AL-RAJEF 82 MW WIND POWER PROJECT

PRELIMINARY ENVIRONMENTAL ASSESSMENT (PEA)
FOR THE OVER HEAD TRANSMISSION LINE

2 May 2016

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1. INTRODUCTION

Green Watts Renewable Energy (GWRE) has participated in submitting an Expression of Interest (EOI) to the Ministry of Energy and Mineral Resources (MEMR) as part of the "Direct Proposal Submission Procedure" for the development of a Wind Farm Project in Ma'an Governorate. GWRE was selected by MEMR for the development of an 82 Mega Watt (MW) Wind Farm project, and has obtained the Cabinet approval on 20 September 2015 and signed a Power Purchase Agreement (PPA) in October 2015.

The environmental clearance for this Project is governed by the Ministry of Environment (MoEnv), as stipulated by the "Environmental Impact Assessment Regulation No. (37) of 2005". The MoEnv requires the preparation of a comprehensive Environmental and Social Impact Assessment (ESIA) for such a Project before an environmental permit is granted, in order to commence with construction and operational activities.

In addition, the Developer will be seeking financing for the Project from international Financial Institutions (IFIs) to include the European Bank for Reconstruction and Development (EBRD) and the Société de Promotion et de Participation pour la Coopération Economique S.A. (Proparco). In line with EBRD's "2014 Environmental and Social Policy", an ESIA study must be undertaken for the Project.

In accordance with the above, the ESIA for the Project has been prepared by ECO Consult and has been submitted to the MoEnv. The ESIA was approved and the environmental permit was granted for the Project in November 2015.

The ESIA prepared at that time covered the Project components but not its associated facilities – which mainly includes the Over Head Transmission Line (OHL) which will connect from the substation located within the Project site to the national grid (and which extends a length of around 11km). At the time of the preparation of the ESIA detailed information on the OHL (e.g. grid connection plans, route for the line, etc.) were not available and thus it could not be included as part of the ESIA study.

Therefore, the EBRD and Proparco as part of the Environmental and Social due diligence undertaken for the Project in April 2016, has requested that a Preliminary Environmental Assessment (PEA) is undertaken for the OHL with the objective of identifying any key issues of concern which could potentially affect the project development.

This report is the PEA undertaken for the OHL by ECO Consult. This report is considered an annex to the Rajef Wind Farm ESIA study.

It is important to note that a detailed ESIA study will be undertaken for the OHL at a later stage once the route has been confirmed and its detailed design is available. The ESIA will be developed by GWRE on behalf of NEPCO (whom is responsible for the development of the OHL).

2. PROJECT DESCRIPTION

The Project is located within the western borders of Ma'an Governorate in the South of Jordan, approximately 200km south of the capital city of Amman. More specifically, the Project site is located in the Sharah highlands – where the closest villages to the Project site are: (i) Al-Rajef and Dlaghah & Rassees both of which are located on the western border of the Project site, (ii) Taybeh which is located around 3km to north of the Project site, and (iii) Fardakh and Sadaqah located to the eastern borders of the Project site at a distance of around 2.5 and 1.5 km respectively as presented in Figure 1 below.

The Project area consists mainly of hilly areas at altitudes ranging from 1550-1700m above sea level. The Project area is characterized as being barren and heavily degraded with few vegetation strips and scattered trees of remnant forests that use to prevail in the entire mountain of Al-Rajef area.

The Project site is mainly accessed through Highway #35 (better known as the 'King's Highway'); one of the highways which connects Ma'an Governorate with the capital city of Amman in the North – but is not the major one. Highway #35 runs through some parts of the Project site. In addition, within the site there are other access roads and several additional small agricultural roads.

The Project area is approximately 7.6km^2 which will be used for the development of the 82MW Wind Farm Project. The 7.6 km^2 consists of 49 parcels of land that have been leased by GWRE from the local community land owners (mainly Al-Rajef, Dlaghah and Taybeh) for the development of the Project (represented in green in Figure 1 below). Such leased lands are spread over an area of 26km^2 which represents the Project boundary (represented in blue in Figure 1 below).

Figure 1: Overview of Project Location

The key components of the Project are the wind turbines which convert the kinetic energy in wind (i.e. movement of wind) into electricity. There will be 41 turbines spread out throughout the Project site. Each turbine will be of 2.0MW capacity with a hub height of 80m, rotor diameter of 114m (or blade length of 57m) and thus a tip height of 137m.

Other buildings and infrastructure needed onsite include:

- Office buildings used for normal daily operational related work;
- A warehouse for storage of equipment and machinery;
- Crane pad next to each wind turbine to accommodate cranes for the installation of the wind turbines and for maintenance activities during operation. Each crane pad will be around 1,500m^2 in area; and

- A road network will be required for installation of the turbines during the construction process and for ease of access to the turbines for maintenance purposes during operation. The internal roads are designed to follow the existing agricultural roads within the Project area to the greatest extent possible. The road network will have a width of 6m and a total length of 28.5km.

The Project will also include underground cables which connect the wind turbines with the Rajef substation located onsite. The substation is a high voltage transformer substation that collects and converts the output from the turbines to a higher voltage (from 33 kV to 132 kV) that is appropriate for connection with the High Voltage National Grid (132 kV). The land for the Al-Rajef Substation has been secured within the Project area.

The Al-Rajef substation above will be connected to another receiving substation which is a simple facility with safety breakers and control panels – mainly used to control the connection/disconnection of the Project to the grid. This substation will be constructed by the National Electric Power Company (NEPCO) and is located right next to the Al-Rajef substation in which the land area has been secured.

From the NEPCO substation an Over Head Transmission Line (OHL) (132kV) will run and connect with the national grid for a distance of 11km. The receiving NEPCO substation and the overhead high voltage transmission line will be constructed and operated by NEPCO.

Figure 2 below presents the route for the OHL from the NEPCO substation until its connection with the national grid. However, it is important to note that the route of the OHL has not been fully defined but it will be within +/- 500m buffer of the route indicated in figure below. In addition, the height and location of the OHL pylons have not been defined at this stage. All of the above will be determined at a later stage by NEPCO as part of the detailed design to be prepared.

Figure 2: Project Site and Indicative OHL Route

3. PRELIMINARY ENVIRONMENTAL ASSESSMENT

This chapter presents the outcomes of the Preliminary Environmental Assessment (PEA) that was undertaken for the Project. The key attributes that were investigated are summarized below. In addition, for each attribute the additional requirements which must be undertaken at a later stage of the Project development have been identified.

- Land Use;
- Biodiversity;
- Archeology and Cultural Heritage;
- Air Quality and Noise;
- Geology and Hydrology (Soil and Groundwater); and
- Occupational Health and Safety.

3.1. Land Use

This section presents the outcome of the preliminary assessment undertaken for land use along with the additional requirements which must be taken into account at a later stage of the Project development.

3.1.1. Methodology

The assessment was based on collection of secondary data available from various governmental entities (which are highlighted below) in addition to a 1 day rapid site assessment (on 28 April 2016) that was undertaken for the OHL route and a 1km buffer area around it.

3.1.2. Formal Land Use

The section below presents the formal land use of the OHL route based on available plans set by the relevant governmental authorities. This includes the following: (i) land use planning by MoMA, (ii) planning for areas of critical environmental concern by MoEnv, and (iii) grazing reserves and forests planning by MoA.

(i) Areas of Critical Environmental Concern - Ministry of Environment/ The Royal Society for the Conservation of Nature

The proposed route could potentially conflict with the use of current or planned nearby specially designated areas such as wilderness areas, areas of critical environmental concern, and/or special recreation management areas. The Ministry of Environment (MoEnv) has the responsibility of establishing natural reserves, national parks, and any site of special environmental significance for protection and management.

However, the MoEnv delegates such responsibilities to the Royal Society for the Conservation of Nature (RSCN). In accordance with the above, the RSCN has designated four (4) categories for areas of environmental concern as highlighted below.

- Established Reserves: in accordance with the "National Network of Protected Areas in Jordan" the RSCN has established a number of reserves which have been announced as protected areas and are currently managed and operated by the RSCN;

- Proposed Reserves: areas proposed within the "National Network of Protected Areas in Jordan" as protected areas but have not been announced as reserves yet and currently are not managed or operated by the RSCN;
- Reserves Under Establishment: areas proposed within the "National Network of Protected Areas in Jordan" as protected areas and are announced as so, but are still underway to be established, operated, and managed by the RSCN; and
- Important Bird Areas (IBA's): areas proposed within "Important Bird Areas of the Hashemite Kingdom of Jordan".

Taking the above into account, the RSCN has prepared a comprehensive plan that identifies the location of the reserves and IBA's discussed above. As noted in the figure below, there are no areas of critical environment concern within OHL route or its immediate surroundings. A number of preservation areas exist further away with the closest delineation being the Petra IBA located around 9km to the north.

To this extent, it can be concluded that no conflict exists between the Project Site and RSCN's planning context. The Project Site is not located within established/planned reserves or important bird areas.

