construction, operation, decommissioning); also, non-routine events during project phases. The methodology followed in this ESIA for the impact assessment is presented in the "European Union, EIA

Guidance on scoping, 2017". This methodology applies a multi-criteria analysis to evaluate impacts significance. It worth notice that the majority of impact significance are "Minor "or "Moderate".

MITIGATION MEASURES

Specific mitigation recommendations for those impacts of Moderate significance are provided. Proposed technical, social and/or institutional mitigation measures for the expected impacts/change during construction and operation of the proposed Project. Additional mitigation measures are presented as part of the Environmental Management Plan Framework and Monitoring Plan.

STAKEHOLDER ENGAGEMENT

A summary of the most important stakeholder groups identified and a summary of the analysis of stakeholder significance are presented in this report. Furthermore, a summary of the Stakeholder Engagement activities is documented in this report.

Finally, based on the findings and recommendations of the environmental and social impact assessment for the proposed Project, the assessment team concludes that if mitigation measures are followed properly; the Project shall be meeting all regulatory requirements without any tangible impact to the environment. In addition, Positive impacts upon the local community through renewable energy generation and local employment created by the Project during construction and operation are expected.

1 INTRODUCTION:

Waad Al Shammal Wind Park project (hereinafter “the Project”) is located at a distance of approximately 30 km southeast of the city of Turaif and 150 km from Qurrayat city, in in the Norther Borders Province of Saudi Arabia. The location is mostly undeveloped with an area of approximately 88.1 km2. Waad Al Shammal allocated area is split between 10 sub-areas in 8 rows. The overall plant capacity is expected to be close to 516 MW.

The proposed Project was originally planned to entail the installation and operation of 190 wind turbines, which would result in an overall plant capacity of 798 MW. The total power generation capacity was expected to be equivalent to 2,787 MWh per yea1 (Master Plan, Waad Al Shammal wind energy park, Worley, September 2021). This design was the basis of the original Worley ESIA.

The current design, which has been assumed for the purpose of this amended ESIA summary prepared by WSP, is presented in Table below.

Table 1-1 Windfarm Design

	Current Design	Original Design
Generation capacity (MW)	500MW	798MW
Turbine Manufacturer (supplier)	Windey Energy Technology Group Co., LTD (OEM)	
Turbine model	WD200-7700	
Turbine hub height (m)	131	120
Turbine rated power (MW)	7.7	4.2
Rotor diameter (m)	197.3	150
Number of wind turbines	67	190
Number of substations	1	1

It should be noted that the number of turbines and overall generation capacity of the windfarm is significantly reduced. Therefore, while the individual turbine size (in MW), turbine height and rotor diameter are increased in the new design, it is expected that the predicted environmental

and social impacts of the new design will generally be reduced compared to those associated with the original design.

The Associated facilities to the Project include the following:

- A switching substation that will be constructed on the site.
- Connection from the switching substation to the transmission lines that already exist in close proximity to the site.

These assets will be developed, owned and operated by the Saudi Electricity Company (SEC) and are outside the scope of the ESIA.

This NTS provides a summary in non-technical language of the findings contained in the ESIA Report. The updated ESIA Report contains more detailed information on the Project. It includes an Environmental and Social Management Plan (ESMP) which describes the monitoring and mitigation requirements for the duration of the project, including responsibilities and any legal requirements.

2 ASSESSMENT METHODOLOGY:

To be consistent with the initial ESIA, this ESIA Addendum has followed the same assessment methodology as of the initial ESIA. Where relevant, assessment has been updated and mitigation measures have been provided

2.1 ESIA SCOPE AND OBJECTIVES

The proposed Project has been classified as Category 3 as per NCEC response to the Project Environmental Classification Form. The original ESIA for the windfarm development was prepared by Worley in 2021 and approval was obtained from the Saudi National Center for Environmental Compliance (NCEC) in accordance with local Saudi regulations. The NCEC issued the permit on August 9th, 2022, and it is valid until May 28th, 2025.

WSP is advised that the original ESIA was completed and is broadly consistent with International Finance Corporation (IFC) requirements for ESIAs at the time that the original ESIA was prepared.

WSP was commissioned by the Client to review the original ESIA and amend the ESIA where required to meet the requirements of the following guidelines and standards for ESIAs:

- International Finance Corporation (IFC) Performance Standards (PSs);
- Equator Principles IV (EP IV);
- IFC Environment, Health & Safety (EHS) General Guidelines;
- IFC Environment, Health & Safety (EHS) Guidelines for Wind Energy; and
- The Japan Bank for International Cooperation (JBIC) Environmental Guidelines.

