

Kingdom of Saudi Arabia – Arab Republic of Egypt Interconnection Project



Environmental & Social Impact Assessment Addendum

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LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
AC	Alternating Current
BSP	Bulk Supply Point
CESMP	Construction Environmental and Social Management System
CRMP	Collision Risk Management Plan
DC	Direct Current
E&S	Environmental & Social
EBRD	European Bank for Reconstruction and Development
ECAs	Export Credit Agencies
EEAA	Egyptian Environmental Affairs Agency
EHA	Environment Health and Safety
EIA	Environmental Impact Assessment
EP	Equator Principles
EPAP	Equator Principles Action Plan .
EPC	Engineering, procurement, and construction
EPFIs	Equator Principles Financial Institutions
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
GAMEP	General Authority of Meteorology and Environmental Protection
Geotec	Geotechnical & Environmental Co.Ltd
GER	General Environmental Regulations
GHG	Green House Gas
HDD	Horizontal Directional Drilling
HEC	Hyundai Engineering & Construction Co., Ltd
HRIA	Human Rights Impact Assessment
HVDC	High Voltage Direct Current
IES	International Environment Service
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
Km	kilometre
KSA	Kingdom of Saudi Arabia
KV	Kilo Volt
LAP	Land Acquisition Plan
LGES	Leaf Green Environmental Services
LRP	Livelihood Restoration Plan
MEWA	Ministry of Environment, Water & Agriculture

ABBREVIATION	MEANING
MoD	Ministry of Defence
MW	Mega Watt
NCC	National Contracting Company Ltd
NCEC	National Centre for Environmental Compliance
NCVCCD	National Centre for Vegetation Cover and Combatting Desertification
NCW	National Centre for Wildlife
OECD	Organization for Economic Cooperation and Development
OHTL	Over Head Transmission Line
OHTL	Over Head Transmission Line
PMC	Project Management Company
RAP	Resettlement Action Plan
RoW	Right of Way
SEC	Saudi Electricity Company
SEP	Stakeholder Engagement Plan
SMBC	Sumitomo Mitsui Banking Corporation
SSEM	Saudi Services for Electro Mechanic Works
StEC	Staterra Environmental Consulting
STL	Spiny Tailed Lizard
TCF	Temporary Construction Facilities
WBG	World Bank Group

1 INTRODUCTION

The proposed Kingdom of Saudi Arabia (KSA) – Egypt Electrical Interconnection Project is a planned 1,200 km Overhead Transmission Line (OHTL) that will run north from the western city of Madinah towards Tabuk and across the Gulf of Aqaba to the Sinai Peninsula and extend further into Egypt (the Project). The Saudi Electricity Company (SEC) has recently signed a contract to build, own and operate the section of the electrical interconnection project within the KSA.

The Project agreement was signed between the two countries and aims to establish a infrastructure for electricity trade between both countries. This will allow each country to export its surplus electricity and support the other country during its peak periods up to a maximum loading of 3,000 MW. The proposed Project will help manage challenges in power supply by ensuring stable and high-quality energy supplies required to meet the growing energy demand in the area and thus mitigating losses caused by power outage in the regions of Medina and Tabuk (KSA). The source of electricity will be the KSA and Egyptian national grids which have both renewable and conventional sources (i.e. thermal power plants) in their energy mix.

SEC are seeking financing for the Project from international lenders and Export Credit Agencies (ECAs). As a result, the Project, including the associated facility in Egypt, is required to comply with the Equator Principles (EP IV, 2020) and Organization for Economic Cooperation and Development (OECD) Common Approaches. In turn, this necessitates compliance with the IFC Performance Standards on Environmental & Social (E&S) Sustainability (2012) and the United Nations (UN) Guiding Principles on Business and Human Rights. Standard Chartered Bank has been mandated as lead arranger with Sumitomo Mitsui Banking Corporation (SMBC) on behalf of SEC for the potential financing of the Project.

Standard Chartered has commissioned 5 Capitals Environmental & Management Consulting (5 Capitals) on behalf of SEC to develop the Environmental and Social Impact Assessment (ESIA) Addendum for the Project to provide a cumulative assessment on the Project components including the OHTL alignment, the subsea cable, the converter and transmission stations, the temporary construction facilities as well as the temporary site offices & accommodation facilities located within KSA. The purpose of ESIA addendum is to provide lenders with an overview of the E&S studies prepared for the Project so far and highlight key gaps that may need to be addressed to meet their requirements (considering EPs, OECD Common Approaches and IFC PS and WBG EHS Guidelines) or can be covered during project implementation.

Prior to this addendum, SEC commissioned multiple Environmental Impact Assessments (EIAs) (split for portions of the transmission alignment) to assess environmental impacts of construction and operation of the OHTL route within KSA. These have been provided to 5 Capitals for review

and analysis. Accordingly, this addendum has been prepared based on the information made available by the Client at the time of writing and the results of the targeted validation surveys, of land-use, proximity to local communities, ecology/biodiversity and other environmental issues.

Beside the Project components in KSA, there are also associated facilities on the Egyptian side including OHTL subsea cable, sub-stations, temporary construction facilities (including construction accommodation facilities) that will be located within Egypt. It is noted that no information to date has been provided on the route alignment or ESIA studies undertaken on the Egyptian side. Therefore, the ESIA Addendum includes a gap analysis of the Egyptian requirements for EIA/ESIAs against typical lenders requirements to consider where risks may exist.

1.1 Structure of the Report

To address the scope of the ESIA Addendum, this Report is structured in the following format:

- Chapter 1 (this chapter): provides a brief introduction of the Project;
- Chapter 2: provides a brief description of the Project, including the Project location, components, planned construction and operation activities and delivery programme;
- Chapter 3: provides a description of the Project categorisation as per national regulator and lenders;
- Chapter 4: provides the gap analysis which includes a review of the existing EIAs and other applicable E&S documents/information provided at the time of writing and identifies the main gaps versus the E&S Lenders requirements. In the absence of data of the associated facilities in Egypt, a gap analysis of the Egyptian requirements versus the relevant elements of the IFC Performance Standards was carried out.
- Chapter 5: provides the terrestrial ecology impact assessment. It includes the ground truthing surveys baseline data and accordingly assesses the potential Project impacts on terrestrial ecology and the identified ecosystem services and proposes applicable mitigation measures to address the gaps identified in the EIAs.
- Chapter 6: provides the land use and land acquisition impact assessment. It includes the ground truthing surveys baseline data and accordingly assesses the potential Project impacts on existing formal and informal land users and proposes applicable mitigation measures to address the gaps identified in the EIAs.
- Chapter 7: provides the ecosystem services impact assessment to address the gaps identified in the EIAs.
- Chapter 8: provides the climate change impact assessment to address the gaps identified in the EIAs.
- Chapter 9: provides the cumulative impact assessment to address the gaps identified in the EIAs.

-
- Chapter 10: provides a conclusion of the main identified gaps and the way forward.
 - Chapter 11: Provides the list of references.
 - Appendices: includes all appendices, which are as follows:
 - Appendix A – List of Project Materials and Vendors
 - Appendix B – Manpower Histogram
 - Appendix C – Routing Alternatives to Avoid Impact on Existing Archaeological Sites
 - Appendix D – Land Lease Contract of TCF2 of Portion 2
 - Appendix E – Summary of Authorities Feedback on the Project as Provided by SEC

2 PROJECT DESCRIPTION

The sections below provide an overview of the Project routing, locations and activities of components within KSA. For details related to these Project activities, please refer to the existing EIA reports.

It is noted that no information to date has been provided on the route alignment or technical details of the studies undertaken within the Egyptian sector.

2.1 Project Location and Components

The Project includes components in KSA and associated facilities in Egypt. The ± 500 KV High Voltage Direct Current (HVDC) OHTL extends for approximately 930 km from Madinah through Tabuk, reaching Gulf of Aqaba.

The Project location within KSA is shown in the following figure.

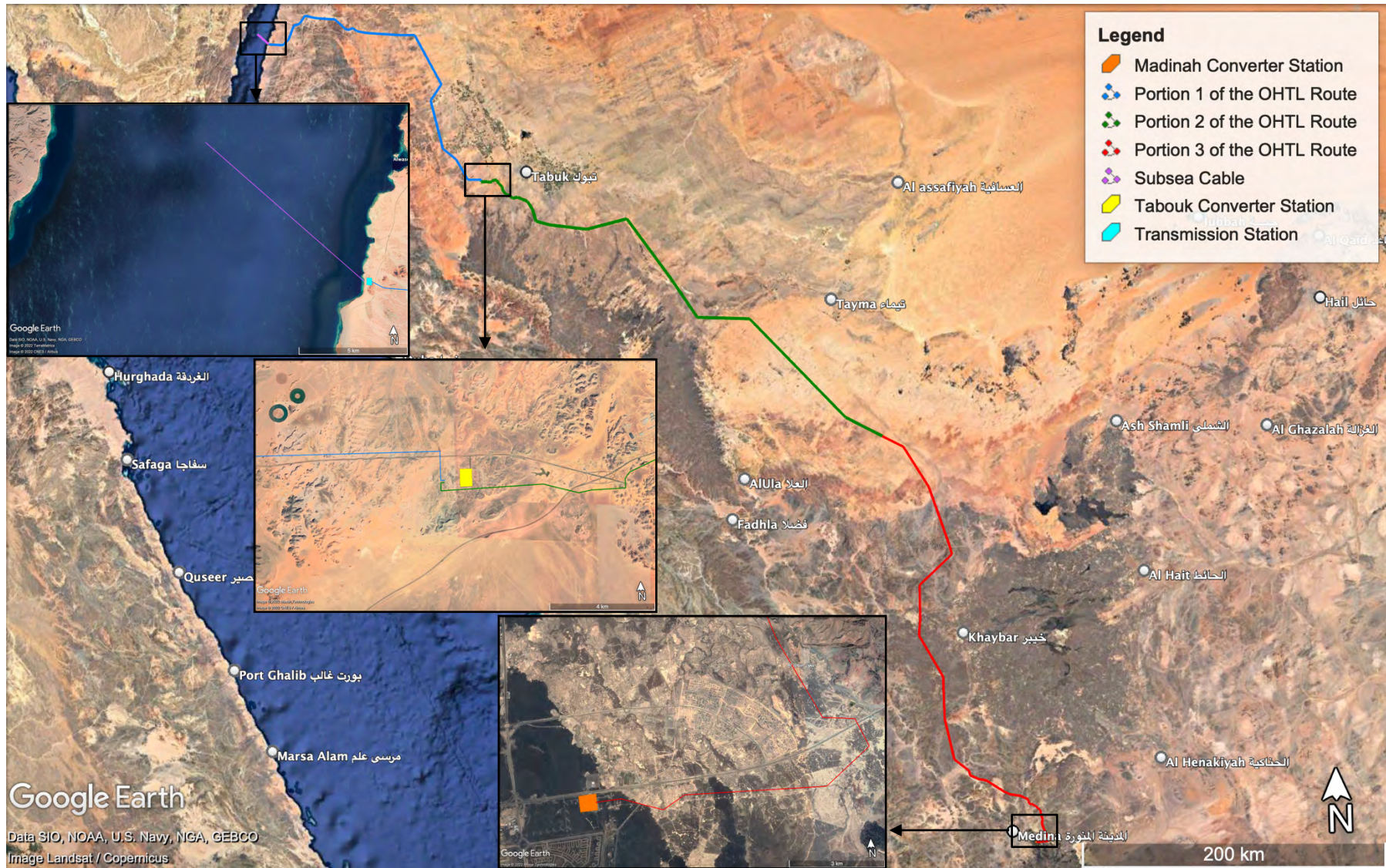


Figure 2-1 Project Components within KSA

2.2 Project Contracts

On the KSA side of the Project, contracts have been awarded to five (5) different Contractors. It is understood that the reason for the split is due to the size of the Project and the difficulty for one Contractor to cover the whole alignment. These contracts include:

- Substations (two existing converter stations and one new transmission station);
- Contract 1- 228km of the OHTL (Portion 1);
- Contract 2- 336km of the OHTL (Portion 2);
- Contract 3- 336km of the OHTL (Portion 3); and
- 10 km Subsea cable Aqaba to Taba.

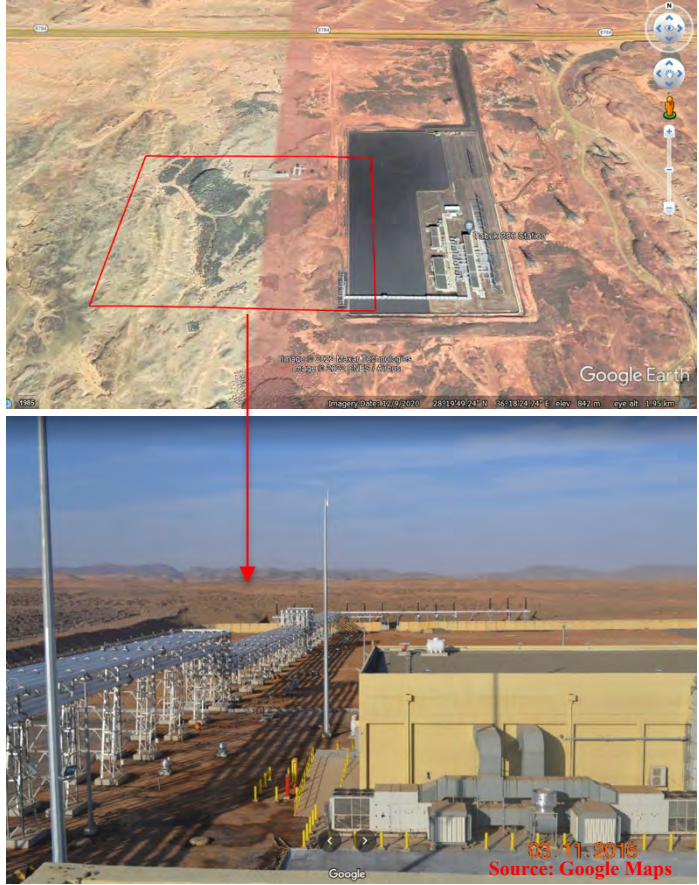
The table below provides an overview of the Contracts listed above.



2.2.1 EIA status and Environmental Permitting

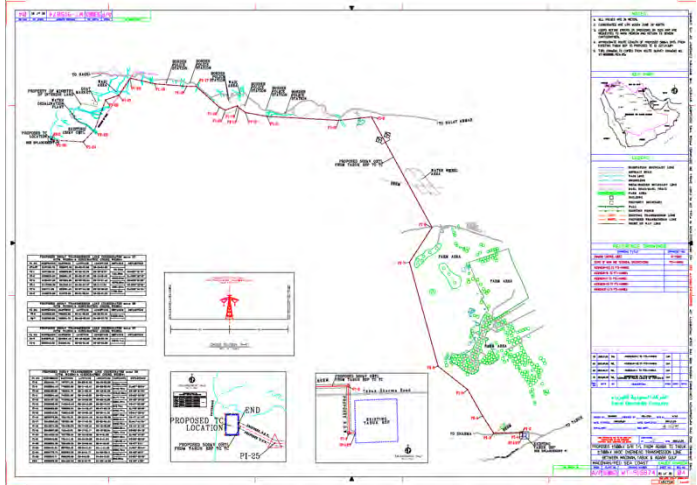
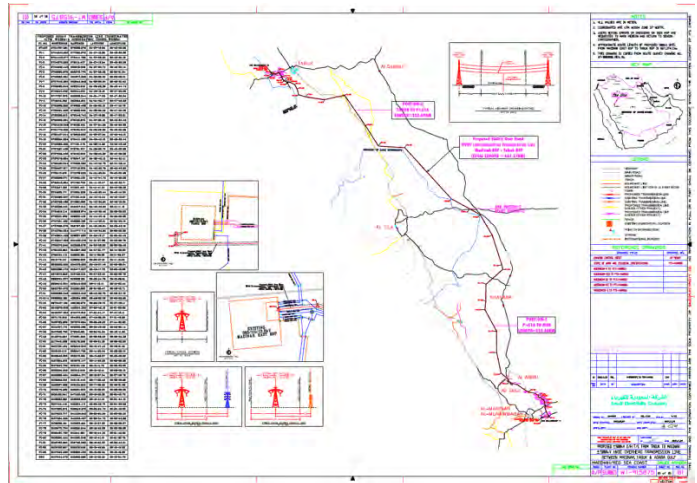
In line with the national requirements in KSA, the Project's Environmental Impact Assessments (EIAs) have been prepared for the OHTL and Subsea cable as well as the transmission station. Contract 1 for OHTL Portion 1 EIA was submitted on behalf of SEC to the national regulator, the National Centre for Environmental Compliance (NCEC) and obtained the permit in 2020 with two years validity; the permit expired in May 2022 and is currently being renewed. The status of the remaining EIAs submissions to NCEC for permitting are provided in the following table.

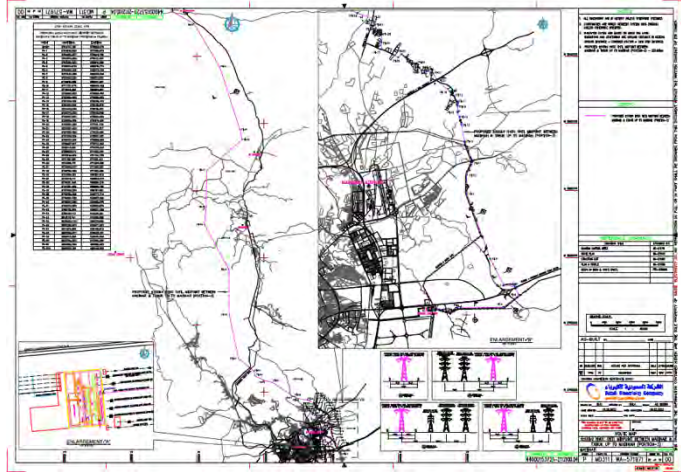
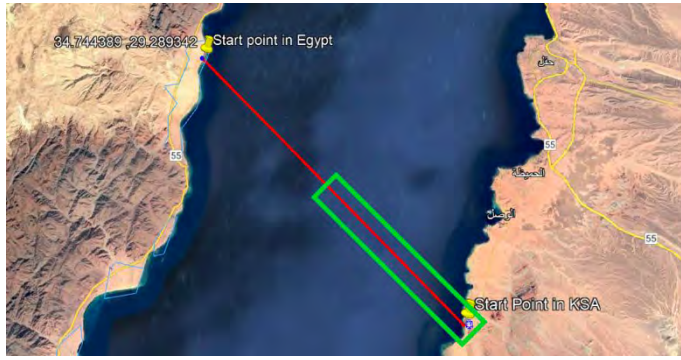
No EIA was prepared for building the converter stations nor for the temporary offices/accommodation facilities.

Table 2-1 Project Contracts and EIA Studies

COMPONENT	CONTRACTOR	LOCATION OF COMPONENTS	EIA	MEWA CATEGORY	PERMIT
Substations	ABB of Hitachi Energy	 <p>1500MW Tabuk Converter Station (near existing station)</p>	The EIA for the substations is being commissioned and expected to be completed by mid-August.	-	-

COMPONENT	CONTRACTOR	LOCATION OF COMPONENTS	EIA	MEWA CATEGORY	PERMIT
		 <p>3000MW Madinah East Converter Station (near existing station)</p>  <p>Transmission Station at Gulf of Aqaba (new)</p>			

COMPONENT	CONTRACTOR	LOCATION OF COMPONENTS	EIA	MEWA CATEGORY	PERMIT
<p>Portion 1: HVDC - Tabuk to Aqaba (228km)</p>	<p>National Contracting Company Ltd (NCC)-</p>		<p>Prepared by Geotechnical & Environmental Co.Ltd (Geotec)</p>	<p>As per NCEC permit, the Project is category 2</p>	<p>Obtained on 2nd June 2020 and valid till 11th May 2022</p> <p>The Permit is currently being renewed</p>
<p>Portion 2: HVDC - Tabuk to Al Muthalath area (336km)</p>	<p>Saudi Services for Electro Mechanic Works (SSEM)</p>		<p>Prepared by Staterra Environmental Consulting (StEC)</p>	<p>As per EIA, the Project is category 3</p>	<p>The EIA report was submitted to NCEC in March 2022 and is pending approval and permitting</p>

COMPONENT	CONTRACTOR	LOCATION OF COMPONENTS	EIA	MEWA CATEGORY	PERMIT
Portion 3: HVDC - Al Muthalath to Madinah (336km)	Hyundai Engineering & Construction Co., Ltd (HEC)		Prepared by Leaf Green Environmental Services (LGES)	As per the draft EIA, the Project was considered category 2. However, on June 2 nd 2022, NCEC confirmed that the project is considered Category 3	The Project was categorised by NCEC as category 3. Accordingly, the environmental consultant will prepare and submit a scoping report to NCEC for approval prior to the submission of the EIA report and receiving the Construction Permit.
Subsea cable Aqaba to Taba (10km)	Prysmian		Prepared by International Environment Service (IES)	The EIA does not specify the Project categorization	The EIA report was submitted to NCEC in may 2022 and is pending approval and permitting

2.3 Project Components

The $\pm 500\text{kV}$ HVDC OHTL extends between the 3000MW Madinah East Converter station over a distance of approximately 672 km to the 1500MW Tabuk Converter station. The OHTL then extends over a distance of 228 km from Tabuk towards the north until it reaches Halat Ammar Port where it extends west, running parallel to the borders with Jordan till it reaches Al Wasel coastal area and connects to the Transmission Station that will be built at Gulf of Aqaba. From the Gulf of Aqaba Station, a 10 km subsea cable will be installed to connect KSA to Egypt (10 km from the coastal area in Gulf of Aqaba till the maritime boundary of KSA). The Project location is shown of the following figure.

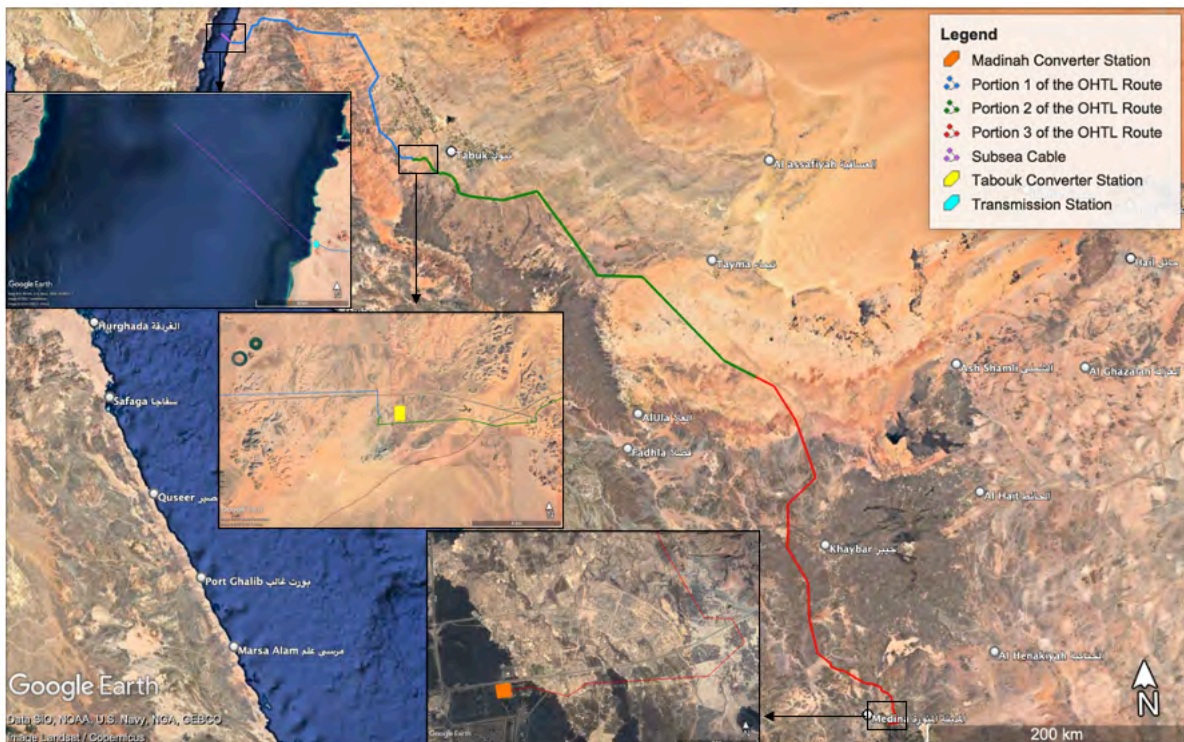


Figure 2-2 Project Location within KSA

The OHTL will have both Alternating Current (AC) and Direct Current (DC) sections and will link the two nodes of the operational 380kV Madinah East Bulk Supply Point (BSP) and 380kV Tabuk BSP of the existing AC network. The 3000MW Madinah East DC converter station will be constructed near the existing substation in Madinah over a Plot area of around 300,000m², the 1500MW Tabuk DC converter station will be built near the existing substation in Tabuk over a Plot area of around 320,000m², while the transmission station be built in Aqaba over a Plot area of around 70,000m².¹

¹ The areas for the substations were estimated using satellite imagery based on snapshots of the Project area provided by the Contractor.

The sizes and heights of the pylons/towers differ from one contractor to another. The towers will have a height of approximately 70 to 80 m, each will occupy an area of 100-110 m² and will be located at a distance of 470 to 800 m from each other. The number of pylons/towers will be determined at a later stage when the route and the geotechnical and soil investigation studies are complete. The OHTL Right of Way (RoW) is around 82 m as shown on the figure below. The conductors/cables will extend between the towers at a minimum height clearance of 18 m above ground. In the case where the Proposed 500 KV OHTL runs parallel to existing 380 KV or 132 KV OHTLs, a buffer of 58.5 m to 75 m will be considered (calculated from/to midpoint of the towers).

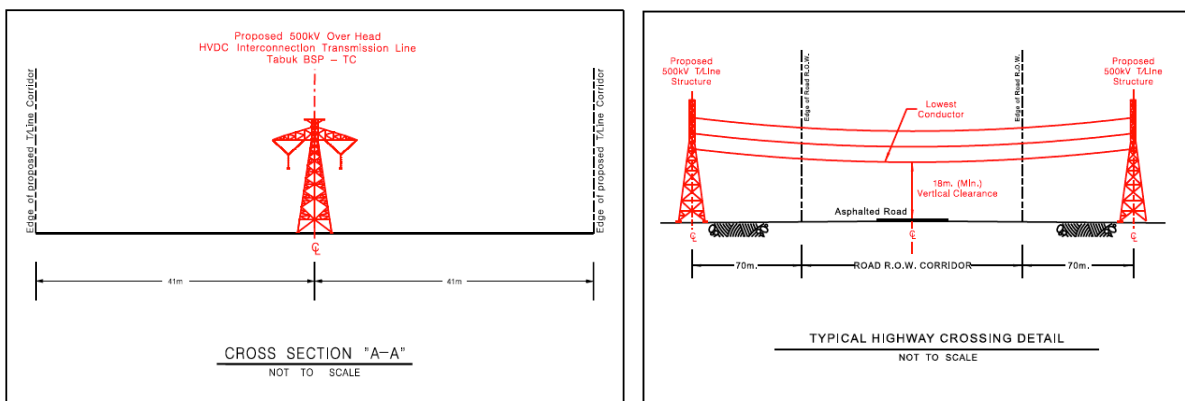


Figure 2-3 Cross Section of the OHTL

2.4 Associated Facilities

The 10 km subsea cable within KSA's maritime boundary will connect to a 10 km subsea cable extending through Gulf of Aqaba to Egypt after which a 335km OHTL will be installed in Egypt to connect to 3000MW Badr Converter station.

It is understood that the associated facilities include the OHTL, subsea cable, station, temporary construction facilities as well as accommodation facilities that are located within Egypt. The subsea cable will be contracted to Prysmian while the OHTL will be contracted to Orascom.

It is noted that no information to date has been provided on the route alignment, technical details or ESIA studies undertaken within the Egyptian sector. The Egyptian Environmental Affairs Agency (EAAA) and the Guidelines of Principles and Procedures for Environmental Impact Assessment (2nd Edition published in January 2009) require the Project to prepare an EIA prior to commencing the construction activities. Therefore, it is expected that an EIA for the associated facilities will be prepared. The requirements for the EIA are provided in section 4.7 of this ESIA Addendum.

2.5 Project Construction Activities

The Project is at an early design stage and therefore, construction methods have not been finalized yet as presented in the Project progress up till May 2022 shown on the following figure. The expected Project construction activities for the land-based activities including the OHTL and substations and the marine-based activities (subsea cable) according to the existing EIAs and data provided by the Contractors are presented in the sections below. These may be updated as the design progresses and construction methods are confirmed. Based on discussions with the Project team, the design for the OHTL is expected to be finalized after the soil and geotechnical investigations within the coming two months.

SAUDI ELECTRICAL COMPANY - SEC	OHTL Portion-1			OHTL Portion-2			OHTL Portion-3			MADINAH/TABUK CONVERTER ST.			SBMARINE / LAND CABLE			SEC OVERALL		
	NCC			SSEM			HYUNDAI			HITACHI			PRYSMIAN					
	PLAN	ACT.	Var.	PLAN	ACT.	Var.	PLAN	ACT.	Var.	PLAN	ACT.	Var.	PLAN	ACT.	Var.	PLAN	ACT.	Var.
Project Management	95%	66%	-30%	93%	63%	-29%	99%	84%	-15%	64%	64%	0%	19%	15%	-4%	70%	57%	-13%
Engineering and Design	29%	22%	-7%	29%	22%	-7%	46%	16%	-30%	23%	12%	-12%	18%	16%	-2%	28%	17%	-11%
Procurement	18%	9%	-8%	6%	9%	3%	11%	6%	-4%	7%	3%	-5%	0%	0%	0%	8%	5%	-3%
Construction	1%	1%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	2%	1%	0%	1%	1%	0%
Installation / Erection	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Testing & Commissioning	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Close-Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SEC OVERALL	11.2%	6.7%	-4.5%	6.8%	6.5%	0%	10.9%	6.0%	-4.9%	6.2%	3.4%	-2.8%	2.4%	2.2%	-0.2%	7.1%	4.6%	-2%

Figure 2-4 Progress Report up till May 2022

2.5.1 Land Based Construction Activities

The land-based construction activities for the Project provided at the time of writing include:

- Surveying the OHTL route to identify and micro site the locations of the pylons/towers.
- Mobilizing, site clearance and early works for constructing the TCFs including site offices, accommodation facilities and storage and laydown areas.
- Delivering the construction materials and equipment for civil works to the dedicated storage and laydown areas for each Project contract.
- Site preparatory works such as clearing, compacting and levelling areas including access routes, pylons/towers locations, and the substations. The OHTL alignment crosses through mountainous areas. Jack hammers and bulldozers will be used to create the access roads and allow for constructing the OHTL towers on or across the mountains/hills. In cases where this is not sufficient to break through rocks, blasting may be required which needs special permits and authorized contractors to be carried out.
- Foundation excavation for the pylons locations and the substations; the excavated soil will be stored in a dedicated area and reused for backfilling where possible. The geotechnical and soil investigations are ongoing and therefore excavation details were not available at the time of writing. According to rough estimations provided by SSEM, the foundations for Portion 2 OHTL will require excavations of 1m diameter and 5-7m depth in rocky areas and 8-9m depth in sandy areas.
- Pouring concrete foundations where for the pylons/towers and the substations.
- Grounding, installing and assembling the electric towers.
- Installing the cables and connecting the towers.

- Civil and mechanical works to construct and fence the substations buildings.
- Installing the substations' required steel structures and electrical equipment including cables, transformers, reactors, circuit breakers, switchgears, substation bus and connections, capacitors, insulators, HVDC control and protection etc.
- Connecting the HVDC OHTL to the new substations.
- Inspecting, commissioning and testing the Project to rectify any defects before operation.

2.5.2 Marine Based Construction Activities

As the project is at an early design stage, the details on the marine-based construction activities for the subsea cable were not available at the time of writing. It is understood that the construction of the subsea cable may potentially include a combination of surface laying and excavation to lay the cables within trenches. It is understood that the construction methods will be confirmed as the design progresses.

2.5.3 Construction Requirements

2.5.3.1 Construction Material

The main materials used to construct the OHTL include iron towers, electricity cables (conductors) and ready-made concrete. Some of these materials will be brought from the local market while these that are not available locally will be imported. The table below provides a summary for the country of origin of the equipment and material required for the Project as provided in the EIAs or by the Contractors. The list of material, vendors and country of origin of these materials for some of the contractors is provided in Appendix A.

Table 2-2 Source of Materials Used for Constructing the OHTL

PROJECT COMPONENT	SOURCE
Portion 2 OHTL – SSEM	KSA, Germany, China and Turkey
Portion 3 OHTL – HDEC	KSA, Russia, France, Croatia, Austria and Korea
Subsea Cable – Prysmian	Italy, Finland, Germany, Spain
Substations – ABB/Hitachi	Sweden, Spain, Korea, KSA, Austria, UK, India, China, Switzerland, Portugal and Germany, France

Ready-made concrete will be purchased from local sources whenever possible. According to SSEM, approximately 25,000m³ concrete will be required for the foundations of the OHTL pylons/towers. However, due to the location of Portion 2 alignment in remote areas and the potential shortage of ready-made concrete due to the number of active construction Projects in the area, a mobile batching plant with a capacity of 60m³/hr will be installed at TCF 1 (near Al-Aradah Village). The batching plant is expected to accommodate for a minimum of 50% of the quantity of concrete required for Portion 2 OHTL.

2.5.3.2 Construction Equipment

The process of constructing the OHTL is expected to require the following equipment:

- Cranes;
- Excavators;
- Bulldozer;
- Grader;
- Vehicles transporting materials (trucks, locomotives, and D- trucks);
- Vehicles transporting Ready Mix Concrete;
- Small-sized fuel trucks (to fill cranes and trucks with diesel during construction);
- Road Compactor; and
- Trucks to transport water.

The Project will also require designated equipment for installing the subsea cable, these include:

- Excavators, JCB & soil compactors for earth works at the coastal area from the transmission station to the shoreline;
- Survey boats and cable laying vessels (Examples are shown below); and
- Mobile cranes for lifting operations.



Figure 2-5 Examples of Vessels Required for Offshore Cable Laying

2.5.3.3 Access Roads

Several highways and main roads cross through or near the Project area, including Highways 15, 60, and 340 as shown on the Figure below. These roads will be used to access the Project area after which each contractor will utilize existing internal roads and dirt routes where possible or create new dirt access roads that will run parallel to the OHTL and limit the Project footprint to the extent possible.

Access roads will be developed by clearing, compacting and levelling access routes, this may require cutting/excavating through mountainous/hilly areas.



Figure 2-6 Main Highways and Roads (shown in yellow) within the Project Area

2.5.3.4 Temporary Construction Facilities (TCF)

Each contractor will develop their TCF which include the laydown areas where the materials and equipment will be stored temporarily for use during the construction activities, site offices as well as the temporary accommodation areas for their workers. The site offices and laydown areas will be developed in areas along the OHTL route. While the accommodation areas will be developed in the surrounding area. The accommodation areas will be portacabins that will potentially be removed after the project construction is complete. A brief description of the TCFs required for the construction of the Project and their locations are provided below with the exception of the TCF details related to the subsea cable as these were not provided at the time of writing.

For the development of Portion1 OHTL, two TCF areas will be developed. One in Bir Ibn Hirmas town located approximately 2km from the proposed OHTL alignment and around 55km from Tabuk. The second TCF will be located in Haql, approximately 9km from the OHTL alignment. The TCFs include portacabins for workers accommodation and site offices. The TCF in Bir Ibn Hirmas is currently under construction and is planned to accommodate approximately 350 workers, whereas the TCF in Haql is in the design stage for construction in September 2022 with a capacity for 100 workers. Additional portacabins will be added to accommodate any additional workers required for Portion 1 OHTL. The TCFs will be provided with a prayer hall, two kitchens and two dining halls, toilets and showers, as well as wastewater storage tanks and designated waste collection areas. The exact boundaries for the TCFs for Portion 1 OHTL were not provided at the time of writing and therefore, the following figure provides the indicative locations of these facilities

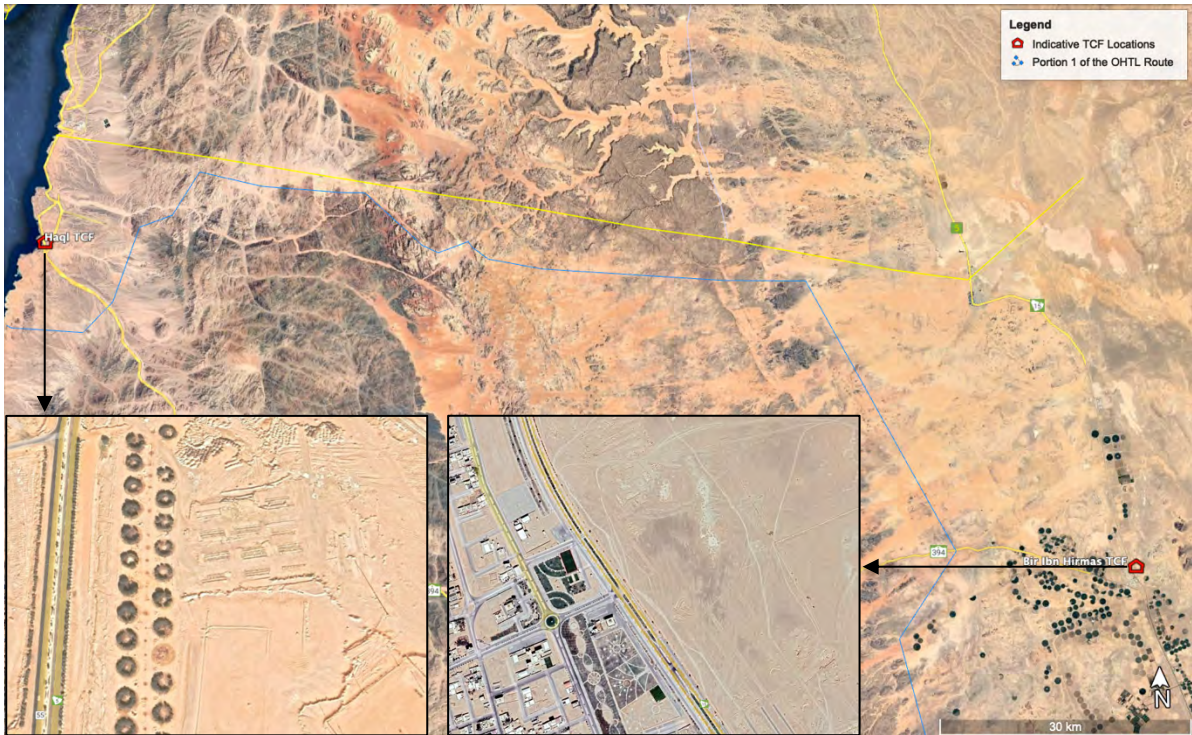


Figure 2-7 Indicative Locations of the TCFs for Portion 1 OHTL

The design layout for the offices and the accommodation facility at Bir Ibn Hirmas are shown on the following figures.



Figure 2-8 Layout of Bir Ibn Hirmas Accommodation Area for Portion 1 OHTL

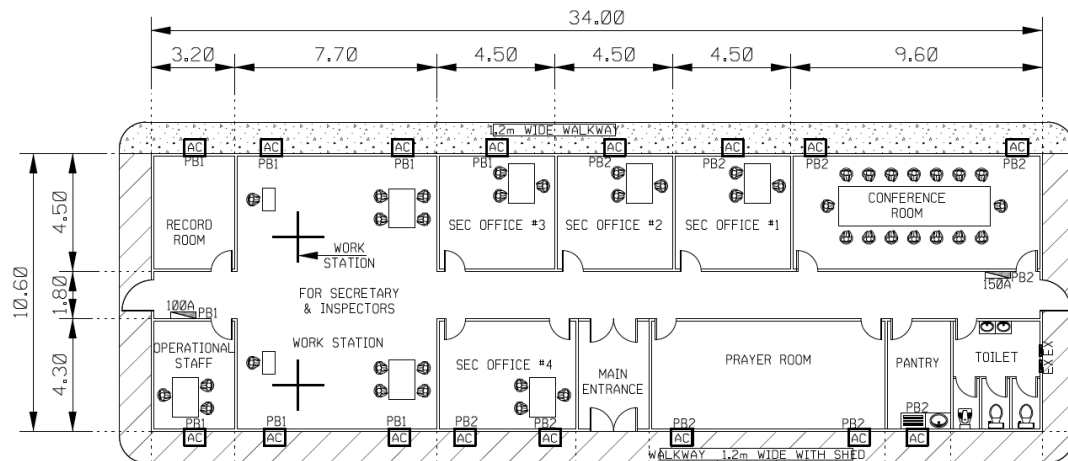


Figure 2-9 Layout of Bir Ibn Hirmas Site Office for Portion 1 OHTL

For the development of Portion 2 OHTL, Thee TCF areas will be constructed:

- TCF1 has an approximate area of 41,500m² located within the OHTL RoW, near al Ardah town; construction was completed in May 2022.
- TCF2 has an approximate area of 44,700 m² located near Al-Mauzzam town; commenced in May and is expected to be completed in August 2022. Part of this land is privately owned and was leased from the land owner; this is further discussed in section 6.2.5 of this ESIA Addendum.
- TCF3 has an approximate area of 30,000 m² located within the OHTL RoW, near Tabuk. The land is currently under the Jurisdiction of the Ministry of Defense and the Project team is in the process of obtaining the required permits to utilize the area before commencing construction.

The TCFs will be provided with a prayer hall, a mess hall, and a fully equipped kitchen for workers to cook their own food as well as toilets and showers, wastewater storage tanks and designated waste collection areas. The following figures provide the locations and the design layout of the TCFs for Portion 2 OHTL.

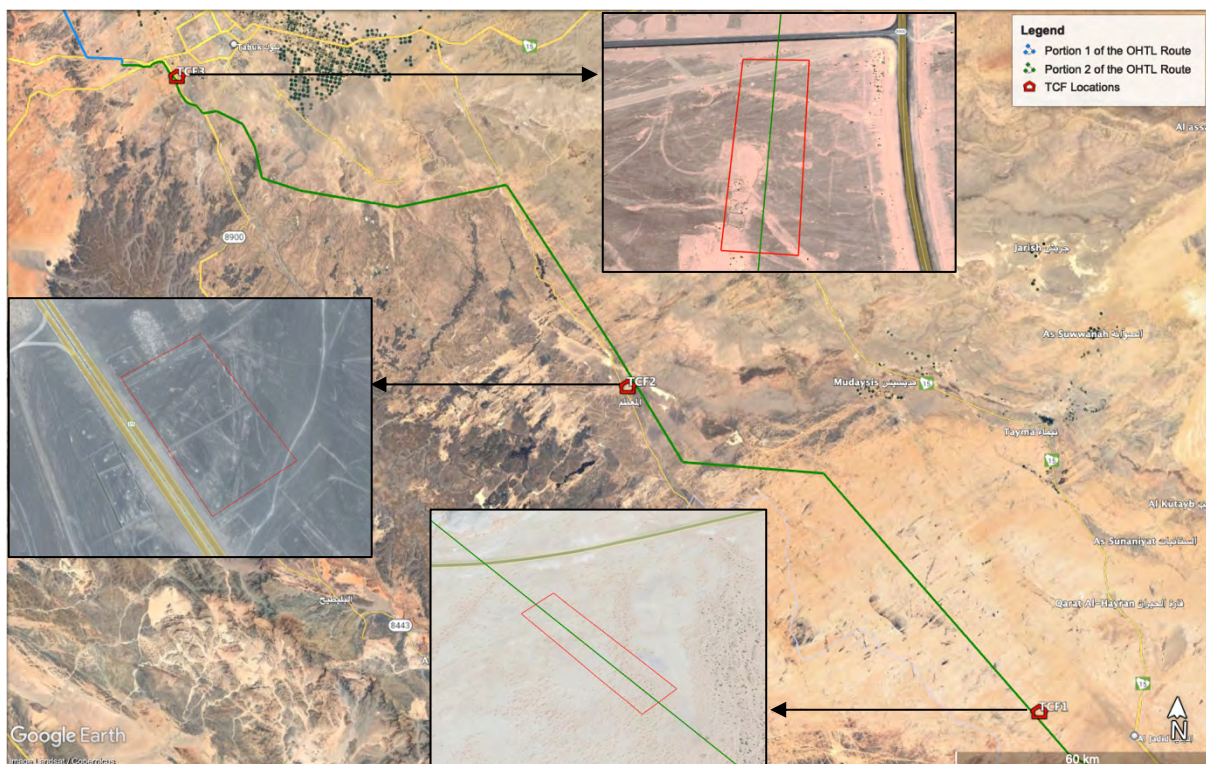


Figure 2-10 Locations of the TCFs for Portion 2 OHTL

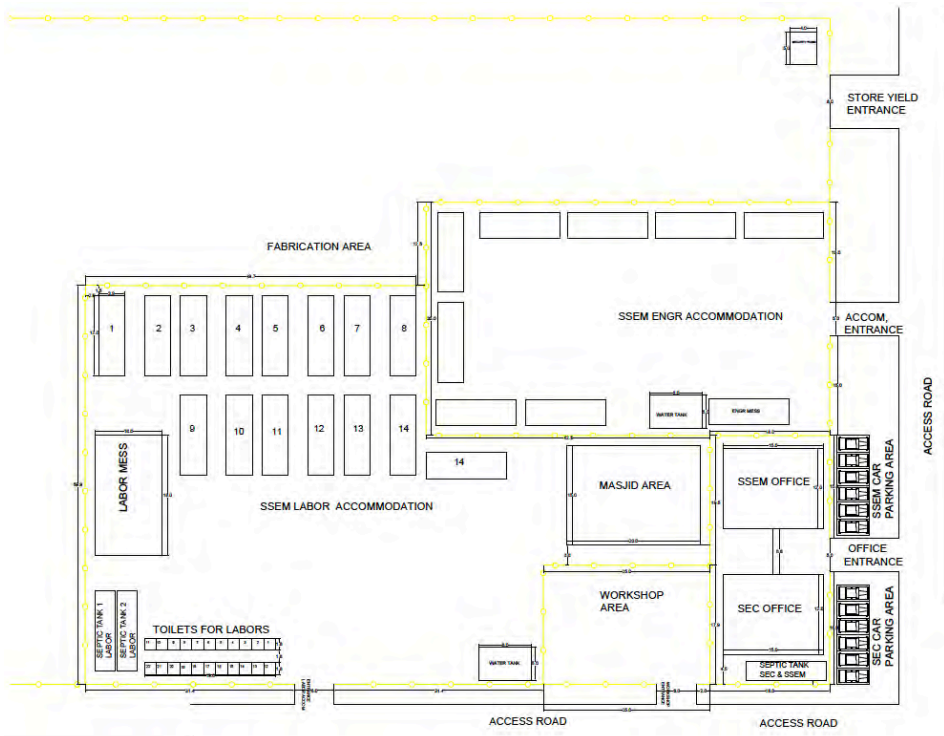


Figure 2-11 Layout of the Accommodation Facilities for Portion 2 OHTL

For the development of Portion 3 OHTL, one TCF area will be constructed. The TCF is located in Al Mulylih town, along Highway 15, approximately 1 km from the OHTL alignment and is currently under construction. The TCFs will be provided with a prayer hall, a mess hall, and a canteen for workers as well as toilets and showers, wastewater storage tanks and designated waste collection areas. The following figures provide the locations and the design layout of the TCFs for Portion 3 OHTL.



Figure 2-12 Indicative Location of the TCF for Portion 3 OHTL



Figure 2-13 Layout of the Laydown Area for Portion 3 OHTL

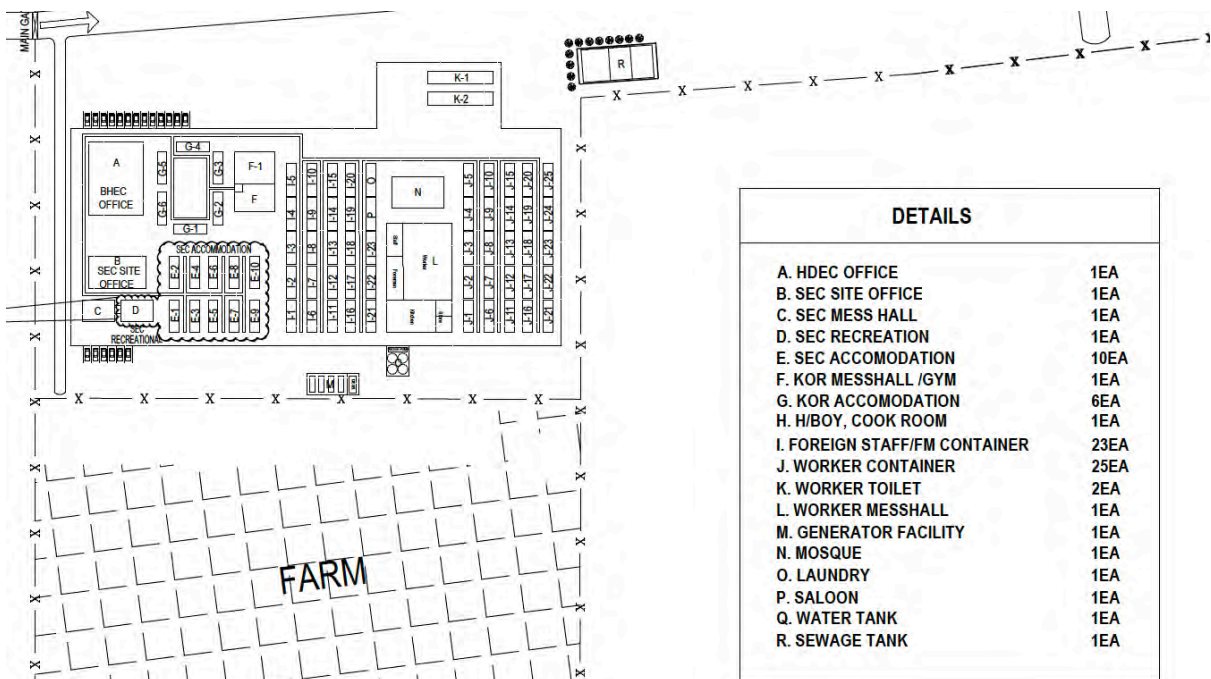


Figure 2-14 Layout of the Accommodation Area for Portion 3 OHTL

For the development of the substations, laydown areas will be allocated at the substations' construction areas. Residential buildings and apartments will be rented out for these workers in the cities of Madinah and Tabuk (potentially). The following figures provide the locations and the design layout of the site offices for Tabuk substation.

