Egyptian Electricity Transmission Company

ESIA for OHTL for Obelisk PV Power Plant – Nagaa Hammadi

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1. Introduction

1.1 Background

The Egyptian Electricity Company (EETC) intends to establish an Overhead Transmission Line (OHTL) to evacuate the electricity generated from Obelisk, (PV) power plant to the national grid. In this respect, Obelisk Company is preparing this Environmental and Social Impact Assessment (ESIA) on behalf of EETC for submission to EEAA for review and approval. It is to point out that Obelisk company obtained the environmental approval on their PV project in December 2024. Annex (1) presents Obelisk environmental approval.

The OHTL will operate at an ultra-high voltage of 220 kV. It will transfer energy to the nearest transformer substation, which is the Nagaa Hammadi Transformer Substation, located approximately 11.5 km from the PV power plant.

The distance between Obelisk PV power plant and the Nagaa Hammadi Transformer Substation can be divided into two distinct segments as shown in Figure 1-1: the southern segment from point 5 to 12 and the northern segment from point 1 to 5. In the southern segment, new transmission towers will be constructed, while in the northern segment, cables will be replaced on existing transmission towers without construction of new ones.

In the southern segment, the OHTL to be constructed spans a distance of 7.8 km. According to the Egyptian Environmental Affairs Agency (EEAA), this OHTL project is classified as a 'Category C' project since it exceeds the distance threshold of 5 km. Consequently, scoping and consultation activities are required.

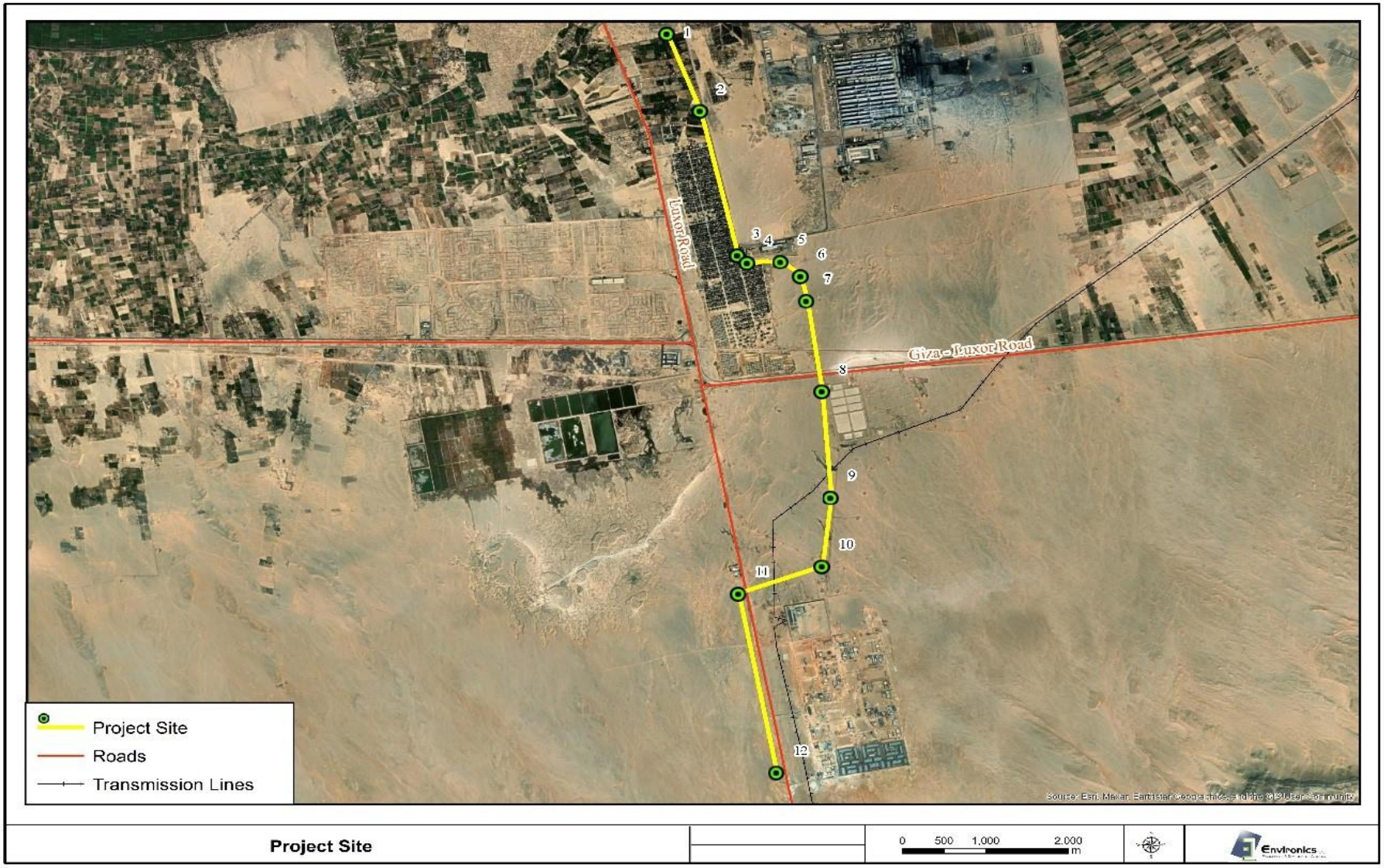

Figure 1-1: OHTL Northern and Southern Segments

1.2 Objective of the ESIA

The objective of the ESIA is to ensure that the project is environmentally and socially sound and sustainable, and that any potential negative environmental and social (E&S) risks are recognized early in the project cycle and taken into account before project implementation. Furthermore, it is also intended to satisfy the environmental legal requirements of the Egyptian Environmental Law 4 of 1994 and its current executive regulations.

Moreover, the ESIA is also intended to satisfy the environmental and social requirements of the international financial institutions, including the European Bank for Reconstruction and Development (EBRD), African Development Bank Group (AFDB) , and the U.S. government's Development Finance Institution (DFC). Since the OHTL is an "associated facility"[1] to Obelisk PV power plant.

1.3 Scope of Work

The ESIA of the proposed project evaluates the project's potential environmental and social risks and impacts within its area of influence. It identifies ways to improve the project's environmental performance during its various stages by preventing or mitigating potential adverse environmental and social risks and impacts while enhancing positive impacts. This ESIA covers the different components of the project across the phases of site preparation, construction and maintenance, and it presents the results of the public consultation activities.

1.4 Outline of ESIA study

This ESIA report includes:

- ***Chapter 1:*** Introduction (the current chapter)
- ***Chapter 2:*** Project Description
- ***Chapter 3:*** Description of the Environmental and Social Baseline
- ***Chapter 4:*** Legal and Administrative Framework
- ***Chapter 5*****:** Analysis of Alternatives
- ***Chapter 6:*** Environmental Impact Assessment and Mitigation Measures
- ***Chapter 7:*** Environmental Management and Monitoring Plans
- ***Chapter 8:*** Public Consultation Activities

[1] Associated facilities: facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable. (IFC Performance Standards)

2. Project Description

2.1 Project Location

The proposed OHTL runs parallel to the Nagaa Hammadi industrial zone (Hiw light industrial zone) before heading north, crossing the Giza–Luxor Road. The route proceeds north, traversing villages including El Baraka, as well as reclaimed agricultural lands. Eventually, the line reaches the Nagaa Hammadi Transformer Substation, located north of the agricultural areas.Figure 2-1, below shows the proposed OHTL route and surrounding area.

The area also includes a netwrok of OHTLs, where the proposed OHTL is runnung parallel to an exisiting transmission line.

As mentioned earlier, the distance of the OHTL between the Obelisk PV Power Plant and the Nagaa Hammadi Transformer Substation can be divided into two segments: the southern segment and the northern segment. The southern segment, where new transmission towers will be constructed, consists of desert land. In contrast, the northern segment, where cables will be replaced, is located near a village and reclaimed agricultural land.

In summary, as illustrated in Figure 2-1:

- 3.7 km of existing OHTL will have its cables replaced. It extends from point 1 to point 5.
- 7.8 km OHTL will be constructed. It extends from point 5 to point 12, connecting the existing OHTL from Point 5 to the PV power plant.

Figure 2-1: The route of the proposed OHTL and other surroundings areas

2.2 Construction Phase

The description of construction phase will be divided as follows: the construction of the Southern segment and the construction of the Northern segment, considering the distinct nature of the land, surroundings, different construction activities, and project components in each area. The construction of the project will be executed by EETC selected contractor(s), in collaboration with subcontractors for specific tasks.

The construction of OHTL typically involves planning and design procurement and site preparation (1-2 months), followed by actual construction (and finalization).

2.2.1 Construction phase of the Southern Segment

The main components of the southern segment of the project include:

Transmission Towers

The exact number of towers and the spacing between the towers will be determined by the construction contractors, during the detailed design phase. Typically, an average distance of 400 to 600 meters is maintained between each tower. In this respect am number of about 11-13 towers are expected to be constructed in this segment.

Tower Components

The main components of the towers include the foundation, lattice steel structure, conductors, insulators and earth wires.

Foundations:

The tower foundations will be constructed using reinforced concrete pads.

Lattice Steel Structure

The tower structure is primarily made of lattice bolted steel elements. The Tower shape will be designed for vertical arrangement, Lattice steel self-supporting double circuit towers will be used. Each transmission tower will have steel beam cross arms which connects the conductors with the towers. A typical OHTL tower is shown in Figure 2-2 below.

Conductors, insulators, spacers and dampers

These components are installed on the lattice structure to serve various purposes:

- Conductors (cables): They are the main components that transfer the electrical power generated in the power plant to the transformer substation.
- Insulators: Suspension insulators are designed to support the weight of the conductors and to accommodate limited movement due to wind or other external forces. These insulators will typically be made of porcelain or toughened glass. Tension insulators, on the other hand, are used at locations where the transmission line experiences mechanical stress—such as at angle towers or points where the line changes direction. Suitable materials for tension insulators include porcelain, toughened glass, or composite types consisting of a glass-fiber core with silicone rubber sheds, providing both mechanical strength and effective electrical insulation...
- Spacers: They are installed to keep partial conductors of the bundle line spaced to prevent their damage. The spacer is designed to maintain the bundle spacing of 450mm

under all normal operating conditions and to effectively control aeolian vibrations as well as sub span oscillations.

- Dampers: They reduce oscillations and vibrations caused by wind.

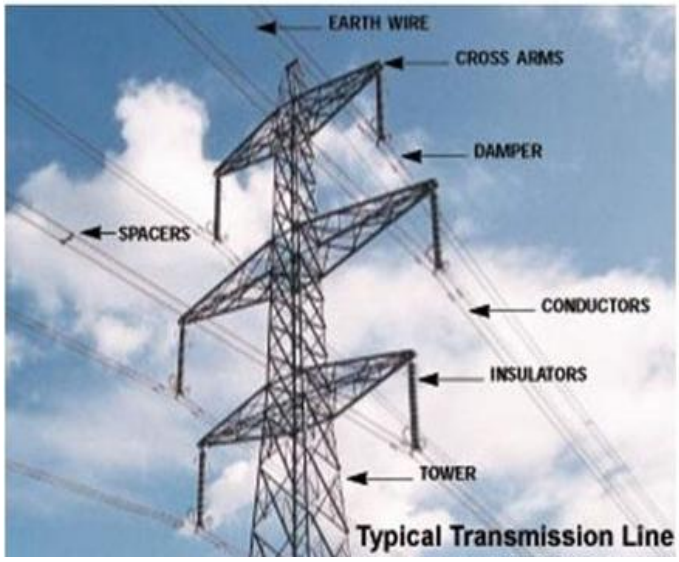

Figure 2-2: Main Tower Components

Main Construction Activities for the Southern OHTL Segment

The towers' locations will require site preparation before constructing the foundations. The locations, as shown in Figure 2-3, are planned to run parallel to existing towers.

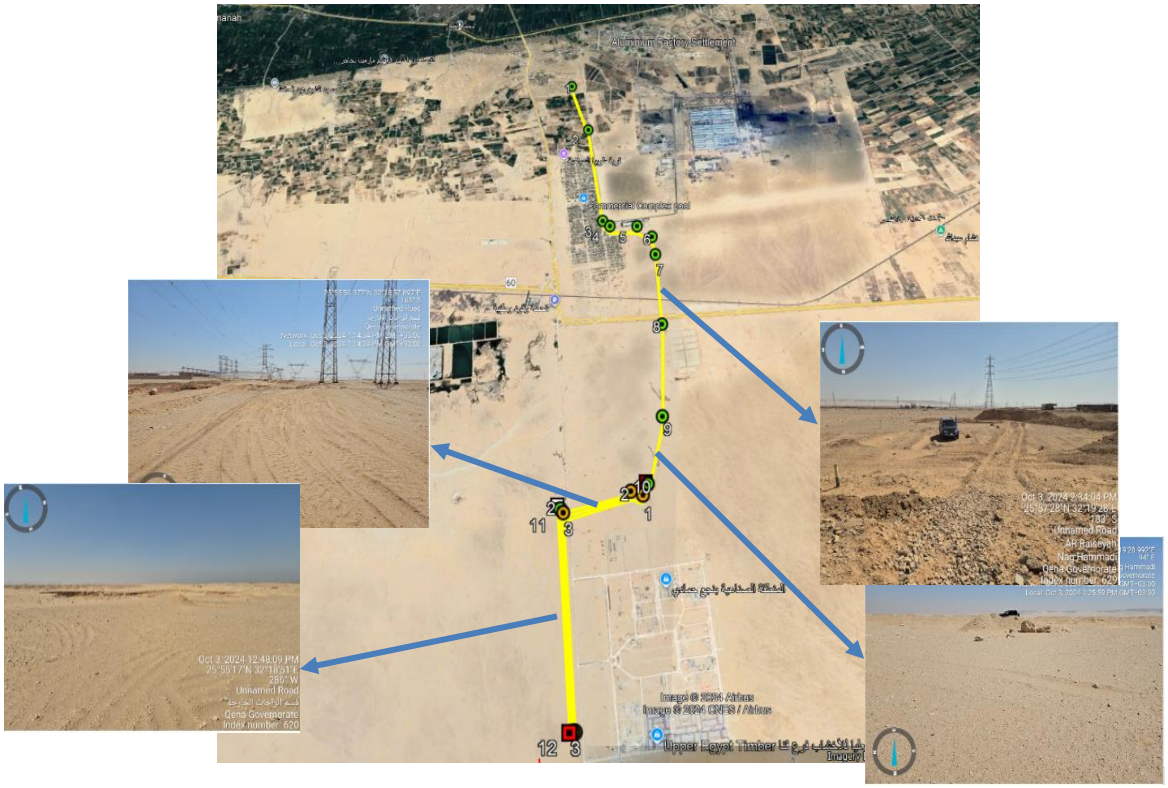

Figure 2-3: Characteristics of surrounding area in the Southern Segment

The preconstruction activities can be summarized as follows:
- Geotechnical investigations;
- Design of tower foundations;
- Electrical design, including number and types of towers, relevant earthing, sag and tension calculations, creepage distance, etc..
- Detailed survey and finalization of the selection of the towers' specific locations.

While the construction activities can be summarized as follows:
- Excavation for foundations;
- Construction of tower foundations;
- Assembly of transmission line towers;
- Cabling stringing and installations of electrical components;
- Commissioning and testing the OHTL;
- Site restoration.

The construction equipment will include:
- Mobile crane and crane-mounted truck;
- Excavator;
- Roller compactor;
- Concrete mixer trucks and vibrators.

OHTL Stringing

stringing includes all activities associated with the installation of the primary conductors onto the transmission line structures. Wire stringing involves the following operations:
- Stringing the pilot line to install the conductor: A light-weight sock line (pilot line) is flown from tower to tower, threading the sock line through wire rollers attached to the insulators on each structure. A device lock is used to secure the sock line in the rollers.
- Pulling: The sock line is attached to a conductor pulling rope or cable, which is connected to a tensioning machine mounted on a truck. The conductors are then pulled through using a pulling machine.
- Sagging and dead-ending: Once the conductor is pulled through the length of the line, the tensioner is then used to sag the conductors to the proper tension. As conductors expand and shrink with changes in temperature (they are longest at high temperatures), they need to be installed at the proper tension so that they do not sag too low when temperatures are at a maximum.

2.2.2 Construction phase of the Northern Segment

The only component being addressed in this segment is the conductors (cables). The scope of work is limited to their replacement, while the existing towers (as shown in Figure 2-4) located near El Baraka and El Hiw villages will remain unchanged. The sole modification involves replacing the cables to ensure improved performance and reliability. This will havea limited impact on the surrounding area.

Figure 2-4: Existing tower near El Baraka villages

Main Construction Activities for the Norhtern Segment

The towers are already in place as shown in Figure 2-5. The only activity to be carried out is the stringing of cables as explained in the previous section.

Figure 2-5: Characteristics of surrounding area in the Northern Segment

OHTL Stringing

For the existing towers area (northern segment), as previously described, only the conductors will be replaced; no new towers will be constructed. During the conductor replacement process, anchoring points for the puller and tensioner machines will be necessary. These anchoring points, which are temporary and localized, may require a limited and temporary use of areas within the agricultural land. .

There will be no need for a pilot line as the existing conductor is planned to be used as a pulling rope. Puller machines (as shown in Figure 2-6) are used to fasten the machinery at the beginning towers and the end tower during stringing. The stringing activities described above are the same for the area of the new towers and that of the existing towers. As there is no direct contact with land between towers, this stringing process is intended to avoid any damage to plantations under the line, specifically in the most northern section of the OHTL where the existing towers are constructed within agricultural land.

Figure 2-7 below presents the process of line stringing[2].

Figure: 2-6: Example of Puller Machine

Figure 2-7: Example for line stringing

[2]-https://www.youtube.com/watch?v=xuWB9CodHlM&ab_channel=ElectricalPowerSystem
-https://hnlongreen.en.made-in-china.com/product/LdsAHWoUAVYq/China-115-Kv-Transmission-Line-for-Hv-Electric-Powerlines-Conductor-Stringing-and-Pulling.html?pv_id=1imfe70l4e5d&faw_id=1imfe73ql2a6

2.2.3 Utilities

Temporary Laydown Areas

For the southern segment

During construction, temporary laydown areas will be identified along the alignment, with the main equipment and construction yards being located along the alignment within the publicly owned desert lands along the southern segment of the OHTL alignment. For both segments, the location and the size of laydown areas is to be determined by EETC and the construction contractor.

For the existing towers

As described above, no new towers will be constructed in the northern segment of the OHTL, only conductors will be replaced at this segment. In this respect, it is expected that only anchoring area for the footprint of the puller and tensioner machines for conductor stringing.

Water

The concrete for foundations and pads for the new towers will be supplied as ready-mixed concrete. Accordingly, water will be required mainly for domestic purposes during construction, specifically for potable uses. it is expected to be supplied by a subcontractor through a potable PVC water tank....

Electricity

During construction, electricity will be needed to power construction equipment, tools, lighting, and temporary facilities. A diesel generator will be installed along with its built-in diesel tank.

2.2.4 Construction phase labour requirements

During the construction phase, the project will need both skilled labour, including engineers and technicians, and unskilled labours.

2.3 Operation Phase (Southern and Northern Segments)

2.3.1 Main Operational Activities

The OHTL does not require a specific operational process. Only the towers and conductor would require periodic checks and periodic maintenance. Maintenance activities will include regular inspections to identify and address wear and damage in conductors and towers.

2.3.2 Operation phase labor requirements

During the operational phase, maintenance activities will primarily be carried out by EETC personnel visiting the site. No permanent labour will be on site.

3. Environmental and Social Baseline

The Overhead Transmission Line (OHTL) route is administratively located in Qena Governorate, within the Markaz of Nagaa Hammadi. The entire length of the OHTL route is approximately 11.46 km long. The OHTL route is divided into two sections, an already existing northern section (3.66 km) and a yet to be constructed southern section (7.8 km).

The northern section of the OHTL route connects to the Nagaa Hammadi Transformer Substation ('Point 1'). Between Points 1 and 2, the route traverses a plot of agricultural lands, whilst Points 3 and 4 run parallel to a residential areas of El Hew village.

The starting point of the southern section of the OHTL route is located at the planned Obelisk PV power plant ('Point 12)). The southern section of the OHTL route is located in the desert hinterland of the city and Markaz of Nagaa Hammadi and crosses the Giza – Luxor Road to meet the northern section of the route at Point 5.

The location of the OHTL route and the area land uses are illustrated below, with the purple line representing the existing northern section of the OHTL route and the yellow line representing the route's southern section (Figure 3-1).

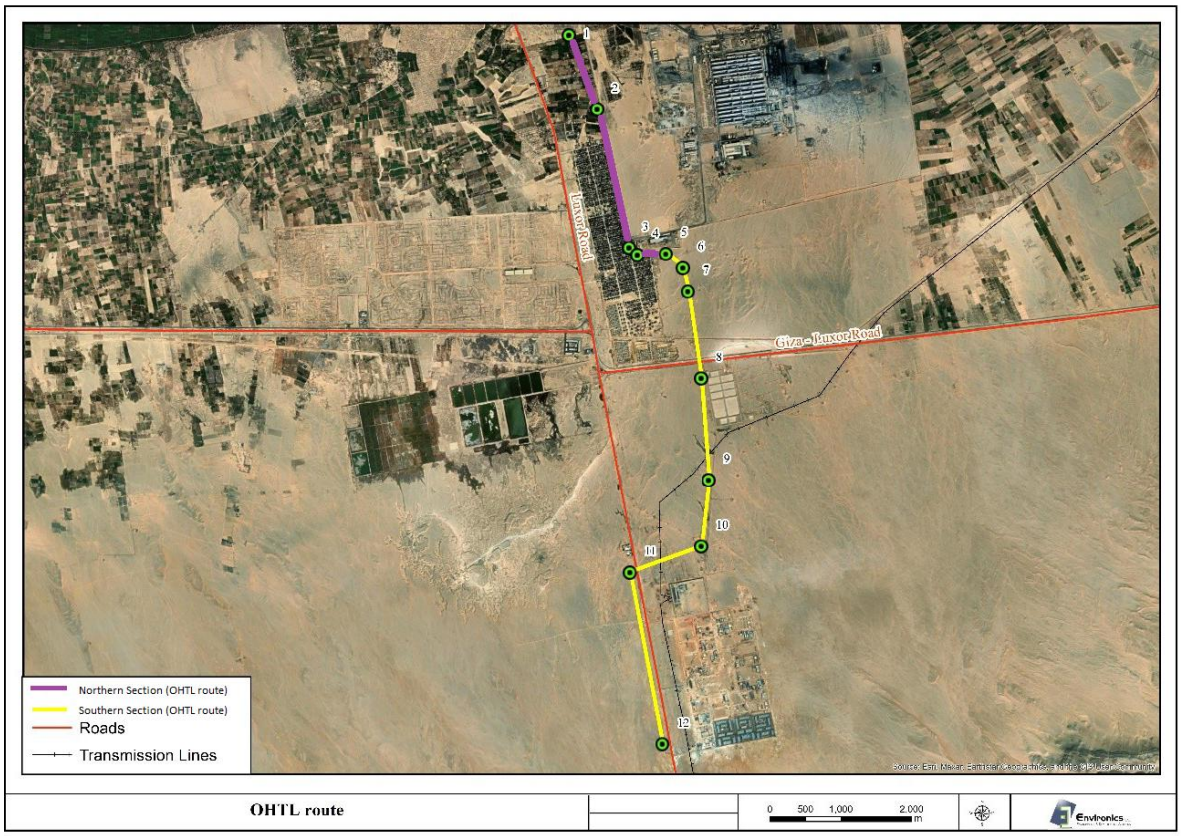

Figure 3-1: Location of the two sections of the OHTL route, and the locations of the nearest roads to the route

The coordinates of the existing towers of the northern section of the OHTL route and the proposed transmission towers planned for the southern section of the OHTL route are provided above (Figure 3-1).

3.1 Physical Environment

3.1.1 Climate and Meteorology

The Qena governorate is characterised by its year-long aridity, temperature variability (manifested in the form of very hot summers and very cold winters), and a highly variable diurnal air temperature (i.e., the difference between the daily maximum and daily minimum air temperature) range (Katavoutas et al., 2023).

The subsequent sections provide more detailed climate and meteorological information for the Qena governorate, derived from historical data recorded at the Qena meteorological station.

The Qena meteorological station is the closest meteorological station to the OHTL route, and is located approximately 53 km east of it.

- ***Temperature***

Air temperature data collected over a monitoring period of 112 years from the Qena meteorological station found that the annual average air temperature of the Qena governorate is 23.9°C. In terms of the monthly average air temperatures, the highest monthly average temperature of 31.2°C was recorded in July. followed by an average temperature of 30.9°C recorded in June (Table 3-1).

Table 3-1: Air temperature recorded from the Qena meteorological station over a period of 112 years

Monthly Avg. Temp. (°C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Avg. Temp. (°C)
	14.4	16.1	19.7	24.6	28.3	30.9	31.2	30.8	29	25.6	20.3	16	23.9

The monthly average minimum temperatures recorded over the 112-year monitoring period indicate that the lowest monthly average temperature over the Qena governorate occurred in January, where temperatures drops to 14.4°C. The second lowest monthly average temperature of 16.1°C closely followed and occurred in the month of February (Table 3-1) (Weatherbase, 2024).

This temperature variation throughout the year underscores the seasonal temperature variability experienced by the Qena governorate.

- ***Maximum and Minimum Temperature***

The monthly average maximum temperatures reached at the Qena governorate according to data collected by the Qena meteorological station over a monitoring period of 112 years were found to be 37.9°C and 37.6°C (in June and July, respectively). The annual average maximum temperature over the 112-year monitoring period was around 31°C (Table 3-2).

Table 3-2: Average maximum and minimum air temperatures recorded by the Qena meteorological station over a monitoring period of 112 years

Monthly Avg. Temp. (°C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Avg. (°C)
Max	21.1	23.3	27	31.8	35.5	37.9	37.6	37.3	35.7	32.6	27.4	22.5	30.8
Min	5.3	6.7	10.3	15	18.9	21.5	22.7	22.3	20.4	16.8	11.5	6.9	14.9

In terms of the monthly average minimum temperatures of the region, based on data collected by the Qena meteorological station over a period of 112-years, the monthly average minimum temperature of 5.3°C occurred in January. The annual average minimum temperature over the 112-year period was found to be 14.9°C (Table 3-2).

- ***Windspeed and Direction***

The Qena governorate experiences slight variations in wind speeds throughout the year. The annual average wind speed as recorded by the Qena meteorological station over a period of 112 years is 12 km/h, the maximum monthly wind speed recorded over the same period does not deviate much from this value, with windspeeds peaking at 13.7 km/h during April. Similarly, the minimum windspeed values drop to 9.7 km/h between October and November, only a slight deviation from the annual average. In terms of wind direction, northerly and north-northwesterly winds are the dominant wind directions at Qena governorate throughout the year. Table 3-3 below illustrates the average windspeeds of the OHTL routes locality in the Qena governorate in more detail (Meteoblue, 2024).

Table 3-3: Average wind speeds as measured by the Qena meteorological station over 112 years

Annual Average Wind Speed (km/h)	Monthly Average Wind Speed (km/h)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	12.6	12.6	13	13.7	13	13	12.6	12.2	12.6	9.7	9.7	9.7

Northerly winds are the dominant winds, followed by north-northwesterly winds and to a lesser extent, north-north easterly and north westerly winds (Figure 3-2) (Meteoblue, 2024).

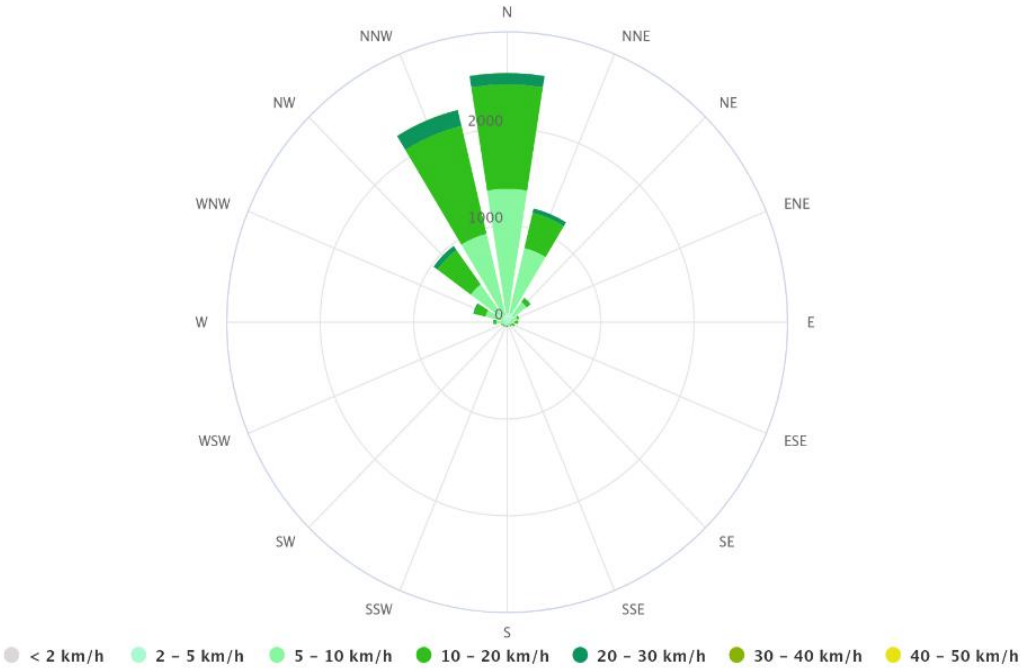

Figure 3-2: Wind rose illustrating the dominant wind directions at Qena

- ***Precipitation***

The OHTL route is located in the western part of the Qena governorate, within the Western Desert (WD). This part of the WD is known for its aridity and warm temperatures throughout the year. During the summers, the area is known to be susceptible to periods of drought, and during the winters, rainfall events are rare, sporadic, and only negligible amounts of rainfall occur during these events. The peak monthly average amount of rainfall is reached in May (0.4 mm), whilst during the winter (December and January), rainfall amounts drop to 0.1 mm. The annual average amount of rainfall as calculated using data collected over a 112-year period was only 1.6 mm. Both annual and monthly average rainfall data as recorded by the Qena meteorological station over 112 years are detailed below (Table 3-4) (Weatherbase, 2024).

Table 3-4: Average rainfall amounts according to data recorded by the Qena meteorological station over a monitoring period of 112 years

Annual Avg. rainfall (mm)	Monthly Average Rainfall (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.6	0.1	0.3	0.2	0.3	0.4	0	0	0	0	0.2	0	0.1

- ***Humidity***

The average Relative Humidity (RH) is highly variable in the Qena governorate, with the annual average RH value in percent (%) being around 41%. In terms of monthly average RH values, the maximum RH peaks at 54.2% (in December), and the minimum drops to 30% (in May). A more comprehensive summary of the regions RH is depicted below (Table 3-5) (Weatherbase, 2024).

Table 3-5: Annual and monthly average RH data as recorded by the Qena meteorological station over a 112-year monitoring period

Annual Avg. RH (%)	Monthly Avg. RH (%)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
41	52.8	46.1	39.7	33.9	30	30.8	34.4	37	40.2	43.5	49.9	54.2

- ***Meteorological Hazards***

A dust, sandstorm, and haze assessment was conducted for the project area using data extracted from Luxor meteorological station, due to its relative vicinity of the OHTL route (located around 50 km away), and the availability of relevant data, for a 22-year monitoring period. The results of this assessment are summarised below.

- ***Haze***

Haze is an extreme meteorological phenomenon with negative health implications for humans. Haze is caused by the increase and accumulation of polluting aerosol emissions, such as fossil fuel combustion from automobile exhaust. In recent years, haze events have progressively increased in frequency across North Africa (Zhang et al., 2021). According to the results of the haze assessment conducted this year, over the last 22 hours, the total number of observed hours of haze events in the vicinity of the OHTL route was 2,864 hours (1.5% of the total number of hours of monitoring).

Haze events peaked in February, with the average maximum number of hours of observed haze events occurring during February, while the summer months had the minimum average number of hours of haze. The 2,864 hours of observed haze events occurred over a period 804 days Thes events were correlated with very slow windspeeds (< 1 m/s) and light winds (< 3.5 m/s).

- ***Dust Storms***

Over the same 22-year period, the total number of observed hours of dust storming was 544 hours, accounting for 0.29% of the total observed hours. These events occurred across 105 days and were characterised by moderate windspeeds (between 2 m/s and 5 m/s). Dust storming peaked in March, where the maximum number of hours of dust storm events observed occurred. As above, the summer months exhibited the lowest frequencies of dust storm occurrences.

- ***Sandstorms***

The total number of observed hours of Sandstorm events is 34 hours, accounting for 0.02% of the total hours. These events occurred across 16 days, characterised by high wind speeds (> 5 m/s). Westerly winds were deduced to be the predominant winds causing sandstorms, followed by northwesterly winds, and to a lesser extent, easterly winds. Again, sand storm frequency peaked in March, where the maximum number of hours of sandstorm events occurred. However, in April and May, the minimum number of observed sand storm events occurred in April and May.

- ***Sand Rising***

The total number of observed hours of Rising Sand events is 446 hours, accounting for 0.23% of the total hours. These events occurred across a total of 122 days and were characterised by

high windspeeds (> 5 m/s). The number of hours of observed rising sand events peaked in March, and again, the minimum rate of rising sand events occurred during the summer.

3.1.2 Air Quality

According to data from the Qena meteorological station recorded in December of 2023, the air at the governorate was found to have a relatively high average monthly concentration of PM_{10} (particulate matter where particles have a diameter less than or equal to 10 micrometers) of 166 µg/m³. The average monthly concentrations measured during the same period (December of 2023) of Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and Ammonia (NH_3) are outlined below (Table 3-6) (EEAA, 2023).

Table 3-6: Monthly average concentration of air pollutants according to data obtained from the Qena and Luxor meteorological stations in December 2023

Air Pollutant	PM_{10}	SO_2	NO_2	NH_3
Monthly Avg. Concentration (µg/m³)	166	18	29	17

Annual average concentrations of common pollutants were also recorded and collated from the Qena meteorological station over the year 2022. The records indicated that, as above, the air at Qena was found to have a high annual average concentration of PM_{10}, 149 µg/m³. This value is higher than the 100 µg/m³ Ambient Air Quality Limit (AQL) imposed by the Egyptian Environmental Affairs Agency (EEAA) for PM_{10}. The annual average concentrations of SO_2 and NO_2 over the same year (2022) are also provided below, along with the relevant EEAA AQLs based on the Egypt's 'Environment Law', Law no. 4 of 1994 (amended by Law no. 9 of 2009 and Decree no.1095 of 2011) (Arab Republic of Egypt, 2011). (Table 3-7) (EEAA, 2023).

Table 3-7: Annual average concentration of air pollutants according to data obtained from the Qena and Luxor meteorological stations in 2022

Air Pollutant	PM_{10}	SO_2	NO_2
Annual Avg. Concentration (µg/m³)	149	15	22
AQL (Annual Avg. Concentration) (µg/m³)	100	50	60

3.1.3 Physical Landscape and Topography

- ***Geomorphology***

There are two main geomorphological units making up the Qena governorate, the alluvial plain and the structural plateaus. Where the OHTL route is located, the alluvial plain is the main unit. The alluvial plains may be divided into the young alluvial plain and the old alluvial plain. The old alluvial plain occupies the outer portions of the valley and extend to the foot slopes of the surrounding escarpments, including the land directly beneath the OHTL route. This land lies between the rugged terrain and the limestone plateau to the south, and the young alluvial plains along the valley to the north (Figure 3-3) (GAEB, 2003; EEAA, 2006).

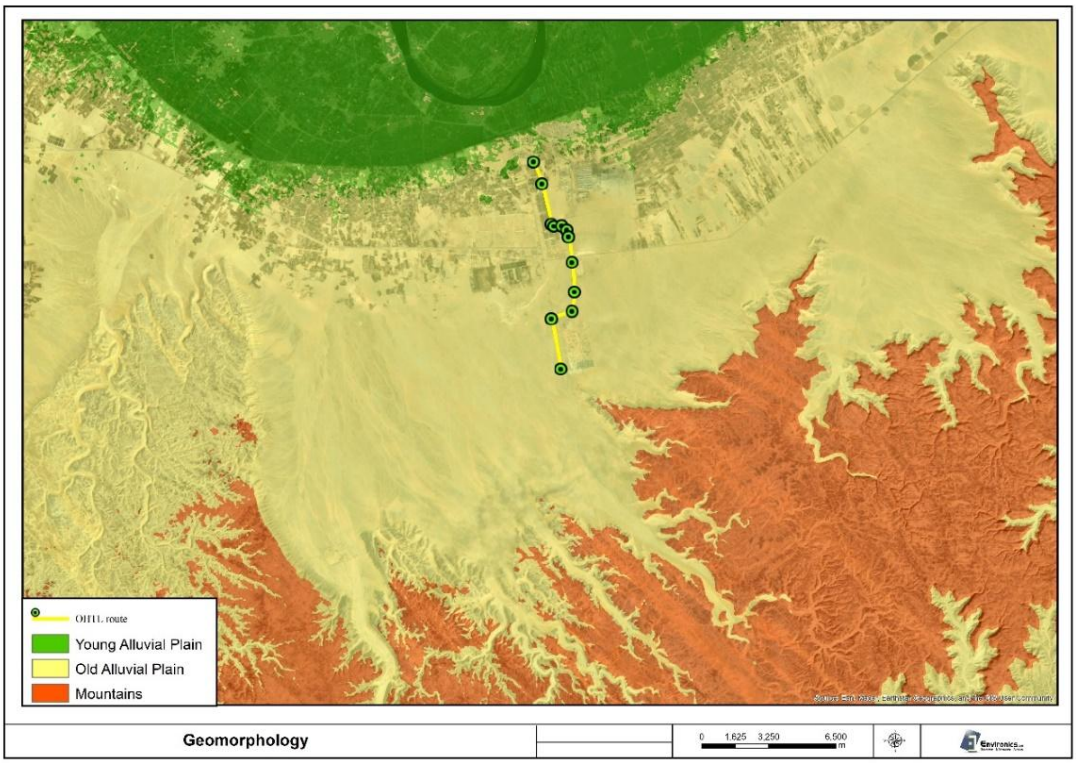

Figure 3-3: The main geomorphological unit characterising the land beneath the OHTL route

The surface of the old alluvial plain is covered by mixed sand and gravels and is developed into successive terraces at different heights (rising more than 25 m above the present level of the flood plain) above the level of the young alluvial plain. These terraces are dissected by complex drainage channels or wadis (GAEB, 2003; EEAA, 2006).

- ***Soils***

According to the soil map of Egypt, the soils of the entire OHTL route are soils developed mainly from limestone. More specifically, the OHTL route's soil type is classified as sandy loam soil that is particularly shallow or stoney (El-Ramady et al., 2019).

- ***Topography***

Elevations reach 100 meters above Mean Sea Level (MSL) in the northern section of the OHTL route and reach 250 above MSL in the southern section of the route. Elevations outside of the ground vertically aligned with the OHTL route increase southwardly, reaching around 250 m above MSL southeast of the OHTL route, and conversely, elevations drop northwardly, with a minimum elevation of about 50 m above MSL characterising the land northwest of the OHTL route (Figure 3-4).