In undertaking this work, WSP recognizes the original work of Worley and has only amended the ESIA where strictly necessary to comply with the above requirements.

2.2 ORIGINAL ESIA SCOPE AND OBJECTIVES

The scope of work for the Project requires the preparation of an ESIA report based on Saudi national legal requirements, Equator Principles, International Finance Corporation (IFC) Performance Standards and World Bank Environmental, Health, and Safety (EHS) Guidelines.

This ESIA provides the legal framework, the proposed project description, description of the receiving environment, the identification and analysis of impacts during the project phases and frameworks for various management plans.

The ESIA study report is prepared to meet the national requirements for permitting new activities as stipulated in the executive regulations for construction and operation environmental permitting. The study is also prepared to meet international guidelines, namely IFC. The main objectives of the ESIA are:

Identify and analyse sensitive components of the existing environment. Review the existing literature and document the regional and site-specific environmental baseline status, as far as practical in order to describe the pre-project environment. All media potentially affected shall be considered

Determine the type, nature and significance of the potential environmental and/or social impacts during construction and operation phases

Identify and recommend practical/ feasible mitigation measures early in the design process to eliminate, minimise, mitigate or avoid any negative environmental and/or social impacts resulting from the Project

Recommend environmental and social management/monitoring plans for the Project in order to eliminate and/or minimise the potential negative environmental and/or social impacts as identified above

The scope of the present study is limited to Waad Al Shammal proposed project different components within the site boundaries.

As per the EP IV categorisation of Project, the Project is likely to be classified as Category B Project and would require an ESIA to be undertaken for the Project.

The EPs make reference to the IFC PSs as the benchmark for ESIAs and therefore compliance with the above-mentioned IFC documents effectively achieves compliance with the assessment requirements of the EP:

- There are however some important additional considerations arising from the EPs.
- Climate Change Risk Assessment (CCRA, refer to the Guidance Note on Climate Change Risk Assessment, 2020).

The project will not generate any continuous direct greenhouse gas (GHG) emissions and, in fact, the project will reduce GHG emissions by reducing power generation by other fossil-fuel fired power plants. A CCRA is therefore unlikely to be required.

3 CLIMATE AND METEOROLOGY

3.1 CLIMATE

The climate in Eastern Region Province can be characterized as a hot dry climate in the Koppen Climate Classification system (Koppen, 1884) and is translated in the Volken & Brannaman classification (2011) as Baha, i.e., tropical, and subtropical desert climate.

In addition, the province falls within the semi-tropical high-pressure belt, which makes wind an influence in the region. In the winter, the arid northeast winds blow, making weather stable and cool in this season.

3.2 TEMPERATURE AND PRECIPITATION

As the region is a desert climate, it is expected that the temperature varies diurnally and seasonally as well. In addition, as the province is one of the northern most provinces in Saudi Arabia, it is expected to be one of the coldest regions during the winter. Table below shows more details on historical meteorological conditions in Turiaf. Average temperatures were recorded over a period of 21 years (weatherbase.com accessed March 2021); Average high and low temperatures were recorded over a period of 12 years (World Weather Online, accessed 2021).The table also shows precipitation (mm) at Turiaf for 39 years on record.

Parameter	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average temperature (°C)	18	7	8	12	18	23	27	29	29	26	20	13	8
Average high temperature (°C)	26.5	14	16	20	26	31	35	38	38	35	29	21	15
Average low Temperature (°C)	15.9	5	7	10	15	20	23	25	25	23	19	12	7
Average precipitation (mm)	84	14	14	12	9	4	-	-	-	-	8	12	12

3.3 WIND

Historical wind data has been obtained from data made available by the Saudi government from meteorological stations (Open Data website, accessed March 2021). The location of the meteorological station relative to the Project area is shown in Figure below. In the Project area wind blows from the west throughout the year, with the exception of the months of November, December, and January, when the predominant wind direction is from the east. The available data from the meteorological station at Turiaf is presented in Table below.

