

Energy Valley Company

ESIA for Overhead Transmission Lines (OHTLs) and Consumer Substation- Energy Valley

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List of Abbreviations

The following abbreviations are used throughout this ESIA document, listed in alphabetical order.

Abbreviation	Full Term
AoI	Area of Influence
CO	Carbon Monoxide
CR	Critically Endangered
DC	Direct Current
E&S	Environmental and Social
EGP	Egyptian Pound
EN	Endangered
EW	Extinct in the Wild
EX	Extinct
GPG	Gender Pay Gap
HS	Hazardous Substances
HW	Hazardous Waste
kV	Kilovolt
kWh	Kilowatt-hour
LC	Least Concern
MVA	Mega-Volt Ampere
MW	Megawatt
MWh	Megawatt-hour
NA	Not Applicable
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NT	Near Threatened
OS	Operational Safeguard
PPE	Personal Protective Equipment
PS	Performance Standard
SF ₆	Sulfur Hexafluoride
SO ₂	Sulfur Dioxide
USD	United States Dollar
VU	Vulnerable

List of Acronyms

Acronym	Full Name / Description
AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds
AfDB	African Development Bank Group
AVISTEP	Avian Sensitivity Tool for Energy Planning
BESS	Battery Energy Storage System
CAA	Competent Administrative Authority
CAPMAS	Central Agency for Public Mobilization and Statistics
CESMP	Construction Environmental and Social Management Plan
CH	Critical Habitat(s)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLO	Community Liaison Officer
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CULTNAT	Center for Documentation of Cultural and Natural Heritage
EAAA	Ecologically Appropriate Area of Analysis
EBRD	European Bank for Reconstruction and Development
EEAA	Egyptian Environmental Affairs Agency
EETC	Egyptian Electricity Transmission Company
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EPC	Engineering, Procurement and Construction (Contractor)
ERM	Environmental Risk Management
ESHIA	Environmental, Social, Health and Social Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESR	Environmental and Social Requirement (EBRD)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FPIC	Free, Prior and Informed Consent
GBV	Gender-Based Violence
GBV/SH	Gender-Based Violence / Sexual Harassment
GBVH	Gender-Based Violence and Harassment
GER	Gross Enrolment Ratio
GIIP	Good International Industry Practice
GIS	Geographic Information System
GRM	Grievance Redress Mechanism
HSE	Health, Safety and Environment
HSMS	Health and Safety Management System
HSSE	Health, Safety, Security and Environment
IBAT	Integrated Biodiversity Assessment Tool

Acronym	Full Name / Description
IEC	International Electrotechnical Commission
IFC	International Finance Corporation
ILO	International Labour Organization
INDC	Intended Nationally Determined Contribution
ISS	Integrated Safeguards System (AfDB)
IUCN	International Union for the Conservation of Nature
LILO	Loop-In Loop-Out (substation connection configuration)
LRP	Livelihood Restoration Plan
LTO	Lithium-Ion Titanate (battery chemistry)
MOTA	Ministry of Tourism and Antiquities
MSBT	Migratory Soaring Birds Tool
NCCS	National Climate Change Strategy (Egypt)
NDC	Nationally Determined Contribution
NREA	New and Renewable Energy Authority (Egypt)
NTS	Non-Technical Summary
OHS	Occupational Health and Safety
OHTL	Overhead Transmission Line
PBF	Priority Biodiversity Features
PV	Photovoltaic
RAP	Resettlement Action Plan
SCADA	Supervisory Control and Data Acquisition
SEAH	Sexual Exploitation, Abuse and Harassment
SEP	Stakeholder Engagement Plan
SH	Sexual Harassment
TMP	Traffic Management Plan
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
YEO	Youth Employment Office

المخلص التنفيذي

١. مقدمة

تعتزم شركة فالي للطاقة المستدامة التابعة لشركة سكاتك تنفيذ مشروع محطة محولات نسيج السريية وخطوط نقل الطاقة الهوائية في محافظة المنيا، مصر. يعتبر هذا المشروع أحد مكونات المشروع الأكبر "فالي للطاقة المستدامة"، والذي يتضمن إنشاء محطة فالي للطاقة الشمسية وإنشاء نظام لتخزين الطاقة باستخدام البطاريات التي تم تناولها ضمن دراسات منفصلة لتقييم الأثر البيئي والاجتماعي. يهدف المشروع إلى دعم نقل وتوزيع الكهرباء المتجددة بشكل موثوق، والمساهمة في أهداف التحول الأخضر في مجال الطاقة في مصر، ودعم التصنيع الأخضر لمنطقة السريية الصناعية.