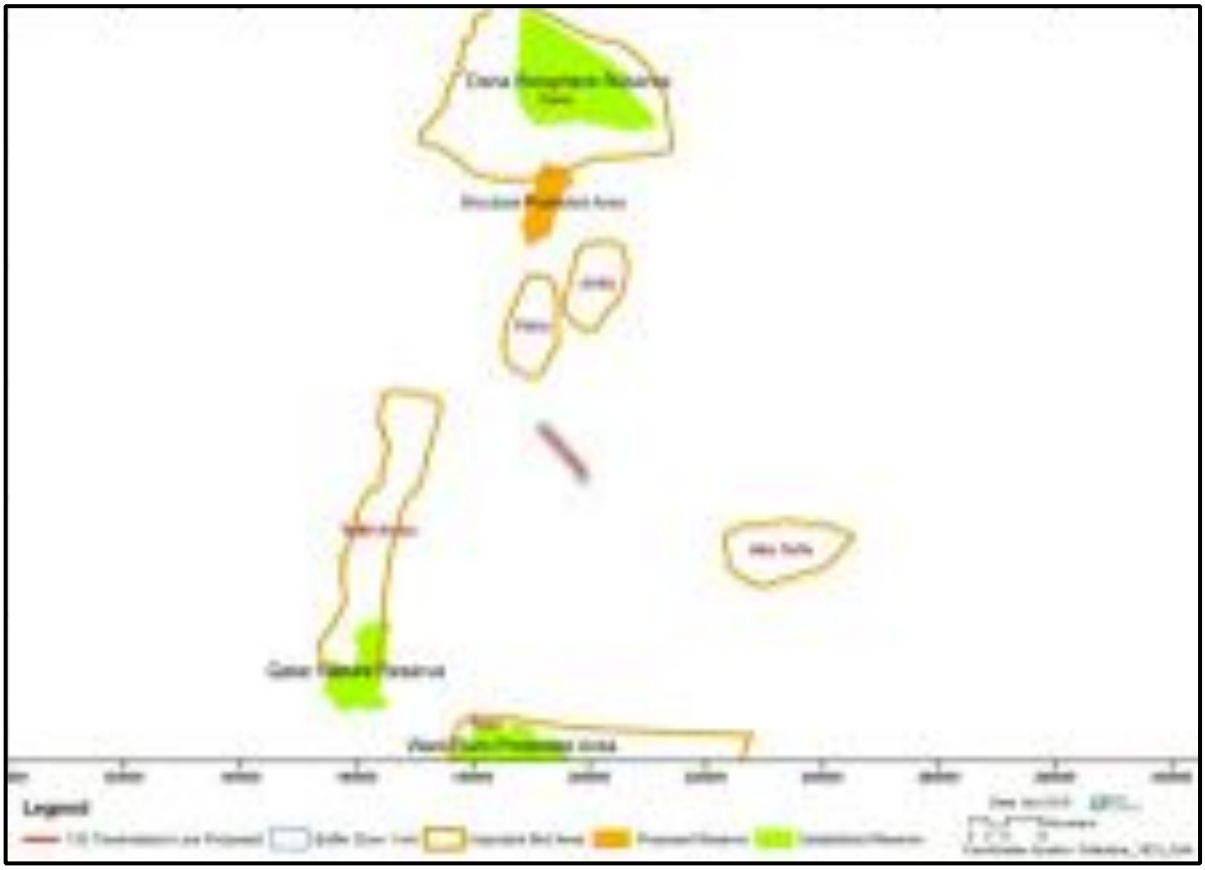


Figure 3: Project Site in Relation to Areas of Critical Environmental Concern

(ii) Grazing Reserve and Forest Lands – Ministry of Agriculture

The Project might conflict with current or proposed planning policies of the Ministry of Agriculture (MoA) for the general area. The most important planning issues that must be investigated include potential conflict with grazing reserves of the MoA as well as forest lands.

Grazing Reserves

The MoA is entitled to planning grazing reserves in the Kingdom on rangelands. The Project site is not located within or near any grazing reserves. Figure 4 below presents the location of the Grazing Reserves in

relation to the Project site. As noted in the figure below, there are no grazing reserves within OHL route or its immediate surroundings. The closest is Aysha Grazing Reserve location around 7km to the east.

Forest Lands

According to the "Agriculture Law No. (44) of the year 2002" Forest Lands are "lands of the State that are registered as forests and the lands of the State that are allocated for forestry purposes". Article 32 of the Law states " it shall be prohibited to abuse forest lands whether by erecting permanent or temporary residences, buildings or structures thereon, or digging wells or caves, or installing water, electricity or telephone lines, or opening sewage lines or canals therein, or by cultivation or plowing, or by grazing therein, without a license".

The law also refers to private forests as "forest trees, bushes, and plants growing on privately owned lands". Article 27(c) states "According to technical conditions and criteria specified by the Minister, owners of private forests shall be permitted to invest their forests through pruning or replacement of forest trees with fruit trees provided that they obtain a license from the Ministry and pay the pre-set fees". In addition, Article 34 (a-1) states "it shall be prohibited to cut Forest Trees or bushes or wild plants without a license from the Minister".

Based on information collected, the OHL route mainly passes through privately owned lands as well as limited number of governmental lands but none of which are registered as forest lands (this is discussed in further details in "Section 3.1.4" below).

Within the private owned lands no forest trees were recorded within the OHL and its 1km buffer except for a limited area as noted in Figure 5 below. Those areas are mainly privately owned farms used for agricultural purposes (mainly olive tree plantations as well as wheat and barley). The perimeter of those lands are fenced with a wire in addition to planted forest trees which mainly include Pine trees as noted in Figure 6 below (it is important to note that the Pine trees are not native to the area).

In accordance with the above, once a final detailed design has been prepared *and only if construction activities require any forest trees in those identified areas be removed*, then as a standard requirement, the developer must submit an application to the Sherah Agricultural Development Directorate. The application must provide the final design details of the Project, the expected number of trees that will be removed, along with a proper justification as to why they need to be removed (e.g. possible conflict with certain Project components). The Directorate will review the application and officials would inspect the site and it is highly likely that such an approval will be granted should it be required.

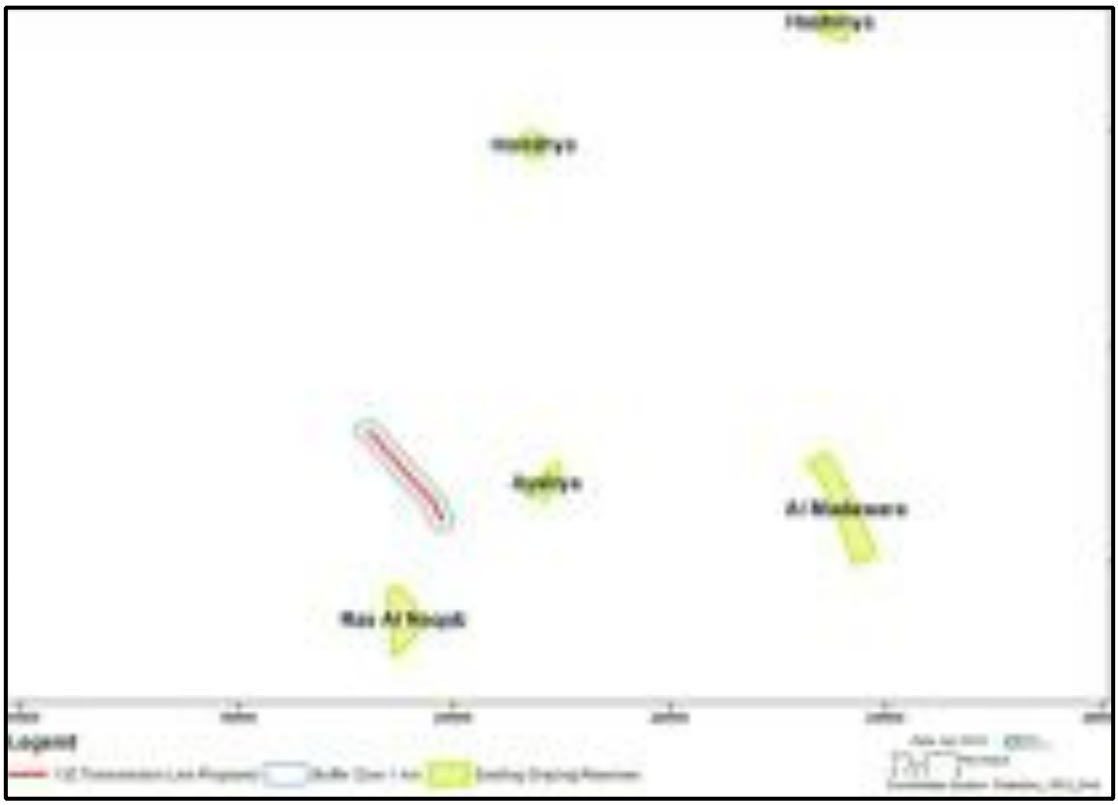


Figure 4: Project Site in Relation to Grazing Reserves

Figure 5: Areas with Forest Trees in Relation to the OHL Route

Figure 6: Areas with Forest Trees on Private Lands

(iii) Land Use Planning – Ministry of Municipal Affairs

The Project might conflict with the allowed land use set for the area by the MoMA, which designates specific land uses in Jordan where only certain activities are allowed. This issue has been investigated and the results are presented below.

In accordance with the "Law for the Organization of Cities, Villages and Buildings No. 79 for 1966", MoMA designates specific land uses for areas in the Kingdom that are within organized boundaries (urban areas). However, at that time, no land use plans were developed for areas that lay outside of the organizational boundaries. Therefore, in 2006 a project to prepare a land-use map for such areas (which lie outside the organized boundaries) began. The output was the National Land Use Master Plan of 2007; which is a recent attempt to produce a harmonized land use plan for those areas that are outside of organized boundaries.

Accordingly, the "Land Use Planning Regulation No. 6 of 2007" was issued to regulate land-use for those areas outside of organized boundaries and to divide territories by using zoning cryptography as follows:

- Agricultural areas sector, identified by the symbol (A);
- Rural areas sector, identified by the symbol (B);
- Marginal areas sector, identified by the symbol(C);
- Desert areas sector, identified by the symbol (D); and
- Forest areas.

Figure 7 below presents the location of the Project site and the land use plan set within the National Land Use Master Plan of 2007.