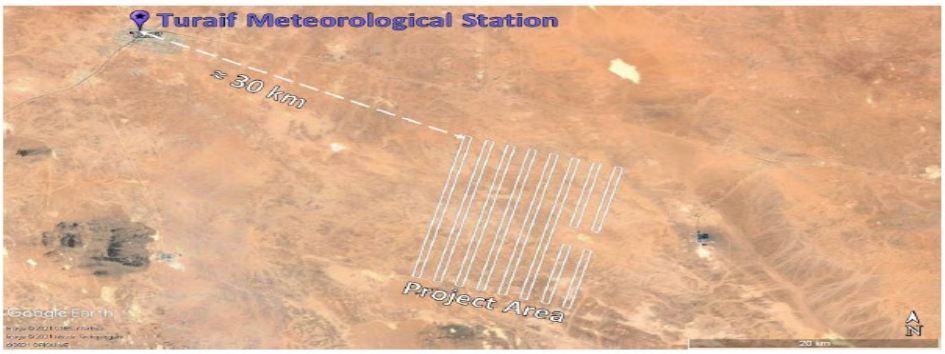

Figure 5-4 Turaif meteorological station

Parameter	Year											
Direction	E	W	W	W	W	W	W	W	W	W	E	E
Speed (knots)	7	8	7	9	10	9	8	8	8	7	7	6
	2012											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	W	W	W	W	W	W	W	W	W	Ese	E	Ese
Speed (knots)	7	10	10	9	10	9	8	8	8	7	8	7

Table 5-2 Wind Statistics from Turiaf

Parameter	Year											
	2007											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	E	W	W	W	W	W	W	W	W	E	E	E
	2008											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	E	W	W	W	W	W	W	W	W	W	E	E
	2009											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	E	W	W	W	W	W	W	W	W	W	E	W
	2010											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	W	W	W	W	W	W	W	W	Nne	W	E	E
Speed (knots)	7	9	9	8	8	9	10	8	8	6	5	7
	2011											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Parameter	Year											
Direction	E	W	W	W	W	W	W	W	W	W	E	E
Speed (knots)	7	8	7	9	10	9	8	8	8	7	7	6
	2012											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	W	W	W	W	W	W	W	W	W	Ese	E	Ese
Speed (knots)	7	10	10	9	10	9	8	8	8	7	8	7

3.4 AIR QUALITY

The Project site is in a remote area. Existing sources of air pollutants in vicinity of the Project Site are the cement plant belonging to Northern Region Cement Company ca 7.5 km east, traffic on road #85 and dust particles resuspended by wind from sandy areas. The Waad Al Shamal power project at 12.5 km north-east, the Maaden and open cast Umm Wu 'al phosphate mines and the Waad Al Shamal Phosphate Industrial Complex to the north of the site across road #85 (including Phosphoric Acid Plant, Sulphuric Acid Plant, Purified Phosphoric Acid Plant, Sodium TriPolyPhosphate Plant, Mono and Dicalcium Phosphate Plant and the associated infrastructure required to process the extracted ore) also contribute to the overall ambient air quality in the wider project area, There is a potential for suspended particles to carry contaminants specific for these mining projects.

The site was visited in November 2021, during which some field measurements were taken at 5 different points within the boundaries of the proposed project site by Support Establishment for Environmental Services (Figure 5-9 and Table 5-6).

Table 5-6 Coordinates of sampling points

Location name	Latitude	Longitude
Point 1	31°31'47.66"N	38°57'57.32"E
Point 2	31°29'17.93"N	39°2'46.18"E
Point 3	31°21'38.39"N	39° 0'36.10"E
Point 4	31°24'52.69"N	38°54'37.98"E
Point 5	31°27'53.35"N	38°59'8.74"E

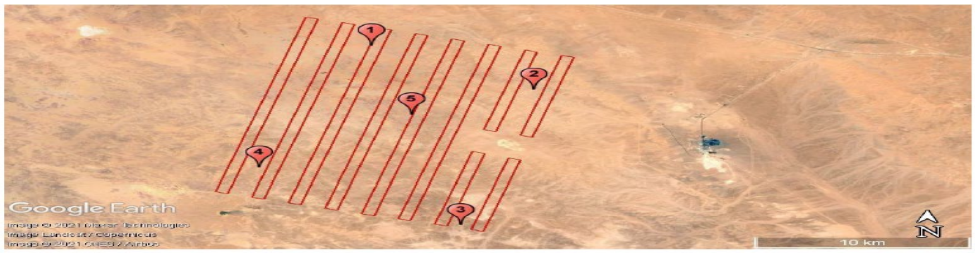

Figure 5-9 Location of air sampling points

Table 5-7 show the results of air parameters measured at the site. It is clear from the results of the measurements that all the elements comply with the permissible values in accordance with the standards of environmental protection in the general environment system and its implementing regulations.