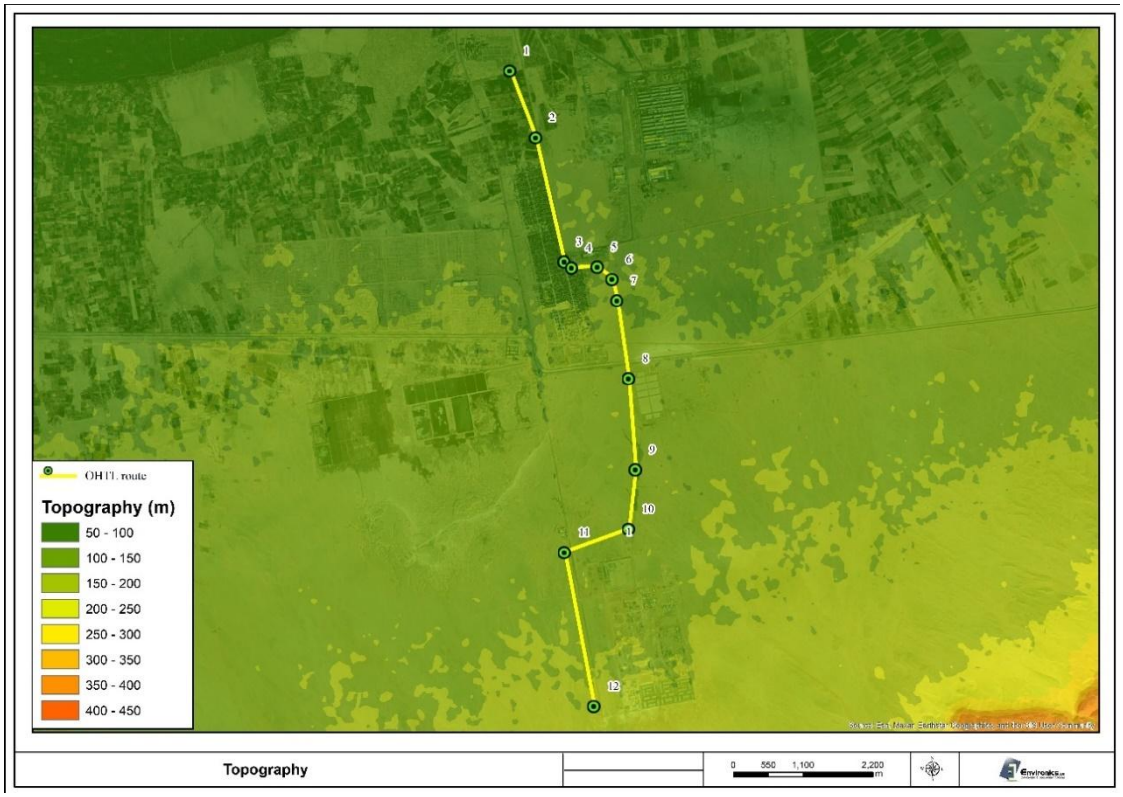

Figure 3-4: Topography of the land underlying the OHTL route

3.1.4 Hydrology

- ***Surface Water***

As previously mentioned, the OHTL route passes through the desert hinterland of Markaz Nagaa Hammadi, an area largely devoid of natural surface water bodies. However, three artificial water features are located near the alignment of the OHTL: the Alranan Canal, the Almarashda Canal, and a wastewater treatment lagoon (or a 'sewage pond').

The Alranan and Almarashda canals are located to the north of the OHTL route, with the Alranan Canal being the closest—approximately 2 km away. The wastewater treatment lagoon (sewage pond) is situated about 2.25 km to the east of the route, while the Almarashda Canal lies approximately 2.5 km to the north.

The only naturally occurring surface water body in proximity to the OHTL route is the River Nile, located approximately 3.5 km to the north (Figure 3-5).

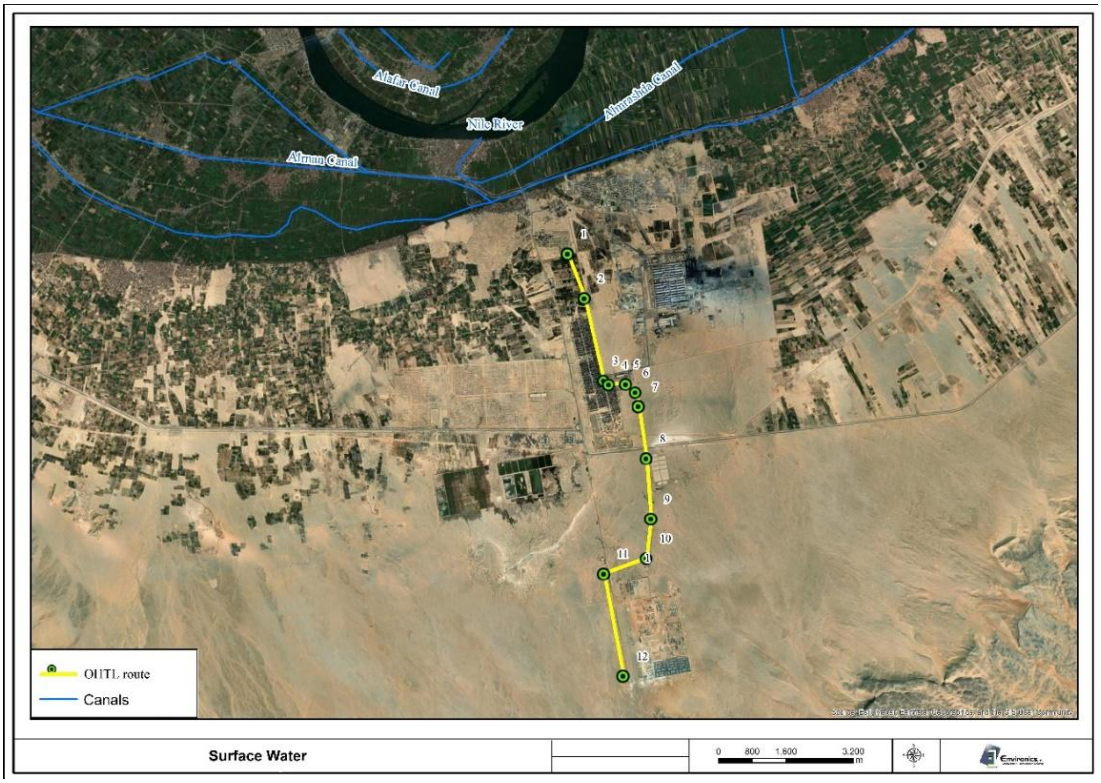

Figure 3-5: Surface water bodies in close proximity to the OHTL route

- ***Groundwater***

The Quaternary aquifer is the principal aquifer underlying the OHTL route. This aquifer represents the main groundwater resource in the Nile Valley. The Quaternary aquifer consists mainly of the Pleistocene graded sand and gravel intercalated with clay lenses and is underlain by an impermeable layer of Pliocene clays that prevents its connection with the deeper aquifers. It is covered by a permeable layer of Wadi deposits at the old alluvial floodplain, which means that groundwater occurs under unconfined conditions (Gaber et al., 2020).

In addition, the thickness of the aquifer varies from about 200 m at the center of the cultivated floodplain to about 80 m at the desert fringes. It is recharged continuously from excess irrigation water and occasionally from infrequent rainfall events. The old alluvial floodplain is characterised by moderate to very high recharge potentialities. The OHTL route is located in an area of high recharge groundwater potentiality (Figure 3-6) (Gaber et al., 2020).

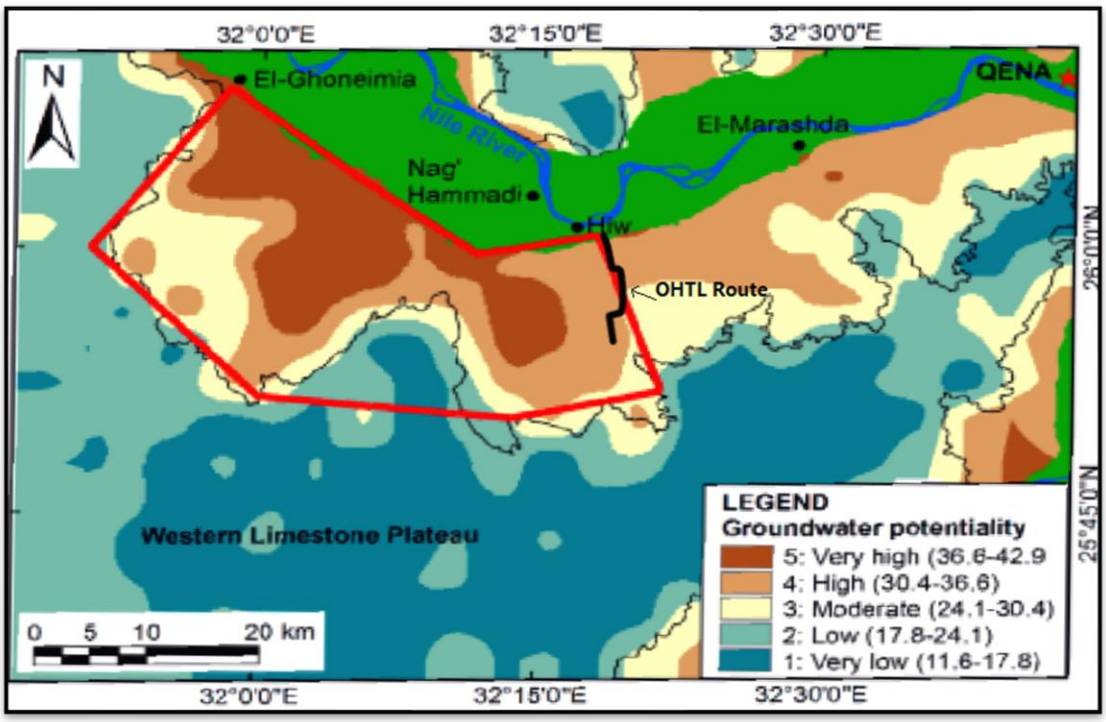

Figure 3-6: Groundwater recharge potentiality map including the OHTL Route

Lastly, the groundwater where the OHTL route passes over the aquifer which occurs at shallow depth ranging between about 30 m and 36 m closer to the agricultural lands. The depth increases towards the plateau, reaching depths exceeding 70 m (Gaber et al., 2020).

- ***Hydrological Hazards***
  - ***Flash Flooding***

    Although the locality wherein the OHTL route is situated receives negligible rainfall throughout the year, the potential for extreme rainfall events taking place in the Qena governorate, where the OHTL route is proposed, still exists. The Qena governorate is one of the most susceptible regions in the Nile Valley to flash flooding, particularly during the winter seasons (between October and February). This is a historical phenomenon, with numerous flash flood events having been documented in the Qena governorate since 1938 (Mohamed, 2019).

    Digital Elevation Models (DEMs) for the whole study area were obtained from the ALOS satellite for imaging and Earth observation. These are widely used to identify drainage basins to facilitate hydrological analyses. Morphological studies and identification of streams and drainage basins affecting the boundaries of the study area were performed using DEM within ArcGIS using ArcHydro Tools. Particular focus is placed on the southern segment of the OHTL route, as it is the one yet to be constructed. The relevant streams near the southern section of the OHTL route using DEMs are illustrated below (Figure 3-7). None of them are major streams that could affect the OHTL route.

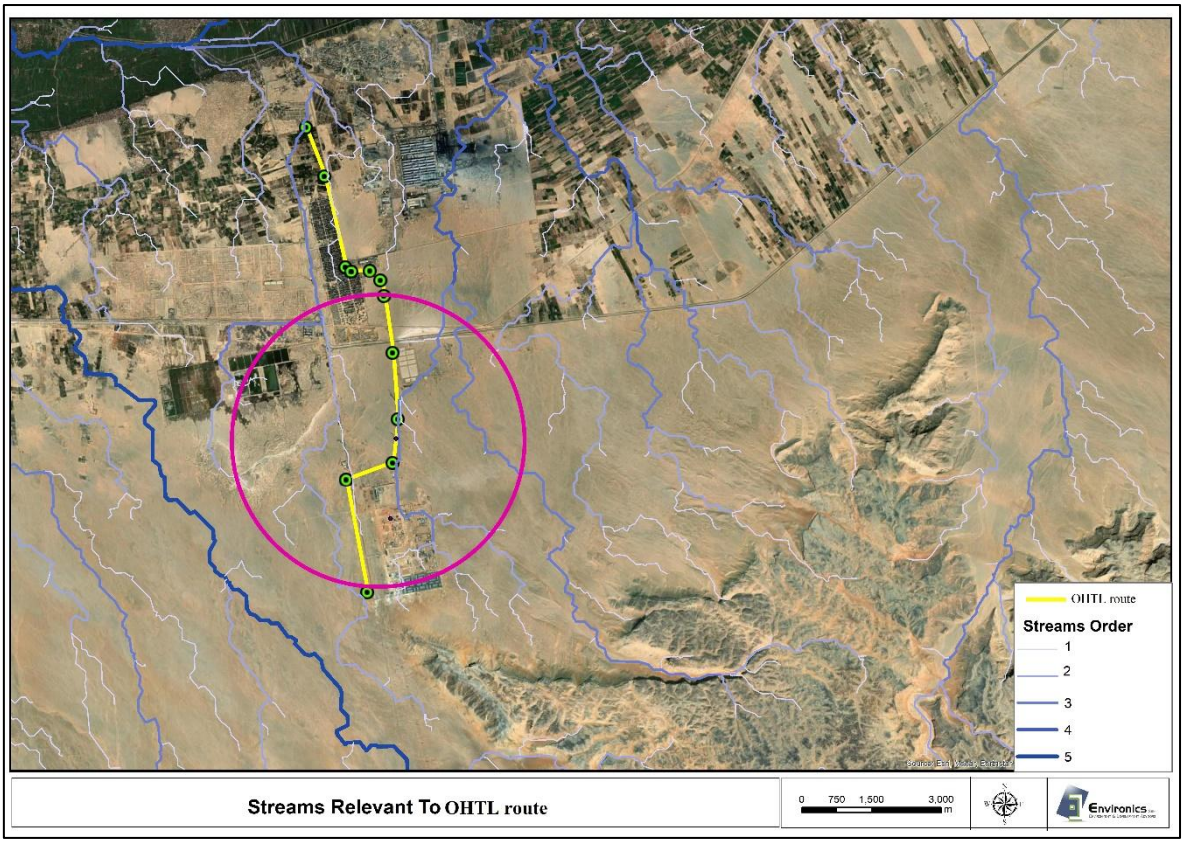

Figure 3-7: Streams relevant to the southern section of the OHTL route

A number of culverts are located under the Luxor – Giza Road in ethe middle of the OHTL route to control anticipated flooding events. The streams and the dams that were constructed to mitigate floods do not affect the OHTL route.

3.2 Biological Environment

The Overhead Transmission Line (OHTL) route is located at the fringes of the vast Egyptian Western Desert (WD) which covers about two thirds of the total area of Egypt. The WD can be divided into three principal physiographic regions:

- The Miocene Northern Plateau, which slopes towards the Mediterranean coast and where the inhabited Siwa Oasis and the Qattara Depression are located (EEAA, 1993).
- The Nubian Sandstone Plateau, which slopes gradually towards the north from Gebel Uweinat and the Gilf El-Kebir plateau, both located in the southwestern corner of Egypt (EEAA, 1993).
- The Middle Limestone Plateau (MLP) extends from latitude 25° N to 29° N. This plateau embraces a number of oases and depressions. The OHTL route is located in the southeastern corner of the MLP (Figure 3-8) (EEAA, 1993).

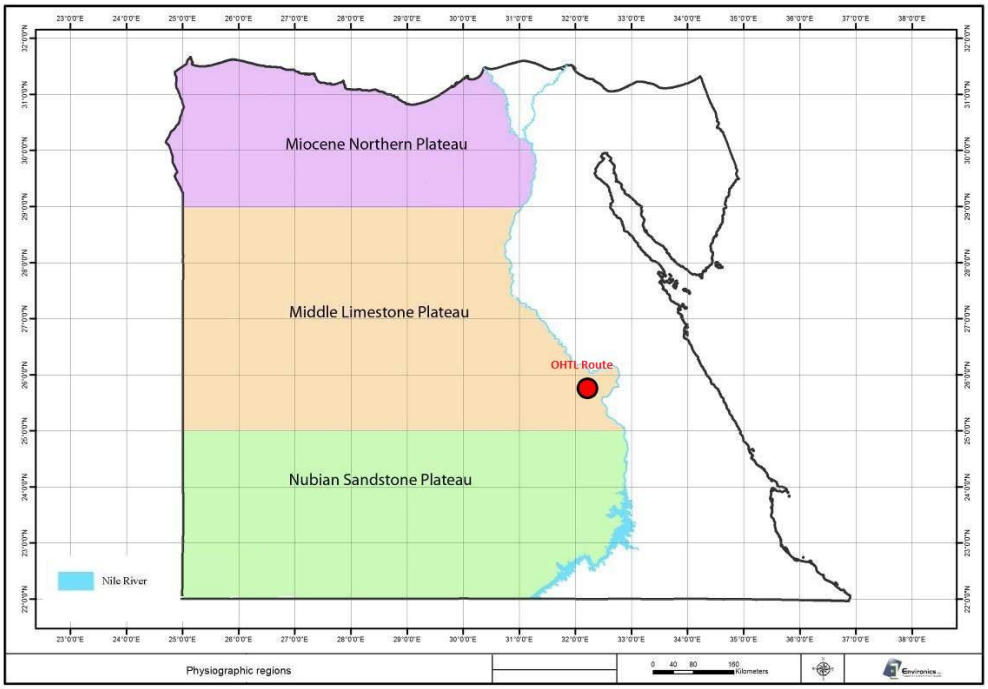

Figure 3-8: Physiographic regions of the WD and location of the OHTL route within the MLP of the WD

3.2.1 Habitats

In accordance with the International Finance Corporation's (IFC's) Performance Standard 6 (IFC PS6), habitat types are categorised into either modified or natural habitats. Modified habitats are "*areas that may contain a large proportion of non-native (i.e., introduced) floral and/or faunal species, and/or areas where human activity has significantly modified an area's primary ecological functions and species composition*". Modified habitats may also include areas managed for agriculture. On the other hand, natural habitats are "*areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition*" (IFC, 2012).

The European Bank for Reconstruction and Development (EBRD) has also set out clear definitions distinguishing between modified and natural habitats, both outlined in Performance Requirement 6 (PR6) of EBRD's 2019 Environmental and Social Policy (ESP):

"*Modified habitats are those where there has been apparent alteration of the natural habitat, often with the introduction of alien species of plants and animals, such as agricultural areas [...]*"

"*Natural habitats are land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions [...]*" (EBRD, 2019).

Due to the presence of reclaimed agricultural lands as well as man-made structures, both sections of the OHTL route fall under the overarching 'modified habitat' category, based on the definition of a modified habitat according to EBRD's 2019 ESP (Figure 3-9 and Figure 3-10).

Figure 3-9: Map of the southern section of the OHTL route depicting the modified nature of its surroundings

Figure 3-10: The modified nature of the land beneath the northern section of the OHTL route and its surroundings

- ***Habitat Topologies***

Modified habitats are the most significant habitat topology along the northern section of the OHTL route, particularly, farmland habitats. Firstly, there is a large area of reclaimed agricultural land, traversed by part of the northern section of the OHTL route as it extends towards the Nagaa Hammadi Transformer Substation. Secondly, roadside habitats would exist along almost the entire length of the northern section of the OHTL, with the Aluminum Baraka Road bordering the route to the west for most of its length. The entire length of the northern section of the OHTL route is about 3.66 km long.

The southern section of the OHTL route is approximately 7.8 km long and is characterised by urban and bare ground habitats. However, bare ground habitats are notably more extensive along the length of the southern section of the OHTL route. Furthermore, there are no farmland habitats in this segment of the OHTL route. Still, modified habitats are prevalent in roadside habitats. The southern segment of the OHTL route also passes over a road and railway tracks. There is also a wastewater treatment pond (covering an area of about 0.85 km^2), located about 2.25 km east of the southern section of the OHTL route.

The habitat map below depicts the habitat topologies dominating the land underlying the OHTL route for its entire length (11.46 km) (Figure 3-11) (Copernicus, 2025).

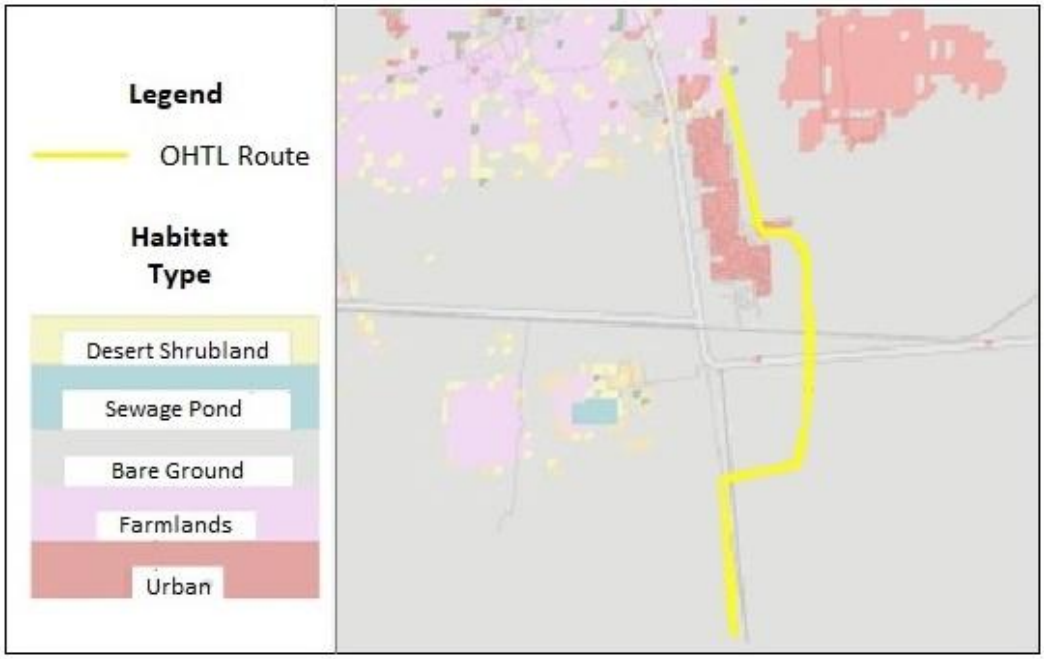

Figure 3-11: Habitat map indicating the most prominent habitat types of area directly below the OHTL route

- ***Bare Ground Habitats***

The majority of the Western Desert (WD) is covered by bare ground (also known as barren land). Bare ground habitats are defined as habitats where the soil surface is exposed, with little to no vegetation cover. Such habitats can offer limited soil and nutrients for plants and can be crucial for various faunal species that rely on bare ground for activities such as nesting and foraging (Chen et al., 2021). Although bare ground habitats have limited capacity to support human life, they are an important desert habitat for the desert-adapted native flora and fauna of the WD (El-Ramady et al., 2019).

- ***Farmland Habitats***

The River Nile is located about 3.4 km north of the OHTL route, and as previously mentioned, there is a large plot of reclaimed agricultural land, as well as an isolated pocket of reclaimed agricultural land east of the OHTL route and several others north of it. Although these lands are almost entirely modified, farmland habitats in such arid environs provide important habitat for numerous floral and faunal species due to high vegetation cover attracting species from the Nile Valley that would otherwise avoid this arid and largely barren part of the WD.

- ***Urban Habitats***

The main urban habitat types on the land along the length of the OHTL route and surroundings are the roadside and railway habitats, home gardens, ornamental patches, and decorative lawns. The diversity of flora and fauna that depend on these is detailed in the following section. However, these urban habitats are mainly home to exotic (i.e., alien or non-native) floral species and opportunistic faunal species closely associated with anthropogenic activity (e.g., feral dogs and cats, rats, mice, etc.).

3.2.2 Flora and Fauna

- ***Flora***

Due to the extreme aridity of the southeastern part of the WD's Middle Limestone Plateau, where the OHTL route is located, wild, native floral species diversity and vegetation cover is markedly poor. Perennial plant life in this part of the WD is largely confined to the oases and depressions of the plateau, of which, there are none extending to either section of the OHTL route. Outside of these oases and depressions, plant life is mostly ephemeral (annual) and limited due to its dependence on the low chance of rainfall. This type of vegetation is defined as "accidental vegetation" as it occurs where precipitation is so low and falls so irregularly that no permanent vegetation exists (Abd El-Ghani, 2000).

Due to the MLPs aridity, the majority of it is totally devoid of flora, save for a few deserts adapted floral species distributed as scattered, isolated shrubs throughout the plateau. These species are adapted to the harsh conditions of the WD outside of its oases and depressions. In the sandy bare ground habitats of the WD where the southern section of the OHTL route is, characteristic species are; the Syrian mesquite (*Prosopis farcta*), *Caroxylon imbricatum* (Syn: *Salsola imbricata*) (Abd El-Ghani, 2000), *Bassia eriophora*, *Haloxylon salicornium*, *Zygophyllum album*, and *Pulicaria undulata* (Pokorný & Pokorná, 2010).

In terms of the farmland habitats along the northern section of the OHTL route, the native species of the agricultural landscape of the area are; *Acacia nilotica*, *Tamarix aphylla, T. nilotica*, and *Cotropis procera*. The most common alien species and weeds associated with the major crops of Qena's reclaimed agricultural lands are; *Sonchus oleraceus*, *Chenopodium murale*, *Convolvulus arvensis*, *Melilotus indicus*, *Cynodon dactylon*, and *Portulaca oleracea* (Salama et al., 2016).

Furthermore, *Deverra tortuosa*, also known as "Shabat El-Gabal" is found in almost all of Egypt's phytogeographical regions, particularly in desert plains where it is a widespread and common plant. *D. tortuosa* can grow in a variety of habitats in Egypt including farmland habitats and roadsides (Bedair et al., 2020; Slima et al., 2021).

Lastly, the urban desert edge habitats and farmland margin habitats of the areas extending between the sandy bare ground and cultivations typically include; *Calligonum polygonoides*, *Desmostachya bipinata*, *Stipagrostis scoparia*, *T. passerinoides*, *T. amplexicaulis,* and *Alhagi graecorum* (Pokorný & Pokorná, 2010).

In terms of the urban habitats , these can be divided into two main project relevant habitats; the habitats associated with the rural settlements adjacent to the OHTL route (e.g., the El-Baraka sub-village) and the railway and roadside habitats.

Examples of urban habitats associated with the inhabited rural areas in the vicinity of the OHTL route include home gardens, decorative lawns, and ornamental patches. Floral communities associated with these habitats in the WD's harsh desert environs are usually dominated by; the Hairy fleabane (*Conyza bonariensis*), *Euphorbia hirta*, Perennial ryegrass (*Lolium perenne*), and the Annual beard-grass (*Polypogon monspeliensis*) (Pokorný & Pokorná, 2010).

The Hairy fleabane (*C. bonariensis*) is most typically found in highly modified and disturbed habitats, roadsides, and farmland habitats. However, it is considered an invasive weed in Egypt. Hairy fleabane is reported to be resistant to paraquat, a commonly used herbicide, complicating weed management strategies in Egyptian agriculture (Mahanur et al., 2023). *C. bonariensis* also invades non-cultivated lands, gardens, and roadsides in Egypt, particularly in the WD (El-Ghani et al., 2013).

Lastly, the following species are characteristic of the railway and roadside vegetation in Qena's desert hinterland; *Phragmites australis*, *Zygophyllum coccineum*, *Schouwia purpurea*, *Zilla spinosa* and *Pulicaria undulata* (Abd El-Ghani et al., 2013).

- ***Fauna***

a) Herpetofauna

Based on species distribution maps for the amphibians and reptiles of Egypt and their suitable and preferred habitat types, the following species may occur along parts of the area underlying either the northern or southern sections of the OHTL route.

b) Amphibians

The African toad (*Sclerophrys regularis*) is a very adaptable species and primarily lives in farmland habitats as well as urban habitats, including small gardens in residential areas (such as the home gardens of the El-Baraka sub village) west of the northern section of the OHTL route). In Egypt, the range of the species is increasing with the development of desert land reclamation for agriculture schemes (Baha El Din, 2006; IUCN, 2024).

c) Reptiles

- **Snakes**

The Horned viper (*Cerastes cerastes*) is also a widespread desert species found throughout Egypt's WD and found in most desert habitat types. It is more frequently found in patches of loose sandy soils in fairly exposed situations and has a high capacity to tolerate extreme hyper-arid habitats. *C. cerastes* is one of only two snakes to be encountered over almost all of Egypt's deserts, with the other being the Saharan Sand Snake (*Psammophis aegyptius*). The Saharan sand snake is predominantly found in sandy and rocky desert areas and is particularly common in open desert habitats devoid of vegetation (Baha El Din, 2006; IUCN, 2024), such as the bare ground habitats along parts of the OHTL route. Furthermore, the farmland habitats of the OHTL route may attract species such as the Striped Sand Snake (*P. sibilans*). This snake is found in the cultivated areas as well as the naturally vegetated habitats along the Nile in Egypt, however, its range is expanding into areas reclaimed from the desert for agriculture. This snake is near endemic (Egypt, Sudan and Somalia) (Baha El Din, 2006; IUCN, 2024).

The Diadem Snake (*Spalerosophis diadema*), another common snake species in Egypt, is widely distributed in the WD along the margins of the Nile Valley, and is also associated with bare ground habitats in arid and semi-arid areas. It inhabits a wide variety of desert habitats in Egypt, including desert fringes of cultivations, and urban desert areas. Lastly, the Kenyan Sand Boa (*Eryx colubrinus*) may also occur, as this species is regularly found in gardens and subsidence agricultural lands. In Egypt, it mainly inhabits the margins of agricultural lands as well as urban desert edge habitats (Baha El Din, 2006; Saber & Masood, 2011; IUCN, 2024).

- **Lizards**

The Egyptian subspecies of Bosc's Fringe-toed Lizard (*Acanthodactylus boskianus* subsp. *asper*), one of the most common and widespread reptiles in Egypt, has a high likelihood of frequenting either of the two sections of the OHTL route, owing to its prominence in the WD. This species is generally found in open, arid areas with a sandy or clay substrate, including areas with sparse vegetation. *A. b. asper* individuals are also known to inhabit traditionally cultivated lands. The Red-spotted Desert Racer (*Mesalina rubropunctata*) is a species of extreme desert, is also typically found in open desert areas of the WD, with or without scant vegetation cover. It is often the only easily observed vertebrate in the most remote and harsh parts of the WD (Baha El Din, 2006; IUCN, 2024).

Lastly, the Desert Monitor (*Varanus griseus*) could also potentially frequent parts of the OHTL route where suitable habitats are available, essentially the sandy areas where some desert scrub is available east of the southern section of the OHTL route and the edges of the farmland habitats along the northern section of the route. This species has also been recorded throughout the WD in areas completely devoid of vegetation. This species is never found within reclaimed agricultural lands, however, it is known from the edges of these (Baha El Din, 2006; Saber & Masood, 2011; IUCN, 2024).

d) Avifauna

Based on data extracted utilisng the Migratory Soaring Bird Tool (MSBT) developed by BirdLife International (BI), species distribution maps and recorded observations of the birds of Egypt and their habitat preferences, the following species are likely to occur in the area of OHTL route, either as residents or passage migrants.

Resident Breeders

The Qena governorate has a relatively high diversity of avifauna amounting to several hundred species; however, resident breeding bird species comprise less than 30% of the total number of species recorded in the governorate. The majority are transit populations of passage migrants, winter visitors and summer visitors. The Grey heron (*Ardea cinerea*), for example, is a fairly common visitor in the summer, but nesting has not been recorded. Resident breeding birds are for the most part dominated by species inhabiting arable habitats and the desert-adapted species. The desert-adapted resident breeders characteristic of the WD's sandy desert habitats include the Spotted Sandgrouse (*Pterocles senegallus*), Cream-coloured Courser (*Cursorius cursor*), and the Brown-necked Raven (*Corvus ruficolllis*) (EEAA, 1995).

Common breeding birds of the Nile Valley and Delta include 66 species (Goodman et al. 1989) and at least 14 of these are known to breed outside the Nile Valley and Delta. These include the Cattle Egret (*Bubulcus ibis*), Black-winged Kite (*Elanus caeruleus*), Black Kite (*Milvus*

migrans), Common Kestrel (*Falco tinnunculus*), Common Moorhen (*Gallinula chloropus*), Spur-winged Lapwing (*Vanellus spinosus*), Greater Painted-snipe (*Rostratula benghalensis*), Laughing Dove (*Spilopelia senegalensis*[3]), Senegal coucal (*Centropus senegalensis*), Barn owl (*Tyto alba*), Asian green bee-eater (*Merops orientalis*), Crested Lark (*Galerida cristata*), Barn Swallow (*Hirundo rustica*), Western Yellow Wagtail (*Motacilla flava*), Graceful Prinia (*Prinia gracilis*), Hooded Crow (*Corvus cornix*[4]) and the House Sparrow (*Passer domesticus*) (Saleh, 1993). Some of these Nile Valley species are expected to have expanded in the reclaimed agricultural lands located in close proximity close to the northern OHTL section where Cattle Egret and Common Hoopoe (*Upupa epops*) have been effectively recorded (Figure 3-12 and Figure 3-13).

Figure 3-12: Cattle Egrets in a reclaimed agricultural land

Figure 3-13: A Common Hoopoe in a reclaimed agricultural land

Migratory Birds

According to the results of assessment of the importance of the area where the southern section of the OHTL route is proposed to Migratory Soaring Birds (MSBs), there are two MSB species which could fly over this section of the OHTL route on migration. This is based on the three satellite tracks depicted in the figure below (Figure 3-14) of tagged MSB species over the northern and southern sections of the OHTL route, including a 5.5 km radius input into the assessment to act as a buffer zone. One of the satellite tracks belonged to the White Stork (*Ciconia ciconia*) and the remaining two belonged to the Egyptian Vulture (*Neophron percnopterus*).

[3] Previously placed in the genus *Streptopelia*

[4] Considered until recent times a subspecies of *Corvus corone*

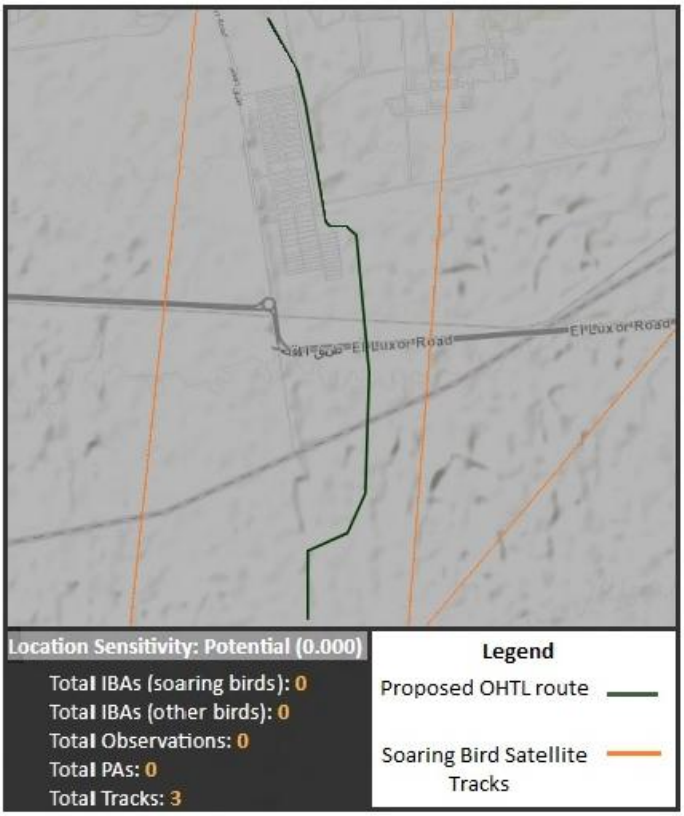

Figure 3-14: Results of the MSBT assessment illustrating the OHTL route's location's low (0.0) location sensitivity index

The results of the MSBT assessment indicate that the location sensitivity index (SI) was found to be 0.000, implying that the area of the OHTL route is not an important migratory route for MSBs (MSBT, 2024).

Nonetheless, it is worth mentioning that the northern segment is closer to the Nile Valley and its northern half crosses a large plot of farmlands, where food and water are more available (as confirmed by the presence of resident birds typical of agricultural areas), thus birds potentially flying at lower altitudes and using these areas as a resting and fueling station cannot be excluded. However, as the Nile Valley is more abundant in terms of resources for MSBs, this is expected to be at a relatively low occurrence, and it is more likely that the MSBs would have more suitable rest-stops closer to the Nile Valley further to the north

On the other hand, the southern section passes through an area mostly consisting of bare ground with very little or no vegetation. Since there are no resources in this section to attract these birds, it is unlikely that their passage over the area will be of any concern.

In fact, a key point relevant to considering the airspace utilised by avifauna is that the airspace is "anchored" to an important terrestrial area from which avifauna could take advantage. In other words, the airspace is typically considered with respect to the ecological use of terrestrial habitat and not "on its own"[5]. In the present case, the southern section of the OHTL route is located in an area which does not provide any resources to avifauna in terms of food and resting areas.

[5] IFC (n.d.) Memorandum Determining Biodiversity Management Requirements Related to Airspace around Wind Energy Facilities

Accordingly, the locality where the OHTL route is situated is likely to be one of 'low intensity passage' (i.e., a low number of individual birds per species passing over a defined location during migration). However, the northern section is more likely to experience a higher occurrence of birds.

e) Mammals

Based on species distribution maps for the mammals of Egypt, recorded observations of mammals in the literature, and their suitable and preferred habitat types, the following species may occur along parts of the area underlying either the northern or southern section of the OHTL route.

Large Mammals

Rüppell's Fox (*Vulpes rueppellii*) is the most widespread desert fox in Egypt, and the most likely to be seen in true desert areas. It is widespread throughout the WD and has been recorded from all desert habitat types, including areas devoid of water, as well as farmlands. It typically prefers habitats in open sandy and stony deserts, often with sparse vegetation cover dominated by small desert scrubs. The Fennec Fox (*Vulpes zerda*) could also be present along parts of the OHTL route, as this fox is mainly recorded in Egypt from the WD, including from the harsh environs of the southern WD. This fox actively avoids fertile desert areas, preferring sandy desert spots with some vegetation, and is one of the few carnivores that can survive without water (Hoath, 2009; Basuony et al., 2010; IUCN, 2024).

Although the Dorcas Gazelle (*Gazella dorcas*) has the capacity to inhabit a wide range of arid and semi-arid habitats, including sparsely vegetated rocky and/or sandy plains, and the margins of sandy desert, it is less likely to frequent or inhabit the OHTL route's locality as its range in Egypt has been drastically reduced due to habitat loss and hunting activities (Hoath, 2009; Basuony et al., 2010; IUCN, 2024). Moreover, the area is already disturbed by the human presence and gazelles are known to avoid man-made habitats including agricultural areas (Chammem et al., 2008), while the undeveloped parts of the southern sector are almost entirely barren, not providing food and shelter.

Small Mammals

There are three rodents with a high likelihood of occurring along either section of the OHTL route, these are the Lesser Egyptian Gerbil (*Gerbillus gerbillus*), Greater Egyptian Gerbil (*Gerbillus pyramidum*) and the Lesser Egyptian Jerboa (*Jaculus jaculus*). *G. gerbillus* is one of the most widespread Egyptian mammals and occurs throughout the WD. It is typically found in dry sandy or rocky areas, sometimes with sparse vegetation, and tends to burrow in sandy areas clear of vegetation. It is also known to be attracted to campsites. *J. jaculus* has been recorded throughout the WD and has been described as "one of the most successful mammalian colonists of the desert peninsula of Arabia". *G. pyramidum*, is also widespread throughout the WD and is associated with the sandy habitats of the WD, including both true desert and semi desert habitats. In more barren and arid areas, it is more likely to be found around buildings, cisterns, or near cultivated areas (Hoath, 2009; Basuony et al., 2010; IUCN, 2024).