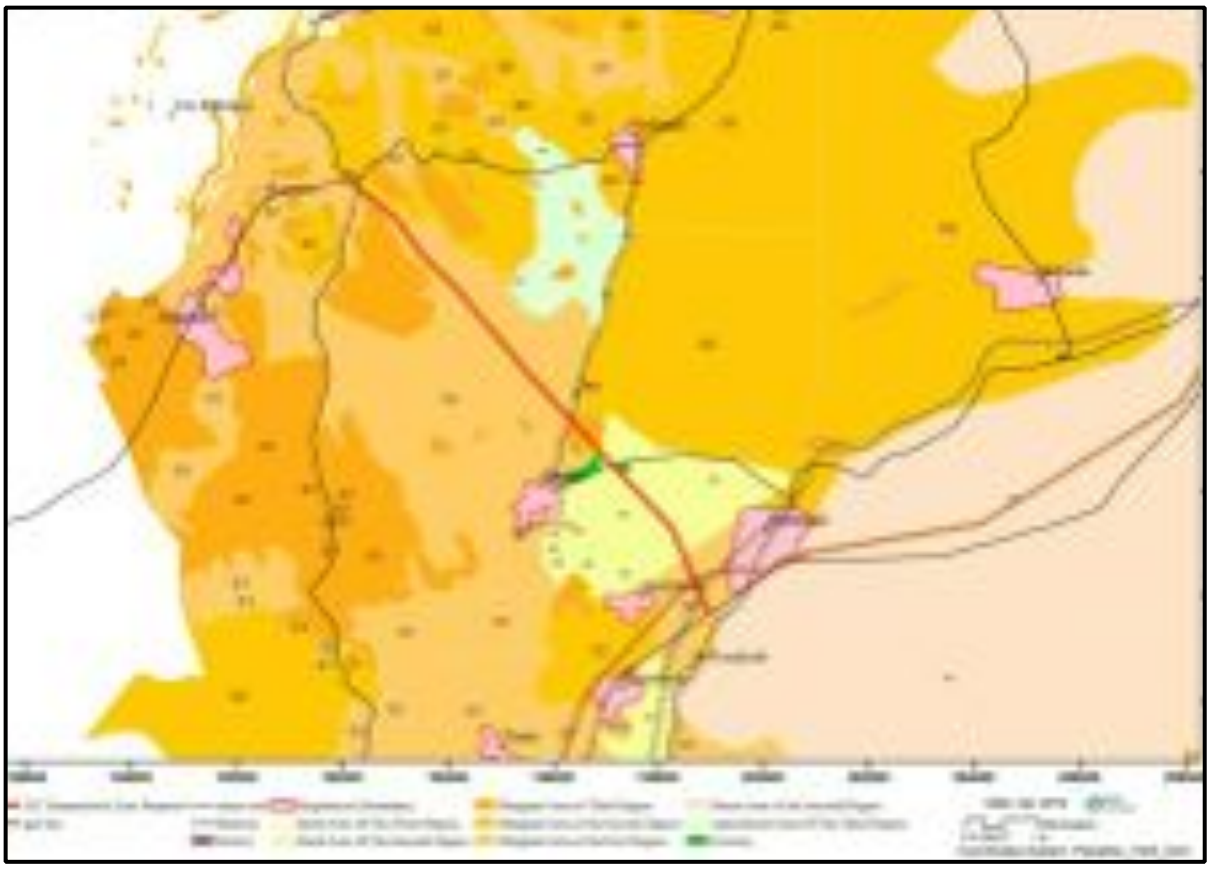


Figure 7: MoMA National Land Use Master Plan for the Project Site and its Surroundings

The pink areas include urban areas within organized boundaries with assigned land use categories in the "Law for the Organization of Cities, Villages and Buildings No. 79 for 1966". As noted in the figure above, the Project site is located outside of organized boundary areas, where the closest is Qurain, Swaimreh and Mraighah.

The rest are areas outside land use planning boundaries and are considered as areas outside planning zones with assigned land use categories set in accordance with the "Regulation No. 6 of 2007". According to Figure 7 above, the OHL route lies within the following areas:

Table 1: MoMA National Land Use Master Plan Area Description

Area	Description
Marginal Area of the 1 (C1)	Article [8(a)–1] of the Regulation describes C1 areas as "areas suitable for grazing and forestry". Article 8(b) of the Regulation specifically states "In those areas the following land use are allowed: electric power generation facilities, transmission, and distribution networks".
Marginal Area of the 2 (C2)	Article [8(a)–2] of the Regulation describes C2 areas as "areas suitable for grazing". Article 8(b) of the Regulation specifically states "In those areas the following land use are allowed: electric power generation facilities, transmission, and distribution networks".
Marginal Area of the 3 (C3)	Article [8(a)–3] of the Regulation describes C3 areas as "areas suitable for grazing and forestry". Article 8(b) of the Regulation specifically states "In those areas the following land use are allowed: electric power generation facilities, transmission, and distribution networks".

Forest Areas	Article 10(a) classifies such areas as lands with forest trees. Article [10(b) – 4D] of the Regulation specifically states "In those areas with private lands the following land use are allowed: electric power generation facilities, transmission, and distribution networks". It is important to note that based on the site visit, the Forest areas were noted to be private lands that are fenced and used for agricultural purposes – mainly planted with olive trees, wheat and barley. Refer to "Section 3.1.4" for additional details.
Rural Area of the 2nd (B2)	There is no description for B2 areas in the Regulation. However, Article [7(b) – 2] of the Regulation specifically states "In those areas the following land use are allowed: electric power generation facilities, transmission, and distribution networks".

To this extent, it is evident that the Project site does not conflict with MOMA's land use plan; in fact the designated land use for the area allows the development of such a Project.

(iv) Other

Based on secondary data collected as well as the rapid site assessment undertaken it was noted that there are several infrastructure elements located within the OHL route and its 1km buffer area. Such elements must be taken into account as part of the detailed design to be prepared. Based on the preliminary assessment this mainly includes the following:

- Gas pipeline: an underground gas pipeline passes through the OHL route as noted in Figure 7 above. The relevant authority (most likely to be the Jordanian Egyptian FAJR Company) must be contacted in order to obtain additional information on the pipeline (e.g. exact route, depth, specifications, etc.) and also take into account any requirements they might have within the detailed design to be prepared to ensure that the pipeline will not be affected from the project development.
- Railroad: according to secondary data collected a railroad passes through the OHL route (refer to Figure 7 above). However as part of the site assessment the railroad could not be located on the ground – the railroad could have been dismantled however this could not be confirmed as part of this assessment. Nevertheless, the relevant authority (most likely to be the Aqaba Railway Corporation) must be contacted in order to obtain additional information on the railroad (e.g. exact route, specifications, etc.) and also take into account any requirements they might have within the detailed design to be prepared to ensure that the railroad will not be affected from the project development.
- Electricity distribution lines: through the site visit several electricity distribution lines were noted throughout the OHL route as presented in Figure 8 below. The relevant authority (most likely to be Electricity Distribution Company – EDCO) must be contacted in order to obtain additional information on the electricity distribution lines (e.g. exact routes, specifications, etc.) and also take into account any requirements they might have within the detailed design to be prepared to ensure that the lines will not be affected from the project development.
- Road networks: throughout the site visit the OHL and its 1km buffer was noted to cross several road networks as presented in Figure 8 below. The relevant authority (most likely to be Ministry of Public Works and Housing – MPWH) must be contacted in order to obtain additional information on the road networks (e.g. exact routes, specifications, etc.) and also take into account any requirements they might have within the detailed design to be prepared to ensure that the roads will not be affected from the project development.

Figure 8: Infrastructure Elements within the OHL Route

Figure 9: Electricity Line 2

Figure 10: Electricity Line 1

Figure 11: Road 3

3.1.3. Discussion and Additional Requirements

Taking the above into account, the additional requirements which must be taken into account at a later stage of the Project development include the following:

1. A limited part of the OHL route passes through private agricultural lands (used mainly for olive tree plantations as well as wheat and barley). Such areas are fenced with a wire as well as introduced forest trees (pine trees). As a standard requirement, once a final detailed design has been prepared and only

if construction activities require any forest trees in the Project site be removed**,** then an application must be submitted to the Sherah Agricultural Development Directorate. The application must provide the final design details of the Project, the expected number of trees that will be removed, along with a proper justification as to why they need to be removed (e.g. possible conflict with certain Project components). The Directorate will review the application and officials would inspect the site and it is highly likely that such an approval will be granted should it be required

2. A detailed survey must be undertaken to identify the infrastructure elements which could be affected by the Project development. The rapid assessment undertaken as part of this study identified several elements which could potentially be within the OHL route; this includes a gas pipeline, railroad, electricity distribution lines and road networks. The relevant authorities for those infrastructure elements must be contacted to obtain additional information (e.g. exact routes for infrastructure elements, specifications, etc.) and also to take into account any requirements they might have as part of the detailed design to be prepared.

3.1.4. Land Ownership and Actual Land use

This section first investigates the land ownership status of the OHL and then investigates the actual land use of the route.

The figure below presents the land ownership status of the OHL route. The land parcels shown in red are governmental owned lands while the land parcels shown in white are privately owned lands. As noted in the figure below, the OHL currently passes through around 36 privately owned lands and 3 governmental lands.