Table 5-7 Result of air measurement

Location	Measurement time		Carbon monoxide (co)	Nitrogen oxide (no2)	Sulphur oxide (so2)	Hydrogen sulfide (h2s)	Ozone (o3)	Volatile organic compounds (VOW)
	START	END	PPM	PPM	PPM	PPM	PPM	PPM
Point 1	10:00 to 14:10		0.19	0.02	0.09	≤ 0.01	≤ 0.01	≤ 0.01
Point 2			0.23	0.03	0.10	≤ 0.01	≤ 0.01	≤ 0.01
Point 3			0.17	0.03	0.10	≤ 0.01	≤ 0.01	≤ 0.01
Point 4			0.15	0.03	0.15	≤ 0.01	≤ 0.01	≤ 0.01
Point 5			0.21	0.03	0.14	≤ 0.01	≤ 0.01	≤ 0.01
The permissible limit according to the NCEC			35	0.106	0.168	0.01	0.08	N/A

3.5 NOISE

Noise and vibration were measured through 5 points within the site boundaries and the recorded results were as follows as shown in Table 5-9. It is clear from the results of the measurements that all the elements comply with the permissible values in accordance with the standards of environmental protection in the general environment system and its implementing regulations.

Table 5-9 Results of ambient noise sampling

Location	Measurement Time		L_{eq}
	Start	End	dB
Point 1	10:00 to 14:10		66.8
Point 2			65.1
Point 3			67.2
Point 4			68.3
Point 5			68.7
The permissible limit according to the NCEC			70

3.6 GEOLOGY AND SOIL

The Arabian Peninsula is a huge crustal plate composed of ancient sedimentary and volcanic rocks, deformed, metamorphosed, and injected by plutonic intrusions. The Arabian Peninsula consists of two major regions: Arabian Shield in the west and the Arabian Platform in the east.

Figure 5-10 shows the simplified geologic map of the Arabian Peninsula, the distribution of the main rock sequences and the main tectonic elements (Al Ajmi et.al., 2014). The approximate location of the Project is indicated on the map.

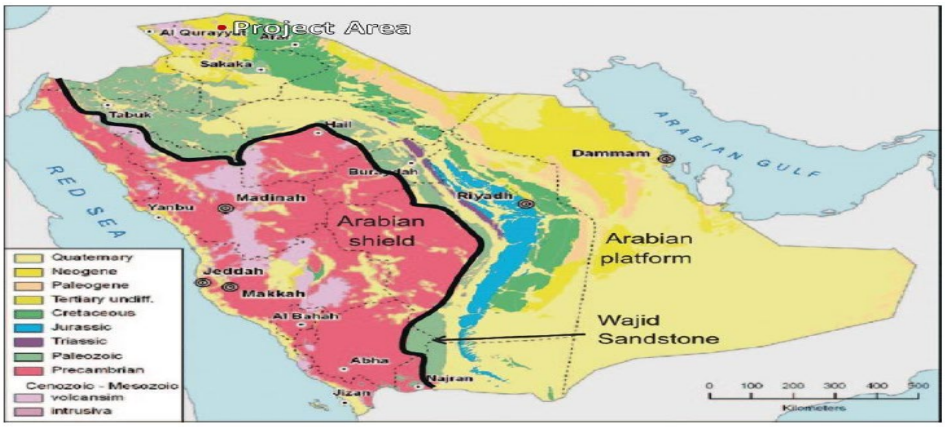

Figure 5-10 Simplified geologic map of the Arabian Peninsula

3.7 HYDROLOGY AND WATER RESOURCES

The site is located within the Wadi as Sirhan basin. Wadi as Sirhan is a geographical depression that extends northwestward from the northwestern part of the map area to the Jordan border. In Wadi as Sirhan gravel fans and outwash plains are deposits of material eroded from the Quraymiz escarpment.

There are no permanent surface water bodies in the Project area and its surroundings as noted in the Preliminary Site Assessment Report. However, there is an extensive series of wadis in the wider area, which carry water during the sporadic rainfall events. Rainwater appears to accumulate in certain lower laying areas around the Project area Figure 5-13. The closest one is less than 1.5 km to the southwestern corner of the Project area.