Bats

There are four species of bats that may cross over the OHTL route in-flight and/or its vicinity. These are the Cape Long-eared Bat (*Nycteris thebaica*), Greater Mouse-tailed Bat (*Rhinopoma microphyllum*) and Rüppell's Pipistrelle (*Pipistrellus rueppellii*) and the Egyptian Fruit Bat (*Rousettus aegyptiacus*). The Cape Long-eared Bat has a wide habitat tolerance which includes semi-desert and true-desert habitats, whilst the Greater Mouse-tailed Bat is a true desert species that occurs in arid areas with sparse vegetation. Lastly, Rüppell's Pipistrelle is one of the most highly adapted bats to arid conditions and has also been recorded from several parts of the Qena governorate. In Egypt, *P. rueppellii* is commonly found in desert and semi-desert areas, including urban desert edge habitats (such as the location of the OHTL route) (Hoath, 2009; Basuony et al., 2010; IUCN, 2024).

3.2.3 Ecological Sensitivities

The following sections identify and describe species of conservation concern (i.e., endangered, threatened, endemic, highly sensitive, keystone species) from the above-mentioned species potentially occur at the location of the OHTL route. However, it should be taken into consideration that the length of the OHTL route is negligible when compared to the vast extent of the Western Desert (WD). Moreover, the site is not characterised by any ecological features that renders it particularly attractive to faunal species. Therefore, even if one or more of these species were present onsite, relocation to other readily available suitable habitats is the most likely outcome to any disturbance.

- ***Flora***

None of the floral species mentioned in the inventory of species typical of the habitats of the area underlying the OHTL route are endemic or threatened, neither on the national level, Mediterranean level, or the global scale.

- ***Fauna***
  - ***Herpetofauna***

Out of the above-mentioned amphibians and reptiles that may inhabit or occur the area along the OHTL route or its adjacent surroundings, there is one snake and one lizard of conservation concern: the Kenyan Sand Boa (*Eryx colubrinus*) and the Desert Monitor (*Varanus griseus*). The Kenyan Sand boa (*Eryx colubrinus*) is threatened by collection for the pet trade, and local reclamation of suitable habitats for intensive agricultural use. Although, this snake's global conservation status is listed as a species of Least Concern (LC), it is classified as a Vulnerable (VU) species at the national level. It is listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), a multilateral treaty to which Egypt is a member party (Baha El Din, 2006; Saber & Masood, 2011; El-Gabbas et al., 2016; IUCN, 2024).

The Desert monitor (*Varanus griseus*) is also globally listed as a species of LC but is nationally categorised as a NT species (Baha El Din, 2006). However, as this conservation status listing was published nearly a decade ago, this species may be classified as a VU species in Egypt. This ensures a more precautionary approach to assessing a species' threat level based on dated and/or limited information. The Desert Monitor is also listed on Appendix I of CITES (Saber & Masood, 2011; El-Gabbas et al., 2016; IUCN, 2024).

- ***Avifauna***

All of the resident breeding bird species mentioned above are widespread and common species throughout Egypt. However, out of the two MSB species presumed to fly over the OHTL route on migration via the MSBT assessment of the satellite tracks of tagged MSBs, only one is globally threatened; the Egyptian vulture (*Neophron percnopterus*). The Egyptian vulture is classified globally as an EN species, and at the Mediterranean scale, it is considered a VU species. Furthermore, it is listed in Appendices I and II of the Convention of Migratory Species of Wild Animals (CMS), of which Egypt is a signatory . The other MSB with a chance of flying over the OHTL route on migration, the White Stork (*Ciconia ciconia*), is also listed under Appendix II of CMS, however, it is not a threatened species (IUCN, 2024).

- ***Mammals***

The Dorcas Gazelle (*Gazella dorcas*) is the primary mammalian species of concern due to the important ecological roles it plays in Egypt's deserts as one of the largest remaining herbivores[6]. Nevertheless, the OHTL route not only lacks suitable foraging habitats but is also already disturbed by human presence and activities, the Dorcas Gazelle is known to avoid. Accordingly, this species is highly unlikely to be encountered in close proximity to the OHTL route.

Another mammal of conservation concern that may visit parts of the area underlying the OHTL route is the Fennec Fox (*Vulpes zerda*). The Fennec Fox is categorised as LC at the global and Mediterranean levels; however, it is nationally classified as EN species, due to heavy trapping pressure for the pet trade. *V. zerda* is also listed in CITES Appendix II. The aforementioned bat species are also generally sensitive taxa, due to the marked sensitivity bats have to increased noise disturbance general disturbance. However, Rüppel's Pipistrelle (*Pipistrellus rueppellii*) and the Greater Mouse-tailed Bat (*Rhinopoma microphyllum*) are both markedly noteworthy due to their threatened statuses In Egypt. Despite being listed by the IUCN as LC at the global level, both species are categorised as VU at the national level (Hoath, 2009; Basuony et al., 2010; IUCN, 2024).

- ***Key Biodiversity Areas***

The OHTL route does not encompass any Key Biodiversity Areas (KBAs), Protected Areas (PAs) legally protected by the Egyptian Government, BirdLife International designated Important Bird Area (IBAs), or PlantLife International designated Important Plant Areas (IPAs). The closest KBA to the OHTL route is located at a substantial distance away, the Upper Nile IBA, which is situated about 40 km east of the of the OHTL route. The next closest ecological sensitive area is the Dababia PA, which is around 50 km southeast of the OHTL route and not considered a KBA, but rather, protected for its geological significance (Figure 3-15).

[6] The Dorcas Gazelle has lost approximately 86% of its historical global range and is regionally categorised an EN species (at the Mediterranean level), globally as VU and is probably Critically Endangered (CR) in Egypt. It is also listed in Appendix I of CMS. Major threats to the animal are habitat degradation, overhunting, and drought (Hoath, 2009; Basuony et al., 2010; IUCN, 2024). This species is highly sensitive to human disturbance and tends to become nocturnal when threatened by human presence. Human activities and land use are currently limiting the distribution and abundance of gazelle populations, which are in rapid decline in Egypt, especially outside protected areas (El Alqamy & Bahaa El Din, 2006; Soultan et al., 2021; Nagy et al., 2022).

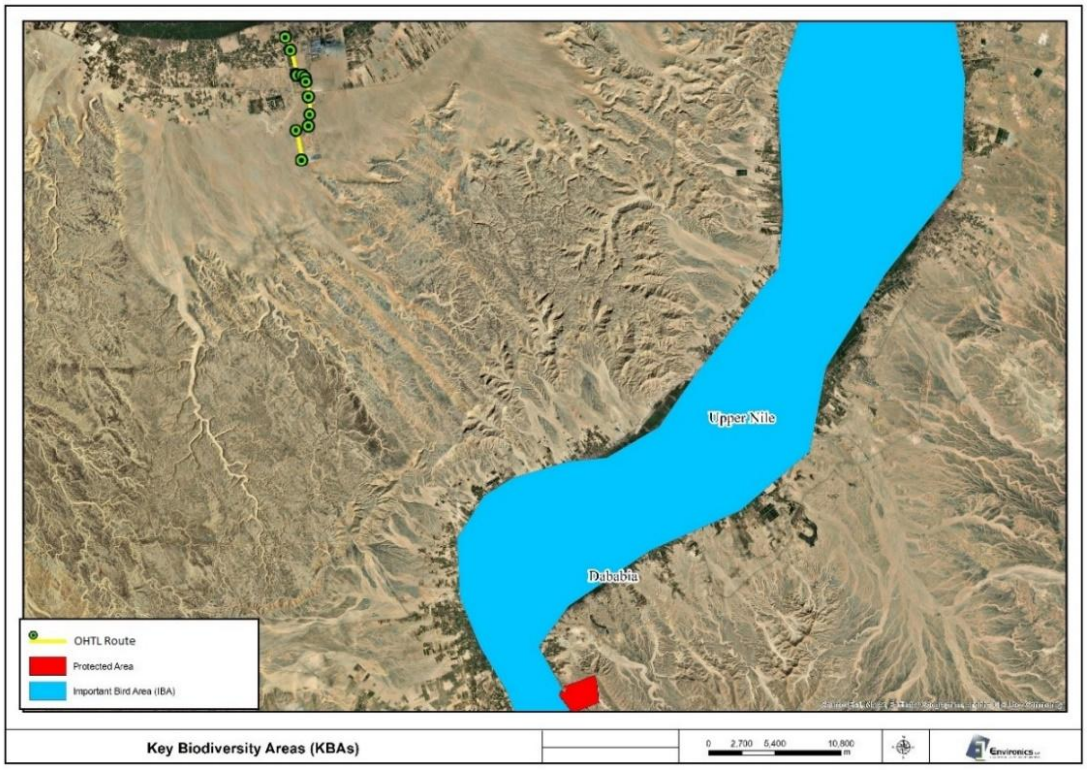

Figure 3-15: Nearest key biodiversity areas, the Upper Nile IBA and the Dababia PA, to the OHTL route

Lastly, the Wadi Qena proposed PA is located on the fringes of the Eastern desert about 80 km northeast of the OHTL route and is separated from it by the Nile.

3.2.4 Ecological Value and Significance

According to the Integrated Biodiversity Assessment Tool (IBAT), the biological significance or value of an area to the area's local flora and fauna can be represented by a rarity-weighted richness map. A rarity-weighted richness map is a raster layer showing the relative importance of each ~10 km grid cell in terms of its aggregate contribution to the global distribution of species of mammals, birds, amphibians, crabs, crayfishes and shrimps and a representative set of plant taxa. High values show that a cell holds a large number of species and/or that the average ranges of the species present in the cell are small, so that the cell represents a relatively high proportion of their range.

As illustrated below (Figure 3-16), the OHTL route is located in an area of low to moderate rarity-weighted richness (i.e., its relative importance to the global distribution of different categories of species ranges between low and moderate importance) (IBAT, 2024).

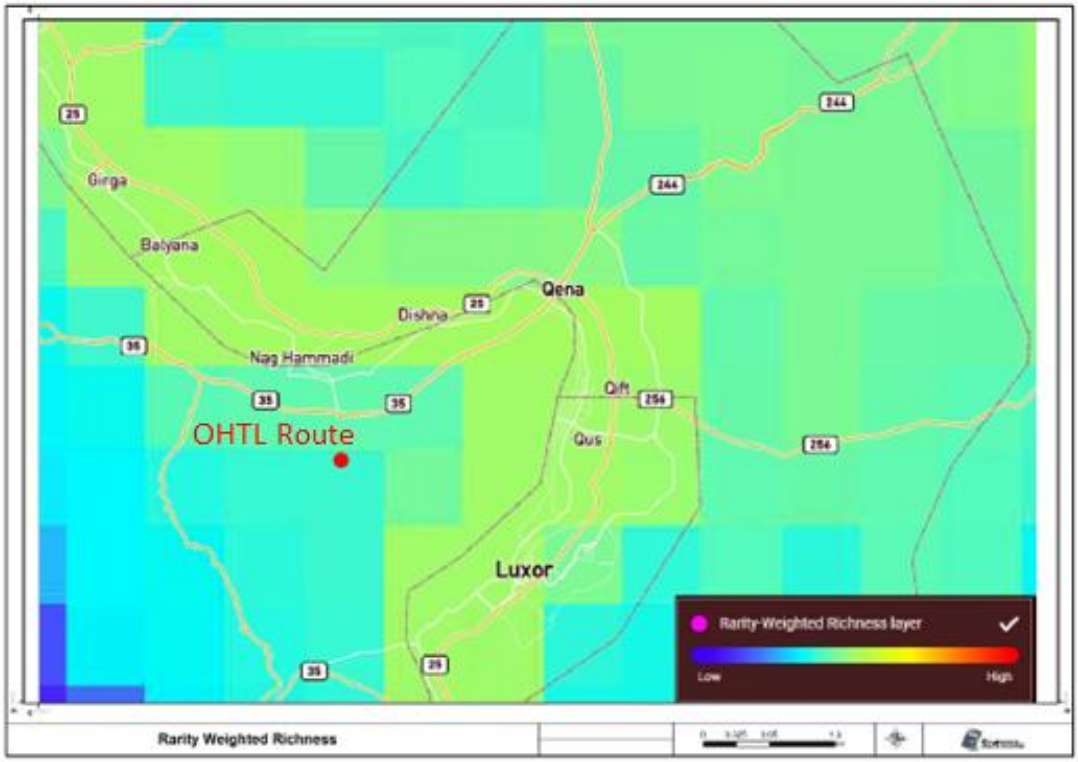

Figure 3-16: Rarity-weighted richness map illustrating the low value of the OHTL route's locality to global biodiversity

3.2.5 Ecosystem Services

Paragraph 2 of IFC Performance Standard 6 (PS6) defines ecosystem services as the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organised into four types:

(i) Provisioning services, which are the products people obtain from ecosystems such as food, freshwater, timber, fibers and medicinal plants;
(ii) Regulating services, which are the benefits people obtain from the regulation of ecosystem processes such as surface water purification, carbon storage and sequestration, climate regulation and protection from natural hazards;
(iii) Cultural services, which are the nonmaterial benefits people obtain from ecosystems and may include natural areas that are sacred sites and areas of importance for recreation and aesthetic enjoyment; and
(iv) Supporting services, which are the natural processes that maintain the other services.

Provisioning Services

The northern section of the OHTL route entails several existing transmission towers and t extends for about 3.8 km. The northernmost part of this section of the OHTL route, about 1.5 km of it passes through a plot of reclaimed agricultural lands.

Regulating Services

The area underlying the OHTL route does not contribute to ecosystem processes (such as pollination, seed dispersion, etc.) in any substantial manner, due to its barren, species poor and highly modified nature, particularly in terms of its lack of vegetation cover, outside of its scant desert scrub and reclaimed agricultural lands.

Cultural Services

The OHTL route itself does not directly entail any elements that would allow for recreational use, aesthetic enjoyment, and has no indications of spiritual or other cultural purposes.

Supporting Services

As above, the area underlying the OHTL route does not contribute to any supporting ecosystem services (i.e., services that maintain fundamental ecosystem processes, such as habitat provision for flora and fauna) in any substantial manner, due to its resource poor and highly disturbed nature, particularly in terms of its lack of vegetation cover and natural habitat availability.

3.2.6 Critical Habitats

Paragraph 16 of IFC PS6 defines Critical Habitat (CH) as an area with high biodiversity value, which meets the following criteria:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species
- Criterion 2: Endemic and/or restricted-range species
- Criterion 3: Migratory and/or congregatory species
- Criterion 4: Highly threatened and/or unique ecosystems
- Criterion 5: Key evolutionary processes

The OHTL route and the localities in its proximity are largely either barren desert lands with no or sparse vegetation, or highly modified and disturbed urban habitats. Such habitats are common and recurring throughout the WD. Moreover, even if one or more of the reported species of conservation concern was found to be present in the area, this would likely be in low densities. This, coupled with the small geographical area taken up by the OHTL route (compared to the vast size of the WD) would not trigger the thresholds for the above-mentioned criteria. Therefore, no CHs are expected to exist within or in close proximity to the OHTL route.

3.3 Socio-economic Environment

This section describes the baseline socio-economic conditions and demographic characteristics of areas around the OHTL route, including some general information on the Qena governorate and the concerned local villages (e.g., their existing infrastructure, utilities, and land use types), focusing on Markaz Nagaa Hammadi ('Markaz[7] is the Arabic term for a governorate's second-level hierarchy beneath the governorates, the term loosely translates to the English definition of a 'county') as well as Al Hew village, mainly due to its status as being the potential host community.

The information described below is derived from secondary sources, including the official website of the Qena Governorate (QG), the Central Agency for Public Mobilization and Statistics (CAPMAS) the State Information Service (SIS), the official media and public relations apparatus of the Egyptian state. This information is also supplemented and verified during meetings with local unit officials.

The OHTL route is located within the desert hinterland of the city and Markaz Nagaa Hammadi of the Qena governorate., The residential area of the Al Baraka (settlement administratively affiliated to Al Hew village of Markaz Nagaa Hammadi is situated to the east of the northern section of the OHTL route.

3.3.1 Local Context

Hew Village is bordered by the Sugar Factory from the North, and the Aluminium Factory and El Derb Village from the South and Baraka village on the east .

During consultation sessions with local authorities and local leaders , it was advised that all agricultural lands are State-owned (agricultural reform lands), where some farmers have legally transacted the lands and others are still holding a usufruct contract. The main crop cultivated in Al Hew Village is sugar cane and other traditional crops, e.g., wheat, corn, beans, clover, and vegetables.

According to the Key Informant Interviews held at Al HEW local unit held with the local authorties and local leaders, the Local Unit is the local administrative body , while local residents are represented by = members of the Parliament[8] . Although not elected, village Omdas and Sheikhs are also considered representatives . The Hew Agricultural Cooperative, also has an important role as it provides farmers with agricultural supplies, e.g., seeds, fertilizers, and pesticides. However, in case of any problems related to water supply or= power cuts, farmers refer to the local unit. While in cases of disputes among farmers, they refer to local leaders.

3.3.2 Socio-demographic Characteristics

The Qena governorate is one of Egypt's South Upper Egypt's governorates. It is known for its strong agricultural and industrial economic sectors, particularly as the nation's leading

[7] The Capital of the Markaz id considered a city or town.

[8] Mr Khaled Khalaf-Allah was mentioned as an active member of Parliament

producer of sugar cane, tomato, banana, sesame, and hibiscus. The total cultivated area in the Qena governorate is approximately 1,225.14 km2, with sugar cane accounting for 64% of this area and contributing to 60% of the nation's sugar production.

The total area of the Qena governorate amounts to 10,798 km², this translates to approximately 1% of the total area of Egypt proper. The inhabited parts of the governorate take up an area covering around 1,740 km², accounting for 16.11% of the governorate's total area (SIS, 2016; QG, 2024).

- ***Administrative Divisions***

The Qena governorate is divided into various administrative divisions including one "Kism" (i.e., district), Kism Qena, one new city, 41 main villages, 111 affiliated villages, and 1,466 hamlets and small villages. These villages and hamlets administratively fall under the governorates Marakiz, of which there are 8; Markaz Abu Tesht, Dishna, El-Waqf, Farshut, Naqada, Qena, Qift, and Markaz Qus and, Markaz Nagaa Hammadi where the OHTL route is located (Figure 3-17) (SIS, 2016; QG, 2024).

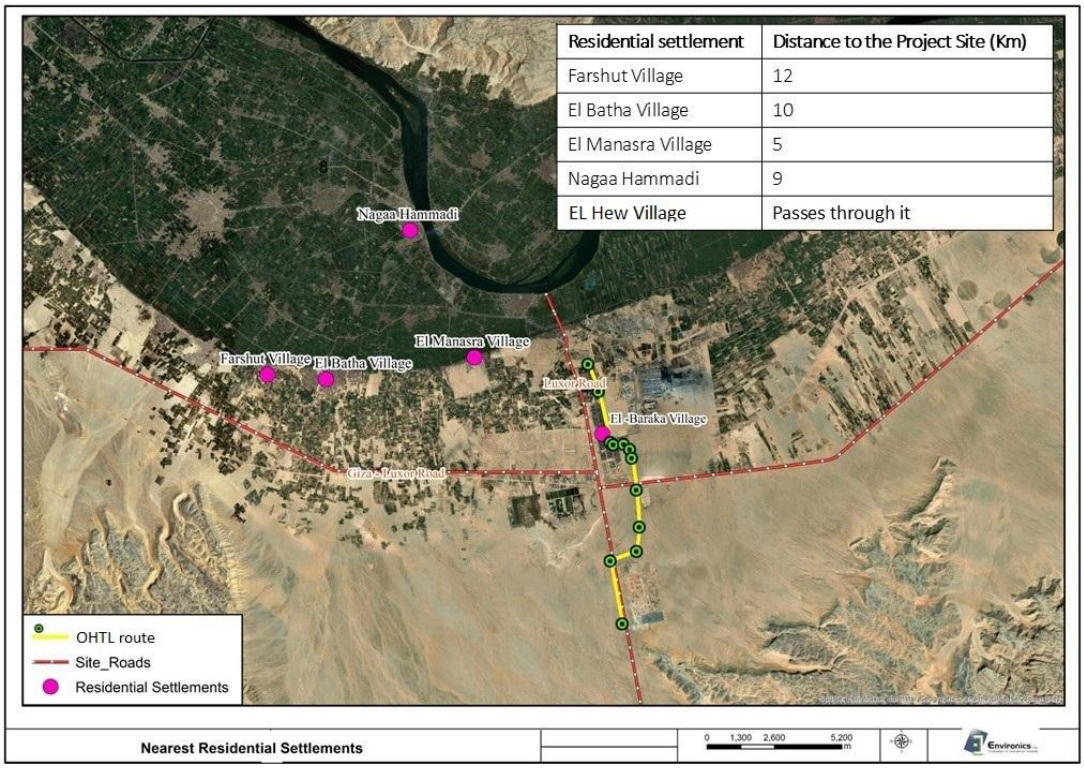

Figure 3-17: Locations of the residential areas and settlements in close proximity to the OHTL route

- ***Population***

The total population size of Qena governorate is 3,164,281 people, with a nearly equal gender distribution, with a population gender ratio of approximately 105 males to 100 females. However, rural residents make up the vast majority of the population (81.21%), while urban areas house the remaining 18.78% of the population. The governorate has 748,990 households and within its inhabited areas, the population density is around 1,827.8 individuals/km2. In Markaz Nagaa Hammadi, the total population size amounts to 578,237 individuals, with males accounting for 51.07% (295,357) and females 48.92% (282,880), again

a highly balanced population in terms of gender. An overview of the population demographics of the Qena governorate and Markaz Nagaa Hammadi is provided below (Table 3-8) (CAPMAS, 2017).

Table 3-8: Population demographics of the Qena governorate and Markaz Nagaa Hammadi

Demographic Characteristic	Qena Governorate	Markaz Nagaa Hammadi
Total Population (TOT)	3,164,281	578,237
Male Population	1,623,352	295,357
Male Population (% of TOT)	51.3	51.07
Female Population	1,540,929	282,880
Female Population (% of TOT)	48.69%	48.92 %
No. of Households	748,990	135,018

The total population size of the Local Unit (LU) of Al Hew mother village is 112,854 capita in 2023 (86,785 capita in Hew and 26,069 in El Derb); with a male to female ratio of 51:49 (Hew LU, 2024).

- ***Gender Aspects***

As per the head of the Social Solidarity Department for women in the Hew LU, "Intessar Abdel Wahab", it was explained that the "Rural Pioneers" (El Raeededat El Rifeyat) are active in the area of health care awareness, illiteracy eradication, first aid, abatement of early marriage and genital circumcision. Women have little or no capacity to start an income generation enterprise due to lack of training on handicrafts and lack of financial resources to offer needed materials and machines. Depending on the subject of concern, women affairs in Hew are mostly addressed by the LU and/or the department of social solidarity.

- ***Labour Force and Economy***

Qena governorate has a total labour force of 927,102 people; however, labour force participation rates differ greatly by gender, with 75.07% of the governorates total labour force being male workers (compared to only 24.92% being female. In Markaz Nagaa Hammadi, the total labor force size amounts to 182,449 workers, and similarly, male labour force participation rates (72.09%) significantly outweigh female labour force participation rates (27.9%) (CAPMAS, 2017).

Moreover, the labour force of Markaz Nagaa Hammadi makes up 19.67% of that of Qena governorate as shown below. An overview of the governorate's labour force population demographics and labour force participation rates by gender as well as those of Markaz Nagaa Hammadi is provided below (Table 3-9) (CAPMAS, 2017).

Table 3-9: Labour force population (≥15 years) demographics and participation rates at the Qena governorate and Markaz Nagaa Hammadi

Labour Force Demographic Characteristic	Qena Governorate	Labour Force Participation Rate (%)	Markaz Nagaa Hammadi	Labour force Participation Rate (%)
Total Labour Force Size	927,102	N/A	182,449	N/A
Male Workers	696,020	75.07	131,542	72.09
Female Workers	231,082	24.92	50,907	27.90

- ***Economic Activities***

The principal economic activities practiced by the labour force of Markaz Nagaa Hammadi are agriculture employing around 40%, manufacturing which employs about 7.26% of the labour force and construction, which employs around 7.64%, and accommodation and food service activities, wherein 6.53% of the labour force are engaged. Following that, transportation and storage service activities are practiced by 4.13% of the labour force and about 2.66% of the labour force engage in the human health and social work economic sector. The wholesale and retail trade sector, including motor vehicle and motorcycle repairs, occupies around 1.64% of the labour force, and the electricity, gas, steam, and air conditioning supply services sector and administrative and support services sector closely follow, with 1.30% and 1.17% of the labour force partaking, respectively. On the other hand, the water sewerage, waste management, and remediation service sector only engage 0.57% of the labour force, similar to the information and communications services sector, where only 0.54% of the labour force are active. Lastly, professional, scientific, and technical activities are less practiced, with only 0.33% of the labour force engaging in these activities (Table 3-10) (CAPMAS, 2017).

Table 3-10: Number of workers (≥15 years) from the Qena governorate and the Markaz Nagaa Hammadi labour forces according to main economic activity practiced

Economic Activity	Qena Governorate Labour Force			Markaz Nagaa Hammadi Labour Force		
	Male Workers	Female Workers	Total	Male Workers	Female Workers	Total
Human Health and Social Work	15,039	7,948	22,987	2,762	2,082	4,844
Administrative and support services	7,815	1,244	9,059	1,830	308	2,138
Agriculture	45534	7832	53366	41635	4741	46376
Professional, Scientific and Technical Activities	2,885	498	3,383	472	131	603
Real Estate	2,328	146	2,474	355	20	375
Information and Communication	5,924	336	6,260	884	102	986
Accommodation and Food Service	27,228	20,121	47,349	6,273	5,639	11,912
Transportation and Storage	36,539	2,601	39,140	6,982	560	7,542
Wholesale and Retail Trade: Motor Vehicle and Motorcycle Repairs	11,980	2,335	14,315	2,382	604	2,986
Construction	96,023	679	96,702	13,808	139	13,947
Water Sewerage, Waste Management, and Remediation	5,308	281	5,589	985	59	1,044
Electricity, Gas, Steam, & Air Conditioning Supply	10,762	370	11,132	2,260	105	2,365
Manufacturing	33,052	8,221	41,273	11,087	2,157	13,244

- ***Occupation Types***

In the Qena governorate, the economically active population (i.e., workers officially documented in the labour force) working across all occupations practiced in the governorate amount to 927,111 workers. Male workers predominantly take up the plant and machine operator jobs, skilled trades posts, and the roles that fall under the umbrella of 'elementary occupations. On the other hand, female workers have higher participation rates when it comes to service and sales positions and clerical support roles (CAPMAS, 2017).

In Markaz Nagaa Hammadi, the economically active population engaged in all occupation types available at the Markaz amount to 182,451 workers. Again, male workers principally take on skilled trades posts, and the roles that fall under the umbrella of 'elementary occupations', whilst female workers have higher occupation participation rates in service and sales positions and clerical support roles. The labour force participation rates of workers from the Markaz Nagaa Hammadi labour force is highly variable when broken down by occupation types (participation rates range between 9.85% and 23.47% across different occupations) (CAPMAS, 2017).

There was no data nor statistics found in the statistical booklet of Hew LU on employment and labor however, at El Hew village local unit,, participants of consultation sessions from the local unit employees & local leaders confirmed that about 70% of the working males in the Village are employed at the Aluminium Company and Sugar Company, 20% are farmers, and about 10% are engaged in services (small enterprises, handicrafts, and construction works). A very small percentage of women is employed in governmental professions, and no females engage in agricultural activities. During the discussions, it was made clear that the village struggles from high unemployment rates, and shortages of employment opportunities.

More comprehensive information on the labour forces of the Qena governorate and Markaz Nagaa Hammadi broken down by gender and occupation type is provided below (Table 3-11) (CAPMAS, 2017).

Table 3-11: Number of workers (≥15 years) from the Qena governorate and the Markaz Nagaa Hammadi labour forces according to the workers main occupation

Occupation Type	Qena Governorate			Markaz Nagaa Hammadi		
	Male Workers	Female Workers	Total Labour Force	Male Workers	Female Workers	Total Labour Force
Elementary Occupations	128,745	9,351	138,096	24,944	1,959	26,903
Plant and Machine Operators	41,571	497	42,068	9,077	112	9,189
Crafts and Related Trades	139,579	16,178	155,757	23,352	4,414	27,766
Skilled Agricultural, Forestry, and Fishery Work	143,466	56,351	199,817	22,310	9,889	32,199
Service and Sales Roles	93,006	113,260	206,266	20,178	25,772	45,950
Clerical Support	28,896	3,618	32,514	6,572	1,060	7,632
Technician	52,786	11,269	64,055	11,791	2,618	14,409
Associate Professional						
Professional	50,871	18,607	69,478	9,841	4,567	14,408
Managerial	17,112	1,948	19,060	3,479	516	3,995

- ***Labour Force Education Level***

The Qena governorate has a labour force made up of a total of 927,108 workers. The highest numbers are seen in the Technical Intermediate education level, totaling 291,793, followed by the illiterate level with 271,015 workers Following that, University education also has significant numbers, totaling 119,404, and General / Al-Azhar Secondary with 97,114 workers, and the lowest number of workers is found in the intellectual education with 252 workers. In Markaz Nagaa Hammadi, the total number of workers is 182,450. The Technical Intermediate category shows the highest numbers, totaling 61,707, followed by the illiterate level with 51,801 workers. Following that university education, with 24,837 workers, and the lowest number of workers is found in the intellectual education with 48 workers (CAPMAS, 2017).

A more comprehensive breakdown of the economically active populations of Markaz Nagaa Hammadi and the Qena governorate according to level of education and gender is provided below (Table 3-12) (CAPMAS, 2017).

Table 3-12: Number of workers (≥15 years) from the Qena governorate and the Markaz Nagaa Hammadi labour forces according to the workers level of education

Education Level	Qena Governorate			Markaz Nagaa Hammadi		
	Males	Females	Total	Males	Females	Total
Illiterate	168,971	102,044	271,015	30,688	21,113	51,801
Literate (Unqualified)	16,318	5,564	21,882	3,087	11,83	4,270
Literate (Qualified)	4,131	945	5,076	720	235	955
Special Education	223	29	252	38	10	48
Primary Education	23,843	8,571	32,414	4,431	1,758	6,189
Preparatory	31,978	17,309	49,287	5,096	2,401	7,497
General / Al-Azhar Secondary	81,724	15,390	97,114	14,517	2,922	17,439
Technical Intermediate	246,818	44,975	291,793	49,348	12,359	61,707
Above Intermediate	28,625	6,913	35,538	5,809	1,371	7,180
University Degree	91,014	28,390	119,404	17,435	7,402	24,837
Higher Diploma	953	485	1,438	161	105	266
Master's Degree	843	243	1,086	107	0	107
Ph.D.	585	224	809	106	48	154

- ***Land Use, Infrastructure, and Services***

As mentioned, the Overhead Transmission Line (OHTL) alignment will extend from the Nagaa Hammadi transformer station to the Obelisk PV power plant.

Below the northern section of the route, where there are existing transmission towers in place, the OHTL will pass over plots of Al Hew village's agricultural lands, and further southwards, the route is aligned with the El Baraka sub-village, located just east of the land directly beneath the OHTL route. Further south, the OHTL route only overpasses one road, the Giza – Luxor Road, as it extends southwards until it reaches the Obelisk PV power plant (Figure 3-18).

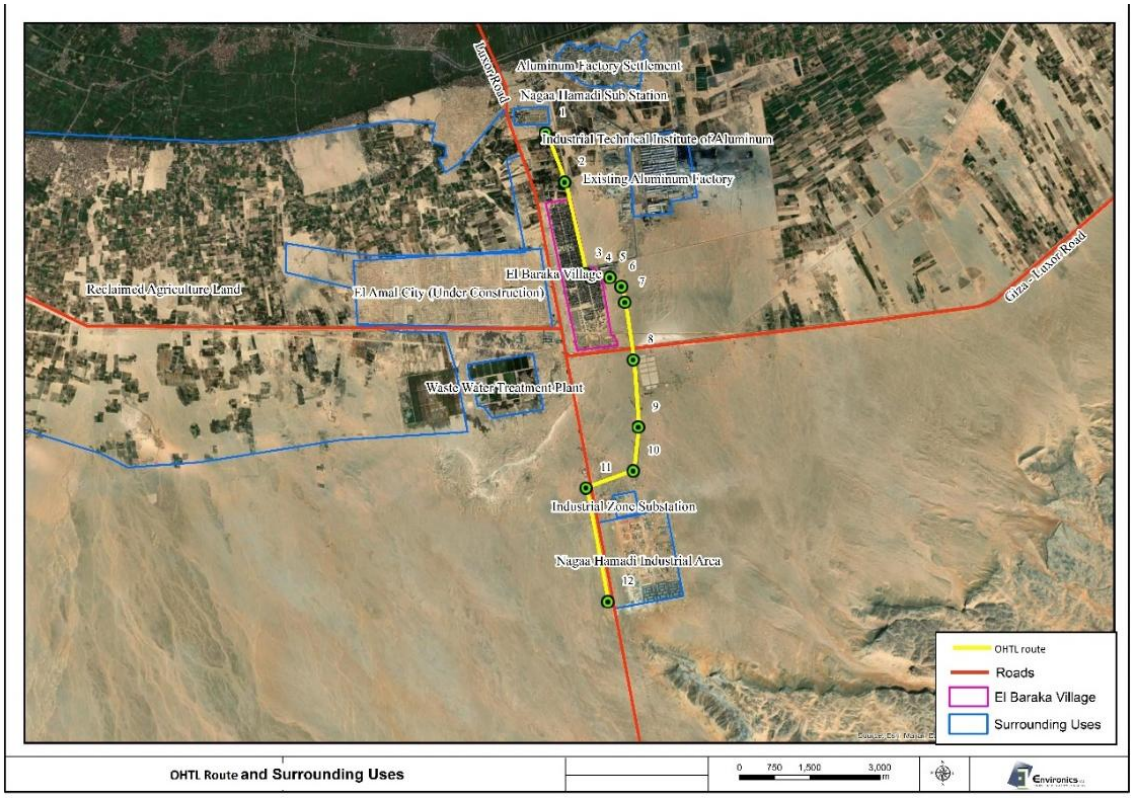

Figure 3-18: Land use types in close proximity to the OHTL route

Land use types in close proximity to the Project Site are as follows:

- The Nagaa Hammadi industrial zone (0.10 km east of the OHTL route from Point 12)
- Reclaimed agricultural lands (Points 1 and 2)
- The Giza – Luxor Road
- A residential area (vertically aligned to the route from point x to y)
- Other local communities located between 2 km and 10 km north of the OHTL route

- ***Health Infrastructure***

The Qena governorate boasts a total of 52 hospitals, 46 Intensive Care Units (ICUs), and over 200 health units. The governorates healthcare infrastructure includes a fleet of 92 ambulances, which are maintained by a well-equipped network of both road ambulance stations and highway ambulance stations (Table 3-13) (QG, 2024).

Table 3-13: Hospitals and other healthcare facilities in the Qena Governorate

Healthcare Facility Type	Quantity
Central Hospitals	11
Specialised Hospitals	11
Private Hospitals	14
Health Insurance Hospitals	1
Educational Hospitals	1
Dialysis Centres	18
Health Units	241
University Hospitals	2
Specialised Medical Centres	1
Military Hospitals	1
Oncology Institutes	1
Ambulance Points and Centres	52
Ambulances	92
Highway Ambulance Units	20
Regional Blood Banks	1
Intensive Care Units	46

On the level of Al Hew village, there are four health care units & other four family planning units.(statistical quarterly booklet of Hew LU, Q3 of 2024).

Furthermore, based on the site visit, there are three healthcare facilities located in close proximity to the OHTL route; the El-Baraka Village Health Unit. The Aluminum City Hospital (10 km northeast of the OHTL route), and one of theHew Village Health Care Units (Figure 3-19).

- ***Transport Infrastructure***

The OHTL route crosses the Giza–Luxor Road. This road connects the city of Qena and the city and Markaz of Nagaa Hammadi to the OHTL route. The Giza – Luxor Road consists of two separate lanes, each 9 meters wide.. Additionally, there are two bridges leading from the east of the Nile to the OHTL route, the Qena – Nagaa Hammadi Bridge, and the Nagaa Hammadi – Deshna Bridge.

The Qena – Nagaa Hammadi Bridge is located within the city of Qena, approximately 50 km east of the OHTL route. This bridge provides a direct route from the Qena – Safaga and Qusseir – Qeft roads to the Giza – Luxor Road.

The Nagaa Hammadi – Deshna Bridge is located in the city and Markaz of Nagaa Hammadi, and is situated about 19 km north of the OHTL route. It wide and connects localities east of the Nile Valley to the Giza – Luxor Road.

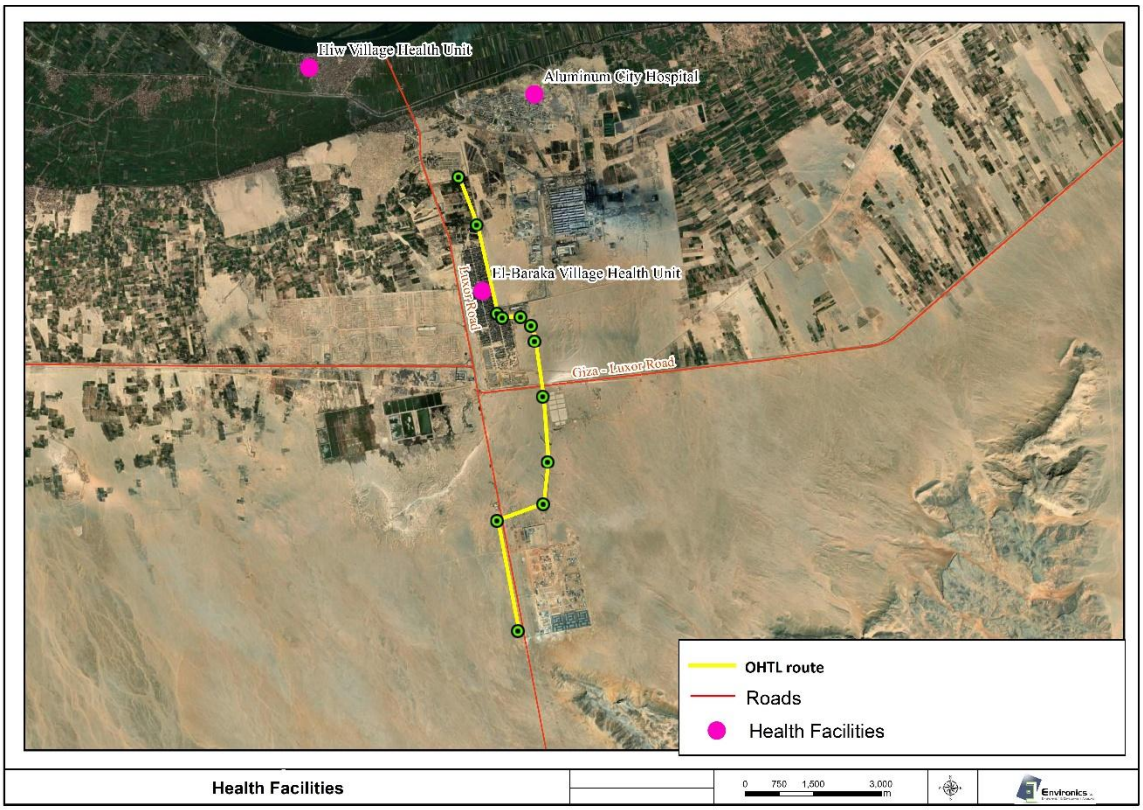

Figure 3-19: Healthcare facilities in close proximity to the OHTL route

- ***Potable Water Supply***

According to the most recent (2017) national general census for population, housing and establishments, the total number of households in the Qena governorate amounts to 748,990. Out of these, 723,767 households rely on public water supply networks for their potable water. The majority of these are households located in the governorate's rural areas, with 579,064 rural households (out of a total of 603,680 rural households) connected to the public water supply network, and the remaining rural households (4.08% of the total number of rural households) relying on pumps, groundwater wells, and bottled water. With regards to the urban households in the governorate, there are 145,310 households in the governorate's urban areas, out of these, 144,703 use the public water supply network (translating to 99.58% of urban households relying on the public water supply network). The remaining 0.42% of urban households use pumps, groundwater wells, and bottled water (CAPMAS, 2017).