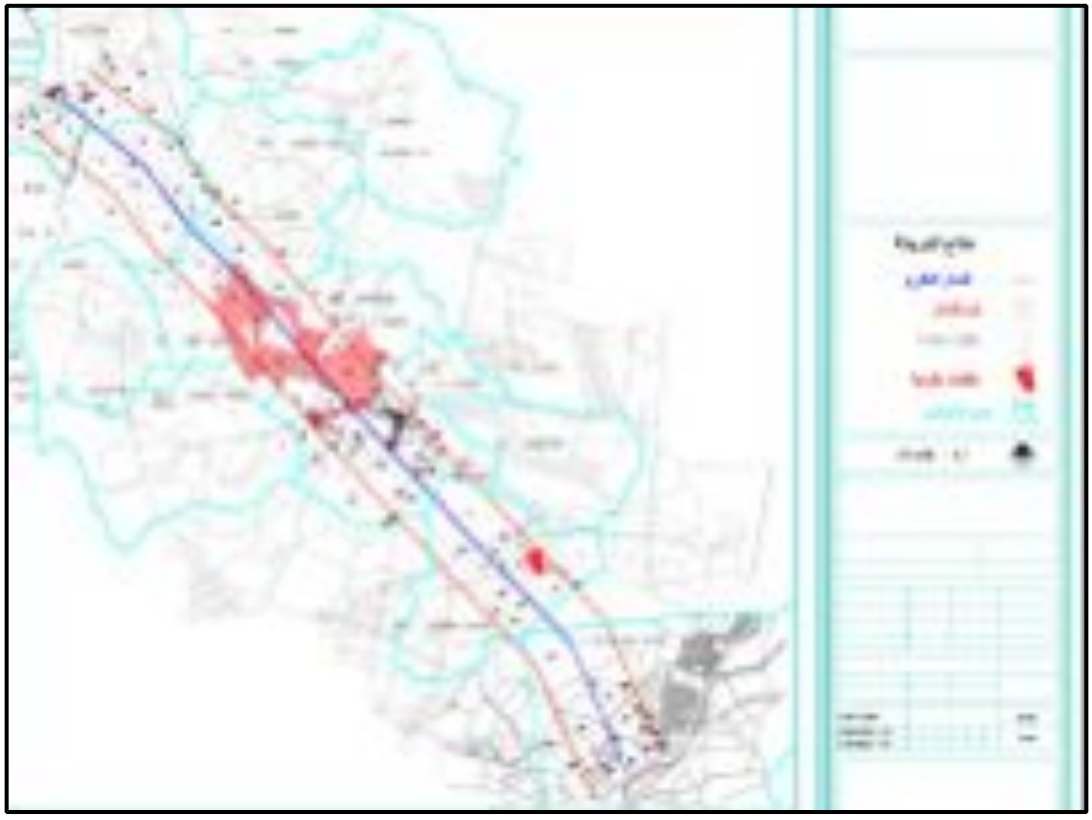


Figure 12: Land Ownership Status of the OHL Route

A rapid site assessment was undertaken for the OHL route and a 1km buffer area around it to better understand the actual land use of area. Based on the rapid site assessment undertaken, no key sensitive receptors have been identified along the OHL route such as structures, community settlements, etc. The

OHL mostly passes through vacant lands which are mostly used for agriculture (mainly wheat and barley) – most of which are open areas that are not fenced (it is not clear whether those are undertaken by the land owners or community members in agreement with the land owner). In addition, within the area in general grazers from the local communities were noted as well as a limited number of nomadic populations.

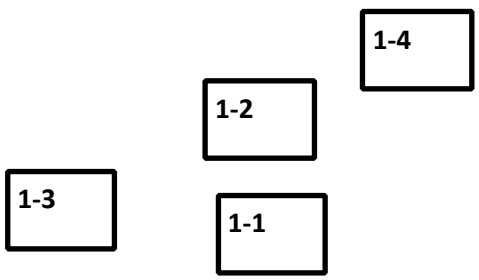
The figure below presents the OHL route and its 1km buffer zone. The OHL was divided into 7 areas each of which was investigated as part of the rapid site assessment. The results are further discussed below.

Figure 13: OHL Divided into 7 Areas

(i) *Area 1*

Within this area, the OHL route does not seem to pass within any key sensitive receptors such as structures or community settlements, etc. Within the surrounding areas a number of receptors were identified but which are unlikely to be affected by the OHL, those are identified in the figure and table below.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land which is most likely undertaken by the local communities in the area. In addition, grazing activities were also noted in the area as well as several nomadic settlements.



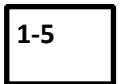


Figure 14: Potential Sensitive Receptors in Area 1

Table 2: Potential Sensitive Receptors in Area 1

No.	Distance from OHL	Description	Issues of Concern
1-1	300m	Police station. Refer to Figure 15.	None. Final detailed design is expected to avoid this area.
1-2	580m	3 telecommunication transmission towers. Refer to Figure 15.	None. Final detailed design is expected to avoid this area.
1-3	150m	A car repair workshop and a house. Refer to Figure 16	None. Final detailed design is expected to avoid this area.
1-4	680m	Olive mill. Refer to Figure 17.	None. Final detailed design is expected to avoid this area.
1-5	780m	House like structure. Exact use could not be identified.	None. Final detailed design is expected to avoid this area.

Figure 15: Police Station and Telecommunication Towers

Figure 16: Car Repair Workshop and House Structure

Figure 17: Olive Mill

(ii) *Area 2*

Within this area, the OHL route does not seem to pass within any key sensitive receptors such as structures or community settlements, etc. In addition, no surrounding receptors were identified which could be affected by the OHL.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land which is most likely undertaken by the local communities in the area. In addition, grazing activities were also noted in the area as well as several nomadic settlements

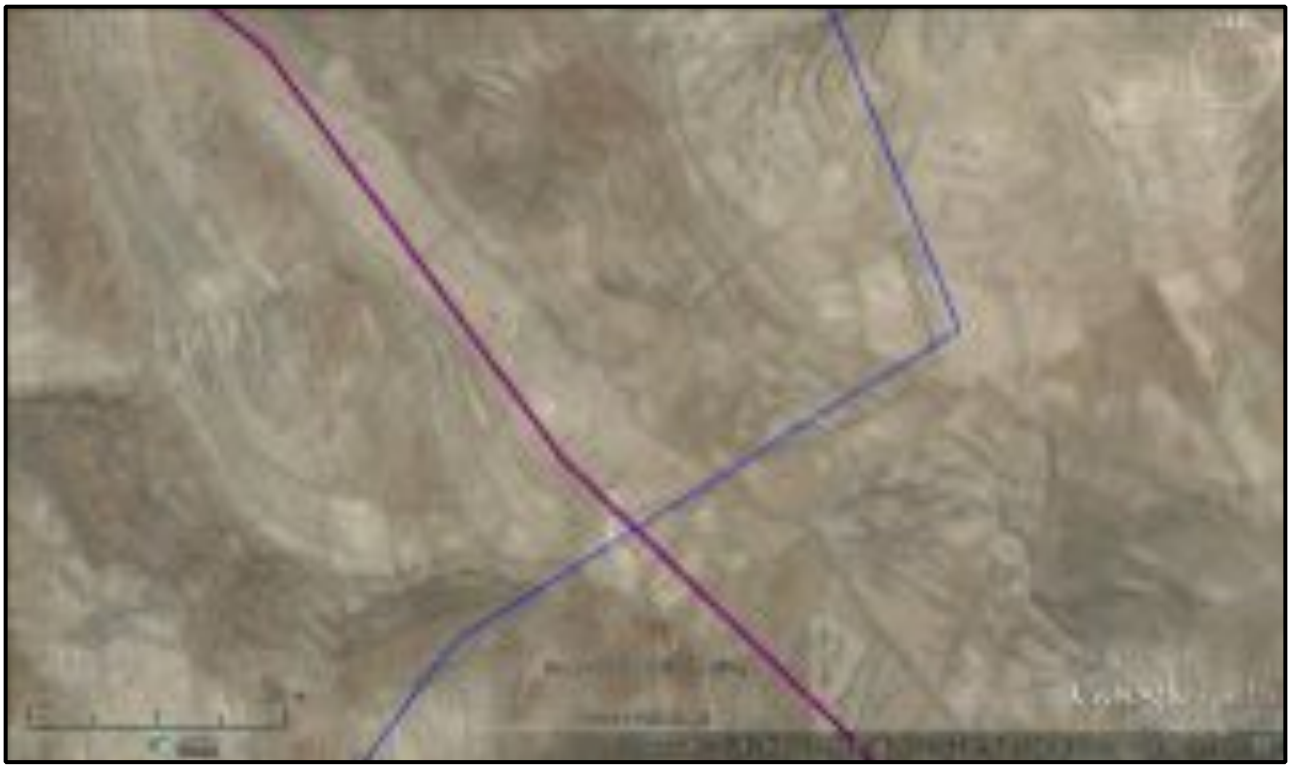


Figure 18: Potential Sensitive Receptors in Area 2 – None

(iii) *Area 3*

Within this area, the OHL route does not seem to pass within any key sensitive receptors such as structures or community settlements, etc. Within the surrounding areas a number of receptors were identified but which are unlikely to be affected by the OHL, those are identified in the figure and table below.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land which is most likely undertaken by the local communities in the area. In addition, grazing activities were also noted in the area as well as several nomadic settlements near point 3-1.

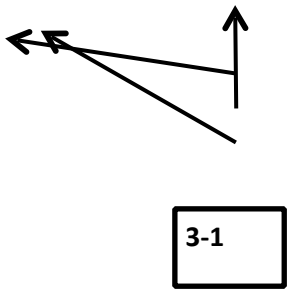


Figure 19: Potential Sensitive Receptors in Area 3

Table 3: Potential Sensitive Receptors in Area 3

No.	Distance from OHL	Description	Issues of Concern
3-1	300-800m	A number of private agricultural farms that are fenced some of which include water reservoirs. Agricultural activities mainly include wheat and barley as well as olive trees.	None. Should detailed design of the route pass through this area, land acquisition and compensation process will take place in accordance with process discussed in "Section 3.1.6".