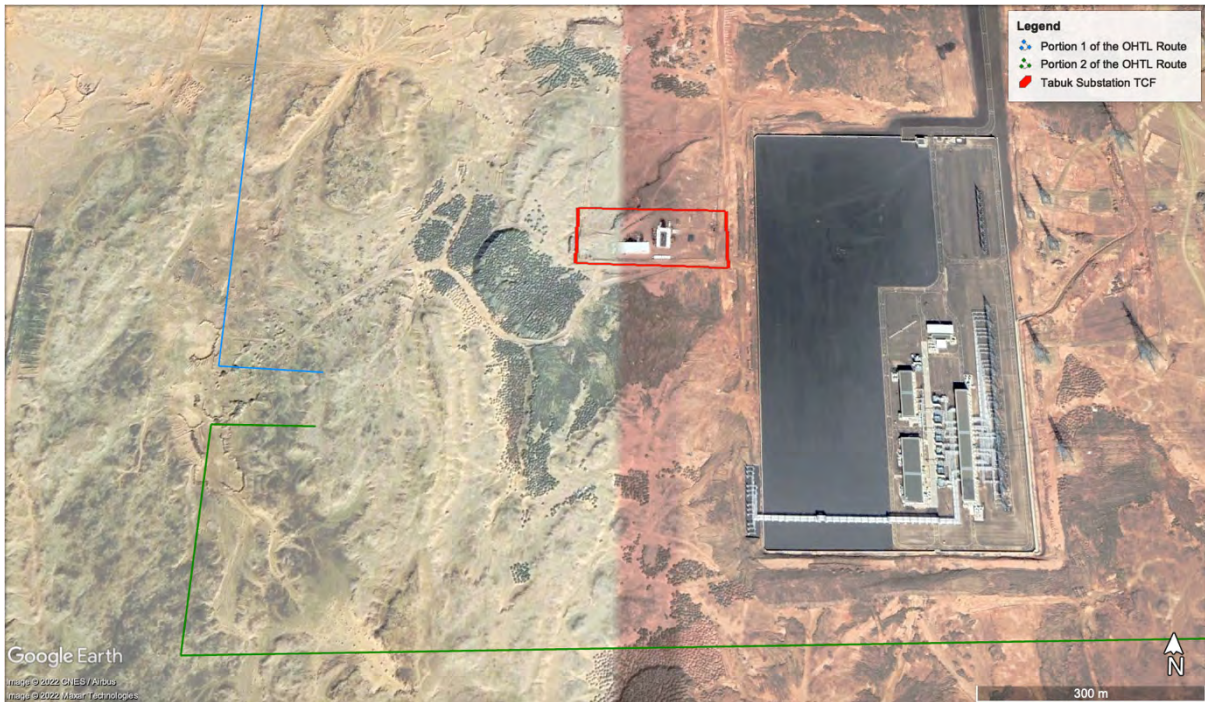


Figure 2-15 Location of the TCF for Tabuk Substation

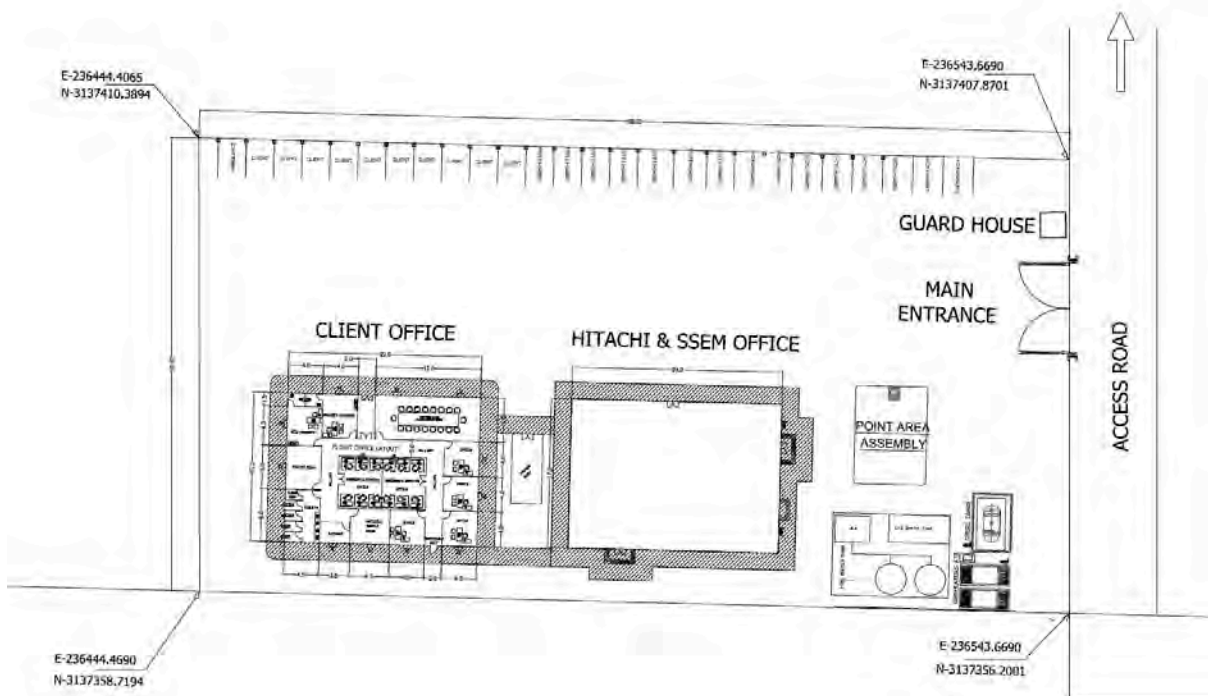


Figure 2-16 Layout of the Site Offices for the Substations

The accommodation areas for each Contract of the Project are expected to accommodate all required workers; in case of additional workers, portacabins will be added to ensure everyone is included.

2.5.3.5 Construction Workers

The expected number of workers for each Contract of the Project are provided in the table below. The manpower histograms provided by some of the contractors are included in Appendix B. The potential construction workers nationalities are provided in the following table; where possible, Saudi nationals will be hired for office or non-construction related jobs. Due to the nature of the Project and the remoteness of the OHTL alignment in certain areas, it was noted that there are no plans to hire female workers.

Figure 2-17 Project Workers

CONTRACT	NUMBER OF WORKERS AT PEAK	WORKERS' NATIONALITY
Portion 1	450 workers	India, Bangladesh, Nepal, Pakistan, Sudan, Egypt, and Philippine
Portion 2	550 workers	India, Bangladesh, Nepal and Pakistan
Portion 3	540 workers	India, Bangladesh and Nepal
Substations	800 workers at each substation	India, Bangladesh and Nepal
Subsea Cable	100-120 workers	Not provided at the time of writing

2.5.3.6 Security

Security personnel will be employed at the TCF and the areas under construction. Security guards will be sub-contracted through a third party company. The guards will not be armed and will be equipped with wireless radio sets, implement visitor & access control management. As per SEC requirements, the security guards have to be Saudi nationals and they will be trained for communicating with workers and the community, handling emergency situations.

2.5.3.7 Utility Requirements

Electricity required for the Project construction phase will be supplied through on-site small diesel generators. Diesel will also be used to power cranes, equipment and trucks. Quantities will vary according to demand and work intensity. Diesel will be transported to site by third parties using small trucks. It was estimated that an amount of 20,000 to 35,000 L of fuel will be required for the construction phase of each Portion of the OHTL.

Water will be used for domestic purposes by the workers at offices and accommodation areas, spraying concrete as well as roads and the site to prevent dust generation. Water will be transported to the sites by tankers.

2.5.3.8 Waste and Waste Water

Municipal Solid Waste: The main source of MSW non-hazardous solid waste is from workers at site offices and accommodation areas. This includes paper, cardboard, food waste etc. as well as cartons of raw materials such as electrical accessories. Municipal waste will be stored in designated areas till its collected by approved third party waste management contractors who will dispose waste in the nearest municipal landfills. It was estimated that an amount of

0.5 to 2 tonnes/month of general waste will be generated from the construction phase of each Portion of the OHTL.

Iron and copper waste (scrap): During the construction phase, the Project will generate scrap waste resulting from cutting the cables. These will be returned to the supplier (if possible) or collected by scrap dealers/contractors for reuse or recycling.

Oil waste: Used oil may potentially be generated from maintenance of equipment or machinery or the transformers of the Station to be constructed for the Project. These will be collected and disposed by an approved third party. It was estimated that an amount of 500 kg/month of hazardous waste will be generated from the construction phase of each Portion of the OHTL.

Wastewater: The main source of wastewater are the workers at the site offices and accommodation areas. Wastewater will be collected in tanks that will be emptied when required and disposed at the nearest wastewater treatment plant. It was estimated that an amount of 150,000 L/month of wastewater will be generated from the construction phase of each Portion of the OHTL. According to HEC, the Contractor for Portion 3, the wastewater storage tank at the accommodation areas will be concrete tank built underground with a capacity for holding wastewater for a period of two (2) months.

2.6 Construction Schedule

The Project schedule is provided in the table below.

Table 2-3 Project Schedule

CONTRACT	ENGINEERING, PROCUREMENT, MOBILIZATION AND EARLY WORKS (ACCOMMODATION, ACCESS ROADS)	CONSTRUCTION/ INSTALLATION	TECHNICAL COMPLETION	PRELIMINARY ACCEPTANCE	FINAL ACCEPTANCE
Portion 1	29-Nov 2021	August-2022	20-Feb-24	20-Apr-24	20-Jul-24
Portion 2	05-Oct-21	August-2022	20-Feb-24	20-Apr-24	20-Jul-24
Portion 3	05-Oct-21	August-2022	20-Feb-24	20-Apr-24	20-Jul-24
Subsea Cable	05-Oct-21	04-Sep-23	05-Oct-24	05-Nov-24	End of Warranty Period in 05-Nov-29
CONVERTER STATIONS					
Madinah	01-Dec-21	01-Nov-22	01-Jun-25	01-Aug-25	End of Warranty Period
Tabuk	01-Dec-21	02-Jan-23	01-Dec-25	01-Feb-26	
TRANSMISSION STATION					
AQABA	01-Dec-21	01-Mar-23	29-Jul-24	-	-

3 PROJECT CATEGORISATION

3.1 KSA Regulations Project Categorisation

The General Environmental Regulations (GER) was enacted by Royal Decree No. M/34 dated 28/7/1422 H (15th October 2001) and established the general regulatory framework for the development and enforcement of environmental rules and regulations in KSA. Under this law the Presidency of Meteorology and Environment (PME), later the General Authority of Meteorology and Environmental Protection (GAMEP), had been assigned with the responsibility for the development and enforcement of environmental rules and regulations.

GAMEP was superseded by the National Centre for Environmental Compliance (NCEC) on 1st January 2021. The previous national KSA legislation, the GER (2001) has also been superseded by the National Environmental Law issued under Royal Decree M/165 of 19th Dhul Qada 1441 Hejra in July 2020 supported by the new Ministry of Environment, Water & Agriculture (MEWA) Implementing Regulations which became law on 17th January 2021. In addition to NCEC, four other National centres of excellence have also been established including: Waste Management, Wildlife, Vegetation and combatting desertification and Meteorology.

Industrial and development projects within KSA are subject to an EIA as part of the planning and permitting process in accordance with the National Environmental Law 2021 and as described in the Environmental Regulations on Environmental Permits for the Construction and Operation of Activities. Whilst all major development projects are required to pass through the EIA process, the level of reporting and detail required is subject to classifying the project into three (3) individual classes based upon their predicted impacts. The table below provides further detail on these categories as described in the relevant Environmental Regulations.

Table 3-1 ESIA Classes

SUBJECT	DETAILS
C1	Projects with Limited Environmental Impacts Covers projects that are not expected to have tangible adverse environmental and social impacts. Require submission of an Environmental Management Plan and Environmental Rehabilitation Plan to NCEC.
C2	Projects with Significant Environmental Impacts Covers projects that are likely to have some adverse environmental and social impacts which can be substantially mitigated and will not significantly impact areas beyond site boundary. Require submission of an EIA to NCEC as per Article 7.
C3	Projects with Serious Environmental Impacts Covers projects that are likely to have significant adverse environmental and social impacts, which cannot be fully mitigated, and will likely affect to areas beyond the site boundary. Require submission of an EIA to NCEC as per Article 8.

The implementing regulations categorize Power Transmission Lines and Transformer Stations as Category 2 while International Trans-Boundary Power Transmission Lines and Stations are considered Category 3. The Project categorisation is confirmed by NCEC when the environmental permit application for the Project is initiated on the NCEC portal.

The EIA prepared by Geotec for Portion 1 and the environmental permit obtained in 2020 considered the Project category 2 considering it is an OHTL within the country. However, this was prepared for GAMEP before updating the regulations in 2020/2021. The EIA prepared by StEC for portion 2 categorises the Project as Category 3.

It is understood that the EIAs for Portion 2 and the subsea cable are under review and awaiting the Permit which confirms the Project categorisation.

The draft EIA prepared by LGES for Portion 3 considered the Project a Category 2. However, on June 2nd 2022, NCEC confirmed that the Project is classified as Category 3. Accordingly, the environmental consultant will prepare and submit a Scoping Report to NCEC for approval prior to the submission of the EIA report and receiving the Construction Permit.

An EIA for the substations is being commissioned and is expected to be completed by mid-August.

3.2 Associated Facilities Project Categorization

The regulatory body responsible for the protection and promotion of the environment and the development of environmental regulations in Egypt is the Egyptian Environmental Affairs Agency (EAAA).

The law that governs environmental protection issues and addresses pollution resulting from existing projects or establishments as well as potential pollution from new establishments and expansions of existing establishments in Egypt is the Law No. 4 of 1994 for the "Protection of the Environment" amended by Law No 9 of 2009.

This Law states that "Certain new establishments are required to conduct an Environmental Impact Assessment (EIA) prior to the start of construction works, prior to the implementation or the relevant expansion of such project or prior to a license is issued by the competent administrative authority". According to Article 1 (36), Environmental Impact Assessment is defined as "studying and analysing the environmental feasibility of proposed projects, whose construction or activities might affect the safety of the environment".

The law identifies projects that should be subjected to an Environmental Impact Assessment based upon the four (4) main principles; the type of the activity performed by the project/establishment, the extent of natural resources exploitation, the location of the project/establishment and the type of energy to be used during operation of the project.

In 2009, the EEAA published the second edition of the Guidelines of Principles and Procedures for Environmental Impact Assessment which groups projects that may be subjected to an EIA into three (3) main categories based on different levels of EIA requirements according to the severity of potential environmental impacts and location of the establishment/project and its proximity to residential settlements.

According to the list of Category A, B & C projects provided in this guideline, "Intercontinental Transmission Lines" are categorised as a Category "C" Projects that require the preparation of an Environmental Impact Assessment (EIA) Study. Therefore, the KSA-Egypt Interconnection Line is considered Category "C".

3.3 EP IV and IFC Project Categorization

Equator Principle Financial Institutions (EPFIs) will categorise a project proposed for financing based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. These categories are:

Category A – Projects with potential significant adverse social or environmental risks and/or impacts that are diverse, irreversible or unprecedented;

Category B – Projects with potential limited adverse social or environmental risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and

Category C – Projects with minimal or no social or environmental risks and/or impacts.

Based on the size of the Project, its associated facilities and its overall development across international borders between KSA and Egypt, the Project is likely to be classified under Category A according to Equator Principle 1. However, the category will be determined by the specific Lenders based on their own risk assessment.

3.4 OECD Common Approaches Project Categorization

Where export-credits from OECD countries are being provided for projects, the OECD Common Approached will apply.

The current agreement between OECD members is the 'OECD Recommendation of the Council on Common Approaches for Officially Supported Export Credits and Environmental and Social Due Diligence' (the "Common Approaches"), which was adopted on 28 June 2012 and revised by the OECD Council on 6 April 2016 (OECD/LEGAL/0393).

'Adherents should identify the potential positive and negative environmental and social impacts relating to the applications to be classified. The three categories for classification are:

- Category A: a project is classified as Category A if it has the potential to have significant adverse environmental and/or social impacts, which are diverse, irreversible and/or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. Category A, in principle, includes projects in sensitive sectors or located in or near sensitive areas. An illustrative list of Category A projects is set out in Annex I' of the OECD Common Approaches.
- 'Category B: a project is classified as Category B if its potential environmental and/or social impacts are less adverse than those of Category A projects. Typically, these impacts are few in number, site-specific, few if any are irreversible, and mitigation measures are more readily available.
- Category C: a project is classified as Category C if it has minimal or no potentially adverse environmental and/or social impacts.'

Annex I of the Common Approaches, 2016 consider the construction of overhead electrical power transmission lines with a length of 15 km or above and a voltage of 110 kV or above to be Category A. Accordingly, the Project is expected to fall under Category A.

4 GAP ANALYSIS OF EXISTING EIAs

The primary objective of this gap analysis has been to review the existing EIAs and other applicable E&S documents/information provided at the time of writing and identify the main gaps versus the E&S Lenders requirements. The gap analysis accordingly identifies required actions to bridge these gaps and highlight risks related to potential Project non-compliance with the E&S Criteria that were not otherwise addressed in the existing EIAs.

Note:

- The E&S reports related to the associated facilities in Egypt were not available at the time of preparing this gap analysis and therefore, the national Egyptian requirements for EIA/ESIAs were reviewed against lenders requirements.

4.1 Lenders Requirements Reviewed

The Project will be reviewed against the applicable lenders requirements including:

- IFC Environmental and Social Performance Standards;
- Equator Principles IV;
- OECD Common Approaches;
- World Bank Group EHS Guidelines (including the EHS guidelines for Power Transmission and Distribution (2007); and
- United Nations Guiding Principles on Business and Human Rights.

4.2 E&S Documentation Reviewed

The Project related E&S documentation reviewed as part of this gap analysis include:

- Portion 1 – Proposal for EIA, Technical and Environmental Survey Report (January 2020). Prepared by Geotechnical & Environmental Co.Ltd for NCC.
- Portion 2 – EIA Report (March 2022). Prepared by StEC for SSEM.
- Portion 3 – EIA Report (May 2022). Prepared by LGES for HEC.
- Subsea cable:
 - EIA Report Prepared by IES on behalf of Prysmian
 - Social Impact Assessment Report Prepared by IES on behalf of Prysmian
- Other applicable documents shared by SEC and the Contractors.

4.2.1 E&S Studies and Permitting (to Date)

The GAMEP 'Environmental Permit' for Portion 1 EIA prepared in January 2020 was obtained in June 2020. The permit and the environmental conditions are provided in the figure below. The remaining EIAs are pending National Center for Environmental Compliance (NCEC) approval and permits.

VISION رؤية 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

الهيئة العامة للأرصاد وحماية البيئة
The General Authority of Meteorology & Environmental Protection

تصريح بيئي للإنشاء

رقم الصادر ٢٠٢٠/١٠/٤٤٤٦	رقم الطلب ١٤٤١/٤٤٥٢	مشروع الربط السعودي المصري ثانية	أسم المنشأة ثانية
تاريخه ١١٤١٦	هاتف ٠١١٢١٥٣٧٦٠٩	منطقة تبوك	العنوان منطقة تبوك
فاكس ١١٤١٦	صندوق البريد ٢٢٩٥٥	٢٠٠٦٠٤١٦٦٨	رقم المنشأة ٢٠٠٦٠٤١٦٦٨
الرمز البريدي ١١٤١٦	توك N	٢٨,٣٣٣٨٣٠ E ٣٦,٣٠٥٣٥٤	الحدائق خط موالي لتوصيل الطاقة الكهربائية بطول ٢٢٠ كيلومتر

توافق الهيئة العامة للأرصاد وحماية البيئة على النشاط الموضح أعلاه من الناحية البيئية مع مراعاة اللوائح والأنظمة الصادرة من الجهات الأخرى ذات العلاقة والالتزام بالنظام العام للبيئة ولاتحته التنفيذية والاشتراطات المرفقة مع هذا التصريح وتنتهي صلاحيته في ١٠/١٠/١٤٤٣ هـ

نرصد ونحتمي
حاضرنا ومستقبلهم

مدير الإدارة العامة للتراخيص البيئية
أنور بن ميكروت الزهدي

الختم

الرقم:
التاريخ:
المرفقات: الصفحة ١ من ١

رصد ونحتمي
نظامياً ومستقبلهم

تأيب الرئيس العام لشؤون البيئة (١٠٨)

أشتراطات موافقة بيئية للإنشاء

اسم المنشأة: مشروع الربط السعودي المصري
النشاط: خط هوائي لتوصيل الطاقة الكهربائية بطول ٢٢٠ كيلومتر

- 1- الالتزام بالمقاييس والمعايير والاشتراطات الصادرة عن الهيئة العامة للأرصاد وحماية البيئة.
- 2- إبلاغ الهيئة رسمياً في حال وجود أي تعديلات أو إضافة أو توسعة في مسار الخط الكهربائي خلال المراحل الإنشائية.
- 3- إبلاغ الهيئة في حال وجود مياه نازحة نتيجة أعمال الحفر والتخلص وأخذ الاستشارات البيئية من أحد الجهات المؤهلة لكيفية التخلص السليم ببنياً منها.
- 4- تهيئة منطقة تخزين المواد الخام والمعدات بوسائل وإجراءات تمنع الانسكابت والتسربات للتربة والمياه الجوفية.
- 5- عمل تقرير مراقبة بيئي دوري كل ٣ أشهر خلال المراحل الإنشائية للمشروع ورصد أي تأثيرات خلال تلك الفترة.
- 6- الالتزام بإجراءات التخفيف من الآثار البيئية الناجمة عن العمليات الإنشائية والتقيد بتوصيات الدراسة وملحقها. التخلص من مخلفات ونواتج الحفر في المواقع المخصصة لهذا الغرض وعن طريق الجهات المؤهلة والمعتمدة من هذه الهيئة.
- 7- التخلص من المخلفات البلدية الصلبة في المواقع المخصصة لهذا الغرض وعن طريق الجهات المؤهلة والمعتمدة من أمانة المنطقة.
- 8- التخلص من المخلفات الخطرة عن طريق الجهات المؤهلة والمعتمدة ببنياً من هذه الهيئة في مجال إدارة ومعالجة النفايات والمخلفات الصناعية والخطرة.
- 9- استكمال جميع الموافقات والتصاريح من الجهات ذات العلاقة والاختصاص بالنشاط ومسار المشروع.
- 10- في حال الإخلال بالاشتراطات فإن ذلك يعرض المقاول للمنفذ للمشروع لإيقاع العقوبة استناداً للنظام العام للبيئة ولاتحته التنفيذية.

يمكنكم الإطلاع على النظم العام للبيئة والاتحة التنفيذية في المملكة العربية السعودية على الرابط التالي:
<https://www.pme.gov.sa/Ar/Environment/Pages/GeneralEnvironmentalRegulations.aspx>

Figure 4-1 HVDC – Tabuk to Madinah Portion 1 Environmental Permit

4.3 Gap Analysis of Existing EIAs vs. IFC Performance Standards

The table below presents the identified compliance gaps of the applicable E&S project documentation versus the IFC Performance Standards (2012). The table also includes certain management provisions that are in place by the project teams (i.e. SEC and contractors).

Table 4-1 EIA Gap Analysis vs. IFC PSs Relevant Elements

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
PS 1 Assessment and Management of Environmental and Social Risks and Impacts			
Policy	The client will establish an overarching policy defining the environmental and social objectives and principles that guide the project to achieve sound environmental and social performance.	SEC has an overarching Environmental Policy	A Project specific policy is not available, the SEC Environmental Policy will be included in the Environmental and Social Management System (ESMS) and the Construction Environmental and Social Management System (CESMP).
Identification of Risks and Impacts	<ul style="list-style-type: none"> The risks and impacts identification process will be based on recent environmental and social baseline data at an appropriate level of detail. The process will consider all relevant environmental and social risks and impacts of the project, including the issues identified in Performance Standards 2 through 8, and those who are likely to be affected by such risks and impacts. ...consider the emissions of greenhouse gases, the relevant risks associated with a changing climate and the adaptation opportunities, and potential transboundary effects, such as pollution of air, or use or pollution of international waterways. Assessment of project Area of impacts, including the area likely to be affected, 	<p>Risks and impacts were identified and assessed based on baseline information collected at the time of writing the EIAs in 2020 and 2022. The baseline chapters within the EIAs was mostly based on high level desktop review of available information and preliminary site visits or surveys including:</p> <ul style="list-style-type: none"> Portion 1 EIA <ul style="list-style-type: none"> Site visit to identify general site conditions Preliminary terrestrial ecology site visit High level identification of receptors Air quality monitoring survey Noise quality monitoring survey 	<p>This ESIA Addendum is prepared to complement the EIAs and includes the following scope:</p> <ol style="list-style-type: none"> Land use survey and detailed impact assessment Terrestrial ecology survey (including avifauna) and detailed impact assessment Climate change assessment Human Rights Impact Assessment (provided in a separate report) Cumulative impact assessment <p>Additional requirements to address the identified gaps by the Project include:</p> <ol style="list-style-type: none"> While parts of the alignment near Madinah and Tabuk (visited during the land use ground truthing survey) are located in an area that is disturbed by existing OHTLs and other parts extend in

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	<p>associated facilities and cumulative impacts.</p> <ul style="list-style-type: none"> ...the client will identify individuals and groups that may be directly and differentially or disproportionately affected by the Project because of their disadvantage or vulnerable status. 	<ul style="list-style-type: none"> Portion 2 EIA <ul style="list-style-type: none"> Site visit to identify general site conditions Preliminary terrestrial ecology site visit High level identification of receptors Noise quality monitoring survey Soil quality analysis Portion 3 Draft EIA <ul style="list-style-type: none"> Preliminary terrestrial ecology data Subsea Cable EIA and SIA <ul style="list-style-type: none"> Site visit to identify site conditions Marine Baseline survey Socio-economic survey Hydrological Study & Flood Risk Assessment <p>The baseline studies undertaken for the EIAs are not extensive however, the majority of impacts such as air, noise, soil and groundwater, waste and wastewater were assessed and can be managed by implementing good practice construction methods.</p> <p>However, the main elements that were not fully addressed in the EIAs include:</p> <ol style="list-style-type: none"> The potential risk in regard to terrestrial ecology and vegetation as well as the potential impact to migratory avifauna utilising the Red Sea-Rift 	<p>remote areas with no potential landscape and visual receptors, there may potentially be areas where the OHTL will result in landscape and visual impacts and therefore, appropriate mitigation measures may be required during operation.</p> <ol style="list-style-type: none"> Based on discussions with the Project design team, SEC standard measures for flood risk should be implemented in areas where the pylons have to be located within wadis. However, it is recommended that for these particular areas where it is confirmed that the Pylons will be developed within wadis, a hydrology & flood risk study is prepared. The study should take into consideration future climate change projections and the required mitigation measures based on that study should be implemented by the relevant contractor. A satellite imagery review of the indicative locations provided for the TCFs at the time of writing did not indicate the presence of vegetation and therefore, the majority of the potential impacts from the construction activities can potentially be managed by implementing good practice construction methods. <p>It is noted however, that to align with lender requirements, all accommodation (for direct staff and sub-contractor staff who are dedicated to the project) would be expected to be of a standard commensurate of the IFC & EBRD Workers Accommodation: Processes and Standards (2009). It is understood from the discussions with the contractors and their</p>

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		<p>Valley flyway and potential nesting sites which was not surveyed or discussed in the EIAs.</p> <p>2. The EIAs indicated that the alignment is far from potential human receptors and therefore, details related to land use and the potential impacts on the livelihood of local human receptors (including herders) and affected communities and the potential need for land acquisition was not covered in any of the EIAs especially Portion 3 EIA which based on the ground truthing survey indicated several land users within the Project ROW.</p> <p>3. Elements such as climate physical and transition risks are not assessed in the EIAs.</p> <p>4. Human Rights Impact Assessment (HRIA) was not included in the in the EIAs.</p> <p>5. A cumulative impact assessment was not included in any of the EIAs.</p> <p>6. Landscape and visual impacts were not assessed in the EIAs.</p> <p>7. With the exception of the substation for the subsea cable EIA, hydrology & flood risk is not assessed in the remaining EIAs.</p> <p>8. Surveys and impact assessment of the temporary construction facilities (TCF) including site offices and accommodation</p>	<p>responses to the RFIs that they are aware of these requirements and the obligation to comply with these standards. It is therefore recommended that the are visited/audited after completion of construction to ensure compliance and propose relevant mitigation where required.</p> <p>9. The National Centre for Wildlife (NCW) requires Projects to prevent impacts to marine habitats and ecology and find alternative design and construction methods to avoid coral relocation (micro siting pipelines away from corals, using Horizontal Directional Drilling (HDD) etc.). A detailed marine baseline survey will be required to identify the sensitive habitats and fauna along the final route alignment and delineate the specific areas of impact that may potentially require coral translocation. Different design and construction alternatives should be considered and assessed to minimise impacts on corals to the extent possible. Based on that a coral relocation plan may be required for the approval of the NCW before translocating the corals and commencing the construction activities.</p> <p>10. The converter stations are located adjacent to the existing substations and main roads in Tabuk and Madinah in areas that may have previously been disturbed by other Projects. The review of satellite imagery indicated that the converter stations areas are rocky/mountainous and do not indicate the presence of vegetation. The transmission station is located in an area that is disturbed by</p>

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		<p>areas was not included in any of the EIAs.</p> <p>9. The marine survey included in the subsea cable EIA did not include a habitat map of the Project area, and the survey was not carried out along the subsea cable corridor but was rather carried out at five (5) locations running parallel to the shoreline. One Transect only was carried out at the potential subsea cable location whereas the remaining four (4) transects were selected to the North the South of the proposed subsea cable route. A transect of 100 meter length and 3 meter width was carried out at each location.</p> <p>The survey at 3m and 6m depth identified that the habitats are composed of 43% live hard corals, and 33% live hard corals and 13% soft corals (Alcyonacea) respectively while the remaining area was calcareous rocks or sand.</p> <p>10. An EIA for the two new converter stations that will be constructed adjacent to the existing substations in Madinah and Tabuk was no prepared.</p> <p>11. Based on the input from SSEM, the contractor on the Portion 2 of the OHTL, a mobile batching plant with a capacity of 60m³/hr will be installed at office/camp No. 1 (near Al-Aradah Village). The</p>	<p>vehicles tracks and activities from the NEOM Project in its close vicinity. Therefore, the majority of the potential impacts from the construction activities of the substations can be managed by implementing good practice construction methods. However, it is understood that an EIA for the substations has been commissioned and is expected to be completed in August 2022.</p> <p>11. A risk assessment and management plan should be developed for the batching plant to identify the required mitigation measures and controls to limit impacts on potential surrounding receptors.</p> <p>12. In the case where blasting is necessary and cannot be avoided to allow for construction through/on mountains, a specific assessment of these areas to assess possible impacts on local communities, ecology (birds/bats etc.) and archaeology and cultural heritage will be required. It is recommended that the EIA is updated based on detailed blasting areas and activities which may then require additional surveys too.</p> <p>13. In the absence of information on the associated facilities in Egypt, a detailed assessment will not be possible. However, a level of oversight by SNC-Lavalin the Project Management Company (PMC) may be required to ensure that the associated facility contractors (potentially Prysmian and Orascom) have developed Project specific ESIA's and the are implementing the required mitigation measures and management plans (in line with Lenders requirements).</p>

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		<p>installation and operation of the batching plant was not included in the EIA for Portion 2 of the OHTL.</p> <p>12. Based on discussions with the contractors, in cases when cutting through the mountains is not achievable using conventional processes (i.e., bulldozers), blasting may be required. This was not assessed in the EIA studies.</p> <p>13. Assessment of the associated facilities and cumulative impact assessment was not included in any of the EIAs.</p>	<p>14. The need to have a process in place for future re-assessment and evaluation of risks and impacts on an on-going basis will be highlighted within the CESMP and ESMS.</p>
Management Programs	<p>Consistent with the client's policy and the objectives and principles described therein, the client will establish management programs that, in sum, will describe mitigation and performance improvement measures and actions that address the identified environmental and social risks and impacts of the project.</p> <p>Where the identified risks and impacts cannot be avoided, the client will identify mitigation and performance measures and establish corresponding actions to ensure the project will operate in compliance with applicable laws and regulations, and meet the requirements of Performance Standards 1 through 8.</p>	<p>The relevant mitigation measures based on the assessments carried out in the EIAs have been identified.</p>	<p>Based on the gaps identified in the previous item, the ESIA Addendum includes additional mitigation required for incorporation into the CESMP or highlights the need for developing related management plans.</p>
Organisational Capacity and Competency	<p>The client, in collaboration with appropriate and relevant third parties, will establish, maintain, and strengthen as necessary an organizational structure that defines roles, responsibilities, and authority to implement the ESMS.</p>	<p>Organisational Capacity and Competency for the implementation of the Environmental Management Plan is provided in Portion 2 EIA.</p>	<p>The ESMS Manual and the CESMP that will be developed for SEC will provide further details concerning the expected roles and responsibilities and the structures/functions allowing effective E&S management.</p>

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Emergency preparedness and response	Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment.	The EIA for the subsea cable includes a Preparedness and Emergency Response Plan that includes an overview of the required measures. It indicates that an emergency response plan for the project shall be developed.	The ESMS Manual and the CESMP that will be developed for SEC will address the need for the Project to develop Emergency Preparedness and Response for all contractors to implement.
Monitoring and Review	The client will establish procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements.	Air quality and noise monitoring required is included Portion 2 EIA. Monitoring and reviewing the effectiveness of the management program is not applicable to the EIA.	Monitoring and review will be required for the Project Company and contractors specifically, and will be mentioned (as applicable) in the CESMP and the ESMS Manual.
Stakeholder Engagement	<p>Disclosure of relevant project information helps Affected Communities and other stakeholders understand the risks, impacts and opportunities of the project. The client will provide Affected Communities with access to relevant information on: (i) the purpose, nature, and scale of the project; (ii) the duration of proposed project activities; (iii) any risks to and potential impacts on such communities and relevant mitigation measures; (iv) the envisaged stakeholder engagement process; and (v) the grievance mechanism.</p> <p>When Affected Communities are subject to identified risks and adverse impacts from a project, the client will undertake a process of consultation in a manner that provides the Affected Communities with opportunities to express their views on project risks, impacts</p>	<p>Considering it is not required as part of the EIA process in KSA, stakeholder engagement and local consultation was not carried out as part of the OHTL alignment EIAs.</p> <p>The substation for the subsea cable EIA did not indicate the presence of any affected communities within the Project footprint. However, a Social Impact Assessment (SIA) was carried out and the study indicated that in compliance with the Banks' requirements, the local community of Haql city were consulted with. Consultations were carried out to gather socio-economic data of the area and identify any concerns from the community. The SIA reports</p>	<p>On the assumption that this will not be possible during ESIA Addendum preparation, it will be necessary for the Project to implement a Stakeholder Engagement Plan (SEP) to plan certain engagements with Affected Communities and other relevant stakeholders in processes leading up to and during construction (as a minimum).</p> <p>The Stakeholder Engagement Plan (SEP) will be prepared on behalf of SEC based on the findings of the site visits and land use survey taking place as part of the ESIA Addendum.</p>

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	and mitigation measures, and allows the client to consider and respond to them.	information gathered through questionnaires responded to by an Imam, a surveyor, Association manager, an accountant, owner of boats and diving centre, a revenue controller, passports controller/supervisor, administrative assistant manager at Haql Hospital, accounting clerk, manager of Haql Society for Orphan Care. No concerns were raised while three (3) respondents highlighted that the Project will potentially have a positive impact on the area.	
PS 2 Labour and Working Conditions			
(General)	Note: IFC PS2 is more concerned with processes for project implementation, as related to worker welfare, health & safety, processes for management of HR, policies etc.		Key methods for the implementation of contractors and owner/operator human resources policies and procedures to be outlined in the Labour Management Plan and the ESMS Manual being developed on behalf of SEC.
Workers Accommodation	Where accommodation services are provided to workers covered by the scope of this Performance Standard, the client will put in place and implement policies on the quality and management of the accommodation and provision of basic services. The accommodation services will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements should not restrict workers' freedom of movement or of association.	Very high level information of worker accommodation was discussed in the EIAs.	Information on the accommodation facilities provided by the contractors at the time of writing is outlined in section 2.5.3.4 of this ESIA addendum. It is noted however, that to align with lender requirements, all accommodation (for direct staff and sub-contractor staff who are dedicated to the project) would be expected to be of a standard commensurate of the IFC & EBRD Workers Accommodation: Processes and Standards (2009). It is understood from the discussions with the contractors and their responses to the RFIs that they are aware of these requirements and the obligation to comply with these standards. It is therefore

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			recommended that the are visited/audited after completion of construction to ensure compliance and propose relevant mitigation where required.
PS 3 Resource Efficiency and Pollution Prevention			
Water Consumption	... 'the client shall adopt measures that avoid or reduce water usage so that the project's water consumption does not have significant adverse impacts on others.'	According to the EIAs, water will be supplied through water tankers. The EIA for Portion 2 includes mitigation measure to reduce water consumption.	The measures proposed in the EIAs will be included in the CESMP which will be shared and implemented by all contractors involved in the Project.
Pollution Prevention	'The client will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release.' Including management of wastes and hazardous materials.	The EIAs include mitigation/management measures for managing wastes and hazardous materials.	The measures proposed in the EIAs will be included in the CESMP which will be shared and implemented by all contractors involved in the Project.
PS 4 Community, Health, Safety and Security			
Community Health and Safety	'The client will evaluate the risks and impacts to the health and safety of the Affected Communities during the project life-cycle and will establish preventive and control measures consistent with good international industry practice'	The EIAs do not address all aspects for community health and safety including design safety and potential impacts from incidents and accidents, exposure to disease etc.	Public safety during operation from the OHTL towers i.e. safety from electrocution, people climbing the towers, collapse etc. should be addressed in the Project Emergency Preparedness and Response Plan.
	<u>Community Exposure to Disease</u> 'The client will avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. Where specific diseases are endemic in communities in the project area of influence, the client is encouraged to explore opportunities during the project life-cycle to	Based on discussions with the design team, a buffer of 82m along the OHTL alignment will be considered as the OHTL RoW and mitigate potential impacts of the electromagnetic waves on the nearby human receptors. However, the EIA reports do not provide a detailed assessment to ensure that the 82 m corridor is sufficient to mitigate potential impacts. Portion 2 EIA mentions that	Impacts to the health and safety of affected communities should be assessed taking into consideration health controls and transmission mitigation (between workers and to the community) for the current COVID-19 pandemic. The land use ground truthing survey especially for the OHTL alignment near Madinah (part of Portion 3) confirmed the presence of several receptors who are potentially located within the OHTL RoW and

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	<p>improve environmental conditions that could help minimize their incidence.</p> <p>The client will avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.'</p>	<p>the impact from electromagnetic waves is insignificant.</p>	<p>in close proximity to the proposed OHTL alignment. It is therefore important to ensure the buffer zone considered for the Project is inline with the WBG EHS Guidelines related to Power Transmission and Distribution (2007).</p>
	<p><u>Emergency Preparedness and Response</u></p> <p>'In addition to the emergency preparedness and response requirements described in Performance Standard 1, the client will also assist and collaborate with the Affected Communities, local government agencies, and other relevant parties, in their preparations to respond effectively to emergency situations, especially when their participation and collaboration are necessary to respond to such emergency situations.'</p>	<p>The EIA for the subsea cable includes a Preparedness and Emergency Response Plan that includes an overview of the required measures. It indicates that an emergency response plan for the project shall be developed.</p>	<p>The need for such a plan (during all phases of the Project) will be outlined in the CESMP and ESMS Manual being developed on behalf of SEC.</p>
Security Personnel	<p>'When the client retains direct or contracted workers to provide security to safeguard its personnel and property, it will assess risks posed by its security arrangements to those within and outside the project site.'</p>	<p>The EIA does not mention security management of site.</p> <p>Data provided by the contractors confirm that security (some may be outsourced) will be available as required on site. Security guards will be trained as required, however, they will not armed.</p>	<p>Security provisions are discussed in section 2.4.3.5 this ESIA Addendum. The assessment of security risks are provided in the HRIA (subject to a separate report).</p>
PS 5 Land Acquisition and Involuntary Resettlement			
Compensation and Benefits for Displaced Persons	<p>'When displacement cannot be avoided, the client will offer displaced communities and persons compensation for loss of assets at full replacement cost and other assistance to help them improve or restore their standards of living or livelihoods, as provided in this Performance Standard. Compensation standards will be transparent and applied consistently to all communities and persons affected by the displacement.'</p>	<p>The EIAs do not identify land users within the Project RoW and do not address the requirement for compensation or resettlement.</p>	<p>A land use ground truthing survey has been carried out as part of the ESIA Addendum and several land users (permanent structures and mobile users) were identified within the Project RoW.</p> <p>Based on the findings of the survey, chapter 6 of this ESIA addendum provides the land use impact assessment and highlights the recommendations for the way forward for</p>

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Private Sector Responsibilities Under Government-Managed Resettlement	'Where land acquisition and resettlement are the responsibility of the government, the client will collaborate with the responsible government agency, to the extent permitted by the agency, to achieve outcomes that are consistent with this Performance Standard.'		SEC to address the identified potential impacts.
PS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Protection and Conservation of Biodiversity	For the protection and conservation of biodiversity, the mitigation hierarchy includes biodiversity offsets, which may be considered only after appropriate avoidance, minimization, and restoration measures have been applied. A biodiversity offset should be designed and implemented to achieve measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity; however, a net gain is required in critical habitats. The design of a biodiversity offset must adhere to the "like-for-like or better" principle and must be carried out in alignment with best available information and current practices. When a client is considering the development of an offset as part of the mitigation strategy, external experts with knowledge in offset design and implementation must be involved.	<p>The EIAs include a general overview of the terrestrial ecology in the Project area based on site visits at the time of writing the EIAs and include some mitigation measures to avoid impact.</p> <p>The EIA for the subsea cable includes a marine survey and some mitigation measures including routing the cable away from corals and offsetting corals that may potentially be impacted. However, the following is not provided in the existing EIA:</p> <ul style="list-style-type: none"> • Clear subsea cable construction method. • Alternative construction methods to reduce or avoid impact on corals. • Level of impact on existing live corals. • Any potential need for coral relocation to minimize impact. 	<p>The baseline data included in the existing EIAs was complemented by the data collected during the terrestrial ecology ground truthing survey that is carried out as part of the ESIA Addendum. The required mitigation measures are proposed in section 5.4 of this ESIA Addendum.</p> <p>A satellite imagery review of the indicative locations provided for the TCFs at the time of writing did not indicate the presence of vegetation and therefore, the majority of the potential impacts from the construction activities can potentially be managed by implementing good practice construction methods.</p> <p>In line with PS6, the National Centre for Wildlife (NCW) requires Projects to prevent impacts to marine habitats and ecology and find alternative design and construction methods to avoid coral relocation (micro siting pipelines away from corals, using Horizontal Directional Drilling (HDD) etc.). A detailed marine baseline survey will be required to identify the sensitive habitats and fauna along the final route alignment and delineate the specific areas of impact that may potentially require coral translocation. Different design and construction alternatives should be considered and assessed to minimise impacts on corals to the extent</p>

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
			possible. Based on that a coral relocation plan may be required for the approval of the NCW before translocating the corals and commencing the construction activities.
Management of Ecosystem Services	Where a project is likely to adversely impact ecosystem services, as determined by the risks and impacts identification process, the client will conduct a systematic review to identify priority ecosystem services. Priority ecosystem services are two-fold: (i) those services on which project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and/or (ii) those services on which the project is directly dependent for its operations (e.g., water). When Affected Communities are likely to be impacted, they should participate in the determination of priority ecosystem services in accordance with the stakeholder engagement process as defined in Performance Standard 1.	Ecosystem services is not covered in the EIAs.	The ESIA Addendum includes a section to clarify the role of ecosystem services for the local environment and people.
PS 7 Indigenous Peoples			
Indigenous Peoples	The client will identify, through an environmental and social risks and impacts assessment process, all communities of Indigenous Peoples within the project area of influence who may be affected by the project, as well as the nature and degree of the expected direct and indirect economic, social, cultural (including cultural heritage), and environmental impacts on them.	Indigenous peoples were not identified in the EIAs.	The World Directory of Minorities and Indigenous Peoples indicates that there are no Indigenous Groups listed for Saudi Arabia however it lists religious minorities (Shi'is, Isma'ilis and Zaydis Muslims). As such, this performance standard is not considered to be triggered and further assessment of indigenous peoples may not be required.
PS 8 Cultural Heritage			
Protection of Cultural Heritage in Project Design and Execution	<u>Chance Find Procedures</u> 'The client is responsible for siting and designing a project to avoid significant	The EIAs includes general archaeology and cultural heritage	During the land use ground truthing survey, the team came across an area of archaeological heritage that is fenced and

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	<p>adverse impacts to cultural heritage. The environmental and social risks and impacts identification process should determine whether the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations. In such cases, as part of the client's ESMS, the client will develop provisions for managing chance finds through a chance find procedure which will be applied in the event that cultural heritage is subsequently discovered.'</p>	<p>overview of KSA based on desktop review.</p> <p>The EIAs indicate that nothing particular in the Project site (for tangible cultural heritage - i.e. archaeology/other features) was observed during the site visits.</p>	<p>access is restricted by the Saudi Commission for Tourism and National Heritage (SCTNH). Details on this site are discussed in section 6.2.3.2 of this ESIA Addendum.</p> <p>Based on 5 Capitals discussions with the Project design team, they confirmed that they are aware of three existing archaeological/heritage sites within Potion 1 OHTL RoW and are currently considering alternative routes for the OHTL to avoid impacts to existing archaeological sites. The site surveys by the design team are ongoing and if other sites are identified, the route will be optimized to avoid potential impacts.</p> <p>The alternative routes considered for preventing impacts on these sites is provided in Appendix C.</p> <p>The following is required to prevent potential impacts:</p> <ul style="list-style-type: none"> • Consultations with the SCTNH to identify any existing archaeological sites (other than the ones identifies so far). It is also important to confirm with SCTNH the setback required from the existing archaeological/heritage sites to avoid any impacts or physical damage during construction. • Based on the outcomes of the consultation with SCTNH, potential archaeological survey or further OHTL route refinement may be required to avoid impact on existing archaeological sites (other than the ones identified so far). • It will be necessary to develop a 'Chance Finds Procedure' in the event

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	<p><u>Consultation</u> 'Where a project may affect cultural heritage, the client will consult with Affected Communities within the host country who use, or have used within living memory, the cultural heritage for long- standing cultural purposes. The client will consult with the Affected Communities to identify cultural heritage of importance, and to incorporate into the client's decision-making process the views of the Affected Communities on such cultural heritage. Consultation will also involve the relevant national or local regulatory agencies that are entrusted with the protection of cultural heritage.'</p>	<p>The EIAs do not address 'intangible cultural heritage'.</p>	<p>that the construction phase encounters any other possible archaeological finds.</p> <p>To identify any potential impact from the Project on intangible cultural heritage, consultations with the relevant authorities may be required to be carried out by SEC.</p>

4.4 Gap Analysis of Existing EIAs vs. EP IV Principles

The table below presents the identified gaps of the applicable E&S project documentation versus key and applicable elements of the Equator Principles IV.

Table 4-2 EIA Gap Analysis vs. EP IV Relevant Elements

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
Principle 1	<p>Review and Categorisation</p> <p>When a Project is proposed for financing, the EPFI will, as part of its internal environmental and social review and due diligence, categorise the Project based on the magnitude of potential environmental and social risks and impacts, including those related to Human Rights, climate change, and biodiversity. Such categorisation is based on the International Finance Corporation's (IFC) environmental and social categorisation process.</p>	<p>Categorisation is for each EPFI(s) to determine.</p> <p>However, it is considered that a properly scoped, IFC Category A ESIA process, will adequately satisfy the national EIA requirements.</p>	<p>This ESIA addendum along with the implementation of the requirements to bridge the gaps identified in section 4.3 of this ESIA addendum shall ensure the Projects Compliance with Principle 1.</p>
Principle 2	<p>Environmental and Social Assessment</p> <p>The EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II)...</p>	<p>As discussed under IFC PS1 Identification of Risks and Impacts, the risks and impacts were identified and assessed based on baseline information collected at the time of writing the EIAs in 2020 and 2022. The baseline chapters within the EIAs was mostly based on high level desktop review of available information and preliminary site visits or surveys.</p> <p>The baseline studies undertaken for the EIAs are not extensive however, the majority of impacts such as air, noise, soil and groundwater, waste and wastewater were assessed and can be managed by implementing good practice construction methods.</p>	<p>The ESIA Addendum is prepared to complement the EIAs and specifically includes the following as agreed with SCB:</p> <ul style="list-style-type: none"> • Land use survey and detailed impact assessment • Terrestrial ecology survey (including avifauna) and detailed impact assessment • Climate change assessment • Human Rights Impact Assessment (subject to a separate report) • Cumulative impact assessment <p>The requirements to fill other items are discussed under IFC PS1 Identification of Risks</p>

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
		The gaps identified are discussed under IFC PS1 Identification of Risks and Impacts (please refer to Table 4-1, Chapter 4.3),	and Impacts (Please refer to Table 4-1 under section 4.3).
	Human Rights <i>The client is expected to include assessments of potential adverse Human Rights impacts...</i>	The EIAs do not include a specific assessment of human rights impacts.	A HRIA is prepared (subject to a separate report).
	Climate Change <i>The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks...</i>	The EIAs do not include a specific assessment of climate change impacts and risks.	Chapter 7 of this ESIA Addendum is prepared to address climate related risks and impacts.
Principle 3	National Standards <i>The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.</i>	<ul style="list-style-type: none"> Portion 1 EIA was prepared prior to publishing the new MEWA regulation and therefore, it states that it has been prepared to fulfil the requirements of the PME GER and its implementing regulations enacted by Royal Decree No. M/34 in October 2001. The 'Environmental Permit' issued by GAMEP has been provided to 5 Capitals. As such, it is considered that all applicable EIA requirement for GAMEP in the KSA context have been fulfilled at this stage. Portion 2 EIA states that it has been prepared to fulfil the requirements of the Saudi National legislation. Portion 3 and Subsea cable EIAs state that they were prepared to fulfil the requirements of the new Environmental Law issued under Royal Decree M/165 of July 2020 and the new Implementing Regulations which became law on 17th January 2021. 	<p>It will be necessary for the contractors to comply with the latest environmental regulations and standards (Environmental Law issued under Royal Decree M/165 of July 2020 and the new Implementing Regulations which became law on 17th January 2021.)</p> <p>These will be included in the CESMP that will be prepared on behalf of SEC for the Project.</p>
	IFC Performance Standards & WBG EHS Guidelines	Portion 2 EIA indicates that the report will comply with IFC Performance Standards, EP III	The ESIA Addendum will ensure further reference and assessment in line with the IFC PSs.