As for El Hew and El Derb, both villages are connected to the public water company (Hew LU, 2024).

- ***Sewage Management and Services***

The Qena governorate has a total of 748,990 households. Of these, 115,895 households (15.47%) are connected to public sewage disposal networks, while the remaining 2.01% rely on private sewage disposal systems. A significant proportion of the total number of households within the governorate, 82.14%, rely on cesspits for sewage disposal. Around 0.35% of the governorate's households use open field drains, and other alternative sewage disposal methods. There are 145,310 households in the governorate's urban areas, of these, 92,961 households (63.97%) are connected to public sewage disposal networks with, whilst

only 1.5% of these households are connected to private sewage disposal networks. A large share of the governorate's urban households (34.39%) relies on cesspits, whilst the remaining households in the governorate's rural areas (0.12%) use open field drains and other alternative methods for the disposal of their sewage. In the governorate's rural areas, the majority of households (93.64% of the governorates total number of rural households) rely on cesspits. In stark contrast, only 22,934 rural households (3.79%) are connected to the public sewage disposal network, and 2.13% of rural households solely rely on private sewage disposal systems. Lastly, 0.40% of the governorates rural households depend on open field drains and other alternative methods of sewage disposal (CAPMAS, 2017).

In terms of sewage treatment facility availability, there are 9 sewage treatment stations within the Qena governorate, with a combined total design capacity of 207,000 m³/day. This roughly equates to 48.1 million m³ of sewage being treated per year (Table 3-14) (CAPMAS, 2021).

Table 3-14: Number of sewage treatment facilities in the Qena governorate and other sewage treatment facility metrics (data from July 2019 to June 2020)

Sewage Treatment Facility Metric	Qena Governorate
Number of Stations	9
Total Design Capacity of Sewage Treatment Stations (m^3/day)	207,000
Sewage Treatment Quantity (Mill.m^3/year)	48.1

Since the aforementioned national general census for 2017, the government program" Hayah Karima" has invested in multiple wastewater projects in the Qena governorate. As such, it is expected that the percentage of households connected to the public sewage disposal network has currently substantially increased since 2017. In this same context, the figures in the table above, comparing the design capacity to the sewage treated, indicate that in 2021, the governorate had a surplus of design treatment capacity. This was probably in advance of extending the public sewage network to additional beneficiaries.

Lastly, at the local level, only the village of El Derb is connected to the public sewage network, as the public sewage network in Hew is still under construction (Hew LU, 2024).

- ***Educational Services***

Focusing on the educational services within the OHTL route's AoI, there is a total of 11 kindergartens (9 in Hew and 2 in El Derb), 18 primary schools (13 in Hew and 5 in El Derb), 12 preparatory schools (8 in Hew and 4 in El Derb), one secondary school and one industrial school (both in Hew), and 2 one-class school (one in Hew and one in El Derb). In addition, there is a number of Azhar schools; one kindergarten in Hew, 3 primary schools (2 in Hew and one in El Derb), 2 preparatory schools, and 2 secondary schools in Hew (all four in Hew). Lastly, schools for those with special needs and hearing disorders are only available in Hew, where there are 6 special needs schools (2 primary schools, 2 preparatory schools, and 2 secondary schools) (Hew LU, 2024).

4. Policy, Legal and Administrative Framework

This section summarizes the environmental and social legislation and regulations of relevance to the project. They were identified according to the type of the proposed activities, its geographic location and the expected impacts. Consideration is first given to the national legislations pertaining to the execution of the ESIA, followed by a review of guidelines of international financing institutions for environmental requirements relevant to the project.

4.1 National Legislation Pertaining to ESIA

According to law of the environment (law 4/1994) that was amended by laws 9/2009 and 105/2015, and according to its updated executive regulation (ER), the project proponent should prepare an EIA with the application for license of new projects and/or extension of existing facilities, thus integrating environmental requirements into the existing licensing system.

According to project classification lists issued by the EEAA, which were updated in June 2023, OHTLs with distance more than 5 km are classified as Category C projects.

According to law 4/1994 and its ER, the ESIA will be submitted to the Competent Administrative Authority (CAA), under which jurisdiction the project falls. For this project, the CAA is the EETC Authority, located at the Ministry of Electricity & Renewable Energy. The CAA would send the ESIA to the EEAA to issue its response within 30 days. If no response is received beyond this period, the assessment shall be deemed approved.

4.2 National Environmental Regulations Pertaining to the Project

4.2.1 Air Quality

Article 36 of Law 4/1994, article 36 of its ER, and Annex 6 of the ER set the maximum allowable limits generated from power generating units. Table 4-1 below summarizes the maximum allowable limits for diesel generators.

Table 4-1: Maximum Limits for Diesel Power Generators

Fuel Type	Maximum Allowable Limit (mg/m^3)			
	TSP	Carbon Monoxide	Sulfur Dioxide	Nitrogen Oxides
Diesel	100	250	400	600

4.2.2 Ambient noise

Article 42 of Law 4/1994 and article 44 of its modified ER (710/2012) give the maximum allowable limits for sound intensity. Table 4-2 shows the maximum limits of environmental noise levels.

Table 4-2: Maximum Limit Permissible for Noise Level in the Different Zones

Type of zone		Permissible limit for noise level, dB (A)	
		Day time 7 am – 10 pm	Night 10 pm – 7 am
Areas on roads whose width is 12 m or more, or industrial areas which comprise light industries and other activities.	National guidelines	70	60
	International guidelines	70	70
Residential areas with low traffic and limited service or commercial activities.	National guidelines	60	50
	International guidelines	55	45

4.2.3 Solid Wastes

Chapter 4 of Egypt's Waste Management Law 202/2020 and its Executive Regulations (ERs) 722/2022 and 1113/2024 address the requirements for solid waste management framework. Article 36 of the executive regulation addresses construction waste management through contracting licensed contractors and proper storage of construction material/waste.

4.2.4 Hazardous Substances and Wastes

Law No. 202/2020 and its executive regulations, Nos. 722/2022 and 1113/2024, introduced specific requirements for hazardous waste management. Chapter Five of Law No. 202/2020, in conjunction with Articles 50 to 54 of Executive Regulations No. 722/2022, delineates the protocols for hazardous waste management process, including comprehensive record-keeping and disposal methodologies.

4.2.5 Registers/ Records

Environmental Register:

According to Article 22 of Law No. 9 of 2009, amending Law No. 4 of 1994, and Article 17 of its modified Executive Regulations No. 1741 of 2005, all establishments are mandated to maintain comprehensive environmental registers. The specific content of these registers is outlined in Article 17 and Annex 3 of the aforementioned Executive Regulations.

Hazardous Materials & Waste Register:

According to Article 56 of Law No. 202 of 2020, establishments that generate hazardous waste must maintain a register of such materials and waste, including details on its disposal and the entities contracted for any waste management operations.

In addition, in accordance with the provisions of Article 211 of Law No. 12/2003 and Appendix (3) of the ERs of Law No. 4/1994, and Article 50 and Appendix (7) of the ER of Law No. 202/2020 on waste management and its executive regulations (654/2021), establishments

generating hazardous waste shall maintain a register of this type of waste that explains the method of disposal and the companies responsible for waste management.

Moreover, article 211 of Labor Law No. 12/2003 and Article 34 of Minister of Manpower Decree No. 211/2003 stipulate that the facilities shall prepare chemical safety records, reports and regulations.

4.2.6 Work Environment

Workplace Noise

Table 4-3 provides the maximum noise levels in the workplace, as extracted from table (1) in Annex 7 of ER 710/2012 for Law 4/1994. According to the same ERs, the exposure period must be reduced to half with increasing the noise level by 3 dB.

Table 4-3: Maximum Noise Levels within Workplace (dB (LAeq))

Type of Place and Activity	Exposure Period (hours)	Maximum Noise Level dB (LAeq))
Workplace (construction site)	8	85
Administrative offices - Work rooms for computers, typewriters and similar equipment	--	65

Heat Stress

Article (46) of Law 4/1994, provides the maximum allowable limits for heat stress. Table 4-4 includes the maximum limits for heat stress inside workplaces, depending on the type of work.

Table 4-4: Permissible Exposure Limits of Heat Stress in Workplace

System of work and hourly rest break	Heat Stress		
	Light Work	Medium Work	Hard Work
continuous work	30.0°C	26.7°C	25.0°C
75% work, 25% rest	30.6°C	28.0°C	25.9°C
50% work, 50% rest	32.4°C	29.4°C	27.9°C
25% work, 75% rest	32.2°C	31.1°C	30.0°C

Occupational Health and safety structure and committee

Based on the Ministerial Decree 153/2003 for the labor law 12/2003, the project with more than 50 workers should establish an occupational health and safety structure/department which is responsible for health and safety issues and will undertake all related responsibilities and should undertake daily inspections to detect hazards and risks.

Personal Protective Equipment (PPE)

According to articles 43 and 45 of Law 4/1994 and articles 44, 45, and 46, of its ER, the facility owner must provide the Personal Protective Equipment and the necessary safety measures for the workers against noise and heat stress inside the workplace. Additionally, according to Article 209 of Labor Law 12/2003, and Article 22 of its Executive Decree 211/2003, it is prohibited to employ anyone at risk of falling unless the necessary precautions are taken, by providing suitable protective fences, ladders, or climbing boards that are firmly fixed, or by providing workers with safety belts and ropes to enable them to tie themselves to a fixed point in the building.

Firefighting

According to Article 214 of Labor Law 12/2003, and Article 2 of its Executive Decree 211/2003, The facility should take precautions for firefighting and protection by Alarms, detectors and other equipment as per the requirements of the Civil Defense Authority, in accordance to the nature of activities and chemicals used.

Hazards

Article 32 of the decree 211/2003 addresses protection against high voltage risks. It describes measures for occupational safety measures when handling and maintaining electric equipment, wires and cables. In addition, it addresses the requirements to prevent adverse physical and mechanical hazards and the dynamic electricity hazard in the workplace.

Moreover, according to electrical regulations, ultra-high voltage is defined as any voltage exceeding 132 kV. And according to Article 55 of the electricity law 87/2015, such lines must be located at least 25 meters away from permanent human habitations.

Incidents investigation and reporting

According to the Executive Decree 126/2003 of Labor Law 12/2003, The facility should prepare biannual statistics and forms for incidents, injuries, occupational diseases, normal disease and chronic diseases. In case of major accidents, it should be submitted within 24hours.

Labour Conditions

The Egyptian Labor Law 12/2003 regulates working conditions and the management of worker relations in Chapters 1 to 4 of Book 5. It addresses various aspects through its different articles, including:

- The individual labor contracts and terms of employment
- Child labor
- The employment of women
- Fair treatment and equal opportunity
- Annual leaves and vacations
- Working and rest hours
- Services and accommodation
- Wages and overtime
- Collective negotiations and collective labor agreements and litigations
- Vocational training
- Conducting investigations and disciplinary code
- End of work relation
- The right of labors to create trade union organizations

4.2.7 Electricity Law

Article 55 of the law includes the distances that must be adhered to for the sanctuary of various transmission lines measured from the axis of the track:

- Twenty-five meters in the case of high-voltage overhead lines.
- Thirteen meters in the case of high-voltage overhead lines.
- Five meters for medium voltage overhead lines.

4.2.8 Biodiversity

Article 28 of Law 4/1994, along with Annex 4 of its updated EU, defines the wild animals and plants that are prohibited from being hunted, killed, or captured as follows:

- Birds, wild animals, and aquatic living organisms, including their parts and derivatives, are forbidden to be hunted or killed.
- Certain flora cannot be collected, exported, cultivated, or commercialized.
- Faunal and floral organisms threatened with extinction, or those raised or cultivated outside their natural habitats, require a permit from the EEAA.

4.2.9 Cultural Heritage

Law No. 117 of 1983, as amended by Law No. 3 of 2010, serves as the cornerstonefor safeguarding archaeological and historical sites. The Ministry of Tourism and Antiquities (MOTA) is the primary authority responsible for overseeing all archaeological activities. This legislation provides the primary legal framework for the preservation of archaeological and historical sites. According to Article 5 of the law, MOTA is the designated authority responsible for supervising all archaeological activities and sites within the country.

Additionally, Article 23 assigns the MOTA the responsibility for the discovery and exploration of antiquities across Egyptian territory. It mandates that any person who discovers an unregistered archaeological artifact is obligated to notify the MOTA. The artifact shall be considered state property, and the MOTA must take the necessary measures to preserve it. Within three months, the MOTA must either remove the artifact found on private property, or take the necessary procedures to expropriate the land on which it was found, or leave it in place and register it following the provisions of this law.

4.3 Guidelines of the International Financial institutions

In addition to complying with Law 4/1994, the ESIA study has been prepared in accordance with the requirements of international financial institutions, including EBRD, AFDB, and DFC. The sections below provide summary of the international environmental and social requirements.

4.3.1 EBRD Environmental and Social Requirements (ESRs)

ESR1: Assessment and Management of Environmental and Social Risks and Impacts

This ESR establishes the importance for:

1. Integrated assessment to identify the social and environmental impacts, risks, and opportunities of projects.
2. Effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them.
3. The client's management of social and environmental performance throughout the life of the project.

This ESR is relevant to most projects and applies to the current one.

ESR2: Labour and Working Conditions
This ESR emphasizes the relation between the economic growth and the well-being of a company in one side, and establishing a relationship with the workers as a valuable asset that requires a healthy and safe work environment as well as protection for basic rights of workers. It also recognizes the need for employment creation and income generation as an approach for economic growth. It pertains to issues around labour and working conditions, occupational health and safety, migrant labour, etc.

This ESR applies to the project, the study addressed the aspects requirements of employment during different phases of the project. In addition, it addressed the occupational health and safety aspects with particular emphasis on working in remote sites as it should have specific emergency procedures.

ESR3: Resource Efficiency and Pollution Prevention and Control
This ESR recognizes that industrial activities often generate increased levels of pollution in air, water, and land, which can have potential adverse impact on the surrounding environment.

This ESR applies to the potential emissions and wastes from different sources during the construction and operation phases and their potential impacts. These aspects are well addressed in the study.

ESR4: Health, Safety and Security
This ESR recognizes that the project activities and infrastructure can increase the potential for community exposure to risks and impacts arising from equipment accidents, structural failure, and releases of hazardous materials. Impacts may also occur from exposure to diseases and the use of safety and security personnel. Additionally, the EBRD mandates a risk assessment for gender-based violence and harassment (GBVH), recognizing its severe impact on women's health and wellbeing. This includes identifying and mitigating risks related to physical, mental, or sexual harm and ensuring safe, inclusive working conditions.

Given the nature of project location, this ESR applies to the project. Its impacts are explained in details in the environmental and social assessment of this study.

ESR5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
This ESR recognizes that the project design minimizes economic and physical displacement, balancing social environmental and financial costs and benefits.

No involuntary resettlement for this specific project, but partial temporary change in small, specific areas is expected to take place. Therefore, provisions of this ESR are applicable to the project.

ESR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
This ESR addresses how projectscan avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources.
Preliminary information about the proposed project area indicates the absence of significant ecological diversity. Yet, the ESIA described the different habitats and biodiversity surrounding the area and investigated the potential project impact on them where applicable.

ESR7: Indigenous Peoples
This ESR aims at preventing adverse impacts of the projects on communities of Indigenous Peoples and to provide opportunities for development benefits.

Provisions of this ESR do not apply to the proposed project since there are no indigenous communities in the area.

ESR8: Cultural Heritage
The objective of this ESR is to protect the cultural heritage from the adverse impacts of the project activities and support its preservation.

No cultural heritage components are expected. Moreover, there are no registered archeological sites within or in close proximity to the proposed project location. However, in case of chance finds, the procedures outlined in the Egyptian Antiquities Law No. 117 of 1983 will be followed.

ESR9: Financial Intermediaries
It recognizes that strong domestic capital and financial markets, and access to finance are important for economic development, growth, and poverty reduction. Also, it addresses the environmental and social requirements associated with intermediated financing through financial and nonfinancial institutions.

This ESR is not applicable to the present project.

ESR 10: Information Disclosure and Stakeholder Engagement
This ESR recognises the importance of an open and transparent engagement between the client, its workers, worker representatives, local communities and persons affected by the project. The ESR aims to ensure that appropriate environmental and social information is disclosed and meaningful consultation is held with the project's stakeholders and where appropriate, feedback provided through the consultation is taken into consideration; and ensure that grievances from stakeholders are responded to and managed appropriately.

Provisions of this ESR apply to the proposed project.

4.3.2 African Development Bank Group's Operational Safeguards (AFDB OSs)
The Bank has defined the environmental and social OSs, which are designed to maximize positive impacts and to avoid, minimize, reduce, mitigate or compensate for the adverse environmental and social risks and impacts of projects, including those related to climate change.

OS1: Assessment and Management of Environmental and Social Risks and Impacts
It addresses how the borrower will address the environmental and social risks and impacts of the project, throughout the project life cycle to meet the requirements of the Environmental and Social Safeguards in a manner and within a time frame acceptable to the Bank.

This safeguard is applicable to most projects and applies to the current one.

OS2: Labor and Working Conditions
It recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Also, the importance of treating workers in the project fairly and providing safe and healthy working conditions and respect of workers 'rights to promote the sound worker-management relationships and enhance the development benefits of a project.

This safeguard is applicable to the proposed project during the construction and operation phases.

OS3: Resources Efficiency and Pollution Prevention and Management
It recognizes the economic activities often cause air, water, and land pollution and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. It sets out the requirements to address resource efficiency and pollution prevention and management throughout project life cycle in a manner consistent with Good International Industry Practice (GIIP).

This safeguard is applicable on the construction and operation phases of the project.

OS4: Community Health, Safety and Security
It recognizes that projects, activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to a project or activities. It addresses the health, safety, and security risks to and impacts on project-affected communities and the corresponding responsibility of the borrower to avoid or minimize them.

This safeguard is applicable on the construction and operation phases of the project.

OS5: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement
It recognizes that involuntary resettlement should be avoided and where involuntary resettlement is unavoidable, it will be minimized, and appropriate measures to mitigate adverse impacts on displaced persons (and on host communities receiving displaced persons) will be carefully planned and implemented.

This safeguard is applicable to the proposed project since the activities will involve partial change in small, specific areas.

OS6: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources
It recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. Also, recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support in a changing climate and the need to consider the livelihoods of

project-affected parties. Also, addresses the sustainable management of primary production and the harvesting.

This safeguard is applicable to the construction of most project components as they are located within a natural desert environment.

OS7: Vulnerable Groups
It requires assessment and mitigation of impacts on vulnerable groups, including women, children, the elderly, and indigenous peoples. It contributes to poverty reduction and sustainable development by ensuring that projects supported by the Bank enhance opportunities for vulnerable groups to participate in, and benefit from, the development process in ways that do not threaten their unique cultural identities and well-being.

This safeguard is applicable on the construction and operation phases of the project.

OS8: Cultural Heritage
It sets out measures designed to protect cultural heritage throughout the project life cycle.

No cultural heritage components are expected. Moreover, there are no registered archeological sites within or in close proximity to the proposed project location. However, in case of chance finds, the procedures outlined in the Egyptian Antiquities Law No. 117 of 1983 will be followed.

OS9: Financial Intermediaries
It recognizes that strong domestic capital and financial markets, and access to finance are important for economic development, growth, and poverty reduction. Also, it addresses the environmental and social requirements associated with intermediated financing through financial and nonfinancial institutions.

This safeguard is not applicable to the present project.

OS10: Stakeholder Engagement and Information Disclosure
It recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice.

This safeguard is applicable on the construction and operation phases of the project.

4.3.3 DFC Environmental and Social Policy and Procedures (ESPP)

The ESPP of DFC outlines the its commitments to environmental and social screening, review, risk mitigation, and monitoring. These measures ensure the sustainability of DFC-supported projects.

The ESPP adopts the Performance Standards on Social and Environmental Sustainability of the International Finance Cooperation (IFC) and the Environmental, Health and Safety (EHS) Guidelines of the World Bank Group. These standards guide the assessment and mitigation of environmental and social impacts of the projects supported by DFC.

The ESPP underscores DFC's commitment to reducing GHG emissions associated with its projects. DFC evaluates projects for climate-related risks and vulnerabilities, promotes energy efficiency and conservation, encourages the use of low-carbon fuels and technologies, and supports climate adaptation and resilience measures. The ESPP also details the responsibilities of clients regarding climate change mitigation and adaptation.

4.3.4 IFC Guidelines for Transmission lines

The EHS Guidelines for Electric Power Transmission and Distribution[9] outline key EHS issues related to electric power transmission and distribution, with a focus on those arising during the construction and operation phases of a facility. Recommendations for effectively addressing these issues were also included. Additionally, further guidance on managing environmental impacts during the construction and decommissioning phases of power transmission and distribution systems could be found in the General EHS Guidelines.

[9] https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf

5. Analysis of Alternatives

The analysis of alternatives is based on the evaluation of various project options during the conceptual and pre-feasibility design phases.

When evaluating these alternatives, special emphasis was placed on their environmental and social implications to ensure that the selected options are both environmentally sound and compliant with national regulations and international guidelines.

5.1 "No Development" Alternative

This OHTL project will connect Obelisk solar energy plant to the national electricity grid. This connection will help meet Egypt's growing energy needs, particularly from renewable energy sources. This will support Egypt National Climate Change Strategy (NCCS), which aims to reduce greenhouse gas emissions and promote sustainable development.

Choosing the "No Development" alternative for this project would mean that the generated solar power by the Obelisk plant would not be connected to the national electricity grid.

5.2 Alternative OHTL Alignment

The selected alignment for the OHTL follows an existing one connecting the Nagaa Hammadi transformer substation to the industrial zone transformer substation. The alignment for the OHTL has been selected for favorable technical and logistical reasons:

- The adjacent road allows for easy transportation of equipment and materials, minimizing the need for new access roads.
- Utilizing an existing corridor reduces environmental and social impacts by avoiding new land disturbance.
- The alignment simplifies permitting and coordination, leveraging existing infrastructure and minimizing project risks.

6. Environmental Impacts Assessment and Mitigation Measures

6.1 Methodology

The environmental assessment was carried out to cover potential impacts of the project on the environment as well as impacts of the environment on the project. The assessment was carried out in four main steps, as follows:

1. Identification and classification of impacts into irrelevant (scoped out), positive, and negative;
2. Assessment of negative impacts in terms of their significance;
3. Identifying and proposing suitable mitigation measures for minimizing the effects of negative impacts; and
4. Evaluation of residual impacts.

The main cumulative impacts have also been assessed using the same methodology utilized to assess potential negative impacts.

- ***Identification and Classification of Impacts***

Interaction between the different project activities and the environmental receptors, identified through the baseline information, was carried out. Such interactions may result in negative or positive impacts. The different types of impacts were identified.

Based on the analysis of the baseline environmental conditions and the nature of the receiving environment, some aspects were found to be irrelevant to specific activities of this particular project. These are identified as "scoped out impacts".

Potentially relevant aspects were subject to a process of impact evaluation, based on the analysis of the proposed project components and activities, in order to determine the significance of the different impacts. The evaluation process takes into account the information collected in the field, available in the literature and/or based on the professional judgment of the consulting team and public consultation.

Aspects evaluation is based on pre-set criteria including, aspect magnitude, duration, planned mitigation measures, regulatory standards and the sensitivity of environmental receptors.

- ***Assessment of Negative Impacts***

The procedure to assess the "significance" of negative impacts is outlined below. It should be noted that the significance of each potential negative impact is determined before and after implementing the mitigation measures and/or applying mitigation, management and monitoring practices (i.e. residual impacts).

The magnitude of an aspect will be determined according to the following criteria:

- The temporal scale or timeframe within which the aspect t can occur;
- The spatial scale or size of the aspect; and
- The severity scale or intensity of the aspect.

Temporal scale + spatial scale + intensity scale = Magnitude of aspect

The overall significance of the aspect will consider the magnitude of an aspect in combination with the sensitivity/vulnerability/value of the receptor or resource, in the absence of quantified standards, as shown in the following table.

Assessment of the overall significance of impacts

Magnitude of aspect	**Sensitivity / Vulnerability / Value of Resource / Receptor**		
	Low	Medium	High
Negligible	Insignificant	Insignificant	Insignificant
Small	Insignificant	Minor	Moderate
Medium	Minor	Moderate	Major
Large	Moderate	Major	Extreme

- ***Mitigation Measures***

The mitigation of impacts follows a hierarchy of actions, referred to as the "Mitigation Hierarchy", which comprises the following sequential steps:

- **Avoidance**: actions taken to fully prevent impacts, such as relocating a project or changing its spatial layout to prevent impacts in specific locations;
- **Minimization**: actions taken to reduce the duration, intensity and/or extent of impacts that cannot be completely avoided;
- **Restoration**: actions taken to assist in the recovery of a feature that has been degraded, damaged, or destroyed; and
- **Offset**: measurable outcomes resulting from actions designed to compensate for significant residual adverse impacts arising from project development and persisting after appropriate avoidance, minimization, and restoration measures have been taken. These could be applied in both biodiversity conservation (e.g., restore and protect areas degraded by impacts unrelated to the planned development or avert the loss of biodiversity from impacts unrelated to the planned development) and pollution loads (e.g., by investing in pollution abatement in an adjacent industrial facility emitting pollutants in the same air shed).

Mitigation measures are either incorporated as integral part of the project design or through management and monitoring measures. By implementing mitigation measures, the residual impacts, which are those potentially, remaining after implementing the mitigation measures, should be minimal and acceptable.

Based on the impact identification and evaluation process, mitigation measures are proposed for significant impacts, while minor impacts are usually integrated within the management plans of the project. As much as possible, the avoidance and prevention of impacts is favoured over minimization, restoration or offset.

- ***Residual Impacts***

Residual impacts have been evaluated and their significance is stated in this chapter after the implementation of relevant mitigation measures.

6.2 Impacts Identification of the Proposed Project

Interaction between the different activities and the environmental receptors, identified through the baseline information, was carried out. Such interactions may result in negative or positive impacts. The different types of impacts were identified.

Based on the analysis of the baseline environmental conditions and the nature of the receiving environment, some aspects were found to be irrelevant to the specific activities of this particular project. These are identified as "scoped out impacts".

Potentially relevant impacts were subject to a process of impact evaluation, based on the analysis of the proposed project components and activities, to determine the significance of the different impacts. The evaluation process takes into account the information collected in the field, available in the literature, and/or based on the professional judgment of the consulting team and public consultation.

Impact evaluation is based on pre-set criteria including, impact magnitude, duration, planned mitigation measures, regulatory standards, and sensitivity of environmental receptors.

6.2.1 Scoped Out Impacts

The potential impacts of the project are identified based on the analysis of impacts on the surrounding environmental components. This step would facilitate eliminating and scoping out irrelevant impacts taking into consideration the following:

- Type of project
- Location
- Characteristics of the surrounding environment
- Receptor sensitivity or importance: depends on its nature, value, scarcity, etc.

Examination of the environmental setting of the area and the operational processes has shown that the project impacts on the following resources/receptors are irrelevant:

Impacts on surface water quality and aquatic life

The nearest water body, Alranan Canal, is located approximately 1.8 km from the end point of the OHTL at the Nagaa Hammadi Transformer Substation. Given this distance and the nature of the project, there will be no anticipated interaction with surface water. Therefore, impacts on surface water and aquatic life can be excluded from assessment.

Impact on groundwater

There are no interactions between the project and groundwater, as groundwater in the OHTL segment is found at depths ranging from 30 to 36 m near the cultivated lands, with depth increasing toward the plateau to more than 70 m. Therefore, impacts on groundwater can be excluded from assessment.

6.2.2 Positive Impacts

Connecting Obelisk project to the national grid

The project will connect Obelisk solar energy plant to the national grid. This connection is important for using Egypt's plentiful renewable energy resources, and meet its growing energy needs.

Employment

The project's construction phase is expected to create direct job opportunities for the local community, including both skilled and unskilled labor, such as engineers, technicians, and surveyors. Priority will be given to local workforce members, with job availability and duration dependent on roles and the construction schedule. Accordingly, the project will contribute positively to the social impacts.

6.3 Assessment of Potential Negative Impacts and Proposed Mitigation Measures

As indicated above the OHTL project area can be divided into two segments: the southern segment, where new transmission towers will be built, and the northern segment, where cables on existing towers will be replaced without constructing new towers. It is also important to recall that the southern segment is vacant, desert land, while the northern segment is near by a village and agricultural lands.

6.3.1 Potential Impacts relevant to the OHTL Southern Segment

Potential Impact on the Physical Environment

- **Impacts on Air Quality:**

Construction

Construction activities may impact air quality through emissions from construction equipment and transport vehicles, dust/particulate matter from soil leveling, as well as from used of mobile diesel generator(s) that will be used to supply electricity during construction. As a result, the air emissions generated during this period are expected to include dust, nitrogen oxides, Sulphur oxides, and carbon monoxide.

The construction activities of the OHTL towers will be *localized and short* the intensity of aspect is expected to be slight, thus the magnitude of the impact is considered **small**.

The sensitivity of the receptors in the southern segment is **moderate**. Thus, this impact is considered ***Minor***.

Mitigation Measures

The following mitigation measures will minimize the impacts of construction activities on the air quality:

- Implementing policies/procedures to reduce idling times for vehicles and machinery.
- Maintaining machinery and vehicles in good working conditions to minimize fugitive emissions and exhaust.
- Ensuring workers awareness of safe driving and maintaining good practices in machinery usage.
- Implement dust control measures such.

- Ensuring compliance with law 4/1994 and its relevant executive regulations regarding emissions from power generator stacks.

Residual Impacts

Impacts during construction activities will be **Insignificant** implementing the management measures.

E&S Aspect	Characteristics
Duration	Short-term
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	Medium
Significance	**MINOR**
Residual impacts	**INSIGNIFICANT**

Operation

The operational phase will have minimal emissions, mainly due to transport of persons and supplies for periodical inspection and maintenance activities. These activities are minor, and the air emissions are **INSIGNIFICANT**.

Residual impacts are **None**

- **Impacts on Ambient Noise**

Construction

The construction activities of the OHTL towers will be *localized and short* the intensity of aspect is expected to be slight, thus the magnitude of the impact is considered **small**.

The sensitivity of the receptors in the southern segment is moderate. Thus, the impact is considered ***Minor***.

Mitigation Measures

- Machines and construction equipment must comply with the best practice technical developments
- Periodical maintenance of machines and equipment with internal combustion engine according to the manufacturer's instructions.

In addition, a grievance mechanism is to be adopted for assessing complaints associated with construction noise, if any.

Residual Impacts

The above mitigation measures are expected to be efficient in minimizing the potential impacts. Therefore, the residual impacts of construction activities of the proposed project on workplace air quality are deemed **INSIGNIFICANT.**

E&S Aspect	Characteristics
Duration	Short-term
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	Medium

E&S Aspect	Characteristics
Significance	**MINOR**
Residual impacts	**INSIGNIFICANT**

Operation

The operational phase will have minimal emissions, mainly due to the transport of persons and supplies for periodical inspection and maintenance activities. These activities are minor, and the air emissions are **INSIGNIFICANT**.

Residual Impacts: None

- **Impacts on Soil**

Construction

The construction activities are unlikely to result in soil contamination that will need future decontamination and clean-up activities. Potential impacts during the construction phase generally result from onsite material and waste handling, accidental spills from machinery, and potential spills from the diesel generator fueling and lubricating oils changes.

The aspects during the construction phase will be localized, short-term, and their intensity is medium. As the proposed project will be carried out on a site where productivity is low, the sensitivity of the receptors is low. Therefore, the overall significance of the impact is assessed as **MINOR**.

Mitigation Measures

Wastes generated during the construction phase will be collected by an approved contractor to be disposed of in designated landfill sites. Contractors will be required to apply good workmanship and housekeeping during construction by contractual stipulations and by assignment of supervising E&S site personnel.

Residual impacts

The impact on soil during construction activities will be **Insignificant** with implementing the management measures.

E&S Aspect	Characteristics
Duration	Short-term
Extent	Localized
Intensity	Medium
Receptor's sensitivity/vulnerability to the aspect	Low
Significance	**Minor-**
Residual impacts	**Insignificant**

Operation

No potential impacts on soil

Potential Impacts on Biological Environment

Construction

- **Habitats**

The project will involve direct habitat transformation of the towers' areas, trails for the power line, use of heavy machines and other technical installations. However, the towers footprint is relatively small, which minimizes potential impact. This ecosystem is characterized by an almost total absence of water and, accordingly, the vegetation cover is very low.

Furthermore, since the project site does not include any Key Biodiversity Areas (KBAs) or any other Protected Areas (PAs), the construction aspects affecting the biological environment are *localized* and short-term. The aspects affecting the habitat is deemed *permanent and irreversible*. As a result, its intensity of the aspect is ***medium***, and as the sensitivity of the receptors is low (a barren desert habitat, almost lifeless). Therefore, the overall significance of the impact is assessed as **MINOR**.

Mitigation Measures

Habitat loss and/or modification would be permanent and cannot be mitigated.
However, potential mitigation measures may include limiting off-road driving to specific tracks which will avoid any sign of vegetation detected on site.

Residual Impacts

By implementing the above mitigation measures, there will be **INSIGNIFICANT**.

E&S Aspect	Characteristics
Duration	Permanent
Extent	Localized
Intensity	Medium
Receptor's sensitivity/vulnerability to the aspect	Low
Significance	**Minor**
Residual impacts	**INSIGNIFICANT**

Operation

No impacts are expected to occur on habitats during operation except potential soil compaction from off-road vehicles during periodical inspection and maintenance. During periods of maintenance, driving will be restricted to the already existing roads.

- **Interaction with birds - Collision Risks**

Construction

None

Operation phase

Based on data extracted utilisng the Migratory Soaring Bird Tool (MSBT) developed by BirdLife International (BI), there are two MSB species which could fly over this section of the OHTL route on migration. One of the satellite tracks belonged to the White Stork (*Ciconia ciconia*) and the remaining two belonged to the Egyptian Vulture (*Neophron percnopterus*).

In addition, the sensitivity index of the OHTL route has been calculated by the

MSBT to be ≤ 0.001. Based on the site sensitivity and the number of species potentially crossing the area, the intensity of aspects affecting birds is **medium,** and the sensitivity of the receptors is **considered to be small**, thus, the overall significance of impact is deemed **Small**

Mitigation Measures

Periodic carcass recording would take place to assess the efficiency of the proposed mitigation measures.

Residual Impacts

The residual operation impact is **Negligible**

E&S Aspect	Characteristics
Duration	Long term
Extent	Localized
Intensity	Medium
Receptor's sensitivity/vulnerability to the aspect	Small
Significance	**Small**
Residual impacts	**Negligible**

- **Interaction with birds -Electrocution Risks**

Electrocution may occur by contact between a conductor and an earthed metallic structure (either the crossarm or an earth wire) but can also occur by contact between two conductors. Large birds with extensive wingspans are more vulnerable as they have a higher likelihood of making contact with conductors when perched and opening wings. The intensity of the aspect is permanent localized; thus, the intensity of aspect is deemed **small** and the sensitivity of receptors is **medium**, thus the overall electrocution risk is considered and impact on migratory birds is **MINOR**

Mitigation Measures

Measures to reduce the risk of electrocution are either to increase the distance between earthed structures (pylons, crossarms) and points of contact with conductors, or to deter birds from using these structures as perches or nest sites.

The following mitigation measures are recommended:

- Increase the number of insulators where conductors connect to each tower, using insulators that prevent birds from landing on them.
- Cover the crossarms with insulating materials such as PVC strips to ensure that birds are not earthed when perched.

Residual Impacts

The residual impact is **Insignificant**

E&S Aspect	Characteristics
Duration	Long term
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	Medium
Significance	**Minor**
Residual impacts	**INSIGNIFICANT**

- **Workplace Health and Safety**

Construction Phase

Potential impacts during construction could arise from noise, accidental slipping of
The workers and hazards from exposure to dust and emissions from material handling, issues of working at height, as well as potential electric shocks from handling of electrical equipment and installations.

The aspects relevant to the workplace are *short-term term* limited to the construction activities, and *localized* with *medium* intensity and sensitivity of receptors is moderate. In this context, the potential workplace impacts can be considered **Moderate**

Mitigation Measures

- EETC will oblige the contractor, through the contracts, with the following measures and will follow up their implementation:
- Abide by national occupational health and safety regulations, including Law 12/2003.
- Provision of personnel protective equipment (PPE) and training suitable for different activities.
- Develop a health and safety plan for the construction site

Residual impacts

Through implementation of the above mitigation measures, the expected residual impact on the workers' health is **Insignificant**.

E&S Aspect	Characteristics
Duration	Short term
Extent	Localized
Intensity	Medium
Receptor's sensitivity/vulnerability to the aspect	Moderate
Significance	**Moderate**
Residual impacts	**INSIGNIFICANT**

Operation activities

Potential occupational health and safety risks are Minor if a proper health and safety program is established and properly executed.

Impact on Socio-economic Environment

- **Cultural heritage**

Based on baseline chapter of this ESIA report, there are no registered antiquities or cultural heritage sites within the project site and the surroundings, as the nearest cultural heritage area is at more than 9 km from the project site. In this respect, the potential impact on cultural heritage is **INSIGNIFICANT**.

However, chance find procedures will be developed to indicate the actions to be taken in case of any finds during the construction activity excavations.

Table 6–1 shows the impact assessment matrix for the construction phase.

Table 6–1: The Impact Assessment Matrix for the OHTL Southern Segment

Aspects		Without Mitigation					Level of Residual Impacts
		Temporal scale	Spatial Scale	Intensity	Receptor's sensitivity/vulnerability to the aspect	Significance of Impact before Mitigation	
Construction Phase							
Physical Environment	Air Quality	*Short term*	*Localized*	*Small*	*Medium*	*Minor*	*Insignificant*
	Ambient Noise	*Short term*	*Localized*	*Small*	*Medium*	*Minor*	*Insignificant*
	Soil	*Short term*	*Localized*	*Medium*	*Low*	*Minor*	*Minor*
Biological Environment	Habitat	*Permanent*	*Localized*	*Medium*	*Low*	*Minor*	*Insignificant*
Workplace Health and Safety		*Short term*	*Localized*	*Medium*	*Medium*	*Moderate*	*Insignificant*
Cultural heritage		*Short term*	*Localized*	*Small*	*Low*	*Insignificant*	No Residual impacts
Operation Phase							
Air Quality		*none*	*none*	*none*	*none*	*none*	*none*
Ambient Noise		*Short term*	*Localized*	*small*	*low*	*Insignificant*	*No Residual impacts*
Soil		*none*	*none*	*none*	*none*	*none*	*none*
Biological Environment (Birds)	*Collision*	*Long term*	*Localized*	*Medium*	*Small*	*Small*	*Negligible*
	Electrocution	*Long term*	*Localized*	*Small*	*Medium*	*Minor*	*Insignificant*

6.3.2 Potential Impacts relevant to the OHTL Northern Segment

Impact on the Physical Environment

- **Ambient noise**

Construction

None

Operation

The replacement of existing conductors is not expected to have additional noise impacts. It is assumed that the ambient noise levels will mask the sound generated by the conductors, the crackling (hissing) and low frequency humming sounds. The impact is **Insignificant**.