يشمل المشروع المقترح إنشاء محطة محولات جديدة لنسيج السريية وبنية تحتية لخطوط النقل الهوائية. يشمل المشروع:

- (أ) **محطة محولات نسيج السريية وخط ربط محطة نسيج السريية بالشبكة القومية:** ويشمل هذا إنشاء محطة محولات نسيج السريية بالمنيا جهد ٢٢/٢٢/٥٠٠ كيلو فولت (ك.ف) سعة ٢٠٠×٣ ميجا فولت أمبير (م.ف.أ) قابلة للتوسع بمحول رابع من النوع GIS لتوفير التغذية الكهربائية لأحمال بقدرة تصل إلى ٦٠٠ ميجا فولت أمبير (م.ف.أ) وربطها بالشبكة الكهربائية عن طريق فتح الخط الهوائي المزدوج الدائرة جهد ٥٠٠ ك.ف (توليد بني سويف / شرق أسيوط) (د/خ) من النوع (4xACSR490/65) ومده بطول حوالي ٢ × ٥٠٠ متر من نفس نوع الموصل
- (ب) **خط ربط محطة توليد فالي الشمسية بالشبكة القومية:** ويشمل هذا فتح الخط الهوائي المزدوج الدائرة جهد ٥٠٠ ك.ف (نسيج السريية / شرق أسيوط) (د/خ) من النوع (ACSR 4x490/65 mm2) ومده بطول حوالي ٢ × ٢٥٠٠ متر من نفس نوع الموصل، يربط محطة توليد فالي الشمسية جهد ٣٣/٣٣/٥٠٠ ك.ف بالشبكة القومية الموجودة ذات الجهد ٥٠٠ كيلو فولت.

تم تصميم محطة محولات نسيج السريية لتزويد المنطقة الصناعية في السريية بأحمال كهربائية تصل إلى ٦٠٠ ميجا فولت أمبير، بينما سيعمل خط ربط محطة فالي الشمسية بالشبكة القومية علي تفريغ الطاقة الكهربائية المتجددة المولدة في محطة فالي الشمسية إلى الشبكة القومية. يشمل المشروع حوالي ٠.٥ كم من خط النقل المرتبط بمحطة محولات نسيج السريية وحوالي ٢.٥ كم من خط النقل المرتبط بشبكة محطة فالي الشمسية.

تقع مكونات المشروع على أراض صحراوية غير مطورة مملوكة للدولة ضمن المناطق الداخلية الشرقية لمحافظة المنيا. يقع خط ربط محطة فالي الشمسية بالشبكة القومية غرب حدود محطة فالي الشمسية، بينما تقع محطة محولات نسيج السريية وخط ربطها بالشبكة القومية على بعد حوالي ٢٦ كم شمال محطة فالي الشمسية. تتميز منطقة المشروع بطبيعة صحراوية نائية وغياب تجمعات سكنية كبيرة ضمن نطاق المشروع المباشر.

يتم تنفيذ المشروع وفقا لمتطلبات جهاز شئون البيئة المصري (EEAA)، بالإضافة إلى المتطلبات البيئية والاجتماعية للمؤسسات المالية الدولية، بما في ذلك معايير أداء مؤسسة التمويل الدولية، ومتطلبات البنك الأوروبي لإعادة الإعمار والتنمية (EBRD)، ونظام الضمانات المتكاملة للبنك الأفريقي للتنمية (AfDB).