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	For Projects located in Non-Designated Countries, compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines)	(particularly principles 1, 2, 3 and 4) and the World Bank requirements where applicable. The gap analysis for compliance with the IFC Performance Standards & WBG EHS Guidelines is provided in sections 4.3 and 4.6 respectively.	Where applicable the WBG EHS Guidelines will be included, this will likely be with regard to good practice mitigation processes and elements related to Power Transmission and Distribution (2007).
Principle 4	Environmental and Social Management System and Equator Principles Action Plan For all Category A and Category B Projects the EPFI will require the client to develop and / or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree to an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.	The EIAs include the relevant mitigation measures and management plans relevant to the impact assessments they covered. However, the Project does not have a dedicated ESMS.	An ESMS Manual for the Project will be prepared on behalf of SEC. It is understood that the lenders will develop an ESAP to capture E&S obligations and future actions for SEC.
Principle 5	Stakeholder Engagement For all Category A and Category B Projects the EPFI will require the client to demonstrate effective Stakeholder Engagement, as an ongoing process in a structured and culturally appropriate manner, with Affected Communities, Workers and, where relevant, Other Stakeholders... For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process.	Considering Public consultations and stakeholder engagement is not required by the KSA environmental laws, the HVDC - Madinah to Tabuk Portion 1 and Portion 2 EIAs do not include stakeholder engagement. The substation for the subsea cable EIA did not indicate the presence of any affected communities within the Project footprint. However, a Social Impact Assessment (SIA) was carried out and the study indicated that in compliance with the Banks' requirements,	On the basis that this has not been possible during the ESIA Addendum preparation, it will be necessary for the Project to implement a Stakeholder Engagement Plan (SEP) to plan certain engagements with Affected Communities and other relevant stakeholders in processes leading up to and during construction (as a minimum). Consultations with the Project Contractors was carried out as part of the HRIA (subject to a separate report).

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	To facilitate Stakeholder Engagement, the client will, commensurate with the Project's risks and impacts, make the appropriate Assessment Documentation readily available to the Affected Communities, and where relevant Other Stakeholders, in the local language and in a culturally appropriate manner.	the local community of Haql city were consulted with.	The SEP will be prepared on behalf of SEC based on the findings of the documents review and gap analysis, site visits, ground truthing surveys (terrestrial ecology and land use) as well as the assessments taking place as part of the ESIA Addendum.
	Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis.	No disclosure has been undertaken.	This will be included as a requirement in the SEP.
	EPFIs recognise that Indigenous Peoples may represent vulnerable segments of Project-Affected Communities. All Projects affecting Indigenous Peoples will be subject to a process of Informed Consultation and Participation...	Indigenous peoples were not identified in the EIAs.	The World Directory of Minorities and Indigenous Peoples indicates that there are no Indigenous Groups listed for Saudi Arabia however it lists religious minorities (Shi'is, Isma'ilis and Zaydis Muslims). As such, this performance standard is not considered to be triggered and further assessment of indigenous peoples may not be required.
Principle 6	Grievance Mechanism For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance.	Not Applicable for the EIA reports.	The requirement for a grievance mechanism for staff and third-party complaints (for construction and operations respectively) will be included in the CESMP and ESMS Manual prepared by 5 Capitals.
Principle 7	Independent Review For all Category A and, as appropriate, Category B Projects, an Independent	Not Applicable for the EIA reports.	The lenders will review the addendum as part of the E&S documentation.

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	<p>Environmental and Social Consultant, will carry out an Independent Review of the Assessment process including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence and determination of Equator Principles compliance. The Independent Environmental and Social Consultant will also propose or opine on a suitable EPAP capable of bringing the Project into compliance with the Equator Principles, or indicate where there is a justified deviation from the applicable standards...</p>		
Principle 8	<p>Covenants <u>Project Finance and Project-Related Corporate Loans</u></p> <p>The client will covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects.</p> <p>Furthermore, for all Category A and Category B Projects, the client will covenant in the financial documentation:</p> <p>a) to comply with the ESMPs and EPAP (where applicable) during the construction and operation of the Project in all material respects; and</p> <p>b) to provide periodic reports in a format agreed with the EPFI (with the frequency of these reports proportionate to the severity of impacts, or as required by law, but not less than annually), prepared by in-house staff or third party experts, that i) document compliance with the ESMPs and EPAP (where applicable), and ii) provide representation of compliance with relevant local, state and</p>	<p>Not Applicable for the EIAs but more related to a commitment of the EPFI to include relevant covenants to the loan agreements.</p>	<p>To align with EPs, the loan document would need to include an EPAP (or other E&S obligations subsequent to financial close), so that these are contractually committed.</p>

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	host country environmental and social laws, regulations and permits; and c) to decommission the facilities, where applicable and appropriate, in accordance with an agreed decommissioning plan.		
Principle 9	Independent Monitoring and Reporting For all Category A and, as appropriate, Category B Projects, in order to assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required in Principle 8b.	Not Applicable for the EIA report.	It is typical for monitoring and reporting to be quarterly during construction and annually during operations. It is usually undertaken by way of an audit that evaluates compliance with the ESMS, EPAP and any other applicable E&S criteria. 5 Capitals can assist here for this scope if required.
Principle 10	Reporting and Transparency <u>Client Reporting Requirements</u> The following client reporting requirements are in addition to the disclosure requirements in Principle 5. For all Category A and, as appropriate, Category B Projects: <ul style="list-style-type: none"> The client will ensure that, at a minimum, a summary of the ESIA is accessible and available online and that it includes a summary of Human Rights and climate change risks and impacts when relevant The client will report publicly, on an annual basis, Green House Gas (GHG) emission levels (combined Scope 1 and Scope 2 Emissions, and, if appropriate, the GHG efficiency 	n/a for the content of the ESIA itself. The EIAs have not been disclosed publicly.	To align with the requirements of the EPs, it is suggested that the ESIA Addendum and existing EIAs are made available online (on the Clients website, or Project specific website) once completed to satisfy the requirements of EP 10. Given the Project is an OHTL, it will not have Scope 1 or 2 GHG emissions of >100,000 tonnes of CO ₂ equivalent annually and as such will not be required to report annually on GHGs. A decision on uploads of data to the GBIF will need to be made by the Project.

REQUIREMENT	KEY COMPLIANCE ELEMENTS	IDENTIFIED GAPS	REQUIREMENTS TO BRIDGE THE GAPS
	<p>ratio) during the operational phase for Projects emitting over 100,000 tonnes of CO₂ equivalent annually. Refer to Annex A for detailed requirements on GHG emissions reporting.</p> <ul style="list-style-type: none"> The EPFI will encourage the client to share commercially non-sensitive Project-specific biodiversity data with the Global Biodiversity Information Facility (GBIF) and relevant national and global data repositories, using formats and conditions to enable such data to be accessed and re-used in future decisions and research applications. 		

4.5 Gap Analysis of Existing EIAs vs. OECD Common Approaches

Gaps in complying with the OECD Common Approaches are similar to those identified compared to the IFC Performance Standards and EPIV Principles (discussed in section 4.3 and 4.4). The gaps that are addressed in this ESIA Addendum include:

- The potential risk in regard to terrestrial ecology and vegetation as well as the potential impacts to migratory avifauna utilising the Red Sea-Rift Valley flyway and potential nesting sites were not surveyed or discussed in the EIAs.
- The EIAs indicated that the alignment is far from potential human receptors and therefore, details related to land use and the potential impacts on the livelihood of local human receptors (including herders) and affected communities and the potential need for land acquisition were not covered in any of the EIAs.
- Elements such as climate physical and transition risks were not assessed in the existing EIAs.
- Human rights impact assessment was not covered in the existing EIAs.
- Cumulative impact assessment was not included in any of the EIAs.

4.6 World Bank Group EHS Guidelines

The general Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general examples of Good International Industry Practice (GIIP), while the EHS guidelines for Power Transmission and Distribution (2007) are industry-specific GIIP. The standards and measures provided by these guidelines were not included in the existing EIAs. These are referenced where required in this ESIA Addendum and will be referenced in the CESMP that will be prepared by 5 Capitals on behalf of SEC for the Project.

4.7 Associated Facilities Gap Analysis Vs. Relevant IFC PS Requirements

It is noted that no information to date has been provided on the route alignment or ESIA studies for the associated facilities within Egypt. Therefore, in the absence of receiving assessment documentation for these associated facilities a gap analysis of the Egyptian requirements versus the relevant elements of the IFC Performance Standards was carried out.

In Egypt, Projects are expected to comply with the requirements of the Egyptian Environmental Affairs Agency (EEAA) and the Guidelines of Principles and Procedures for Environmental Impact Assessment (2nd Edition published in January 2009). Accordingly, a gap analysis of these guidelines compared to the lenders requirements was prepared and is presented in the following table.

Table 4-3 EIA Gap Analysis vs. IFC PSs Relevant Elements

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
PS 1 Assessment and Management of Environmental and Social Risks and Impacts			
Identification of Risks and Impacts	<ul style="list-style-type: none"> The client will establish and maintain a process for identifying the environmental and social risks and impacts of the project. The risks and impacts identification process will be based on recent environmental and social baseline data at an appropriate level of detail. The process will consider all relevant environmental and social risks and impacts of the project, including the issues identified in Performance Standards 2 through 8, and those who are likely to be affected by such risks and impacts. The process will consider the emissions of greenhouse gases, the relevant risks associated with a changing climate and the adaptation opportunities, and potential transboundary effects, such as 	<p>Impacts of the Project on the Environment:</p> <ul style="list-style-type: none"> A detailed analysis of the impacts during construction and operation phases as well as closure if relevant. This is undertaken for both normal and emergency situations while clearly indicating criteria upon which significant impacts are determined and at the same time calculating emission loads, which necessitates a detailed qualitative description of the impact. According to the case, the analysis will extend to cumulative impacts and EEAA will make needed information available. The analysis should address impacts on physical, biological and social environment. A high focus on social impacts is required in cases of impacts on livelihood, 	<p>The EIA process requires a detailed impacts assessment; however, it does not identify in detail the environmental and social aspects that should be included. Therefore, it is not clear if the EIA process in Egypt will consider all relevant environmental and social risks and issues identified in Performance Standards 2 through 8.</p>

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
	<p>pollution of air, or use or pollution of international waterways.</p> <ul style="list-style-type: none"> Assessment of project Area of impacts, including the area likely to be affected, associated facilities and cumulative impacts. The client will identify individuals and groups that may be directly and differentially or disproportionately affected by the Project because of their disadvantage or vulnerable status. 	<p>involuntary re-settlements and property expropriation.</p> <ul style="list-style-type: none"> Quantification of significant impacts in normal operations whenever possible in relation to the quality threshold of different environmental attributes. This could be undertaken through modelling and simulation techniques or by deduction. Assessment of the decommissioning related impacts as applicable. It should be noted that EEAA has the right to request additional studies such as quantitative risk assessment or health risk assessment as parallel studies to EIAs for specific projects based on the nature of the project. <p>Impacts of the Environment on the Project</p> <ul style="list-style-type: none"> It is required to undertake an analysis of impacts of environment on the project including impacts due to the natural factors such as landslides, seismic activities and floods and neighboring activities as well as the previous land use of the project site. In addition, it is required to quantify the magnitude of the significant impacts, whenever possible. 	
<p>Management Programs</p>	<p>Consistent with the client's policy and the objectives and principles described therein, the client will establish management programs that, in sum, will describe mitigation and performance improvement measures and actions that address the identified environmental and social risks and impacts of the project.</p> <p>Where the identified risks and impacts cannot be avoided, the client will identify mitigation</p>	<ul style="list-style-type: none"> An Environmental Management Plan (EMP) is an integral part of the EIA report. It provides an essential link between the impacts and mitigation measures, and implementation and operational activities. The EMP should be formulated in such a way that it is clear and concise as much as possible. References within the plan should be clearly and readily identifiable. The EMP 	<p>The EIA process requires a detailed management plan; however, it does not identify in detail the environmental and social aspects that should be included. Therefore, it is not clear if the EIA process in Egypt will consider all relevant requirements in Performance Standards 2 through 8.</p>

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
	and performance measures and establish corresponding actions to ensure the project will operate in compliance with applicable laws and regulations, and meet the requirements of Performance Standards 1 through 8.	should identify linkages to other relevant plans relating to the project, such as emergency plan, which will be prepared in later stages. The EMP will include a summary of impacts, description of mitigation measure, monitoring program as well as the institutional arrangements.	
Organisational Capacity and Competency	The client, in collaboration with appropriate and relevant third parties, will establish, maintain, and strengthen as necessary an organizational structure that defines roles, responsibilities, and authority to implement the ESMS.	Responsibilities for mitigation and monitoring will be clearly defined. Training needs will also be indicated. The EMP will identify arrangements for coordination between the various parties responsible for mitigation. It is important to account for specific constraints of the project and to include a cost estimate of the institutional arrangements.	This is in line with PS1 requirements
Emergency preparedness and response	Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment.	The Impact assessment will cover emergency scenarios and the EMP should include preventive measures for emergency cases as well as elements of the emergency plan, prepared according to the labor law no 12/2003.	This is in line with PS1 requirements
Monitoring and review	The client will establish procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements.	Environmental performance monitoring will be designed to check whether mitigation measures are implemented, have the intended result, and that remedial measures are implemented. The monitoring program will clearly indicate the linkages between impacts identified in the EIA, indicators to be measured, sampling locations, frequency of measurements and allowable limits. Cost	This is in line with PS1 requirements

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
Stakeholder Engagement	<p>Disclosure of relevant project information helps Affected Communities and other stakeholders understand the risks, impacts and opportunities of the project. The client will provide Affected Communities with access to relevant information on: (i) the purpose, nature, and scale of the project; (ii) the duration of proposed project activities; (iii) any risks to and potential impacts on such communities and relevant mitigation measures; (iv) the envisaged stakeholder engagement process; and (v) the grievance mechanism.</p> <p>When Affected Communities are subject to identified risks and adverse impacts from a project, the client will undertake a process of consultation in a manner that provides the Affected Communities with opportunities to express their views on project risks, impacts and mitigation measures, and allows the client to consider and respond to them.</p>	<p>estimates for the monitoring should be included as well as personnel/entities undertaking the monitoring.</p> <p>The involvement of the public and concerned entities in the EIA planning and implementation phases is mandatory for Category C projects through the public consultation process with concerned parties. The consultation process provides the concerned parties with the opportunity to indicate their opinion in the measures to minimize potential negative environmental and social impacts, strengthen social acceptance of the project, informing the concerned parties that the environmental impacts will be minimized to levels that are low as reasonably practical and achieve the balance between legitimate requirements for development and environmental protection. The concerned parties of a project include, as a minimum:</p> <ul style="list-style-type: none"> • EEAA and its Regional Branch Offices (RBO) • Competent Administrative Authorities (CAA), indicated as per the project location and nature • The governorate in which the project is located (in some of the projects the CAA is not the governorate) • Local popular councils • Representative from affected communities such as neighboring facilities, people living near the project. This is related to the project location, type and resulting impacts 	This is in line with PS1 requirements

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
		<ul style="list-style-type: none"> In addition to the continuous consultation along the EIA process, public consultation should be carried out with a minimum at two stages of the EIA process: shortly after the EIA scoping and once a draft EIA report has been prepared. <p>These could include:</p> <ul style="list-style-type: none"> Local NGOs interested in environment Local universities and research centres Other concerned parties <p>Disclosure of relevant material is an important process and should be undertaken in a timely manner. This process permits meaningful consultations between the project proponent and project-affected groups and local NGOs. Before the public consultation on the draft EIA, the draft technical summary in Arabic should be disclosed to all concerned parties. After the EIA process is complete, the EIA report will be stored at EEAA's central library or that of the RBO of the projects region. Moreover, the executive summary of the final EIA will be available at EEAA website.</p>	
PS 2 Labour and Working Conditions			
Workers Accommodation	Where accommodation services are provided to workers covered by the scope of this Performance Standard, the client will put in place and implement policies on the quality and management of the accommodation and provision of basic services. The accommodation services will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation	Quantify the labor during operation and their mode of operation and work shifts.	The guideline does not specify any requirement related to the workers accommodation.

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
	arrangements should not restrict workers' freedom of movement or of association.		
PS 3 Resource Efficiency and Pollution Prevention			
Water Consumption	... 'the client shall adopt measures that avoid or reduce water usage so that the project's water consumption does not have significant adverse impacts on others.'	The EIA guideline states that the project description should include annual water consumption and identify proactive project design measures for water conservation.	This is in line with PS3 requirements
Pollution Prevention	'The client will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release.' Including management of wastes and hazardous materials.	Identification of proactive measures taken in project design to minimize impacts such as substitute of hazardous material to a more environmentally friendly material, energy and water conservation, waste Minimization. An EMP is required as part of the EIA.	This is in line with PS3 requirements
PS 4 Community, Health, Safety and Security			
Community Health and Safety	'The client will evaluate the risks and impacts to the health and safety of the Affected Communities during the project life-cycle and will establish preventive and control measures consistent with good international industry practice'	A specific community health and safety assessment is not required as part of the EIA process.	Eventhough a community health and safety assessment is not required as part of the EIA process, these impacts may be addressed as part of other environmental aspects addressed as part of the EIA. Based on the nature of the project, EEAA may also request preparing a health risk assessment in parallel to the EIA.
	<u>Community Exposure to Disease</u> 'The client will avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. Where specific diseases are endemic in communities in the project area of influence, the client is encouraged to explore opportunities during the project life-cycle to improve environmental conditions that could help minimize their incidence.		

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
	The client will avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.'		
	<u>Emergency Preparedness and Response</u> 'In addition to the emergency preparedness and response requirements described in Performance Standard 1, the client will also assist and collaborate with the Affected Communities, local government agencies, and other relevant parties, in their preparations to respond effectively to emergency situations, especially when their participation and collaboration are necessary to respond to such emergency situations.'	The Impact assessment will cover emergency scenarios and the EMP should include preventive measures for emergency cases as well as elements of the emergency plan, prepared according to the labor law no 12/2003. Emergency Preparedness and Response is required as part of the EMP which will identify arrangements for coordination between the various parties responsible for mitigation.	This is in line with PS4 requirements
Security Personnel	'When the client retains direct or contracted workers to provide security to safeguard its personnel and property, it will assess risks posed by its security arrangements to those within and outside the project site.'	-	The EIA Guideline do not include specific mention of security Personnel for Projects.
PS 5 Land Acquisition and Involuntary Resettlement			
Compensation and Benefits for Displaced Persons	'When displacement cannot be avoided, the client will offer displaced communities and persons compensation for loss of assets at full replacement cost and other assistance to help them improve or restore their standards of living or livelihoods, as provided in this Performance Standard. Compensation standards will be transparent and applied consistently to all communities and persons affected by the displacement.'	As part of the impact assessment, the guidelines state the need for "A high focus on social impacts is required in cases of impacts on livelihood, involuntary re-settlements and property expropriation."	The EIA guideline does not provide details regarding the compensation process required in case of land acquisition, involuntary re-settlements or property expropriation.
Private Sector Responsibilities Under Government-	'Where land acquisition and resettlement are the responsibility of the government, the client will collaborate with the responsible government agency, to the extent permitted		

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
Managed Resettlement	by the agency, to achieve outcomes that are consistent with this Performance Standard.'		
PS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Protection and Conservation of Biodiversity	For the protection and conservation of biodiversity, the mitigation hierarchy includes biodiversity offsets, which may be considered only after appropriate avoidance, minimization, and restoration measures have been applied. A biodiversity offset should be designed and implemented to achieve measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity; however, a net gain is required in critical habitats. The design of a biodiversity offset must adhere to the "like-for-like or better" principle and must be carried out in alignment with best available information and current practices. When a client is considering the development of an offset as part of the mitigation strategy, external experts with knowledge in offset design and implementation must be involved.	The EIA guideline requires providing a baseline description of the biological environment (terrestrial/marine fauna and flora) and assessing the impacts and providing the required mitigation measures as part of the EMP.	The EIA guideline does not specifically require biodiversity offset.

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
Management of Ecosystem Services	Where a project is likely to adversely impact ecosystem services, as determined by the risks and impacts identification process, the client will conduct a systematic review to identify priority ecosystem services. Priority ecosystem services are two-fold: (i) those services on which project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and/or (ii) those services on which the project is directly dependent for its operations (e.g., water). When Affected Communities are likely to be impacted, they should participate in the determination of priority ecosystem services in accordance with the stakeholder engagement process as defined in Performance Standard 1.		
PS 7 Indigenous Peoples			
Indigenous Peoples	The client will identify, through an environmental and social risks and impacts assessment process, all communities of Indigenous Peoples within the project area of influence who may be affected by the project, as well as the nature and degree of the expected direct and indirect economic, social, cultural (including cultural heritage), and environmental impacts on them.	The EIA guideline requires identifying project affected groups.	<p>The EIA guideline requires identifying project affected groups, however, it does not specifically require identifying potential indigenous people within the Project area.</p> <p>The World Directory of Minorities and Indigenous Peoples indicates that the Main minority and indigenous communities in Egypt are include Copts (6-9 %), Nubians (0.25%) and Jews, fewer than 30. Other minorities include: Shi'a, Jews, Sufi Muslims, Jehova's Witnesses, Ahmadis and Quranists.</p>

REQUIREMENT	KEY IFC PSS COMPLIANCE ELEMENTS	CATEGORY 3 EIA REQUIREMENTS IN EGYPT	IDENTIFIED GAPS
PS 8 Cultural Heritage			
Protection of Cultural Heritage in Project Design and Execution	<p><u>Chance Find Procedures</u></p> <p>'The client is responsible for siting and designing a project to avoid significant adverse impacts to cultural heritage. The environmental and social risks and impacts identification process should determine whether the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations. In such cases, as part of the client's ESMS, the client will develop provisions for managing chance finds through a chance find procedure which will be applied in the event that cultural heritage is subsequently discovered.'</p>	<p>For the description of the baseline environment in the area, it is required to include an exhaustive description of environmental attributes in the project area including cultural environments (if relevant).</p> <p>It also highlights that the Project alternatives should consider socio-cultural aspects.</p>	<p>The EIA guideline does not require developing a chance find procedure.</p> <p>While the EIA guideline does not specifically mention consultations for culture heritage, it requires extensive consultation during the scoping and EIA phases to present the potential Project impacts.</p> <p>It is assumed that if impact to cultural heritage was identified as part of the EIA process, it will be covered during the consultation process.</p>
	<p><u>Consultation</u></p> <p>'Where a project may affect cultural heritage, the client will consult with Affected Communities within the host country who use, or have used within living memory, the cultural heritage for long- standing cultural purposes. The client will consult with the Affected Communities to identify cultural heritage of importance, and to incorporate into the client's decision-making process the views of the Affected Communities on such cultural heritage. Consultation will also involve the relevant national or local regulatory agencies that are entrusted with the protection of cultural heritage.'</p>		

5 TERRESTRIAL ECOLOGY

Further to the ecology chapters in the EIAs prepared for the Project, this 'Terrestrial Ecology Assessment' addendum has been prepared to address the gaps identified in the EIAs and provide an overview of the local ecosystem services people (and businesses) interact with and benefit from. This addendum assesses the potential Project impacts on the terrestrial ecology and the identified ecosystem services and proposes applicable mitigation measures.

5.1 Standards and Regulatory Requirements

5.1.1 KSA Requirements

Under the Environmental Law and the creation of the National Centres of Excellence, the National Center of Wildlife (NCW) has been established as the responsible authority for the protection and development of wildlife and biodiversity and the planning and management of protected areas. The NCW supersedes the Saudi Wildlife Authority (SWA) and will work with NCEC to develop and implement the national policy for conservation and protection of species and reserve areas. NCEC and NCW has identified conservation areas that require protection and are working to protect and prevent damage to these areas.

Under the Environmental Law, the following Implementing Regulations pertaining to flora and fauna have been released:

- Development of Vegetation Cover and Combating Desertification: sets out KSA's commitment to protecting vegetated areas in the Kingdom and promoting their development through the implementation of a greater level of regulation and sustainable management practises
- Logging: sets out KSA's commitment to the regulation of the import, collection (including felling), transfer, storage and commercial sale of firewood and charcoal.

NCW in accordance with the MEWA Implementing Regulations (2021) will therefore be responsible for issuing permits where vegetation cover maybe impacted, such as trees to be felled or transplanted and other fauna that may also require translocation.

In its commitments to the United Nations Convention of Biological Diversity (UNCBD), KSA has produced a list of species considered to be of High Conservation Priority (HCP), these are commonly used as a de facto protected species list for the purpose of ESIA in KSA.

KSA has two policy documents related to biodiversity: The National Biodiversity Strategy and Action Plan (NBSAP) and the National Protected Area System Plan (NPAS), which together set national targets and a vision for Protected Areas in KSA. The NPAS is the guiding document for KSA to fulfil its obligations regarding in situ conservation under the Convention on Biological Diversity.

5.1.2 Lender Requirements

The assessment of impacts upon terrestrial ecology is made with due reference to the IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Natural Resource Management which establishes requirements for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources. When avoidance of impacts is not possible, measures to minimise impacts and restore biodiversity and ecosystem services should be implemented. Specifically, it is necessary to determine baseline conditions and categorise the projects habitats as 'critical', 'modified' or 'natural' to undertake the necessary assessment. The Performance Standard defines the different habitats as follows:

- Natural Habitat: "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";
- Critical Habitat: "Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes"; and
- Modified Habitat: "Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands".

The assessment of impacts upon ecosystem services is made with due consideration to the following:

- Performance Standard 6: Management of Ecosystem Services: through identifying priority ecosystem services, avoiding adverse impacts where possible or implementing the required mitigation measures to maintain the value and functionality of the priority services. The Ecosystem Services are divided into two priority types:
 - Type I: Services that the project operations are most likely to impact and, therefore, would result in adverse impacts to affected communities.
 - Type II: Services on which the project is directly dependent for its operations (e.g., water).
- Performance Standard 4 Community Health, Safety, and Security to address the project's potential impacts on provisioning and regulating ecosystem services which will result in adverse health and safety risks and impacts to affected communities.

5.2 Baseline

5.2.1 EIA Data

Note: The below provides an overview of relevant EIA elements related to terrestrial ecology and ecosystem services. For the full baseline ecology sections please refer to the EIAs listed in Chapter 2.1 of this report.

5.2.1.1 Portion 1

The EIA prepared by Geotechnical & Environmental Co.Ltd in 2020 undertook a combination of desk-based and site ecological survey work. The site survey element primarily consisted of incidental observations of flora and fauna recorded.

The EIA reports that the Project area to the East of P1 to P9 shown on the figure below includes agricultural fields of citrus and olive trees and is considered to be relatively limited with respect to ecology compared to the remaining part of the OHTL alignment. Faunal species including lizards, snakes and scorpions in addition to migratory avifauna such as hawks, crows, kestrel etc. were identified. The area running parallel to the borders with Jordan primarily comprises desert habitats with limited grazing areas and mountains that include some perennial trees and wadis where vegetation flourishes.

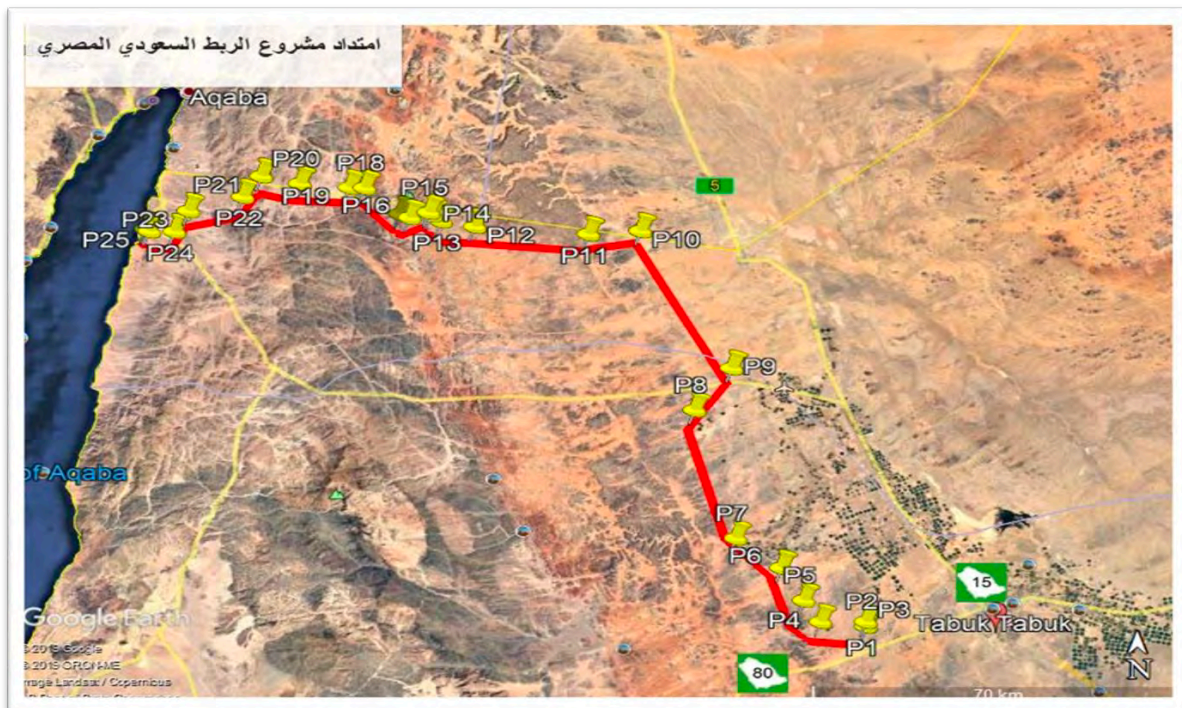


Figure 5-1 OHTL Route from Tabuk to Madinah Portion 1 (Geco, 2020)

5.2.1.2 Portion 2

The EIA prepared by StEC in 2022 undertook a combination of desk-based and site ecological survey work. The site survey element primarily consisted of incidental observations of flora and fauna.

The EIA classifies the area surrounding the project route as a dry desert area of barren nature with sandy habitats interspersed with some calcareous sedimentary rocks as well as some mountains and rocky plateaus. According to the EIA the area is poor in biodiversity and wildlife in general with the absence of sensitive vegetation or perennial trees along the OHTL route.

The rainy season helps in the growth of some shrubs and seasonal plants that are considered dominant perennials and annuals characterised by their ability to tolerate drought.

The dominant trees along the route were *Acacia* spp and *Ziziphus spina-christi*. Shrubs and flora along the route included *Haloxylon*, *Calligonum*, tamarisk, *Rhanterium epapposum*, *neurada precumbens*, *Atriplex*, *Salsola azaurena*, and *Anisosciadium* and small flora such as sea lavender, saffron, desert truffles, hibiscus, *Plantago ovata*, *Erodium*, *Artemisia*, *Achillea* and *chrysanthemum*.

Due to the dry nature of the site, the absence of surface water and the lack of trees and shrubs, the site is not of ecological value and does not represent a vital habitat for the breeding of animals such as mammals, birds or amphibians.

Therefore, the ecological diversity of the region's fauna is very limited, represented in some insects and reptiles such as scorpions, snakes and Spiny-tailed Lizards (STL), which are widespread in the deserts within KSA (it is important to note that STLs are listed as a High Conservation Priority (HCP) species in KSA). Besides STLs, no sensitive animals or flocks of migratory birds or other rare or endangered animals were observed in the Project area, however, the EIA highlights the potential presence of some domestic animals found grazing in the area including livestock and camels, as well as some vertebrates living in the desert environment near the OHTL route.



Figure 5-2 OHTL Route from Tabuk to Madinah Portion 2 (StEC, 2022)

5.2.1.3 Portion 3

The ecology survey carried out as part of the EIA prepared by LGES in 2022 identified ten (10) flora species within the OHTL route alignment all of which are categorised as Least Concern (LC) according to the International Union for Conservation of Nature (IUCN) and are not considered valuable for grazing. These include Suaeda maritima, Zygophyllum simplex, Zygophyllum gatarense, Salsola arabica, Salsola vermiculata, Anabasis setifera, Heliotropium diygynum and Calotropis procera. Fauna recorded included rodents, red fox, and badger while three (3) species of avifauna were observed including Streptopelia senegalensis, Corvus ruficollis and Passer domesticus.

5.2.1.4 Subsea Cable Aqaba to Taba

The EIA prepared by IES in 2022 focuses on the marine ecology and water quality and provides a high level desk based review of the ecology in KSA in general and states that the site is disturbed and the terrestrial ecology within the Project area shown on the figure below is considered poor.



Figure 5-3 Location of the Substation for the Subsea Cable Aqaba to Taba (IES, 2022)

5.2.2 Secondary Desktop Review

According to the National Centre for Wildlife (NCW), there are 15 Protected Areas within the Kingdom of Saudi Arabia including 12 terrestrial protected areas and three marine protected areas. The Project is not in close proximity to any of these areas; the two nearest Protected Areas to the OHTL are the Al-Tubayq and Al-Khunfah Protected Areas located approximately 115 km and 170 km to the East of the OHTL respectively. Al-Tubayq Protected Area is an IUCN Category III site and covers an area of c.12,200 km² south of Harrat Al Harrah. The site consists primarily of desert and sandstone rocky plateaus and is one of the last remaining strongholds for the Nubian Ibex (*Capra nubiana*) (IUCN, 2013). Al Khunfah Protected Area is an IUCN Category VI site. The Al Khunfah protected declared in 1986 has an area of 19,339 km² protecting the Reem Gazelle and a few Mountain Gazelle (NCW, 2021).

The 2nd National Report on the Convention on Biological Diversity (NCWCD, 2004) stated that more than 5% of Saudi Arabia is covered by protected areas that are actively managed to maximise conservation of biological diversity. However, insufficient manpower and financial resources are available for in situ conservation of the large areas and especially for the marine areas. Saudi Arabia has ratified the Convention on Biological Diversity and fulfilled the obligation of preparing a National Biodiversity Strategy designed to promote the conservation of biodiversity and its sustainable use. Accordingly, biodiversity is considered within national planning and development. The NCWCD aims to develop and maintain effective protected areas. This is largely built on the ancient tradition of Himas to ensure adequate coverage of widespread ecological types and their elements rather than focussing on small, less representative types.

According to the NCW, it is planned that the centre will manage 35 protected areas (15 existing protected areas, and 20 proposed protected areas) while 40 additional areas are managed by other bodies. The Authority's proposed protected areas system plan is estimated at 10.42% of the Kingdom's area.

5.2.2.1 Important Bird Areas

Areas recognised as Important Bird and Biodiversity Areas (IBAs) have been identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations. IBA was developed and sites are identified by BirdLife International. Currently there are over 12,000 IBAs worldwide with 39 in Saudi Arabia.

HIMA AL-FIQRAH

Hima al-Fiqrah is a 124,000 ha site located 17 km west of the OHTL alignment in Madinah. The site comprises a mountain with surrounding foothills at 1,700 - 2,000 m in the Hijaz range, west of Madinah. The vegetation is open *Juniperus phoenicia* climax woodland with associated Mediterranean-type flora. Lichens and ferns occur on the wetter slopes. The *Juniperus* zone is easily accessible, unlike anywhere else in the central Hijaz. There is an ancient agricultural terrace system, now abandoned. Beekeeping is an important local activity; secondary human activities are agriculture and recreation.

Other breeding species include *Aquila verreauxii* with a minimum of one pair, *Buteo rufinus* with a minimum of one to two pairs, *Hieraaetus fasciatus*, *Tachymarpis melba* (possible), *Apus pallidus*, *Rhodopechys githaginea* and *Emberiza striolata*.

The site is proposed as a Special Nature Reserve, Natural Reserve, Resource Use Reserve and Controlled Hunting Reserve in the NCWCD System Plan for Protected Areas, and establishment is proceeding. The mountain is a 'hima' (traditional protected area) for bee-keeping, and grazing animals have long been excluded. Possible abandonment of this system in the future is a major threat to the presently good condition of the vegetation. Agricultural intensification, involving rehabilitation of terraces and construction of new houses and roads, is currently a

major problem. Water supplies are now being brought in by tanker to permit this otherwise unsustainable development.

JEBEL AL LAWZ

Jebel al Lawz IBA is a 30,000 ha site located 65 km north-west and south the OHTL route. The site comprises a group of granitic mountains with at least 20 peaks over 2,000 m, rising from 700 m to a maximum of 2,549 m (Jabal Fayhan, the tallest mountain in northern Arabia and high enough to have snow in winter). There is some permanent running water and the rocky high mountain habitats are densely vegetated in places, with clear zoning. *Retama raetam* scrub dominates the wadis; trees include *Pistacia*, *Ficus*, *Salix* and (on the summit) some stunted *Juniperus*. *Acacia* trees/bushes are only found below 1,200 m. The area is remote and very sparsely populated.

Species present include: Verreaux's Eagle (*Aquila verreauxii*) with a minimum of one pair; Chukar Partridge (*Alectoris chukar*) which is numerous, and range restricted in Saudi Arabia; Blackstart (*Cercomela melanura*); Palestine Sunbird (*Nectarinia osea*), Great Grey Shrike (*Lanius excubitor*), Fan-tailed Raven (*Corvus rhipidurus*) and Trumpeter Finch (*Rhodopechys githaginea*).

The site is threatened by grazing, tree-cutting, road construction and military development. It is proposed as a Natural Reserve, Biological Reserve and Resource Use Reserve in the NCWCD System Plan for Protected Areas.

OTHER IBAS

Other IBAs within the vicinity of the Proposed OHTL route include Aqaba Coast and Mountains IBA and Hisma basin-Rum IBA located in Jordan at the borders with KSA within close proximity to the OHTL route between Tabuk and Al Wasel.

Aqaba Coast and Mountains IBA is a 28,300 ha site located in Jordan at the borders with KSA and approximately 5 km north-west of the OHTL Route. Aqaba Coast and Mountains IBA is present along Jordan's only coastline.

A migratory bottleneck site also holding a breeding bird community representative of the Rift Valley. The enormous spring passage of raptors just across the border at Eilat only occasionally passes over Aqaba, as indicated by the relatively small maximum daily counts: *Buteo* (105 in April) and *Accipiter brevipes* (75 in September). Generally raptors cross the Rift Valley into Jordan further North up Wadi Araba, raptor passage in autumn is relatively insignificant, nevertheless, spring passage at Aqaba undoubtedly exceeds 50,000 raptors per season.

Other spring migrants occurring in good numbers include *Nycticorax nycticorax*, *Ardea cinerea*, *Sterna hirundo*, *Chlidonias leucopterus*, *Sylvia curruca*, *S. atricapilla*, *Passer hispaniolensis* and *Emberiza hortulana*. *Falco pelegrinoides* and *Corvus rhipidurus* are resident and the town has a small population of *Corvus splendens* with minimum of 10-20 pairs.

A diverse selection of non-breeding seabirds occurs offshore between spring and autumn due to an upwelling at the head of the Gulf; species appear to occur only in small numbers although there has been no detailed investigation and include *Calonectris diomedea* (more than 50 in June), *Puffinus pacificus*, *P. griseus*, *Sula leucogaster*, *Stercorarius pomarinus*, *S. parasiticus* (75 in June), *S. longicaudus*, *Larus leucophthalmus*, *Sterna repressa* and *S. anaethetus*, as well as vagrant pelagic species.

Hisma basin-Rum IBA is a 200,000 ha site located in Jordan at the Northern borders with KSA approximately 2-3 km North the OHTL route. Hisma basin-Rum IBA is an isolated tract of huge, precipitous, sandstone and granite mountains, ranging up to 1,754 m (Jabal Rum, the highest point in Jordan), separated from each other by flat, sandy 'corridor'-wadis (at 800 m), and surrounded by a desert of extensive siltflats and mobile dunes. The predominant desert vegetation is a scanty shrub-steppe of *Haloxylon*, *Anabasis*, *Retama*, *Artemisia* and *Acacia tortilis* bushes. *Amygdalus arabicus* bushes are common in sandy wadis and in gorges leading into the mountains. Vegetation on the high and inaccessible peaks of the mountains is poorer than in wadis, including scattered *Acacia tortilis* and *Juniperus* trees, which also occur along seepage lines in Wadi Rum at the base of Jabal Rum, together with patchy, remnant vegetation of *Pistacia*, *Ficus*, *Olea* and *Phoenix* palms. The main land-uses are nomadic pastoralism (sheep, goats and camels), a Ministry of Agriculture irrigation project on the siltflats (centred on Disi and Abu Suwana) and 'wilderness tourism'.

The IBA hosts an unusually varied assemblage of desert and mountain birds. Possible or known breeders include *Circaetus gallicus*, *Buteo rufinus*, *Aquila chrysaetos* (outside the Reserve), *Aquila verreauxii*, *Hieraaetus fasciatus*, *Falco pelegrinoides*, *Alectoris chukar*, *Bubo ascalaphus*, *Pycnonotus xanthopygos*, *Oenanthe lugens*, *O. leucopyga*, *Nectarinia osea*, *Corvus rhipidurus* and *Emberiza striolata*. Quite large numbers of migrating *Buteo* *buteo* have been seen irregularly. Two key species, now apparently extinct, are the globally threatened *Chlamydotis undulata* (formerly a rare winter visitor) and the regionally threatened *Gypaetus barbatus* (formerly a rare resident).

BIRDS MIGRATION ROUTES AND TIMINGS

The OHTL route is located on a part of the Red Sea/Rift Valley flyway as shown in the following figure, which is one of three main flyways connecting the Palearctic and Africa (BirdLife Data Zone). This migration route from Europe and Central Asia into Africa follows two general paths which run either side of the Red Sea. The main southward (autumn) passage of birds occurs through Jordan and Israel into Africa north of the Gulf of Aqaba, through the Sinai province of Egypt, and across the Gulf of Suez. The most notable 'bottleneck' sites, i.e., the locations where the largest aggregations of birds are observed, are located on this flyway (Zalles & Bildstein, 2000).

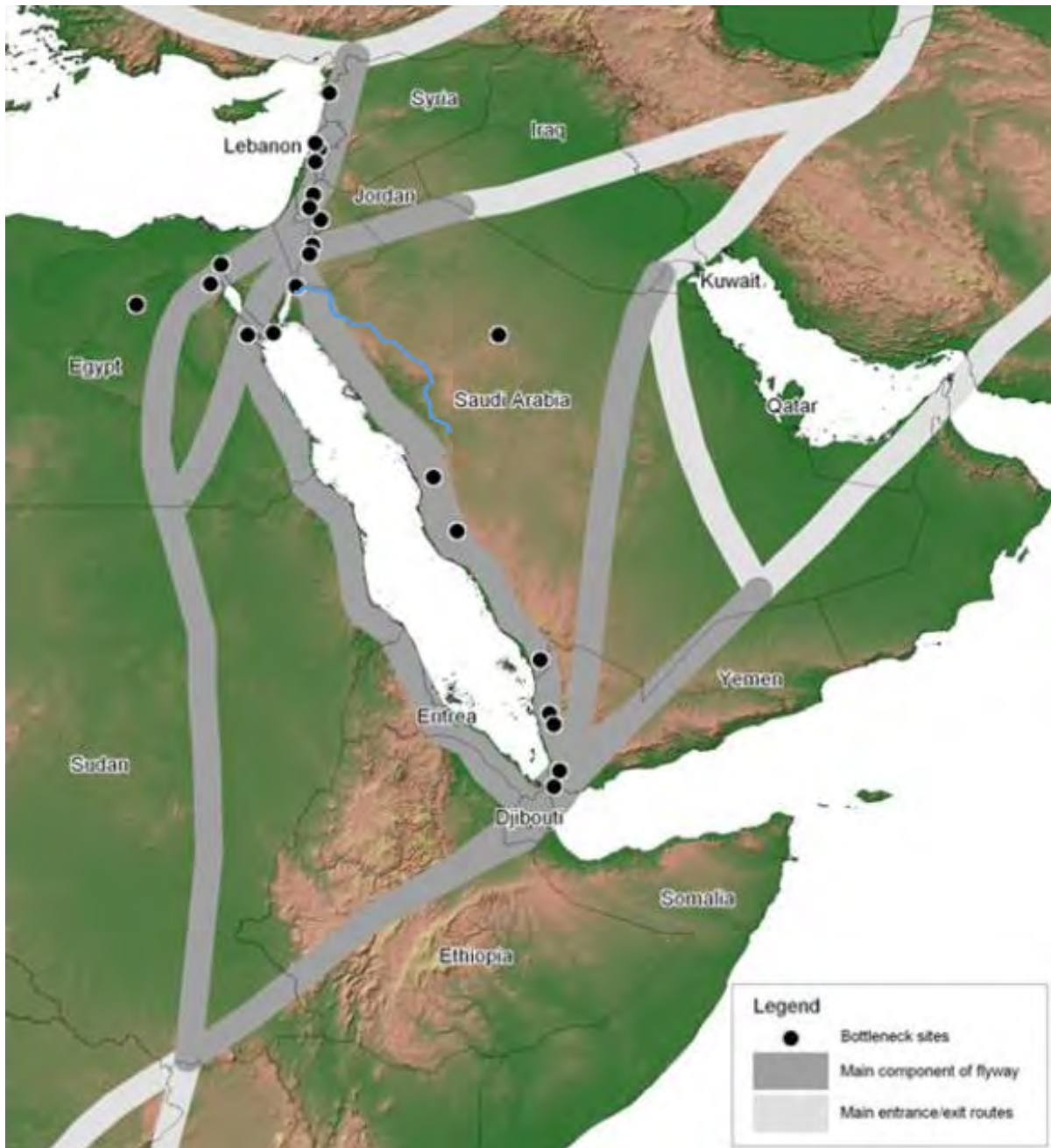


Figure 5-4 The OHTL Alignment (blue line) with Respect to the Rift Valley / Red Sea Flyway Routes

Source: Adapted from BirdLife International, 2015

A section of the flyway also runs from Jordan down through KSA along the eastern side of the Red Sea following the alignment of the Hejaz and Asir Mountain ranges of the Arabian Peninsula. Birds generally follow this path until crossing into Africa at the narrow south-eastern strait of the Red Sea known as the Strait of Bab-el-Mandab (Meyburg et al., 2003) although some birds are likely to cross the Red Sea itself.

Birds crossing the Strait of Bab-el-Mandab into Africa are joined by birds from Central Asia which arrive in the north-east of KSA and travel south-west across the country. There is no distinct path across the region for these birds with individuals reaching the western coast of KSA along most of its length before travelling south to cross into Africa (or crossing the Red

Sea). Some species using this route for example the Steppe Eagle (*Aquila nipalensis*), are known to not cross to Africa but remain and winter in KSA.

The OHTL route running parallel to the northern borders of KSA crosses directly through The Rift Valley/Red Sea Flyway migration pathway towards Aqaba, which is utilised in reverse during spring (northward) migration. Migrating raptors and other large soaring birds from Eastern Europe typically stick close to the Hejaz/Asir mountain ranges, which provide good migration conditions and a quick route over the land mass.

Whilst migration occurs over broad regularly used flyways this behaviour is more predictable than breeding activity with birds migrating during set periods when they are moving to and from wintering grounds in Africa and breeding territories in Europe and Asia.

5.2.3 Ground Truthing Survey

The terrestrial ecology data provided in the EIAs as well as the secondary desktop review data was complemented by eleven (11) ground truthing site surveys to identify areas of potential ecological risk along the OHTL route. In addition, vantage point (VP) surveys were conducted at each of these eleven (11) sites. The Terrestrial Ecology ground truthing survey was carried out between 18th and 26th May 2022. The following sections provide the survey methodology and the survey findings.

5.2.3.1 Methodology

The ground truthing sites were delineated and selected following a review of the data provided in the EIAs and a desk review of publications and studies, in addition to review of satellite imagery. Site selection considered the following:

- The three different portions of the alignment.
- Areas covering different habitats along the alignment.
- Areas that appeared to include wadis, vegetation, flat plains, and mountains while focusing predominantly on areas in the northern section of the project (KSA side) as this coincides with the aforementioned flyway.
- Areas that are safe and easy to access.

The ground truthing survey was planned to cover Ten (10) areas referred to as Plots P1 - P10 as shown on the following figure.

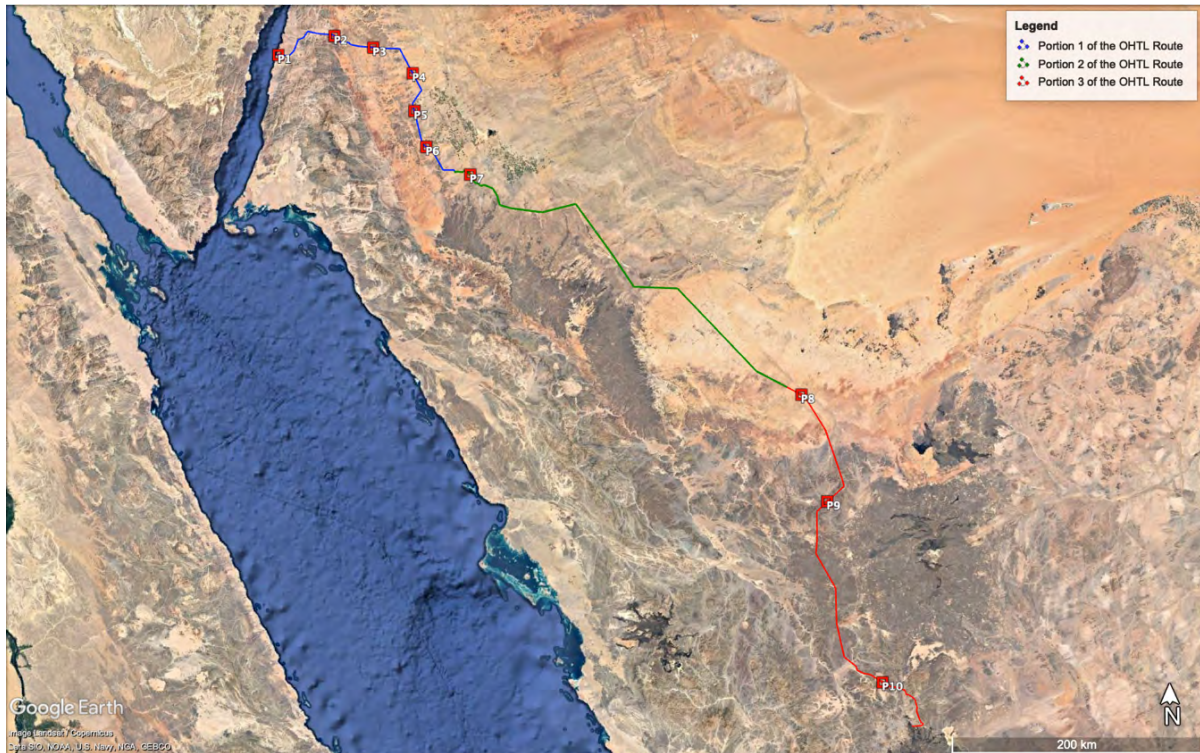


Figure 5-5 Proposed Terrestrial Ecology Ground Truthing Survey Locations along the OHTL and the Restricted Areas

However due to Police access restrictions, two (2) of the originally selected Plots in locations near KSA's borders with Jordan, namely P2 and P3) were surveyed. These two Plots were replaced with three new Plots shown as P11, P12 and P13 shown on the figure below.