Residual Impacts ***None***

E&S Aspect	Characteristics
Duration	Permanent
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	Low
Significance	**Insignificant**
Residual impacts	**None**

Impact on the Biological Environment

- **Interaction with birds - Collision Risks**

Construction

None

Operation

As described above, no new towers will be constructed within this segment, and only replacement of conductors will take place on the existing towers crossing the farmlands near El Baraka village. The replacement of existing conductors is not expected to result in potential bird collision risks. Periodic carcass recording would take place to assess the efficiency of the proposed mitigation measures.

E&S Aspect	Characteristics
Duration	Permanent
Extent	Localized
Intensity	Medium
Receptor's sensitivity/vulnerability to the aspect	Medium
Significance	**Small**
Residual impacts	**Negligible**

- ***Interaction with birds -Electrocution Risks***

  Electrocution may occur by contact between a conductor and an earthed metallic structure (either the crossarm or an earth wire) but can also occur by contact between two conductors. Large birds with extensive wingspans are more vulnerable as they have a higher likelihood of making contact with conductors when perched and opening wings. The intensity of the aspect is permanent localized; thus, the intensity of aspect is deemed small and the sensitivity of receptors is medium, thus the overall electrocution risk is considered and impact on migratory birds is **MINOR**

Mitigation Measures

Measures to reduce the risk of electrocution are either to increase the distance between earthed structures (pylons, crossarms) and points of contact with conductors, or to deter birds from using these structures as perches or nest sites.

The following mitigation measures are recommended:

- Increase the number of insulators where conductors connect to each tower, using insulators that prevent birds from landing on them.
- Cover the crossarms with insulating materials such as PVC strips to ensure that birds are not earthed when perched.

Residual Impacts

The residual impact is **Insignificant**

E&S Aspect	Characteristics
Duration	Permanent
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	Medium
Significance	**Minor**
Residual impacts	**INSIGNIFICANT**

Workplace Health and Safety

Construction

None

Operation

Impacts on workplace during operation are relevant when considering maintenance activities. Although the frequency of maintaining the transmission line is low, safety hazards are potential due to;

- Electrocution or electrical fires from improper handling of electrical equipment and installations.
- Workers may be at risk of falling from heights during maintenance activities.
- Risks from falling tools or materials from the towers.

These aspects are considered *localized*, *intermittent*, and of *small intensity*. While the sensitivity of receptor (the workers) is high. Based on this, the overall significance of the impact is considered **MODERATE**.

Mitigation measures

- EETC will ensure that the maintenance workers are properly trained especially for working at height training
- Provision of suitable personnel protective equipment (PPE)

Residual Impacts

The above mitigation measures are expected to be efficient in minimizing the potential impacts. Therefore, the residual impacts of the construction activities of the proposed project on the health and safety of workers are deemed to be **MINOR**

E&S Aspect	Characteristics
Duration	Short term
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	High
Significance	**Moderate**
Residual impacts	**Minor**

Impact on Socio-economic Environment

As described in the project description above, for the northern segment of the OHTL, no new towers will be constructed. In this respect, it is expected that only anchoring area for the footprint of the puller and tensioner machines for conductor stringing may take place within the agricultural land areas. In this respect, potential impacts on existing assets (potential damage to existing plantation) might occur as a result of anchoring of the stringing machines. Such potential impact is temporary and expected to be minimal and will be limited to the anchoring areas of the stringing machines at the beginning and at the end of the towers.

In this context, a site visit took place in the area on the 18th and 19th of February 2025 for the purpose of identifying the potential social impacts of the stringing activities. During the site visit, meetings with concerned stakeholders and potentially affected agricultural landowners took place. The details of the site visits and the stakeholders meetings, and interviews are presented in **Annex 2** of this ESIA.

Interviews with two PAPs of the landowners indicated that they did not have any reservations related to stringing activities on their lands. This was mainly because throughout its activities, EETC maintains continuous interaction and communication with the potentially affected communities. In addition, the EETC policy of compensation in case of any damage to the land and/or the crops usually sets a margin of the budget for each project to cover any potential compensation expenses for crop damage that took place during the construction activities. Compensation is valued according to the area of land and the number of crops damaged, according to the valuation list of the Agricultural Directorate at the governorate level.

During the site visit, the PAPs also confirmed that farmers did not encounter previous issues or problems with EETC in this regard during the construction of the existing towers on their lands. In addition, PAPs indicated that they trust the process of compensation valuation in case of any crop damage.

Reportedly, during regular maintenance of towers on agricultural lands, EETC manages to locate its equipment on the border of the lands to avoid damage to crops.

Therefore, the aspect of land requirements is categorized as *short-term* and *localized*, with *small* intensity. While the sensitivity of the affected receptors is considered **Medium**. Therefore, the overall significance of the impact is assessed as **MINOR**.

Mitigation Measures

- The time of construction activity in the agricultural land should be minimized as possible.
- The owners of lands will be compensated for any potential plantation damage due to the stringing machine.
- As much as possible and feasible, schedule the stringing activities in timeframes where no crops or plantations existing within the agricultural area.

Residual Impacts

By implementing the above mitigation measures, the residual impacts of the construction activities on the land ownership will be **INSIGNIFICANT**.

E&S Aspect	Characteristics
Duration	Short term
Extent	Localized
Intensity	Small
Receptor's sensitivity/vulnerability to the aspect	Medium
Significance	**Minor**
Significance after mitigation	**INSIGNIFICANT**

Table 6–2: The Impact Assessment Matrix for the OHTL Northen Segment

Aspects		Without Mitigation					Level of Residual Impacts
		Temporal scale	Spatial Scale	Intensity	Receptor's sensitivity/vulnerability to the aspect	Significance of Impact before Mitigation	
Operation Phase							
Ambient Noise		*Permanent*	*Localized*	Small	Low	Insignificant	Insignificant
Biological Environment (Birds)	*Collision*	*Permanent*	*Localized*	Medium	Medium	Small	Negligible
	Electrocution	*Permanent*	*Localized*	Small	Medium	Minor	Insignificant
Workplace Health and Safety (during maintenance)		*Short term*	*Localized*	Small	High	Moderate	Minor

6.4 Impact of the Project on the Environment

6.4.1 Potential Impact of Extreme Heat

The project's location in Qena governorate, characterized by extreme temperatures. This could pose challenges to both the construction and operation phases of the project.

During the construction phase, Extreme heat can lead to heat stress for workers, reducing productivity and increasing the risk of heat-related illnesses.

During the Operation Phase, it is projected that the area in which the Project would be located will get warmer in the future, with an increase in number of very hot days (more than 35^{o}C) or extreme heat events. Higher ambient temperatures increase the temperature of the conductors, which generates more resistance with increasing load and may result in the overheating of the conductor and greater transmission losses.

Mitigation Measures:

Construction:

- Implement heat stress management plans, including providing shaded rest areas, frequent water breaks, and adjusting work schedules to avoid peak heat hours.
- Provide training to workers on recognizing and preventing heat-related illnesses.

Operation

- The conductors will be selected with due consideration of the projected increase in mean annual temperature and extreme heat events.

Residual Impacts:

With the implementation of these mitigation measures, the residual impacts of extreme heat are expected to be minimal. However, ongoing monitoring and adaptive management will be essential to ensure the project's resilience to the changing climate**.**

6.4.2 Potential impact of Flash Flood

The OHTL is located in an area with minimal rain fall. The stream potentially impacting the OHTL (within the circle in Figure 8-2 below) is of order 3 and its catchment area does not exceed 40 km^2. Its upstream is characterized by moderate sloping, and sandy soil. Accordingly, the flood risk on the proposed OHTL path is negligible.

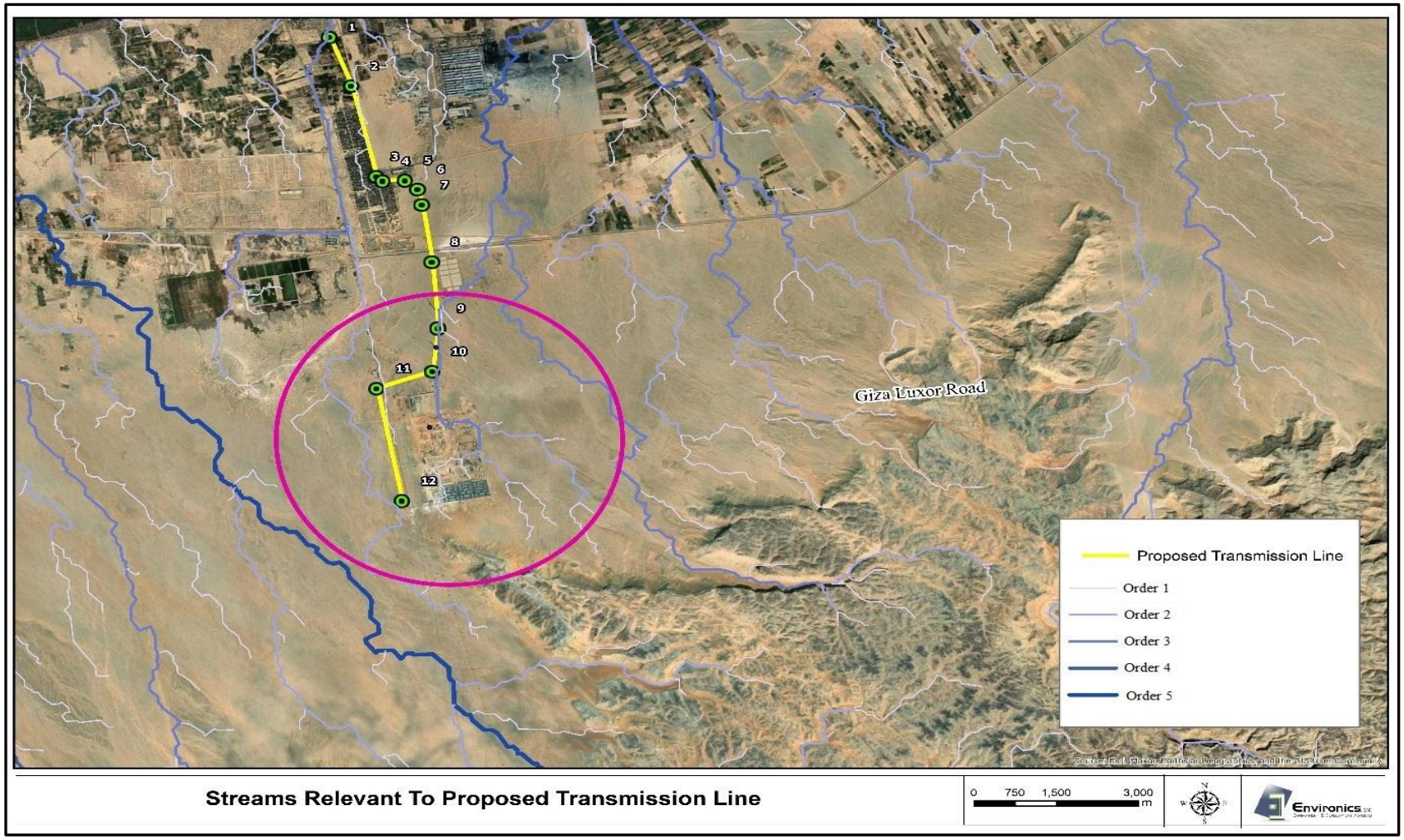

Figure 6–1: Flash Flood Streams

6.5 Potential Impacts during decommissioning

The anticipated impacts during the decommissioning phase are similar to the impacts assessed during the construction phase. The mitigation measures for the potential impacts during decommissioning are also similar, specifically related to proper management and disposal of nonhazardous and hazardous waste. 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.

6.6 Cumulative Impacts

The IFC Performance Standard 1 emphasizes addressing the cumulative impacts that are generally recognized as important on the basis of scientific concerns and/or concerns from affected communities. The methodology used to assess cumulative impacts is the same utilized to assess negative impacts based on the IFC "Good Practice Handbook Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets".

The OHTL generally does not pose significant environmental adverse impacts during the construction activities since these are mostly localized and short-term, while during operation, the main impacts are related to the potential risks to birds as a result of collision and electrocution. As described above, it is to point out that the area in which new towers will be constructed includes a network of already existing OHTLs. The proposed OTHL in hand will be running parallel to an existing line, OHTL. Nevertheless, the incremental potential impacts as a result of constructing the new OHTL towers are not expected to have significant impacts on the birds potentially flying over the area, given the area sensitivity index and the fact that only two MSB species could fly over the OHTL route. As described above, as a precautionary approach, EETC will install bird diverters along the whole OHTL segments as well as on the parallel existing OHTL to try to achieve no net loss. Thus, the potential cumulative impacts would be **INSIGNIFICANT.**

7. Environmental and Social Management Plan (ESMP)

7.1 Institutional Arrangements

EETC is responsible for ensuring compliance with the ESMP and any conditions of approval from the EEAA. The EETC will ensure that all contractors and sub-contractors will comply with National HSE Regulations, EBRD PRs, and AFDB OSs.

7.1.1 Health, Safety, and Environment Policy

The project HSE policy is in line with international and local best practice. The outline of the HSE policy requirements for the OHTL is as follows:

- Contractors will ensure and demonstrate to the client that they and all subcontractors to be appointed on the construction project will implement a health and safety management system.
- EETC will ensure that the construction contractors will designate for the project a proper number of HSE personnel depending on the project duration.
- Depending on the activity to be performed and several workers/contractors on site, EETC could require from the contractor and the subcontractors the appointment of:
  - A Health and safety officer
  - An environmental control officer
  - Details and specifications of responsibility for all appointments shall be defined in the health and safety (HS) plan, and described in a suitable organizational chart

7.1.2 Risk assessment and hazard identification

The contractor and the subcontractors performing construction work shall, before the commencement of any construction work and during construction work, perform risk assessments.

The risk assessments shall form part of the health and safety plan to be applied on the site and shall include at least:

- The identification of the risks and hazards to which persons may be exposed
- The analysis and evaluation of the risks and hazards identified
- A documented plan of safe work procedures to mitigate, reduce, or control the risks and hazards that have been identified
- A monitoring plan
- A review plan

These risk assessments will identify the hazards, risks, and mitigation measures to reduce the risks. The method statements will describe how these tasks will be performed to implement the necessary mitigation measures.

Workers shall be familiar with the Risk assessment, use the existing controls and preventive measures while performing the tasks, and provide input to their Supervisors to ensure that the Risk assessment procedures reflect all hazards identified.

7.1.3 Human resources policy

EETC, as a public entity, has a developed Human Resources (HR) policies and procedures and in line with the national labour laws that applies to all its projects and activities all over the country.

With respect to contracted workers, EETC will ensure that the third parties who engage these workers abide by the project's environmental and health, and safety management requirements through a contractor management plan. This is to be included in the contractor's scope of work (contract). This is to include ensuring proper transportation, housing conditions for workers during construction and/or operation, as relevant.[10]. In this context, EETC will project specific procedures for managing and monitoring third-party performance.

7.2 Environmental and Social Management Plans

7.2.1 Construction Environmental and Social Management Plan (CMEP)

The main objectives of the Construction Environmental and Social Management Plan (CESMP) are to:

- Address environmental and social issues identified as part of the present ESIA.
- Minimize the residual environmental impacts of construction activities;
- Prepare an achievable environmental and social management plan for the construction activities.
- Provide details of reporting requirements;
- Identify roles and responsibilities for ensuring that relevant tasks are completed;
- Provide contingency plans that can be followed in the event of non-compliance or complaint; and
- Detail registers and standards reporting forms for documenting complaints or non-compliances

7.2.2 Hazardous waste management

Hazardous waste includes mainly used machinery oils. Used oils will be collected and temporarily stored till transferred off-site.

7.2.3 Solid waste management

A procedure will be developed for handling, transporting, and disposing of wastes generated as a result of typical construction activities, future maintenance activities, or domestic wastes in accordance with the requirements below:

- An integrated waste management approach will be implemented based on waste minimisation and will incorporate the waste hierarchy (i.e. reduction, re-use, recycling, treatment and disposal where appropriate).
- Adequate waste bins/containers will be provided on-site and at the shared infrastructure area.
- The Project site will be kept clean and tidy and free from rubbish.
- No solid waste will be burned on-site.

[10] Workers' accommodation: processes and standards - A guidance note by IFC and the EBRD, 2009

- Waste bins will be cleaned regularly or when capacity has been reached to prevent any windblown waste and or visual disturbance.
- Waste will be disposed of at an appropriately licensed waste management facility.

7.2.4 Biodiversity Management

The Project will ensure that the contractors are aware of the importance of the biological environment and their compliance with the law and international regulations, and conventions. Contractors and subcontractors should be aware of species that are prohibited from being hunted, captured, or killed. In case of the presence of vagrant animals, Annex 4 of the Executive Regulations of Law 4/1994, amended by Decree 1095 /2011, defines the wild animals and plants prohibited from being hunted, traded, killed, or captured. Awareness sessions on the impact of hunting, trading, or killing wild animals will be provided to workers. Strict measures will be taken by the Project in case of non-compliance with the laws and regulations (including taking legal action). Additionally, the Project will ensure that contractors are following proper mitigation measures, including proper waste and wastewater management according to legal requirements, to avoid the attraction of pests and other alien/invasive species and the growth of marginal vegetation.

7.2.5 Occupational health and safety documentation

The appointed EPC Contractor(s) will prepare and implement an Occupational Health and Safety (OHS) Management Plan which ensures the health and safety of all personnel. The Plan will be in line with existing systems put in place by EETC as well as the requirements of national labour laws. The Health and Safety aspects will focus particularly on Construction risk, working at height risks and electrocutions and other such exposures. Health and safety materials (appropriate posters) will be displayed.

- All construction camps, laydown areas, and work sites will be made secure with fencing, signage, access control, and security.
- Protect / fence open foundation excavations.
- All foundations will be back-filled, stabilised through compaction, and capped with concrete at ground level

7.2.6 Training and Awareness

The contractor and the subcontractors shall ensure that all the workers are trained and that they have valid, competent certificates of training, especially for working at high elevations. The contractor shall develop a system of training, to be implemented also by the subcontractors, which will ensure the engagement on the project of skilled employees capable of performing all work in a manner to prevent incidents.

HSE Orientation

A Site Health, Safety, and Environment Orientation is required prior to a worker's first work assignment, necessary to authorize access on site. Some specifics that should be addressed during the HSE Orientation shall include:

- The site emergency procedures
- Restrictions (i.e., smoking ban)
- Housekeeping
- Site Specific Rules/Behaviors
- PPE to use on-site

- Reporting procedures
- Waste Handling and Disposal

The site HSE orientation shall advise of the requirements and expectations outlined in this document and the contractor's HSE program. Re-training will be required when workers demonstrate non-compliance, prove non-understanding, or prove to be incompetent in their adherence to the HS plan.

Other required training

All workers shall be trained for the work assigned, skilled as required by the Local Act. Depending on the employee's exposure to certain hazards, other required trainings may include:

- Respiratory Protection
- Fall Protection
- Personal Protective Equipment
- Excavation Safety
- Mechanical Lifting (including rigging, slings, etc.)
- Manual Lifting
- Arc Flash / Electrical Safety
- Certifications in the operation of Cranes and Forklifts
- Work at heights and rescue training
- First aid
- Fire fighting

7.2.7 Personnel security

In the course of ensuring that operation assets and personnel are secured and safeguarded in a legitimate manner. The contractor will ensure safe access and security of the site, and ensure the safety of all Employees and visitors to the site.

Security personnel will have not been implicated in past abuses, appropriate conduct toward workers and community and to act within the applicable law. Furthermore, the grievance mechanism will allow the potentially affected community to express concerns about the security arrangements and acts of security personnel.

7.2.8 Information Disclosure and Stakeholder Engagement

To ensure the correct level of engagement is being achieved by each stakeholder, the Obelisk solar power plant project will develop a communication plan and strategies to communicate with key stakeholders in a proactive and timely manner. Stakeholders' engagement typically encompasses the following key components:

- Disclosure of relevant information and transparency
- Consultation with affected communities
- Establishment of a grievance mechanism

The receipt of community contacts through a well-functioning system addresses one part of the communication to be maintained with the community.

Grievance mechanism

In addition, the project would develop a Grievance Mechanism that allows the workers/stakeholders to address their comments, worries, and complaints that should be accessible. An example of a basic structure for such a system is shown in Figure 7-1 below.

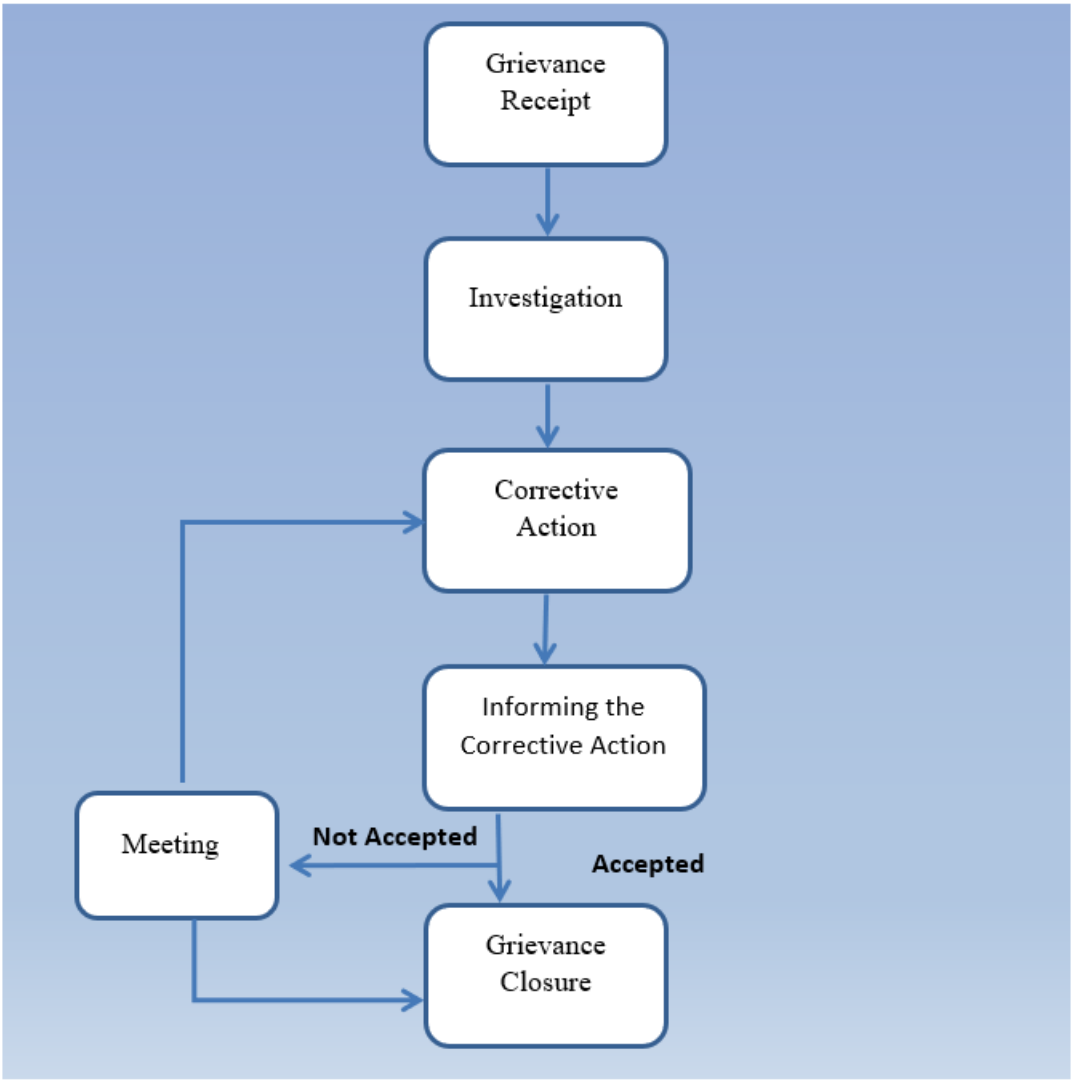

Figure 7-1: Example of Grievance Mechanism Structure[11]

All employees shall be informed of this mechanism at the time of recruitment or before start of any work on site. The grievance mechanism shall also include an anonymous communication channel such as a "suggestion box". The mechanism involves the site management and will address issues and concerns promptly.

All issues raised will be addressed using a transparent process that provides timely feedback where applicable, without retribution. The procedure for the grievance mechanism for both workers and the local community is described below:

- A concern is raised, either anonymously or with a known name and source. All issues raised are tracked in the project's "Issue Log", and a responsible person for the issue is

[11]A Guide to Designing and Implementing Grievance Mechanisms for Development Projects, The Office of the Compliance Advisor/Ombudsman for the International Finance Corporation (IFC), 2008)

identified. The Project Manager is ultimately responsible for all issues, but a concern/issue may be delegated to the Site Manager, HSSE Manager, or QA Manager as required (these might be the same person).

- Any concern indicating danger for human life, significant environmental damage or corruption will demand an immediate shut down until the concern has been investigated.
- Identified concerns are investigated. All concerns will be evaluated and corresponding actions to be agreed within 72 hours.
- For all community-related issues, the agreed action is added to any planned agenda for information meetings or reports.
- For all worker-related issues, the agreed procedure is communicated through the supplier foreman to all employees concerned at the first opportunity.
- Once agreed-upon actions are completed, the issue is closed, and final notification is given.

Any concern related to possible corruption, significant security or safety breaches or other potential major concerns gives anyone on site the right and duty to stop work and report to the Site Manager.

All concerns and corresponding actions are included in reporting to management as defined in the project charter and relevant reporting templates.

7.3 Monitoring Plan (Construction and Operation)

Once the identification and the assessment of risks have been made, according to the results obtained, a number of measures are defined in order to minimize or remove them. Taking as a reference that information, a control for each of risks identified and evaluated are conducted.

Technical instructions will be established to control and measure the following activities:

- Medical assessment
- Personnel protective equipment control
- Health and safety technician/Qualified personnel
- Security inspections

7.3.1 Workplace Monitoring

HSE Audit

A system will be implemented to ensure the constant monitoring of the HSE performance on site.

- Audits: Contractor's safety and environmental officers shall perform periodic site audits (minimum bi-weekly) to verify the implementation of the HS plan and EOP. Jointly they shall perform a documentation review.
- EETC HSE team will perform periodic audits on the site and documentation. Contractors are required to ensure the prompt resolution of any evidence found
- Inspections: Contractor and subcontractors shall ensure that visual inspections of tools and vehicles are performed daily or prior to the start of each shift.
- Monthly documented inspections of tools, equipment, and vehicles shall be performed.

- The contractor and subcontractors shall perform daily visual inspections of the workplace as required by the project of the workplace to identify potential hazards and work process verification.
- HSE Meetings: Contractor shall hold weekly HSE meetings, in the presence of EETC and subcontractors' representatives, in order to manage ongoing activities, and to avoid any interference.
- HSE Meeting shall be held whenever a new contractor starts to work.

Workplace Noise

During Construction

During construction, the project will ensure that the noise level from all operating equipment will not exceed the allowable limit set by Law 4/ 1994 for 8 8-hour shift (85 dB). In case the noise levels exceeded this limit, the exposure periods will be carried out according to those indicated in Annex (7) of Law 4/1994. Moreover, earplugs will be provided for the workers at the locations generating increased noise levels. Noise level measurement will be carried out quarterly.

During Operation

Sources of noise due to the corona effect of the OHTL and maintenance activities will be compared to the noise levels set in Annex (7) of Law 4/1994, where the noise should not exceed the maximum limit of 50 dB in the residential areas with weak traffic and service activities. Regular checks will be carried out twice a year for the closest part to the residential area.

Health monitoring

The contractors must ensure that all their employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner.

Personal protective equipment

All visitors and employees on the construction site shall wear appropriate personal protective equipment (PPE). Contractor and subcontractors shall ensure that their employees wear PPE as required by the specific task being performed, the potential hazards that the person will be exposed to, and the specifics of the job. All employees (including supervisors) shall wear a shirt with long sleeves and long pants at all times. Tank tops, sleeveless shirts, and short pants or cutoffs are not permitted. Loose or floppy clothing is prohibited around rotating or moving equipment. Rings, neck chains, or loose jewelry shall be removed.

The provision of PPE for visitors must be maintained on-site, with all equipment kept in good condition. The following is a list of minimum PPE that must be implemented and available:

- Head Protection
- Eye Protection
- Foot Protection
- Hand Protection
- Hearing Protection

Health and safety technician, qualified personnel

A project HSE team will be assigned. who will permanently stay on site for monitoring and auditing the execution of the contractors' Health and Safety.

7.3.2 Monitoring Air Quality

During Construction

Workplace air monitoring of equipment exhaust will be performed quarterly. Emissions are generated from exhaust from construction equipment and motor vehicles, and particulates during site works. Monitoring results will be compared with the allowable limits of Law 4/1994.

The following parameters shall be measured:

- Carbon monoxide, CO
- Sulfur dioxide, SO_2
- Nitrogen oxides, NO_x
- PM_{10}

7.3.3 Solid and Hazardous Wastes

Non-hazardous solid wastes will be recorded in the Environmental Register of the plant. On the other hand, according to Law 4/1994, a register will be prepared for hazardous wastes. Information of the HW register should include types and quantities of hazardous wastes, storage means, and disposal.

Table 7-1: ESMP Summary

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost	Required completion Date
Construction Phase						
Air Quality	Dust emissions	• Water spraying using low water-consuming suppression equipment • Implementing a speed limit for construction vehicles	Construction contractor	• Monitoring plan • Air quality measurements	To be determined at the lab contracting	Throughout the construction phase period
	Working conditions of machinery	• Ensure good working conditions through frequent inspection of all construction equipment	Construction contractor	Maintenance logs	Cost of maintenance	
Noise Level	Working conditions of machinery	• Ensure good working conditions through machinery maintenance	Construction contractor	Noise measurements and Maintenance logs	To be determined at the lab contracting and the cost of maintenance	Throughout the construction phase period
	Provision of PPEs	• Providing necessary PPEs for workers	Construction contractor			
Soil	Housekeeping practices	• Develop and implement a site management plan and a solid waste management plan • Secondary containment for all waste/material storage containers that could contaminate soil if released. • Availability of spill response plan, training, and response equipment	Construction contractor Developers (include provisions in the construction contracts. Developers are to ensure contractors' compliance.	• Solid/hazardous waste and wastewater management contract • Contractor follow-up documents	• Part of the construction activities management • Cost of transportation and disposal	Throughout the construction phase period
Occupational Health and Safety	Site Staff and Workplace Safety	• Implementing HSE procedures according to company, national	Contractor	HSE provisions in the construction contracts	Construction cost	Before construction activities

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost	Required completion Date
Construction Phase						
		requirements, and international standards				
Emergency Response	Site Staff and Workplace Safety	• Implement procedures for emergency control	Developer	Emergency response plan		Before project commissioning
Biological Environment	• Avoid sensitive wadis during tower location selection and while off-road driving • waste management • Minimize vegetation clearance • Avoid working at night and early morning • Avoid work activities during sensitive periods of the year (such as breeding seasons)	• Develop and implement a site management plan and a solid waste management plan	Construction contractor and developer Waste management contractor	• Monitoring plan • Solid waste management contract	• Part of construction activities • Cost of transportation and disposal	Throughout the construction phase period
Cultural heritage	Chance find	• Halt activities and immediately notify the concerned authorities	Construction contractor	Procedures for chance finding		Throughout the construction phase period

8. Stakeholders Consultation, Engagement, and Disclosure of Information

8.1 Overview and Objectives

Stakeholder engagement is a process designed specifically to provide an opportunity for affected individuals to express their opinions and/or concerns regarding the project. These inputs (opinions) should contribute to evaluating all aspects of the project, aiming to improve the project by maximizing benefits and minimizing negative impacts.

Stakeholder engagement is an ongoing process that may include, to varying degrees: stakeholder analysis and planning for their engagement, disclosure of project-related information, consultation and participation, grievance mechanisms, and ongoing reporting to affected communities. The nature, frequency, and level of stakeholder engagement can vary significantly and will be proportional to the project's risks, potential negative impacts, and development stage.
The main objectives of stakeholder engagement are:

- To inform affected persons and key interested parties about the proposed development and environmental and social studies;
- To initiate meaningful and timely stakeholder engagement;
- To identify key issues and concerns of stakeholders related to project implementation (focusing on important issues);
- To enhance transparency regarding the project and its potential environmental and social impacts (both positive and negative);
- To provide responses to stakeholder inquiries.

As part of the current environmental and social impact assessment study, communities and relevant entities within the project area were invited to a public consultation session in Qena on May 21, 2025.

8.2 Steps of Stakeholder Engagement

The stakeholder engagement process in this current study was implemented following the steps outlined in Figure 8-1.

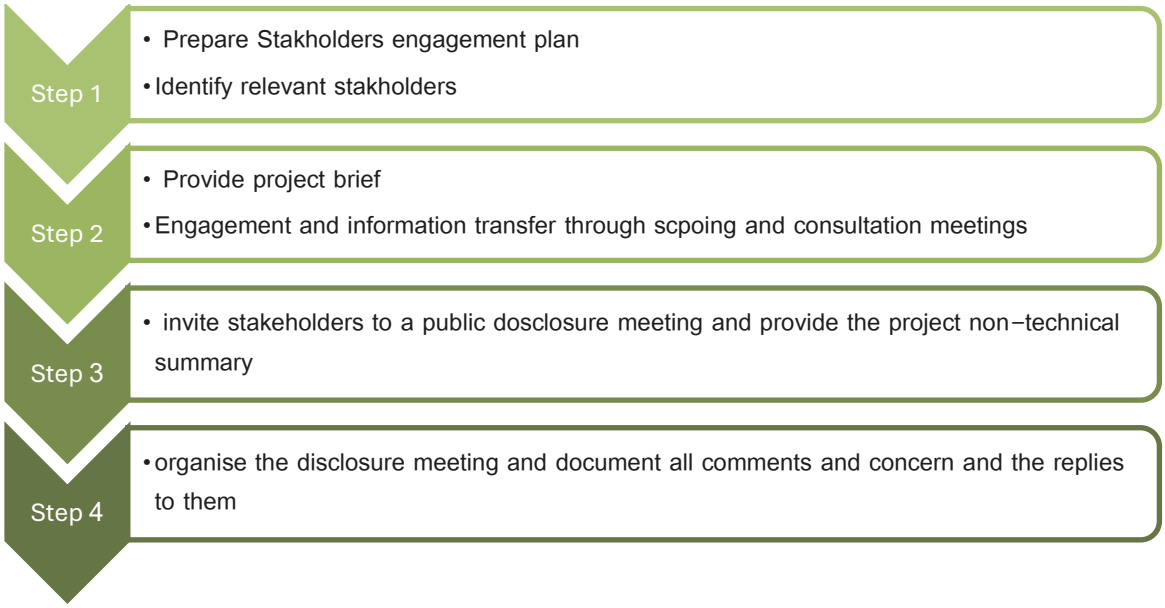

Figure 8-1: Steps for Stakeholders Engagement

The relevant stakeholders were identified considering factors such as:

- Nature and activities of the project and its environmental aspects
- Project location

Table 8-1 presents the stakeholders and their relevant roles:

Table 8-1: Stakeholders and Their Relevant Roles

Stakeholders	Role / Potential Interest
Egyptian Electricity Transmission Co.	Project owner
Environmental Affairs Agency	Overall coordination for monitoring, ensuring compliance with laws and regulations, and developing regulatory procedures via an environmental and social impact assessment system
Qena Governorate	The governorate where the proposed project will be situated and which is expected to benefit economically and socially
Local Unit Hew village	The authority within which the project falls
Egyptian Survey Authority	Responsible for defining cultivation areas and participating in developing mechanisms and compensation values for affected crops
Scientific Community	Researchers and academics who can contribute technical knowledge beneficial to the project
Surrounding Community	Landowners and farmers possibly impacted by project activities
Community-based Associations and/or Community Representatives	Protect the environment, influence decision-making, and represent part of the local community

8.2.1 Notification and Consultation Regarding the Project

Participation during the Scoping Phase During the scoping phase, stakeholder engagement activities included:

- Identifying stakeholders within the project vicinity (Appendix 2);
- Conducting informal interviews with key stakeholders including local entities, individuals potentially affected by the project, and local community associations.

These consultations mainly consisted of individual meetings. At the start of each meeting, the consulting team clarified the purpose, goals, and context to meet national and international environmental and social requirements. The objectives were to gather baseline social and economic data for impact assessment purposes. The interviewed parties included:

- Qena Governorate
- The Egyptian Survey Authority
- Local Unit of Hew village
- Qena branch of Electricity Transmission Company
- Some landowners potentially affected by the placement of transmission line in the northern segment of the line route

Annex 2 summarizes key topics discussed in the scoping meetings.

8.2.2 Disclosing the Environmental and Social Impact Assessment

A public consultation meeting was held on May 21, 2025, in Qena city. Annex 3 includes the meeting minutes, agenda, list of participants, and photographs. The meeting aimed to present the draft study, including preliminary consultation session results, project environmental impact assessment findings, proposed mitigation measures, and environmental and social management plans.

The following key issues and observations were discussed:

- The electricity transmission line route and its impact on the adjacent to Baraka village and agricultural lands in the northern segment.
- Compensation mechanisms in cases of damage to existing crops.
- Environmental and social responsibilities of the Electricity Transmission Company and contractors, as well as grievance mechanisms.
- Employment and job opportunities.

Annex (1): Environmental approval for the Obelisk solar energy project

جمهورية مصر العربية
رئاسة مجلس الوزراء
وزارة البيئـــة
جهاز شئون البيئة

4246

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الموضوع: دراسة تقييم تأثير بيئي (ب) محددة
رقم الإيصال: ٢٠٥٧٠٦

السيدة المهندسة / إيمان إبراهيم رمضان
مدير عام الدراسات الهندسية والاقتصادية والبيئية – هيئة تنمية واستخدام الطاقة الجديدة والمتجددة

تحية طيبة وبعد،

بالإشارة إلى كتاب سيادتكم الوارد لنا بتاريخ ٢٠٢٤/١١/٢٤ والمرفق به دراسة تقييم التأثير البيئي (ب) محددة المقدمة لمشروع/ إنشاء وتشغيل محطة توليد الطاقة الكهربية باستخدام تكنولوجيا الخلايا الكهروضوئية بقدرة (١٠٠٠ميجاوات)، والمزودة بنظام تخزين الطاقة بالبطاريات سعة (٢٠٠ ميجاوات / ساعة)، المساحة الكلية للمحطة (٣٨٨٨ فدان)، الموقع/ منطقة صحراوية في نطاق مركز نجع حمادي – محافظة قنا، مالك المشروع/ شركة أوبليسك للطاقة الشمسية.