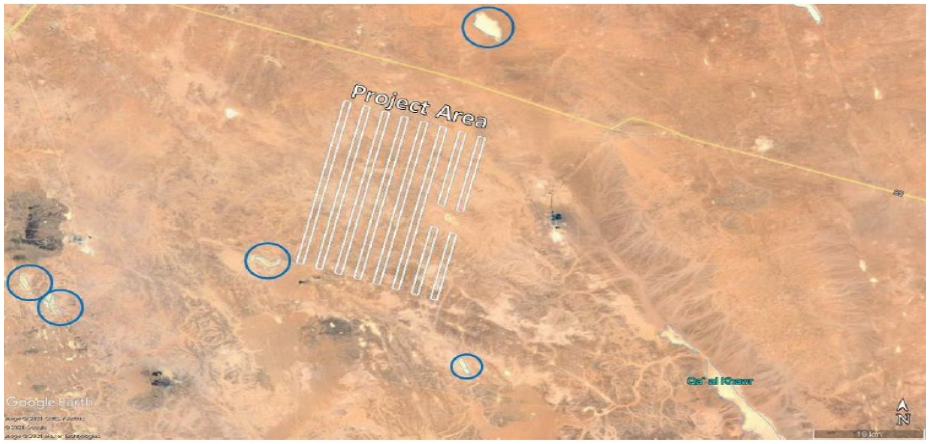

Figure 5-13 Area where rainwater is collected

The recent, superficial, deposits in the area are expected to have limited potential to hold groundwater and are unlikely to represent a significant water resource. Similarly, the Aruma and Wasia Formations are generally thin and are expected to be above the prevailing water table. Water quality is expected to be poor in these formations, with high salinity. The Wasia may be locally exploited but is highly variable. The Jubah is recognised in some areas as a minor aquifer but is not exploited in the area. The Tawil aquifer is the main hydrogeological unit to supply the water demands of the mining projects north of the wind project site. The overlying shales of the main Jouf formation are believed to confine both aquifer units at depth. The uppermost groundwater north of the wind project site was reported at 160 - 350m depth below ground level and is under confined conditions.

The town of Turaif is reportedly supplied with water from the Tawil aquifer, and via a pipeline from Al Jouf. Due to its high salinity, groundwater from the region is unlikely to be acceptable for potable water use without treatment (Jacobs, 2013). Groundwater was not encountered in the drilled boreholes at the time of this geotechnical site investigation. All boreholes drilled were drilled at 30 m depth.

4 BIOLOGICAL ENVIRONMENT

The Project is located in the Northern Border province approximately 30 km southeast of Turaif city. The area can be classified within the World-Wide Fund for Nature (WWF) eco-region called “Arabian Desert and East- Sahero- Arabian xeric shrub lands”. This is a desert eco-region characterized by very little biodiversity. The area is characterized by dry shrubs and Acacia trees and gravel plains. According to the habitat classification scheme of the International Union for Conservation of Nature (IUCN), the Project area can be classified as a Subtropical/Tropical Dry Shrubland.

The Project site is located within the boundaries of King Salman Royal Protected Area (KSRPA) which has a total area of 130,700 km^2; and includes within its boundaries three environmentally protected areas (Figure 31):

- Harrat Al Harrah located approximately 4 km to the south of the site
- At-Tubayq at approximately 130 km to the southeast of the site
- Al-Khunfah Protected Area which at 245 km south of the site.

4.1 SITE FLORA

According to the Preliminary Site Assessment Report for the proposed wind park site, vegetation is very limited across the site and was restricted to runnels of sand. The floristic community is dominated by the dwarf shrub Haloxylon salicornicum Figure 5-18. This plant species was not evaluated by the International Union for Conservation of Nature (IUCN).

Photographed By: Abdelhalim Mahmoud

Figure 5-18 Flora as Observed on site

4.2 SITE FAUNA

This report section is prepared based on the relevant information collected from different resources such as the Preliminary Site Assessment Report and specific site surveys (e.g. for birds), the National Centre for Wildlife's website, the National Strategy for Conservation of Biodiversity in the Kingdom of Saudi Arabia (Abuzinada et al., 2005), the IUCN Red List of Threatened Species, Birds of the Middle East by Richard Porter and Simon Aspinall (2013) in addition to other scientific publications and EIA reports for neighbouring sites. Findings of will be also presented in the relevant sections.

4.2.1 MAMMALS

Based on a study of mammals carried out in Turaif a total of 15 species belonging to 9 families (Desert Hedgehog (Erinaceidae), Cape Hare (Leporidae), Cricetidae, Lessor Egyptian Jerboa (Dipodidae), Erethizontidae,Ruppell's Fox (Canidae), Arabian Ratel (Mustelidae), Arabian Striped Hyaena (Hyaenidae) and Sand Cat (Felidae)) could potentially be present in the project area (Paray & Al-Sadoon, 2018). During This study, among the 9 families Cricetidae was represented by 4 genera, Canidae by 3 genera, Dipodidae by 2 genera and remaining all families were represented by 1 genus each.

Harrat al Harrah protected area was surveyed and mammal species observed were documented by Seddon et al. (1997). A number of regionally threatened carnivores were recorded such as the Arabian Wolf (Canis lupus), and the Striped Hyena (Hyaena hyaena) (Mallon et al., 2011).

Some gazelle species were also recorded in the area such as Sand Gazelle (Gazella marica) and Mountain Gazelle (Gazella gazella). Small mammals such as the Desert Hedgehog (Paraechinus aethiopicus), Lesser Egyptian Jerboa (Jaculus jaculus), Libyan Jird (Meriones libycus), and Dwarf Gerbil (Gerbillus nanus) were also recorded in the protected area.