وفقا للاجتماع الأولي الذي عقد مع جهاز شئون البيئة المصري في ٦ يناير ٢٠٢٦، تم تصنيف محطة محولات نسيج السريية وخطوط النقل الهوائي لمشروع فالي للطاقة المستدامة ضمن مشروعات الفئة (ب) محددة. ووفقا لإطار تصنيف البنك الأوروبي لإعادة الإعمار والتنمية ، يمكن اعتبار المشروع في البداية مشروع من الفئة أ بسبب مكوناته التحتية للنقل. ومع ذلك، نظرا لان خطوط النقل الهوائية المقترحة تمتد لمسافات قصيرة نسبيا وتقع داخل الأراضي الصحراوية المملوكة للدولة، منخفضة الحساسية، تفتقر إلى عناصر تنوع بيولوجي أو مستقبلات اجتماعية ذات أهمية. والطبيعة الخاصة بالموقع والقابلة للتخفيف بسهولة للتأثيرات المتوقعة، قد يعتبر تصنيف الفئة ب مناسباً.

تم تكليف شركة إنفايرونيكس من قبل شركة إنرجي فالي بإعداد دراسة تقييم الأثر البيئي والاجتماعي (ESIA) الخاصة بمشروع خطوط النقل الهوائية ومحطة محولات نسيج سريية، وذلك بما يتوافق مع المتطلبات التنظيمية الوطنية المعمول بها ومعايير مؤسسات التمويل الدولية ذات الصلة. وتتناول هذه الدراسة تحديداً محطة محولات نسيج سريية وخطوط النقل الهوائية المرتبطة بها، في حين يتم تقييم محطة فالي الشمسية وأنظمة تخزين الطاقة بالبطاريات (BESS) من خلال دراسات تقييم أثر بيئي واجتماعي مستقلة.

أهداف الدراسة

يهدف المشروع إلى دعم أهداف جمهورية مصر العربية في مجال الطاقة المتجددة والتنمية الصناعية المستدامة، وذلك من خلال تمكين نقل الكهرباء المولدة من مصادر متجددة من محطة فالي الشمسية إلى الشبكة الكهربائية القومية، وتوفير مصدر موثوق لإمدادات الكهرباء للمنطقة الصناعية السريية، عبر البنية التحتية المقترحة لخطوط نقل الكهرباء ومحطة المحولات.

ويتمثل الهدف العام لدراسة تقييم الأثر البيئي والاجتماعي في تزويد صنّاع القرار والجهات القائمة على المشروع بالمعلومات المتعلقة بالآثار والمخاطر البيئية والاجتماعية المحتملة ذات الأهمية المرتبطة بمشروع خطوط النقل الهوائية ومحطة محولات نسيج سريية المقترح بمحافظة المنيا. كما تهدف الدراسة إلى ضمان أن يكون المشروع سليماً من الناحيتين البيئية والاجتماعية ومستداماً، وذلك من خلال تحديد المخاطر والآثار المحتملة في مرحلة مبكرة، ووضع إجراءات التخفيف والرصد والإدارة اللازمة طوال دورة حياة المشروع.

وتتمثل الأهداف المحددة للدراسة فيما يلي:

- تحديد الآثار البيئية والاجتماعية الإيجابية والسلبية المحتملة للمشروع المقترح.
- اقتراح إجراءات التخفيف من الآثار السلبية ذات الأهمية، وتعزيز الآثار الإيجابية التي تم تحديدها.
- إعداد خطط الإدارة والرصد البيئي والاجتماعي.
- ضمان توافق المشروع المقترح مع التشريعات واللوائح البيئية الوطنية ومتطلبات مؤسسات التمويل الدولية.
- لضمان التزام المشروع المقترح باللوائح البيئية الوطنية ومتطلبات مؤسسات التمويل الدولية.

٢. الإطار التشريعي والمؤسسي

يشمل هذا الإطار كلاً من التشريعات الوطنية والمعايير والإرشادات الدولية.

التشريعات الوطنية

يلتزم المشروع بالامتثال للقوانين واللوائح البيئية والاجتماعية المعمول بها في جمهورية مصر العربية، بما في ذلك:

تقييم الأثر البيئي: تنص أحكام قانون البيئة رقم ٤ لسنة ١٩٩٤ وتعديلاته بالقانونين رقم ٩ لسنة ٢٠٠٩ ورقم ١٠٥ لسنة ٢٠١٥، ولائحته التنفيذية، على ضرورة إعداد دراسة لتقييم الأثر البيئي للمشروعات الجديدة، وتقديمها إلى جهاز شؤون البيئة المصري للمراجعة والحصول على الموافقة. ووفقاً للتشريعات الوطنية، يُصنف هذا المشروع ضمن مشروعات الفئة ب محددة.