Figure 20: Private Agricultural Farms (3-1)

(iv) *Area 4*

Within this area, the OHL route does not seem to pass within any key sensitive receptors such as structures or community settlements, etc. Within the surrounding areas a number of receptors were identified but which are unlikely to be affected by the OHL, those are identified in the figure and table below.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land which is most likely undertaken by the local communities in the area. In addition, grazing activities were also noted in the area as well as several nomadic settlements near point 4-2 (refer to Figure 22).

4-2

4-1

Figure 21: Potential Sensitive Receptors in Area 4

Table 4: Potential Sensitive Receptors in Area 4

No.	Distance from OHL	Description	Issues of Concern
4-1	780m	A small village which consists of around 12 houses. This small village is known as Dor. Refer to Figure 23 below.	None. No organized boundary is identified for this village. Nevertheless, final detailed design is expected to avoid the village.
4-2	330m	Archeological site known as Dor. This is discussed in further details in "Section 3.3".	None. Final detailed design is expected to avoid this area.

Figure 22: Nomadic Settlement

Figure 23: Dor Village

(v) *Area 5*

Within this area, the OHL route does not seem to pass within any key sensitive receptors such as structures or community settlements, etc. Within the surrounding areas a number of receptors were identified but which are unlikely to be affected by the OHL, those are identified in the figure and table below.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land which is most likely undertaken by the local communities in the area. In addition, grazing activities were also noted.

Figure 24: Potential Sensitive Receptors in Area 5

Table 5: Potential Sensitive Receptors in Area 5

No.	Distance from OHL	Description	Issues of Concern
5-1	950m	Qurain Village. Closest house is around 950m from the OHL (refer to Figure 25).	None. Detailed design is expected to avoid regularized boundary of the village.
5-2	370m	A private agricultural farm that is fenced. Area is ploughed with what seems to be wheat and barley (refer to Figure 26).	None. Should detailed design of the route pass through this area, land acquisition and compensation process will take place in accordance with process discussed in "Section 3.1.6".
5-3	Within the OHL route	A private agricultural farm that is fenced and which mainly consists of olive plantations (refer to Figure 27).	None. Should detailed design of the route pass through this area, land acquisition and compensation process will take place in accordance with process discussed in "Section 3.1.6".
5-4	700m	A cemetery used by the local community. Refer to Figure 28.	None. Final detailed design is expected to avoid this area.

5-5	900m	One caravan which seems to be inhabited. Exact use could not be determined. Refer to Figure 29.	None. Final detailed design is expected to avoid this area.
5-6	350m	A cemetery used by the local community. Refer to Figure 30.	None. Final detailed design is expected to avoid this area.

Figure 25: Closest Houses in Qurain Village to the OHL (5-1)

Figure 26: A Private Agricultural Farm with Wheat and Barley (5-2)

Figure 27: A Private Agricultural Farm with Olive Plantations (5-3)

Figure 28: Cemetery used by the Local Communities (5-4)

Figure 29: Caravan which Seems to be Inhabited

Figure 30: Cemetery used by the Local Communities (5-6)

(vi) *Area 6*

Within this area, the OHL route does not seem to pass within any key sensitive receptors such as structures or community settlements, etc. Within the surrounding areas a number of receptors were identified but which are unlikely to be affected by the OHL, those are identified in the figure and table below.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land which is most likely undertaken by the local communities in the area. In addition, grazing activities were also noted.

6-2

6-1

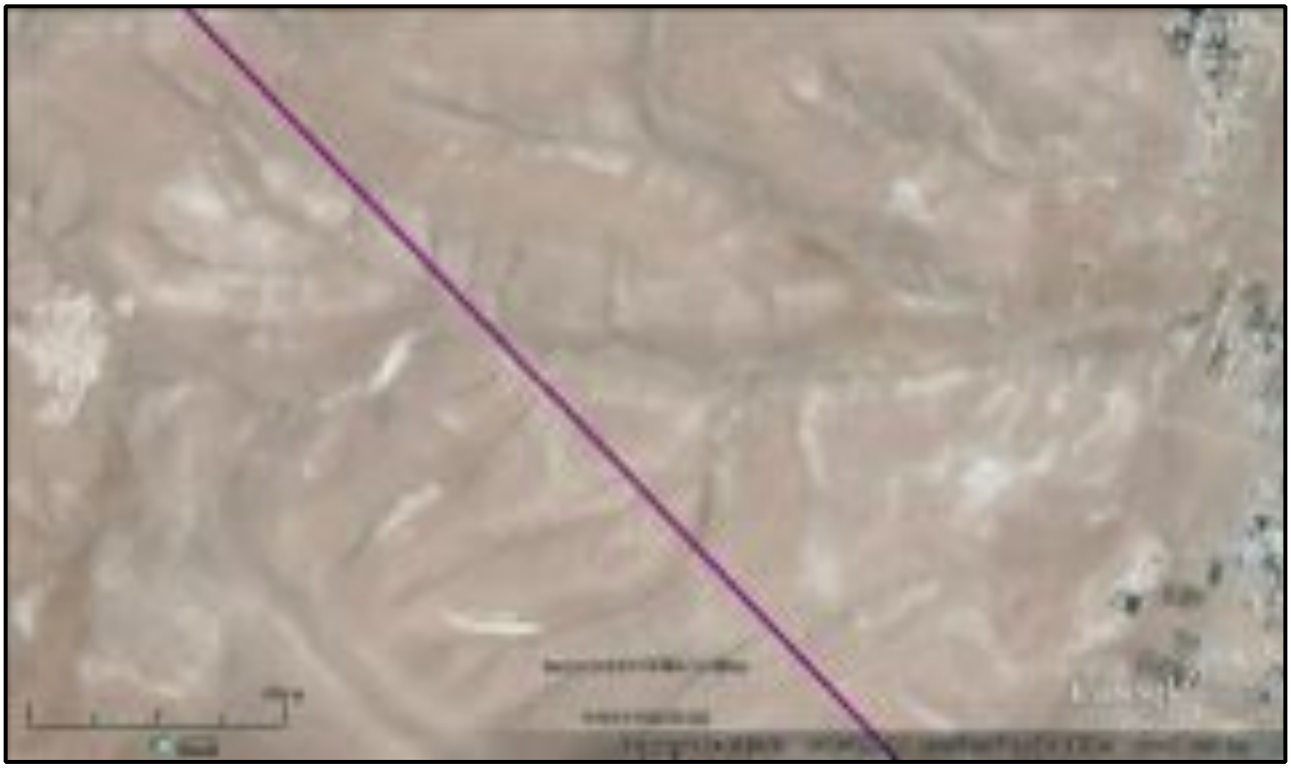


Figure 31: Potential Sensitive Receptors in Area 4

Table 6: Potential Sensitive Receptors in Area 6

No.	Distance from OHL	Description	Issues of Concern
6-1	Around 200m	Excavated area with stone piles which seems to be no longer in use. No activity was noted during the site visit. Refer to Figure 32 below.	None.
6-2	Around 800m	Mregha Village. Closest house to the OHL is around 800m some of which are still under construction. Refer to Figure 33 below.	None. Detailed design is expected to avoid regularized boundary of the village.

Figure 32: Excavated Areas in 6-2

Figure 33: Closest Houses in Mregha Village to the OHL

(vii) *Area 7*

Generally, within this area, the OHL route does not pass within any key sensitive receptors such as structures or community settlements, etc. The only issue is point 7-3 presented in the figure below which was noted to be a road like structure and which could most likely be the gas pipeline discussed earlier in "Section 3.1.2". Apart from that, within the surrounding areas a number of receptors were identified but which are unlikely to be affected by the OHL, those are identified in the figure and table below.

Within the route and the area in general signs of agricultural activities are evident due to the ploughing of the land (Figure 36) which is most likely undertaken by the local communities in the area (mainly wheat and barley). In addition, grazing activities were also noted to take place in the area (Figure 35).

Figure 34: Potential Sensitive Receptors in Area 7

Table 7: Potential Sensitive Receptors in Area 7

No.	Distance from OHL	Description	Issues of Concern
7-1	Around 600m	Mregha Village. Refer to Figure 37 below.	Detailed design is expected to avoid regularized boundary of the village.
7-2	Around 800m	Swaimreh Village.	Detailed design is expected to avoid regularized boundary of the village.

7-3	Within and near the OHL route.	This includes excavated areas (white spots) which seem to be longer in use. In addition, the road like structure which connects from Mregha Village to Swaimreh village is most likely the gas pipeline discussed earlier in "Section 3.1.2". Refer to Figure 38 below.	None. As discussed earlier, the relevant authority (most likely to be the Jordanian Egyptian FAJR Company) must be contacted in order to obtain additional information on the pipeline (e.g. exact route, depth, specifications, etc.) and the detailed design to be prepared must ensure that the pipeline will not be affected from the project development and also take into account any requirements or specifications from the relevant authority.
7-4	300 m	Unidentified object. Nothing found on the ground.	None.

Figure 35: Grazing Activities Undertaken in the OHL Area

Figure 36: Ploughing Undertaken within the OHL Area

Figure 37: View towards Mregha Village from the OHL

Figure 38: Road Like Structure from Mregha to Swaimreh Village

Figure 39: Excavated Areas

3.1.5. Discussion and Additional Requirements

1. As discussed earlier, currently, the OHL route passes through around 36 privately owned lands and 3 governmental lands. Such lands will be subject to a land acquisition and compensation process by NEPCO. A discussion on the NEPCO land acquisition and compensation process is discussed in further details in "Section 3.1.6" below.