According to the Preliminary Site Assessment Report, sheep and goats were observed during the site visit, as part of temporary livestock camps

Based on the above studies as well as surveys carried out as part of the Umm Wu'al Phosphate Project ESIA, excluding domestic species and livestock, a total of 19 wild mammal species may occur in the project area, of which a total of 7 are species of conservation concern at a global and regional level.

4.2.2 BATS

KSA is home to 30 Chiroptera species belonging to 21 genera within 9 families. (Pteropodidae, Rhinopomatidae, Rhinolophidae, Emballonuridae, Nycteridae, Hipposideridae, Miniopteridae, Molossidae, and Vespertilionidae)((Al Obaid, et al., 2023). The study by Al Obaid et al., (2018) indicated that the bat species of KS have six 96) major zoogeographical affinities; Afrotropical (eight species), Saharo-Sindian (three species), Afrotropical-Palaearctic (four species), Palaearctic (four species), oriental (one species), and Afrotropical-oriental (two species). The project area falls within the Saharo-Arabian phytogeographical regions.

Bats expected in the wider region of the Project area include species such as Egyptian Fruit Bat (Rousettus aegyptiacus), and Egyptian Mouse-tailed Bat (Rhinopoma cystops). These bats are common and have a wide distribution in Saudi Arabia. One species of bat was recorded in Harrat al Harrah protected area, the Desert Long-eared Bat (Otonycteris hemprichii) (Seddon et al., 1997).

A number of bat species were recorded during baseline surveys for neighbouring projects such as Dumat Al Jandal Wind Energy Park in the south, near Dumat al Jandal and Sakaka in Al Jouf Province. The species recorded were.

- Kuhl's Pipistrelle (Pipistrellus kuhliid)
- Desert Long-eared Bat (Otonycteris hemprichii),
- Sind Bat (Eptesicus nasutus) and/or Botta's Serotine (Eptesicus bottae), and
- Egyptian Free-tailed Bat (Tadarida aegyptiaca).

The Egyptian Fruit Bat has a broad habitat tolerance, as long as abundant food and roosting sites are available. It is known to feed on soft fruits, flowers, and occasionally leaves as well as flying insects. It typically roosts in natural caverns, artificial structures including underground irrigation tunnels, ruins, mines, and open wells. It is also known to roost with other bat species.

Botta's Serotine is found in a wide range of semi-arid habitats. It is a crevice dwelling species, and will inhabit buildings, ruins, and natural rock crevices.

The Desert Long-eared Bat is also known from arid and semi-arid habitats and considered to be well adapted to these climates. It roosts in rock fissures or human constructions such as buildings and tunnels.

Records of Sind Bat in Saudi Arabia are wide but patchy. This species has been recorded in crevices of walls and behind stones of ruined buildings, isolated in semi-desert terrain and sand dunes.

An investigation on bat species' global vulnerability to collision and mortality at wind energy parks revealed an association between some traits and higher collision rates. Species dispersing furthest had significantly greater collision rates than sedentary species, but roost site and hibernation were not significant predictors. Dispersal distance was defined as follows:

- Sedentary: less than 10 km

- Regional: 10-100 km
- Long distance: 100+ km (equating to migration)

The investigation also found that tree-roosting species had significantly higher collision rates than other species (Thaxter et al., 2017). Most species identified above are known to roost in caves, old buildings, crevices, wells, and such.

4.2.3 BIRDS

The peninsula is home to a plethora of bird species and an important stopover site for many migratory species. In Northern Borders, resident birds include common and widespread species such as Rock Pigeon (Columba livia), Laughing Dove (Streptopelia senegalensis), Common Kestrel (Falco tinnunculus), Fan-tailed Raven (Corvus rhipidurus), Crested Lark (Galerida cristata), among others.

Forty-three (46%) of the 93 species of migratory birds of prey listed in Annex 1 of the Raptors MOU have been recorded in Saudi Arabia (https://www.cms.int/en/news/saudi-arabia-pledges-conserve-migratory- birds-prey). The country holds an internationally important breeding population of the Critically Endangered Lappet-faced Vulture (Torgos tracheliotos) and hosts several other threatened species of birds of prey both on migration and during the winter months.