جودة الهواء والانبعاثات الجوية: يحدد قانون البيئة رقم ٤ لسنة ١٩٩٤ ولائحته التنفيذية الحدود القصوى المسموح بها لتركيزات ملوثات الهواء المحيط وانبعاثات العادم، ويلتزم المشروع بالامتثال لهذه الحدود خلال مرحلتي الإنشاء والتشغيل.

الضوضاء والاهتزاز: يحدد قانون البيئة رقم ٤ لسنة ١٩٩٤ الحدود القصوى المسموح بها لمستويات الضوضاء في بيئات العمل والبيئة المحيطة، ويتعين على المشروع الالتزام بهذه الحدود.

إدارة المخلفات: يحدد قانون تنظيم إدارة المخلفات رقم ٢٠٢ لسنة ٢٠٢٠ ولائحته التنفيذية متطلبات إدارة المخلفات غير الخطرة والمخلفات الخطرة الناتجة عن مختلف أنشطة المشروع.

حماية التنوع البيولوجي والحفاظ على الطبيعة: تحظر المادة (٢٨) من قانون البيئة رقم ٤ لسنة ١٩٩٤ القيام بأي أنشطة تضر ببعض أنواع الحيوانات والنباتات البرية أو موائلها الطبيعية، كما يتضمن الملحق الرابع للقانون قائمة بالأنواع المحمية. ويقع موقع المشروع داخل بيئة صحراوية ذات حساسية بيئية منخفضة نسبياً، ومع ذلك سيتم تطبيق إجراءات حماية التنوع البيولوجي كلما اقتضت الحاجة.

حماية التراث الثقافي: يوفر قانون حماية الآثار رقم ١١٧ لسنة ١٩٨٣، والمعدل بالقانون رقم ٣ لسنة ٢٠١٠، الحماية للموارد الأثرية والتراث الثقافي. وسيتم تطبيق إجراءات الاكتشافات العرضية (Chance Finds Procedures) أثناء أعمال الإنشاء، مع التنسيق مع وزارة السياحة والآثار عند الضرورة.

الصحة والسلامة المهنية: يحدد قانون العمل رقم ١٤ لسنة ٢٠٢٥ والقرارات الوزارية المرتبطة به متطلبات حماية العاملين، والصحة والسلامة المهنية، وساعات العمل، والاستعداد للطوارئ، والوقاية من المخاطر المهنية. وتسري هذه المتطلبات على جميع المقاولين والمقاولين من الباطن العاملين بالمشروع.

تخصيص الأراضي وتطوير مشروعات الطاقة المتجددة: تم تنفيذ المشروع على أرض مخصصة من قبل هيئة تنمية واستخدام الطاقة الجديدة والمتجددة (NREA)، وذلك وفقاً للتشريعات الوطنية المنظمة لمشروعات الطاقة المتجددة واستخدامات الأراضي الصحراوية.

الصحة والسلامة المجتمعية: تحدد الأحكام ذات الصلة بقانون البيئة رقم ٤ لسنة ١٩٩٤، وقانون العمل رقم ١٤ لسنة ٢٠٢٥، وغيرها من التشريعات السارية، المتطلبات الخاصة بحماية المجتمعات المجاورة ومستخدمي الطرق من المخاطر المرتبطة بأعمال الإنشاء، بما في ذلك آثار حركة المرور، والأثرية، والضوضاء، وحالات الطوارئ.