2. No key sensitive receptors have been identified along the current OHL route which could be affected by the Project development such as structures, community settlements, etc. Therefore, it is highly unlikely that the development of the Project would results in any significant impacts on land use such as voluntary or involuntary resettlement. However, at a later stage, as part of the detailed design a detailed survey must be undertaken to verify the outcomes discussed earlier throughout this section. In addition, the detailed design should also take into account the various receptors identified within the 1km buffer area (e.g. cemeteries, local community settlements, etc.) and avoid siting the project components (mainly the pylons) within or near such receptors.

3. The OHL mostly passes through vacant lands which are mostly used for agriculture (mainly wheat and barley), most of which are open areas that are not fenced. It is not clear whether those are undertaken by the land owners or community members in agreement with the land owner. In addition, within the area in general grazers from the local communities were noted as well as a limited number of nomadic populations.

   It is highly unlikely that the Project would result in any significant impacts on the actual land use activities undertaken by the local communities (mainly grazing and agricultural), due to the very small footprint in which construction and operation activities will take place (limited to the pylon locations) and the widespread lands of similar habitats in the area that can be used for grazing and agriculture.

   Nevertheless, as part of the ESIA study to be undertaken for this project, additional consultations must be undertaken with the local communities, nomadic groups and grazers to better understand the land use of the area. In addition, appropriate mitigation measures should be identified to ensure that the local communities, grazers and nomadic groups are not affected by the Project. This could include commitments to allow such groups to continue with their grazing and agricultural activities within the OHL route. In addition, a grievance mechanism must be prepared to ensure that any issues related to prohibition of access to the OHL are addressed.

3.1.6. *Acquisition and Compensation Process undertaken by NEPCO for the OHL*

The National Electric Power Company (NEPCO) is an independent financial and administrative state owned entity that owns, operates, maintains and develops the transmission network with main responsibility to regulate the electricity sector in Jordan, especially with respect to power generation and distribution. It is also responsible for the retail supply business in respect of principal consumers connected to its network.

NEPCO has been granted authority by law to confiscate land as long as it is for public benefit and based on a fair and just compensation for any Project Affected Persons (PAP).

NEPCO must ensure that any Land acquisition is undertaken in accordance with the Land Acquisition Law Decree (12) of 1987 and its amendments, commonly referred to as the Land Acquisition Law (LAL). The LAL applies in all cases of land acquisition in the Jordan. Additionally, the General Electricity Law no. 64 of the year 2002 and its amendments identified process to be followed in such cases, which to a great extent mirrors that stipulated with the LAL.

NEPCO has an internal division that deals with the acquisition/confiscation of land associated with NEPCO projects and that is also responsible to negotiate appropriate payment for parties affected by NEPCO projects.

The following process is followed by NEPCO for determining the final OHL route design and the land acquisition and compensation process:

Acquisition and Compensation Process undertaken by NEPCO for the OHL	
Provisional OHL route	▪ NEPCO prepared a provisional route (10.5 km) for the OHL from the NEPCO substation until its connection with the national grid. It is important to note that the route of the OHL has not been fully defined but it will be within +/- 500m buffer of the route and will be specified based on actual surveys on the ground and also during the construction phase to avoid any obstacles that might arise.
(Art.6) of LAL: Marking of Expropriation on Land Registry and Preliminary Survey	▪ NEPCO starts the process by submitting a copy of decision and acquisition plan to the land registry (Department of Lands and Survey (DLS)) to provide the provisional route along with a +/- 500m buffer and request the land ownership within this zone. This process generally requires around one (1) month to be completed. NEPCO already initiated this process and contacted the DLS first week of May 2016. ▪ NEPCO will compile an inventory of landholdings, crops in agricultural land, and buildings to identify a reasonable level of compensation for the land parcels along the transmission line route. ▪ NEPCO as developer of the project shall work with representatives from local entities and form a committee to identify the public benefits of the project as well as agree the appropriate level of compensation with the PAP's. Agencies that that could provide assistance in this as necessary include: Ministry of Finance, Ministry of Municipalities, Department of Land and Survey (DLS), Ministry of Agriculture, and Ministry of Environment.

Project (i.e. OHL) development process and detailed surveys	▪ In parallel, NEPCO announces a tender in the local newspapers requesting a proposal from a local contractor to undertake required site assessments and surveys, finalise the design, and construct the OHL. Procurement process follows government procedures and NEPCO awards the tender to the most suitable bidder. NEPCO may ask a contractor that is already assigned for similar work in a nearby area in order to expedite process. ▪ Contractor undertakes site assessments and surveys (topography, geotechnical, infrastructure and utilities...etc). ▪ The final design shall take into account the main principle which is to avoid land acquisition of private properties to the extent possible, or minimised where unavoidable. ▪ Contractor prepares final design for the route.
(Art.4) of LAL and (Art. 43) of Electricity Law Declaration of acquisition for Public Benefit	▪ Before undertaking any construction works, NEPCO is required to place an advert in at least two (2) daily newspapers stating that in 15 days time they will start constructing the OHL. The announcement shall identify the land parcels on which the OHL will be constructed. ▪ Land owners wanting to receive compensation are asked to submit application once OHL is energised.
Construction of the OHL	▪ After the 15 days period, the construction works are started and the final (as-built) design of the OHL is decided based on actual work on the ground as the Contractor may have to modify the designs to avoid potential obstacles. ▪ OHL is energised. ▪ Upon final authentication by the DLS and land valuation committee, an authentication of the Cabinet is required.

(Art.9and Art.10) of LAL and (Art. 44) of Electricity Law: Announcement on Decision of Expropriation and Negotiation on Compensation	▪ Land owners submit a request for compensation once OHL is energised. ▪ NEPCO will provide each PAP with a Compensation Statement that records the precise loss of property (type, physical dimensions, and replacement value) or livelihood and state the compensation due for this loss to each property holder. If the PAPs confirm the content of the Statement and his acceptance of the compensation offered, he/she will sign the Statement. ▪ According to Article 9 of the law, direct negotiation between NEPCO and land owners may be conducted until agreement is reached. However, compensation amounts are based on the land valuation and compensation amounts decided by the committee. ▪ Once the compensation amounts have been negotiated and agreed upon, NEPCO will deliver the compensation to the land owners directly or place it in the Treasury under their names according to the requirements of the LAL of 1987 articles 14 and 16D. The officials at the DLS or the local Municipality will verify the delivery of the negotiated amount of compensation. ▪ NEPCO's land acquisition team will monitor the delivery of such funds so as to ensure that all amounts reach all intended beneficiaries. ▪ In the event that agreement cannot be found between the two parties cases are referred to the Primary Court that has jurisdiction in this area and to higher courts if necessary. On referral to the court, issue will be resolved in accordance with article 10 of the LAL. The article states that the court can be assisted by governmental experts from the Ministry of Finance, Directorate of Land, or others as necessary to assist in establishing the proper amount of just and fair compensation. (Note: NEPCO already identified land valuation in collaboration with these entities so compensation amounts are mainly fixed). ▪ PAPs are given three (3) years from the date of energising of the OHL to submit compensation claims. Their requests are rejected after this period.

3.2. Biodiversity

This section presents the outcome of the preliminary assessment undertaken for biodiversity along with the additional requirements which must be taken into account at a later stage of the Project development.

3.2.1. Methodology

A rapid site assessment was undertaken through a one day field visit (on 28 April 2016) by a biodiversity expert. The assessment consisted of a walkthrough of the entire route of OHL and its 1km buffer area to the greatest extent possible. The objective was to assess the general ecological state and biodiversity of the study area and identify, list and record all faunal, flora, and avi-faunal species encountered along the route and its surroundings;

3.2.2. Results and Outcomes

Discussed below are the outcomes of the site assessment with regards to flora, fauna and avi-fauna.

Plant species and floral diversity was noticed to be higher by the western part of the study area while the diversity and vegetation cover continued to decrease eastwards. Throughout the survey it was noticed that natural vegetation would make up not more than 50% of the study area. The remaining lands are either agriculture fields planted with annuals such as wheat and barley or are previously farmed lands. The site survey recorded a total of 25 species are presented in the table below. Generally, the plant species recorded are considered of least concern.

Table 8: List of Floral Species Recorded Onsite

Family	Scientific name	Conservation Status – IUCN Regional Assessment of Jordan
Chenopodiaceae	*Noaea mucronata* (Forssk.) Asch. & Schweinf.	Least Concern
Compositae (Asteraceae)	*Achillea fragrantissima* (Forssk.) Sch.Bip.	Least Concern
	Artemisia sieberi Besser *Syn. Artemisia herba-alba*	Least Concern
	Carlina libanotica Boiss.	Not Evaluated
	Centaurea damascena Boiss.	Least Concern
	Filago desertorum Pomel	Least Concern
	Launaea angustifolia (Forssk.) Sch.Bip. ex Kuntze	Least Concern
	Onopordum ambiguum Fresen.	Least Concern
	Senecio flavus (Decne.) Sch.Bip.	Least Concern
Cruciferae (Brassicaceae	*Diplotaxis harra* (forssk.) Boiss.	Least Concern
Geraniaceae	*Erodium laciniatum* (Cav.) Willd.	Least Concern
Graminae (Poaceae)	*Avena barbata* Pott ex Link	Least Concern
	Bromus tectorum	Least Concern
	Hordeum glaucum Steud.	Least COncern

Labiatae (Lamiaceae)	*Salvia multicaulis* Vahl.	Not Evaluated
	Teucrium leucocladum Boiss.	Least Concern
Papilionaceae	*Astragalus spinosus* (Forssk.) Muschl.	Least Concern
	Ononis natrix L.	Least Concern
Ranunculaceae	*Ranunculus asiaticus* L.	Least Concern
Resedaceae	*Reseda lutea* L.	Least Concern
Scrophulariaceae	*Anarrhinum forskahlii* (J.F. Gmel.) Cuf.	Least Concern
	Verbascum eremobium Murb.	Not Evaluated
	Verbascum sinaiticum Benth.	Not Evaluaed
Solanaceae	*Lycium shawii* Roem. & Schult.	Least Concern
Zygophylaceae	*Pegnum harmala* L.	Least Concern

With regards to fauna, only a single species was recorded during the field survey and that was the Small Spotted Lizard (*Mesalina guttulata)*. It should be highlighted that the species was recorded in the eastern side of the study area in the part covered by scattered rocks which could provide a suitable habitat for small-sized fauna. This species is considered a common species in Jordan. It is important to note that such results are based on a rapid site assessment undertaken. Other potential faunal species are likely to occur in the area, some of which could have a conservation status such as the Spur-thighed Tortoise *(Testudo greacea),* and the Eurasian Badger *(Meles meles)*.