The Waad Al Shammal wind park site is notable for the presence of significant migratory bird flyways. The East Asian / East African Flyway is known to involve a broad corridor of movement, which is generally to the northeast in spring and to the southwest in autumn. This flyway has been described in literature (BirdLife International, 2010) although is not well known and is particularly ill-defined in KSA. Birds using this broad flyway are considered likely to occur within the development site (Figure 5-20 – Yellow). A few hundred kilometres to the west of the site, another significant flyway extends from Europe to Africa called the Rift Valley / Red Sea Flyway (also known as the Black Sea Flyway) (Figure 5-20 – Blue). This corridor of migration is relatively well-defined and studied although it is considered likely that birds using this corridor may also be recorded within the development site in northwest KSA. The Central Asian Flyway has also been identified as another broad corridor of bird movement which crosses from Europe into Asia (Figure 5-20 – Red). It is possible that birds using this flyway may also occur within the development site. Importantly, there is significant general migratory bird movement throughout the Arabian Peninsula in spring (northwards) and autumn (southwards) which may also result in increased bird activity within the development site during migration periods (Jacobs, 2021).

5 ARCHAEOLOGICAL AND CULTURAL ENVIRONMENT

According to a brochure released by Saudi Commission for Tourism and National Heritage, the Northern Borders Province has many archaeological and historical sites distributed over a large area of its territory. Pre-Islamic history in its archaeological sites in Arar including Budainah, Badnah Valley and Shadhi Valley, among other historical sites in the Amarah Palace, which was built during the rule of King Saud.

In Turaif, the bases of Doukarah Palace, which dates back to the pre-Islamic era are considered the most famous historical sites. Every year, Turaif city holds a falconry festival (location on Figure 39) where many participants from Saudi Arabia and the Gulf gather to show off their birds and falconry skills. The sixth (last) edition was held in February 2020. The festival includes many events such as musical performances, art galleries, exhibits among many others (Youm7, accessed February 2021).

6 RESIDENTIAL AREAS

The closest town is Turaif city at 30 km northwest from the Project site. The main governorate of the province is Arar; the city with the same name is located about 195 km southeast of the Project site. Hazem Aljalamid is located about 102 km east of the site.

According to the Preliminary Site Assessment Report, a few temporary camps were observed within the site during the visit, but no permanent dwellings or buildings were observed.

Waad Al Shammal Industrial City is planned to be a full-fledged industrial city in Saudi Arabia, which will integrate all existing and future industrial development planned for the area. Many mining complexes already exist in the area such as Umm Wu'al Mine and Waad Al Shamaal Phosphate Industrial Complex. Bechtel is managing the development of Waad Al Shammal City, under the King Abdullah program for Saudi Arabian Mining Company (Ma'aden). The master plan was developed by Bechtel in 2012, and construction began in 2013 (Bechtel's webpage on Waad Al Shammal, accessed March 2021).

According to news reports, in 2018, Saudi Arabia launched an ambitious multi-billion-dollar project aimed at boosting the Kingdom's mining infrastructure and providing thousands of jobs to locals in the northern region of the country (Arab News, accessed March 2021).

7 MITIGATION OF IMPACTS DURING CONSTRUCTION

During construction, the contractor should ensure that no encroachment to the nearby land should occur and should follow the clearly defined transportation routes. Transport routes will be identified, and training will emphasize that employees should keep to the designated routes in order to protect the environment and reduce encroachment on adjacent land, reduce dust fall across the site due to the movement of trucks on undesignated sand tracks and also protect the visual aesthetics of the landscape. Construction activities should be limited to demarcated areas.

Quantitative noise assessment should be carried out to verify compliance with standards during construction especially at the southern wind park site boundary and at 4 km south from that boundary, along the northern border of Harrat al-Harrah Key Biodiversity Area.

Given the absence of sensitive receptors close to the site, a dust control plan and dust monitoring are not considered necessary; however, typical dust control measures are recommended to be implemented throughout the construction phase. Especially since construction will last for a long period, the site is recommended to be fenced with barriers at least as high as any uncovered stockpiles, to minimise dust mobilisation away from the site when dust generating construction activities are carried out in dry and windy conditions.

Construction and decommissioning traffic will be managed as per the requirements of IFC EHS Standard 3.0: Community Health and Safety and IFC EHS Standard 4.0: Construction and Decommissioning. This will minimize the potential for impacts to occur because of the park. This includes the development of a logistics, traffic and transportation plan which will cover the transportation of oversized and heavy turbine components using specialist transportation vehicles. The management of the transportation of turbines will be carried out in compliance with the relevant permitting requirements of the Ministry of Transport.

Occupational health and safety hazards during the construction, operation, and decommissioning of wind energy facilities are generally similar to those of most large industrial facilities and infrastructure projects. The project will follow the IFC EHS Guidelines for Wind Energy (2015) to ensure the health.