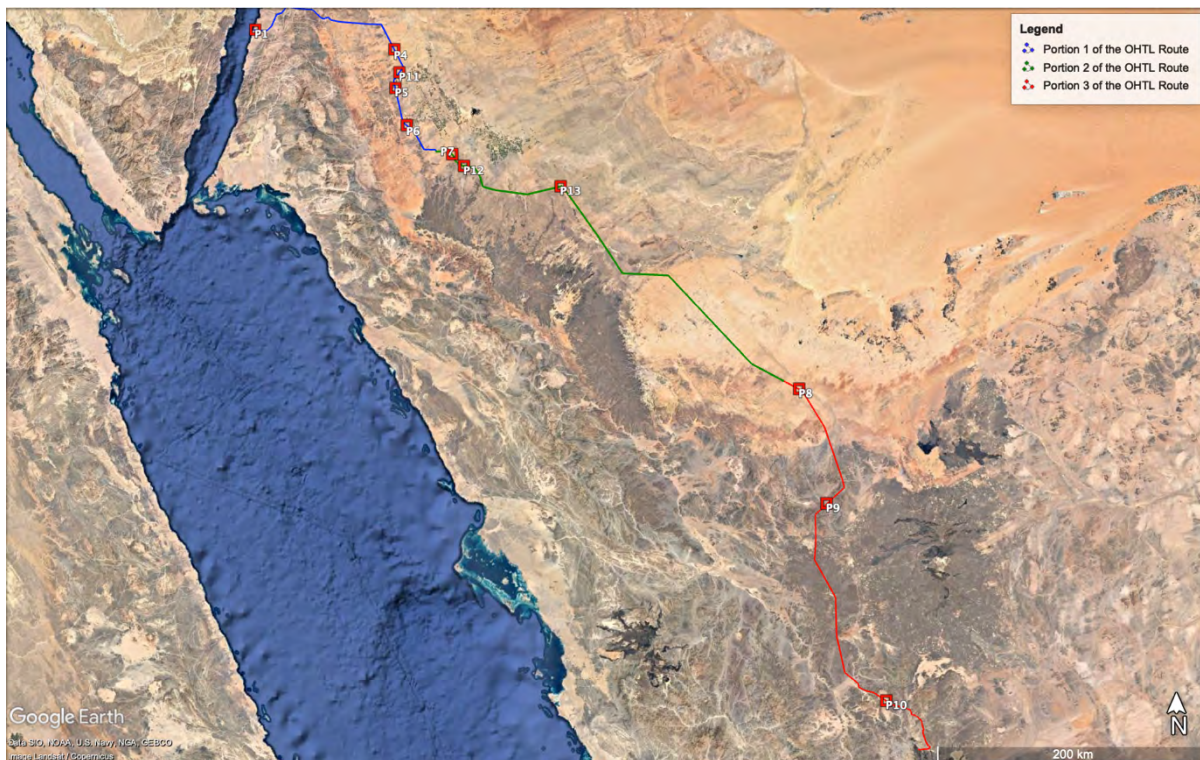


Figure 5-6 Carried out Terrestrial Ecology Ground Truthing Survey Locations along the OHTL

Accordingly, the terrestrial ecology ground truthing survey covered 11 survey areas along the OHTL alignment as shown on the following figures. The terrestrial ground truthing survey within each survey area comprised of three transects; one transect line of 1 km and two transects of 500 m each, in addition to the vegetation survey at six points within each area.

Bird monitoring was also undertaken at pre-determined VPs at each survey Plot out of which P1, P4, P5 and P11 are potentially located within the migratory pathway for birds in the northern area between Tabuk and Aqaba. Six (6) VPs were selected at each survey Plot, and 30 minutes of 180-degree observation was undertaken to identify and record bird species, in addition to ongoing observations throughout the 11-day survey period. Furthermore, bird activities such as calls, nesting and foraging were recorded. The locations of the VPs at each survey Plot are shown on the following figures.

It is worth mentioning that the survey was not carried out during the migrating season for birds and two of the survey areas, namely P2 and P3 that were selected in the northern section of the Project (KSA side) as they coincide with the birds flyway path were not carried out due to border control and police restrictions.

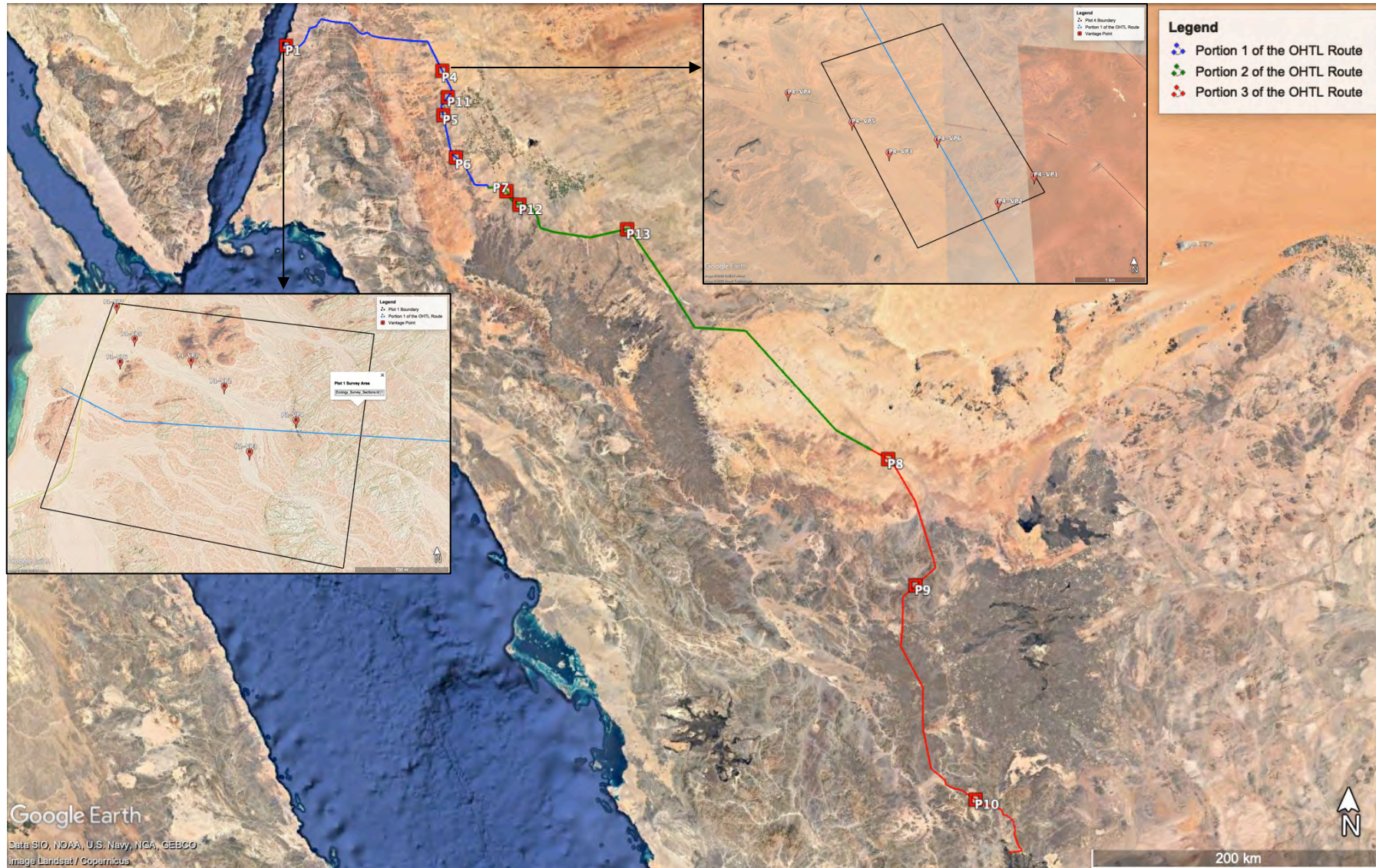


Figure 5-7 Terrestrial Ecology Ground Truthing Survey Areas – Plots 1 and 4

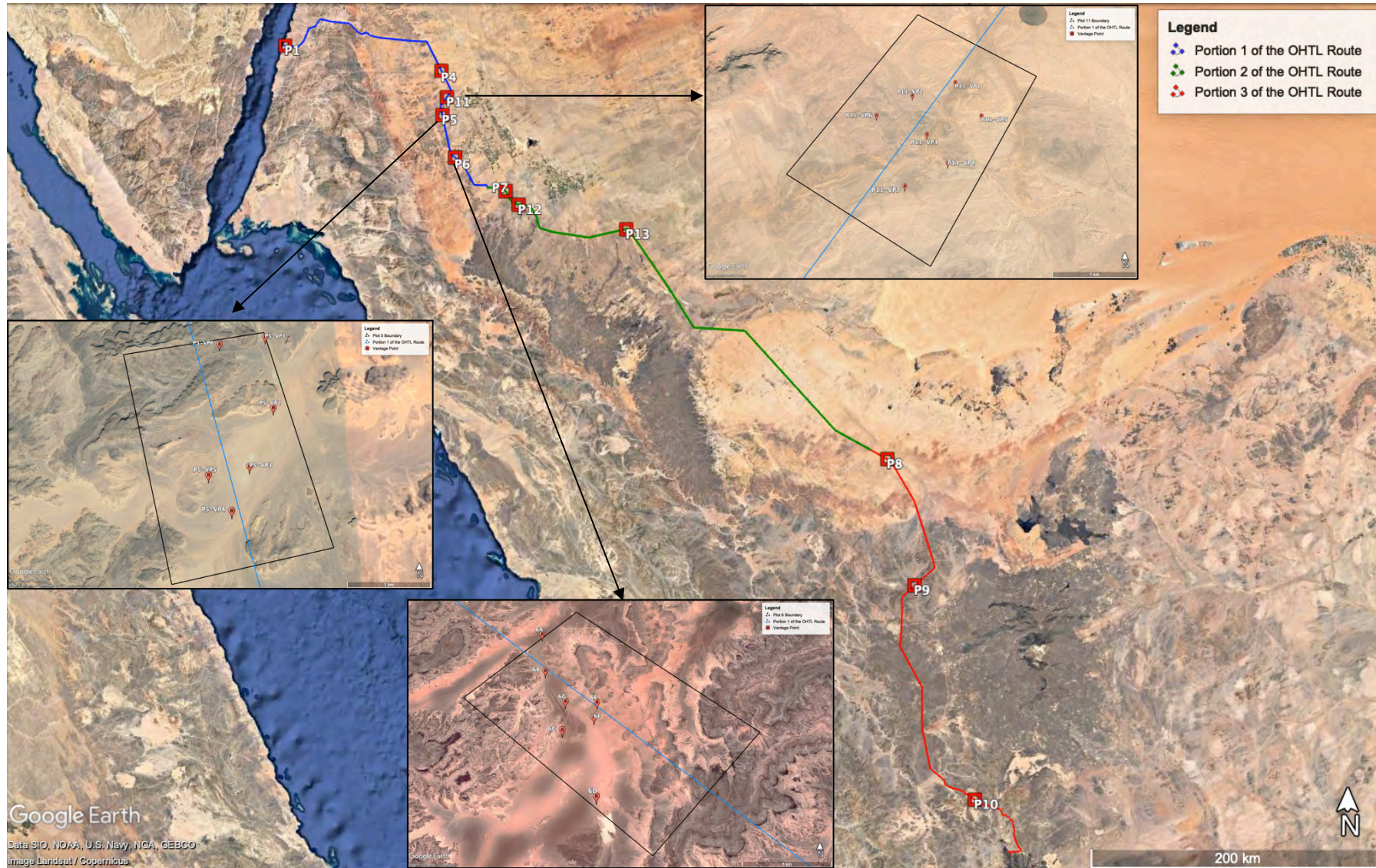


Figure 5-8 Terrestrial Ecology Ground Truthing Survey Areas – Plots 11, 5 and 6

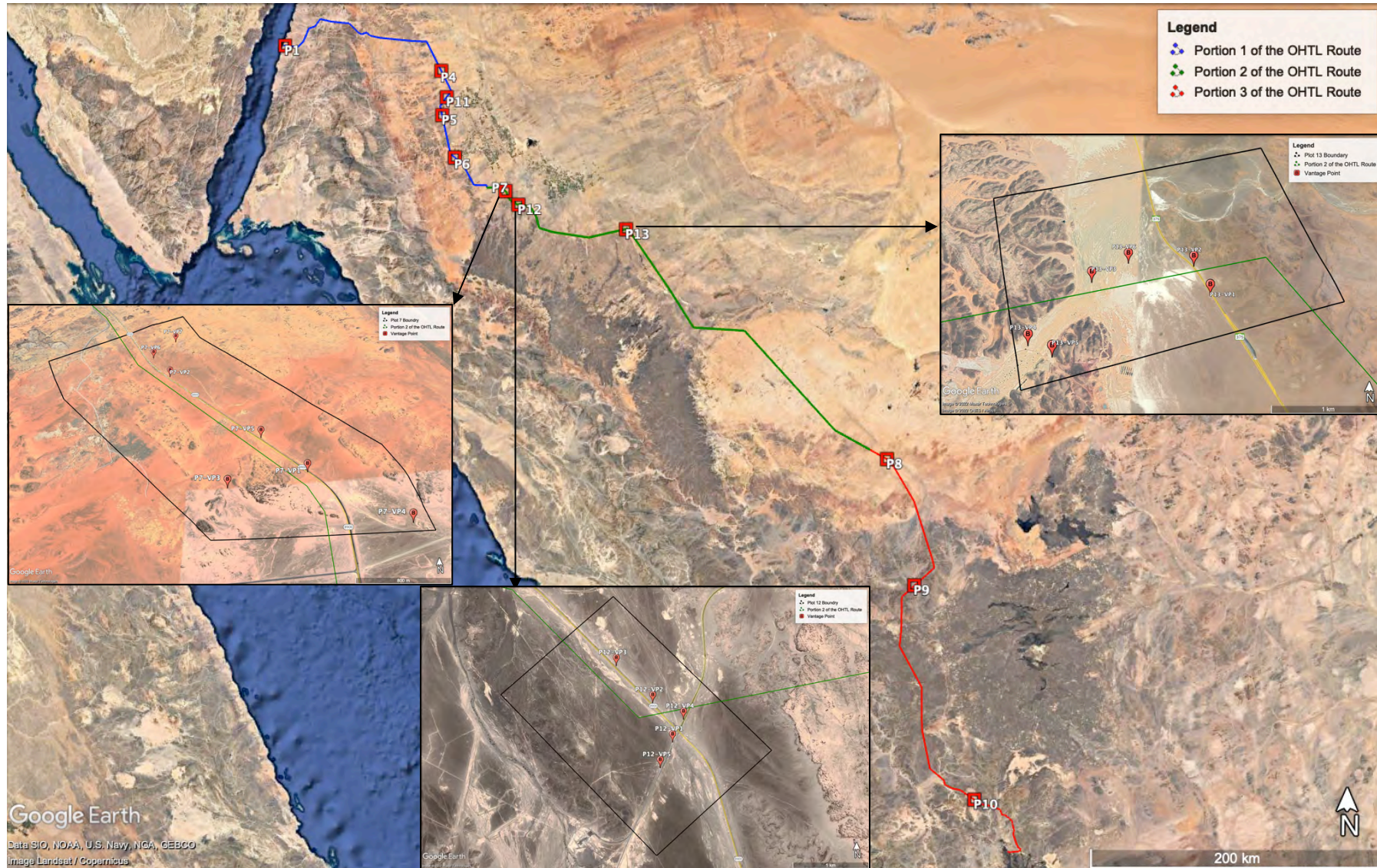


Figure 5-9 Terrestrial Ecology Ground Truthing Survey Areas – Plots 7, 12 and 13

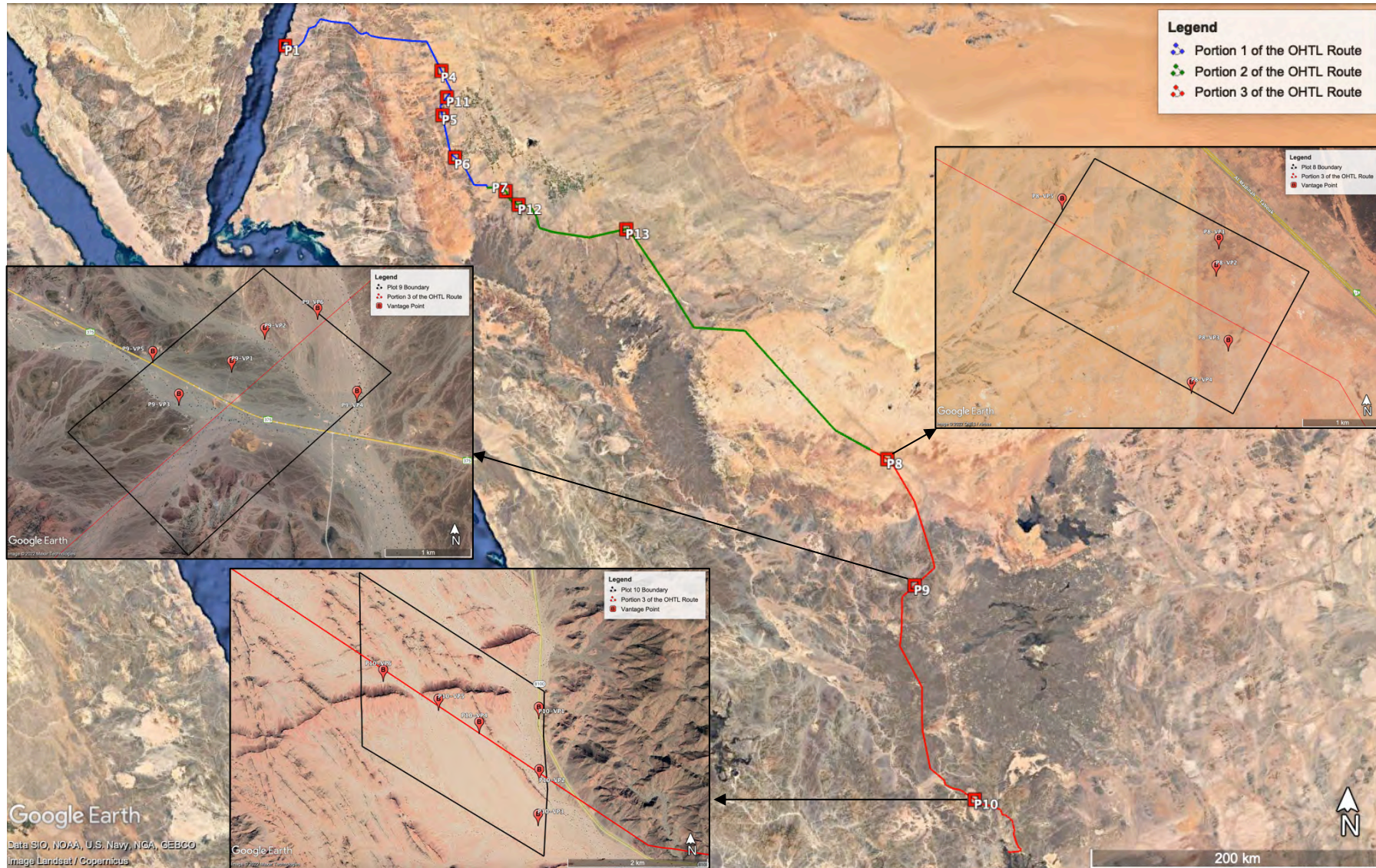


Figure 5-10 Terrestrial Ecology Ground Truthing Survey Areas – Plots 8, 9 and 1

Flora, fauna, avifauna and habitat characterization within each plot were recorded and are presented in the following sections.

Sightings of environmental and socio-economic issues within the terrestrial ecology ground-truthing survey areas were also recorded. These are mentioned in the following section and are discussed in detail in Section 6.2.3 of this ESIA Addendum.

5.2.3.2 Plot 1 Ground Truthing Survey Area

Site Conditions: Plot 1 was located within the coastal plain, around 16km from Haql, between the Gulf of Aqaba and Hijaz Mountains. The OHTL alignment predominantly crosses through mountains and open wadi terrains with some areas of gravel plain interspersed with sparse vegetation. The area surrounding the OHTL route has evidence of some anthropogenic activities including abandoned farms and construction activities (not related to the OHTL). The habitats identified in Plot 1 are shown on the following habitat map.

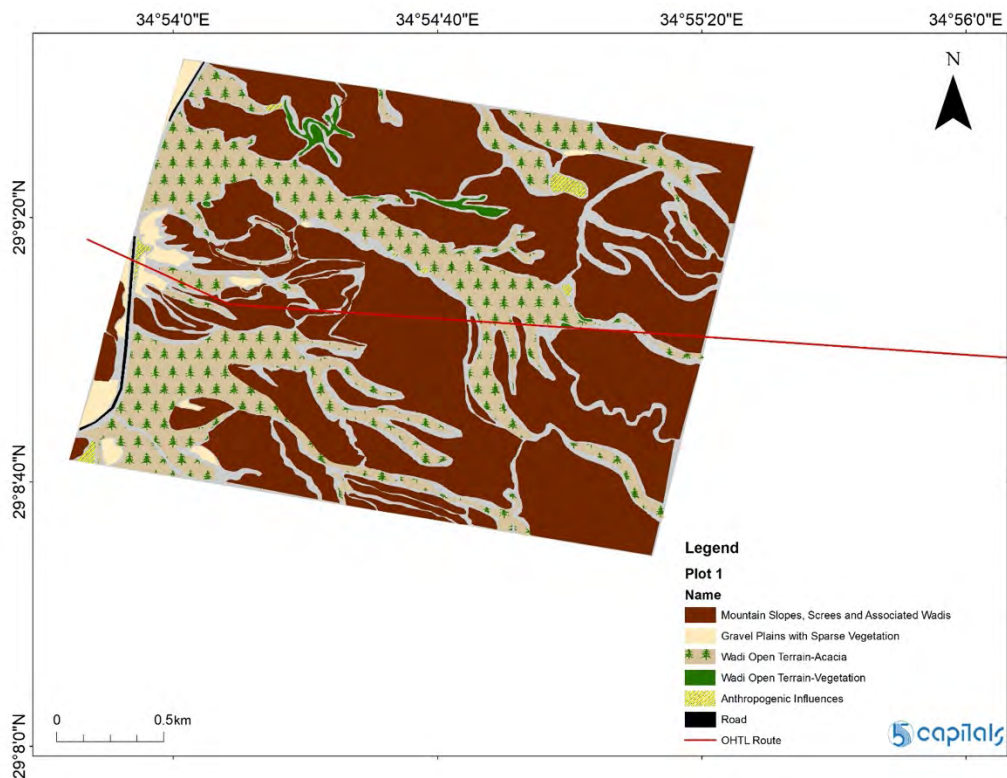


Figure 5-11 Plot 1 Habitat Map

The figures below provide an overview of the site conditions and the recorded habitats within Plot 1 survey area.



Mountains, Rocky Terrain and Wadis



Mountain Slopes, Scree and Associated Wadis



Gravel Plain

Figure 5-12 Photos of the Different Habitats Identified at Plot 1

Flora: The rocky beach near Plot 1 was covered with filamentous algae *Chaetomorpha* sp. The coastal plain supports the growth of shrubs and trees as well as some grasses and herbs. The dominant low shrub species recorded was the Unbranched Bean-caper *Tetraena simplex*. Other shrub species commonly recorded at this survey area included the Kharasan Thorn *Fagonia arabica* and *Tribulus terrestris* while a common grass species identified at Plot 1 was *Stipagrostis obtusa*. The open terrain wadis and drainage channels within this survey area mainly support tree species of *Acacia* spp., Italian senna *Senna italica* and Fire Bush *Calligonum comosum*.

The flora identified at Plot 1 is shown on the following figures.



Tetraena simplex in wadis



Acacia Tree



Gravelly Beaches Covered with Algae
(*Chaetomorpha* Sp)



Tetraena simplex & *Stipagrostis* sp



Tetraena simplex



Arnebia hispidissima



Blepharis ciliaris



Senna italica

Figure 5-13 Photos of Flora Identified at Plot 1

Fauna: Mammals and reptiles were not observed during the survey and no evidence of faunal activity was recorded on site.

Avifauna: Laughing Dove *Silopelia senegalensis*, Arabian Green Bee-eater *Merops cyanophrys*, House sparrow *Passer domesticus* and Eastern Black-eared Wheatear *Oenanthe melanleuca* were recorded during the ground truthing survey.



Figure 5-14 Example of White-crowned wheatear

5.2.3.3 Plot 4 Ground Truthing Survey Area

Site Conditions: Plot 4 is located in between Haql and Tabuk, approximately 6 km from Tabuk Water Station and around 10 km from the nearest agricultural area in Tabuk. The area consists mainly of mountain slopes and gravel plains with sparse vegetation. The habitats identified in Plot 4 are shown on the following habitat map.

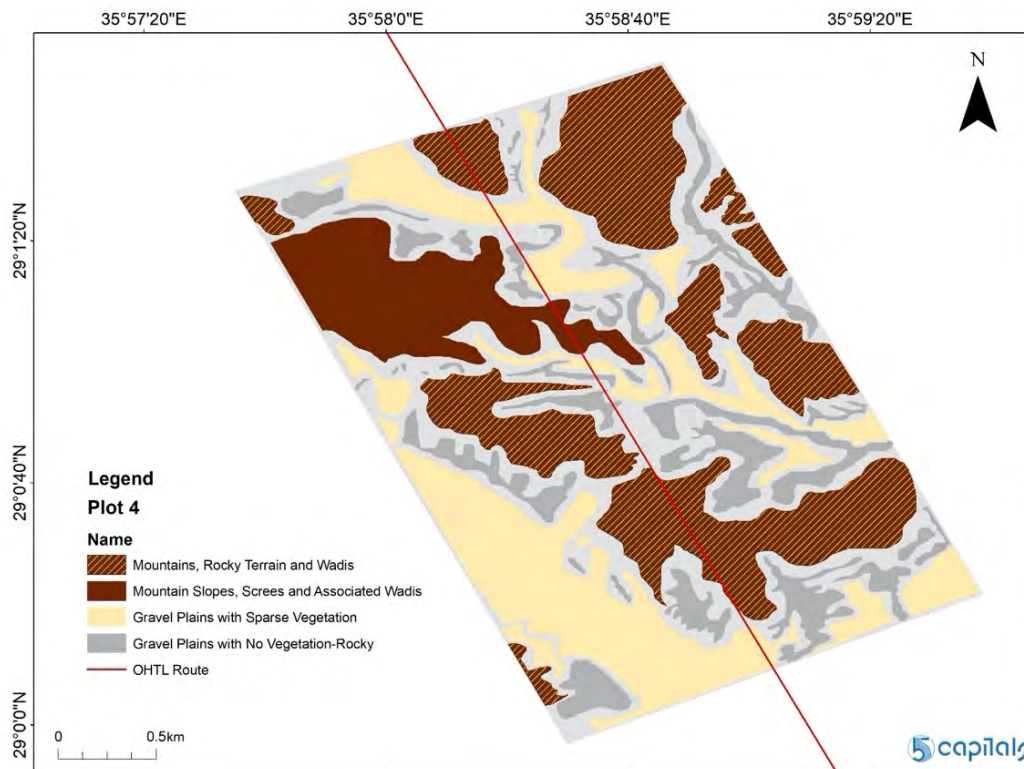


Figure 5-15 Plot 4 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 4 survey area.



Gravel Plains with Sparse Vegetation



Mountain Exposure in Gravel Plain

Figure 5-16 Photos of the Different Habitats Identified at Plot 4

Flora and Fauna: Vegetation is limited in Plot 4 with *Haloxylon salicornicum* sparsely dispersed across the gravel plains. Mammals and reptiles were not observed during the survey and no evidence of faunal activity was recorded on site. Very few common birds were observed at this Plot while no raptors were recorded.

5.2.3.4 Plot 11 Ground Truthing Survey Area

Site Conditions: The OHTL route crosses mainly through gravel plains with no vegetation and open wadi terrain surrounded by some escarpments and mountain slopes. The habitats identified in Plot 11 are shown on the following habitat map.

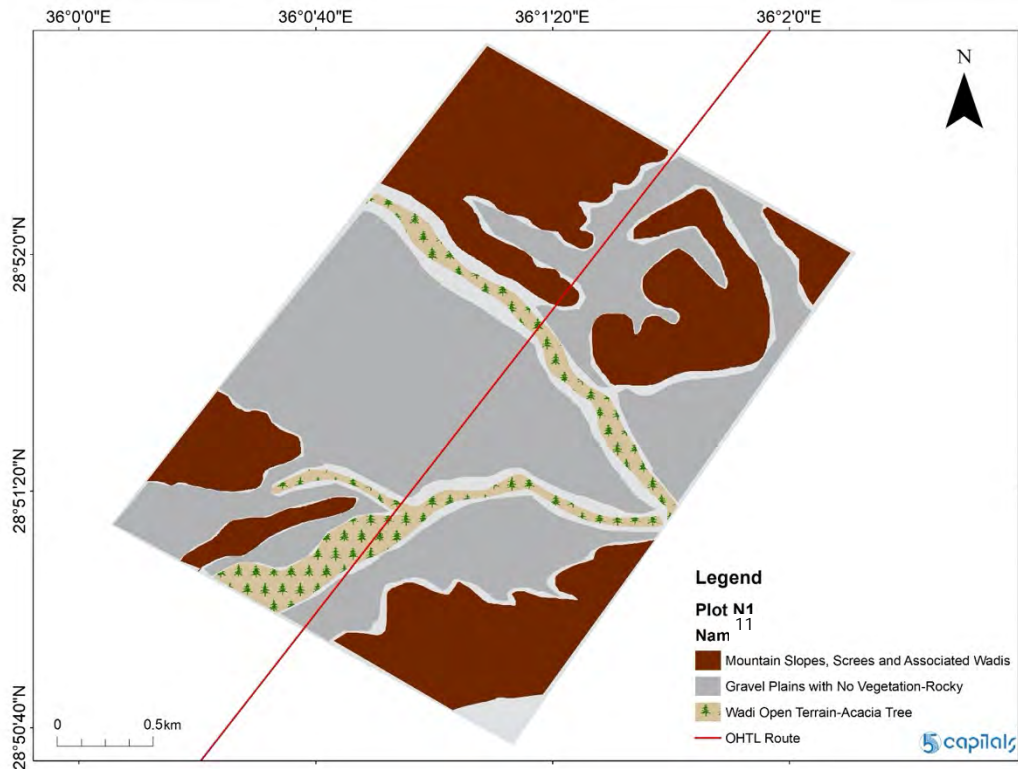


Figure 5-17 Plot 11 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 11 survey area.



Gravel Plains with No Vegetation



Escarpments in Gravel Plain

Figure 5-18 Photos of the Different Habitats Identified at Plot 11

Flora: Vegetation recorded at Plot 11 included significant numbers of Acacia trees as well as perennial species including *Haloxylon salicornicum*, *Haloxylon persicum*, *Artemisia monosperma* and *Citrullus colocynthis*.



Figure 5-19 Acacia Trees and Acacia Flower

Fauna: Common birds species and evidence of reptiles and mammals (e.g., burrows) were recorded at this plot.

5.2.3.5 Plot 5 Ground Truthing Survey Area

Site Conditions: Plot 5 is primarily characterised by mountains, rocky terrain, wadis and gravel plains with some vegetation and limited areas of Acacia trees. The habitats identified in Plot 5 are shown on the following habitat map.

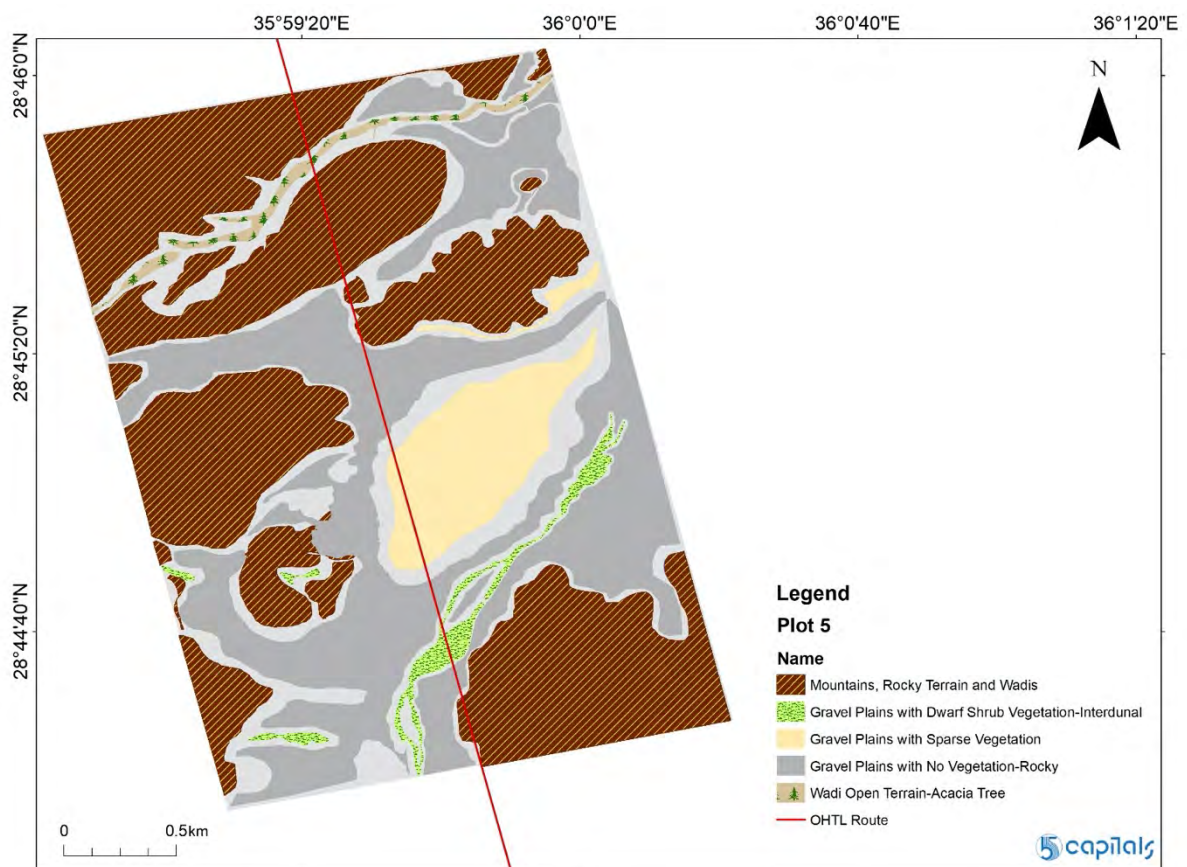


Figure 5-20 Plot 5 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 5 survey area.



Rocky/Gravel Plains with No Vegetation



Mountain Slope and Gravel Plain with Dwarf Vegetation

Figure 5-21 Photos of the Different Habitats Identified at Plot 5

Flora: The dominant flora species recorded at Plot 5 included Saxaul *Haloxylon salicornicum* in wadis. Other flora species recorded were perennial shrubs including *Haloxylon persicum*, *Salsola tetrandra*, *Artemisia monosperma*, *Retama raetam* and *Fagonia arabica*, perennial herbs (*Citrullus colocynthis*) and grass species (*Centropodia forsskaolii*). Sparse *Acacia* trees were present in open wadi terrain.



Fagonia arabica



Retama raetam

Figure 5-22 Examples of Flora Identified at Plot 5

Fauna: Camels and grazing activities were observed in the survey area. Burrows were observed on site indicating potential presence of reptiles in the survey area. Common birds were recorded during the survey, those included Eurasian Collared Dove (*Streptopelia decaocto*) and Laughing Dove (*Streptopelia senegalensis*).

5.2.3.6 Plot 6 Ground Truthing Survey Area

Site Conditions: The OHTL alignment at Plot 6 is located approximately 2 km from the agricultural areas surrounding Tabuk. The survey area is primarily comprised of mountainous rocky terrains and some gravel plains with sparse vegetation. Gravel plains with dwarf shrubs

were recorded to an area to the west of the OHTL alignment. The habitats identified in Plot 6 are shown on the following habitat map.

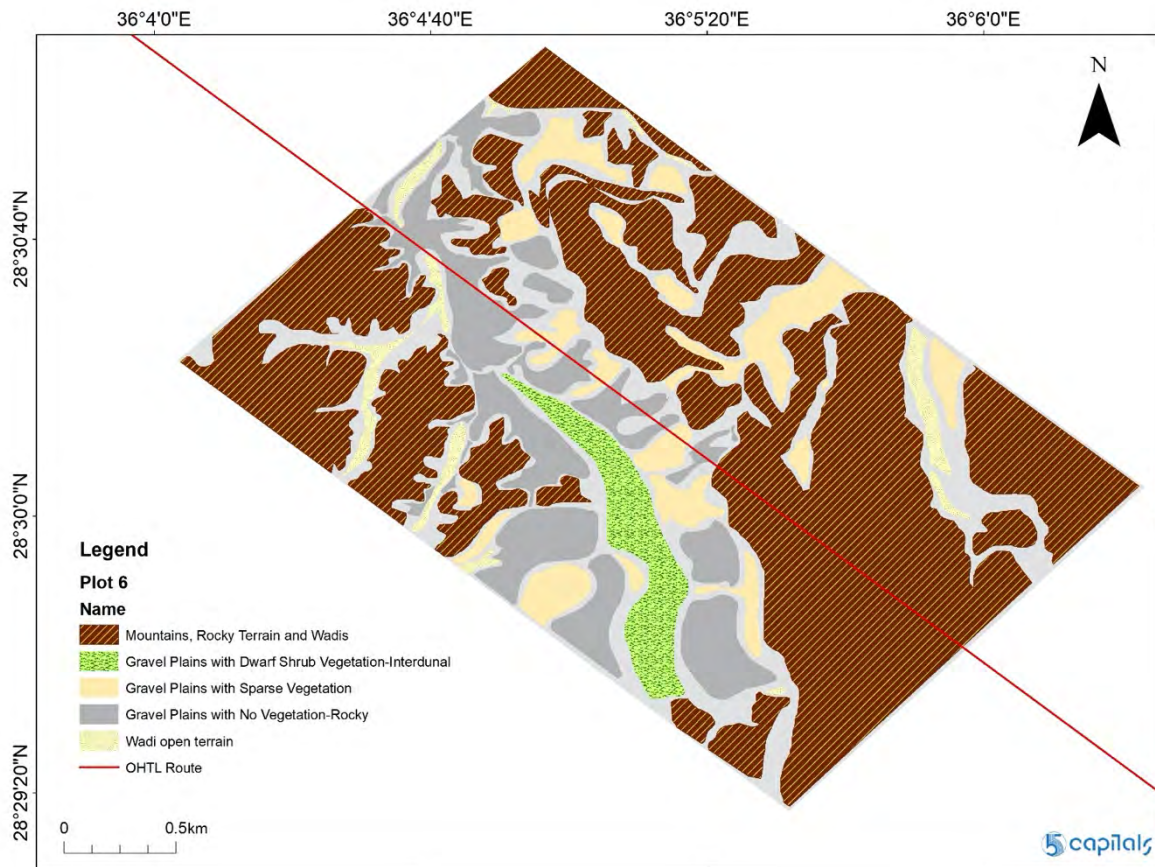


Figure 5-23 Plot 6 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 6 survey area.



Open plain with Vegetation



Gravel Plain with No Vegetation

Figure 5-24 Photos of the Different Habitats Identified at Plot 6

Flora: The main vegetation observed onsite included Acacia trees, *Haloxylon* sp. and *Retema* sp. Other common species recorded at Plot 6 included perennial shrubs such as *Artemisia*

monosperma, *Calligonum comosum*, *Lycium shawii*, annual herbs including *Picris cyanocarpa*, *Pulicaria undulata*, *Paronychia arabica* and *Neurada procumbens* as well as perennial herbs such as *Zilla spinosa*, *Citrullus colocynthis* and *Plantago albicans*.



Retama raetam



Lycium shawii

Figure 5-25 Examples of Vegetation Recorded at Plot 6

Fauna: Camels and grazing activities were observed in the survey area. Burrows were observed on site, indicating potential presence of reptiles or small mammals in the survey area.



Figure 5-26 Burrows of Reptiles or Mammals

Avifauna: Common birds such as Eastern Black-eared Wheatear *Oenanthe melanoleuca*, White-spectacled Bulbul *Pycnonotus xanthopygos*, Blackstart *Oenanthe melanura* and Eurasian Collared Dove *Streptopelia decaocto* were recorded at this survey area.



Figure 5-27 Blackstart (*Oenanthe melanura*)

5.2.3.7 Plot 12 Ground Truthing Survey Area

Site Conditions: The OHTL alignment at Plot 12 intersects with existing roads and crosses through areas dominated by gravel plains with dwarf shrubs and some open terrain wadis. The habitats identified in Plot 12 are shown on the following habitat map.

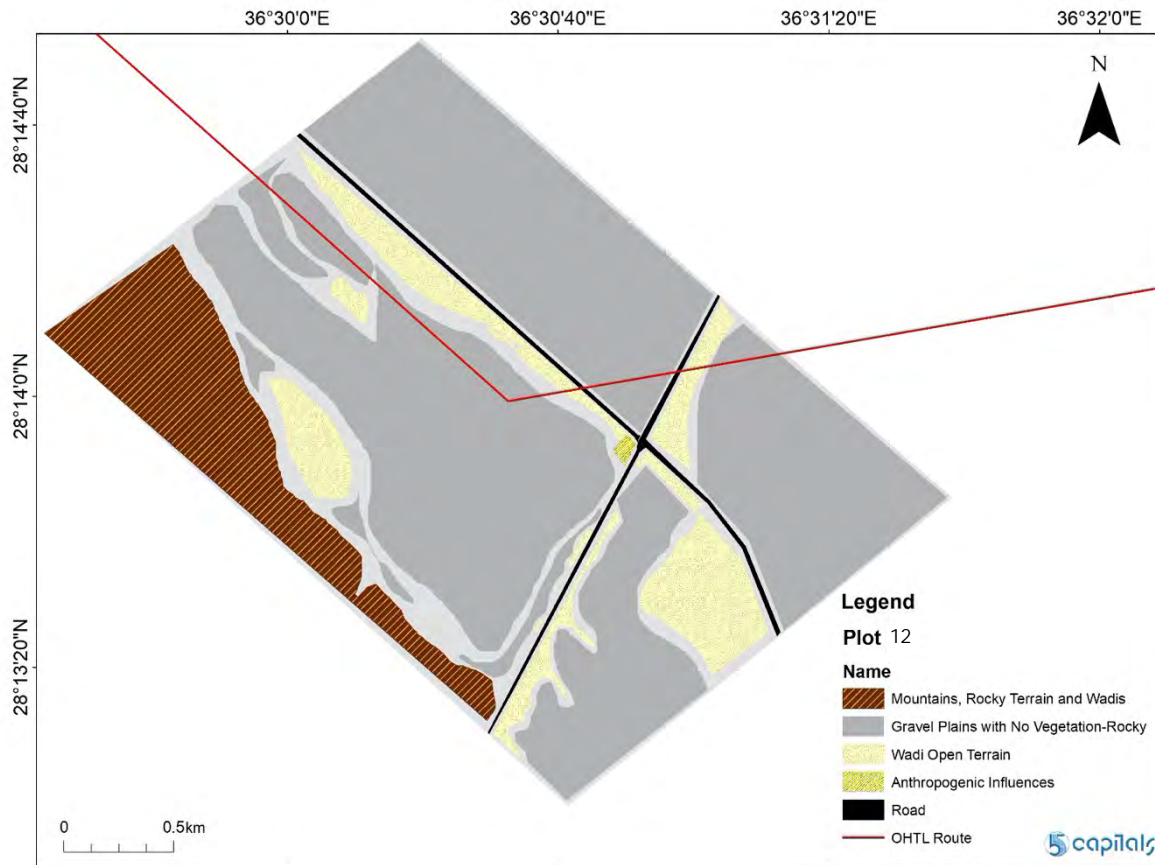


Figure 5-28 Plot 12 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 12 survey area.



Open/Gravel Plain with Vegetation



Gravel Plain with No Vegetation

Figure 5-29 Photos of the Different Habitats Identified at Plot 12

Flora: The area was dominated by a perennial herb, *Pulicaria undulata* while vegetation including *Haloxylon* sp. and Acacia trees were recorded occasionally at this survey area.

Fauna: Common bird species recorded at Plot 12 included Eurasian Collared Dove *Streptopelia decaocto*. Burrows were observed on site, indicating potential presence of reptiles or small mammals in the survey area.



Figure 5-30 Burrows of Reptiles or Mammals

5.2.3.8 Plot 13 Ground Truthing Survey Area

Site Conditions: The OHTL at Plot 13 crosses an area that is primarily characterized by mountains and open wadis as well as gravel plains with no vegetation. An area of gravel plains with dwarf shrub vegetation was recorded to the north of the alignment. The habitats identified in Plot 13 are shown on the following habitat map.

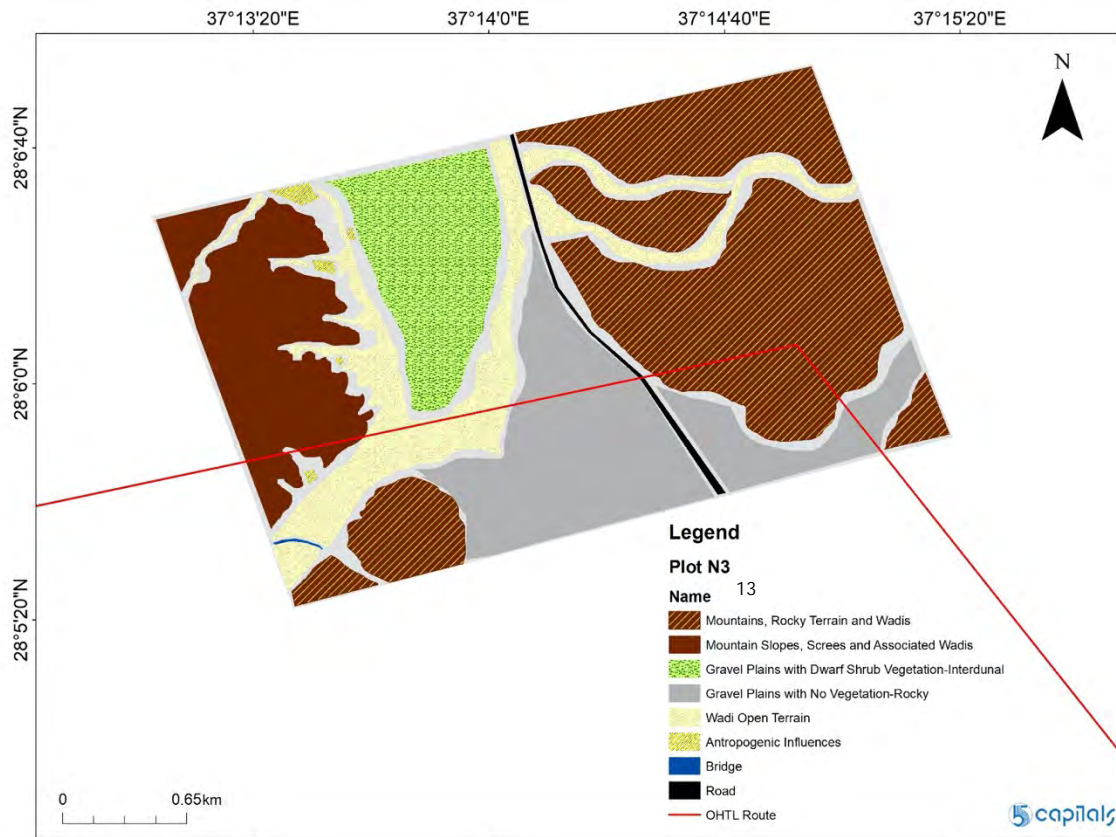


Figure 5-31 Plot 13 Habitat Map

The following figures provide an overview of the site conditions and the habitats within Plot 13 survey area.



Open/Gravel Plain with Shrub Vegetation



Mountain Escarpment and Gravel Plain with Dwarf Shrub

Figure 5-32 Photos of the Different Habitats Identified at Plot 13

Flora: The main flora species recorded at this site included *Acacia* trees, *Pulcheria* sp. and *Haloxylon* sp. The area is covered with perennial shrubs such as *Artemisia monosperma* and *Fagonia arabica*, annual herbs such as *Anastatica hierochuntica* and *Malva parviflora* as well as *Centropodia forsskaolii* grass species.



Pulicaria undulata



Malva parviflora

Figure 5-33 Examples of Flora Identified at Plot 13

Fauna: Camels and grazing activities were observed at the survey area. Burrows were observed on site, indicating potential presence of reptiles or small mammals in the survey area.

Avifauna: Eurasian Laughing Dove *Spilopelia senegalensis*, Arabian Green Bee-eater *Merops cyanophrys*, House sparrow *Passer domesticus* and Eastern Black-eared Wheatear *Oenanthe melanleuca* were recorded (10 - 20 individuals).



Figure 5-34 Example of House Sparrow Observed at Plot 13

5.2.3.9 Plot 7 Ground Truthing Survey Area

Site Conditions: Plot 7 is located approximately 5 km from the main city of Tabuk. The OHTL route runs parallel to an existing road and transmission line and crosses through areas of sand sheets and dunes as well as gravel plains with no vegetation. The surrounding area at Plot 7 is characterized by few escarpments, gravel plains with shrub vegetation and sand sheets. Waste dumping areas and some ongoing construction activities were observed around 400m from the proposed OHTL route indicating that the area is impacted by human activity. The habitats identified in Plot 7 are shown on the following habitat map.

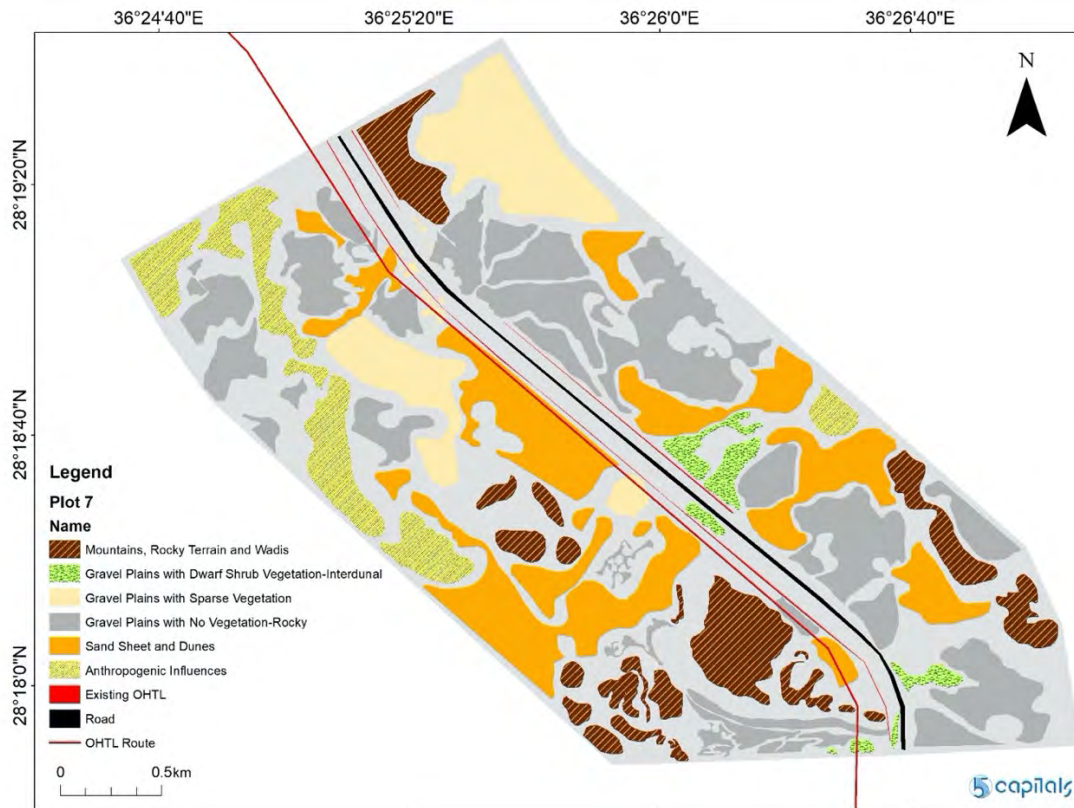


Figure 5-35 Plot 7 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 7 survey area.