أتشرف بالإحاطة بأنه بعد مراجعة الدراسة المقدمة، و بناءا على رأي قطاع حماية الطبيعة والاجتماع المنعقد بتاريخ ٢٠٢٤/١٢/٥ بمقر الوزارة ، فإن جهاز شئون البيئة **يوافق** على إقامة المشروع، بشرط الالتزام بجميع المواصفات والإجراءات التي وردت بالدراسة المقدمة والالتزام بجميع الأسس والاشتراطات التي نص عليها القانون رقم (٤) لسنة ١٩٩٤ بشأن حماية البيئة ولائحته التنفيذية رقم (٣٣٨) لسنة ١٩٩٥وتعديلاتهما وقانون تنظيم إدارة المخلفات رقم (٢٠٢) لسنة ٢٠٢٠ولائحته التنفيذية رقم (٧٢٢) لسنة ٢٠٢٢مع الالتزام بالاشتراطات الآتية:

١. الإلتزام بموقع وإحداثيات المحطة بالمنطقة الصحراوية الواقعة في نطاق مركز نجع حمادي – محافظة قنا، كما ورد بالدراسة.

النقاط	خط طول	خط عرض
١	٣٢,٢٦٢١٤٤	٢٥,٩١٣٨٧
٢	٣٢,٣١١١٧٥	٢٥,٩١٦٧١
٣	٣٢,٣١٧٢٨١	٢٥,٨٨٧١٩٧
٤	٣٢,٢٦٩١٨٨	٢٥,٨٨٦٩٣٣

٢. الالتزام بأن يقتصر المشروع على إنشاء وتشغيل محطة توليد الطاقة الكهربية باستخدام تكنولوجيا الخلايا الكهروضوئية بقدرة (١٠٠٠ميجاوات)، والمزودة بنظام تخزين الطاقة بالبطاريات سعة (٢٠٠ ميجاوات/ ساعة) بمساحة كلية للمحطة (٣٨٨٨ فدان)، مع الالتزام بعدم انشاء خطوط نقل الكهرباء التابعة للمحطة المقترحة ومحطة المحولات أو القيام بإضافة أي أنشطة أخرى أو توسعات قبل الحصول على الموافقة البيئية المسبقة من جهاز شئون البيئة.
٣. الالتزام بالحصول على موافقات الجهات المعنية قبل البدء في تنفيذ المشروع.
٤. الالتزام بالمواصفات الفنية والمكونات الرئيسية للمشروع كما ورد بالدراسة، وهي كالآتي: -
- عدد (١,٦٢٠,٧٥٠) من ألواح الطاقة الشمسية (قدرة كل منها ٧١٠ وات).
- عدد (٣٩٧٥) عاكس (مغير للتيار) لتحويل التيار المتردد المستمر إلى تيار متردد بقدرة إجمالية (١١٣١ ميجا فولت امبير).
- أنظمة تتبع أحادية المحور بعدد ١٨٠٠٧ وحدة (٢/٣) سلسلة لكل طاولة.
- قواطع كهربائية بجهد (٣٣ كيلو فولت).
- عدد (٤٨) بطارية BESS (بطاريات أيون الليثيوم بقدرة (٢٠٠ ميجاوات/ ساعة) لتخزين الطاقة الناتجة
- أنظمة التبريد لمنع ارتفاع درجات الحرارة بالبطاريات.

٥. الالتزام باستخدام التكنولوجيا ثنائية الوجه، كما ورد بالدراسة.
٦. الالتزام بطلاء أسطح الخلايا الكهروضوئية بطلاء مضاد للانعكاس وكذلك تلوين حواف الواح الخلايا بلون مغاير لتقليل تأثير (lake effect) على الطيور المهاجرة.

م/ إيرانيا يونس
ع. أحمد ...

رئيس قطاع الإدارة البيئية

يعتمد

د. شريف باز ٢٠٢٤/١٢/٨

هذه الموافقة من صفحتين (٢/١)

جمهورية مصر العربية
رئاسة مجلس الوزراء
وزارة البيئة
جهاز شئون البيئة

الإدارة المركزية ... التأثير البيئي
إدارة وثائق ... التأثير البيئي
٤٤/١٢/٨
٤٤٩٦

وزارة البيئة / MINISTRY OF ENVIRONMENT
335217

٧. الالتزام بعدم زيادة ارتفاع نظام تثبيت الالواح عن ١,٥ متر من الأرض كما ورد بالدراسة.
٨. الالتزام باستخدام الألومنيوم والصلب في أنظمة التركيب نظرا لقابلية إعادة تدويرها في نهاية المشروع مما يقلل من البصمة البيئية.
٩. الالتزام بإقامة سور حول المحطة بفتحات من الاسفل بارتفاع مناسب تسمح بمرور الكائنات الحية دون قيود.
١٠. الالتزام بالصيانة والتنظيف الدوري والمستمر للخلايا الشمسية ومكونات المشروع، مع استخدام التنظيف الآلي الجاف (robotic) للألواح الشمسية بدون استخدام مياه، كما ورد بالدراسة.
١١. الالتزام بوضع خطة لتجنب الإضرار بالطيور وتقليل احتمالات اصطدام الطيور بالألواح الشمسية والبنية الأساسية المرتبطة بها، مع ضرورة أن يكون هناك مسئول عن البيئة بالموقع لرصد مكونات التنوع البيولوجي بالموقع.
١٢. الالتزام بوضع أجهزة انذار على الخلايا لتقليل الاصطدام.
١٣. الالتزام بوضع ملصقات توضح ضرورة الالتزام بالحفاظ على التنوع البيولوجي في جميع انحاء الموقع.
١٤. الالتزام بعدم تجاوز الحدود القصوى لملوثات الهواء بما يتفق مع الملاحق أرقام (٦،٥) من اللائحة التنفيذية المعدلة بالقرار رقم (١٠٩٥) لسنة ٢٠١١، خاصة أثناء مراحل الإنشاء والتشييد.
١٥. الالتزام بعدم تجاوز الحدود القصوى لمستويات الضوضاء أثناء عمليات التركيب، بما يتفق مع الملحق رقم (٧) من اللائحة التنفيذية وتعديلاتها.
١٦. الالتزام بعدم استخدام المياه الجوفية في المشروع.
١٧. الالتزام بالتنسيق مع الإدارة العامة للمرور فيما يخص تحرك المركبات لنقل المعدات والمواد اللازمة خلال فترة الإنشاء والتشييد.
١٨. الالتزام بإعادة تأهيل الموقع لأصله في حالة الاغلاق للمشروع.
١٩. الالتزام بالتخلص من مخلفات الصرف الصحي عن طريق تجميعها في خزانات معزولة ومحكمة الغلق معدة خصيصا لهذا الغرض وتسليمها لمتعهد معتمد وحاصل على الموافقة البيئية للتخلص النهائي منها طبقا للمعايير والقوانين المنظمة لذلك، كما ورد بالدراسة.
٢٠. التداول السليم والآمن بيئياً للمواد الخطرة المستخدمة طبقاً للمادة رقم (٦٠) من القانون رقم (٢٠٢) لسنة ٢٠٢٠ بشأن تنظيم إدارة المخلفات.
٢١. الالتزام بالتخلص السليم بيئيا من المخلفات الغير قابلة لإعادة التدوير (المكونات الإلكترونية) عن طريق تجميعها وتسليمها لمتعهد معتمد حاصل على الموافقة البيئية لإعادة تدويرها أو التخلص الآمن منها في الأماكن المخصصة لذلك.
٢٢. الالتزام بالتخلص السليم بيئيا من المخلفات الصلبة الناجمة عن عمليات الإنشاء والتركيب والتشغيل بشكل دوري منتظم عن طريق تجميعها وتسليمها لمتعهد معتمد حاصل على الموافقة البيئية للتخلص منها في الأماكن المخصصة لذلك.
٢٣. الالتزام بالتخلص السليم والآمن من المخلفات السائلة الخطرة (الزيوت والشحوم) عن طريق تجميعها وتسليمها لمتعهد معتمد وحاصل على الموافقة البيئية للتخلص النهائي منها طبقا للمعايير والقوانين المنظمة لذلك، كما ورد بالدراسة.
٢٤. الالتزام بالتخلص السليم والأمن بيئياً من المخلفات الصلبة الخطرة الناتجة عن النشاط (هوالك الخلايا الشمسية، الخلايا المتقادمة، البطاريات المستهلكة، .... إلخ) بتجميعها وتسليمها لمتعهد معتمد حاصل على الموافقة البيئية للتخلص النهائي منها، طبقا للمعايير والقوانين المنظمة لذلك، كما ورد بالدراسة.
٢٥. الالتزام بخطة الإدارة البيئية والرصد الدوري، مع ضرورة تدوين نتائج القياسات في السجل البيئي
٢٦. إعداد السجل البيئي للنشاط طبقا للمادة (٢٢) من القانون (٤) لسنة ١٩٩٤، والمعدل بالقانون رقم (٩) لسنة ٢٠٠٩، وإعداد سجل للمخلفات الخطرة طبقاً للمادة (٦٥) من القانون رقم (٢٠٢) لسنة ٢٠٢٠ بشأن تنظيم إدارة المخلفات، وجعلهم متاحين عند التفتيش البيئي.

هذه الموافقة من الناحية البيئية فقط دون الإخلال بأية قوانين أو قواعد أو قرارات أخرى تخص هذا النشاط، وفي حالة عدم الالتزام بأي شرط من الاشتراطات الموضحة بالحالة تعتبر هذه الموافقة لاغية.

وتفضلوا بقبول فائق الاحترام ،،،

رئيس الإدارة المركزية لتقييم الأثر البيئي
(م/ فاطمة عبد الرحيم)

رئيس قطاع الإدارة البيئية
يعتمد،،،
(م / نسرين محمد باز)

Annex (2): Stakeholders Scoping Meetings

التشاور المبدئى لتحديد النطاق
لمشروع خط نقل الكهرباء – نجع حمادي

تم القيام بزيارة ميدانية لجمع البيانات الأولية الخاصة بالتقييم الاجتماعي على مدار يومي ١٨ و١٩ فبراير ٢٠٢٥. وقد اعتمدت عملية جمع المعلومات على أدوات نوعية تمثلت في اجتماعات فردية، اجتماعات عارضة، وجلسات نقاش، وذلك على النحو التالي:

- زيارة ميدانية لموقع الأبراج القائمة الواقعة في المنطقة الزراعية، مع الإشارة إلى تعذّر الوصول إلى مواقع الأبراج المقترحة الجديدة خلال فترة الزيارة؛
- عقد سبعة (٧) اجتماعات مع مسؤولين رئيسيين من السلطات المحلية بمحافظة قنا والوحدة المحلية لقرية هوّ.
- عقد اجتماع واحد مع مسؤول التواصل المجتمعي (CLO) لمشروع محطة الطاقة الشمسية؛
- عدد (٢) اجتماعات فردية مع أشخاص من أصحاب المصلحة المتأثرين بالمشروع: أحدهما من موقع البرج رقم ٢، والآخر ممثل عن حائزى الأراضي الزراعية التي تقع عليها الأبراج.
- تنفيذ جلسة نقاشية مع عدد من ممثلي السلطات المحلية وقادة المجتمع المحلي في الوحدة المحلية لهوّ، بمشاركة ستة (٦) أفراد

شكل ١ : صورة من مناقشة جماعية مع السلطات المحلية وقيادات قرية هو – فبراير ٢٠٢٥

١-١ تحديات متعلقة بالبيانات المتاحة

رغم الجهود المكثفة التي بُذلت خلال مرحلة جمع البيانات، واجه الفريق عددًا من التحديات التي حدّت من إمكانية الحصول على معلومات متكاملة وشاملة. ومن أبرز هذه التحديات ما يلي::

- **تفاوت مستوى تفصيل البيانات الثانوية** :اتسمت البيانات المستقاة من مركز المعلومات بالوحدة المحلية لقرية "هوّ" بعدم التجانس من حيث مستوى التجزئة؛ إذ غطّت بعض البيانات كامل الوحدة المحلية، بينما اقتصرت أخرى على قريتي "هو" و"الدرب". بالإضافة إلى ذلك، فإن مؤشرات ديموغرافية واجتماعية مهمة – مثل معدل النمو السكاني، التوزيع العمري، المستوى التعليمي، الحالة الاجتماعية، ومعدلات التشغيل والبطالة – كانت متوفرة بصيغة أرقام مطلقة فقط، دون نسب مئوية ترتبط بإجمالي السكان (٦ سنوات فأكثر أو ١٠ سنوات فأكثر)، مما قلل من إمكانية استخدامها بفعالية في إعداد خط الأساس الاجتماعي.
- **تعذر التواصل مع الجمعية الزراعية المحلية** :لم يتسنَّ عقد اجتماع مع الجمعية الزراعية في قرية "هوّ"، والتي تُعد الجهة التمثيلية للمزارعين على المستوى المحلي، الأمر الذي حال دون استكمال المعلومات النوعية حول أوضاعهم المعيشية وتحدياتهم المتعلقة بالنشاط الزراعي.
- محدودية التفاعل مع المزارعين داخل نطاق المشروع: نتيجة لضيق الوقت المخصص للزيارة الميدانية، لم يكن من الممكن إجراء مناقشات تفصيلية مع المزارعين في نطاق المشروع حول كافة شواغلهم وتوقعاتهم المرتبطة بالتدخلات المقترحة، خاصة في ظل قرب مواقع التنفيذ من أراضيهم الزراعية.

٢ البيئة الاجتماعية الاساسية

تمثل قرية "هوّ" منطقة التأثير الاجتماعي الأساسية للمشروع، وتتبع إداريًا الوحدة المحلية لـ"هوّ"، والتي تضم قريتين رئيسيتين هما "هوّ" و"الدرب"، بالإضافة إلى ٣٠ قرية وتجمعًا ريفيًا تابعًا. وتخضع هذه الوحدة المحلية لمركز نجع حمادي بمحافظة قنا. تحد الوحدة المحلية لـ"هوّ" من الشمال مدينة نجع حمادي، ومن الشرق نهر النيل، ومن الجنوب مصنع الألومنيوم، بينما يحدها من الغرب الطريق الصحراوي (القاهرة–أسوان). تبلغ المساحة الإجمالية للوحدة المحلية.

شكل ٢: قرية "هو"– فبراير ٢٠٢٥

٢-١ السياق المحلي

وفقًا للمناقشات التي أُجريت مع ممثلي الجهات المحلية وقادة المجتمع المحلي، تقع قرية "هوّ" بين شركتين صناعيتين رئيسيتين؛ حيث تحدها من الشمال شركة السكر، ومن الجنوب شركة الألومنيوم وقرية "الدرب". وتضم القرية منطقة تُعرف بـ"بركة نجع" خُصصت لصالح شركة الألومنيوم لتشييد وحدات سكنية للعاملين بها، وقد أوضح المشاركون أن هذه الوحدات تتساوى في المساحة وتحمل سندات ملكية قانونية صادرة عن الجهات المعنية.

خلال جلسات التشاور، تم التأكيد على أن كافة الأراضي الزراعية في نطاق المشروع هي أراضٍ مملوكة للدولة ضمن برنامج الإصلاح الزراعي، حيث قام عدد من المزارعين بتقنين أوضاعهم والحصول على سندات تمليك، في حين لا يزال آخرون يزرعون بموجب عقود انتفاع. ويُعد قصب السكر المحصول الزراعي الرئيسي في القرية، إلى جانب محاصيل تقليدية أخرى مثل القمح، الذرة، الفول، البرسيم، وبعض أصناف الخضروات.

أشار المشاركون إلى أن ما يقرب من ٧٠٪ من الذكور في القرية يعملون في شركتي الألومنيوم والسكر، بينما ينخرط حوالي ٢٠٪ في الأنشطة الزراعية، ويعمل نحو ١٠٪ في مجالات الخدمات مثل المشروعات الصغيرة، الحرف اليدوية، وأعمال المقاولات. أما النساء، فتُعد مشاركتهن الاقتصادية محدودة للغاية، إذ يقتصر عمل عدد قليل منهن على وظائف حكومية، ولا تُسجل مشاركة نسائية تُذكر في القطاع الزراعي.

وقد أبرزت المناقشات المجتمعية جملة من التحديات التنموية التي تواجه القرية، من بينها ارتفاع معدلات الفقر والبطالة، وتدهور الأوضاع المعيشية والاقتصادية، بالإضافة إلى محدودية فرص التوظيف، لا سيما بين فئة الشباب. كما تفتقر الوحدة المحلية لـ"هوّ" إلى التواجد الأمني الكافي؛ إذ لا توجد سوى نقطة شرطة صغيرة في قرية "الدرب"، ويتولى العُمد والمشايخ المحليون المهام الأمنية اليومية. وتُعاني المنطقة كذلك من نقص واضح في الخدمات الاجتماعية الأساسية، حيث تُعد مستشفى نجع حمادي الحكومي أقرب منشأة صحية تقدم خدمات طبية للسكان، في حين أن أقرب مؤسسة تعليمية جامعية تقع في مدينة قنا.

ويتميز المجتمع المحلي بتجانسه وتماسكه الاجتماعي، إذ تُعبر الوحدة المحلية، وعُمد ومشايخ القرى، وعضو البرلمان المنتخب، عن تطلعات السكان ومطالبهم. كما يتولى التعاون الزراعي بقرية "هوّ" تمثيل مصالح المزارعين، ويقوم بتوفير مستلزمات الإنتاج الزراعي كالبذور والأسمدة والمبيدات. وفي حال ظهور مشكلات تتعلق بخدمات المياه أو البنية التحتية كأبراج الكهرباء، يتوجه المزارعون بشكاواهم إلى الوحدة المحلية، أما النزاعات البينية، فيتم حلها غالبًا من خلال القيادات المجتمعية المحلية.

٢-٢ وصف الظروف البيئية والاجتماعية الأساسية

٢-٢-١ السكان

يُقدّر إجمالي عدد سكان الوحدة المحلية بالهوّ بـ ١١٢,٨٥٤ نسمة في عام ٢٠٢٣ (موزعين على ٨٦,٧٨٥ نسمة في قرية "هوّ"، و٢٦,٠٦٩ نسمة في قرية "الدرب"، وذلك بنسبة تقارب بين الذكور والإناث تبلغ ٥١٪ ذكور مقابل ٤٩٪ إناث، وفقًا للنشرة الإحصائية للربع الثالث لعام ٢٠٢٤ الصادرة عن الوحدة المحلية.

٢-٢-٢ خدمات البنية التحتية

تخدم منطقة الوحدة المحلية ثلاثة محولات كهربائية؛ أحدها يقع في قرية "هوّ"، والثاني في قرية "الدرب"، بينما يقع الثالث بالقرب من المنطقة الصناعية التابعة للوحدة المحلية. وترتبط القريتان بشبكة المياه العامة، في حين تختلف أوضاع الصرف الصحي؛ إذ إن قرية الدرب متصلة بالشبكة العامة، بينما لا تزال شبكة الصرف الصحي في قرية "هوّ" قيد التنفيذ، بحسب البيانات الصادرة عن النشرة الإحصائية للربع الثالث لعام ٢٠٢٤.

٢-٢-٣ الخدمات الاجتماعية

تضم الوحدة المحلية عددًا من المنشآت الخدمية الاجتماعية التي تخدم السكان، وتشمل: أربعة مراكز شباب (٢ في الهوّ، و١ في الدرب)، وخمسة مراكز صحية (٤ في الهوّ، و١ في الدرب)، وخمس وحدات لتنظيم الأسرة (٤ في الهوّ، و١ في الدرب)، ووحدة واحدة للشؤون الاجتماعية في الهوّ، ووحدتان زراعيتان (واحدة في الهوّ، والأخرى في الدرب)، ومركز اتصالات واحد في الهوّ، ومكتب بريد واحد في كل من الهوّ والدرب، ومكتب تموين واحد في الهوّ، ونقطة شرطة واحدة في الدرب.

وفيما يخص الخدمات التعليمية،، فتتوفر ١١ روضة أطفال (٩ في الهوّ، و٢ في الدرب)، و١٨ مدرسة ابتدائية (١٣ في الهوّ، و٥ في الدرب)، و١٢ مدرسة إعدادية (٨ في الهوّ، و٤ في الدرب)، ومدرسة ثانوية واحدة في الهوّ، ومدرسة صناعية واحدة في الهوّ، ومدرستان فئة واحدة (واحدة في الهوّ وواحدة في الدرب). كما توجد مدارس أزهرية: روضة واحدة في الهوّ، و٣ مدارس ابتدائية (٢ في الهوّ و١ في الدرب)، ومدرستان إعدادية وثانويتان في الهوّ. أما مدارس ذوي الاحتياجات الخاصة وضعاف السمع، فتتوفر فقط في الهوّ (٢ ابتدائي، ٢ إعدادي، و٢ ثانوي).

٢-٢-٤ المجتمع المدني

تضم الوحدة المحلية نحو ١٥ جمعية أهلية، من بينها ٨ جمعيات خيرية و٧ جمعيات تنموية، وتخدم ما يقرب من ٦٠٠ رجل و١,٠٠٠ سيدة، بحسب النشرة الإحصائية للربع الثالث لعام ٢٠٢٤. إلا أن رئيس قسم التضامن الاجتماعي أشار خلال جلسات الحوار إلى أن خمس جمعيات فقط تُعد نشطة فعليًا، وتقدم خدمات تنموية أساسية وتنظم قوافل طبية لخدمة المجتمعات المحلية.

٢-٢-٥ التضامن الاجتماعي

بحسب بيانات قسم التضامن الاجتماعي، يستفيد حوالي ٣,٥٥٦ فردًا من برامج الدعم الحكومي، من بينهم ١,٩٧٢ سيدة فقيرة تستفيد من برنامج "تكافل"، و١,٥٨٤ من كبار السن وذوي الإعاقة يستفيدون من برنامج "كرامة" حتى فبراير ٢٠٢٥. كما يدعم القسم برنامج "الأسرة المنتجة" من خلال توفير تمويل بسيط ومتابعة فنية لنحو ٣٢ سيدة و٢٤ رجلًا لإنشاء مشروعات مدرة للدخل.

٢-٢-٦ الجوانب المتعلقة بالنوع الاجتماعي

تلعب الرائدات الريفيات دورًا نشطًا في التوعية الصحية، ومحو الأمية، وتقديم الإسعافات الأولية، بالإضافة إلى المساهمة في الحد من الظواهر السلبية مثل الزواج المبكر وختان الإناث. ورغم ذلك، تواجه النساء في المنطقة تحديات كبيرة في مجال التمكين الاقتصادي، تشمل نقص التدريب في الحرف اليدوية، وضعف القدرة على الوصول

إلى الموارد المالية والمعدات اللازمة لتأسيس مشروعات صغيرة. وتُعبر النساء عادةً عن احتياجاتهن من خلال الوحدة المحلية أو إدارة التضامن الاجتماعي، نظرًا لضعف تمثيلهن المباشر في صنع القرار المجتمعي.

٣ التأثيرات الاجتماعية المتوقعة وتدابير التخفيف

٣-١ التأثيرات الإيجابية

أظهرت المناقشات التي أُجريت مع السلطات المحلية وقادة المجتمع المحلي وجود عدد من التأثيرات الاجتماعية الإيجابية المتوقعة للمشروع، من أبرزها:

- **تحسين البنية التحتية للطاقة** من خلال نقل الطاقة الكهربائية إلى شركة الألومنيوم؛
- خفض الأحمال على الشبكة المحلية مما يساهم في الحد من الانقطاعات الكهربائية المتكررة الناتجة عن الضغط الزائد؛
- تعزيز التنمية الاقتصادية المحلية من خلال إيصال الكهرباء إلى مناطق محرومة، مما يُسهم في تهيئة بيئة جاذبة للاستثمار وخلق فرص اقتصادية جديدة داخل قرية "هوّ"؛
- توفير فرص عمل مؤقتة ومباشرة خلال مراحل تنفيذ المشروع، مما يُسهم في تقليل معدلات البطالة المرتفعة في نطاق الوحدة المحلية بالهوّ.

٣-٢ التأثيرات السلبية

لم تُسجل أي مخاوف مجتمعية أو مؤسسية كبيرة بشأن تأثيرات سلبية مباشرة للمشروع، طالما تم تنفيذ الأعمال وفقًا للمعايير الوطنية ومتطلبات السلامة الخاصة بتركيب الأبراج وخطوط الكهرباء. ومع ذلك، تمت الإشارة إلى **احتمالية حدوث أضرار عرضية للمحاصيل الزراعية** أثناء تنفيذ أعمال شد الأسلاك الكهربائية في الأبراج القائمة.

وقد تمت مناقشة هذا الخطر المحتمل بشكل موسع مع كل من إدارة تقييم الأثر البيئي بمحافظة قنا والشركة المصرية لنقل الكهرباء (EETC) بمكتبها في نجع حمادي. وقد أوضح مسؤولو الإدارة وعضو لجنة التعويضات بالشركة أن ادارة تقييم الأثر البيئي لا تتدخل إلا في حال صدور قرار وزاري بنزع الملكية، وهو ما لم يحدث في هذا المشروع، نظرًا لأن مواقع الأبراج الجديدة تقع على أراضٍ صحراوية مملوكة للدولة وغير مأهولة أو مستخدمة.

بالنسبة للأضرار الزراعية الناتجة عن مد الأسلاك، تتولى لجنة التقييم التابعة للشركة المصرية لنقل الكهرباء تقييم وتحديد قيمة التعويضات المستحقة دون تدخل من الجهات الحكومية. وتتم إجراءات التعويض وفقًا للآتي:

- تُخصص ميزانية جزئية ضمن كل مشروع لتغطية تكاليف التعويض عن الأضرار الزراعية المحتملة.
- يتم تقدير قيمة التعويض بناءً على نوع المحاصيل المتضررة، ومساحة الأرض المتأثرة، باستخدام القوائم السعرية المُعتمدة من مديرية الزراعة بالمحافظة.

- في حال اعتراض المزارعين على قيمة التعويض، يمكنهم اللجوء إلى لجنة عرفية لتسوية النزاعات تتكون من قيادات محلية، وذلك للتحقق من ملكيتهم القانونية للأرض المتضررة، والوصول إلى حل ودي مرضٍ لجميع الأطراف. ويتم توثيق نتائج التفاوض في مذكرة رسمية بحضور المستشار القانوني للشركة.

وفي إطار استكمال التقييم، أُجريت اجتماعات مباشرة مع اثنين من المزارعين المحتمل تأثرهم بالمشروع. وقد أفادا بعدم وجود أية تحفظات على مد الأسلاك فوق أراضيهم، وأكدا أن الشركة المصرية لنقل الكهرباء تتخذ احتياطات مناسبة خلال الصيانة الدورية، منها وضع المعدات على أطراف الأراضي الزراعية لتفادي تلف المحاصيل.

كما أكدا أن الشركة المصرية لنقل الكهرباء تتعامل بمرونة مع المتضررين في حال وقوع أية أضرار، حيث تقوم لجنة التعويض بالتفاوض مباشرة مع أصحاب الأراضي، بما يضمن تقدير تعويض عادل ومرضي. وأشارا إلى وجود ثقة مجتمعية واسعة في آلية التقييم المتبعة من قبل الشركة، حيث لم تُسجل أي نزاعات سابقة بشأن التعويضات الزراعية في مشروعات مماثلة.

٣-٣ تدابير التخفيف المقترحة

لزيادة التأثيرات الإيجابية وتفادي الآثار السلبية المحتملة للمشروع، فقد تم اقتراح التدابير التالية :

- تخصيص نسبة من فرص العمل للتوظيف المحلي من سكان القرية في مجالات متعددة، مثل خدمات الأمن، أعمال المقاولات الفرعية، وتوريد المستلزمات؛
- تنفيذ برامج تدريب فني للشباب المحلي على صيانة الخلايا الكهروضوئية، بما يسهم في خلق فرص عمل جديدة داخل القرية.

٤ إشراك أصحاب المصلحة

يستعرض هذا الفصل أنشطة إشراك أصحاب المصلحة التي تم تنفيذها ضمن عملية إعداد تقييم الأثر البيئي والاجتماعي. ويقدم ملخصًا لجلسات التشاور التي أُجريت مع أصحاب المصلحة الأساسيين والثانويين. وقد صُممت هذه الأنشطة بهدف تبادل المعلومات والمعرفة في الوقت المناسب، مع السعي لفهم المخاوف والاستجابة لها، وبناء علاقات قائمة على الثقة المتبادلة.

ويُعرّف "صاحب المصلحة" على أنه: شخص أو مجموعة أو منظمة أو مجتمع قد يتأثر بشكل مباشر أو غير مباشر (إيجابًا أو سلبًا) بالمشروع، أو لديه مصلحة فيه.

أصحاب المصلحة الثانويين الذين تم التشاور معهم خلال التقييم الاجتماعي شملوا الجهات التالية:

- الجهات المحلية بمحافظة قنا: نائب المحافظ، قسم نظم المعلومات الجغرافية، إدارة تقييم الأثر البيئي؛
- الجهات المحلية بالوحدة المحلية بالهوّ: رئيس الوحدة المحلية، مكتب المعلومات، إدارة التضامن الاجتماعي، إدارة العلاقات العامة، العمد والمشايخ؛

- الشركة المصرية لنقل الكهرباء إدارة التشغيل، لجنة التعويضات؛

أما أصحاب المصلحة الأساسيين الذين تم التشاور معهم فهم من الأشخاص المتأثرين مباشرة في مواقع الأبراج القائمة:

٤-١ أنشطة التشاور

يعرض الجدول التالي قائمة بأهم أصحاب المصلحة الذين تم التشاور معهم ضمن الدراسة الاجتماعية لهذا المشروع، موضحًا الغرض من كل اجتماع والنتائج الرئيسية المتحققة من كل منها:

جدول ١ :ملخص الاجتماعات والجلسات النقاشية مع أصحاب المصلحة

م	الاسم	الوظيفة	التاريخ	الغرض من المقابلة	النتائج	رقم الاتصال
السلطات المحلية بمحافظة قنا						
1	أيمن السعيد محمد	السكرتير العام	18-02-25	–تقديم فريق الدراسة – شرح أهداف الزيارة الميدانية – طلب تسهيل تنفيذ أنشطة التشاور	–تم تقديم خرائط المشروع وشرحها –تمت مناقشة واعتماد جدول الاجتماعات	01006050788
2	حسام	رئيس إدارة نظم المعلومات الجغرافية	18-02-25	– التعرف على التبعية الإدارية لمنطقة المشروع	–المشروع يقع في قرية الهوّ التابعة للوحدة المحلية بالهوّ	01000053447
3	محمد إسماعيل محمد	مدير إدارة تقييم الأثر البيئي	18-02-25	– فهم إجراءات التعويض في حالة تلف المحاصيل – تقييم إجراءات التخفيف المقترحة –الاطلاع على تجارب سابقة بالمحافظة	– تشارك الإدارة فقط في المشروعات التي يصدر لها قرار وزاري بنزع الملكية –في حالة عدم وجود قرار وزاري، تتولى الشركة المصرية لنقل الكهرباء التفاوض مع المتضررين عبر لجنة التعويضات – لا توجد مشكلات سابقة مسجلة في هذا الشأن	01024495677
4	محمد مصطفى	مفتش، إدارة تقييم الأثر البيئي	18-02-25	——	——	01000975197
السلطات المحلية بالوحدة المحلية بالهوّ						
5	محمد السمان فندي	سكرتير الوحدة المحلية بالهوّ	18-02-25	– تقديم فريق الدراسة – شرح أهداف الزيارة الميدانية – طلب تسهيل أنشطة التشاور	– تم تحديد الاجتماعات وجلسة النقاش الجماعي لليوم التالي	01021513555

م	الاسم	الوظيفة	التاريخ	الغرض من المقابلة	النتائج	رقم الاتصال
6	نور الصباح أمين	مكتب المعلومات، الوحدة المحلية بالهوّ	19-02-25	– تحديد نطاق تأثير المشروع – جمع بيانات سكانية واقتصادية ثانوية – مناقشة الوضع الاجتماعي والاقتصادي في نطاق المشروع	– تم تقديم خرائط المشروع وشرحها – النطاق الجغرافي للمشروع هو قرية الهوّ –تم تسليم دليل إحصائي رسمي ربع سنوي للفريق –تمت مناقشة أبرز ملامح الوضع الاجتماعي والاقتصادي	01063150344
الشركة المصرية لنقل الكهرباء – نجع حمادي						
7	أمير حمدي محمود	إدارة المشروعات وعضو لجنة التعويضات	18-02-25	–تقديم الدعم خلال الزيارة الميدانية –فهم الآثار والمخاطر المحتملة – تقييم إجراءات التخفيف المقترحة – الاطلاع على التجارب المحلية السابقة	– تمت زيارة الأبراج من ١ إلى ٥ في المنطقة الزراعية – لم يتم تنفيذ زيارة ميدانية لمسار الأبراج الجديدة (٦ إلى ١٢) – قامت الشركة المصرية لنقل الكهرباء بتسهيل التواصل مع أصحاب الأراضي	01027395007
الأشخاص المتأثرين في المنطقة الزراعية						
8	مؤمن أبو الحمد	شخص متأثر – البرج ٢	18-02-25	– الاستفسار عن ملكية الأراضي الزراعية – مناقشة الممارسات الزراعية السائدة –تقييم الآثار المحتملة وإجراءات التخفيف المقترحة – مناقشة التجارب السابقة مع الشركة المصرية لنقل الكهرباء	– –جميع الأراضي الواقعة ضمن الأبراج ١–٥ هي أراضي إصلاح زراعي كانت مملوكة سابقًا للدولة – –جميع المستخدمين الحاليين هم مالكون شرعيون للأراضي – –تقع الأبراج الجديدة (٦–١٢) على أراضي صحراوية مملوكة للدولة	01551054879
9	عصام عبد الله فاوي	شخص متأثر – الأبراج ٣–٥	18-02-25	——	——	01021333165

يعرض الجدول التالي قائمة المشاركين في جلسة النقاش الجماعي التي تم تنظيمها مع السلطات المحلية والقادة في قرية الهوّ، موضحًا الغرض من المشاركة والنتائج الرئيسية التي تم التوصل إليها:

جدول ٢: قائمة المشاركين في جلسة النقاش الجماعي التي تم تنظيمها مع السلطات المحلية والقادة في قرية الهوّ

م	الاسم	الوظيفة	التاريخ	الغرض من الجلسة	النتائج	رقم الاتصال
1	محمد محمود رضوان	رئيس الوحدة المحلية بالهوّ	19-02-25	– تقديم فريق الدراسة – شرح أهداف الزيارة الميدانية – مناقشة الأوضاع الاجتماعية والاقتصادية في الوحدة المحلية وأدوار النوع الاجتماعي – فهم الآثار والمخاطر المحتملة للمشروع – تقييم إجراءات التخفيف المقترحة – مناقشة أنشطة التواصل والتشاور مع المجتمع المحلي – التعرف على آلية الشكاوى المتبعة بشكل عام – تحديد التمثيل المحلي للفلاحين	– تمت مناقشة الظروف الاجتماعية والاقتصادية للمجتمع المحلي، مع التركيز على التفاوتات المحتملة في الأدوار والفرص بين النساء والرجال. – تم عرض وشرح أبرز المخاوف والاحتياجات المحلية ذات الصلة بالمشروع، والتي تركزت غالبًا حول فرص العمل والآثار البيئية المحتملة. – لم تُسجَّل أي آثار سلبية مباشرة متوقعة للمشروع على السكان المحليين، وفقًا لما ورد من المشاركين. – ركزت إجراءات التخفيف المقترحة على تعزيز فرص التوظيف المحلي، لاسيما خلال مرحلة الإنشاء. – لا توجد استراتيجية تواصل مجتمعي منهجية أو منظمة حاليًا بين المشروع والمجتمع المحلي. – لا تتوفر آلية شكاوى رسمية؛ إذ تُقدَّم الشكاوى مباشرة إلى الوحدة المحلية، ويجري التعامل معها بشكل غير موثق. – يتم تمثيل الفلاحين وأصحاب الحيازات الزراعية في المنطقة من خلال الجمعية الزراعية، والتي تلعب دورًا محوريًا في التنسيق مع الجهات الرسمية.	1004443485
2	راضي فرّاج سيد سليم	شيخ البلد – الهوّ				1097588886
3	جمال أحمد عفيفي	شيخ البلد – الهوّ				1005085743
4	رمضان علام حسين	قسم الأملاك				1017317929
5	انتصار عبد الوهاب	رئيسة قسم التضامن الاجتماعي				1009166763
6	شيرين فيصل	قسم العلاقات العامة				1060159547

Annex (3): Minutes of meeting of the public disclosure Meetings

محضر اجتماع التشاور المجتمعى العام

تقييم التأثير البيئي والاجتماعي لمشروع إنشاء خط نقل الكهرباء من محطة أوبيليسك للطاقة الشمسية إلى محطة المحولات نجع حمادى – محافظة قنا

٢١ مايو ٢٠٢٥

تم عقد الجلسة العامة للتشاور المجتمعى لعرض نتائج تقرير تقييم التأثير البيئي والاجتماعي على أصحاب المصلحة ومناقشة إجراءات التخفيف المقترحة.

وفي هذا الصدد، تم دعوة الجهات والأطراف المعنية لحضور الاجتماع من خلال الدعوات الشخصية والإعلان في إحدى الصحف القومية، حيث تم توجيه الدعوات الشخصية والإعلان عن الحدث بإحدى الصحف قبل أكثر من ١٠ أيام من الاجتماع. بالإضافة إلى ذلك، تم إعداد ملخص المشروع وارساله إلى المدعوين مع خطابات الدعوة (الملحق أ)، كما تم إتاحته من خلال الاستشاري على البريد الالكترونى. تم عقد الاجتماع في ٢١ مايو ٢٠٢٥ بفندق حتحور بمدينة قنا..

الحضور

مثل الحضور جميع فئات أصحاب المصلحة على النحو التالي:

- الجهة المقدمة للمشروع، الشركة المصرية لنقل الكهرباء (EETC)
- هيئة الطاقة الجديدة والمتجددة (NREA)
- جهاز شئون البيئة
- الوحدة المحلية بنجع حمادى وقرية هو
- منظمة غير حكومية معنية بالتنمية المحلية
- وسائل الاعلام
- الجامعات المحلية
- أصحاب وحائزى الأراضى الزراعية في القطاع الشمالى من مسار خط النقل
- الجمهور

يتضمن الملحق (ب) سجل الحضور

الإجراءات

بدأ الاجتماع في حوالي الساعة ١١:٠٠ صباحا، وانتهى في حوالي الساعة ٢:٣٠ مساء. ويتضمن الملحق (ج) جدول أعمال الاجتماع وشرائح العرض التقديمي.

بدأ الاجتماع بتقديم المعلومات الأساسية ومقدمة من السيد **المهندس/ ياسر الشريف** – العضو المنتدب للمكتب الاستشاري "إنفايرونكس" – استشاريو البيئة والتنمية، حيث تم التأكيد على أهمية المشروع في دعم توسع مصر في مشاريع الطاقة المتجددة لتلبية الزيادة الكبيرة والمستمرة في الطلب على الطاقة.

بعد ذلك، قام **المهندس/ ياسر الشريف** – المكتب الاستشاري "إنفايرونكس" – بتقديم عرض تقديمي وعرض النتائج التي توصل إليها الاستشاري خلال تقييم التأثير البيئي والاجتماعي.

نقاط النقاش الرئيسية

وكانت الرسالة الرئيسية التي تم تلقيها من جميع الحاضرين هي أن هناك دعمًا عامًا للجهود الوطنية المبذولة لتعزيز البنية التحتية التي من شأنها تأمين إمدادات الطاقة الوطنية لتلبية النمو المحلي والصناعي خاصة في ضوء أزمات الطاقة.