8 MITIGATION OF IMPACTS DURING OPERATION

Standard mitigation measures to reduce landscape and visual impacts would be adopted in order to minimize impacts on landscape and visual receptors. These would include all of the turbines having the same rotor diameter and hub height and turning in the same direction at broadly the same speed. Tubular steel towers reduce visual clutter and are preferred to lattice or pylon-like generator towers. Turbine transformers, in line with larger turbine designs, would normally be mounted within the machines to reduce visual clutter. If the transformers are external to the turbines, then an appropriate colour which diminishes their visual impact should be adopted in relation to the characteristics of the site and surrounding landscape. The turbines would all be a similar colour and finish so as to promote visual integration.

Wind turbines will be subject to continuous monitoring and regular maintenance such that the likelihood of blade throw is unlikely and rare.

It is necessary to consult with stakeholders, owners and operators of communication towers to determine if possibly some local adjustment of a number of turbines within the wind farm area would be required.

Further bird surveys should be based on the existing study outlined in this report and should include, as a minimum, IFC & international best practice compliant surveys prior to construction.

9 STAKEHOLDER ENGAGEMENT ACTION PLAN

This plan will provide all identified stakeholder groups and interested factions with a channel of communications between the stakeholder groups and the Project developer. The approach generally uses the different levels of engagement to provide more focused activities based on the level of significance of each stakeholder groups. For example, a Standard level of engagement can be achieved using disclosure, while a Moderate level can be achieved via consultation and engagement, and focused engagement can achieve a high level of engagement. The action plan included various engagement methods for the different proposed activities. The action plan also details some proposed grievance mechanisms for the project developer in order to monitor grievances and identify any recurrent issues, or escalating conflicts. Including but not limited to the following:

- Implementing a grievance mechanism and ensure the responsiveness of this mechanisms to concerns and complaints
- Receiving and logging all comments and complaints associated with the project
- Responding to such complaints and comments wither verbally or in writing

Lastly, the report emphasizes the importance of monitoring stakeholder engagement activities in order to ensure that the consultation and disclosure efforts are sufficient and effective throughout the process.

10 PUBLIC CONSULTATION

Public consultation session took place on 4 August 2021. Due to COVID-19 pandemic restrictions, the meeting was held through means of video conference. The meeting was attended by representatives from different stakeholders including but not limited to:

- National Centre for Environmental Compliance (NCEC)
- National Centre for Wildlife (NCW)
- Ministry of Environment, Water and Agriculture (MEWA)
- Ministry of Tourism
- The Public Authority for Transport
- Ministry of Transport and Logistic Services
- Ministry of Municipal, Rural Affairs and Housing
- Saudi Railway Company
- Ministry of Defence
- Communications and Information Technology Commission (CITC)
- The Saudi Authority for Industrial Cities and Technology Zones (MODON)
- General Authority of Civil Aviation (GACA)
- Heritage Commission
- Saudi Ports Authority

During the session, the different Project aspects were discussed including but not limited to components as well as the potential positive and negative impacts of the Project. Attendees were supportive of the concept of the renewable energy program and the development of the proposed Project.

11 PROJECT JUSTIFICATION

Overall, the Project is considered to have a relatively low impact on the environment project (see Table 8-2) provided that the CSMP is implemented correctly. All mitigation and monitoring measures will be managed through CSMP which will be further developed in line with regulatory and lender requirements during construction phase. Ultimately, the introduction of the Project will facilitate the diversification of energy supply in KSA and will improve the country's sustainability targets, aiding with the reduction of GHG emissions, and aiding with meeting Saudi Arabia's 2030 renewable energy target, equivalent to 58.7 GW of electricity from renewable sources by 2030. Thus, resulting in an overall positive impact on the environment and a lessening of KSA's dependence on non-renewable energy sources

Table 8-2 Gains and losses summary

Aspect	Gains	Losses
Environmental	— GHGs reduction (approximately 572,260 tonnes of CO_2 per year) — Energy production from renewable resources	Limited negative impacts on the environment (e.g., increased noise levels) during construction and operation phases as detailed in Section 6. However, applying the proposed mitigation measures outlined in Section 7.1 will further minimize these impacts.
Social	— Energy production (798 MW) — Job opportunities creation during the different phases of the project — Purchasing of materials, especially during the construction phase will have indirect positive impacts on the local community due to the improved economic conditions	Limited nuisance to the local community and onsite workers especially during construction phase is expected. However, these impacts are limited in duration and magnitude as well. More details are presented in Section 6. However, applying the proposed mitigation measures outlined in Section 7.1 will further minimize these impacts
Economic	— Purchasing of materials, especially during the construction phase will have direct positive impacts on the local economy — Power generation (approximately 798 MW)	Not applicable