الإطار المؤسسي

- تتولى عدة جهات حكومية مسؤوليات تنظيمية ورقابية تتعلق بالمشروع، وتشمل ما يلي:
- جهاز شؤون البيئة المصري : مسئول عن مراجعة دراسة تقييم الأثر البيئي والاجتماعي، وإصدار الموافقة البيئية ومتابعة التزام المشروع بالمتطلبات البيئية المعمول بها.
 - هيئة الطاقة الجديدة والمتجددة : مسئولة عن تخصيص الأراضي والإشراف على مشروعات الطاقة المتجددة.
 - الشركة المصرية لنقل الكهرباء : مسئولة عن ترتيبات الربط بالشبكة القومية وتطوير وتشغيل البنية التحتية اللازمة لنقل الكهرباء.
 - وزارة الكهرباء والطاقة المتجددة : مسئولة عن الإشراف الاستراتيجي على قطاع الكهرباء ودعم خطط التوسع في مشروعات الطاقة المتجددة.
 - وزارة العمل : مسئولة عن متابعة تطبيق متطلبات العمل والصحة والسلامة المهنية وإنفاذ التشريعات ذات الصلة.
 - محافظة المنيا والجهات المحلية المختصة : مسئولة عن التنسيق الإداري المحلي وإصدار التصاريح والموافقات اللازمة وفقاً للتشريعات المعمول بها.
 - وزارة السياحة والآثار : مسئولة عن حماية وإدارة وصون الآثار والتراث الثقافي والتنسيق بشأن أي مكتشفات أثرية محتملة.

المعايير والإرشادات الدولية

بالإضافة إلى الالتزام بالتشريعات واللوائح الوطنية ذات الصلة، سيلتزم المشروع بالمعايير والإرشادات البيئية والاجتماعية الدولية المعمول بها، ولا سيما متطلبات مؤسسات التمويل الدولية التي قد تشارك في تمويل المشروع. وفي هذا السياق، يوضح الجزء التالي الأطر والمعايير الدولية ذات الصلة بالمشروع.

معايير الأداء الخاصة بمؤسسة التمويل الدولية (IFC Performance Standards)

سيلتزم المشروع بمعايير الأداء الخاصة بمؤسسة التمويل الدولية بشأن الاستدامة البيئية والاجتماعية، والتي تُعد إطاراً دولياً معترفاً به لإدارة المخاطر والتأثيرات البيئية والاجتماعية للمشروعات. وتشمل هذه المعايير متطلبات تتعلق بتقييم وإدارة المخاطر والآثار البيئية والاجتماعية، وظروف العمل والعمالة، وكفاءة استخدام الموارد ومنع التلوث، وصحة وسلامة وأمن المجتمع، والاستحواذ على الأراضي وإعادة التوطين غير الطوعي، والحفاظ على التنوع البيولوجي، وحماية التراث الثقافي، ومشاركة أصحاب المصلحة.

وسوف يتم إعداد وتنفيذ المشروع بما يتوافق مع متطلبات معايير الأداء ذات الصلة طوال مراحل الإنشاء والتشغيل والإغلاق، حسب الاقتضاء.

متطلبات الأداء الخاصة بالبنك الأوروبي لإعادة الإعمار والتنمية (EBRD Performance Requirements)

سليترزم المشروع بسياسة البنك الأوروبي لإعادة الإعمار والتنمية البيئية والاجتماعية ومتطلبات الأداء المرتبطة بها، والتي تحدد المبادئ والمتطلبات الخاصة بالإدارة البيئية والاجتماعية، والعمالة وظروف العمل، وكفاءة استخدام الموارد ومنع التلوث، والحفاظ على التنوع البيولوجي، وحماية التراث الثقافي، والإفصاح عن المعلومات ومشاركة أصحاب المصلحة. وتوفر هذه المتطلبات إطاراً متكاملاً لتحديد وإدارة المخاطر والآثار البيئية والاجتماعية للمشروع بما يتوافق مع أفضل الممارسات الدولية.

الإجراءات الوقائية التشغيلية للبنك الأفريقي للتنمية (AfDB Operational Safeguards)

سليترزم المشروع بالإجراءات الوقائية التشغيلية للبنك الأفريقي للتنمية وإجراءات التقييم البيئي والاجتماعي ذات الصلة، والتي تهدف إلى تجنب وتقليل وإدارة المخاطر والآثار البيئية والاجتماعية المرتبطة بالمشروعات التنموية. وتشمل هذه الإجراءات متطلبات تتعلق بإدارة المخاطر البيئية والاجتماعية، والعمالة وظروف العمل، والحفاظ على التنوع البيولوجي، ومنع التلوث وإدارته، وصحة وسلامة المجتمع، وإشراك أصحاب المصلحة، بما يضمن توافق المشروع مع أهداف التنمية المستدامة ومتطلبات التمويل الدولي.