Gravel/Rocky Terrain



Mountain Escarpments and Gravel Plain



Gravel Plains with Sparse Vegetation

Figure 5-36 Photos of the Different Habitats Identified at Plot 7

Flora: *Haloxylon* sp. was recorded at Plot 7, in addition to perennial shrub species (*Salsola vermiculata* and *Heliotropium digynum*), perennial herbs (*Citrullus colocynthis* and *Seetzenia lanata*), and annual herbs (*Bassia eriophora*, *Pulicaria undulata*, *Paronychia arabica* and *Cleome amblyocarpa*).



Burrows in *Haloxylon salicornicum*



Haloxylon salicornicum



Seetzenia lanata



Citrullus colocynthis

Figure 5-37 Flora Observed at Plot 7

Fauna: Camels and grazing activities were observed in the survey area. Burrows were evident on site, indicating potential presence of reptiles or small mammals in the survey area. Common bird species were recorded during the survey.

5.2.3.10 Plot 8 Ground Truthing Survey Area

Site Conditions: Plot 8 is characterised by two main habitats, gravel plains with sparse vegetation or dwarf shrub vegetation and interdunes. The site had mounds of small sand dunes over gravel plain formed by the deposition of wind-driven loose sand. The habitats identified in Plot 8 are shown on the following habitat map.

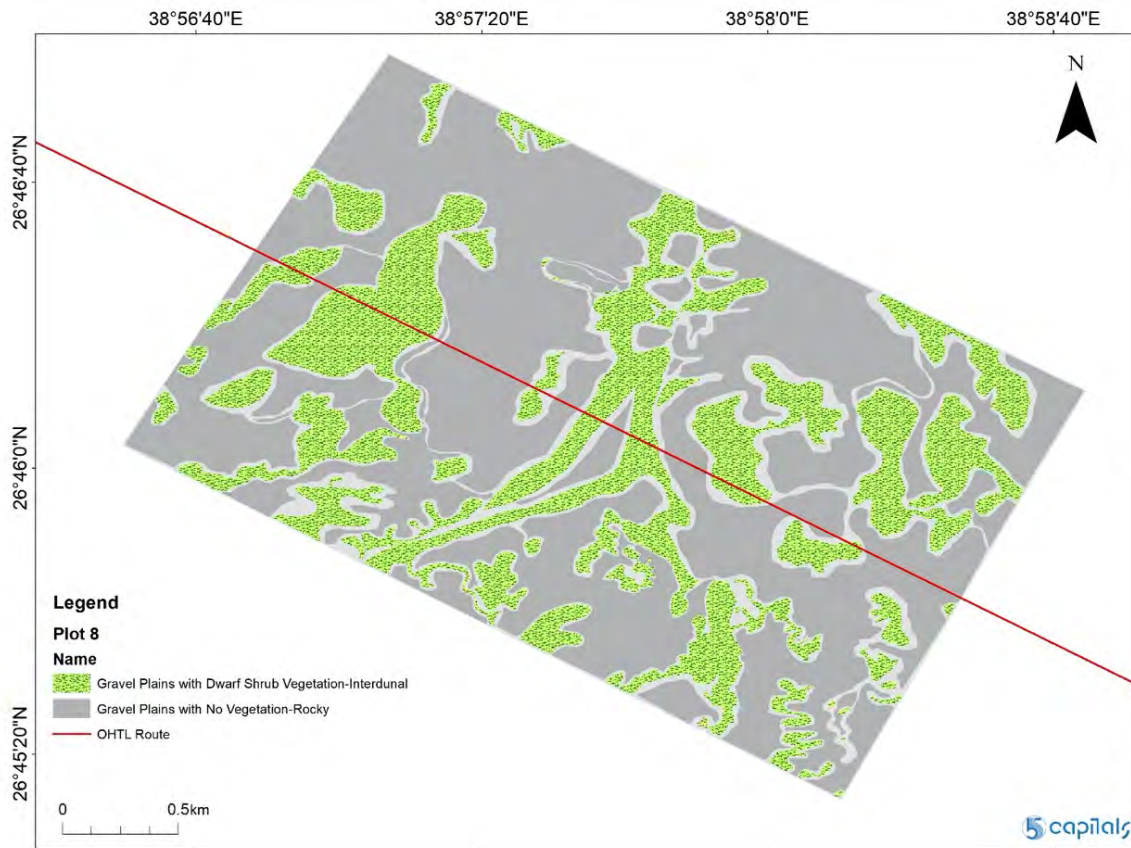


Figure 5-38 Plot 8 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 8 survey area.



Sand Sheets with Vegetation



Gravel Plains with Sparse Vegetation

Figure 5-39 Photos of the Different Habitats Identified at Plot 8

Flora: The sandy sheets are located in low lying areas and support the growth of *Haloxylon* sp.

Fauna: The elevated gravel plain shows no vegetation but supports reptiles with the presence of burrows and a recorded Spiny tailed Lizard *Uromastyx aegyptia*. The STL is classified as a Vulnerable species by the IUCN and is a HCP species. Eastern Black-eared Wheatear *Oenanthe melanleuca* was recorded at Plot 8.



Spiny tailed Lizard *Uromastyx aegyptia*



Burrow

Figure 5-40 Spiny Tailed Lizard and Burrows Recorded at Plot 8

5.2.3.11 Plot 9 Ground Truthing Survey Area

Site Conditions: The OHTL route at Plot 9 crosses through two main habitats including gravel plains with sparse vegetation, and open wadis with Acacia trees. Mountainous slopes with scree and wadis surround the proposed OHTL route. The habitats identified in Plot 9 are shown on the following habitat map.

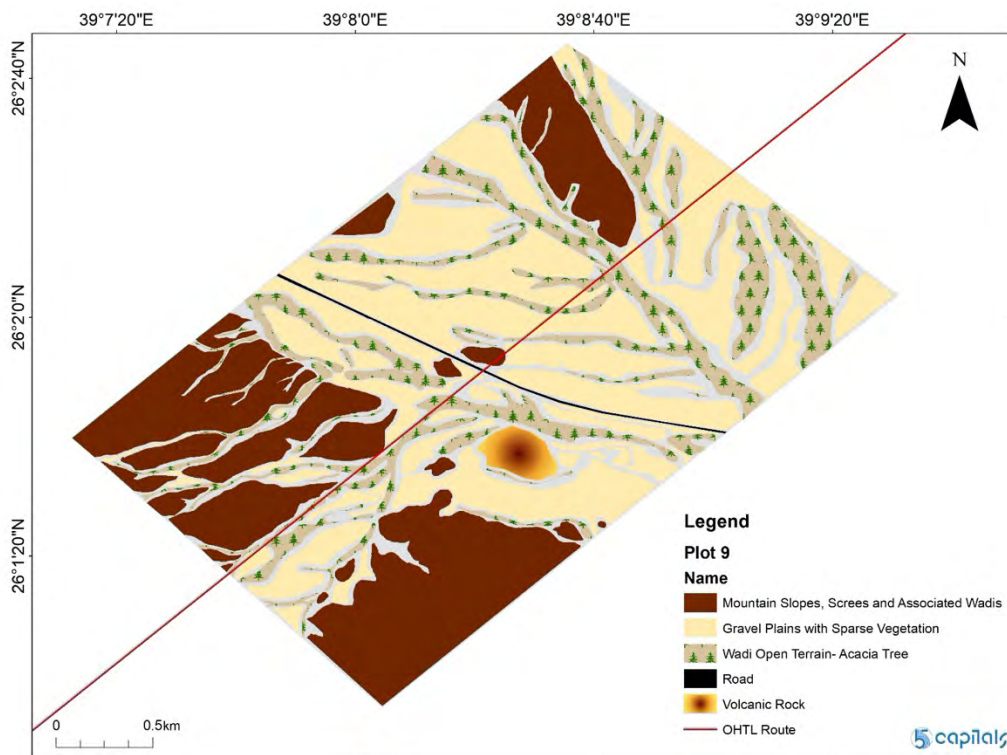


Figure 5-41 Plot 9 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 9 survey area.



Gravel Plains with Vegetation



Grazing Activity



Acacia ehrenbergiana in Gravel Plain

Figure 5-42 Photos of the Different Habitats Identified at Plot 9

Flora: Two species of *Acacia*, *Acacia tortilis* and *Acacia ehrenbergiana* were recorded at plot 9; *Acacia* trees were recorded in significant numbers in the wadis with sandy gravel habitat, (40-50 mature and immature *Acacia* trees in a sample area of 0.1 sq km), whereas very sparse *Acacia* tree population was observed in the rocky gravel plain. Other vegetation recorded at Plot 9 included *Lycium* sp. and a rare sighting of *Maerua crassifolia* tree.



Figure 5-43 *Acacia tortilis* (left) and *Maerua crassifolia* (right)

Fauna: Several common birds including the White-spectacled Bulbul and Eastern Black-eared Wheatear (10-40 total numbers) as well as nests in trees were recorded during the survey.

Burrows were evident on site, indicating potential presence of reptiles or small mammals in the survey area. An insect and its borrow were also observed.



Figure 5-44 Reptiles or Small Mammal Burrow



White-spectacled Bulbul



Eastern Black-eared Wheatear

Figure 5-45 Birds Observed Onsite

5.2.3.12 Plot 10 Ground Truthing Survey Area

Site Conditions: Plot 10 is located approximately 60 km from Madinah. The majority of the site is comprised of mountains slopes and open wadis with vegetation and Acacia trees. The habitats identified in Plot 10 are shown on the following habitat map.

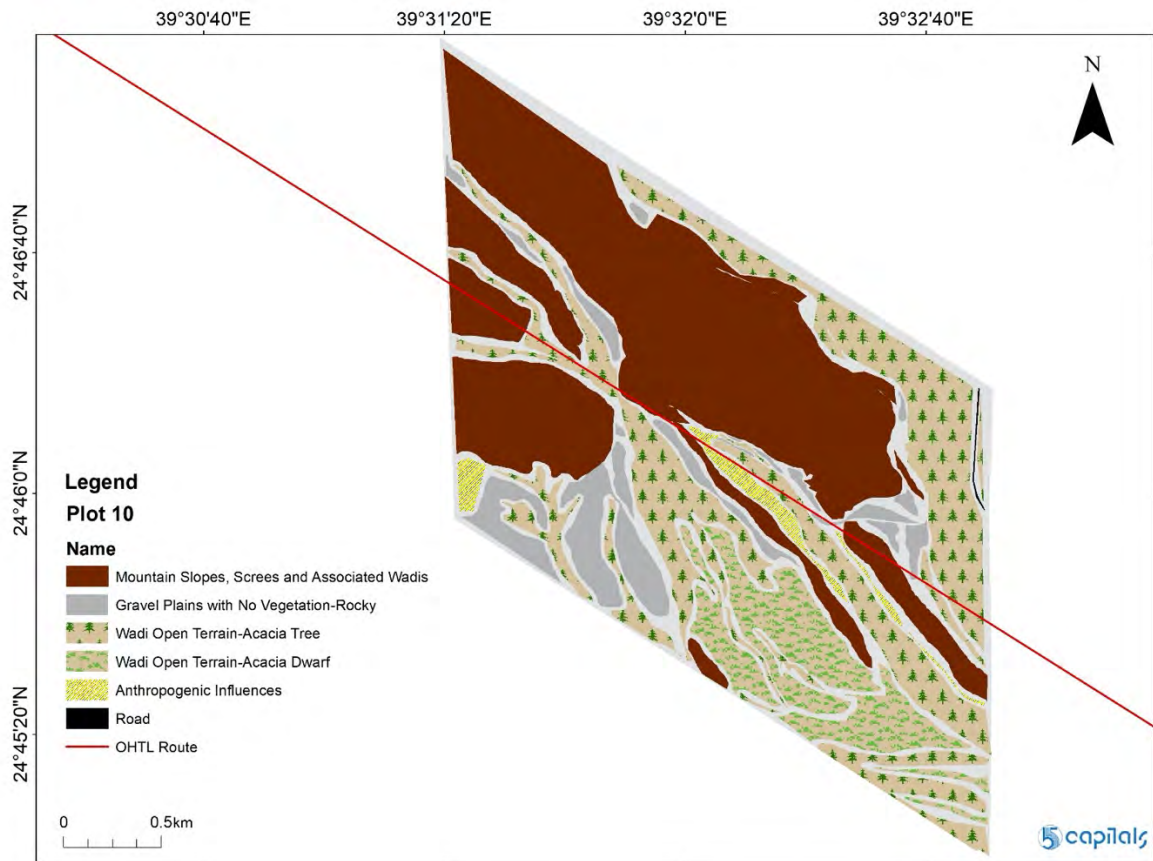


Figure 5-46 Plot 10 Habitat Map

The figures below provide an overview of the site conditions and the habitats within Plot 10 survey area.



Gravel Plain with Sparse Vegetation



Gravel Plains with Acacia Trees

Figure 5-47 Photos of the Different Habitats Identified at Plot 10

Flora: The survey indicated that Acacia trees are a dominant species in Plot 10 and were found in large numbers within wadis of sandy habitat (*Acacia tortillas* and *Acacia ehrenbergiana*) whereas the stony gravel plain provided habitat for dwarf Acacia population. Other species included perennial herbs including *Aizoon canariense*, *Citrullus colocynthis*,

Cucumis prophetarum and *Tribulus terrestris*, perennial shrubs such as *Calotropis procera*, *Morettia parviflora* and *Heliotropium* sp., annual herbs like *Centaurea sinaica*, *Launaea capitata*, *Picris cyanocarpa*, *Diplotaxis acris*, *Sclerocephalus arabicus*, *Malva parviflora*, *Forsskaolea tenacissima* and *Tetraena simplex*, as well as *Digitaria sanguinalis* grass species.



Launaea capitata



Tetraena simplex



Cucumis prophetarum



Sclerocephalus arabicus



Calotropis procera



Forsskaolea tenacissima

Figure 5-48 Examples of Flora Recorded at Plot 10

Fauna: There were 20-50 common birds observed during the survey at Plot 10, including nests in some trees. Reptiles were not observed during the survey while an insect and its burrow was recorded.



Bird Nest



Birds Blackstart

Figure 5-49 Birds Recorded at Plot 10

5.2.3.13 Summary of Survey Findings

A total of 52 species of flora belonging to 22 families, all of which are categorised as Least Concern (LC) or Not Evaluated were recorded in all the surveyed areas. The abundance of these within each survey Plot are shown on the table below.

A total of nine common birds species of LC were identified at different survey Plots. Three reptiles were recorded including the STL which is a HCP and is considered vulnerable according to the IUCN. In addition, four mammals were identified.

Table 5-1 Flora Recorded at Different Sampling Points within the Surveyed Areas



FAMILY	SPECIES	TYPE	HABIT	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Acanthaceae	<i>Blepharis ciliaris</i>	Perennial	Herb	+										
Aizoaceae	<i>Aizoon canariense</i>	Perennial	Herb								++			
Amaranthaceae	<i>Aerva javanica</i>	Perennial	Herb	+										
Amaranthaceae	<i>Bassia eriophora</i>	Annual	Herb					+						
Amaranthaceae	<i>Salsola tetrandra</i>	Perennial	Shrub			+								
Amaranthaceae	<i>Haloxylon salicornicum</i>	Perennial	Shrub	+++	+++	+++	+++	+++	+++				+++	+++
Amaranthaceae	<i>Haloxylon persicum</i>	Perennial	Shrub	+		+	++							
Amaranthaceae	<i>Salsola vermiculata</i>	Perennial	Shrub					+						
Apocynaceae	<i>Calotropis procera</i>	Perennial	Shrub								++			
Apocynaceae	<i>Leptadenia pyrotechnica</i>	Perennial	Shrub				+							
Apocynaceae	<i>Pergularia tomentosa</i>	Perennial	Herb	+										
Apocynaceae	<i>Rhazya stricta</i>	Perennial	Shrub							+				
Asteraceae	<i>Artemisia monosperma</i>	Perennial	Shrub			+	+							+
Asteraceae	<i>Centaurea sinaica</i>	Annual	Herb								+			
Asteraceae	<i>Launaea capitata</i>	Annual	Herb								++			
Asteraceae	<i>Picris cyanocarpa</i>	Annual	Herb	+			+				+			
Asteraceae	<i>Pulicaria undulata</i>	Annual	Herb				+	+					+	+++
Asteraceae	<i>Senecio glaucus</i>	Annual	Herb	+										
Boraginaceae	<i>Arnebia hispidissima</i>	Annual	Herb	+										
Brassicaceae	<i>Anastatica hierochuntica</i>	Annual	Herb	+										+
Brassicaceae	<i>Diplotaxis acris</i>	Annual	Herb								+			
Brassicaceae	<i>Morettia parviflora</i>	Perennial	Shrub								+			
Brassicaceae	<i>Zilla spinosa</i>	Perennial	Herb	++			+							




FAMILY	SPECIES	TYPE	HABIT	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Capparaceae	<i>Maerua crassifolia</i>	Perennial	Tree							+				
Caryophyllaceae	<i>Paronychia arabica</i>	Annual	Herb				+	+						
Caryophyllaceae	<i>Sclerocephalus arabicus</i>	Annual	Herb	+							+			
Cleomaceae	<i>Cleome amblyocarpa</i>	Annual	Herb	++				++						
Cucurbitaceae	<i>Citrullus colocynthis</i>	Perennial	Herb	+		++	++	+			+			
Cucurbitaceae	<i>Cucumis prophetarum</i>	Perennial	Herb								+			
Fabaceae	<i>Acacia ehrenbergiana</i>	Perennial	Tree	++		++				++	++	++		
Fabaceae	<i>Acacia tortilis</i>	Perennial	Tree	++			+++			+++	+++	+++		++
Fabaceae	<i>Acacia spp</i>	Perennial	Tree								+	++	+	++
Fabaceae	<i>Retama raetam</i>	Perennial	Shrub	+		+++	+++		+++					
Fabaceae	<i>Senna italica</i>	Perennial	Shrub	+										
Heliotropiaceae	<i>Heliotropium digynum</i>	Perennial	Shrub					++						
Heliotropiaceae	<i>Heliotropium sp</i>	Perennial	Shrub								+			
Lamiaceae	<i>Otostegia fruticosa</i>	Perennial	Shrub	+										
Malvaceae	<i>Malva parviflora</i>	Annual	Herb								++			++
Neuradaceae	<i>Neurada procumbens</i>	Annual	Herb				+							
Plantaginaceae	<i>Plantago albicans</i>	Perennial	Herb				+							
Plantaginaceae	<i>Plantago boissieri</i>	Perennial	Herb	++										
Poaceae	<i>Centropodia forsskaolii</i>	Perennial	Grass			+								+
Poaceae	<i>Digitaria sanguinalis</i>	Annual	Grass								+			
Poaceae	<i>Stipagrostis obtusa</i>	Perennial	Grass	+++										
Polygonaceae	<i>Calligonum comosum</i>	Perennial	Shrub	+			++							
Polygonaceae	<i>Rumex vesicarius</i>	Annual	Herb	+										
Solanaceae	<i>Lycium shawii</i>	Perennial	Shrub				++			+	+			




FAMILY	SPECIES	TYPE	HABIT	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Urticaceae	<i>Forsskaolea tenacissima</i>	Annual	Herb	++							+			
Zygophyllaceae	<i>Fagonia arabica</i>	Perennial	Shrub	+++		++								++
Zygophyllaceae	<i>Seetzenia lanata</i>	Perennial	Herb					++						
Zygophyllaceae	<i>Tetraena simplex</i>	Annual	Herb	+++							+++			
Zygophyllaceae	<i>Tribulus terrestris</i>	Perennial	Herb	++							+			+
Abundant +++ , Occasional ++ , Rare +														

The nine birds' species, three reptiles, four mammals and one insect species recorded are presented in the tables below.

Table 5-2 Avifauna Species Recorded at the Surveyed Areas

ORDER	SPECIES	COMMON NAME	IUCN	PHOTOS	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Columbiformes	<i>Spilopelia senegalensis</i>	Laughing Dove	LC		8			7							
Columbiformes	<i>Streptopelia decaocto</i>	Eurasian Collared Dove	LC					4	4		5		3	11	

ORDER	SPECIES	COMMON NAME	IUCN	PHOTOS	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Coraciiformes	<i>Merops cyanophrys</i>	Arabian Green Bee-eater	LC						2						
Passeriformes	<i>Oenanthe leucopyga</i>	White-crowned wheatear	LC						4	4					2
Passeriformes	<i>Oenanthe melanoleuca</i>	Eastern Black-eared Wheatear	LC											4	6

ORDER	SPECIES	COMMON NAME	IUCN	PHOTOS	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Passeriformes	<i>Oenanthe melanura</i>	Blackstart	LC				4				6				5
Passeriformes	<i>Passer domesticus</i>	House sparrow	LC		4	2					7			9	10
Passeriformes	<i>Pycnonotus xanthopygos</i>	White-spectacled Bulbul	LC									4		5	4


ORDER	SPECIES	COMMON NAME	IUCN	PHOTOS	PLOT 1	PLOT 4	PLOT 5	PLOT 6	PLOT 7	PLOT 8	PLOT 9	PLOT 10	PLOT 11	PLOT 12	PLOT 13
Passeriformes	<i>Ammomanes deserti</i>	Desert lark	LC				2				4	5	4		3

Table 5-3 Insect Species Recorded from the Surveyed Areas


COMMON NAME	SCIENTIFIC NAME	IUCN STATUS	PHOTOS	PLOT 9	PLOT 10	PLOT 13
Pitted Beetle	<i>Adesmia cancellate</i>	LC		+	+	+

Table 5-4 Reptiles Recorded from the Surveyed Areas








COMMON NAME	SCIENTIFIC NAME	IUCN STATUS	PHOTOS	PLOT 9	PLOT 10	PLOT 13
Bosk's fringe-toed lizard	<i>Acanthodactylus boskianus</i>	LC		+	+	+
Spiny-tailed Lizard	<i>Uromastyx aegyptia</i>	VU		+	+	+
Schmidt's Fringe-toed Lizard	<i>Acanthodactylus schmidti</i>	LC		+	+	+

Table 5-5 Mammals Recorded at the Surveyed Areas

MAMMALS	PHOTOS
Domestic goats- <i>Capra hircus</i>	
Feral Dog- <i>Canis familiaris</i>	
Domestic Donkey- <i>Equus africanus</i>	
Domestic Camel- <i>Camelus dromedarius</i>	

5.3 Potential Impacts

5.3.1 Construction

5.3.1.1 Habitat Loss

The terrestrial ecology ground truthing survey along the OHTL route identified that the Project area includes mountains, wadi habitats and open plains that support the growth of multiple species of vegetation including Acacia sp. which is of national importance in KSA especially Portions 1 and 3 of the OHTL. The survey also identified the presence of gravel wadi plains that provide habitat to STLs (one was recorded at Plot 8 along Portion 3 of the OHTL) and the existing EIA for Portion 2 identified the presence of STL. The STLs are widespread in the deserts within KSA and are listed as Vulnerable according to IUCN and HCP species in KSA. The area also provides habitat to different resident birds species. In addition to its ecological service for grazing animals in the area.

The OHTL route extends over a long distance, and even though the vegetation species identified are LC and may not all be located directly within the OHTL footprint, the clearing, grading, excavation and other earthworks during early construction stages will potentially result in habitat loss (including fauna burrows). Micro siting the pylons and implementing good construction practices and the required mitigation measures can help limit the OHTL construction footprint to the active work areas only which includes the locations of the pylons/towers, TCFs and the new dirt roads used for incoming and outbound traffic. Considering some habitats may re-establish over time (e.g. in areas under towers and dirt roads that are not often used) the impact may not be permanent.

The converter substations are located near existing substations and main roads in Tabuk and Madinah in areas that may have previously been disturbed by other Projects. The review of satellite imagery indicated that the converter stations areas are rocky/mountainous and did not indicate the presence of vegetation. Therefore, the construction of the converter stations is not expected to result in significant habitat loss. It is understood that an EIA will be prepared for the converter and transmission stations including an ecology survey, it will be important for the survey to identify the presence of sensitive species and accordingly propose the required measures. The transmission station is located in an area that is disturbed by vehicle tracks and activities from the NEOM Project in its close vicinity and therefore, no significant habitat loss is expected from the construction of the transmission station in Aqaba.

5.3.1.2 Biodiversity Loss

The terrestrial ecology ground truthing survey along the OHTL route confirmed the presence of STLs that are listed as Vulnerable according to the IUCN and HCP species in KSA and recorded several burrows that indicate the potentially presence of other small mammals or reptiles. The survey also recorded resident birds that are LC and common to the area as well as domesticated and grazing animals.

Clearing of existing vegetation will result in direct loss and mortality of removed specimens. Further, fauna such as burrowing rodents and reptiles including STL may be directly crushed during earthworks leading to injury or mortality.

Fauna can be runover or involved in collisions with motorised vehicles and equipment. Vehicle-related mortality from construction trucks and machinery are less of a concern for larger mammals such as grazing animals which are easier to notice/detect and more likely to disperse in time to avoid collision (as the site vehicles will be traveling under speed restrictions and large equipment movement will be very slow).

Small to medium sized fauna such as reptiles and rodents have a higher chance of mortality from construction vehicular and machinery collisions.

The presence of site workers may lead to increased hunting, poaching, or gathering on site. Flora and vegetation might be gathered for consumption, while spiny tailed lizards or avifauna species may be poached for consumption or for domestic trade.

5.3.1.3 Environmental Quality

AIR

Dust generated during construction works can coat vegetation, reducing photosynthesis and respiration ability, causing desiccation. Emissions of pollutants such as NO_x, SO_x, PM and CO can lower survivorship and increase susceptibility of affected wildlife to disease.

Such impacts are likely due to the typical open dusty and sandy nature of soils, with impacts being most significant in areas with denser vegetation.

NOISE AND VIBRATION

Construction noise can cause acoustic masking, disturbance and displacement, and general reduction in survivorship and reproductive success in a variety of fauna. Most impacted are acoustic communicators such as bird and bat species.

Vibration can cause disturbance but also result in collapse of underground burrows and tunnels, particularly impacting burrowing mammals and reptiles as well as invertebrates and roosting or hibernating bats.

It is typically expected that noise and vibration impacts will result in a flight response from the affected area, which will be a temporary impact.

LIGHTING

Night-time lighting can impact nocturnal wildlife behaviour. It can act as an attractant, which can cause congregation and higher predation rates / change movement and migration behaviour; act as a repellent which causes displacement; or interfere with the circadian cycle and cause lower survivorship and reproductive success. However, lighting will be required only

at specific work areas, thereby limiting lighting to relatively small areas, if at all - where night work is required.

SOIL AND GROUNDWATER

Fuels and solvents will be used during construction activities. Improper use, storage and handling can result in chemical spills and contamination of the soil and groundwater.

During construction earthworks and vehicle movement, soils may become compacted, which prohibits vegetation regrowth and use for burrowing.

LITTERING

Improper management of solid waste such as plastic containers and plastic bags, may result in wind-blown litter, which are a danger to wildlife and the local community grazing herds of goats and camels due to entanglement or ingestion.

5.3.2 Operation

5.3.2.1 OHTL Collisions

The survey and VPs carried out along the OHTL route did not identify the presence of migrating birds, raptors, or raptors nests which could be attributed to the fact that it was carried out at the end of the spring birds' migrating season. It is also noted that the surveys of the OHTL areas at the borders with Jordan were not carried out due to border control and police restrictions. The northern area of the OHTL between Tabuk and Aqaba is known to be an important birds migration flyway and therefore, the potential for migrating birds to fly over/through the Project area cannot be ruled out and those areas in the north may be more susceptible to impacts are more likely to experience potential birds collision and mortality; this may require dedicated birds monitoring survey during migration seasons to confirm.

Thin, dark wires used in OHTLs are visually difficult to detect. Bird mortality by collisions with these wires have been documented for a variety of species.

In the case of power lines, the bird collides with one of the wires, generally the earth wire, which is less visible. Particularly at risk are birds migrating between 20 – 50 m altitude, birds flying at night, birds flying in flocks, and / or large and heavy birds of limited manoeuvrability.

5.3.2.2 OHTL Electrocutation

OHTL present potential electrocution risk to birds. In particular, larger-bodied birds which tend to prefer perching at high altitudes such as raptors, including eagles and vultures, have the highest risk for electrocution, as larger wingspans create the opportunity for span the distance between energised and ground components of power lines. Further compounding the impact is the fact that many of these species are K-selected with low reproductive rates, so additive mortality is of significance.

5.4 Recommended Mitigation Measures

5.4.1 Construction

5.4.1.1 Habitat Loss

The following key mitigation measures are to be implemented:

- Minimize the built footprint in design and minimize construction buffer zone as much as practically possible.
- Restore habitat post-construction in unused land areas that are not required for O&M maintenance.
- Pre-construction walkover survey of Project footprints to identify fauna burrows (specifically STL burrows) and high value flora (such as Acacia sp.).
- Micro siting of OHTL towers to avoid high value flora and burrows and keep a buffer zone within which construction activities should not be allowed. If micro siting is not possible then relocation of STL and Acacia sp may be required. This should be carried out after obtaining the required permits from the National Centre for Vegetation Cover and Combatting Desertification (NCVCCD).
- Prior to start of construction, relocation of any STLs within the construction footprint.
- For low value species such as other, chance-find procedures with individual relocations as deemed necessary may be required.
- Restore habitat post-construction in unused land areas that are not required for O&M maintenance.

5.4.1.2 Biodiversity Loss

The following mitigation measures will be implemented:

- An STL was recorded at survey area Plot 8 along Portion 3 of the OHTL, once the access road routes and the towers locations are identified, a survey should be carried out to identify the presence of STLs or their burrows in these locations and accordingly reroute the road and shift the towers if possible or relocate the STLs.
- Micro site pylons/towers and pylons to avoid burrows and vegetation to the extent possible.
- The Pre-construction survey for the locations of the pylons should include in-situ signage and avoidance and protection of trees where possible.
- To aid re-vegetation, topsoil from the vegetated sand sheets (containing the most nutrient rich soils) should be removed and stored for spreading over any laydown areas once construction has been completed.
- Strict speed controls which will be enforced by EPC HSE and Security teams.
- Prohibit driving outside of delineated access roads and restrict driving and machinery operation to daylight hours, where practical.
- Protocol for recording and removal of any road-kill carcasses immediately upon observation to at least 10 m away from the access roads.

- Strict controls forbidding the gathering, poaching or otherwise disturbance of any flora or fauna on site, included in induction training.
- Staff training and toolbox talks on specific species of concern such as STLs which might be hunted or captured.

5.4.1.3 Environmental Quality - Air, Noise and Lighting

These impacts can be managed with good international practice mitigation measures e.g., implementing noise and air mitigation measures, reducing light spill, waste management etc. as per the Project's CESMP.

5.4.2 Operation

5.4.2.1 OHTL Collision

The following mitigation measures will be implemented, where practical, to further reduce collision risk:

- Removing the thin neutral or earth (shield) wire above the high voltage transmission lines where feasible, and where this is not possible, marking the line to make it more visible.
- Bundling high voltage wires, and using spacers to increase visibility.
- Minimising the vertical spread of power lines. Having lines in a horizontal plane reduces collision risk.
- Where practical, using existing infrastructure corridors such as road RoW, existing powerline transmission corridors, and other areas with existing disturbances that deter bird activity.
- Birds monitoring survey for selected areas in the northern part of the alignment where the OHTL route crosses the Red Sea-Rift Valley flyway is recommended by establishing representative VPs along the northern part of Portion 1 OHTL alignment during the spring (mid-March to mid-May) and autumn (September to November). The VPs survey should cover a minimum of 36 hours at representative VPs locations to determine the number and types of birds and the height at which they fly to determine the potential impacts on migrating birds. Based on that, the need for developing a Collision Risk Management Plan (CRMP) will be confirmed; the CRMP may include fatality monitoring and an adaptive management program to determine how anti-collision mitigation shall be applied and upscaled.

5.4.2.2 OHTL Electrocutation

Where practical, the following mitigation measures will be implemented to further reduce electrocutation risk:

- Ensure a safe design of the cross arm and related equipment (separate energised conductors and grounded hardware distances by more than largest species wingspan)
- Use suspended insulators and avoid pin and dead-end/strain insulators

- Ensure safe distance (minimum 2 m) between suspended conductor/jumper wire and lower branch in the cross arm.
- In the configurations with high electrocution risk (derivations, tap, transformer and switch poles and its connected grounded wires and jumpers) all grounded elements should be insulated, and grounded wires and jumpers should be sheathed wires.

6 LAND USE AND LAND ACQUISITION

Further to the limited social and land use information provided in the EIAs prepared for the Project, this 'Land Use and Land Acquisition' addendum has been included to try and bridge the gaps identified in the EIAs and to provide an overview of the potential formal and informal land users and affected communities within the OHTL ROW.

This addendum intends to clarify the situation in regard to the land use in the Project area, highlight potential residential, agricultural, or grazing activities taking place within the Project footprint and identify the required on-going management strategies to achieve compliance with lender requirements.

6.1 Standards and Regulatory Requirements

6.1.1 KSA Requirements

Appendix 2 and 3 of the Implementing Regulations on Environmental Permits for the Construction and Operation of Activities of the National Environmental Law 2021, provide the Model and Content of the EIA Report for Category 2 and 3 Projects which identifies that EIAs should include a socioeconomic baseline chapter and an analysis and assessment of impacts on land use and socioeconomics.

It is also notable that under MEWA Implementing Regulations (2021) that vegetation is protected and trees cannot be cut down without a permit from the National Centre for Vegetation. Therefore it is important that perennial vegetation (tree, shrubs and other flora) and annual grasses and low growing flora which are used by herders for grazing need to be protected and the OHTL route should minimize impact wherever possible as these will impact the food availability for camels, sheep and goats.

However, there are no specific requirements in KSA concerning involuntary resettlement from land where there are no formal rights or informal land use.

6.1.2 Lender Requirements

IFC PERFORMANCE STANDARDS (PS) ON ENVIRONMENT AND SOCIAL SUSTAINABILITY (2012)

IFC PS 5 on 'Land Acquisition and Involuntary Resettlement' recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use. Where involuntary resettlement is unavoidable, it should be minimized and appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.

6.2 Baseline

6.2.1 Data from the Existing EIA

The following sections provide an overview of relevant land use data presented in the existing EIAs for the Project which were commissioned by SEC. For the full socio-economic and land use baseline, please refer to the EIAs.

6.2.1.1 Portion 1

The EIA prepared for SEC by Geotechnical & Environmental Co.Ltd in 2020 undertook a combination of desk based and site visits to identify the general land use in the Portion 1 project area extending between Tabuk and Al Wasel area.

According to the EIA, no residential receptors were identified directly within the OHTL alignment with the nearest residential area being 3km and 5 km away in Tabuk and Al Wasel respectively. An existing OHTL runs parallel to the proposed Project alignment in the area near Tabuk. Agricultural lands are located outside the RoW of the Project approximately 2.5 km away from the OHTL alignment, most of these are private agricultural lands with few of them being corporate farms namely Nadco and Astra farms. The main produce of these agricultural lands is wheat and citrus while some other crops include olives and local vegetables.

The EIA identified the area between the KSA and the Jordanian borders as mountainous/desert area which includes police stations and borders guards check points and what they reported to be civil camping sites.

Examples of land use in the Portion 1 Project area are shown on the figure below.



Figure 6-1 Examples of Land use in the Portion 1 Project Area as Provided in the EIA (Geco, 2020)

6.2.1.2 Portion 2

The EIA prepared for SEC by StEC in 2022 undertook a combination of high level desk based review and site visits to identify potential land users and receptors. According to the EIA, Portion 2 of the OHTL alignment is located in a desert area completely far from any residential, agricultural or commercial human activities.

Examples of land use in the Portion 2 Project area are shown on the figure below.



Figure 6-2 Examples of Land use in the Portion 2 Project Area as Provided in the EIA (StEC, 2022)

6.2.1.3 Portion 3

The EIA prepared by Leaf Green Environmental Services in 2022 does not provide an overview of the land use within Portion 3 of the Project area.

6.2.1.4 Subsea Cable

The EIA prepared for SEC by IES in 2022 indicates that the transformer station area is in the vicinity of NEOM development area and is disturbed with evidence of vehicles tracks and excavation activities. According to the EIA, the site had no evidence of any industrial, commercial, agricultural or farming activities within the Project area.

6.2.2 Secondary Desktop Review

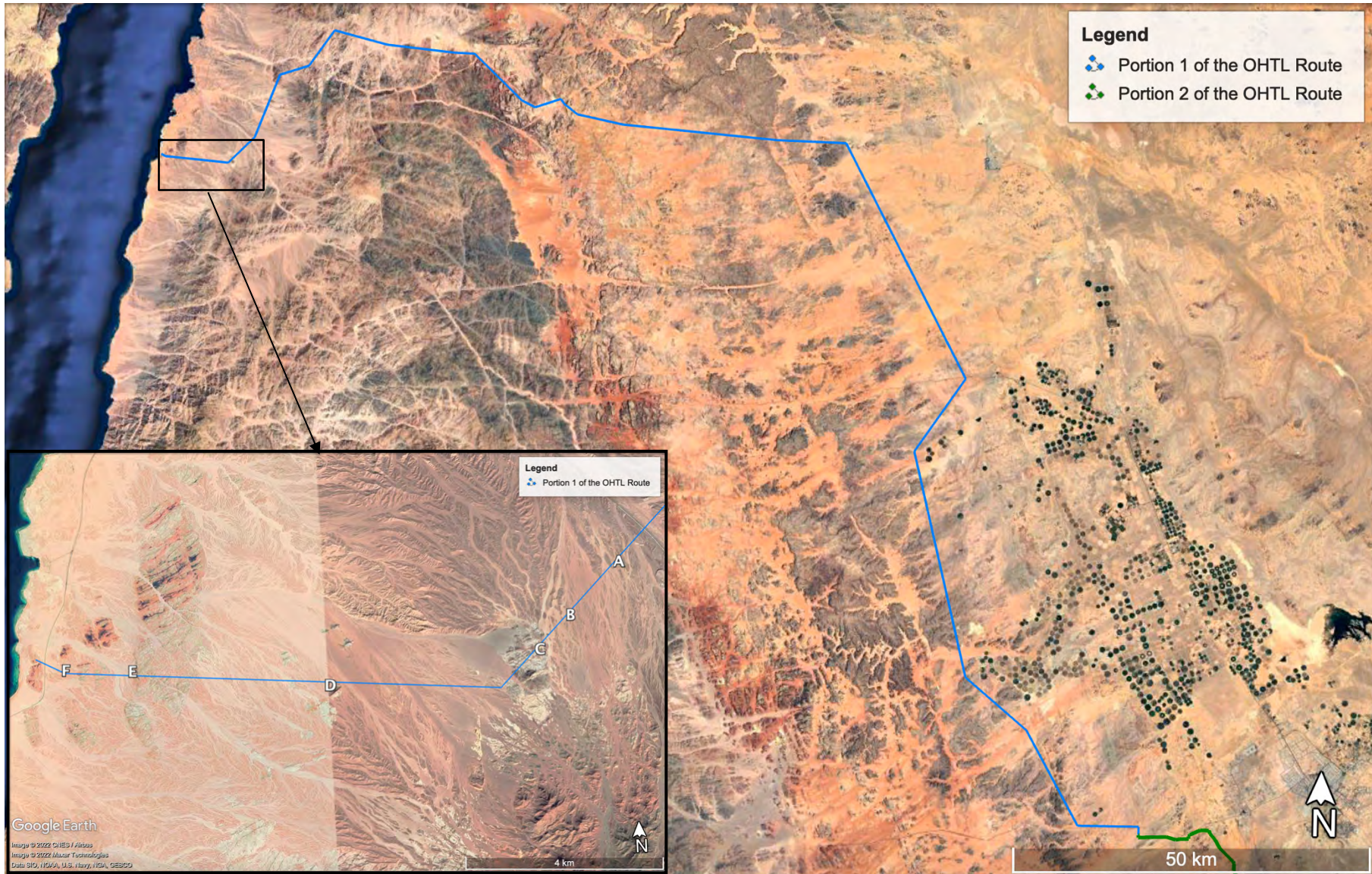
A review of satellite imagery over a period of five (5) years (where available) was carried out by 5 Capitals to map possible features of interest linked to settlements and livelihood within the Project footprint and its surrounding area. The satellite imagery indicated existing structures and potential receptors along the OHTL route mainly near Madinah, Tabuk and Al Wasel. The overall project alignment is shown on the figure below.



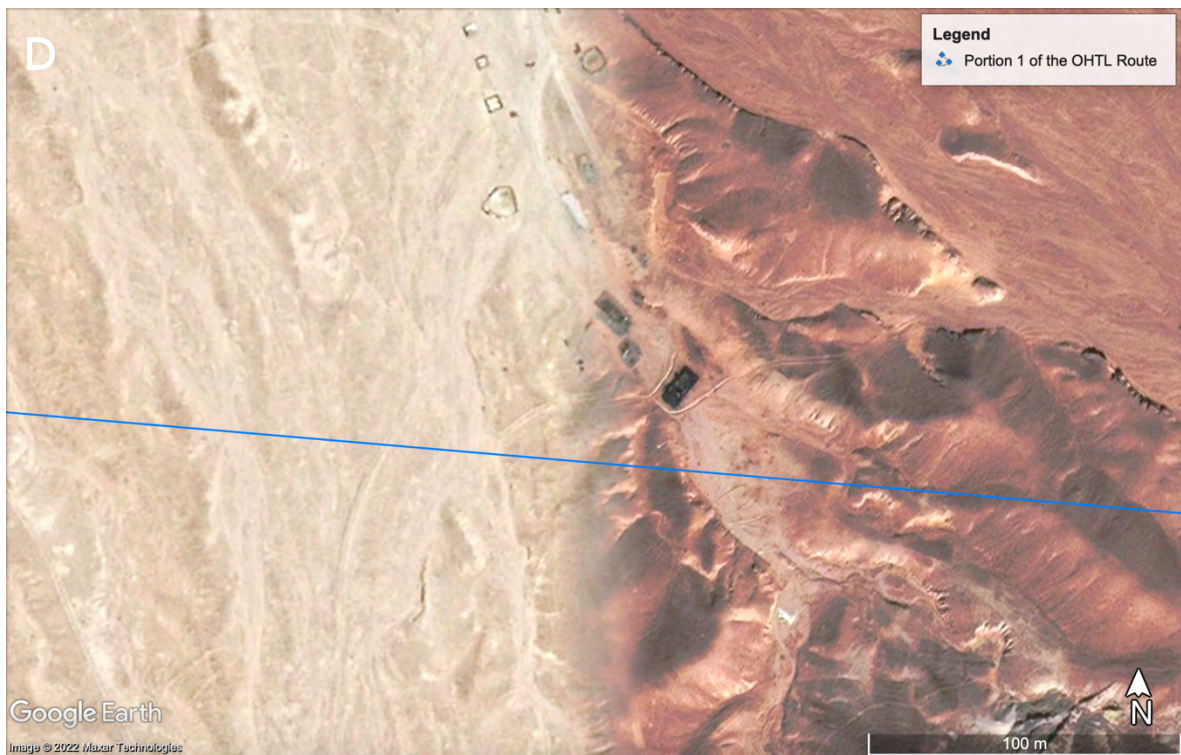
Figure 6-3 Overall OHTL Alignment

The figures below provide the areas that appeared to include human receptors based on the review of satellite imagery for each Portion of the Project.

Receptors A to F along Portion 1 of the OHTL route are highlighted in the figures below. Structures and compounds are visible but it is not known whether they are active or abandoned.







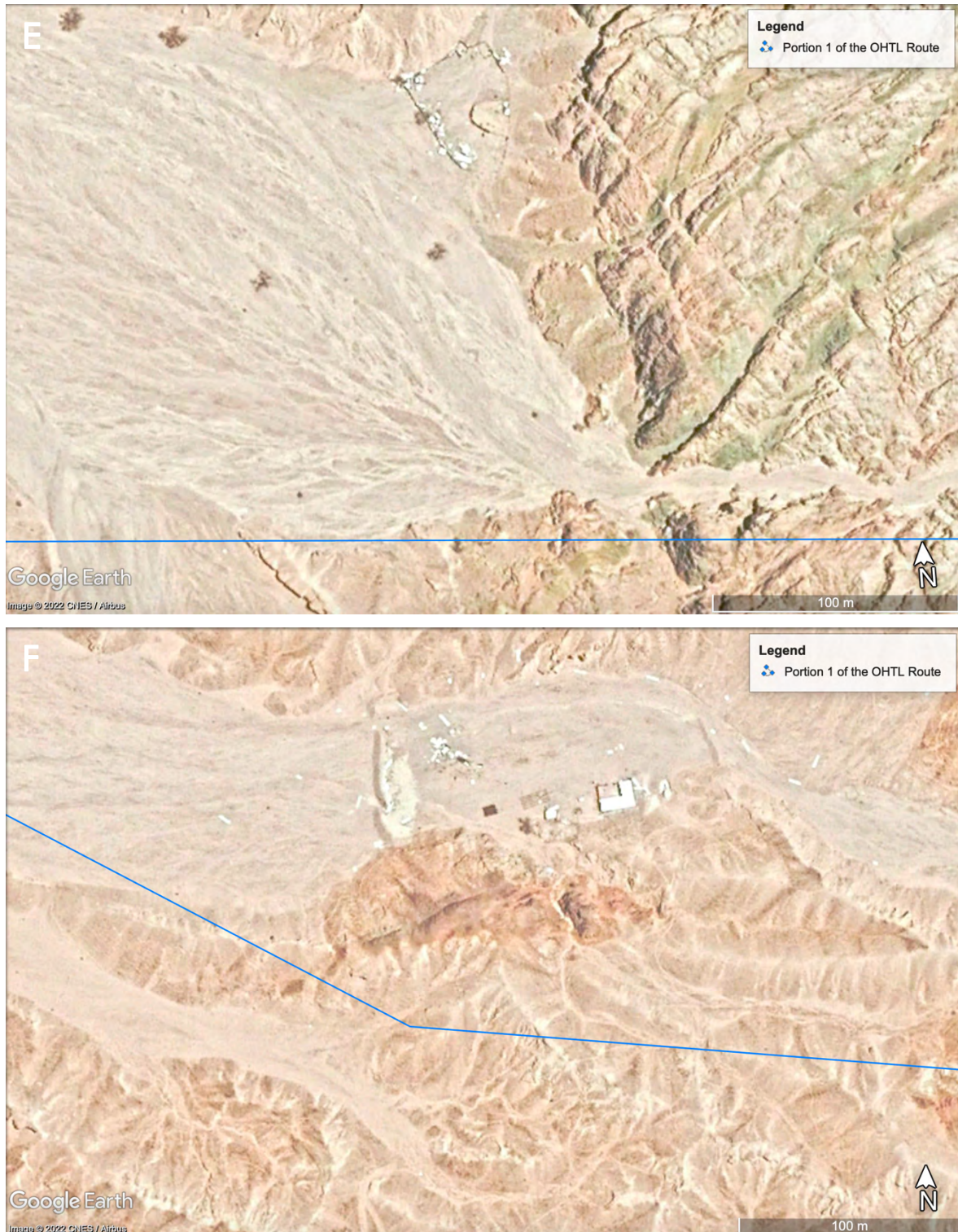
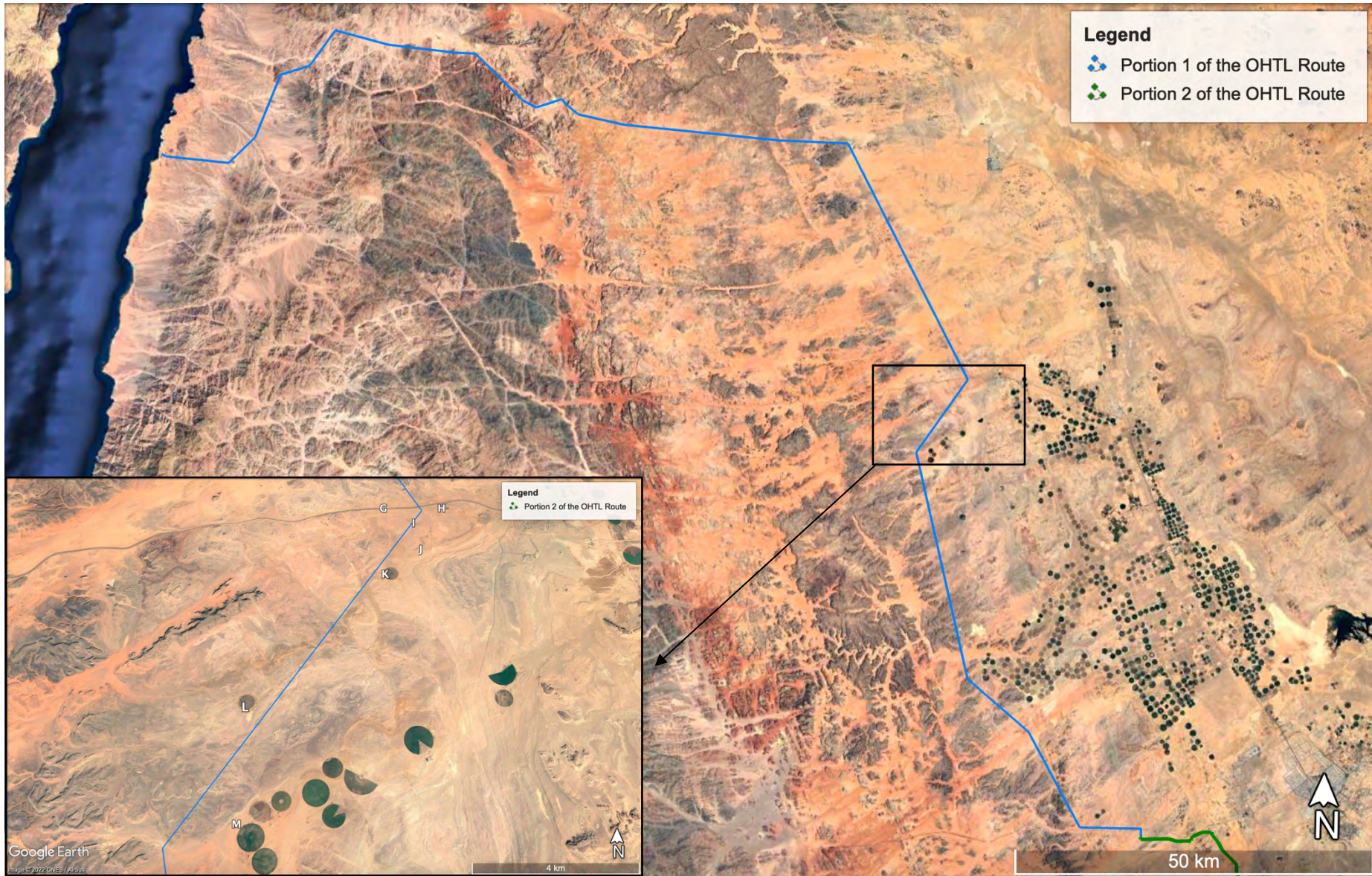


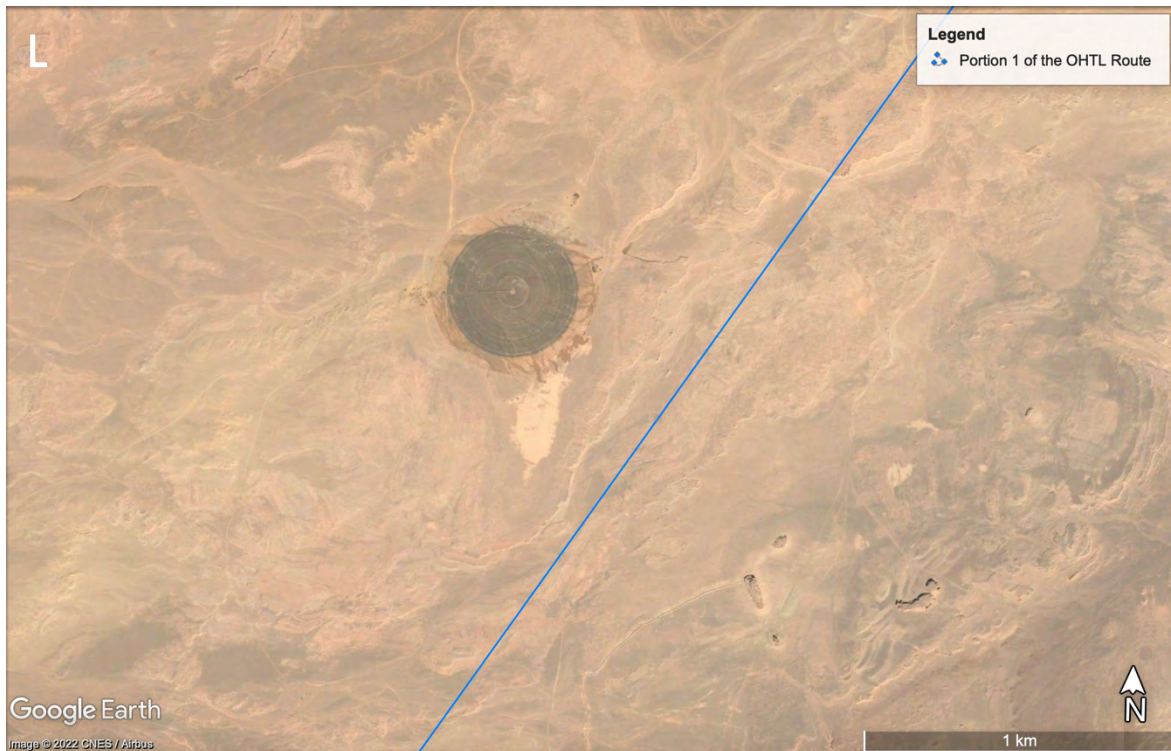
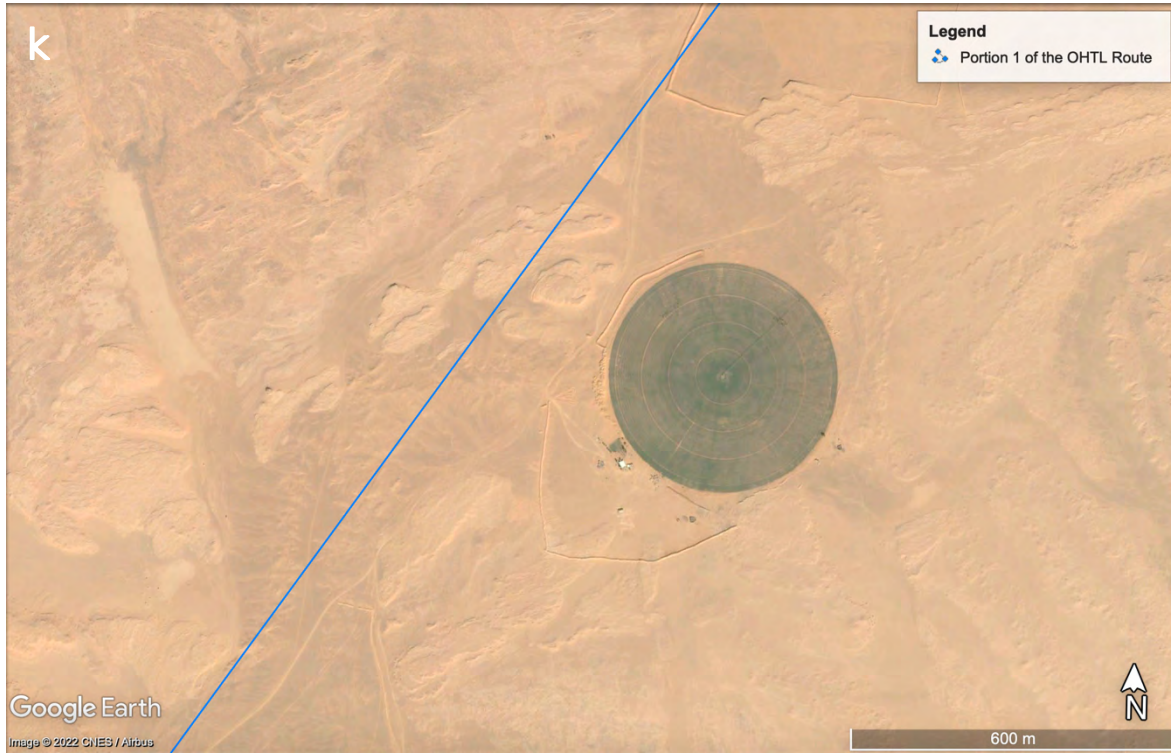
Figure 6-4 Examples of Areas Identified as part of the Satellite Imagery Review for Portion 1 near Al Wajeh

Receptors G to M along Portion 1 of the OHTL route are highlighted in the figures below. Farms with a single central pivot irrigation field is within a few hundred metres of the OHTL (Ref Land K) while large numbers of central pivot irrigation fields are observed 2 to 3km from the OHTL (Ref M). Other structures, compounds are also visible, but it is not known whether they are active or abandoned.