يمكن تصنيف المواضيع ذات الصلة التي أثارها الحضور أثناء المناقشات على النحو التالي:

- **مسار خط نقل الكهرباء** ومدى تأثيره على قرية بركة المجاورة والأراضى الزراعية في القطاع الشمالى وبالتحديد مدى قرب المسار من قرية البركة وهل يمكن أن يؤثر على خط التوسعات للقرية.
- **التأثيرات المحتملة على الأراضى الزراعية**
- **آلية التعويضات** في حالات حدوث تلفيات للمزروعات القائمة.
- **المسئولية البيئية والاجتماعية** لشركة نقل الكهرباء ومقاول الإنشاء وآليه تلقى الشكاوى
- **القضايا الاجتماعية والاقتصادية:**العمالة وفرص التوظيف

- **قضايا أخرى**
  - ارتفاع أسعار الشقق والايجارات نتيجة مشروع الطاقة الشمسية
  - العمالة في مشروع الطاقة الشمسية
  - الموقف البيئي لمحطة محولات نجع حمادى
  - توفير الطاقة لمنطقة الصناعات الخفيفة بهو
  - المدة الزمنية لإنشاء مشروع محطة الطاقة الشمسية

يعرض الجدول (١) تفاصيل القضايا التي أثيرت خلال الاجتماع والمناقشات التي أجريت.

الجدول (١): المناقشات والتعليقات والاستفسارات التي أثيرت بالاجتماع

الموضوع	المشاركون الذين أثاروا ذلك الموضوع	الاستفسارات/ التعليقات	الرد
تأثيرات المشروع على البيئة			
مسار خط نقل الكهرباء	**السيد/ السيد أبو الحمد** – مهندس تخطيط عمرانى – محافظة قنا	تم طرح سؤال مسار خط النقل وإذا ما كان سوف يتعارض مع التوسعات المزمعة لقرية بركة.	– تم توضيح أن مسار الخط في القطاع الجنوبى يمر في منطقة صحراوية بها شبكة قائمة بالفعل من خطوط نقل الكهرباء. بالنسبة للقطاع الشمالى فإن الخط يمر شرق قرية بركة في منطقة فضاء خالية عرضها حوالى أكثر من ٣٠ متر وقد اصبحت مكان لإلقاء القمامة. وهى بعيدة عن التوسعات المستقبلية لقرية بركة . – كما تم توضيح أنه في الجزء الشمالى سوف يتم فقط تغيير الموصلات على الأبراج القائمة بالفعل والخاصة بخط سلوا قنا والذى تم إيقاف استخدامه من فترة طويلة. • كما تم أيضا التوضيح أن القانون المصرى ينص على أن المسافة بين أبراج الضغط العالى وبين المناطق السكنية يجب أن تكون على الأقل ٢٥ متر– لذالك الخط الجديد لن يؤثر على قرية البركة
التأثيرات المحتملة على الأراضى الزراعية	ممثلي أصحاب وحائزى الاراضى الزراعية في القطاع الشمالى من الخط	طُرح سؤال عن التأثيرات المحتملة من للمشروع على الأرض الزراعية.	تم توضيح أنه في القطاع الشمالى من مسار خط نقل الكهرباء لن يتم إنشاء أبراج جديدة وبالتالي لن يوجد أي اعمال حفر أو ردم في الأراضى الزراعية. وإنما سوف يتم استخدام الأبراج القائمة حيث سيتم فقط استبدال الموصلات فقط. ولهذا الغرض سوف يتم استخدام ماكينة شد يتم وضعها عند طرفى أبراج الشد. وقد أوضح المهندس محمود بدوى – مدير عام خطوط قنا أنه يوجد برج شد واحد فقط في الأراضى الزراعية. لذلك فإن أي تأثيرات محتملة ستوف تكون عند برج واحد فقط من الأبراج التي تقع داخل الأرض الزراعية.
آلية التعويضات	المزارعين في الأراضى الزراعية في القطاع الشمالى	تسأل المزارعون عن آلية التعويضات في حالة حدوث أية تلفيات في المزروعات نتيجة	أوضح مهندس محمود بدوى ان التأثيرات المحتملة سوف تكون ضئيلة حيث أن معدة الشد سوف توضع عند برج واحد فقط داخل الأرض الزراعية. وبالرغم من ذلك في حالة حدوث أيه أضرار للمزروعات فإن لجنة التعويضات تقوم بحصر الأضرار الناتجة وتقديرها على حسب إجراءات الجمعية الزراعية.
		كما تسأل المزارعون إذا ما كانت التعويضات تكون على قيمة الأرض ام قيمة المزروعات	تم التوضيح أن التعويض يكون عن الأضرار التي قد تلحق بالمزروعات نتيجة أنشطة شد الموصلات.

الموضوع	المشاركون الذين أثاروا ذلك الموضوع	الاستفسارات/ التعليقات	الرد
		وتسأل المزارعون أيضا عنما إذا ما كان سوف يتم منعهم من الزراعة تحت الأبراج	وتم توضيح أنه يسمح بالزراعات المسموح بها وفقا للقانون فمثلا لا يتم زراعة أشجار عالية. منا أوضح الاستشاري أنه أثناء الزيارة للموقع وجد بالفعل أنه يوجد زراعات تحت الأبراج وعدد منها زراعات منتجة.
المسئولية عن التأثيرات البيئية	م/ صفاء عبد الرحيم دياب – مدير مكتب البيئة بالوحدة المحلية – مدينة نجع حمادى / داليا إبراهيم – خبير المشاركة المجتمعية	طرح سؤال عن الجهة المسئولة عن التأثيرات البيئية الناتجة عن المشروع وهل هي شركة الكهرباء ام المقاول الذى ينفذ المشروع	تم التوضيح أن مقاول الإنشاء مسئول عن التأثيرات البيئية التي تنتج عن أنشطة الإنشاء التي يقوم بها في الموقع وأنه ملزم بالالتزام بكافة القوانين البيئية ذات الصلة. وأن شركة نقل الكهرباء توفر خطة الإدارة البيئية المنصوص عليها في الدراسة للمقاول ليلتزم بها,من ناحية أخرى فإن الشركة المصرية لنقل الكهرباء مسئولة عن متابعة المقاول والقيام بالمراجعات البيئية عليه للتأكد من التزامه بكافة اللوائح والقوانين والإجراءات البيئية.
		كما طرح سؤال عن آليه تلقى الشكاوى وأهمية وجود إدارة جيدة لمنظومة الشكاوى	تم توضيح أن مقاول الإنشاء سوف يطور نظام لتلقى الشكاوى والتعامل معها والتواصل مع الجهات المهنية المختلفة لحلها، كما يتضمن النظام وسيلة تواصل مع الشركة المصرية لنقل الكهرباء حتى يمكن للمتضررين تصعيد الشكوى أذا لزم الأمر أو متابعة حل الشكاوى.
القضايا الاجتماعية والاقتصادية			
العمالة وفرص التوظيف	أ/ عبادة محمد عبادة – رئيس جمعية بركة الخيرية أ/ داليا إبراهيم – خبير المشاركة المجتمعية أ/ بيومى عبد الباسط – مدير إدارة العلاقات العامة – مركز ومدينة نجع حمادى	العمالة وإتاحة فرص التوظيف لأبناء القرية بحيث إذا توافرت الخبرات المطلوبة في أبناء قرية هو فيجب أن تكون أولوية التشغيل لأبناء القرية. من ناحية أخرى يكون أقل تكلفة للمقاولين الاستعانة بالعمالة من أهالى المنطقة	تم توضيح أن الممارسة الشائعة في مشاريع الانشاء هي أن يقوم المقاولون بتوظيف عمال من المجتمعات المحيطة، بشرط توافر المؤهلات اللازمة. وعادة ما يكون هذا النهج أكثر كفاءة في خفض تكاليف النقل والإقامة للعمال القادمين من خارج المنطقة. كما أوضح أ/بيومى عبد الباسط أنه يوجد في ديوان عام المحافظة إدارة تشغيل الشباب تتلقى طلبات الراغبين في العمل. وتتاح هذه البيانات للمقاولين العاملين في المشروعات المختلفة.
	أحد المزارعين من حائزي الأراضى الزراعية	هل شركة نقل الكهرباء هي من تعيين العمالة	

الملحق (أ) – تقرير الملخص غير الفني

الشركة المصرية لنقل الكهرباء

ملخص دراسة
تقييم الأثر البيئي والاجتماعي
لمشروع إنشاء خط نقل الكهرباء لربط محطة الطاقة الشمسية " بمحطة محولات نجع حمادى – محافظة قنا

إعداد

انفايرونكس
استشاريون للبيئة والتنمية ش.م.م

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مايو ٢٠٢٥

١- المقدمة

في إطار الجهود الوطنية لتعزيز استخدام مصادر الطاقة المتجددة وتحقيق الاستدامة في قطاع الكهرباء، تعتزم الشركة المصرية لنقل الكهرباء تنفيذ مشروع إنشاء خط نقل كهرباء هوائي بجهد ٢٢٠ كيلوفولت في محافظة قنا. لربط محطة الطاقة الشمسية الجاري تنفيذها " بمنطقة نجع حمادي، بمحطة محولات نجع حمادي والتي تبعد عنها بنحو ١١,٥ كيلومتر.

ينقل خط النقل الهوائي الطاقة المنتَجة من هذه المحطة إلى الشبكة الكهربائية الموحدة، بما يعزز من كفاءة واستقرار منظومة الإمداد الكهربائي في المنطقة.

٢- موقع المشروع

يقع مشروع خط نقل الكهرباء الهوائي في نطاق مركز نجع حمادي بمحافظة قنا. يمتد المسار المقترح لخط نقل الكهرباء الهوائي بمحاذاة المنطقة الصناعية بقرية الهو المخصصة للصناعات الخفيفة، ويتجه شمالًا عابرًا طريق الجيزة–الأقصر، ويمر بعد ذلك شرق قرية "البركة" مرورا بعدد من الأراضي الزراعية المستصلحة، حتى يصل إلى محطة محولات نجع حمادى شمالا.

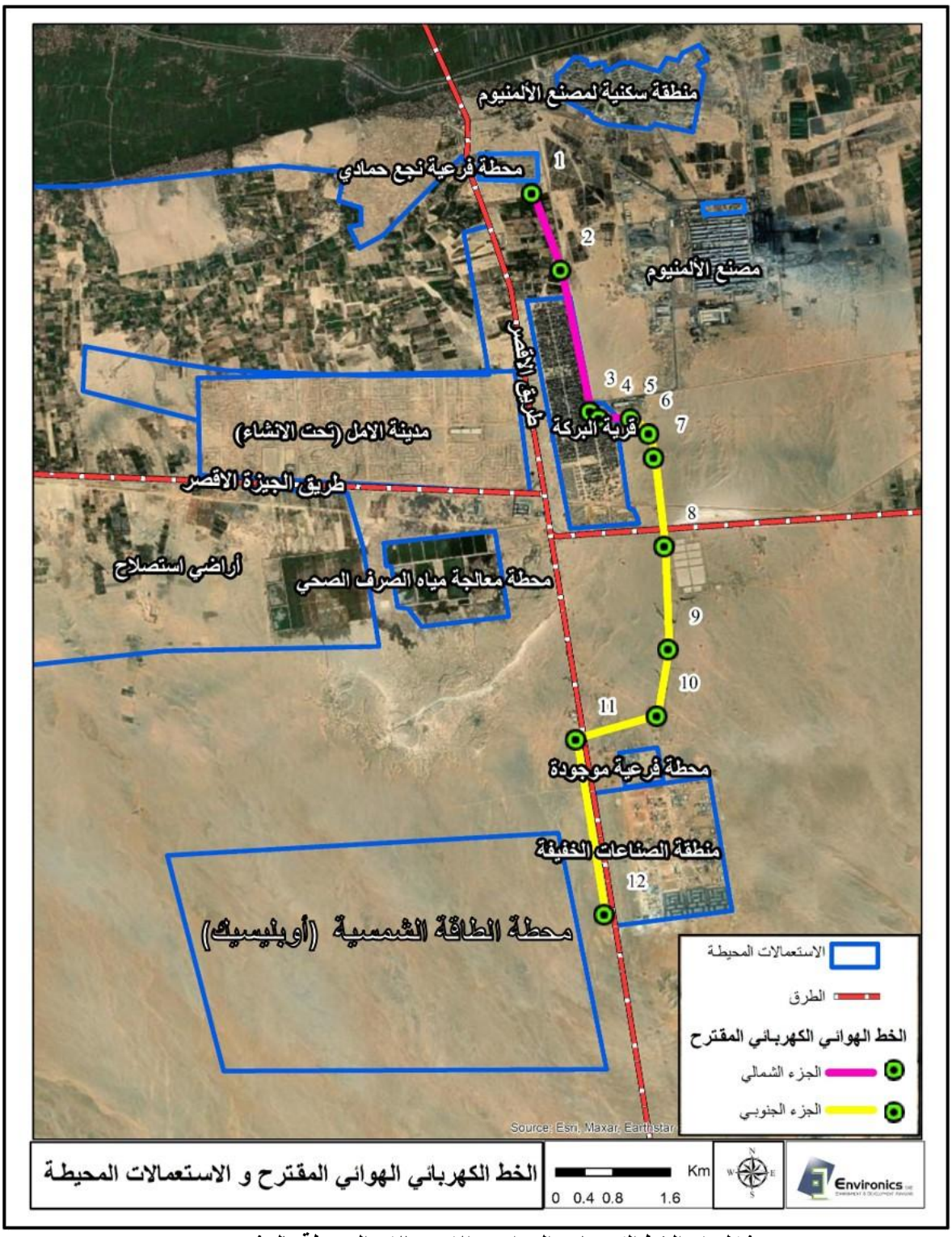
ويُراعي المسار المقترح تقليل التأثير على المجتمعات المحلية والأراضي الزراعية من خلال استغلال مسارات بنية تحتية قائمة، حيث يربط الخط الجديد بخط نقل كهرباء قائم بالفعل كما موضح أدناه.

٣- مكونات المشروع

يتضمن المشروع خطًا هوائيًا يمتد على طول حوالى ١١.٥ كيلومترًا، مقسم إلى جزئين رئيسيين:

- القطاع الشمالي (طوله ٣,٧ كم): يقتصر العمل فيه على استبدال الموصلات على الأبراج القائمة في هذا القطاع ولن يتم إنشاء أبراج جديدة بهذا القطاع.

- القطاع الجنوبي (بطول حوالى ٧,٨ كم): يمتد من محطة الطاقة الشمسية بمحاذاة المنطقة الصناعية بالهو عبورا لطريق الجيزة – الأقصر حتى المنطقة الصحراوية شرق قرية البركة. يشمل هذا المسار إنشاء حوالى ١١–١٣ برجً كهرباء بارتفاع يتراوح بين ٣٠–٤٥ مترًا، سيتم توزيعهم على طول المسار المقترح. وسيتم تدقيق مواقع الأبراج بواسطة مقاول الإنشاء.



شكل ١: الخط الكهربائي الهوائي والاستعمالات المحيطة بالمشروع

٤- وصف المشروع

القطاع الشمالي ـــــ (من النقطة ١ إلى النقطة ٥)

في هذا القطاع لن يتم إنشاء أبراج جديدة أو إجراء أى تعديلات تصميمية على الأبراج القائمة بالفعل ولكن سوف يتم استبدال الموصولات على الأبراج القائمة في هذا القطاع بعضها يمر داخل بعض الأراضي الزراعية المستصلحة.
وتقتصر المعدات التي سوف يتم استخدامها لاستبدال الموصلات فقط على معدات السحب عند أبراج الشد ، دون الحاجة لأي عمليات حفر أو أعمال إنشائية أخرى.

القطاع الجنوبي (من النقطة ٥ إلى النقطة ١٢)

يمتد هذا القطاع لمسافة تقدر بنحو ٧.٨ كيلومتر، ويقع بالكامل داخل منطقة صحراوية مفتوحة غير مأهولة حيث يمتد من مشروع محطة الطاقة الشمسة وحتى المنطقة الصحراوية شرق قرية البركة. و سيتم فيه إنشاء أبراج نقل كهرباء جديدة.

يتوقع أن يتم إنشاء ما بين ١١ إلى ١٣ برجً نقل كهرباء، ويبلغ الارتفاع المتوسط لكل برج حوالي ٣٠ إلى ٤٥ مترًا حسب ظروف الموقع والتصميم الفني. تقام هذه الأبراج على قواعد خرسانية مسلحة في كل موقع برج، ويتم تحديد المسافات بين الأبراج بدقة خلال مرحلة التصميم النهائي، عادةً ما بين ٤٠٠ إلى ٦٠٠ متر.

يتضمن كل برج مجموعة من المكونات الفنية الأساسية، تشمل بالإضافة للهيكل المعدنى الموصلات التي تنقل الطاقة الكهربائية من المحطة الشمسية إلى محطة المحولات ، والعوازل المعلقة لدعم الموصلات وحمايتها من تأثيرات البيئة المحيطة، بالإضافة إلى الفواصل التي تُستخدم للحفاظ على المسافات بين الموصلات والتحكم في الاهتزازات الناتجة عن الرياح أو الأحمال الميكانيكية.

يتم في هذا القطاع استخدام مجموعة متنوعة من المعدات الثقيلة، مثل الرافعات ، الحفارات، شاحنات الخرسانة الجاهزة، وآلات الشد والسحب المتخصصة لتمديد الموصلات بين الأبراج. ويتم توفير الكهرباء في مواقع العمل بواسطة مولدات ديزل ، إلى جانب خزانات مياه متنقلة لتوفير احتياجات المياه خلال فترة الإنشاء.

بعد انتهاء أعمال الإنشاء والربط، لا يتطلب الخط الهوائي أي تدخل يومي، لا تشمل مرحلة التشغيل إلا أنشطة صيانة دورية للأبراج والموصلات، تقوم بها فرق مختصة من الشركة المصرية لنقل الكهرباء. تشمل هذه الأنشطة عمليات فحص بصري دوري لرصد أي تآكل أو تلف في الموصلات أو الهياكل، بالإضافة إلى إجراء الصيانة التصحيحية عند الحاجة، بما يضمن استمرارية وكفاءة نقل الطاقة دون انقطاع.

٥- بدائل المشروع

- **بديل عدم تنفيذ المشروع**

بديل "عدم تنفيذ المشروع" أو عدم إنشاء خط نقل الطاقة المولدة من محطة الطاقة الشمسية إلى الشبكة الموحدة، يعني بقاء الوضع الراهن على ما هو عليه. وبالتالي لن ينتج عن هذا البديل أي تأثير إضافي على البيئة المستقبلة. لكن في الوقت نفسه لن تتحقق الفوائد المرجوة من المشروع.

ويعد إنشاء مشاريع الطاقة المتجددة من الأمور ذات الأهمية الاستراتيجية لزيادة تنوع مصادر الطاقة المحلية وتجنب استيراد الطاقة للبلاد. لذا فبديل "عدم تنفيذ المشروع"، يهدف تنفيذ الرؤية الاستراتيجية للشركة المصرية لنقل الكهرباء لتحويل شبكة النقل لدعم مبادرات الطاقة المتجددة. لذلك، لا يعتبر خيار "عدم تنفيذ المشروع" خيارا مناسبا لهذا المشروع.

- **بدائل الموقع / المسار**

تم اختيار مسار خط النقل في القطاع الجنوبى لأسباب تقنية مواتية؛ وهي: أن اتساع الطريق يتيح إمكانية نقل المواد والمعدات، مما يقلل من الحاجة إلى إنشاء طرق جديدة؛ كما أن جزء من المسار موازى لخطوط قائمة مما يمكن من إجراء أعمال الصيانة بسهولة. أما القطاع الشمالى فالخط قائم بالفعل وسيقتصر العمل به على تغيير المواصلات. وبناء عليه لم يتم النظر في أي بدائل لمسار خط النقل المقترح.

- **بديل طريقة النقل**

يمكن نقل الطاقة الكهربائية عبر خطوط نقل هوائية أو من خلال كابلات أرضية. ونادرا ما تُستخدم خطوط نقل الأرضية لسببين رئيسيين. الأول، عادة ما يتم نقل الطاقة لمسافات طويلة إلى مراكز الأحمال، مما يتطلب قدر كبير من أنشطة الحفر والاضرار بالتربة وتكاليف إنشاء مرتفعة ، فضلاً عن التأثيرات على الموائل الطبيعية. ثانيًا، يجب نقل الطاقة الكهربائية بجهود عالية لتحقيق الكفاءة الاقتصادية، مما يتطلب توفير عزل كهربائي كافٍ للكابلات لتحمل الجهد الكهربى العالي وذلك بتكاليف باهظة. علاوة على ذلك، توجد بالفعل أبراج قائمة على امتداد الجزء الشمالي من المسار المقترح، مما يجعل نقل الطاقة الكهربائية عبر خطوط النقل الهوائية الخيار الأكثر جدوى من الناحية العملية والاقتصادية.

٦- الظروف البيئية والاجتماعية الأساسية

البيئة الطبيعية

المناخ

تتميز محافظة قنا بجوها الجاف على مدار العام، والتفاوت الكبير في درجات الحرارة حيث أن الصيف شديد الحرارة والشتاء شديد البرودة ليلاً، وكذلك التفاوت الكبير في درجات حرارة الهواء اليومية. تشهد محافظة قنا تغييرات طفيفة في سرعة الرياح على مدار العام. ووفقًا للبيانات المسجلة من محطة الأرصاد الجوية في قنا على مدى ١١٢ عامًا، فإن متوسط سرعة الرياح السنوي بلغ ١٢ كم/ساعة.

المخاطر المناخية

من خلال دراسة بيانات الأرصاد لمدة ٢٢ عام من ٢٠٠٢ الى ٢٠٢٣ تبين ما يلى:

- **العواصف الترابية**

على مدار فترة امتدت لـ ٢٢ عامًا، تم تسجيل إجمالي ٥٤٤ ساعة من العواصف الترابية، وهو ما يمثل ٠.٢٩٪ من إجمالي ساعات الرصد. وقعت هذه الأحداث على مدار ١٠٥ أيام، وتميزت برياح معتدلة (بين ٢ م/ث و ٥ م/ث). بلغت العواصف الترابية ذروتها في شهر مارس، حيث تم تسجيل أعلى عدد من الساعات لملاحظة العواصف الترابية خلال هذا الشهر. كما شهدت أشهر الصيف أدنى تواتر لحدوث العواصف الترابية.

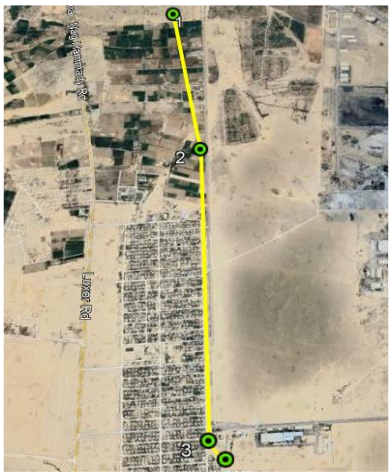
- **العواصف الرملية**

تم تسجيل إجمالي ٣٤ ساعة من أحداث العواصف الرملية، وهو ما يمثل ٠.٠٢٪ من إجمالي ساعات الرصد. وقعت هذه الأحداث على مدار ١٦ يومًا، وتميزت برياح عالية السرعة (أكثر من ٥ م/ث). تبين أن الرياح الغربية هي الرياح السائدة التي تسببت في العواصف الرملية، تليها الرياح الشمالية الغربية، وبدرجة أقل الرياح الشرقية. كما بلغت العواصف الرملية ذروتها في مارس، حيث تم تسجيل أعلى عدد من الساعات لملاحظة العواصف الرملية في هذا الشهر. ومع ذلك، في شهري أبريل ومايو، تم تسجيل أقل عدد من أحداث العواصف الرملية.

- **الرمال المثارة**

تم تسجيل إجمالي ٤٤٦ ساعة من أحداث الرمال المثارة، وهو ما يمثل ٠.٢٣٪ من إجمالي ساعات الرصد. وقعت هذه الأحداث على مدار ١٢٢ يومًا، وتميزت برياح عالية السرعة (أكثر من ٥ م/ث). بلغت ساعات صعود الرمال ذروتها في مارس، حيث تم تسجيل أكبر عدد من الساعات لملاحظة هذه الأحداث. مرة أخرى، كانت أدنى معدلات لارتفاع الرمال خلال أشهر الصيف.

البيئة البيولوجية



تُعد الموائل المعدّلة (Modified Habitats) النمط السائد على طول القطاع الشمالي من مسار خط النقل ، وخاصة موائل الأراضي الزراعية. حيث توجد منطقة واسعة من الأراضي الزراعية المستصلحة، التي يوجد بها أبراج النقل القائمة التي سوف يتم استبدال الموصلات بها.

أما القطاع الجنوبي من المسار فيتميز بتنوع مشابه من حيث الأنماط البيئية الموجودة في الجزء الشمالي من المسار (الموائل الحضرية والموائل شبه الطبيعية الجرداء أو الخالية من النبات). ومع ذلك، فإن الموائل الخالية من النبات تمتد بشكل أكبر على طول الجزء الجنوبي من مسار خط الكهرباء. بالإضافة إلى ذلك، لا توجد موائل زراعية قريبة من هذا الجزء من المسار. تظل الموائل الحضرية المعدلة هي النوع السائد للموائل.

- **النباتات**

نظرًا للجفاف الشديد في الجزء الجنوبي الشرقي من هضبة الحجر الجيري الوسطى لصحراء غرب مصر، حيث يقع مسار الخط، فإن تنوع الأنواع النباتية البرية والمحلية وتغطية النبات ضعيفة بشكل ملحوظ في القطاع الجنوبى من مسار خط النقل.

فيما يتعلق ببيئات الأراضي الزراعية في القطاع الشمالي من الخط، فتشمل الأنواع المحلية للنظام الزراعي في المنطقة. كما تشمل بعض النباتات التي تتواجد فى بيئات هامش الصحراء وهامش الأراضي الزراعية في مناطق الانتقال من الأرض القاحلة الرملية إلى الأراضي المزروعة.

الطيور

<u>الطيور المتكاثرة المقيمة</u>

تشكل الطيور المقيمة المتكاثرة أقل من ٣٠٪ من إجمالي عدد الأنواع المسجلة في المحافظة والتي تكون أغلبها من مجموعات عابرة من الطيور المهاجرة العابرة والزائرة الشتوية والزائرة الصيفية. على سبيل المثال، يعتبر طائر مالك الحزين الرمادي (Ardea cinerea) زائراً شائعاً إلى حد ما في الصيف، ولكن لم يتم تسجيل تعشيشه. تهيمن الأنواع التي تسكن الموائل الصالحة للزراعة والأنواع المتكيفة مع الصحراء على الطيور

المقيمة. تشمل الطيور المقيمة المتكاثرة التي تتكيف مع الصحراء والتي تتميز بها الموائل الصحراوية الرملية في المنطقة الغربية الرملية طائر طائر الطيهوج الرملي المرقط (Pterocles senegallus)، وطائر الكورسور كريمي اللون (Cursorius cursor)، والغراب بني العنق (Corvus ruficolllis)،

الطيور المهاجرة

بناء على البيانات التي تم استخلاصها باستخدام برنامج الطيور المهاجرة الحوامة (MSBT) الصادرة عن جمعية الطيور العالمية (BI)، هناك نوعان من الطيور المهاجرة الحوامة يحتمل عبورهما فوق مسار خط النقل أثناء هجرتهما، وهما: اللقلق الأبيض (*Ciconia ciconia*)، والرخمة المصرية (*Neophron percnopterus*). ويدعم ذلك نتائج تقييم الحساسية للموقع إلى أن مؤشر حساسية الموقع (SI) وجد أنه ≤ ٠.٠٠١.مما يعني أن منطقة مسار خط نقل الكهرباء المقترح ليس مسار هجرة مهم للطيور المهاجرة الحوامة.

يمر القطاع الجنوبي من خط نقل الكهرباء عبر منطقة تتكون في معظمها من أرض جرداء مع القليل جداً من الغطاء النباتي أو بدون غطاء نباتي. وبما أنه لا توجد موارد في هذا القسم لجذب هذه الطيور، فمن غير المرجح مرورها بارتفاعات منخفضة فوق هذه المنطقة.

ولكن تجدر الإشارة إلى أن الجزء الشمالي من خط نقل الكهرباء أقرب إلى وادي النيل حيث يمر خلال بعض الأراضي الزراعية، حيث يتوفر الغذاء والماء بشكل أكبر (كما يؤكد ذلك وجود الطيور المقيمة المعتادة في المناطق الزراعية)، وبالتالي لا يمكن استبعاد احتمال تحليق الطيور على ارتفاعات منخفضة واستخدامها لهذه المناطق كمحطة للراحة والغذاء.

الحيوانات

يوجد عدد قليل من أنواع الثدييات، وكانت القوارض هي الأكثر تنوعا ووفرة. ويُعد ثعلب روبيل (Vulpes rueppellii) أكثر الثعالب الصحراوية انتشارًا في مصر، وأكثرها انتشارًا في المناطق الصحراوية وكذلك في المناطق الزراعية.

٧- التأثيرات البيئية

التأثيرات الإيجابية

- **ربط مشروع الطاقة الشمسية بشبكة الكهرباء الوطنية**

يهدف المشروع إلى ربط محطة الطاقة الشمسية بشبكة الكهرباء الوطنية. ويمثل هذا الربط أهمية بالغة لاستخدام موارد الطاقة المتجددة الوفيرة في مصر، وتلبية الاحتياجات المتزايدة من الطاقة.

- **التوظيف**

من المتوقع أن توفر مرحلة إنشاء المشروع فرص عمل مباشرة تشمل العمالة الماهرة ، كالمهندسين والفنيين والمساحين وكذلك غير الماهرة. وسيتم منح الأولوية للقوى العاملة المحلية، حيث يعتمد توافر الوظائف ومدتها على طبيعة المهام والجدول الزمني للإنشاء.

تأثيرات سلبية محتملة

مرحلة الإنشاء:

القطاع الشمالى:

- لا يتوقع وجود تأثيرات على **البيئة الطبيعية** أثناء الإنشاء حيث أنه لن يتم إنشاء أبراج جديدة وتقتصر الأعمال على استبدال الموصلات على الأبراج القائمة.
- **التأثيرات الاجتماعية:** لن يتم إنشاء أبراج جديدة في هذا القطاع من مسار خط النقل الهوائي. ولكن من المتوقع أن تكون منطقة وضع آلات السحب المستخدمة لربط الموصلات الكهربائية داخل الأراضي الزراعية. وفي هذا الصدد، قد تحدث بعض التأثيرات على المزروعات القائمة نتيجة وضع آلات السحب. وهذا التأثير المحتمل مؤقت، ومن المتوقع أن يكون ضئيلاً، وسيقتصر على مناطق وضع ونقل معدات السحب قبل وبعد أبراج الشد.

وفي هذا السياق فقد تم إجراء زيارة ميدانية للمنطقة يومي ١٨ و١٩ فبراير ٢٠٢٥ بهدف تحديد التأثيرات الاجتماعية المحتملة لأنشطة تغيير الموصلات. وخلال الزيارة، تم عقد اجتماعات مع الأطراف المعنية وأصحاب الأراضي الزراعية التي تتواجد بها الأبراج القائمة. وأوضحت المناقشات عدم وجود تحفظات من أصحاب الأراضى الزراعية على أنشطة شد الموصلات على أراضيهم. ويرجع ذلك بصفة أساسية إلى قيام الشركة المصرية لنقل الكهرباء بالمحافظة، طوال فترة تنفيذ أنشطتها، على التفاعل والتواصل المستمر مع المجتمعات المحتمل تضررهم. بالإضافة إلى ذلك، عادة ما تحدد سياسة التعويض الخاصة بالشركة المصرية لنقل الكهرباء جزء من ميزانية كل مشروع لتغطية أي نفقات تعويض محتملة في حالة وقوع أي ضرر للأراضي و/ أو المحاصيل أثناء أنشطة الإنشاء. ويتم تقدير

التعويضات بناءً على مساحة الأرض وعدد المحاصيل المتضررة، وذلك وفقًا لقائمة التقييم الصادرة عن مديرية الزراعة على مستوى المحافظة.

بالإضافة إلى ذلك، خلال زيارة الموقع أكد أصحاب الأراضي الزراعية عدم مواجهتهم أي مشاكل أو عوائق سابقة مع الشركة المصرية لنقل الكهرباء في هذا الصدد أثناء إنشاء الأبراج القائمة على أراضيهم وأعمال الصيانة. كما أشاروا إلى ثقتهم بعملية تقدير التعويضات في حالة وقوع أي ضرر للمحاصيل.

وبحسب ما ورد، فإن الشركة المصرية لنقل الكهرباء تضع معداتها خلال أعمال الصيانة الدورية للأبراج على حدود الأراضي الزراعية ما أمكن لتجنب الاضرار بالمحاصيل.

القطاع الجنوبى:

- تتضمن التأثيرات المحتملة على **البيئة الطبيعية** تلك المرتبطة بأنشطة الإنشاء العادية التي قد تؤدي إلى انبعاثات هوائية من غبار وعوادم من المعدات الثقيلة والمولدات خلال أعمال الإنشاء ، الضوضاء وتولد المخلفات. ومن شأن تنفيذ خطط الإدارة المناسبة أن تسهم في التحكم أو التخفيف من هذه التأثيرات.
- كما تتضمن أيضا التأثيرات على **الصحة والسلامة بموقع العمل** حيث تتضمن مخاطر السقوط، أثناء الإنشاء ، والتعرض للأتربة والضوضاء، أو المواد الخطرة أثناء الإنشاء. سيتم تطبيق برامج تدريب، توفير معدات وقاية شخصية، وخطة متكاملة للصحة والسلامة.
- بالنسبة **للتنوع البيولوجي (الموائل)** والطيور لن يكون هناك تأثير كبير على الموائل أثناء الإنشاء بسبب طبيعة المنطقة الصحراوية الفقيرة بالنباتات. ومع ذلك، سيتم تجنب القيادة خارج الطرق المحددة لحماية أي نباتات موجودة.

مرحلة التشغيل: القطاع الشمالى والجنوبى

- تتضمن التأثيرات على **الصحة والسلامة بموقع العمل** مخاطر السقوط، أثناء عمليات الصيانة الدورية للخطوط.
- كما تتضمن التأثيرات مخاطر الصعق واصطدام الطيور بالموصلات، وبناء على حساسية الموقع وعدد الأنواع التي يحتمل عبورها الموقع، تعتبر شدة الجوانب المؤثرة على الطيور **متوسطة**، وحساسية المستقبلات **متوسطة**. وبالتالي، تعتبر الأهمية الإجمالية للتأثير **متوسطة**.

وتهتم شركة نقل الكهرباء بدراسة التأثيرات المحتملة لمشروعات خطوط نقل الكهرباء. وقد تجلى ذلك في توقيع بروتوكول تعاون قبل بضع سنوات مع جهاز شئون البيئة والمركز الإقليمي للطاقة المتجددة وكفاءة

الطاقة لدراسة تأثيرات مشروعات خطوط النقل على الطيور المهاجرة. وقد شرعت الشركة المصرية لنقل الكهرباء بناء على نتائج هذه الدراسة في تنفيذ برنامج لتركيب مشتتات الطيور في المناطق التي قد ينتج فيها تأثيرات عالية.

و إن كان هذا المعيار لا ينطبق على مشروع خط النقل محل الدراسة الحالية حيث لا يتوقع أن يكون له تأثيرات عالية ، فسينظر في اتباع نهج تحوطي لتجنب/ تقليل تصادم الطيور المحتمل و ذلك من خلال تركيب مشتتات للطيور على مسار خط النقل المزمع وذلك لتفادي أي مخاطر محتملة للصعق والاصطدام.

٨- خطة الإدارة البيئية والاجتماعية

تم إعداد خطة الإدارة البيئية والاجتماعية لمشروع خط نقل الكهرباء لضمان تنفيذ المشروع بطريقة تحافظ على البيئة وتحمي المجتمع. تهدف هذه الخطة إلى خفض / الحد من أي تأثيرات سلبية محتملة أثناء أعمال الإنشاء والتشغيل، والالتزام بالقوانين الوطنية والمعايير الدولية.
تشمل الخطة عدة جوانب رئيسية، منها إدارة جودة الهواء، الضوضاء، التربة، المخلفات، التنوع البيولوجي، والصحة والسلامة المهنية. كما تتضمن خططًا للطوارئ، وإجراءات واضحة لتقييم المخاطر، وآلية لتلقي شكاوى المجتمع والعمال. من أهم أهداف الخطة:

- إنشاء نظام إدارة بيئية.
- سوف يكون مقاول الإنشاء مسئول عن إدارة المخلفات في موقعها بصورة تتوافق مع متطلبات قانون البيئة وقانون تنظيم إدارة المخلفات.
- استيفاء اشتراطات الإدارة البيئية وذلك من خلال الرصد البيئي، والمراجعة البصرية، والالتزام بمتطلبات القوانين البيئية وقانون العمل وغيرهم من القوانين المنطبقة على النشاط.
- التأكد من الالتزام بالقوانين البيئية وقانون العمل والقرارات الوزارية ذات الصلة.
- توضيح كيفية التعامل مع التأثيرات البيئية والاجتماعية المتوقعة.
- مراقبة الأداء البيئي والصحي أثناء التنفيذ والتشغيل.
- تدريب العاملين على السلامة والبيئة والتصرف في حالات الطوارئ.

وتتأكد الشركة المصرية لنقل الكهرباء من قيام مقاولى الإنشاء بتنفيذ هذه الخطة من خلال إشراف مباشر، والتأكد من التزام جميع المقاولين بالمعايير المحددة.

٩- الخلاصة

في إطار الاستراتيجية الوطنية لتنويع مصادر الطاقة وتعزيز مجالات الطاقة المتجددة، وتحديث الشبكة، وتعزيز كفاءة استخدام الطاقة، يهدف مشروع إنشاء خط نقل الكهرباء الهوائي إلى ربط محطة "أوبيليسك" للطاقة الشمسية بشبكة الكهرباء الوطنية. وسيساعد هذا الربط في تلبية جزء من متطلبات الطاقة المتزايدة باستمرار في مصر، وخاصة من مصادر الطاقة المتجددة. بالإضافة إلى ذلك، فإنه سيدعم الاستراتيجية الوطنية لتغير المناخ في مصر والتي تهدف إلى الحد من انبعاثات الغازات الدفيئة، وتعزيز التنمية المستدامة.

كما تعتبر التأثيرات البيئية والاجتماعية الناتجة عن إنشاء خط الكهرباء المقترح تأثيرات ضئيلة يمكن تخفيفها والحد منها بتطبيق طرق الإدارة البيئية الجيدة والمتابعة المستمرة أثناء مرحلة الإنشاء. كما تكون التأثيرات أثناء التشغيل لا تكاد تذكر.