Finally, as for avi-fauna, 9 species were recorded in the field survey as listed below. All species recorded are considered of least concern.

Common Name	**Scientific Name**	**IUCN Red List Status (2015)**	**Regional Red List Statuss (2015)**	**Status in Jordan**
Honey Buzzard	*Pernis apivorus*	Least Concern	Least Concern	Passage migrant
Collared Dove	*Streptopelia decaocto*	Least Concern	Least Concern	Resident
Crested Lark	*Galerida cristata*	Least Concern	Least Concern	Resident
Desert Lark	*Ammomanes deserti*	Least Concern	Least Concern	Resident
Temminck's Lark	*Eremophila bilopha*	Least Concern	Leas Concern	Resident
Isabelline Wheatear	*Oenanthe isabellina*	Least concern	Least Concern	Resident
Black-eared Wheatear	*Oenanthe hispanica*	Least Concern	Least Concern	Resident
Eurasian Linnet	*Carduelis cannabina*	Least Concern	Least Concern	Resident
House Sparrow	*Passer domesticus*	Least Concern	Least Concern	Resident

The biodiversity of the site in general is considered to be of low sensitivity. The area in general is considered to be heavily disturbed due to the extensive agricultural and grazing activities undertaken and this has greatly affected the natural habitat of the site. In addition, the floral, faunal and avi-faunal species that were recorded as part of the assessment are considered of least concern and common to such area habitats. Finally, no key sensitive habitats were recorded or noted on site (such as breeding habitats, potential roosting sites for bats, etc.)

3.2.3. Discussion and Additional Requirements

Site preparation activities which are to take place for construction of the OHL are expected to include land clearing activities, excavation, grading, etc. Such activities are expected to be limited areas where the pylons are to be installed and thus the actual area of disturbance is relatively minimal. Such construction activities could results local habitat loss and disturbances to the habitats in the area – however it is unlikely that significant potential impacts will occur due to the low sensitivity of the site as discussed above.

In addition, no significant potential impacts on avi-fauna is expected during the operation phase from risks of collisions and strikes with the OHL. The ESIA for Rajef Wind Farm Project concludes that the site is not considered within a highly sensitive area in terms of avi-fauna for several reasons, but which most importantly includes its distance from the rift valley and its margins which is considered the main migration route in Jordan. The OHL extend southeast from the Rajef wind farm making it at a greater distance from the rift valley and its margins.

The additional requirements to be considered include the following:

1. As discussed earlier a rapid biodiversity survey was undertaken in which no key sensitive habitats or species were noted. However, as part of the ESIA a detailed biodiversity survey must be undertaken to confirm the outcomes of the rapid assessment above. The detailed biodiversity survey must include the 11km OHL route along with an appropriate buffer area in which construction activities are expected to take place. The survey must cover flora, fauna and avi-fauna and any key sensitive species must be recorded. Based on the outcomes of the detailed biodiversity survey the appropriate mitigation measures must be identified should any key sensitive species be recorded. This could include for example the relocation of such key species to outside of construction active areas.

2. With regards to avi-fauna specifically, as part of the Rajef ESIA a bird baseline survey was undertaken at the Project site in 4 different seasons to include spring 2012, autumn 2012, autumn 2013 and spring 2015. A total of 547 monitoring hours were undertaken during the spring season and 250 hours during autumn. Such secondary data in addition to desktop review should be utilized to assess the potential impacts on avi-fauna during the operation phase, and typical mitigation measures are to be identified to minimize any potential collision risks (such as wire markers, bird diverters etc.). Such secondary data is considered sufficient for the assessment purpose with no need to undertake additional monitoring studies.

3.3. Archeology and Cultural Heritage

This section presents the outcome of the preliminary assessment undertaken for archeology and cultural heritage along with the additional requirements which must be taken into account at a later stage of the Project development.

3.3.1. Methodology

The preliminary assessment first included a literature review through collection of data from previous archeological surveys and studies undertaken in Jordan which are registered in the Middle Eastern Geodatabase for Antiquities (MEGA) – Jordan. MEGA Jordan is a database, prepared by the Getty Conservation Institute in collaboration with DoA, that encompasses and registers all the known archeological sites in Jordan.

In addition, a rapid site assessment was undertaken through a one day field visit (on 28 April 2016) by an archeology and cultural heritage expert. The assessment consisted of a rapid walkthrough of the OHL route and a 1km buffer area. The objective of the rapid assessment was to: (i) identify and assess archeological and cultural heritage remains located within the route (if any); (ii) investigate and assess archeological and cultural heritage remains in the Project Area that have been identified as part of MEGA Jordan.

3.3.2. Outcomes and Results

As part of the ESIA undertaken for the Rajef wind farm project, the Department of Antiquities (DoA) has already undertaken a site survey of the Rajef Project site (represented in blue in Figure 2 earlier) in which the first 2.5km of the OHL is located. The survey identified a total of 18 sites considered of archeological importance within the Rajef Project site. As noted in Figure 40 below, no sites recorded by the DoA survey are within the OHL route, however some of the sites are located within the 1km buffer area.

Taking the above into account, the focus of the preliminary assessment was on the remaining 8.5km of the OHL which runs from the end of the Rajef Project site boundary till the end of the route.

A search of MEGA Jordan for 8.5km OHL and its 1km buffer area identified 3 sites. The sites are presented in Figure 41 below along with the description as available on MEGA Jordan in Table 9 below.

Table 9: Archeological Sites Description on MEGA Jordan

Site	MEGA JORDAN Description	Distance from OHL
Dor – MEGA No. 8905	Archaeological remains related to different periods from the Iron Age II, 7th century BC till the Ottoman periods. Boundary of the site as included within MEGA Jordan is presented in the figure below.	330m to the east
Um Raps – MEGA No. 4204	A Nabataean settlement that includes sherds and flint scatter. Based on the site assessment undertaken (discussed below) this site was noted to be completely destroyed most likely due to agricultural activities undertaken in the area. No boundary of the site is included in MEGA Jordan.	50m to the west.
MEGA No. 8913	Remains of Roman tower with sherds and flint scatter. Boundary of the site as included within MEGA Jordan is presented in the figure below.	570m to the west.

As part of the preliminary site assessment, several sites were also recorded within the OHL and its 1km buffer. Nevertheless, it is important to note that the exact boundary of such archeological sites could not be determined as part of the rapid assessment. The sites are presented in Figure 41 below along with a description in Table 10 below.

Table 10: Archeological Sites Recorded as part of the Rapid Assessment

Site	Description	Distance from OHL
1	Traces of foundation wall and heap of stones. Two pottery sherds were found within the site dating to the Roman Period. Function or classification of the site could not be determined but it could be described as a 'Khirbeh'. The exact boundaries of the site could not be determined as part of the assessment.	400m to the east.
2	Group of several heaps of stones and remains of wall foundations. No pottery sherds were found and therefore the dating period could not be identified. The exact boundaries of the site could not be determined as part of the assessment.	Within OHL route.
3	Dor Site already reported under MEGA Jordan (site No. 8905). Site contains several archaeological remains related to different periods, from the Iron Age II, 7th century BC till the Ottoman periods. The most important site elements are the remains of stone foundation, circular structure and modern houses which might be dated to the late 19 presented in the figure below as provided in MEGA Jordan.	330m to the east
4	Um Ras site already reported under MEGA Jordan (site No. 4204) as a Nabataean settlement that includes sherds and flint scatter. Based on the site assessment the site was noted to be completely destroyed most likely due to agricultural activities undertaken in the area. No boundary of the site is included in MEGA Jordan.	50m to the west.
5	Walls composed of big boulder stones which could most likely be an old street.	100m to the east.
6	Group of several heaps of stones and remains of wall foundations. No pottery sherds were found and therefore the dating period could not be identified. The exact boundaries of the site could not be determined as part of the assessment.	560 m to the east.
7	Site already reported under MEGA Jordan (site No. 8913) as Remains of Roman tower with sherds and flint scatter. Boundary of the site as included within MEGA Jordan is presented in the figure below.	570m to the west.