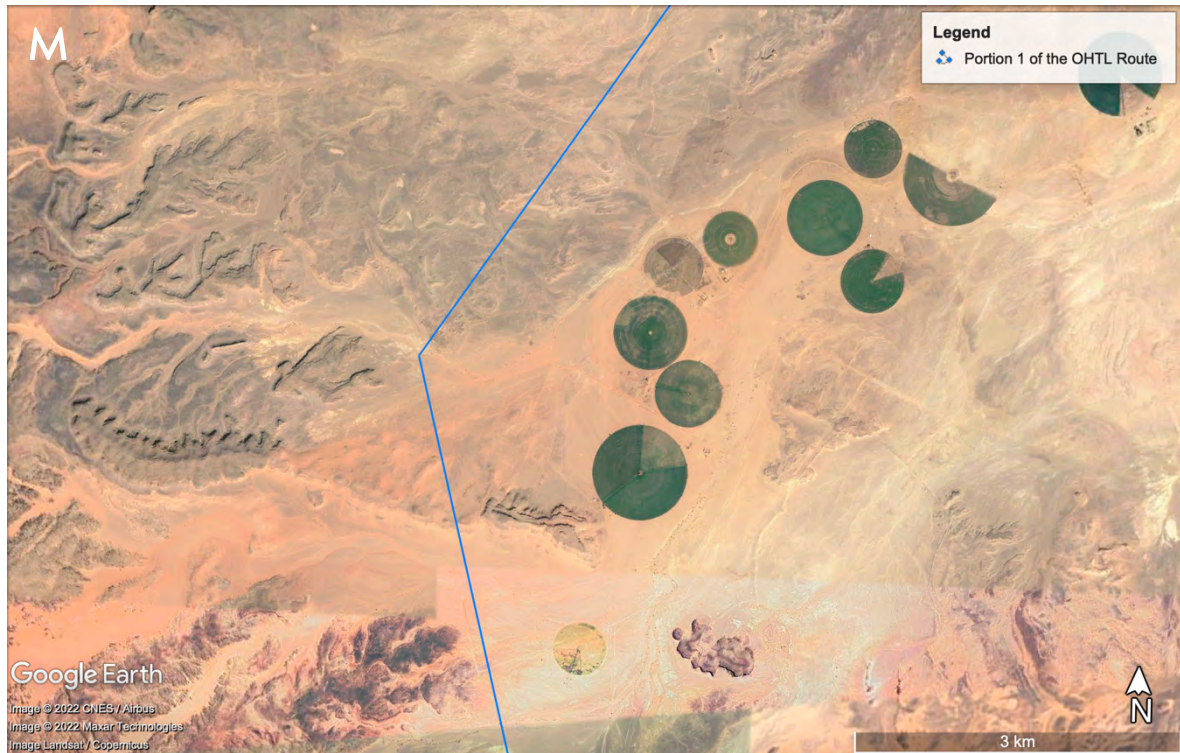
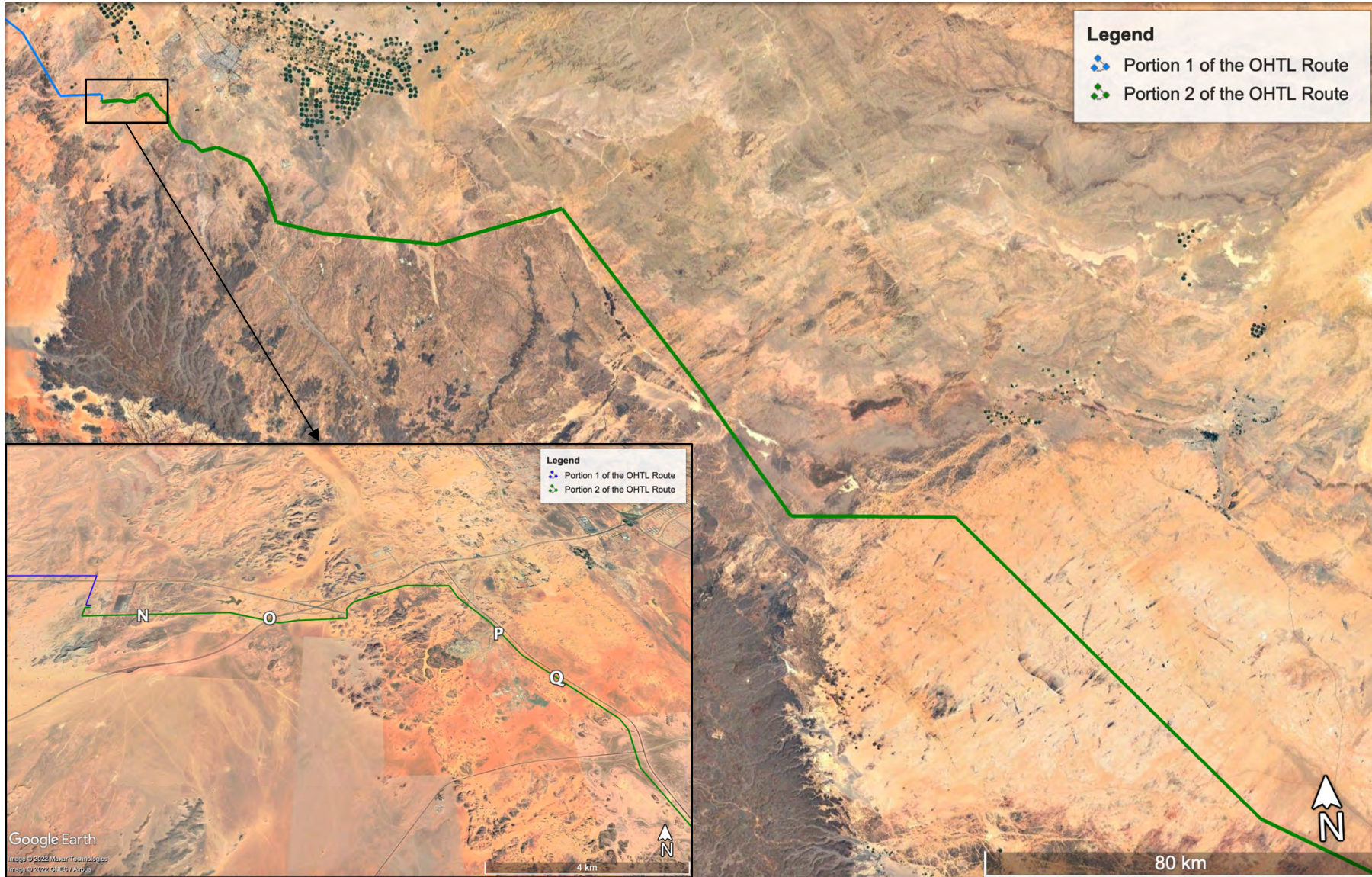
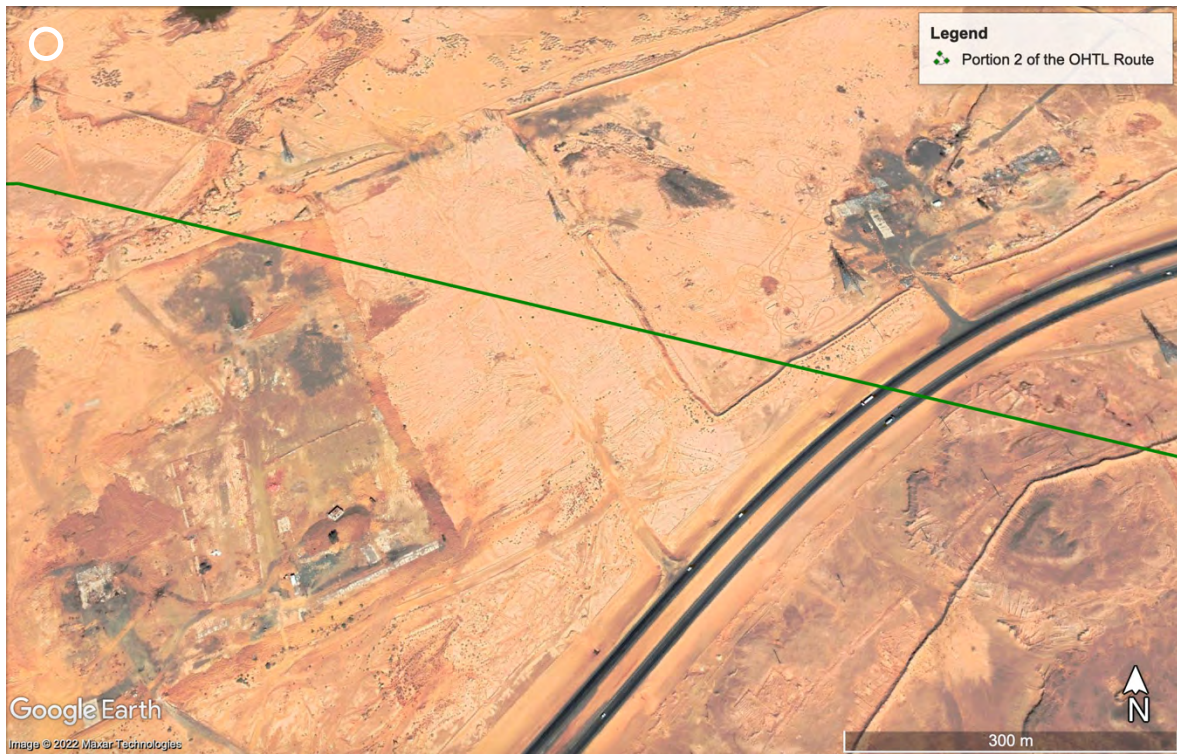
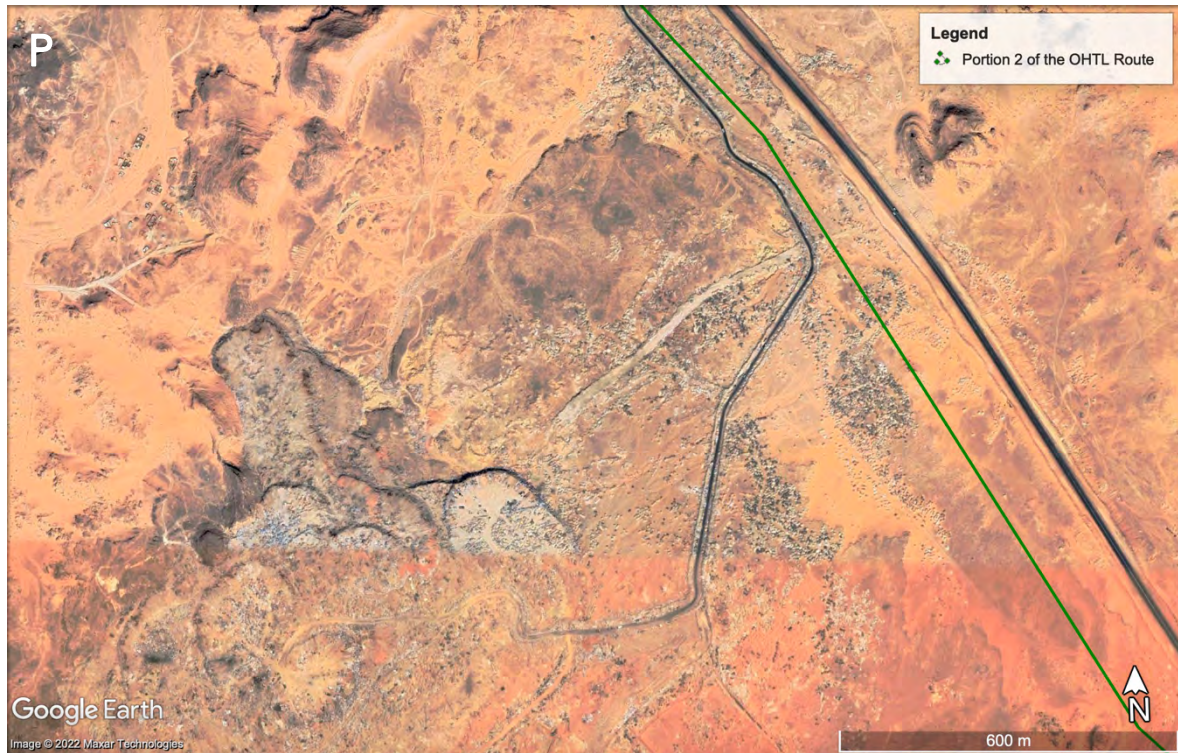


Figure 6-5 Examples of Areas Identified as part of the Satellite Imagery Review for Portion 1 Near Tabuk

Structures or compounds O and Q that appear to be potential receptors along Portion 2 of the OHTL route are highlighted in the figures below. A waste dumping area can be observed along the route (Ref P). Point N shows the location of the Tabuk station.







Receptors R to V along Portion 3 of the OHTL route are highlighted in the figures below. Farms and structures or compounds are visible along this part of the OHTL alignment.







Figure 6-6 Examples of Areas Identified as part of the Satellite Imagery Review for Portion 3

6.2.3 Land Use Ground Truthing Survey

The data provided in the EIAs as well as the secondary desktop review was complemented by five (5) ground truthing site surveys to identify the potential land use and human receptors within the OHTL route.

The survey did not cover the full OHTL route but rather focused on selected areas along Portion 1, 2 and 3 of the alignment. The visit enabled the identification of certain existing conditions (in visited/viewed areas) as well as environmental & social sensitive receptors within the OHTL RoW and its close vicinity.

- The site visit to Portion 1 of the OHTL route was carried out on 23rd and 24th May 2022 to two (2) areas, one near Al Wasel (Area 1) and the other closer to Tabuk (Area 2). The visit was undertaken by 5 Capitals alongside a representative from SEC contractor NCC.
- The site visit to Portion 2 of the OHTL route was carried out on 24th May 2022 to an area near Tabuk (Area 3). The visit was undertaken by 5 Capitals alongside a representative from SEC contractor NCC.
- The site visit to Portion 3 of the OHTL route was carried out on 16th May 2022 to two (2) areas near Tabuk (Areas 4 and 5). The visit was undertaken by 5 Capitals alongside a representative from SEC and a team from SEC contractor HEC.

The areas visited are shown on the figure below.

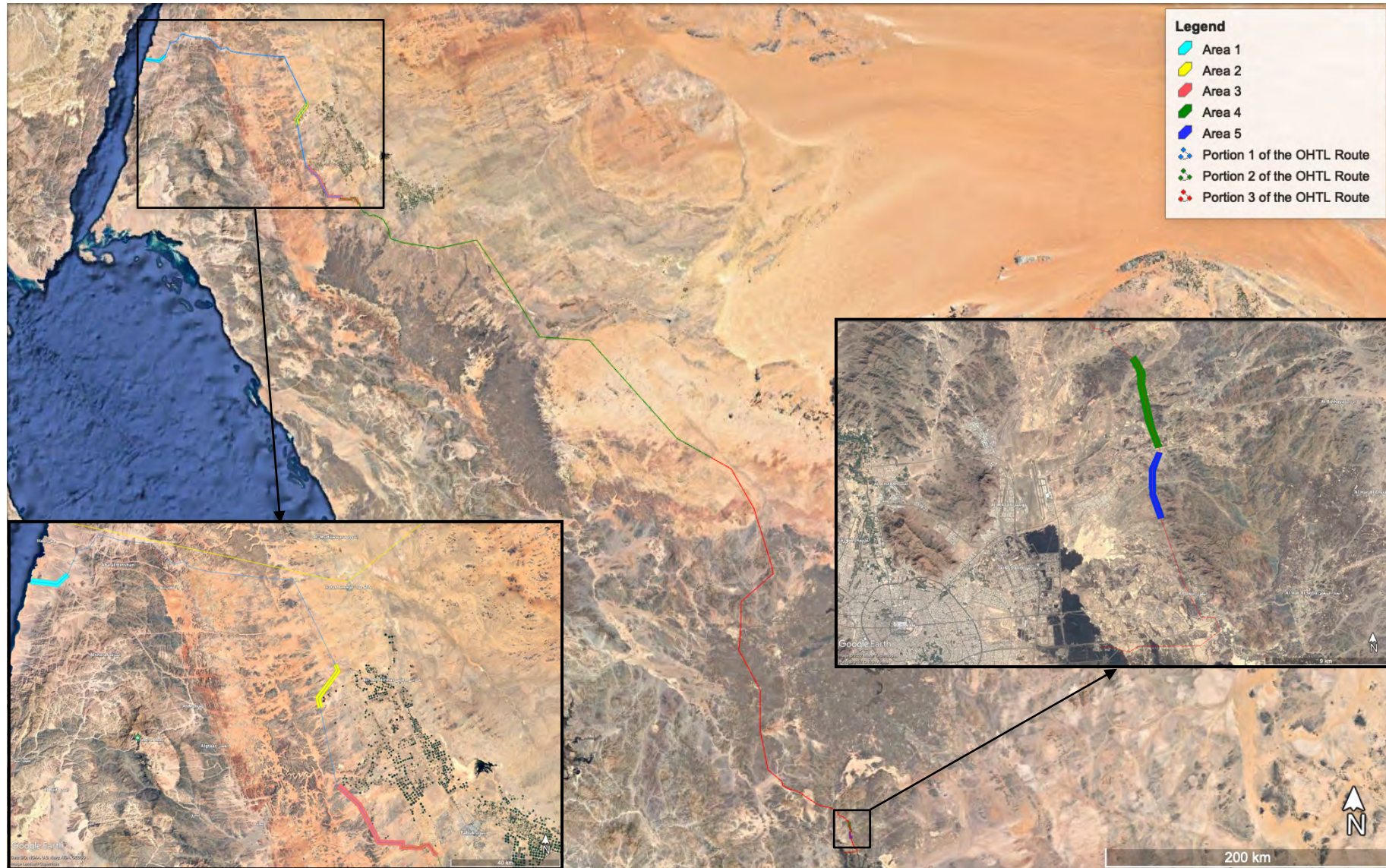


Figure 6-7 Areas Visited

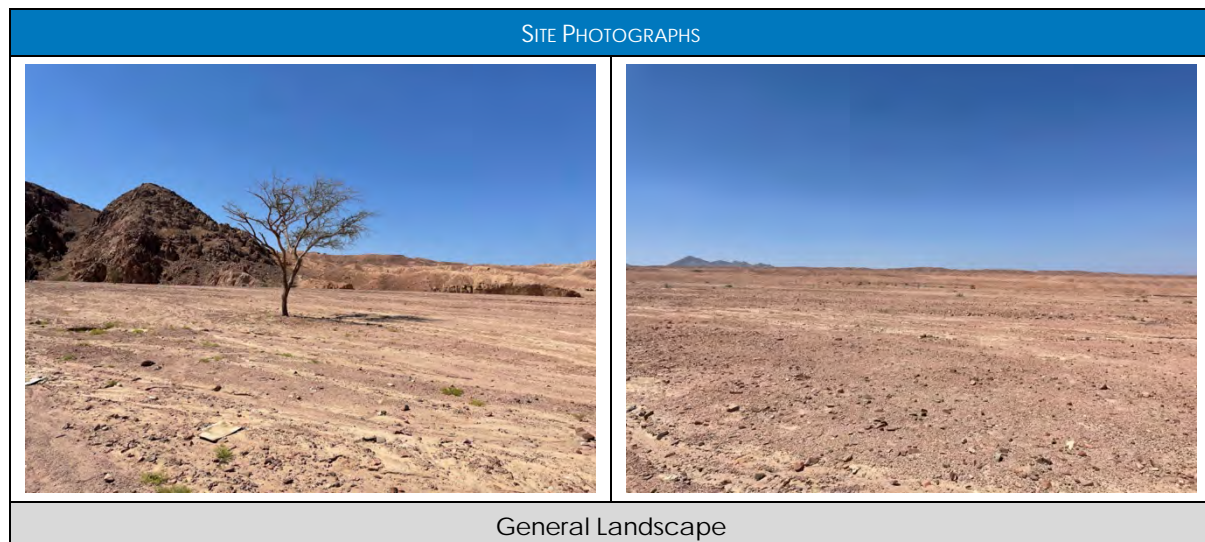
6.2.3.1 Area 1 Land Use and Site Visit Findings - Portion 1 OHTL

Area 1 is located on the Gulf of Aqaba coast near Al Wasel, approximately 23 km from the National Border with Jordan. The Area is accessible from Highway 55 and a small unnamed asphalt road that runs along the coast from Al Humidh to Maqna town. Along the OHTL route there are no permanent or asphalt roads, however, several vehicle tracks and dirt roads were evident.

The site conditions observed during the visit that was carried out on 23rd May 2022 are summarised below and shown in the following figures:

- The OHTL route encompasses an area that is mostly natural and undisturbed, with a few scattered farms and temporary herders' camps.
- The vast majority of structures were abandoned and in an deteriorated state.
- Construction activities (not related to the Project) in the vicinity of the OHTL were observed.
- The OHTL route encompasses a hilly/mountainous topography, interspersed with wadis and open, flat gravel plains.
- Occasional small trees and shrubs stand out amongst the dry nature of the area.
- A few birds were observed within the area.

Table 6-1 Area 1 Site Conditions



SITE PHOTOGRAPHS



Active Construction



Trees



Abandoned Deteriorated Structure

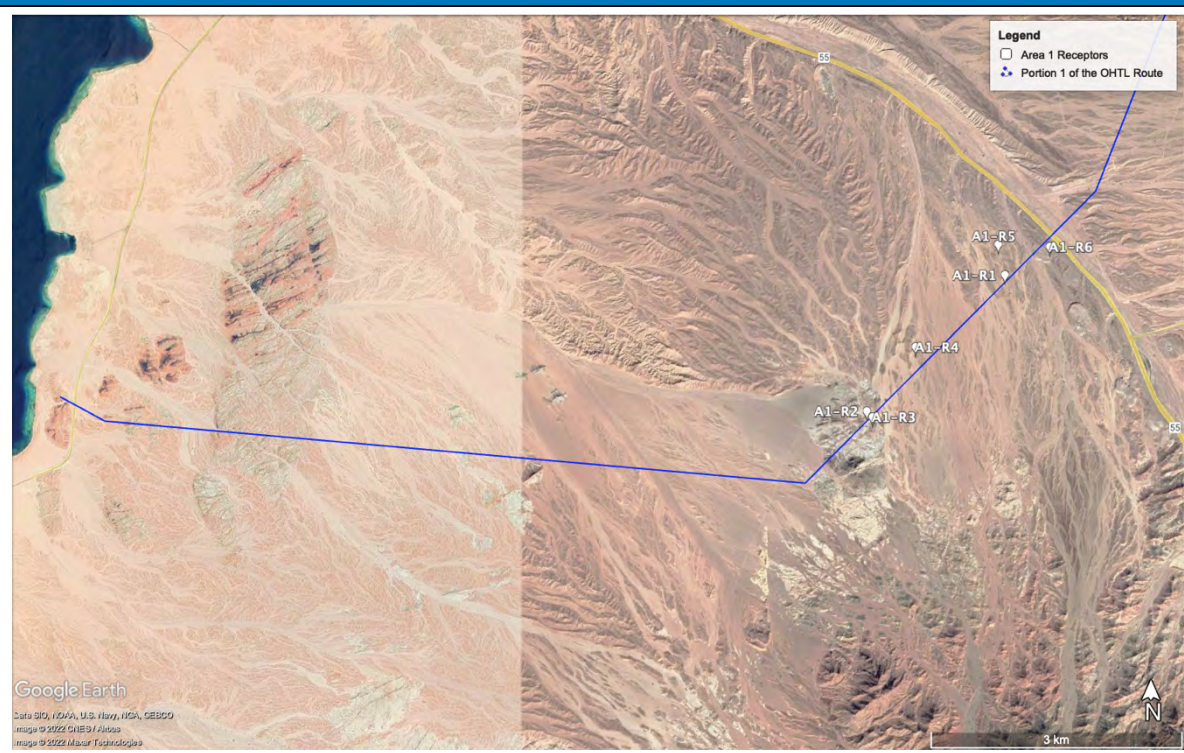




Abandoned Broken Down Cars

EXISTING RECEPTORS AND LAND USES WITHIN AREA 1 OF PORTION 1

The review of satellite imagery indicated the presence of several potential receptors within the OHTL RoW and the surrounding area at survey Area 1. However, the ground truthing visit confirmed that the majority of the structures in the survey area were abandoned farms that are no longer being used and identified two (2) receptors within the OHTL RoW and four (4) receptors in the surrounding area. The receptors were active farms, most notably camel and goat farms. Herding and grazing activity was evident during the site visit, and it is expected that these farms utilize the project area for grazing. The tables below show the location of the active receptors and their location with respect to the proposed OHTL.

Table 6-2 Receptors within Area 1 OHTL RoW and Surrounding Area

RECEPTORS LOCATIONS AND PHOTOGRAPHS	
	
Receptors within the OHTL RoW	
	
A1-R1 (Active Farm)	A1-R2 (Active Farm)

RECEPTORS LOCATIONS AND PHOTOGRAPHS	
Surrounding Receptors Potentially Outside the OHTL RoW	
	
A1-R3 (Grazing Camels 90m from the OHTL RoW)	A1-R4 (Active Farm 133m from the OHTL RoW)
	
A1-R5 (Camp around 300m from the OHTL RoW)	A1-R6 (Active Farm, Accommodation around 170m from the OHTL RoW)





6.2.3.2 Area 2 Land Use and Site Visit Findings - Portion 1 OHTL

Area 2 is located on the 394 Highway between Haql and Tabuk, approximately 21 km from Bir Ibn Hirmas. The Area is accessible from Highway 394 and there are no permanent or asphalt roads along the route, several vehicle tracks and dirt roads were evident.

The site conditions observed during the visit that was carried out on 24th May 2022 are summarised below and shown in the following figures:

- The OHTL route encompasses an area that is mostly a flat barren gravel plain, interspersed with wadis, irrigated fields and herders.
- With the exception of one (1) fuel station, the observed structures were abandoned and in a deteriorated state.
- A restricted Archaeological zone was observed at the southern end of Area 2.
- Some small trees and grass were observed within the wadis.

Table 6-3 Area 2 Site Conditions

SITE PHOTOGRAPHS	
	
General Landscape	
	
Abandoned Destroyed Structure	Highway Rest Area/Park

EXISTING RECEPTORS AND LAND USES WITHIN AREA 2 OF PORTION 1

The desktop review of satellite imagery indicated the presence of potential receptors within the Area 2 of the OHTL RoW and the surrounding area. The ground truthing visit confirmed that the only potential receptor within the OHTL direct RoW is an Archaeology Restricted Zone shown on the figure below. A discussion was carried out with the design team regarding this finding, and it was confirmed that the team is currently assessing alternative routing for the OHTL to avoid this area and obtain the required clearances. The alternative route options are shown Appendix C.

The archaeological/heritage site is the Oasis of Qurayyah located approximately 70 km northwest of Tabuk and 26 Km south west of Bir Ibn Hirmas. A joint multidisciplinary research project of the SCTNH and the University of Vienna in 2018 resulted in chronological frame for this major 'urban' oasis of North Arabia. The preliminary survey results indicate that the formation of the permanent settlement took place during the end of the third millennium cal BC. In addition, the dates for the production of Standard Qurayyah Painted Ware point to the early part of the Late Bronze Age as the incipient phase of its production while additional

pottery class, was confirmed to be earlier than that and present on the site since, at the latest, the beginning of the second millennium BC. A Hellenistic/Roman-period building, possibly a residence and workshop, was also documented in the residential area of the site (Luciani, M., & Alsaud, A. S., 2018).

In addition to that, five (5) receptors were identified within the OHTL surrounding area and these included irrigated fields, goat herders, and a fuel station. The table below shows the location of active receptors and their distance to the proposed OHTL.

Table 6-4 Receptors within Area 2 OHTL RoW and Surrounding Area



RECEPTORS LOCATIONS AND PHOTOGRAPHS

Surrounding Receptors Potentially Outside the OHTL RoW



A2-R2 (Active Farm - Irrigated Field and Grazing Camels approximately 1km from the OHTL RoW)



A2-R3 (Active Farm-Irrigated Field around 600m from the OHTL RoW)

A2-R4 (Goat Herder around 70m from the OHTL RoW)



A2-R5 (Active Farm-Irrigated Field around 430m from the OHTL RoW)

A2-R6 (Fuel Station around 950m from the OHTL RoW)

6.2.3.3 Area 3 Land Use and Site Visit Findings - Portion 2 and 3 OHTL




Area 3 is located on North of the 8784 road, approximately 24 km from Tabuk. There are no asphalt roads along the proposed OHTL route, however some permanent gravel roads are

present in between the irrigated fields and farms in the northern section of Area 3. Several vehicle tracks were also evident along the OHTL route.

The natural site conditions observed during the visit that was carried out on 24th May 2022 are summarised below and shown in the following figures:

- The OHTL route encompasses an area that is mostly a flat barren gravel plain, interspersed with mountains/hills, irrigated fields, and herder camps.
- One (1) waste area was observed in the southern section of Area 3, near Tabuk.
- One (1) Mosque/Prayer building is located near the proposed OHTL route at the southern end of Area 3.
- One (1) abandoned shooting range was observed near the Tabuk Substation.

Table 6-5 Area 3 Site Conditions

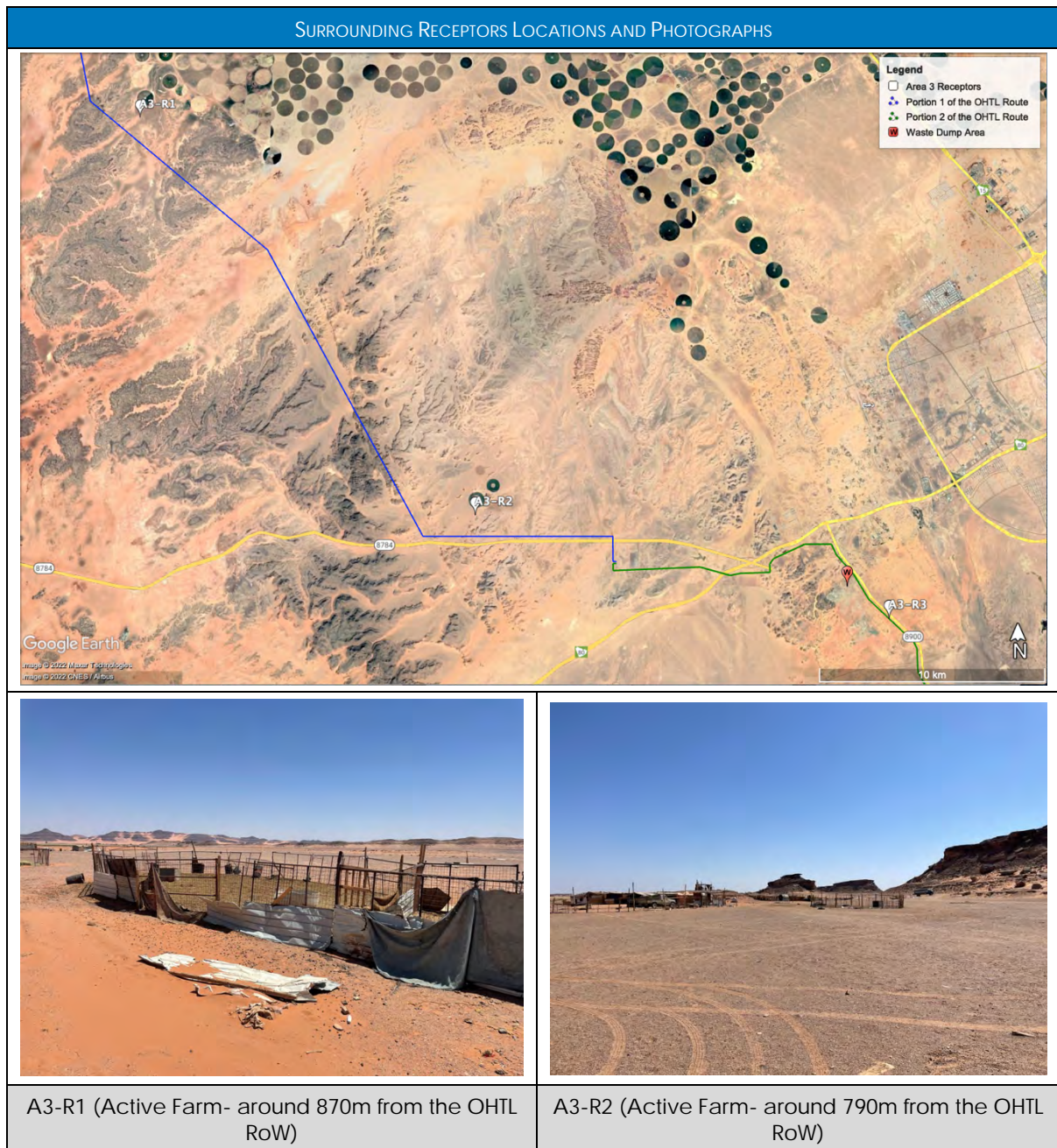
SITE PHOTOGRAPHS	
	
General Landscape	
	
Substation	Abandoned Shooting Range

EXISTING FIXED RECEPTORS WITHIN THE OHTL ROW AND THE SURROUNDING AT AREA 3 OF PORTION 2 AND 3

The ground truthing survey did not identify the presence of fixed human receptors within the Project's direct RoW. However, two active farms and a Mosque were identified during the

survey in the area surrounding the OHTL route. The table below shows the location of the active receptors and their distance to the proposed OHTL.

Table 6-6 Receptors within OHTL Surroundings at Area 3



SURROUNDING RECEPTORS LOCATIONS AND PHOTOGRAPHS



A3-R3 (Mosque / Prayer Area - around 84m from the OHTL RoW)

An operational waste dumping area was identified near the OHTL alignment as shown on the figure below. The entrance of the waste dump is approximately 660 m from the OHTL; however waste was scattered in the surrounding area close to the OHTL. While no construction activities may be required within that area, the presence of workers in close proximity to waste that may contain hazardous materials or host pests may cause a potential risk to the health and safety of workers.

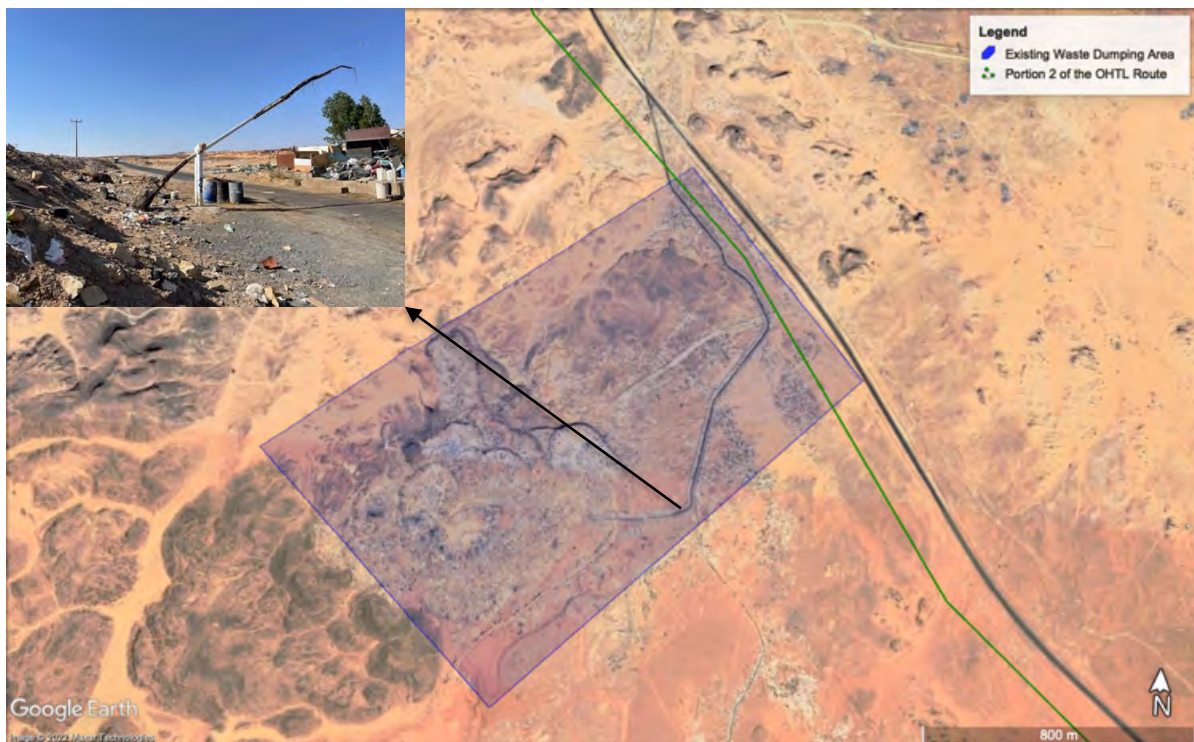


Figure 6-8 Existing Waste Dumping Area

6.2.3.4 Area 4 and 5 Land Use and Site Visit Findings - Portion 3 OHTL

Areas 4 and 5 are located near Madinah, approximately 8 km from Prince Mohammad bin Abdulaziz International Airport. While both areas can be accessed from Highway 340, the OHTL route had evidence of vehicle tracks and dirt roads but is devoid of permanent or asphalted



roads. These survey areas included more human activity such as farms and potential residential structures than the surveyed areas of Portion 1 and 2 of the OHTL alignment.

The site conditions observed during the visit carried out on the 16th May 2022 are summarised below and shown in the following table:

- The OHTL route extends in an area of hilly/mountainous topography interspersed with flat barren gravel plain.
- Evidence of anthropogenic influences/activities was clear during the site visit with existing residential areas and farms (animals and trees).
- An area of dumped waste and abandoned structures were observed in the vicinity of the proposed OHTL route.
- Occasional small trees stand out amongst the dry nature of the area.
- For most of the area visited, the proposed OHTL alignment runs parallel to an existing operational OHTL that is connected to Madinah station.
- A few birds were observed within the area.

Table 6-7 Area 4 and 5 Site Conditions

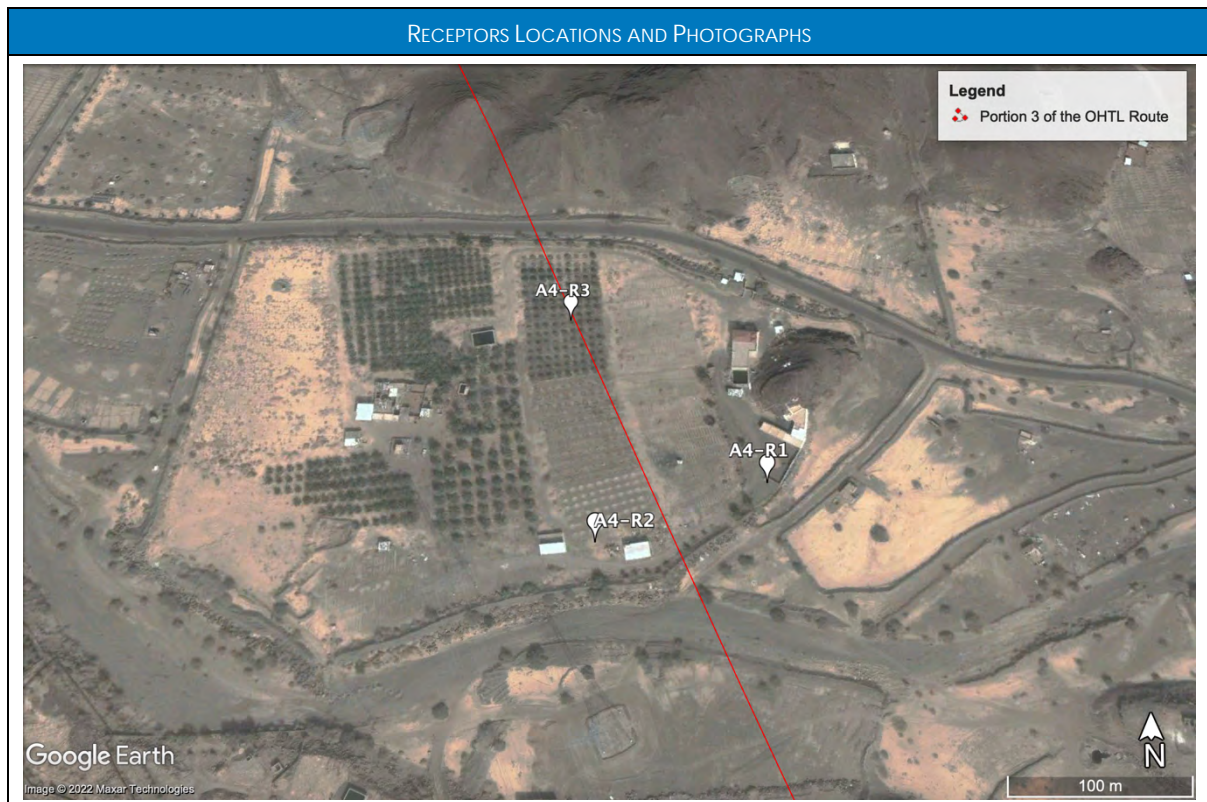
SITE PHOTOGRAPHS	
 <p>May 16, 2022 10:02:16 AM 345 وادي البطان 5429 حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>	 <p>May 16, 2022 9:47:46 AM 387 وادي البطان 2482 حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>
General Landscape	
 <p>May 16, 2022 9:28:23 AM 411 وادي البطان 9341 حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>	 <p>May 16, 2022 9:55:03 AM Unnamed Road Wadal Battan Medina Al Madinah Al Munawwarah Al Madinah Province</p>

SITE PHOTOGRAPHS	
Potential Farm/Residential Structure	Trees
 <p>May 16, 2022 9:09:34 AM Unnamed Road Wadi al Battan Medina Al Madinah Al Munawwarah Al Madinah Province</p>	 <p>May 16, 2022 8:41:36 AM Unnamed Road Wadi al Battan Medina Al Madinah Al Munawwarah Al Madinah Province</p>
Waste	Existing OHTL

EXISTING FIXED RECEPTORS WITHIN THE OHTL RoW AT AREA 4 OF PORTION 3

The ground truthing survey confirmed the presence of four (4) fixed potential receptors within Area 4 of Portion 3 OHTL RoW. These receptors appear to be mostly farms. The table below shows the location of these receptors.

Table 6-8 Receptors within Area 4 OHTL RoW



RECEPTORS LOCATIONS AND PHOTOGRAPHS



A4-R1 (Active Farm)



A4-R2 (Active Farm)



A4-R3 (Active Farm)



RECEPTORS LOCATIONS AND PHOTOGRAPHS



A4-R (Farm Which May Potentially be Abandoned)

EXISTING FIXED RECEPTORS WITHIN THE OHTL ROW AND THE SURROUNDING AT AREA 5 OF PORTION 3

The ground truthing survey confirmed the presence of nine (9) fixed receptors within Area 5 of Portion 3 OHTL RoW. These receptors appear to be mostly farms. The table below shows the location of these receptors.