الملحق (ب): سجل الحضور

جلسة التشاور العام لمشروع إنشاء خط نقل الكهرباء لربط محطة الطاقة الشمسية

" بمحطة محولات نجع حمادى – محافظة قنا

٢١ مايو ٢٠٢٥

	الاسم	الجهة	الوظيفة	رقم المحمول	البريد الالكترونى
١	عباده محمد عباده			٠١٠٢١٧٠٥٢٥١	
٢	عبدالرحمن محمد	Scatec	ES Coordinator		
٣	[illegible] عمر كرم	Scatec	CLO	٠١٥٠١٥٦٨٠٤٩	
٤	كريم عادل عبد الحميد	[illegible] Scatec	[illegible]	٠١٠٩٢٢١٨٢٧٩	
٥	محمد [illegible]	Scatec	EQS Compliance		
٦	[illegible] عبد الرحمن	نجع حمادى	[illegible]	٠١٠٢١٥٦٧٢٠٦	
٧	[illegible] محمد عبد القادر	NREA	[illegible]	٠١٥١٧٢٥١٥٥٨	
٨	[illegible] عبد الرحيم [illegible]	[illegible] الاعلام		٠١٢٢٧٥٨٣٢٨	
		[illegible] قنا			

جلسة التشاور العام لمشروع إنشاء خط نقل الكهرباء لربط محطة الطاقة الشمسية

" بمحطة محولات نجع حمادى – محافظة قنا

٢١ مايو ٢٠٢٥

	الاسم	الجهة	الوظيفة	رقم المحمول	البريد الالكترونى
٩	عبد الصمد عبد الرحيم قرشي	صحافة وإعلام	صحفي وإعلامي	٠١٢١٧٨٤٩٦٣٣	ALKorashy83@gmail
١٠	توفيق عزت جرجس	نجع حمادي	رئيس قسم التخطيط	٠١٢٨٢٤٧٩٨٧٢	
١١	حاتم الحريشي	م.م. نجع حمادي	نائب رئيس المدينة	٠١٠٢٢٢٥٥٤٢٠	
١٢	رجب أبو الوفا عبيد	م.م. نجع حمادي	مدير إدارة الضبط والمتابعة	٠١٠٩١٢٣٢٠٩٦	
١٣	يسري عبد الباسط سيد	م.م. نجع حمادي	مدير إدارة العلاقات العامة	٠١٠٩٠٠٧٨٩٠١	
١٤	م/ محمود بدوي محمد	شركة النقل	مدير عام حقول قنا	٠١٠٠٢٨٤٤٥٥٤	
١٥	لواء/ أماني صلاح عبد اللاه	ديوان عام محافظة قنا	مدير عام شئون البيئة بقنا	٠١١٠٤٧٠٠٥٨	
١٦	صفاء عبد الرحيم دياب	مجلس مدينة نجع حمادي	مدير مكتب البيئة بالوحدة المحلية	٠١٠٦٥٠٠٥٥٢٤٨	
١٧	دعاء سالم محمد صبيح	الشركة المصرية لنقل الكهرباء	كيميائي بالإدارة العامة للدراسات البيئية	01027387226	Doaaselmi3@gmail.com

جلسة التشاور العام لمشروع إنشاء خط نقل الكهرباء لربط محطة الطاقة الشمسية

" بمحطة محولات نجع حمادى – محافظة قنا

٢١ مايو ٢٠٢٥

	الاسم	الجهة	الوظيفة	رقم المحمول	البريد الالكترونى
١٨	هبه لطفي هلالي	المصرية لنقل الكهرباء	باحث بالإدارة العامة للدراسات البيئية	01001577507	hebalotfy120@Gmail.Com
١٩	محمود احمد محمود	مزارع		٠١١١٨٩٧٣٦٧٣	
٢٠	عماد كامل محمود	مزارع		٠١١٠١٢٨٤٤٣٥	
٢١	محمود محمد سليمان	مزارع		٠١١١٧٨٨٤٩٨٨	
٢٢	احمد عبد الله احمد محمود	مزارع		٠١٠٠٣٩٠٦٢٣٨	
٢٣	عمر احمد سليمان	مزارع		٠١١١٨٥٠٦٧٣٣	
٢٤	الحسن محمد احمد محمود	مزارع		٠١١٢٠٥٠٤٧٦٠	
٢٥	عبد الله محمد ابو الحمد	مزارع		٠١٥٥١٠٥٤٨٧٩	
٢٦	طه السيد ابو الوليد ابو القاسم	عميد كلية العلوم		٠١٠٩٥٧٤٩٤٠١	

جلسة التشاور العام لمشروع إنشاء خط نقل الكهرباء لربط محطة الطاقة الشمسية

" بمحطة محولات نجع حمادى – محافظة قنا

٢١ مايو ٢٠٢٥

	الاسم	الجهة	الوظيفة	رقم المحمول	البريد الالكترونى
٢٧	السيد ابو الحمد	محافظة قنا	مهندس تخطيط عمرانى	٠١٠٠٣٨٥١٨٠٦	
٢٨	احمد عبد الحليم حسين	محافظة قنا	سائق بشركة الكهرباء	٠١٠٦٢١٨١١١٠	
٢٩	اسماعيل عبد الوهاب محمد	قنا	رئيس الوحدة الاجتماعية بقرية هو	٠١٠٩١٦٦٧٦٢	
٣٠	صبا ابراهيم عبد الله	قنا	مدير المشاركة المجتمعية	٠١٠٠٠٠٧٨٤١	
٣١	عاطف كرم محمد	نجع حمادى	سائق شيخ البلد	٠١٠٠٢٢٧٦٠٩٧	
٣٢	هيثم محمد عبد الحميد	قنا	صحافة نقابة	٠١٠٠٥٠٣٢٣١٠	
٣٣					
٣٤					
٣٥					

الملحق (ج): الأجندة وشرائح العرض

برنامج الاجتماع التشاوري

دراسة تقييم الأثر البيئي والاجتماعي

خط النقل من محطة للطاقة الشمسية إلى محطة محولات نجع حمادى

فندق حتحور بمدينة قنا

٢١ مايو ٢٠٢٥

١٠:٣٠	**التسجيل**	
١١:٠٠	كلمات افتتاحية	الشركة المصرية لنقل الكهرباء ممثل المحافظة
١١:١٥	مقدمة عن الاجتماع	الاستشاري
١١:٣٠	وصف المشروع	الاستشاري
١١:٤٥	وصف البيئة المستقبلة (الفيزيائية والبيولوجية والاجتماعية)	
١٢:٠٠	تحليل وتقييم الأثر البيئي والاجتماعي	
١٢:١٥	إجراءات التخفيف وخطة الإدارة البيئية والاجتماعية	
١٢:٣٠	مناقشة عامة	
١٣:١٥	ملاحظات ختامية	الاستشاري الشركة المصرية لنقل الكهرباء
١٣:٣٠	**غـذاء**	

انفايرونكس
استشاريون للبيئة والتنمية ش.م.م

وزارة الكهرباء والطاقة المتجددة - الشركة المصرية لنقل الكهرباء
Ministry of Electricity and Renewable Energy - Egyptian Electricity Transmission Company

دراسة تقييم التأثيرات البيئية والاجتماعية لمشروع خط النقل من محطة للطاقة الشمسية إلى محطة محولات نجع حمادى

جلسة التشاور العام

مايو 2025

برنامج الاجتماع

10:30	**التسجيل**	
11:00	كلمات افتتاحية	الشركة المصرية لنقل الكهرباء ممثل المحافظة
11:15	مقدمة عن الاجتماع	الاستشاري
11:30	▪ وصف المشروع ▪ وصف البيئة المستقبلة (الفيزيائية والبيولوجية والاجتماعية) ▪ تحليل وتقييم الأثر البيئي والاجتماعي ▪ إجراءات التخفيف وخطة الإدارة البيئية والاجتماعية	الاستشاري
12:30	مناقشة عامة	
13:15	ملاحظات ختامية	الاستشاري الشركة المصرية لنقل الكهرباء
13:30	**غـذاء**	

موضوعات الجلسة

- الهدف من دراسات تقييم التأثيرات البيئية والاجتماعية
- خطوات تقييم التأثيرات البيئية والاجتماعية
- أهمية التشاور مع الأطراف والجهات المعنية
- أهداف وأهمية المشروع
- موقع المشروع ومكوناته
- الخصائص البيئية لموقع المشروع
- التأثيرات البيئية المتوقعة من المشروع
- الإطار العام لخطط الإدارة الاجتماعية والبيئية
- مناقشة عامة

الهدف من تقييم التأثير البيئي والاجتماعي

الالتزام بالمادة 29 من القانون رقم 4/1994 (قانون البيئة)، المعدل بالقوانين أرقام 9/2009 و105/2015، ولوائحهم التنفيذية المحدثة، التي توجب صاحب المشروع بإعداد دراسة تقييم التأثيرات البيئية للمشاريع الجديدة و/أو توسعات المشاريع

تنفيذ المشروع في إطار التنمية المستدامة بما يحقق التوازن بين أهداف الدولة التنموية والبيئية

وضع حلول علمية وعملية للحد من أية تأثيرات بيئية سلبية محتملة

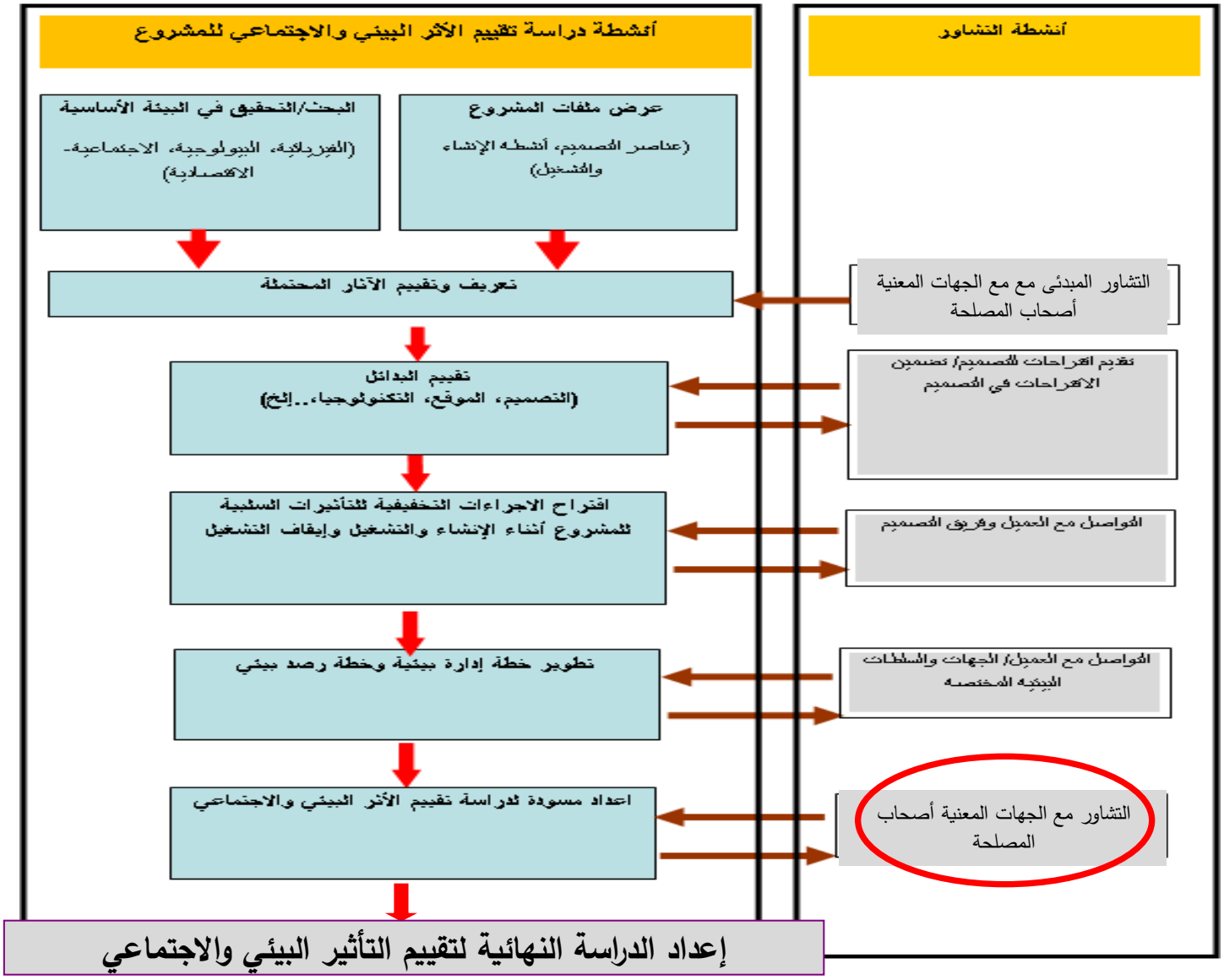
ادراج الاعتبارات البيئية في دورة المشروع (مرحلتي الإنشاء والتشغيل)

الوصول بالتأثيرات الهامة إلى أدنى حد ممكن

اشتراك المجتمع المدني والعلمي في عملية اتخاذ القرار

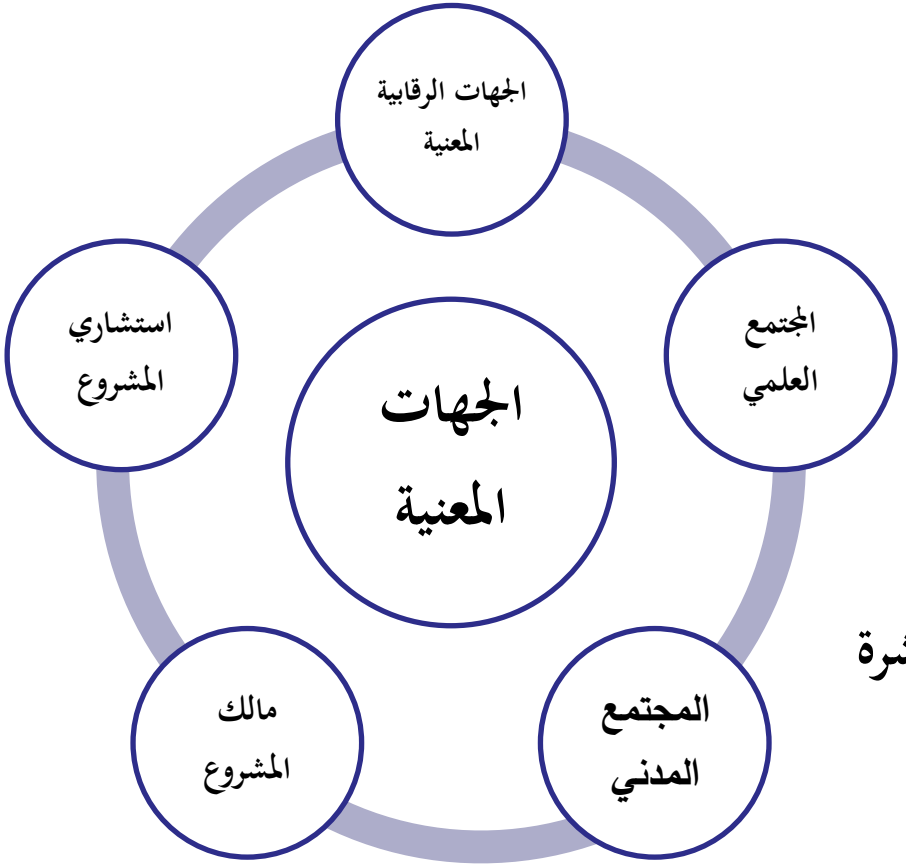
الالتزام بكافة المعايير المحلية المتمثلة بالقوانين والتشريعات المصرية وكذلك المعايير الدولية ذات الصلة بالجوانب البيئية للمشروع المقترح

خطوات تقييم التأثيرات البيئية والاجتماعية



أهمية التشاور مع الأطراف والجهات المعنية

- تحقيق التعاون والتواصل والشفافية بين الجهات المعنية خلال عملية التقييم البيئي والاجتماعي.
- **أدوار متكاملة لكل من:**
- استشاري تصميم المشروع
- الاستشاري البيئي
- الأطراف المعنية (عن طريق نظام التشاور)
  - المتأثرون بالمشروع بطريقة مباشرة أو غير مباشرة
  - المؤثرون في المشروع
  - المهتمون أو المعنيون بالمشروع أو بالبيئة



نبذة عامة عن المشروع

أهداف وأهمية المشروع

ربط محطة الطاقة الشمسية الجاري تنفيذها بقرية "هو" بمركزنجع حمادي بمحطة محولات نجع حمادي و منها للشبكة القومية

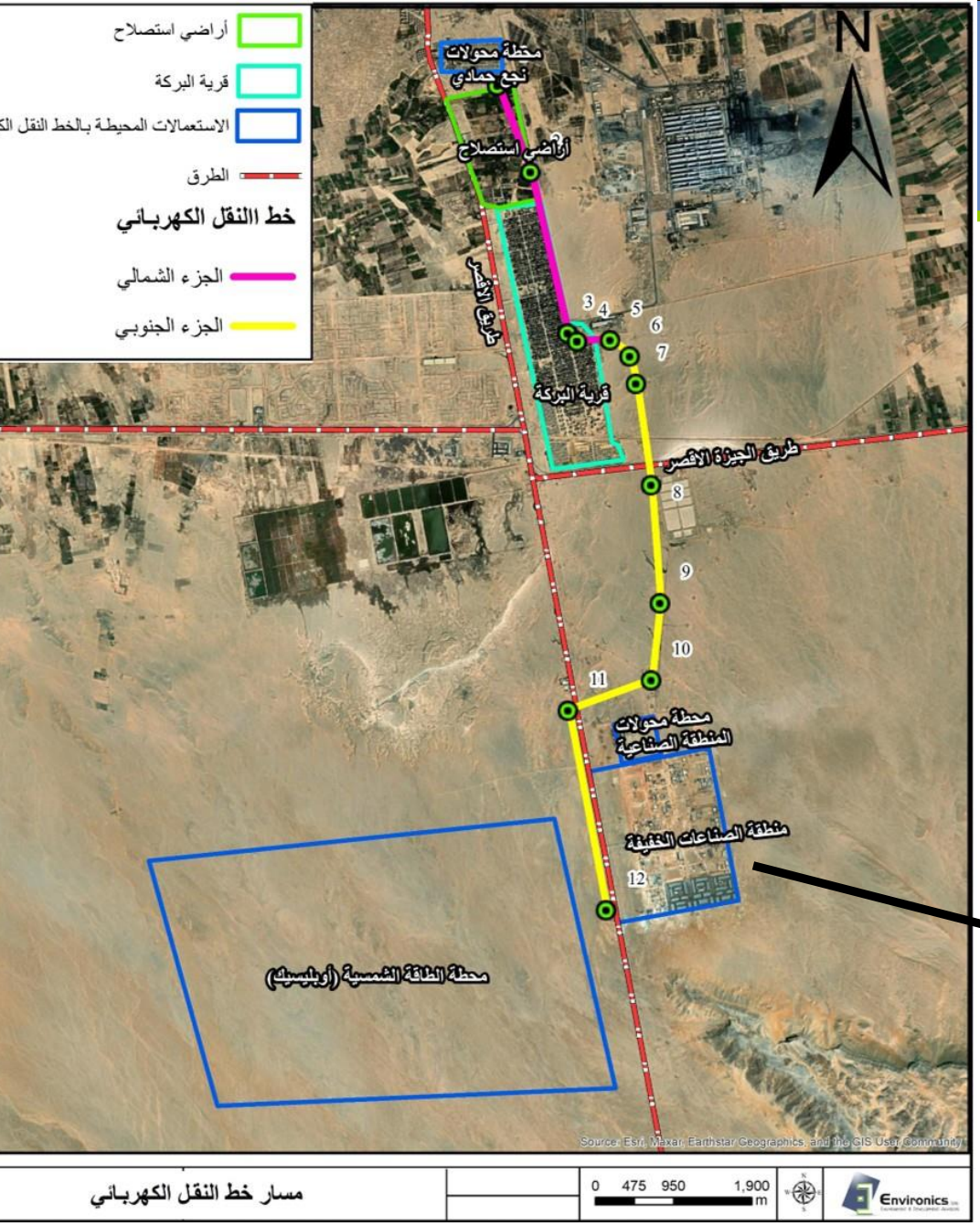
بما يتماشى مع الاستراتيجية الوطنية لزيادة مساهمة الطاقة المتجددة في قطاع الطاقة المتجددة إلى 42% بحلول عام 2035

موقع ومكونات المشروع

يقع مشروع خط نقل الكهرباء في نطاق مركز نجع حمادي بمحافظة قنا

و يتكون من قطاعين

- **الجنوبي** .... حيث تنشأ أبراج جديدة
- **الشمالي** .. حيث يتم تغيير الموصلات



أعمال الإنشاء (القطاع الجنوبي)

- أعمال الحفر
- الأساسات، يتطلب كل برج أربعة أساسات خراسانية مسلحة
  سيتم استخدام الخرسانة الجاهزة
- توريد الهياكل المعدنية للأبراج وتجميعها
- تركيب الأبراج باستخدام أوناش رفع

تشمل معدات الإنشاء

- رافعات متحركة (متنقلة) ورافعة هيدروليكية
- حفار ات
- معدات دك (أو مدماك)

تركيب (أو تغيير) الموصلات

باستخدام طريقة الشد.
وضع ونش سحب عند أحد أطراف الخط (الأبراج)
وشداد بعجلة تدوير

أنشطة التشغيل

- لا تشمل إلا أنشطة صيانة دورية للأبراج والموصلات تقوم بها فرق مختصة من الشركة المصرية لنقل الكهرباء.
- تشمل عمليات فحص بصري دوري لرصد أي تآكل أو تلف في الموصلات أو الهياكل،
- بالإضافة إلى إجراء الصيانة التصحيحية عند الحاجة، بما يضمن استمرارية وكفاءة نقل الطاقة دون انقطاع

الخصائص البيئية لمنطقة المشروع

البيئة البيولوجية

- **القطاع الشمالى:**
  - تُعد الموائل المعدّلة (Modified Habitats) النمط السائد على طول القطاع الشمالي من مسار خط النقل
  - أراضي حضرية واقعة بين" مصنع الألومنيوم" و" قرية بركة"
  - موائل الأراضي الزراعية المستصلحة

البيئة البيولوجية

- **القطاع الجنوبي:**
  - يختلف من حيث الأنماط البيئية عن تلك الموجودة في القطاع الشمالي من المسار
  - الموائل الحضرية المعدلة
  - الموائل شبه الطبيعية الجرداء أو الخالية من النبات.
  - تمتد الموائل الخالية من النبات على أغلب القطاع الجنوبي من مسار خط الكهرباء.
  - لا توجد موائل زراعية قريبة من هذا الجزء من المسار.


Aluminum Factory S
Commercial Complex pool
60
Image © 2024 Airbus
Image © 2024 CNES / Airbus
Upper Egypt Timber
Imagery Date: 4/26/2024

البيئة البيولوجية

النباتات

- تشمل الأراضي الزراعية في **القطاع الشمالي** من الخط، الأنواع المحلية للنظام الزراعي في المنطقة والتي تتضمن نباتات موسمية وأشجار مثمرة
- كما تشمل بعض النباتات التي تتواجد فى بيئات هامش الصحراء وهامش الأراضي الزراعية في مناطق الانتقال من الأرض القاحلة الرملية إلى الأراضي المزروعة

- نظرًا للجفاف الشديد فإن تنوع الأنواع النباتية البرية والمحلية و كثافتها ضعيفة بشكل ملحوظ في **القطاع الجنوبى** من مسار خط النقل.

البيئة البيولوجية

- **الطيور**

<u>الطيور المتكاثرة المقيمة</u>

- تشكل الطيور المقيمة المتكاثرة أقل من 30% من إجمالي عدد الأنواع المسجلة في المحافظة والتي تتكون أغلبها من مجموعات عابرة من الطيور العابرة والزائرة الشتوية والزائرة الصيفية. على سبيل المثال، يعتبر طائر مالك الحزين الرمادي (Ardea cinerea) زائراً شائعاً إلى حد ما في الصيف، ولكن لم يتم تسجيل تعشيشه.

- تهيمن الأنواع التي تسكن الموائل الصالحة للزراعة والأنواع المتكيفة مع الصحراء على الطيور المقيمة.

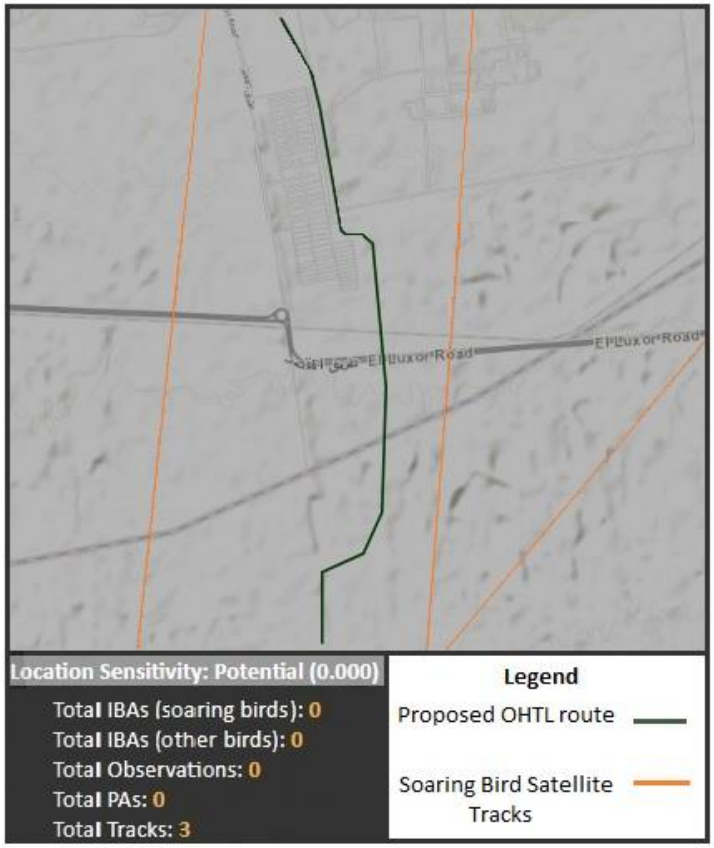
- تشمل الطيور المقيمة المتكاثرة التي تتكيف مع الصحراء والتي تتميز بها الموائل الصحراوية الرملية في المنطقة الغربية الرملية طائر الطيهوج الرملي المرقط (Pterocles senegallus)، وطائر الكورسور كريمي اللون (Cursorius cursor)، والغراب بني العنق (Corvus ruficolllis)،

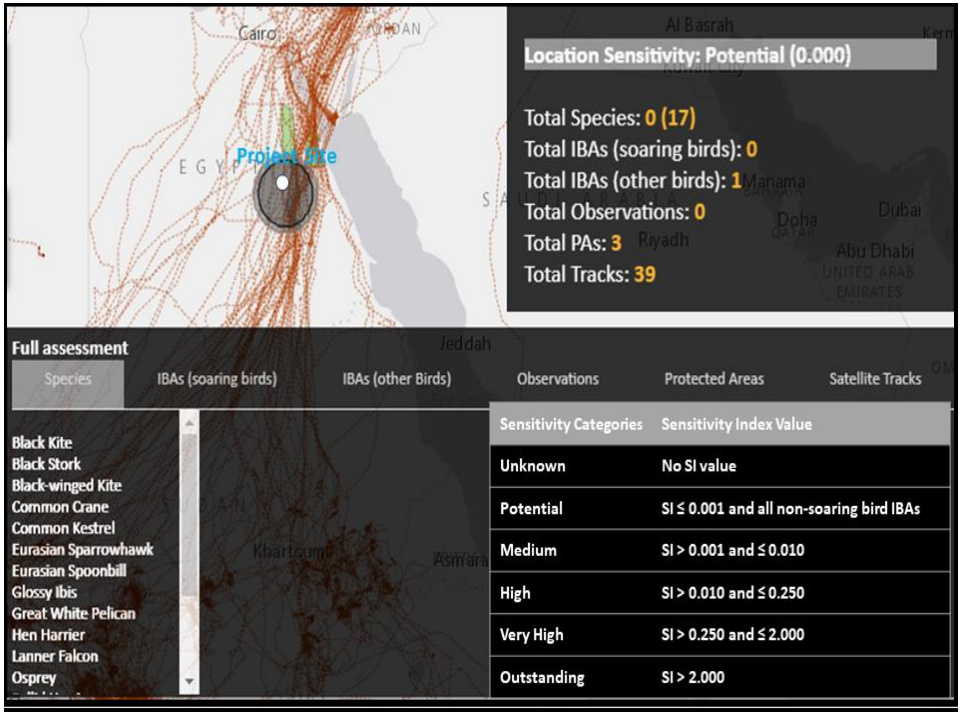
البيئة البيولوجية

- **الطيور المهاجرة**
- بناء على البيانات التي تم استخلاصها باستخدام برنامج الطيور المهاجرة الحوامة (MSBT) الصادرة عن جمعية الطيور العالمية (BI)، هناك نوعان من الطيور المهاجرة الحوامة يحتمل عبورهما فوق مسار خط النقل أثناء هجرتهما، وهما: اللقلق الأبيض (*Ciconia ciconia*)، والرخمة المصرية (*Neophron percnopterus*). ويدعم ذلك نتائج تقييم الحساسية للموقع إلى أن مؤشر حساسية الموقع (SI) وجد أنه ≥ 0.001.مما يعني أن خط نقل الكهرباء المقترح لا يقع في مسار هجرة مهم للطيور المهاجرة الحوامة.

- يمر **القطاع الجنوبي** من خط نقل الكهرباء في منطقة تتكون في معظمها من أرض جرداء مع القليل جداً من الغطاء النباتي أو بدون غطاء نباتي. و لا توجد به موارد تجذب هذه الطيور،لذا فمن المرجح عدم مرورها بارتفاعات منخفضة فوق هذه المنطقة.

- **القطاع الشمالي** من خط نقل الكهرباء أقرب إلى وادي النيل و يمر خلال بعض الأراضي الزراعية، حيث يتوفر الغذاء والماء بشكل أكبر (كما يؤكد ذلك وجود الطيور المقيمة المعتادة في المناطق الزراعية)، وبالتالي لا يمكن استبعاد احتمال تحليق الطيور على ارتفاعات منخفضة واستخدامها لهذه المناطق كمحطة للراحة والغذاء. وذلك بكثافة قليلة حيث أن الأماكن الأقرب لوادي النيل تمثل محطات أفضل للراحة.





Migratory Soaring Birds Sensitivity

البيئة البيولوجية

الحيوانات

- يوجد عدد قليل من أنواع الثدييات، والقوارض هي الأكثر تنوعا ووفرة. ويُعد ثعلب روبيل (Vulpes rueppellii) أكثر الثعالب الصحراوية انتشارًا في مصر، وأكثرها انتشارًا في المناطق الصحراوية وكذلك في المناطق الزراعية

البيئة الاجتماعية

- **القطاع الجنوبى:**
  - يبدأ القطاع الجنوبي الجنوبي من المسارعند محطة الطاقة الشمسية غرب منطقة الهو للصناعات الخفيفة في الظهير الصحراوي لمدينة ومركز نجع حمادي.
  - لا يوجد في نطاق القطاع الجنوبي أي مناطقة سكنية أو أنشطة زراعية.
  - يمتد الخط شمالا عابرًا طريق الجيزة–الأقصر
  - يوجد في القطاع الجنوبي خط نقل قائم موازى لخط النقل المقترح

البيئة الاجتماعية

- **القطاع الشمالى:**

  - يمر في المنطقة الصحراوية شرق قرية "بركة" حتى يربط بخط نجع حمادى – جنوب قنا القائم والذى يمر داخل الأراضي الزراعية المستصلحة
  - تتتضمن مجموعة من المحاصيل التقليدية مثل القمح، والذرة، والفول، والبرسيم، والخضروات وأشجار الليمون المثمرة

تقييم التأثيرات البيئية

التأثيرات المحتملة أثناء الإنشاء

القطاع الشمالي:

التأثيرات الاجتماعية:

- لن يتم إنشاء أبراج جديدة في هذا القطاع من مسار خط النقل الهوائي. ولكن يتوقع أن تكون منطقة وضع آلات السحب المستخدمة لربط الموصلات الكهربائية داخل الأراضي الزراعية.

- قد تحدث بعض التأثيرات على المزروعات نتيجة وضع آلات السحب. وهذا التأثير المحتمل مؤقت، ويقتصر على مناطق وضع ونقل معدات السحب قبل وبعد أبراج الشد.

- تم إجراء زيارة ميدانية للمنطقة في فبراير 2025 وعقد اجتماعات مع الأطراف المعنية ومنهم حائزي الأراضي الزراعية التي تتواجد بها الأبراج القائمة بهدف تدقيق التأثيرات المحتملة لأنشطة تغيير الموصلات.

التأثيرات المحتملة أثناء الإنشاء

- لم توجد تحفظات من حائزي الأراضي الزراعية على أنشطة شد الموصلات على أراضيهم. ويرجع ذلك بصفة أساسية إلى قيام الشركة المصرية لنقل الكهرباء بالمحافظة، طوال فترة تنفيذ أنشطتها، على التفاعل والتواصل المستمر مع المجتمعات المحتمل تضررهم.

- تضمن سياسة التعويض الخاصة بالشركة المصرية لنقل الكهرباء تحديد جزء من ميزانية كل مشروع لتغطية أي نفقات تعويض محتملة في حالة وقوع أي ضرر للأراضي أو المحاصيل أو الأشجار أثناء أنشطة الإنشاء.
- يتم تحديد قيمة التعويضات طبقا لقائمة التقييم الصادرة عن مديرية الزراعة على مستوى المحافظة
- كما تضع الشركة المصرية لنقل الكهرباء معداتها خلال أعمال الصيانة الدورية على حدود الأراضي الزراعية ما أمكن لتجنب الاضرار بالمحاصيل وبخاصة الأشجار

التأثيرات المحتملة أثناء الإنشاء

القطاع الجنوبى:

- تتضمن التأثيرات المحتملة على **البيئة الطبيعية** تلك المرتبطة بأنشطة الإنشاء العادية التي قد تؤدي إلى انبعاثات هوائية من غبار وعوادم من المعدات الثقيلة والمولدات خلال أعمال الإنشاء ، الضوضاء وتولد المخلفات.
- من شأن تنفيذ خطط الإدارة المناسبة أن تسهم في التحكم أو التخفيف من هذه التأثيرات.

- كما تتضمن أيضا التأثيرات على **الصحة والسلامة بموقع العمل** حيث تتضمن مخاطر العمل على ارتفاعات،، والتعرض للأتربة والضوضاء، أو المواد الخطرة أثناء الإنشاء.
- يتم تطبيق خطة متكاملة للصحة والسلامة تشمل التدريب وتوفير معدات وقاية شخصية.

- بالنسبة **للتنوع البيولوجي (الموائل)** والطيور لن يكون هناك تأثير كبير على الموائل أثناء الإنشاء بسبب طبيعة المنطقة الصحراوية الفقيرة بالنباتات.

- سيتم حظر القيادة خارج الطرق المحددة لحماية أي نباتات موجودة.

التأثيرات المحتملة أثناء التشغيل

القطاع الشمالى والجنوبى:

- تتضمن التأثيرات على **الصحة والسلامة بموقع العمل** مخاطر العمل على ارتفاعات والتعامل مع خطوط الضغط العالي ، أثناء عمليات الصيانة الدورية للخطوط. ... الفرق المتخصصة في أعمال الصيانة مدربة على إجراءات واحتياطات السلامة
- كما تتضمن مخاطر الصعق واصطدام الطيور بالموصلات .... بناء على حساسية الموقع وعدد الأنواع التي يحتمل عبورها الموقع، تعتبر الأهمية الإجمالية للتأثير **متوسطة**.
- ينظر في تركيب مشتتات الطيور كنهج تحوطي لتجنب/ تقليل التأثيرات المحتملة على الطيور

ملخص التأثيرات البيئية والاجتماعية

تقييم التأثير بالقطاع الشمالى من مسار خط النقل الكهرباء

التأثيرات		بدون تخفيف					مستوى التأثيرات المتبقية
		النطاق الزمني	النطاق المكاني	الشدة	حساسية/ قابلية تأثر المستقبل	مستوى التأثير قبل التخفيف	
مرحلة الإنشاء							
البيئية الاجتماعية والاقتصادية	التأثير على المزروعات القائمة ناتجة من معدات السحب والشد	قصير الأجل	موضعي	ضئيل	منخفضة	ضئيل	طفيفة
مرحلة التشغيل							
البيئة البيولوجية (الطيور)	الاصطدام	دائم	موضعي	متوسط	متوسطة	ضئيل	طفيفة
	الصعق بالكهرباء	دائم	موضعي	صغير	متوسطة	ضئيل	طفيفة
الصحة والسلامة بمكان العمل (أثناء أنشطة الصيانة)		قصير الأجل	موضعي	صغير	كبيرة	متوسط	ضئيلة

ملخص التأثيرات البيئية والاجتماعية

تقييم التأثير بالقطاع الجنوبي من مسار خط نقل الكهرباء

التأثيرات		بدون تخفيف					مستوى التأثيرات المتبقية
		النطاق الزمني	النطاق المكاني	الشدة	حساسية/ قابلية تأثر المستقبل	مستوى التأثير قبل التخفيف	
مرحلة الإنشاء							
البيئة الطبيعية	جودة الهواء	قصير الأجل	موضعي	صغير	متوسطة	ضئيل	طفيفة
	الضوضاء	قصير الأجل	موضعي	صغير	متوسطة	ضئيل	طفيفة
	التربة	قصير الأجل	موضعي	صغير	منخفضة	ضئيل	طفيفة
البيئة البيولوجية	الموائل	*دائمة*	موضعي	*متوسط*	*منخفضة*	ضئيل	طفيفة
الصحة والسلامة بمكان العمل		قصير الأجل	موضعي	*متوسط*	متوسطة	متوسط	طفيفة
مرحلة التشغيل							
البيئة البيولوجية (الطيور)	الاصطدام	طويل الأجل	موضعي	متوسطة	متوسطة	ضئيل	طفيفة
	الصعق بالكهرباء	طويل الأجل	موضعي	صغير	متوسطة	ضئيل	طفيفة
الصحة والسلامة المهنية (أثناء أنشطة الصيانة)		قصير الأجل	موضعي	صغير	كبيرة	متوسط	ضئيلة	طفيفة

الإطار العام لخطة الإدارة البيئية والاجتماعية

الإطار العام لخطة الإدارة البيئية والاجتماعية

الغرض العام من خطط الإدارة البيئية والاجتماعية للمشروع هو:

ضمان	استمرار الالتزام مع كافة اللوائح والقوانين ذات الصلة؛
تحديد	إجراءات إدارة التأثيرات المحتملة المذكورة بالدراسة؛
ضمان	التزام المشروع بكافة المتطلبات القانونية الخاصة بالأداء البيئي والاجتماعي
وضع	إطار عام للمراجعة البيئية لكفاءة الأداء البيئي والاجتماعي للمشروع.

الإطار العام لخطة الإدارة البيئية والاجتماعية

- تشمل الخطة عدة جوانب رئيسية، منها إدارة جودة الهواء، الضوضاء، التربة، المخلفات، التنوع البيولوجي، والصحة والسلامة المهنية.
- كما تتضمن خططًا للطوارئ، وإجراءات واضحة لتقييم المخاطر، وآلية لتلقي شكاوى المجتمع والعمال.
- سيكون مقاول الإنشاء مسوؤلا عن:
  - إنشاء نظام إدارة بيئية.
  - إدارة المخلفات في بصورة تتوافق مع متطلبات قانون البيئة وقانون تنظيم إدارة المخلفات.
  - استيفاء اشتراطات الإدارة البيئية وذلك من خلال الرصد البيئي، والمراجعة البصرية، والالتزام بمتطلبات القوانين البيئية وقانون العمل.
  - مراقبة الأداء البيئي والصحي أثناء التنفيذ والتشغيل.
  - تدريب العاملين على السلامة والبيئة والتصرف في حالات الطوارئ.

وتتأكد الشركة المصرية لنقل الكهرباء من قيام مقاولي الإنشاء بتنفيذ هذه الخطة من خلال إشراف مباشر، والتأكد من التزام جميع المقاولين بالمعايير المحددة.

الخلاصة

- يساهم المشروع في تحقيق الأهداف القومية في مجال الطاقة المتجددة من خلال توليد الكهرباء النظيفة

- تعتبر التأثيرات البيئية والاجتماعية الناتجة عن خط الكهرباء المقترح تأثيرات ضئيلة يمكن تخفيفها والحد منها بتطبيق طرق الإدارة البيئية الجيدة والمتابعة والتواصل المستمر أثناء مرحلة الإنشاء والتشغيل.

مناقشة عامة