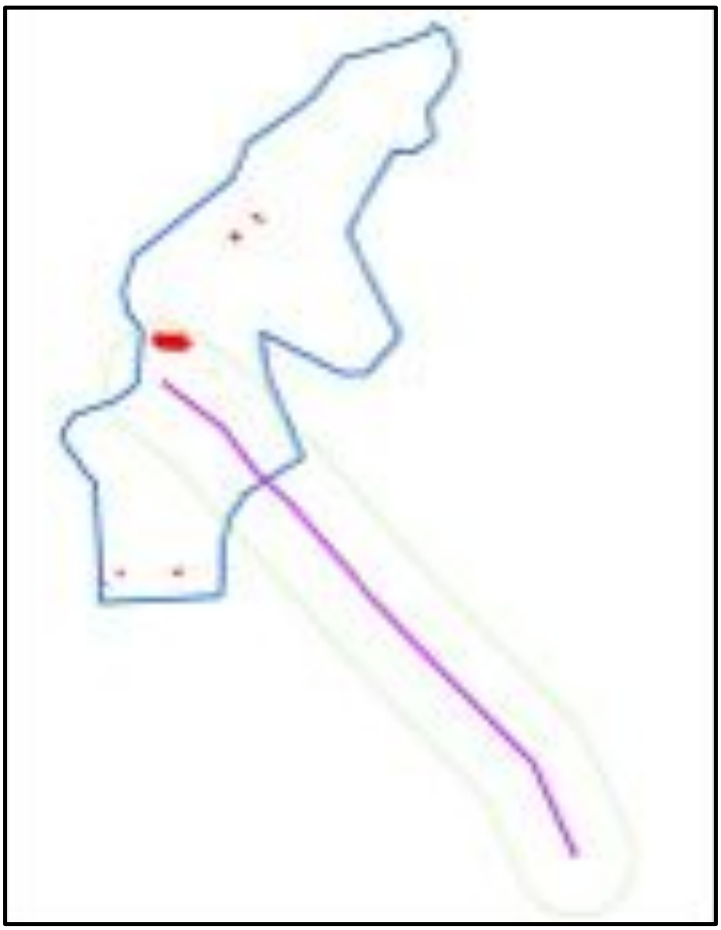


Figure 40: Archeological Sites Recorded within the Rajef Project Site Boundary as part of the Rajef Wind Farm ESIA

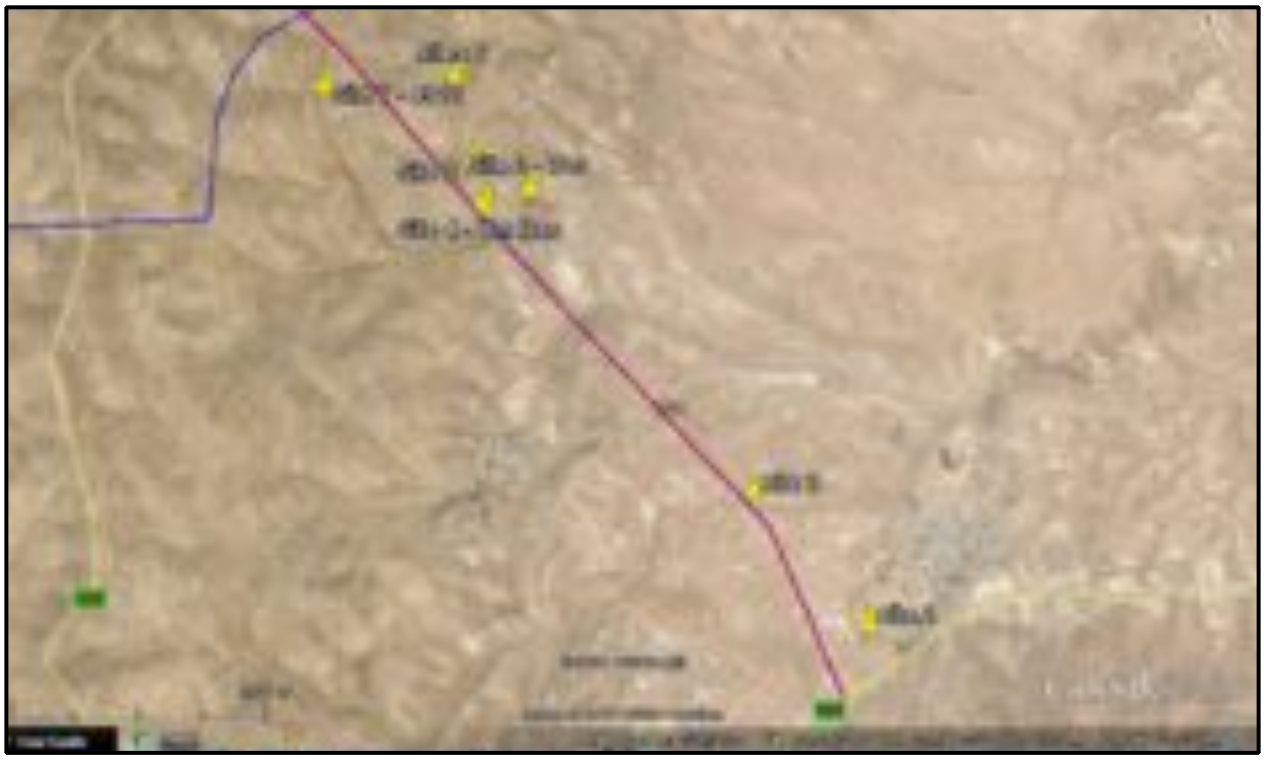


Figure 41: Archeological Sites Recorded by Rapid Assessment and MEGA Jordan

Figure 42: Site 3 – Dor

Figure 43: Walls Composed of Big Boulder Stones in Site 5

Figure 44: Group of Several Heaps of Stones in Site 6

Taking the above into account, it is evident that there are several sites located within the OHL 1km buffer area. Such sites are considered important given their archeological and cultural value and should be protected from potential damage or destruction throughout the various project activities. However, it is important to note that the expert did not consider such sites unique nor distinctive archeological features and most importantly would not affect the Project development; such sites can be found extensively especially in the Petra Region and in such mountainous areas which have most likely had ancient/old human presence especially during the Nabataean/Roman era due to its agricultural potential.

3.3.3. Discussion and Additional Requirements

Site preparation activities which are to take place for construction of the OHL are expected to include land clearing activities, excavation, grading, etc. Such activities are expected to be limited areas where the pylons are to be installed and thus the actual area of disturbance is relatively minimal. Nevertheless, if such activities are improperly managed they could damage or disturb archaeological remains present on the surface of the Project site which was discussed above.

As part of the ESIA that will be undertaken for the OHL at a later stage, a detailed archeological survey must be undertaken the Department of Antiquities (DoA) – the official governmental entity in Jordan responsible for the protection, conservation, and preservation of antiquities in accordance with the "Antiquities Law No. 21 for 1988 and its amendments No. 23 for 2004".

The survey must include the 11km OHL route along with an appropriate buffer area in which construction activities are expected to take place. The objective of the detailed survey is to: (i) identify the exact boundaries of the archeological sites identified earlier; (ii) determine whether such sites are located within the OHL route – mainly pylon locations or identified construction activity areas; (iii) assess the importance of the recorded sites (i.e. whether they should be protected or not given that some of the sites recorded

were noted to be completely destroyed); and (iv) document and assess any other archeological remains which could be present within the OHL route.

Based on the outcomes of the detailed site survey, appropriate mitigation measures must be identified. This could include for example relocation of archeological sites outside of the OHL route in agreement with the DoA (if located within pylon locations or construction areas) or shift of pylon locations outside of recorded areas as part of the detailed design that will be undertaken. In addition, appropriate mitigation measures must also be identified to ensure that construction activities (e.g. movement of vehicles and machinery into/out of the site) avoid such areas (through for example proper planning of construction activities, fencing of recorded sites, awareness raising and training to construction workers, etc.).

Finally, throughout the construction phase and as the case with any Project development that entails such construction activities there is a chance that potential archaeological remains in the ground are discovered. Therefore, chance find procedures must be implemented and which are standard requirements by the DoA as required by the “Antiquities Law No. 21 for 1988 and its amendments No. 23 for 2004”.

3.4. Air Quality and Noise

Typical impacts on air quality and noise are expected during the construction phase and which are unlikely to be significant. This will include an increased level of dust and particulate matter emissions, which in turn will directly and temporarily impact ambient air quality. If improperly managed, there is a risk of nuisance and health effects to construction workers onsite and to a lesser extent to the nearby surrounding receptors from windblown dust (such as local communities, nomadic groups, etc.). In addition, construction activities will likely entail the use of vehicles, machinery and equipment (such as generators, compressors, etc.) which are expected to be a source of other pollutant emissions.

In addition, the use of machinery and equipment such as generators, compressors, loaders, etc. are expected to be a source of noise and vibration generation within the Project site and its surroundings. If improperly managed, there is risk of nuisance and health affects to construction workers onsite and to a lesser extent to the nearby surrounding receptors (such as the local communities, nomadic groups, etc.).

The ESIA must assess potential impacts on air quality and noise and identify typical mitigation measures for dust and noise suppression to reduce and minimize such impacts.

3.5. Geology and Hydrology (Soil and Groundwater)

Typical impacts on soil and groundwater are limited to improper housekeeping practices of waste streams during the construction and operation phase (to include solid waste, wastewater, hazardous waste, hazardous material). Improper housekeeping practices (such as illegal disposal of waste to land and improper storage of hazardous materials) could contaminate and pollute soil which in turn could pollute groundwater resources. This could also indirectly affect flora/fauna and the general health and safety of workers (from being exposed to such waste streams).

Nevertheless, such impacts can be adequately controlled through the implementation of general best practice housekeeping measures which must be identified within the ESIA study and which are expected to be implemented during the construction and operation phase.

3.6. Occupational Health and Safety

Impacts on occupational health and safety are expected during the construction and operation phase. Throughout the construction phase there will be generic occupational health and safety risks to workers from working on construction sites. Such risks include: slips and falls, struck-by objects, moving machineries, working at heights, electric shocks, etc.

Similarly, during operation there will be occupational health and safety risks from routine maintenance activities as well corrective maintenance. Such maintenance activities could entail various health and safety risks such as electric shocks.

Nevertheless, an Occupational Health and Safety Plan is expected to be developed for the construction and operation phase in accordance with the provisions of the Labor Law No. 8 for the Year 1996 and its amendments, including Chapter IX, Occupational Safety & Health before construction activities commence. The Plan must address the likely hazards, emergency response procedures, and provision of protective clothing, adequate safety management.