Table 6-9 Area 5 Fixed Receptors

FIXED RECEPTORS LOCATIONS AND PHOTOGRAPHS



FIXED RECEPTORS LOCATIONS AND PHOTOGRAPHS



A5-R1 (Active Farm)



A5-R2 (Active Farm)



A5-R3 (Active Farm)



FIXED RECEPTORS LOCATIONS AND PHOTOGRAPHS



A5-R4 (Active Farm)



A5-R5 (Active Farm)



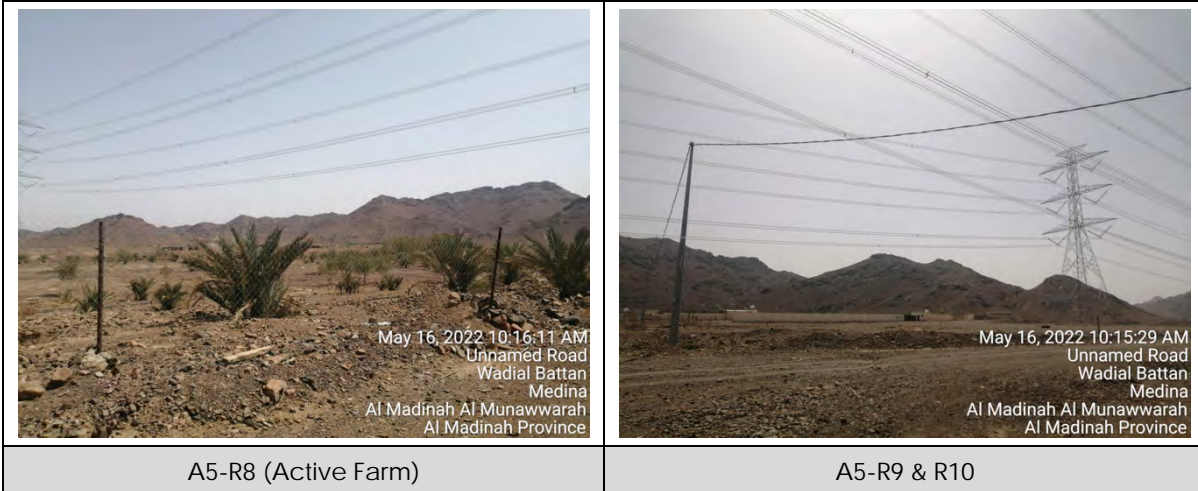
A5-R6 (Active Farm)



A5-R7 (Active Farm)

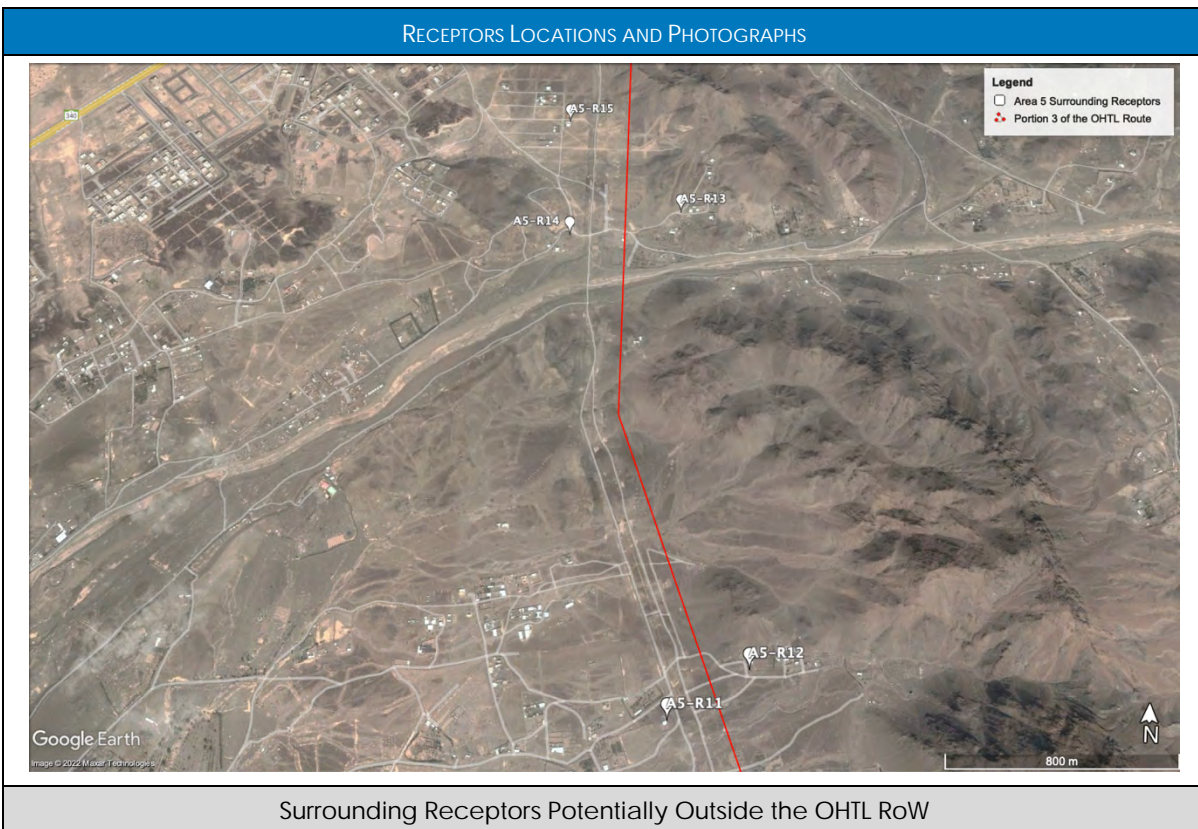


FIXED RECEPTORS LOCATIONS AND PHOTOGRAPHS



The ground truthing survey also confirmed the presence of other receptors in close vicinity to Area 5 of OHTL Portion 3. These receptors appear to be mostly farms or residential structures. The table below shows the location of these receptors and their proximity to the OHTL.

Table 6-10 Receptors Surrounding the OHTL RoW at Area 5



RECEPTORS LOCATIONS AND PHOTOGRAPHS	
 <p>May 16, 2022 10:02:04 AM 345 وادي البطان 5429 حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>	 <p>May 16, 2022 10:07:12 AM 196 وادي البطان 8678 حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>
A5-R11 (Farm/Residential Structures approximately 190m from the OHTL RoW)	A5-R12 (Farm/Residential Structures approximately 135m from the OHTL RoW)
 <p>May 16, 2022 9:28:23 AM 411 وادي البطان 9341 حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>	 <p>May 16, 2022 9:15:16 AM 4144 عباد بن زرعة حي وادي البطان Medina Al Madinah Al Munawwarah Al Madinah Province</p>
A5-R13 (Farm/Residential Structures approximately 240m from the OHTL RoW)	A5-R14 (Farm/Residential Structures approximately 220m from the OHTL RoW)
 <p>May 16, 2022 9:55:50 AM Unnamed Road Wadial Battan Medina Al Madinah Al Munawwarah Al Madinah Province</p>	
A5-R15 (Farm/Residential Structures approximately 240m from the OHTL RoW)	

6.2.4 Land Use Observations During the Terrestrial Ecology Ground Truthing Survey

Incidental observations of human activities in the Project area were also recorded as part of the terrestrial ecology ground truthing survey. Herding, grazing and agricultural activities were evident in the vicinity of the proposed OHTL alignment. Anthropogenic influence such as construction activities, abandoned farms and dumped waste were observed at several locations of surveyed areas. Examples of the observations are provided below.

Table 6-11 Incidental Observations of Human Activities in the Project Area



Agricultural Lands



Active Farms



Herds



Abandoned Farms



Construction Activities



Waste

6.3 Land Ownership

As reported by the Project Development Company and the Real Estate Department of SEC, the alignment has been selected and assigned by the Government to SEC for the Saudi - Egyptian Electrical Interconnection Project, following long discussions between the government, SEC and the relevant municipalities. Documentation confirming the allocation of the lands to the Project were not provided at the time of writing, however, a summary of the feedback received from the authorities as provided by SEC is included in Appendix E.

Accordingly, it is understood that alternative locations for the OHTL route were not considered, however, the contractors are optimizing the layout to the extent possible to avoid obstacles and fixed receptors (farms/inhabited areas).

Based on discussions with the contractors, SSEM has confirmed that around 20,000 m² of TCF2 land located near Al-Mauzzam town is privately owned and was leased from the land owner. The land owner Mr. Daif Allah Bin Baneh, agreed to lease the land for a period of one year, renewable provided the agreement of both parties. The rental amount is paid 50% upon contract signature and 50% at the end of the contractual year. The contract is provided in Appendix D.

It was also determined that around 100m of Portion 2 OHTL is under the jurisdiction of the Ministry of Defense (MoD). SSEM is in the process of obtaining a permit from MoD to use this land for the purpose of the Project.

Based on the review of satellite imagery and the outcomes of the land use ground truthing survey, the OHTL RoW includes several fixed receptors especially along Portion 3, most of which appear to be farms.

It is understood that the majority of the alignment may potentially be public lands. However, the Project is currently in the design stage and the surveys by SEC or the assigned contractors for the OHTL RoW are still ongoing. Therefore, land ownership has not been determined and it is still unclear whether the existing fixed receptors are formal or informal land users.

6.4 SEC Land Acquisition Process

Based on discussions with the Real Estate Department of SEC, it is understood that in case fixed human receptors are located within the OHTL RoW (which includes the 82 m buffer zone), they will have to relocate. However, there is no clear land acquisition and compensation process in place to be implemented if required.

Considering it is not a requirement by the national regulator, no consultations are carried out and the local community is not informed of the Project as part of the EIA process.

Based on the discussions with HDEC, the contractor of Portion 3 OHTL, the land surveys for the alignment were completed and receptors were identified within the OHTL RoW and its vicinity. According to HDEC, most of the structures were not occupied at the time of the surveys and therefore, the surveyors haven't encountered any of the land users to engage with them and get their feedback on the Project or their concerns. However, the survey team has left HDEC's contact details on the marks they are installing as part of the survey to allow people to reach HDEC and raise any concerns they have. With the exception of a call from one community member to clarify about the Project, to date, HDEC has not received any specific complaints or grievances.

Based on discussions with SEC, there is a commitment to compensate all the private land owners on the entire route, wherein the respective department within SEC will start the process after getting a confirmation on finalized route from project development team, which is still on the designing stage. The legal department at SEC will review these documents and the private land owners will be compensated only when the legal ownership of their land is confirmed. The real estate department at SEC then values the land and the compensation amount is decided and provided to the private land owners.

It is however noted that the land acquisition and compensation process does not address the requirements for informal land users who do not have legal rights over the lands they are using.

6.5 Land Use and Land Acquisition Impact Assessment

The main land use impacts are potentially to result from the construction of the Project. Accordingly, the following section assess the potential impacts during the construction phase.

6.5.1 Impact on Existing Fixed Receptors

The Project is currently in the design stage for the final alignment of the OHTL and the surveys carried out by the contractors are taking into consideration to the extent possible existing fixed receptors (residential areas, dwellings, farms etc.) for locating the pylons/towers.

It has been observed by use of satellite imagery that the majority of the OHTL route provided at the time of writing extends through desert and mountainous areas with limited human activity. However, the land use ground truthing site visit confirmed several receptors within the Project RoW and/or within the surrounding area. Therefore, the majority of these receptors may potentially experience short-term temporary impacts due to nuisance from the construction.

Impacts to the land users is anticipated for those who are located within the direct RoW of the OHTL route. The survey identified that two farms are located within the OHTL RoW of Portion 1 near the coastal area and ten farms or dwellings are located within the OHTL RoW of Portion 3 near Madinah. However, other land users or private land owners may also be present in locations that were not covered in the ground truthing survey.

Considering the typical OHTL construction activities, the permanent land take will be limited and is likely to result from the construction of the pylons/towers. The final design of the OHTL route will take into consideration these receptors (to the extent possible) and will aim at micro siting the pylons away from the formal/informal land users and private land owners to limit the impact and prevent potential displacement.

Taking into consideration that the majority of the identified receptors are farms and vegetated lands, displacement or land acquisition may not be required given that the pylons/towers will be located outside these lands. SEC has a set of standards for the required height clearance for each OHTL capacity and types of obstacles. The required height clearance for trees and

vegetation within the 380KV OHTL RoW is a minimum of 6m. While the height clearance required for 500KV OHTLs is not in place yet, 6m can be considered worst case for vegetated areas and the farms with trees shorter than 6m may possibly remain in their locations underneath the OHTL conductors and continue their normal activities.

The proposed OHTL route crosses through existing structures or dwellings. Even though the Pylons may be located away from these receptors, acquisition or resettlement may be required if these dwellings are occupied by residents or if they exceed the height clearance required for the conductors. Further surveys and consultations with the land users will be required to understand the use of these dwellings and the time spent by the Project Affected Persons (PAPs) at these locations to identify the potential electromagnetic waves impact and accordingly identify the need for resettlement.

Therefore, in the cases where the farms or vegetated lands are not within the required height clearance and may not remain in their existing locations and if the dwelling are occupied for residential use, the construction and operation of the OHTL may potentially lead to economic or physical displacement of land users.

The potential impacts on land owners and formal fixed receptors may potentially be alleviated through compensating for any impact on their livelihood or economic or physical displacement caused by the Project.

Based on discussions with SEC, there is a commitment to compensate all the private land owners along the OHTL route. However, the land acquisition and compensation process implemented by SEC does not cover informal land users who do not have legal rights over the lands they are using.

Land ownership has not been determined and it is still unclear whether the existing fixed receptors are formal or informal land users. However, it is understood that the majority of the alignment may potentially be public lands and therefore, several identified land users who may potentially be impacted by the Project may be informal land users. If the Project results in physical or economical displacement of informal land users who are within the OHTL RoW, the Project is expected to result in major adverse impacts to these land users and their livelihoods in the absence of a resettlement and compensation process for informal land users.

6.5.2 Impact on Herders

Herding and grazing activity was evident during the site visits and the ground truthing surveys identified several farms within the OHTL RoW and in the surrounding area and it is expected that these farms utilize the area for grazing.

Taking into consideration the typical OHTL construction requirements, the permanent land take is expected to result from the construction of the pylons/towers. It is therefore expected that herders will experience short-term temporary impacts (during the construction period) but

they will be able to resume their land use activities such as grazing during the operational phase of the Project.

While the grazing lands are open and the herders are mobile and not limited to a specific location, the herds may be indirectly impacted due to air and noise emissions, or directly impacted by accidents. The construction activities may also create an obstacle for accessing certain areas of vegetation during the construction activities. Accordingly, if not properly managed, the Project construction may potentially impact the local herders.

6.5.3 Impact on Archaeological and Cultural Heritage Sites

During the land use ground truthing survey for Portion 1 of the OHTL, the team came across an area of archaeological heritage (Al Qurayyah Oasis) that is located within the Project RoW. The area is fenced and access is restricted by the SCTNH. NCC team is aware of this site and two other sites within the Project RoW, and accordingly, the design is currently considering alternative routes for the OHTL to avoid impacts to existing archaeological sites.

The site surveys by the design team are ongoing and if other sites are identified, the route will be optimized to avoid potential impacts.

Taking into consideration the existing archaeological/heritage sites in the area, the potential presence of other sites within the Project RoW cannot be ruled out. Therefore, without consultations with SCNTH and identifying the need for archaeological surveys for the Project area, the OHTL construction may potentially impact existing or unknown archaeological or heritage sites.

6.6 Recommended Mitigation Measures

6.6.1 Land Acquisition and Compensation

To have a better understanding on the impact of the Project on the existing receptors and land users and to identify the required measures and management plans, the following will be required:

- Ensure the OHTL route is further optimized to avoid impacts on identified land users.
- Once the OHTL route is finalized, a detailed survey will potentially be required to determine all formal and informal land users and the types of activities within the Project footprint.
- Once the land users are determined, all existing fixed human receptors (formal and informal land users) who can remain in their current locations and continue their normal activities without being impacted by removal of their trees, losing part of their land, electromagnetic waves during operation etc. shall be determined.

- Determine all land users who may potentially be impacted by the Project and require land acquisition or resettlement.
- Consultations and stakeholders' engagement will be required:
 - Between the real estate department of SEC and the relevant municipalities to first determine the formal land users followed by direct consultations between SEC and the formal land users.
 - Between the real estate department of SEC and the informal land users (including famers/herders) through on ground surveys and direct communication.
- Based on the above, and in accordance with IFC PS5, the need for developing the following will be determined and implemented by SEC for all formal and informal land users:
 - Land Acquisition Plan (LAP);
 - Resettlement Action Plan (RAP); and
 - Livelihood Restoration Plan (LRP).
- Where compensation is required, a transparent valuation process should be implemented in line with market values for the land loss and other elements within these lands (structures, cabins, trees/crops, profit from trees/crops, etc.)
- Ensure a robust redress grievance mechanism is in place and implemented and grievances are addressed in a timely manner.

6.6.2 Archaeology and Cultural Heritage Sites

The site surveys by the design team are ongoing and if other archaeological sites are identified, the route will be optimized to avoid potential impacts. However, the following additional measures are proposed:

- Consultations with the SCTNH to identify any existing archaeological sites (other than the ones identifies so far). It is also important to confirm with SCTNH and implement the setback/buffer zone required from the existing archaeological/heritage sites to prevent any impacts or physical damage during construction activities.
- Based on the outcomes of the consultation with SCTNH, potential archaeological survey or further OHTL route refinement may be required to avoid impact on existing archaeological sites (in addition to the ones identified so far).
- It will be necessary to develop a 'Chance Finds Procedure' in the event that the construction phase encounters any other possible archaeological finds.

7 ECOSYSTEM SERVICES

This 'Ecosystem Services Assessment' addendum has been included to provide an overview of the local ecosystem services people (and businesses) interact with and benefit from. This addendum assesses the potential Project impacts on identified ecosystem services and proposes applicable mitigation measures.

7.1 Overview

Ecosystems provide services that result in beneficial human impacts. A decline or loss of any of these services and their benefits can result in socio-economic impacts that extend beyond environmental damages (World Resources Institute, 2013).

Ecosystems services are divided into four categories (World Resources Institute, 2013 and also consistent with the four types outlined in IFC PS6):

- "Provisioning services are the goods or products obtained from ecosystems, such as food, timber, fiber, and freshwater.
- Regulating services are the contributions to human well-being arising from an ecosystem's control of natural processes, such as climate regulation, disease control, erosion prevention, water flow regulation, and protection from natural hazards.
- Cultural services are the nonmaterial contributions of ecosystems to human well-being, such as recreation, spiritual values, and aesthetic enjoyment.
- Supporting services are the natural processes, such as nutrient cycling and primary production, that maintain the other services."

IFC PS6 outlines that ecosystem services valued by humans are often underpinned by biodiversity, and hence impacts to biodiversity can adversely affect the delivery of ecosystem services.

7.2 Standards and Regulations

7.2.1 National Regulations

There is no specific Saudi Arabian regulation related to ecosystems services. However, the Environmental Law published in 2020 makes various reference to the general and wider protection of the environment, defining it as, 'Everything that surrounds a person, animal, plant or any living organism; including water, air, land, soil, organisms, biological diversity, atmospheric gases, water bodies, and what these media contain in terms of inanimate objects and various forms of energy, environmental habitats, and natural processes and interaction between each other.' Hence, this includes ecosystems services.

7.2.2 Lender Requirements

The assessment of impacts upon ecosystem services is made with due consideration to the following:

- IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources which establishes requirements for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources.
 - Management of Ecosystem Services: through identifying priority ecosystem services, avoiding adverse impacts where possible or implementing the required mitigation measures to maintain the value and functionality of the priority services. The Ecosystem Services are divided into two priority types:
 - Type I: Services that the project operations are most likely to impact and, therefore, would result in adverse impacts to affected communities.
 - Type II: Services on which the project is directly dependent for its operations (e.g., water).
 - Invasive Alien Species: The project should not intentionally introduce alien species with high risk of invasive behavior. Implement measures to prevent the potential introduction of invasive species including the transportation of substrates and vectors that may contain alien species.
- Performance Standard 4 Community Health, Safety, and Security to address the project's potential impacts on provisioning and regulating ecosystem services which will result in adverse health and safety risks and impacts to affected communities.

7.3 Baseline

The terrestrial ecology and land use baseline are discussed in chapters 5.2 and 6.2 of this ESIA Addendum.

7.4 Identified Ecosystem Services

Based on chapters 5.2 and 6.2 and taking into consideration the ecological conditions of the Project area and the land users and local herders in the Project area the ecosystem services provided by the Project site outlined in the following table.

Table 7-1 Ecosystem Services Provided by the Project Site

ECOSYSTEM SERVICE	TYPE OF SERVICE	BENEFICIARY	CATEGORY	DESCRIPTION
Provisioning service	Type I	Farmers	Crops	Several farms were observed within the OHTL RoW during the ground truthing survey, indicating that these areas are used for growing crops and agricultural purposes.
	Type I	Local herders and farmers	Food-Livestock	Numerous camels and several farms were observed within the OHTL route and the surrounding areas during the ground truthing survey, indicating that these areas are used by herders with livestock for grazing.
Regulating services	Type I	Local communities and the global population	Regulating air quality and climate change	Several trees and shrubs were identified within the OHTL route and its surrounding area. Existing vegetation trap air pollutants and GHGs and accordingly help reduce the impacts on air quality and climate change.
	Type I	Local communities and surrounding landowners	Regulating water flows	The OHTL extends over a long distance through areas of different habitats including mountains, sand sheets, gravel sheets and wadis.

In line with IFC Guidance Note 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources, priority ecosystem services are required to be identified. Priority ecosystem services are defined by IFC as the following:

- (i) those services on which Project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and/or
- (ii) those services on which the Project is directly dependent for its operations.

Upon reviewing the above ecosystem services and the definition of priority ecosystem services, it is determined that the Project may potentially have an impact on affected communities (priority service i). However, this will require finalizing the OHTL route and consultations with the land users to determine the level of impact on priority ecosystem services. Please refer to section 6.5 of this ESIA addendum for the impact assessment on land use.

7.5 Potential Impacts

7.5.1 Construction

PROVISIONING SERVICE-CROPS AND LIVESTOCK

To avoid duplication, please refer to section 6.5 of this ESIA addendum for the assessment of impacts on land use including farms and herders.

REGULATING SERVICES-REGULATING AIR QUALITY AND CLIMATE CHANGE

The OHTL route extends over a long distance where several trees and shrubs were identified during the ground truthing survey within the OHTL RoW and the surroundings of the 11 surveyed areas along the alignment. However, since the direct Project impact is from the construction of the pylons and access roads that can be micro sited to avoid vegetation to the extent possible and considering some habitats may re-establish over time (e.g. in areas under towers and dirt roads that are not often used), and taking into account the sparse vegetative ground cover and the lack of voluminous biomass that would present stores for carbon, the Project is not expected to result in the loss of significant carbon sinks.

REGULATING SERVICES- REGULATING WATER FLOWS

The OHTL route design will avoid to the extent possible the existing wadis. With the exception of the substations, the construction phase of the OHTL is not expected to require large areas of hardground or concrete that may result in impermeable areas or diverting the direction or the natural flow of surface water in the area. Therefore, the Project is not expected to result in diverting water flows away from vegetated areas or result in flooding and impacting upon nearby communities and lands.

7.5.2 Operation

The operation of the Project is not expected to result in adverse impacts to the ecosystems services.

7.6 Recommended Mitigation Measures

7.6.1 Construction

PROVISIONING SERVICE-CROPS AND LIVESTOCK

Please refer to section 6.6 of this ESIA addendum for the proposed mitigation measures on land use including farms and herders.

In addition to the measures mentioned in section 6.6, it is necessary to implement the required construction mitigation measures and environmental management plans proposed in the existing EIAs for air quality, noise, soil and groundwater, ecology etc. to ensure the project construction does not impact the surrounding plots that are used by herders and thus indirectly impacting their livelihoods.

To ensure the concerns of the local communities are taken into consideration, a robust grievance redress mechanism should be implemented. The contact details of the grievance redress team should be distributed around the Project area in areas accessible by third parties.

Any complaints or concerns raised should be acknowledged, addressed and closed out in a timely manner.

REGULATING SERVICES-REGULATING AIR QUALITY AND CLIMATE CHANGE

To limit potential impacts from habitat loss please refer to the mitigation measures proposed in section 5.4.1.1 of this ESIA Addendum.

REGULATING SERVICES- REGULATING WATER FLOWS

The stormwater management measures for the substations should take into consideration the existing wadis onsite (if any) and the natural flow of surface water while maintaining the existing discharge areas of the wadis to the surrounding plots to the extent possible. The aim should be not to increase water flows (or the speed of water flow) off the site, that could result in additional flooding/water flows downstream.

Maintain good housekeeping practices onsite and ensure proper materials, chemicals and waste management procedures are implemented. Waste, chemicals, and stockpiles should be stored in contained areas away from water flow pathways.

In addition, a robust grievance redress mechanism should be implemented to ensure the concerns of the local community and surrounding land owners are considered and addressed.

8 CLIMATE CHANGE AND VULNERABILITY ASSESSMENT

This chapter has been prepared in compliance with the Equator Principles (to EP IV) which require the inclusion of a 'Climate Impact and Vulnerability' assessment as part of the ESIA studies for projects financed by Equator Principles Financial Institutions (EPFIs). This assessment was not included to the original project EIAs prepared for the Project.

8.1 Standards and Regulations

8.1.1 National Context and Regulations

The Paris Agreement came into force on 4th November 2016. The KSA signed and ratified the Agreement on 3rd November 2016 (UNTC, 2020). To date, the Kingdom of Saudi Arabia has not released a national climate action plan, however, the country has established a number of initiatives to address climate change issues, including (Al-Sarihi, 2019):

- Establishing a Renewable Energy Project Development Office (REPDO) by the Ministry of Energy in 2017 to raise the renewable energy capacity in the total energy mix within the Kingdom to 9.5 GW by 2023, in line with Saudi's Vision 2030;
- Establishing a National Committee for the Clean Development Mechanism and Designated National Authority in 2009, which oversees the development process of Clean Development Mechanism projects;
- Establishing a Saudi Energy Efficiency Program launched by Saudi Energy Efficiency Centre (SEEC), which aims at designing and implanting energy efficiency initiatives for the country; and
- Oil and Gas Climate Initiative lead by Saudi Aramco to help member companies support the Paris Agreement and its aims (<https://oilandgasclimateinitiative.com/about-us/#guidingprinciples>).

8.1.2 Lenders Requirements

Equator Principles IV establish that impacts on climate should be avoided where possible, and in support of the 2015 Paris Agreement recognises that EPFIs have a role to play in improving the availability of climate-related information.

Factors such climate change are required for the Project Review and Categorisation (EP1), while a key element of EP IV (under EP2 for Environmental and Social Assessment) is that an assessment of climate change risks is expected in an ESIA and should link to the 'Climate

Physical Risk' and 'Climate Transition Risk' categories developed by the Task Force on Climate-related Financial Disclosures (TCFD).

For projects that have Scope 1 & 2 GHG emissions of over 100,000 tonnes of CO₂ equivalent per annum, additional requirements for alternative analysis and client annual reporting on GHG emissions apply.

8.2 Climate Baseline Data

8.2.1 National Climate Change Context

The mean global temperature has increased by an estimated 1.09 °C since the pre-industrial era. Climate observation and reanalyses in recent decades indicate that the globe is warming up at an average rate of 0.2°C per year (IPCC, 2021). In regard to long-term projections, the IPCC estimates a global mean surface temperature increase of 3.3 to 5.7°C in the period 2080-2100. The warming effect of progressive greenhouse gas emissions on the global climate has caused an upturn in the frequency and intensity of extreme weather events. Indirectly, these effects have also induced the occurrence of climate-sensitive natural hazards such as droughts, floods, sea-level rise and landslides.

The evolution of the global climate system has substantially impacted on natural ecosystems, human livelihoods and national economies at large. By close of 2020, KSA was reported to have a population of 35 million people and Gross Domestic Product (GDP) totalling 700 billion US Dollars. While the oil and gas industry accounts for 50% of the country's GDP, the country's economy is also significantly reliant on climate sensitive sectors such as agriculture (OPEC, 2022). By 2019, KSA scored a Climate Risk Index (CRI) index of 73, ranking 57th in terms of average fatalities, and 51st in terms of economic losses in relation to extreme weather events (Germanwatch, 2022). With a growing urban population, increasing temperatures, dwindling groundwater resources, rising sea levels and recurrent flood events, KSA is faced with growing biophysical and socioeconomic vulnerabilities to climate change. In response to the climate urgency, the country launched a coordinated move towards decarbonisation with its entry into the Paris Climate Accords in 2015.

8.2.2 Climatology and Climatic Natural Hazards – Historical Trends and Projections

Standing amongst the world's hottest and most arid countries, Saudi Arabia is characterized by a desert climate. In terms of climatic zones defined by the Köppen climate classification system, most of the country falls within a hot, arid desert zone, with remote patches of cold, arid desert, and cold, arid steep climates, most of which represent mountainous pockets in the country's western reaches. The climate generally entails high daytime temperatures, inversely low night-time temperatures, and meagre, irregular precipitation. With climatological influences from both tropical and extra-tropical weather systems, the country experiences the

four seasons of winter (December-February), spring (March-May), summer (June-August) and fall (September-November) (Odnoletkova and Patztek, 2021).

8.2.2.1 Temperature

Baseline and Historical Trends

Summers in the central region are extremely hot and dry, ranging from 27°C to 43°C in the inland areas and 27°C to 38°C in coastal areas. In winter, the temperature ranges between 8°C to 20°C in the interior parts while higher temperatures (19°C - 29°C) have been recorded in the coastal areas of Red Sea. With regards to historical temperature trends, countrywide information (high-resolution gridded datasets) on long-term temperature observations was obtained from the Climatic Research Unit. A graph illustrating the variation in mean annual temperature levels in the period 1980 to 2020 is shown below, as reported by a total of 12 weather stations across the country.

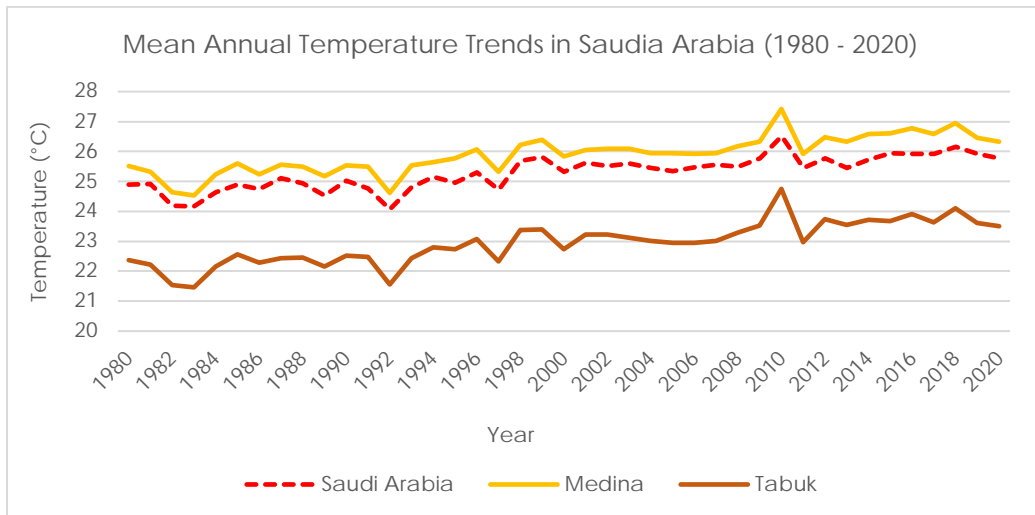


Figure 8-1 Observed Temperature Levels in Saudi Arabia

Projections

To understand possible temperature extremities in the high emissions climate change scenario, within the Project’s operational phase, climatological projections were carried out for the period 2080-2099. The modelling was based on a historical reference period of 1995-2014 and a time horizon of 2099. The collection of up-to-date Global Climate Models (GCM) for an integrated projection analysis was sourced from the Coupled Model Inter-Comparison Project Phase 6 (CIMP6) and ran through the Multi-Model Ensemble (MME). The analysis was premised on the Shared Socioeconomic Pathway (SSP) 5 (Fossil Fuel Development), paired with the Representative Concentration Pathway (RCP) 8.5. The range of simulation outputs from the integrated modelling (MME) was limited to the 50th percentile. The table below provides an overview of modelling results in comparison with historical observations.

Figure 8-2 Comparison of Temperature Metrics for Period of 1980-2020 with Those of 2080-2100 in Accordance with the SSP 5-8.5 Climate Change Scenario

CLIMATE PARAMETER	OBSERVED HISTORICAL VALUES (1991 – 2020)			PROJECTED VALUES (2080 – 2099)		
	SAUDI ARABIA	MADINAH	TABUK	SAUDI ARABIA	MADINAH	TABUK
Mean annual temperature (°C)	25.5	26.1	23.2	30.9	31.8	29.4
Maximum temperature (°C) (annual mean)	31.8	32.6	29.7	37.1	37.6	34.8

Temperature projections for all five climate change scenarios (limited to the 90th percentile) are shown in the plot below. Modelling for the 5-8.5 climate change scenario predicts a 17.4% increase in temperature, with a maximum temperature of about 37.1°C.

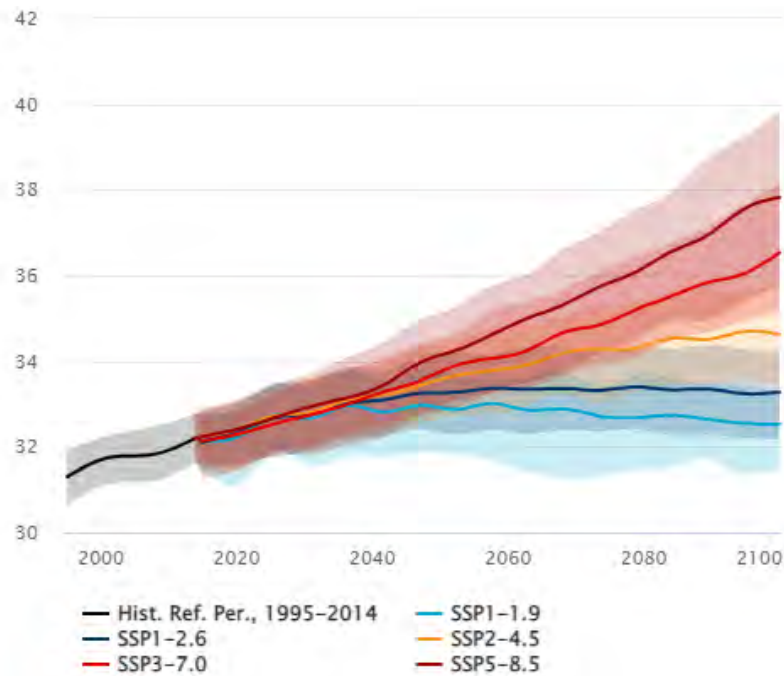


Figure 8-3 Mean Annual Maximum Temperature Projections for Saudi Arabia for the Period 2080-2100 Generated Through the Multi-Model Ensemble

(source: World Bank Climate Tracker, 2022)

8.2.2.2 Precipitation

Baseline and Historical Trends

The annual precipitation cycle of Saudi Arabia consists of a dry season and a wet season. Brief episodes of rainfall take place between October and April, whereas little to no precipitation occurs in May to September, with the exception of the country's southwestern region, which receives scant rainfall throughout the year. The average annual rainfall in most parts of the country does not exceed 150 mm throughout the year, whereas that of the southwestern reaches ranges from 400 – 600 mm annually.

Precipitation patterns in the country’s northern parts are primarily influenced by Mediterranean low pressure systems (troughs), while those in the South are driven by the Sudanese trough, Westerly winds, Monsoon winds and orographic synergies in the highlands extending along the Red Sea. Moreover, the wet season precipitation variability over Saudi Arabia is notably impacted by the El Niño Southern Oscillation (ENSO) (Almazroui, 2020). A graph illustrating the variation in mean annual precipitation levels in the period 1980 to 2020 is shown below, as reported by a total of 12 weather stations across the country.

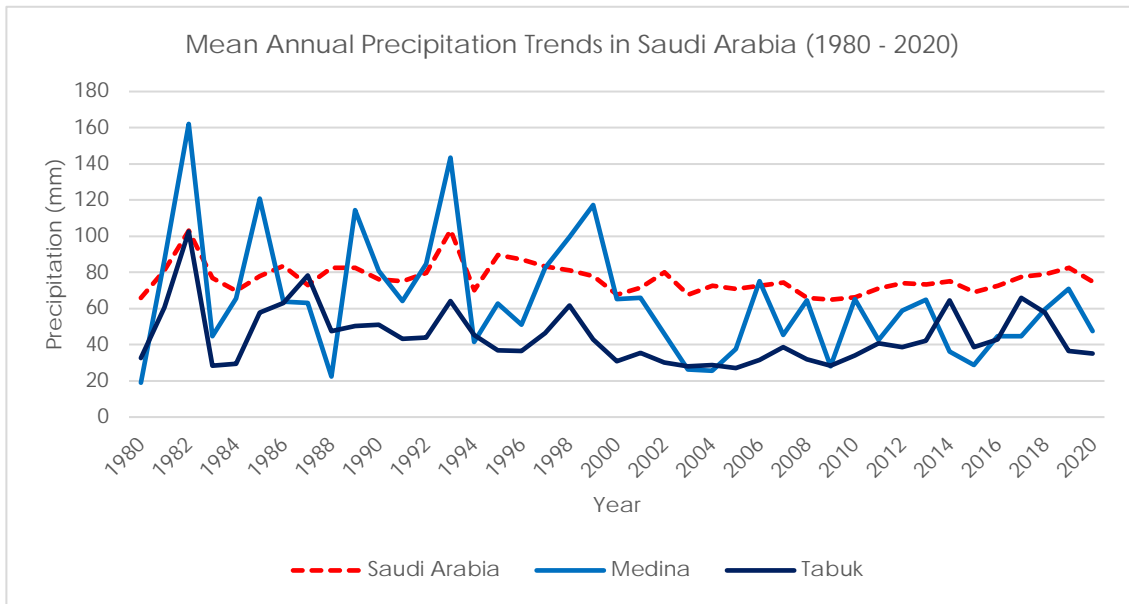


Figure 8-4 Observed Precipitation Levels in Saudi Arabia

Projections

The methodology described in the temperature projections under section 7.2.2.1 was applied for projecting precipitation trends in the SSP 5-8.5 scenario. The table below provides an overview of the modelling results in comparison with historical observations.

Figure 8-5 Comparison of Precipitation Metrics for Period of 1980-2020 with Those of 2080-2100 in Accordance with the SSP 5-8.5 Climate Change Scenario

CLIMATE PARAMETER	OBSERVED HISTORICAL VALUES (1991 – 2020)			PROJECTED VALUES (2080 – 2099)		
	SAUDI ARABIA	MADINAH	TABUK	SAUDI ARABIA	MADINAH	TABUK
Mean annual precipitation (°C)	64.5	59.7	40.9	70.3	49.9	32.8
Maximum precipitation (°C) (annual mean)	N/A	N/A	N/A	37.5	30.4	25.9

Projections for largest one-day precipitation levels for all five climate change scenarios (limited to the 90th percentile) are shown in the plot below. Modelling for the 5-8.5 climate change scenario suggests that the period 2080-2099 could see a 9% increase in mean annual

precipitation, with a maximum 1-day precipitation level of about 37.5 mm, which exceeds the country's cut-off for an extreme rainfall event by 44%.

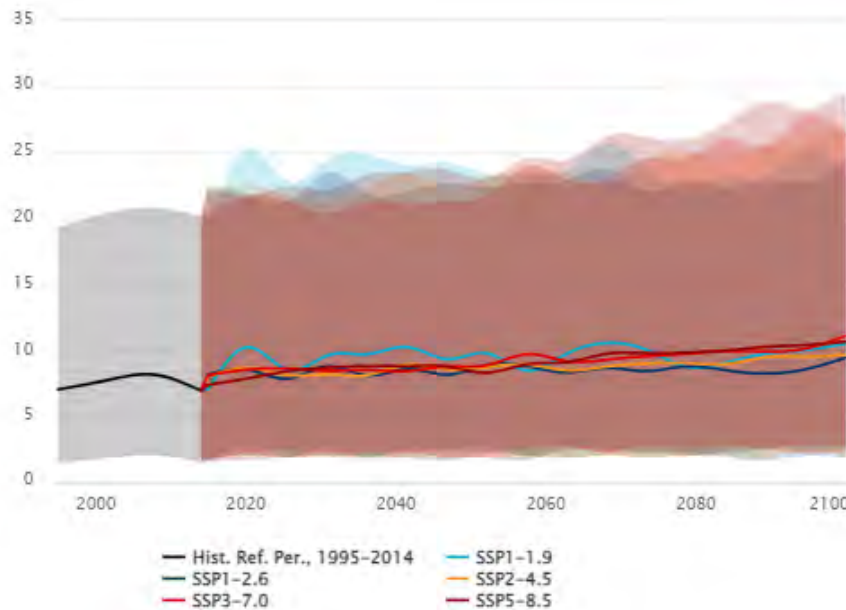


Figure 8-6 Mean Annual Largest 1-day Precipitation Projections for Saudi Arabia for the Period 2080-2100 Generated Through the Multi-Model Ensemble (Source: World Bank Climate Tracker, 2022)

8.2.2.3 Climate-Induced Natural Hazards – Historical Trends

Floods

Flash floods are caused by slow-moving weather patterns (convective systems) that generate intense rainfall over a poorly-drained area in a short space of time (less than six hours). Published reviews of historical rainfall data for the period 1970-2019 suggest that precipitation in Saudi Arabia has decreased at an average rate of 5.89 mm per decade. However, the frequency of intense rainfall events in KSA has increased. Records from weather stations in the coastal and highland regions show the highest frequency of extreme rainfall events as compared to other regions.

In Saudi Arabia, a total of 11 extensive flash-floods have occurred in the country's lowlands since 1985, particularly the basins of Jeddah, Riyadh, Makkah and Tabuk. Recent flash flood events recorded in Jeddah City include the inundation incidents of 2009 and 2011, which saw precipitation levels totalling 74 mm and 111 mm respectively. In Tabuk, rapid population growth, urbanization, the transformation of vast areas of sandy desert into impervious, paved landscapes, and lack of adequate drainage systems have exacerbated the city's vulnerability to flash-floods (Alsubeai and Burckhard, 2021).

Heat Waves and Droughts

Over the past four decades, the mean annual temperature in Saudi Arabia has risen at a rate that is 50% higher than that of the remaining landmass of the Northern Hemisphere. This trend has been paralleled by an increase in humidity. Between 1979 and 2019, Saudi Arabia's mean temperature increased by 2.18°C, which is threefold the global average. Further, the total annual duration of heat waves (prolonged periods of maximum temperature) has grown exponentially in the majority of Saudi Arabia's urban centres. The sharpest temperature increases are projected to prevail in the summer.

Landslides

Landslides can be defined as a down-slope mass movement of earth, rocks and/ or debris. Such events are typically triggered by acute ground destabilization resulting from floods, earthquakes, volcanic eruptions, and anthropogenic activities involving mass excavation, slope loading, vegetation clearance and drainage impediment. To date, land-slides in Saudi Arabia have been reported exclusively in mining hotspots within the country's South-Western region (Youssef et al, 2015).

Dust Storms:

Dust storms refer to extensive dust dispersion events caused by strong winds that raise dust and sand from deserts and surrounding areas and carry it over large distances. Recent research has demonstrated an association between dust storms in the Arabian Peninsula and the Asian summer monsoon system and Shamal and Levar winds over the Arabian Sea. In the KSA, dust-storms are most prevalent in the country's East (10-60 events per year), but also occur in other parts of the country (with a frequency of 10-60 events annually), in proximity to the two major deserts of Ad-Dahna and An Nafud. Dust storms have been shown to exhibit winds speeds of 15-20 metres per second, with maximum incidence in the months of winter and spring when wind and precipitation levels are relatively high (Al Bugami et al, 2019).

Forest Fires

The recent uptick in heat waves and droughts has been witnessed on a global scale. Protracted periods of hot and dry weather have led to the outbreak of forest fires and record-high losses of forest cover have arisen in Southern Europe and Australia. In Saudi Arabia, forest fires have occurred mostly in the south-western region, where more vegetative cover exists (Think Hazard, 2022).

8.2.3 Climate-Induced Natural Hazards – Projections

According to forecasts obtained from the Global Facility for Disaster Reduction and Recovery (GFDRR), extreme weather events that are expected to intensify over Saudi Arabia in the future mainly include heat waves, droughts and flash-floods. Natural hazards with secondary links to

climate change, such as forest fires, sea level rise and landslides, are also predicted to become increasingly frequent. Larger anomalies for flash floods and sea level rise are limited to the South-Western reaches and southern portion of the Red Sea coastline respectively. With the SSP 5-8.5 scenario, sea-level along the country's coast is projected to rise by an average of 0.67 to 0.87 metres over the period 2080-2099, as shown in the graph below.

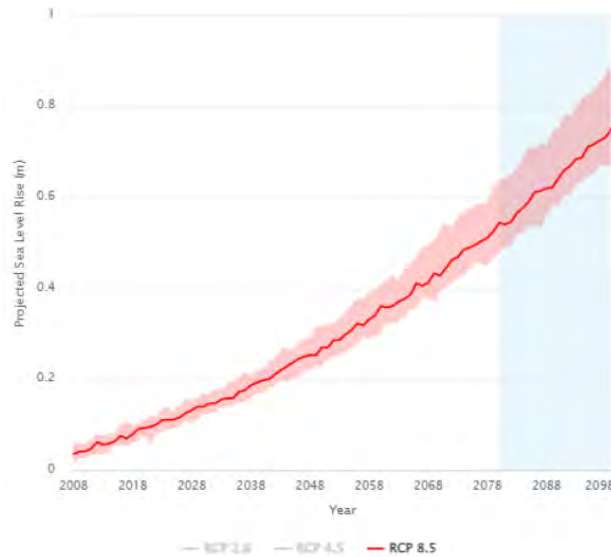


Figure 8-7 Projected Advancement of Sea Level Rise in the SSP 5-8.5 Climate Change Scenario Over the Period 2080-2099.

8.3 Vulnerability of the Project to Climate Change

In the context of the Project, a number of climate-sensitive socio-economic receptors within the Project's influence area have been identified. These vulnerable entities are categorized and described in the table below.

CLIMATE VULNERABILITY	RELATION TO THE PROJECT
Project beneficiaries (power supply recipients) in Saudi Arabia	<p>Recent infrastructural developments in the regions of Tabuk and Madinah mark an urbanization trend that has spurred the growth of country's urban population and commercial centres. The regions are nonetheless beset by increasing ambient temperatures and drought, which have driven up the demand for energy and freshwater resources. The population of KSA at large is also increasingly susceptible to climate induced-natural hazards that have been on the rise with the changing climate.</p> <p>With the advancement of urban growth and broader development within these regions, the general demand for power is set to rise even further. A shortage of power supply to meet this demand will constrain the operation of energy-intensive economic activities and cooling facilities. Such shortages would constrain the productivity and general wellbeing of service users, and low-income users in particular. Potential structural failures of high-voltage transmission lines during climatic extremes also pose a threat to the public.</p>

CLIMATE VULNERABILITY	RELATION TO THE PROJECT
<p>Saudi Electricity Company</p>	<p>SEC is a national entity charged with the development and operation of power supply systems to provide for Saudi Arabia's expanding energy markets. In recent years, the Company has become confronted with increasing pressure for added power supply to expand domestic and foreign grids. The progression of climate change and extreme weather events in particular pose the risk of increased service interruptions and inflated operation and maintenance costs.</p> <p>In addition, the Company is responsible for integrating new renewable energy sources into the national grid, in furtherance of national efforts to decarbonize the economy by 2060.</p>

8.3.1 Climate Physical Risks

8.3.1.1 Reduced Capacity and Reliability of the OHTL due to Increases in Ambient Air Temperature

Conductor resistance to electrical current has an inherent heating effect on transmission cabling. The temperature of transmission cabling is also influenced by external factors such as solar radiation, ambient air temperature and wind conditions. Overheating of transmission lines causes several operational issues, such as cumulative cable wear from annealing, sagging of electrical cabling and, in extreme cases, severe damage to transmission cabling. Thermal expansion and consequent sagging of electrical cables beyond prescribed ground clearance limits poses a public safety hazard. Electric utilities therefore assign specific power ratings (power load maxima) to transmission lines with a view to preventing adverse overheating. In the event that external conditions interact to raise line temperatures above operational thresholds, power loads are reduced proportionally, which often leads to power shortages resulting in congestion within recipient distribution networks.

With the SSP5-8.5 scenario, mean annual maximum temperatures in the KSA are set to reach 37.1°C between 2080 and 2100. The frequency and intensity of extremely hot weather events is projected to rise. Instances of upward temperature extremes accompanied by low wind-speeds and/or precipitation will require de-rating for affected transmission line sections, which may in turn reduce the reach of subsequent power distribution. Concurrent surges in power demand for cooling facilities in the duration of any such hot weather extremes could therefore result in a power deficit. Such deficits could cause the disruption of social and commercial services, as well as heat exhaustion and/or heat stress, amongst gridded users without back-up power sources, in the event of heat waves.

8.3.1.2 Damage to Power Infrastructure and Associated Power Interruptions Due to Extreme Precipitation Events, Sea-Level Rise and Land-Slides

Climatic trends consistent with the SSP5-8.5 scenario will entail a mean annual largest one-day precipitation level of 37.5 millimetres and a sea level rise of up to 0.87 meters. Projected increases in the frequency and intensity of flash-floods on any low-lying and steeply-sloping

sites along the OTL corridor presents the risk of damage to affected transmission line components. Likewise, potential progressions in sea level rise may result in wave flooding, tidal inundation and coastal erosion, which will jeopardize the structural and functional integrity of on-shore electrical equipment and utility assets located on any bare, low-lying coast sections. Increased occurrences and severity of erosion-driven damages will result in more frequent power outages, consequent disruption of social services, high maintenance costs and economic losses due to service interruptions.

Strong winds and high-voltage lightning strikes that may be generated by possible culminations in tropical storms over Saudi Arabia may also lead to damages such as cable breakdowns and flashover combustion. In addition, the risk of land-slides due to flood events along destabilized slopes cannot be ruled out prior to geotechnical investigation. Remote elevation profile analyses indicate slope gradients as high as 14% along the OHTL path. The occurrence of landslides in or around the transmission line corridor would lead to severe damage and loss of utility assets.

8.3.1.3 Public Safety Hazards due to Potential Failure of Transmission Line Infrastructure

Projected changes in the climate regime of Saudi Arabia is foreseen to entail an escalation of weather extremes. During periods of extremely high ambient temperatures, overheated cables with unchecked power loads may breakdown and/ or sag, thereby potentiating electrocution of any persons situated underneath the transmission line. Fatal electrocution incidents may also ensue from encounters with cabling dislocated or ruptured by extreme events such as flash-floods, high-winds and lightening.

The design of the Project follows SEC's technical specifications for OHTL, where by:

- All conductors and cables are insulated with materials that withstands extreme temperatures and storms.
- Service conditions of min -5°C and max 55°C and a monthly average of 45°C.
- A geotechnical and soil investigation is being carried out in order to identify the suitable locations for installing the OHTL towers.
- All structures located in wadis are required to be constructed to resist 2 m flood levels at 20km/h velocity.
- Structures are required to be protected against erosion by means of box gabion.

8.3.2 Climate Transitions Risks

8.3.2.1 Incongruence with National Policy Shift Towards Reduced Carbon Footprint

Following its commitment to the Paris Agreement, Saudi Arabia has launched the Saudi Green Initiative Program in tandem with the National Renewable Energy Program, with a view to restructuring the country's energy base such that renewables will account for 50% of the country's energy output by 2030. KSA also declared a commitment towards zero net carbon emissions by 2060, following initial strides in diversifying the country's energy mix with the establishment of several large-scale solar plants.

The OHTL, will be fed by a combination of renewable energy and conventional sources of energy and is therefore not expected to be subject to drastic operational declines due to the foreseeable de-prioritization of non-renewable power sources to meet national decarbonisation objectives.

8.4 Recommended Mitigation Measures

8.4.1.1 Reduced Capacity and Reliability of the OHTL due to Increases in Ambient Air Temperature

Based on discussion with the design team, to avoid potential impacts from extreme temperatures, the conductors/cables will be protected by insulation. In addition to that, the following measures are proposed to mitigate against potential reductions in transmission line capacity and reliability:

- Detailed design should involve a climate-informed risk assessment to adopt cabling with the most suitable ampacity (current carrying-capacity) in regards to foreseeable upward temperature extremes.
- Detailed design should also take into account preventive approaches such as Dynamic Line Rating (DLR) technology capable of utilizing real-time monitoring systems to enable continuous computation of site-specific power ratings and corresponding adjustment of power loads.

8.4.1.2 Damage to Power Infrastructure and Associated Power Interruptions Due to Extreme Precipitation Events, Sea-Level Rise and Land-Slides

Based on discussion with the design team, the detailed design will avoid areas prone to flash floods and coastal erosion when micro-siting the OHTL pylons/towers. The design will also be informed by the outcomes of the geotechnical and soil investigations that are currently ongoing. In addition, SEC standard measures for flood risk should be implemented in areas where the pylons have to be located within wadis.

The following additional measures are proposed:

- Where realignment to avoid any sites susceptible to flooding or coastal erosion is not feasible, flood models based on detailed hydrological surveys should be considered to delineate high-risk areas and enable any enhancements to tower foundation design and/or structural measures to achieve coastal erosion control.
- For protection against high-voltage lightning, detailed design should demonstrate preventive measures such as installation of shield wires, surge arresters etc.
- Project planning at the detailed design stage should be informed by a comprehensive geotechnical survey along the OHTL corridor. If any high-risk areas are identified in the course of the survey, the OHTL alignment should be modified to avoid unstable ground along sloping zones. Where the alignment is situated in proximity to any low to medium-risk areas, the development of drainage systems can be implemented to minimise the sites' vulnerability to landslides.

8.4.1.3 Public Safety Hazards due to Potential Failure of Transmission Line Infrastructure

The following abatement measures are proposed:

- Regular monitoring of ground clearance observance. Specifications for tower height should take into account maximum thermal expansion scenarios relative to legal ground clearance limits.
- Periodic monitoring and implementation of maintenance routines to fix or replace dilapidated electrical equipment, particularly after extreme events, or end of lifetime of critical electrical components.
- Installing safety (precautionary) signage in and around the OHTL corridor to discourage activity within the OHTL RoW.
- Locating the OHTL infrastructure a safe distance away from human settlements, and an effort to ensure a stringent enforcement of the OHTL RoW clearance.

8.4.1.4 Incongruence with National Policy Shift Towards Reduced Carbon Footprint

Subsequent stages of project design should involve a participatory planning approach to explore and pursue avenues for future integration of alternative, renewable sources of power, or a full-scale transition to renewable power supply for all of the Project's grids.

9 CUMULATIVE IMPACTS ASSESSMENT

Cumulative impacts are defined as those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For any given project, a Cumulative Impact Assessment (CIA) serves to identify resultant environmental and social impacts that can synergize with equivalent impacts of proximate developments, and with natural stressors, such as climate change.

As such, the CIA process primarily consists of the following two aspects:

- Identification and characterization of potential impacts that can be expected to ensue from the Project activities, other developments and environmental drivers within the temporal and special boundaries of the Project in focus.
- Development of actionable measures for effective prevention, mitigation and alleviation of negative cumulative impacts and risks, and enhancement initiatives for any positive cumulative impacts.

9.1 Objectives of the Cumulative Impact Assessment

The objectives and outcomes of the CIA study for the Project are as follows:

- Identification of project components, coincident developments, and natural/unplanned dynamics that bear mutual Environmental and Social (E&S) impacts, which may arise and/or intensify within the Project's lifetime and influence areas.
- Identification of Vulnerable Environmental Components (VECs) that are subject to E&S impacts brought on by the Project in synergy with external drivers.
- Overview of the current state of the VECs identified, with a focus on baseline attributes of particular relevance to the Project.
- A description and assessment of cumulative E&S impacts foreseen to affect established VECs, relative to baseline conditions, legal requirements and internationally recognized benchmarks.
- Recommendation of effective mitigation measures to prevent, abate and/or alleviate negative E&S impacts, alongside enhancement actions to reinforce anticipated project benefits.
- Development of a management and monitoring plan with a specific focus on the Project's E&S impacts, which should set out the timing, monitoring indicators and

responsible implementing parties, in order for consistent impact management and performance evaluation in relation to established indicators and targets.

9.2 Identification of Concurrent Developments and Environmental Drivers

Considering the size of the Project, it will not be feasible to identify the development master plans for the Tabuk and Madinah Regions where the OHTL alignment passes through. Additionally, review of publicly available literature and the land use ground truthing survey conducted did not identify any ongoing or planned development projects within the Project's Area of Influence (AoI), with the exception of the NEOM City Project and existing OHTLs that the Project will run parallel to.

On this basis, the scope of the CIA study was limited to the Project components which include the three (3) portions of the OHTL, the Transmission Station in Gulf of Aqaba and subsea cable, constructing the converter substations in Tabuk and Madinah, NEOM project, and climatic stressors of relevance.

A summary of the existing and planned activities covered in the CIA is provided in the following table.

Table 9-1 List of Existing and Planned Activities in the Project's Area of Influence

PROJECTS/ ENVIRONMENTAL STRESSORS	DESCRIPTION	SPATIAL EXTENT	TEMPORAL EXTENT	
NEOM City Project	NEOM is the flagship project of Vision 2030 and will be developed as a mega-city of the future, aiming to become an international hub for a range of sectors and services. The NEOM site will cover an area of 28,000 km ² . NEOM is located on the north-western edge of KSA, in proximity to Jordan and Egypt and is therefore adjacent to the proposed Portion 1 OHTL alignment.	Tabuk Region	Construction	Development has commenced and is due to be complete by 2030
			Operation	-
SEC Overhead Transmission Line 1	An existing OHTL connecting to Madinah East Converter Station extends in parallel to part of Portion 3 proposed OHTL alignment	Tabuk Region	Construction	Complete
			Operation	-
SEC Overhead Transmission Line 2	An existing operational OHTL connecting to Tabuk Converter Station extends in parallel to part of Portion 2 proposed OHTL alignment	Tabuk Region	Construction	Complete
			Operation	-

PROJECTS/ ENVIRONMENTAL STRESSORS	DESCRIPTION	SPATIAL EXTENT	TEMPORAL EXTENT	
			Construction	Operation
SEC Interconnection Portion 1	Portion 1 (HVDC overhead transmission line) of the Project that extends Ca. 228 Km from the 1,500 MW Converter Station in Tabuk to the planned Transmission Station in Gulf of Aqaba.	Madinah Region	Construction	August 2022
			Operation	-
SEC Interconnection Portion 2	Portion 2 (HVDC overhead transmission line) of the Project with a total length of Ca. 336 km from the 1,500 MW Converter Station in Tabuk to Al Muthalath town.	Tabuk Region	Construction	August 2022
			Operation	-
SEC Interconnection Portion 3	Portion 3 (HVDC overhead transmission line) of the Project measuring Ca. 336 Km and leading up to the 3000 MW Madinah East Converter Station.	Tabuk Region	Construction	August 2022
			Operation	-
Subsea cable and Gulf of Aqaba Transmission Station	The subsea cable of the project extending 10 Km from Gulf of Aqaba Transmission Station to the maritime boundary of KSA.	Tabuk Region	Construction	Sept 2023 and March 2023 respectively
			Operation	-
Converter Stations in Tabuk and Madinah	1500 MW Tabuk Converter Station and the 3000MW Madinah East Converter Station	Tabuk and Madinah Region	Construction	Nov 2022 and Jan 2023 respectively
			Operation	-
Climate change	Continued rise in mean annual temperature levels across Saudi Arabia and Egypt, resulting in elevated frequencies and severity of droughts and heat waves.	Global	Present to 2100 (IPCC current projections horizon)	

9.3 Identification of Valued Environmental Components (VECs)

The impacts on the main VECs that have been considered for the purpose of this CIA during construction and operation are provided in the Table below.

Table 9-2 Valued Environmental Components

VULNERABLE ENVIRONMENTAL COMPONENTS/ RECEPTORS	OUTLINE OF BASELINE CONDITIONS
Terrestrial Ecology	<p>The ecological landscape of the project's surveyed Aol includes mountainous areas as well as wadis and gravel plains interspersed with vegetations and Acacia sp. A total of 52 herb and shrub species were recorded during the ecological survey, all of which are LC and were identified as invasive.</p> <p>A total of nine common birds species of LC were identified, three reptiles were recorded including the STL which is a HCP and is</p>

VULNERABLE ENVIRONMENTAL COMPONENTS/ RECEPTORS	OUTLINE OF BASELINE CONDITIONS
	<p>considered Vulnerable according to the IUCN. In addition, four mammals were identified.</p> <p>Even though the survey and VPs carried out along the OHTL route did not identify the presence of migrating birds, the northern area of the OHTL between Tabuk and Aqaba is known to be an important bird migration flyway.</p>
Ambient Noise and Vibration	<p>The Aol covers limited establishments, and land-use within 1 km of the OHTL corridor include small-scale farming and road transport. The noise surveys conducted as part of the existing EIAs prepared for SEC suggest generally low noise levels within the Aol ranging from 40 dB to 70 decibels (dB).</p>
Air quality	<p>Baseline surveys conducted as part of the existing EIAs prepared for SEC did not indicate heavy traffic along the major highways in and around the Project's footprint and no exceedances of air quality standards were recorded for measurements of emissions within the footprint.</p>
Landscape/ Visual amenity	<p>Landscapes within a 500 m buffer of the Aol corridor are predominantly semi-natural, featuring a continuum of sandy fields, sandstone outcrops and scant patches of desert scrub in most areas. Certain sections of the OHTL corridor cover elevated terrain. Obstructive vertical features impinging on natural landscapes within the 500 m buffer of the proposed OHTL include two existing OHTL paths linked to the Madinah East and Tabuk Converter Stations.</p>
Socioeconomics and human settlements	<p>The land use ground truthing survey carried out as part of this ESIA addendum showed little economic activity. Observed livelihoods included livestock rearing and small-scale cultivation. Besides the nearby communities, residential and commercial peripheries were noted along sections close to Madinah City and Tabuk.</p>
Waste and Wastewater Utilities	<p>No municipal/engineered waste management facilities were observed within the surveyed area. Several waste dumpsites were observed along the corridor section lying across from Tabuk Province.</p>
Traffic and road infrastructure	<p>As indicated in the existing EIAs prepared for SEC and based on the ground truthing surveys, the highways/main roads leading to the proposed OHTL corridor did not indicate congestion or signs of heavy traffic. Vehicle traffic along smaller off-roads branching out of the main highways was found to be very low.</p>
Community Health, Safety and Security	<p>During the ground truthing surveys carried out as part of this ESIA addendum, no industrial facilities were observed and only few construction activities of small farms or dwellings were taking place in the area. With regards to operational transmission lines, two operational OHTLs extend Eastwards from Madinah East Converter Station and Tabuk Converter Station parallel to the proposed OHTL corridor for approximately 5.6 km and 60 km respectively. As for operational transport corridors, a total of 5 major highways stemming from the cities of Tabuk and Medina, in addition to a number of dirt roads, intersect the OHTL corridor.</p>

9.4 Assessment of Cumulative Impacts on VECs

Project activities set for the construction and operation phases were overlaid on all segments of the biophysical and socioeconomic context within the AoI to identify interfaces and potential impacts that could grow in magnitude as a result of commonalities amongst the Project components, other developments and climate-related dynamics. Potential cumulative impacts derived from this analysis are itemized in correspondence to their respective VECs for the Project's construction and operation phases, in the table below.

Table 9-3 Assessment of Cumulative Impacts on VECs

VALUED ENVIRONMENTAL COMPONENTS	IMPACT-GENERATING PROJECTS	CUMULATIVE IMPACTS	
		CONSTRUCTION PHASE	OPERATION PHASE
Terrestrial ecology	<ol style="list-style-type: none"> SEC Interconnection – Portion 1 SEC Interconnection – Portion 2 SEC Interconnection – Portion 3 Constructing the converter stations and the transmission station NEOM City Project SEC Existing OHTLs in Madinah SEC Existing OHTLs in Tabuk 	<p>Indirect and indirect impact including the loss of vegetation and fauna (birds, mammals, and reptiles) may result from the construction activities.</p> <p>Regular transportation of construction personnel, materials and equipment along transit corridors common to the Project's components and the NEOM City Project poses a cumulative impact with regards to the spread of invasive species.</p> <p>Vehicles, earthworks machinery and construction implements in particular may translocate seeds and pores of invasive plant species to construction sites in disturbed habitats where the introduction of such species can lead to the displacement and/or elimination of low-abundance native species over time, with possible knock-on effects on ecosystem function and services.</p>	<p>The northern area of the OHTL between Tabuk and Aqaba is known to be an important birds migration flyway and therefore, the development of the Project and certain developments of NEOM City may result in potential cumulative impacts on migrating birds (collision, mortality etc.).</p> <p>The Project is being constructed near existing OHTLs in areas near Madinah and Tabuk. There are no records of birds collision or electrocution and mortality due to the existing OHTLs. However, a cumulative impact on birds may result from the operation of the multiple conductors/cables running parallel to each other.</p>
Noise and vibration	<ol style="list-style-type: none"> SEC Interconnection – Portion 1 SEC Interconnection – Portion 2 SEC Interconnection – Portion 3 Constructing the converter stations and the transmission station NEOM City Project 	<p>The build-up of traffic characterized by heavy haulage along the main roads and highways during the height of coincident construction works will result in elevated ambient noise levels and ground vibration.</p>	N/A
Landscape/ visual amenity	<ol style="list-style-type: none"> SEC Interconnection – Portion 1 SEC Interconnection – Portion 2 SEC Interconnection – Portion 3 	N/A	<p>Segments of Portion 2 and Portion 3 of the proposed OHTL are adjacent to existing SEC OHTLs. The erection of transmission line towers and cabling will create intrusive views within view-sheds nearby the Project's footprint. The aesthetic value of</p>

VALUED ENVIRONMENTAL COMPONENTS	IMPACT-GENERATING PROJECTS	CUMULATIVE IMPACTS	
		CONSTRUCTION PHASE	OPERATION PHASE
	<ol style="list-style-type: none"> 4. Constructing the converter stations and the transmission station 1. NEOM City Project 		<p>certain view-sheds will be affected by both the proposed and existing OHTLs, hence the loss of visual amenities will be heightened in these areas.</p>
Waste utilities	<ol style="list-style-type: none"> 1. SEC Interconnection – Portion 1 2. SEC Interconnection – Portion 2 3. SEC Interconnection – Portion 3 4. Constructing the converter stations and the transmission station 5. NEOM City Project 	<p>The project's construction phase will coincide with the ongoing construction of NEOM City Project in Tabuk Region. While NEOM will develop its own dedicated waste management facilities it may potentially be using municipal/governmental facilities within the area of Tabuk. Therefore, liquid, solid and hazardous waste streams generated by the Project (Portion 1 in particular) may put a strain on existing waste management facilities within Tabuk.</p>	N/A
Socioeconomics	<ol style="list-style-type: none"> 1. SEC Interconnection – Portion 1 2. SEC Interconnection – Portion 2 3. SEC Interconnection – Portion 3 4. Constructing the converter stations and the transmission station 5. NEOM City Project 	<p>The outset and progress of construction on the SEC interconnection project and NEOM City Project will create income-generating opportunities for skilled labour, and semi-skilled labour and various enterprises in Tabuk Region and wider Saudi Arabia. Employed locals will also benefit from capacity enhancement and transferable skills, which will boost employability.</p>	<p>The main socio-economic advantage of the Project is the benefit of grid stability for economic purposes.</p> <p>The Projects may also create new employment opportunities in the operations phase.</p>
Traffic and road infrastructure	<ol style="list-style-type: none"> 1. SEC Interconnection – Portion 1 2. SEC Interconnection – Portion 2 3. SEC Interconnection – Portion 3 4. Constructing the converter stations and the transmission station 5. NEOM City Project 	<p>Construction works for the Project's three components and the NEOM City Project will be implemented concurrently, and common routes may be utilized for the transportation of construction labour, materials and equipment. The combined scale of construction operations can be expected to cause a surge in transportation. Periods of heavy construction traffic may potentially result in road congestion in certain areas or</p>	N/A

VALUED ENVIRONMENTAL COMPONENTS	IMPACT-GENERATING PROJECTS	CUMULATIVE IMPACTS	
		CONSTRUCTION PHASE	OPERATION PHASE
		physical strain on the existing road infrastructure.	
Community health and safety	<ol style="list-style-type: none"> 1. SEC Interconnection – Portion 1 2. SEC Interconnection – Portion 2 3. SEC Interconnection – Portion 3 4. Constructing the converter stations and the transmission station <ol style="list-style-type: none"> 1. NEOM City Project 2. Climate Change 	<p>The Project's construction phase carries a number of health and safety (H&S) risks in regard to communities located within the Project direct Aol. Whereas some of these risks differ from those of the NEOM City Project in terms of the affected communities, H&S risks pertaining to communicable diseases such as COVID-19 or vehicle traffic are mutual.</p> <p>The risk of COVID-19 infections or other communicable diseases could be high if the safety precautions and procedures are not adhered to.</p> <p>Potential impacts such as injury, disability and fatalities from traffic accidents, as well as acute illness from a deterioration of air quality would bear a greater combined significance, taking the NEOM construction phase into account.</p>	<p>The progress of climate change over the operational lifetime of the Project may potentially raise the frequency and severity of extreme weather events (e.g., flash floods and heat waves) as well as climate sensitive natural disasters (such as sea level rise and landslides), all of which compound the risk of operational OHTL equipment failure. These risks amplify H&S risks to communities, specifically electrocution and injury from contact or blunt force impact from collapsing equipment.</p>

10 CONCLUSION

Based on the gap analysis of the existing EIAs prepared for SEC for the Project and the ground truthing surveys carried out as part of this ESIA addendum, several gaps were identified and are discussed in section 4.3 of this ESIA Addendum.

The main identified gaps are summarized below:

1. Land Use

- The land use ground truthing survey confirmed that in certain areas, particularly along Portion 3 near Madinah, the OHTL passes through existing farms and dwellings and therefore, the construction and operation of the OHTL may potentially lead to economic or physical displacement of existing formal or informal land users.
- The outcomes of the discussion with SEC determined that there is a commitment to compensate all private land owners along the OHTL route. However, the land acquisition and compensation process implemented by SEC does not cover informal land users who do not have legal rights over the lands they are using.
- While the potential impacts on land owners and formal fixed receptors may potentially be alleviated through compensating for any impact on their livelihood or economic or physical displacement caused by the Project, the potential physical or economic displacement of informal land users who are within the OHTL RoW is expected to result in major adverse impacts to these land users and their livelihoods in the absence of a resettlement and compensation process for informal land users.
- Therefore, it is necessary for the OHTL route to be further optimized to avoid impacts on identified land users, after which all potential formal and informal land users who are located within the Project RoW and will be affected by the construction or operation of the Project shall be determined. Consultations and stakeholders' engagement may be required between the real estate department at SEC, the relevant municipalities and the affected community (formal and informal land users) to determine the level of impact of the Project on the existing land users. Based on the above, and in accordance with IFC PS5, the need for developing a LAP, RAP, or LRP will be determined and implemented by SEC for all formal and informal land users.

2. Terrestrial Ecology

- The terrestrial ecology ground truthing survey along the OHTL route identified that the Project area includes mountains, wadi habitats and open plains that support the growth of multiple species of vegetation including Acacia sp. which is of national importance in KSA especially Portions 1 and 3 of the OHTL. The survey also identified the presence of gravel wadi plains that provide habitat to STLs (one was recorded at Plot 8 along Portion 3 of the OHTL) and the existing EIA for Portion 2 identified the presence of STL. The STLs are widespread in the deserts within KSA, but are listed as 'Vulnerable' according to IUCN and HCP species in KSA.
- Micro siting of OHTL towers to avoid high value flora and burrows and keep a buffer zone within which construction activities should not be allowed. If micro siting is not possible then relocation of STL and Acacia spp may be required. This should be carried out after obtaining the required permits from the NCW and NCVCCD, respectively.

- A bird migration monitoring survey for selected areas in the northern part of the alignment where the OHTL route crosses the Red Sea-Rift Valley flyway is recommended by establishing representative VPs along the northern part of Portion 1 OHTL alignment during the spring (mid-March to mid-May) and autumn (September to November). The VP survey should cover a minimum of 36 hours at representative VP locations to determine the number and types of birds and the height at which they fly to determine the potential impacts on migrating birds. Based on that, the need for developing a Collision Risk Management Plan (CRMP) will be confirmed; the CRMP may include fatality monitoring and an adaptive management program to determine how anti-collision mitigation shall be applied and upscaled.

3. Marine Ecology

- The marine survey included in the subsea cable EIA did not include a habitat map of the Project area, and the survey was not carried out along the subsea cable corridor. The NCW requires Projects to prevent impacts to marine habitats and ecology and find alternative design and construction methods to avoid coral relocation (micro siting pipelines away from corals, using HDD etc.). A detailed marine baseline survey will be required to identify the sensitive habitats and fauna along the final route alignment and delineate the specific areas of impact that may potentially require coral translocation. Different design and construction alternatives should be considered and assessed to minimise impacts on corals to the extent possible. Based on that a Coral Relocation Plan may be required for the approval of the NCW before translocating the corals and commencing the construction activities.

4. Archaeology and Cultural Heritage

- During the land use ground truthing survey for Portion 1 of the OHTL, the team came across an area of archaeological heritage (Al Qurayyah Oasis) that is located within the Project RoW. The area is fenced and access is restricted by the SCTNH. NCC team is aware of this site and two other sites within the Project RoW, and accordingly, the design is currently considering alternative routes for the OHTL to avoid impacts to existing archaeological sites.
- Taking into consideration the existing archaeological/heritage sites in the area, the potential presence of other sites within the Project RoW cannot be ruled out. The site surveys by the design team are ongoing and if other sites are identified, the route will be optimized to avoid potential impacts. However, the following additional measures are proposed:
 - Consultations with the SCTNH to identify any existing archaeological sites (other than the ones identifies so far). It is also important to confirm with SCTNH and implement the setback/buffer zone required from the existing archaeological/heritage sites to prevent any impacts or physical damage during construction activities.
 - Based on the outcomes of the consultation with SCTNH, potential archaeological survey or further OHTL route refinement may be required to avoid impact on existing archaeological sites (in addition to the ones identified so far).
 - It will be necessary to develop a 'Chance Finds Procedure' in the event that the construction phase encounters any other possible archaeological finds.

5. Converter Stations

- The impact of the construction and operation of the converter stations were not assessed in any of the EIAs. However, it is understood that an EIA for the substations has been commissioned and is expected to be completed in August 2022.

6. Accommodation Area

- All accommodation (for direct staff and sub-contractor staff who are dedicated to the project) would be expected to be of a standard commensurate of the IFC & EBRD Workers Accommodation: Processes and Standards (2009). The contractors shall be made aware of these requirements and the facilities can be visited/audited after completion of construction to ensure compliance and propose relevant mitigation where required.

7. Associated Facilities

- In the absence of information on the associated facilities in Egypt, a detailed assessment was not possible. However, a level of oversight by SNC-Lavalin the Project Management Company (PMC) may be required to ensure that the associated facility contractors (potentially Prysmian and Orascom) have developed Project specific ESIA's and the are implementing the required mitigation measures and management plans (in line with Lenders requirements).

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12 APPENDICES

Appendix A – List of Project Materials and Vendors

EQUIPMENT/MATERIAL	VENDORS/COUNTRY OF ORIGIN
Portion 2 OHTL – SSEM	
Steel Tower Fabrication and Galvanizing	Al-Batain, KSA
795kcmil "ACSR" Condor Conductors	Riyadh Cable, KSA
Long Rod Porcelain Insulators	PPC Insulator, Germany
96 Cores OPGW & U/G NMFOC	China
Insulator Hardware and Conductor Accessor	SA-RA, China
OGW/OPGW hardwires and Accessories	SA-RA, TURKEY
Spacer Dampers for Conductors	P.T.E., KSA
Vibration Dampers for OGW/OPGW	P.T.E., KSA
Earthing Materials	Legrand, KSA
Ready Mixed Concrete	KSA
Tower Identification and Warning Signs	KSA
Concrete Protective Coating & Repair Mortar Materials	KSA
Reinforcing Steel	KSA
Subsea Cable – Prysmian	
500 k.V. Land Power Cable	Italy
500 k.V. Submarine Power Cable	Italy
36 k.V. Land Power Cable	Finland
36 k.V. Submarine Power Cable	Italy
Submarine Fiber Optic Cable	Germany
Land Fiber Optic Cable	Spain
DTS Cable	Italy
Pressure Tank for 500kV HVDC MI 1900 mm ² ODSE	Italy
Pressure Gauge for 500kV HVDC MI 1900 mm ² ODSE	Italy
500kV HVDC MI 1200-1900 mm ² Sea-Land Trans Joint	Italy
Link Box for Transition Joints 500kV	Italy
Link Box for Terminations 500kV	Italy
Link Box for Transition Joints 3KV	Italy
Link Box for Terminations 36kV	Italy
Substations – ABB/Hitachi	
Power Transformer	ABB, Sweden
HV/MV Auxiliary Power Transformer	ABB, Spain HYCO, Korea
MV/LV Station Service Transformer	ABB, Saudi Arabia WESCOSA, Saudi Arabia

EQUIPMENT/MATERIAL	VENDORS/COUNTRY OF ORIGIN
Auxiliary Supply Diesel Generator Set	Cummins, UK Caterpillar, UK
Smoothing Reactors	Coil innovation, Austria Trench, Austria
Air-core Reactors	Coil innovation, Austria Trench, Austria Xi'an Zhongyang Electric Corporation, China Quality Power, India
Circuit Breaker	ABB, Sweden
GIS Equipment	ABB, Switzerland
HVDC Switchgear	ABB, Sweden
AC Metal clad Switchgear (MV)	ABB, EFACEC and Schneider, Saudi Arabia and Portugal
AC VTs	ABB, Sweden Ritz, Germany
AC Current Transformers	ABB, Sweden Ritz, Germany
HVDC Control & Protection	ABB, Sweden
AIS Equipment	ABB, Sweden
AC and DC Capacitors	ABB, Sweden and China
Thyristor Valves and modules	ABB, Sweden
Thyristor Valve Cooling System	Swedewater, Sweden Goaland, China
AC/DC Low Voltage Auxiliary Service Equipment	ABB and ETA-PCS, Saudi Arabia
DC current sensors	ABB, Sweden Ritz, Germany
DC voltage dividers	Schniewindt, Germany Trench, Italy
Insulators	ABB, Sweden
AC / DC Disconnect Switches	ABB, Sweden, India and Bulgaria Coelme, Italy
AC and DC Surge Arrester	ABB, Sweden
AC/DC Station Post Insulator	PPC, Austria Lapp, Germany Ceralep, France Cerisol, Portugal ABB, Sweden
AC and DC Wall Bushing	ABB, Sweden
Battery Charger and UPS	BENNING, France
Batteries	FIAMM, France

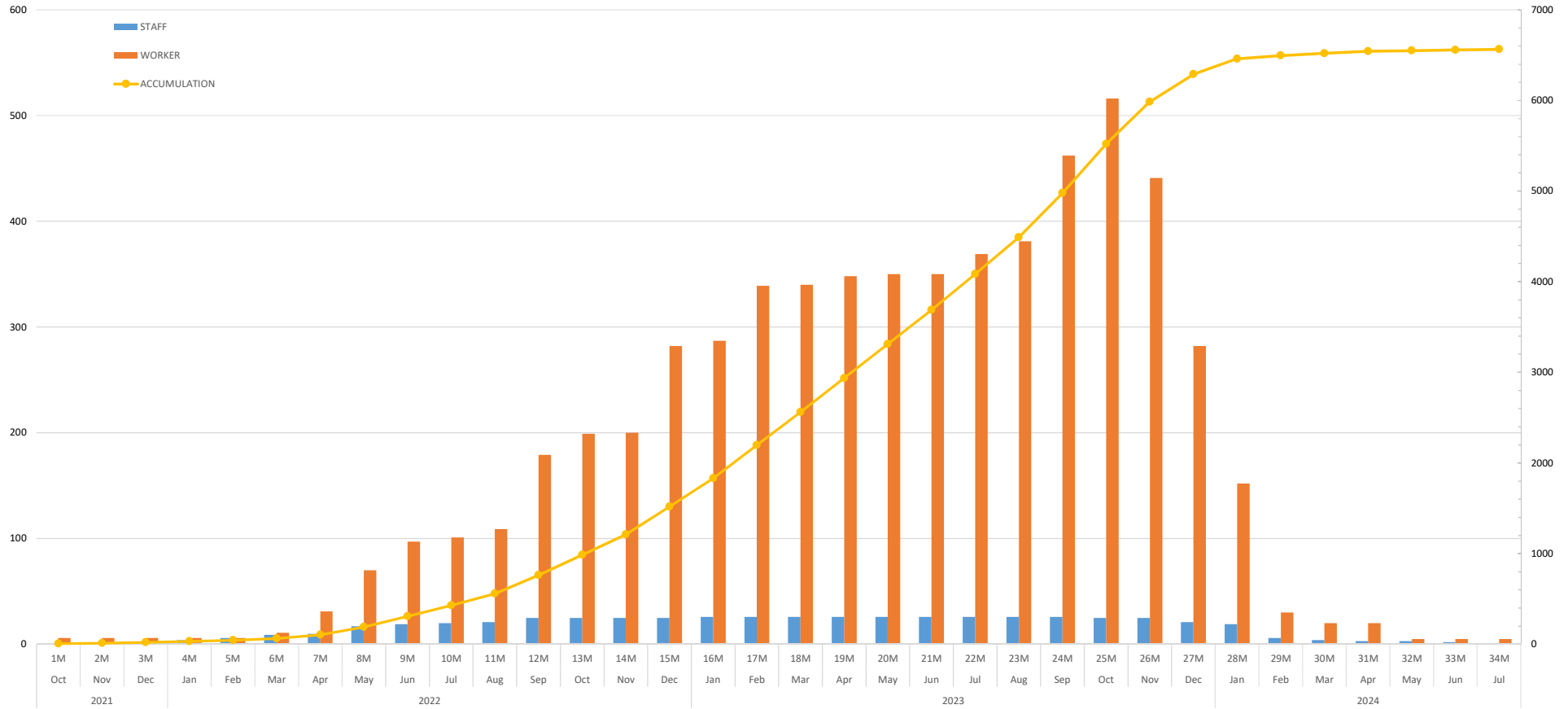
EQUIPMENT/MATERIAL	VENDORS/COUNTRY OF ORIGIN
AC and DC Resistors	Schniewindt, Germany, Metal Deployee Resistors France, Shanghai Gino Telema Resistors China
Surge Capacitors	ABB, Sweden
AC/DC Bus bar conductors	SAPA, Sweden, Germany, Nedal Saudi Arabia
Substation Automation System	ABB and Alstom Saudi Arabia
Power Transformer Protection	MACH, Sweden
Station Service Transformer	MACH, Sweden
Bus Bar Protection	MACH, Sweden
Bus Sectionalizing and/or Bus Coupler Breaker Protection	MACH, Sweden
Breaker and Protection Circuit Failure Supervision	MACH, Sweden
Reactor Protection	MACH, Sweden
Capacitor Bank Protection	MACH, Sweden
Protection Signalling Communication Interface Equipment	MACH, Sweden
Other Relays	MACH, Sweden

Appendix B – Manpower Histogram

Contract No. 4400015372

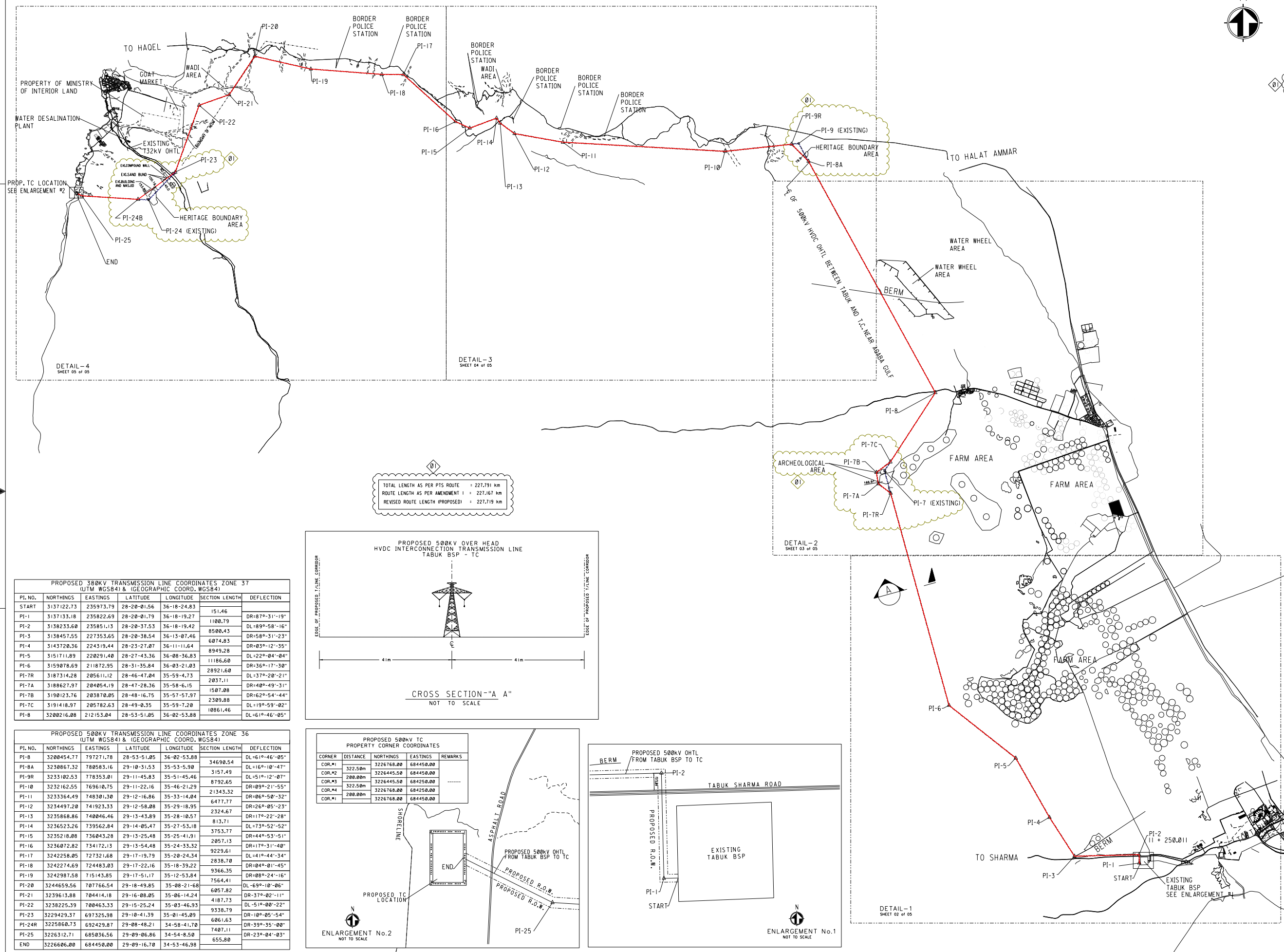
Portion 3 of Saudi Egypt ±500 kV HVDC Interconnection (±500kV HVDC OHTL Midpoint between Madinah and Tabuk up to Madinah - Portion III)

Manpower Histograms



Description	2021			2022									2023												2024										
	Oct 1M	Nov 2M	Dec 3M	Jan 4M	Feb 5M	Mar 6M	Apr 7M	May 8M	Jun 9M	Jul 10M	Aug 11M	Sep 12M	Oct 13M	Nov 14M	Dec 15M	Jan 16M	Feb 17M	Mar 18M	Apr 19M	May 20M	Jun 21M	Jul 22M	Aug 23M	Sep 24M	Oct 25M	Nov 26M	Dec 27M	Jan 28M	Feb 29M	Mar 30M	Apr 31M	May 32M	Jun 33M	Jul 34M	
STAFF	0	1	2	4	6	9	10	17	19	20	21	25	25	25	26	26	26	26	26	26	26	26	26	25	25	25	21	19	6	4	3	3	2	1	
WORKER	6	6	6	6	6	11	31	70	97	101	109	179	199	200	282	287	339	340	348	350	350	369	381	462	516	441	282	152	30	20	20	20	5	5	5
TOTAL	6	7	8	10	12	20	41	87	116	121	130	204	224	225	307	313	365	366	374	376	376	395	407	488	541	466	303	171	36	24	23	8	7	6	
ACCUMULATION	6	13	21	31	43	63	104	191	307	428	558	762	986	1211	1518	1831	2196	2562	2936	3312	3688	4083	4490	4978	5519	5985	6288	6459	6495	6519	6542	6550	6557	6563	

Appendix C – Routing Alternatives to Avoid Impact on Existing Archaeological Sites



- ### NOTES
- ALL DIMENSIONS AND COORDINATES ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
 - COORDINATES ARE IN UTM, WGS 84 ZONE 36 & 37 UNLESS OTHERWISE SPECIFIED.
 - ELEVATION DATUMS ARE BASED ON MEAN SEA LEVEL. DIMENSIONS AND STATIONING ARE GROUND DISTANCE IN METERS. GROUND DISTANCE x COMBINED FACTOR = UTM GRID DISTANCE.
 - LENGTH OF 500kV HVDC TRANSMISSION LINE BETWEEN TABUK AND T.C. NEAR AQABA GULF = 227.719km.
 - PTS ROUTE HAS BEEN CHANGED NEAR PI-07, PI-09 & PI-24 TO AVOID PASSING OVER NEOM AREA.



LEGEND

	PROPOSED 500kV DC OHTL
	EXISTING 380kV OHTL
	EXISTING 132kV OHTL
	EXISTING D/LINE
	EXISTING FENCE
	EXISTING U/G PIPE LINE
	EXISTING U/G TELEPHONE CABLE
	EXISTING HIGHWAY
	EXISTING ASPHALT ROAD
	EXISTING MARL PATH
P.I.	- POINT OF INTERSECTION
OHTL	- OVER HEAD TRANSMISSION LINE
DL	- DEVIATION LEFT
DR	- DEVIATION RIGHT

REFERENCE DRAWINGS

DRAWING TITLE	DRAWING NO.
DRAWING CONTROL SHEET	WE-569441
SCOPE OF WORK & TECHNICAL SPECIFICATION	PTS-14WM016
BASE MAP	WT- 915874
	-
	-
	-

ISSUED FOR APPROVAL

GRAPHIC SCALE

5000 10000 20000
SCALE: 1:200000

AS-BUILT

REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.
01	08.05.22	FKN	ROUTE HAS BEEN REVISED TO AVOID PASSING OVER NEOM AREA	FKN	KSN	
02	02.01.22	FKN	ISSUED FOR APPROVAL	GM	KSN	

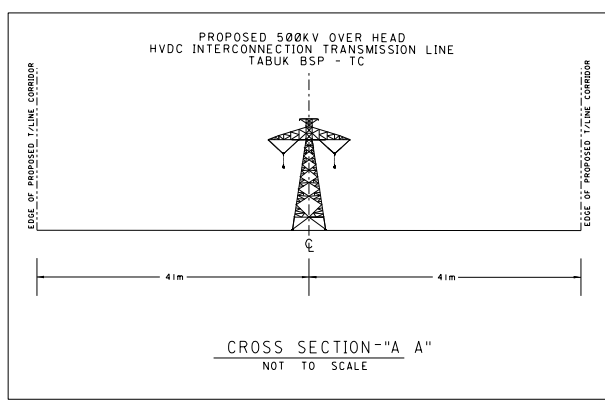
الشركة السعودية للكهرباء
Saudi Electricity Company
نعمل بابتقان من اجلكم

DRAWN BY: FIROZKHAN | CHECKED BY: KSN | SCALE: 1:200000
DATE STARTED: 15-11-2021 | DATE COMPLETED: -
ORIG. DEPT.: - | ENG. DEPT.: -

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED. APPROVAL/CERTIFICATION INFORMATION: ODC NO. REV. NO.

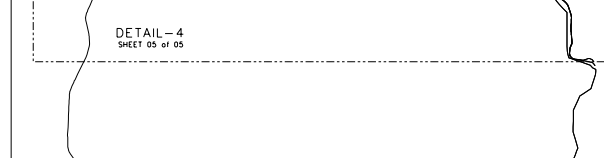
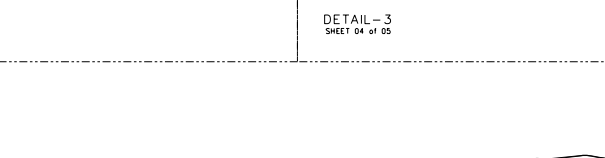
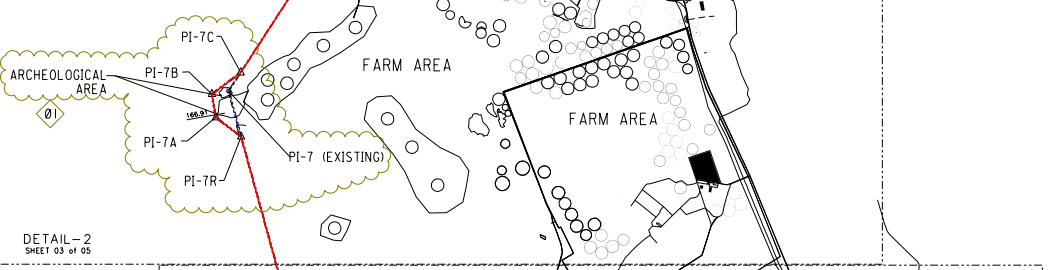
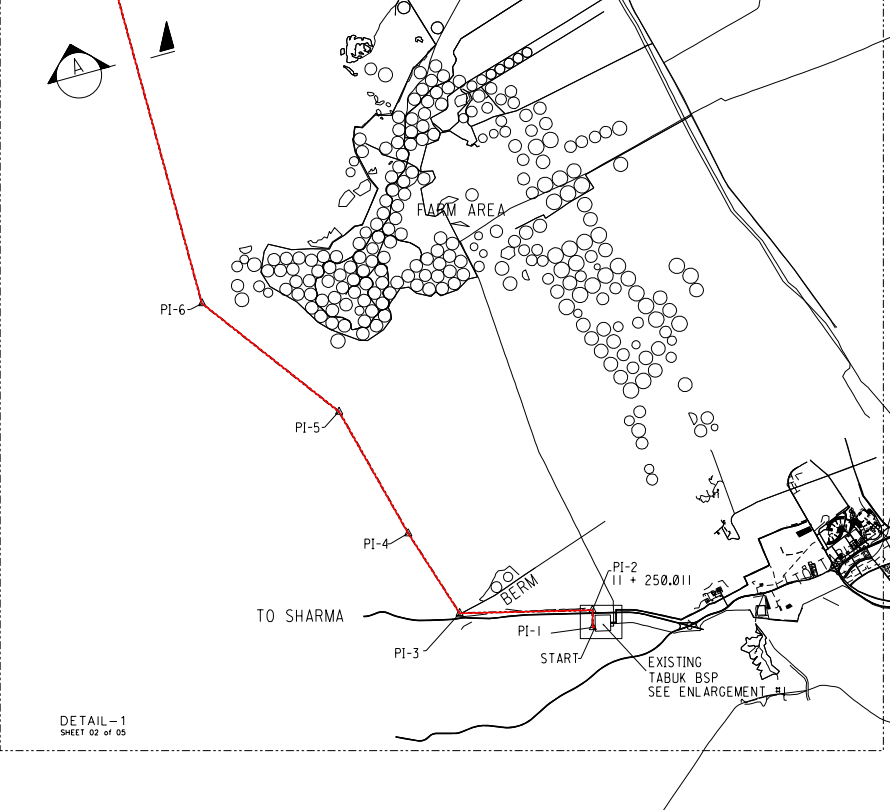
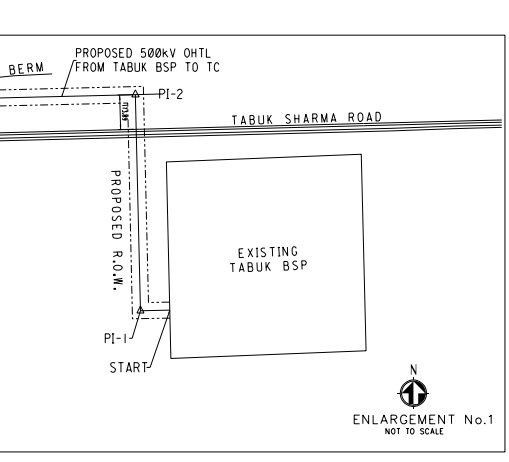
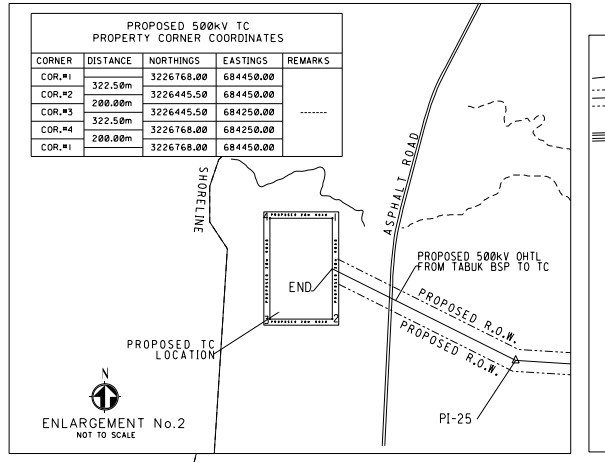
PROPOSED 380kV TRANSMISSION LINE COORDINATES ZONE 37 (UTM WGS84) & (GEOGRAPHIC COORD. WGS84)

PI. NO.	NORTHINGS	EASTINGS	LATITUDE	LONGITUDE	SECTION LENGTH	DEFLECTION
START	3137122.73	235973.79	28-20-01.56	36-18-24.83		
PI-1	3137133.18	235822.69	28-20-01.79	36-18-19.27	151.46	DR=87°-31'-19"
PI-2	3138233.60	235851.13	28-20-37.53	36-18-19.42	1100.79	DL=89°-58'-16"
PI-3	3138457.55	227353.65	28-20-38.54	36-13-07.46	8500.43	DR=58°-31'-23"
PI-4	3143720.36	224319.44	28-23-27.07	36-11-11.64	6074.83	DR=03°-12'-35"
PI-5	3151711.89	220291.40	28-27-43.36	36-08-36.83	8949.28	DL=22°-04'-04"
PI-6	3159078.69	21872.95	28-31-35.84	36-03-21.03	11186.60	DR=36°-17'-30"
PI-7R	3187314.28	205611.12	28-46-47.04	35-59-4.73	28921.60	DL=37°-20'-21"
PI-7A	3188627.97	204054.19	28-47-28.36	35-58-6.15	2037.11	DL=40°-49'-31"
PI-7B	3190123.76	203870.05	28-48-16.75	35-57-57.97	1507.08	DR=62°-54'-44"
PI-7C	3191418.97	205782.63	28-49-03.35	35-59-7.20	2389.88	DL=19°-59'-02"
PI-8	3200216.08	212153.04	28-53-51.05	36-02-53.88	10861.46	DL=61°-46'-05"



PROPOSED 500kV TRANSMISSION LINE COORDINATES ZONE 36 (UTM WGS84) & (GEOGRAPHIC COORD. WGS84)

PI. NO.	NORTHINGS	EASTINGS	LATITUDE	LONGITUDE	SECTION LENGTH	DEFLECTION
PI-8	3200454.77	797271.78	28-53-51.05	36-02-53.88		DL=61°-46'-05"
PI-8A	3230867.32	780583.16	29-10-31.53	35-53-5.90	34690.54	DL=16°-10'-47"
PI-9R	3233102.53	778353.81	29-11-45.83	35-51-45.46	3157.49	DL=51°-12'-07"
PI-10	3232162.55	769610.75	29-11-22.16	35-46-21.29	8792.65	DR=09°-21'-55"
PI-11	3233364.49	748301.30	29-12-16.86	35-33-14.04	21343.32	DR=06°-50'-32"
PI-12	3234497.20	741923.33	29-12-58.08	35-29-18.95	6477.77	DR=26°-05'-23"
PI-13	3235868.86	740046.46	29-13-43.89	35-28-10.57	2324.67	DR=17°-22'-28"
PI-14	3236523.26	739562.84	29-14-05.47	35-27-53.18	813.71	DL=73°-52'-52"
PI-15	3235218.08	736043.28	29-13-25.48	35-25-41.91	3753.77	DR=44°-53'-51"
PI-16	3236072.82	734172.13	29-13-54.48	35-24-33.32	2057.13	DR=17°-31'-44"
PI-17	3242258.05	727321.68	29-17-19.79	35-20-24.34	9229.61	DL=41°-44'-34"
PI-18	3242274.69	724483.03	29-17-22.16	35-18-39.22	2838.70	DR=04°-01'-45"
PI-19	3242987.58	715143.85	29-17-51.17	35-12-53.84	9366.35	DR=08°-24'-16"
PI-20	3244659.56	707766.54	29-18-49.85	35-08-21.68	7564.41	DL=69°-10'-06"
PI-21	3239613.88	704414.18	29-16-08.05	35-06-14.24	6057.82	DR=37°-02'-11"
PI-22	3238225.39	700463.33	29-15-25.24	35-03-46.93	4187.73	DL=51°-08'-22"
PI-23	3229429.37	691325.98	29-10-41.39	35-01-45.09	9338.79	DR=10°-05'-54"
PI-24R	3225860.73	692429.87	29-08-48.21	34-58-41.70	6061.63	DR=39°-35'-00"
PI-25	3226312.71	685036.56	29-09-06.86	34-54-8.50	7407.11	DR=23°-04'-03"
END	322606.00	684450.00	29-09-16.70	34-53-46.98	655.00	



TOTAL LENGTH AS PER PTS ROUTE = 227.791 km
ROUTE LENGTH AS PER AMENDMENT 1 = 227.167 km
REVISED ROUTE LENGTH (PROPOSED) = 227.719 km

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Appendix E – Summary of Authorities Feedback on the Project as Provided by SEC

Madina:

1- Transport Ministry:

- Signing date: 03/01/2021.

- Approved with the following comments:
 - The project does not contradict with any future projects in the area.
 - Keep in consideration the Tabouk/Madina highway as the project intersects with the highway.
 - The project should opt with the vertical clearance when crossing with the existing roads/highways keeping all the towers away from highways and intersection.

2- Madinah Regional Municipality:

- Signing date: 25/04/2021.

- Approved with the following comments: responses from three municipality (خيبر / العشاش / صلصة)
"after reviewing the project route, we confirm there are no projects on the same route"

3- Ministry of Environment, Water and Agriculture:

- Signing date: 13/04/2021.

- Approved with the following comments: The project does not contradict with any of the ministry projects.

Tabuk:

1- Transport Ministry:

- Signing date: 11/02/2021.
- Comments:
 - There is no objection for an initial approval of the route, taking into consideration that the distance of the route from the roads is not less than 300 meters.
 - Obtain the necessary licenses before starting work

2- Tabuk Regional Municipality:

- Signing date: 13/04/2021.
- Comments:
 - The route dose not contradict with any residential communities or any future projects.
 - Passes within PIF lands.

3- Ministry of Environment, Water and Agriculture:

- Signing date: 10/01/2021.
- Comments: We do not have any objection to approve the route within the approved roads/streets of the agricultural scheme, provided that the High-Voltage Transmission Lines are at a distance of 100 meters from the agricultural schemes and the route does not interfere with any private properties.
In the event that the route will go through any the private property, the company undertakes to address it according to the procedures.

PIF:

In 27/08/2021, SEC received a copy of the letter from the Ministry of Energy, which included that SEC is aligning with the Public Investment Fund on the proposed route between the regions of Tabuk and Madinah.