المعايير البيئية والاجتماعية للبنك الأوروبي للاستثمار (EIB Environmental and Social Standards)

سيتم تصميم المشروع وتنفيذه وفقاً للمعايير البيئية والاجتماعية المعمول بها لدى البنك الأوروبي للاستثمار، والتي تغطي مجموعة واسعة من الموضوعات البيئية والاجتماعية، بما في ذلك تقييم وإدارة الآثار البيئية والاجتماعية، وحماية التنوع البيولوجي والنظم البيئية، والعمل المناخي، وحقوق العمال وظروف العمل، والصحة والسلامة المهنية، وصحة وسلامة المجتمع. وتهدف هذه المعايير إلى ضمان تنفيذ المشروعات بطريقة مسؤولة ومستدامة تتماشى مع الممارسات الدولية الجيدة والمتطلبات البيئية والاجتماعية للاتحاد الأوروبي.

الإرشادات العامة للصحة والسلامة والبيئة الصادرة عن مجموعة البنك الدولي

سيتم تطبيق الإرشادات العامة للصحة والسلامة والبيئة، بالإضافة إلى أي إرشادات قطاعية ذات صلة، باعتبارها مرجعاً للممارسات الصناعية الدولية الجيدة طوال دورة حياة المشروع.

وتوفر هذه الإرشادات مستويات الأداء والتدابير الفنية المتعلقة بمنع التلوث، وإدارة المخلفات، والصحة والسلامة المهنية، وصحة وسلامة المجتمع، وكفاءة استخدام الموارد، والتي تعتبر قابلة للتحقيق باستخدام التقنيات المتاحة ووفقاً للممارسات الدولية المعترف بها.

اتفاقيات منظمة العمل الدولية (ILO Conventions)

سليترزم المشروع بالمبادئ والمتطلبات الواردة في اتفاقيات منظمة العمل الدولية التي صدّقت عليها جمهورية مصر العربية، بما في ذلك الاتفاقيات المتعلقة بالصحة والسلامة المهنية، وعدم التمييز وتكافؤ الفرص، ومنع العمل الجبري، وحظر عمالة الأطفال، وحرية تكوين الجمعيات، وحق المفاوضة الجماعية. وسيتم دمج هذه المتطلبات ضمن سياسات وإجراءات إدارة العمالة بالمشروع، بما يضمن توفير بيئة عمل آمنة وعادلة ومتوافقة مع المعايير الدولية.

٣. وصف المشروع

موقع المشروع

تقع مكونات مشروع خطوط النقل الهوائية ومحطة محولات نسيج السريية المقترحة إلى الغرب من منطقة الامتياز التابعة لهيئة تنمية واستخدام الطاقة الجديدة والمتجددة (NREA) بشرق المنيا (ويُشار إليها فيما يلي بـ "منطقة شرق المنيا").

ويقع مسار خط النقل الهوائي الخاص بربط محطة فالي الشمسية بالشبكة الكهربائية في الجزء الشرقي من محافظة المنيا، شرق نهر النيل، وعلى بُعد نحو ٩.٥ كم شرق مدينة المنيا الجديدة. أما محطة محولات نسيج سريرية وخط النقل الهوائي الرابط بينها وبين الشبكة الكهربائية، فيقعان على مسافة تقارب ٢٦ كم شمال خط الربط الكهربائي.

ويقع كلا الموقعين داخل منطقة صحراوية نائية وغير مأهولة بالسكان بمحافظة المنيا. وتعد أقرب التجمعات السكنية إلى محطة محولات نسيج سريرية كلاً من قرية السريية، وقرية السوايطه، وعزبة الشيخ حسن، وتقع على مسافات تقدر بحوالي ١١ كم، و١٢.٥ كم، و١٣ كم إلى الغرب من موقع المشروع، على التوالي.

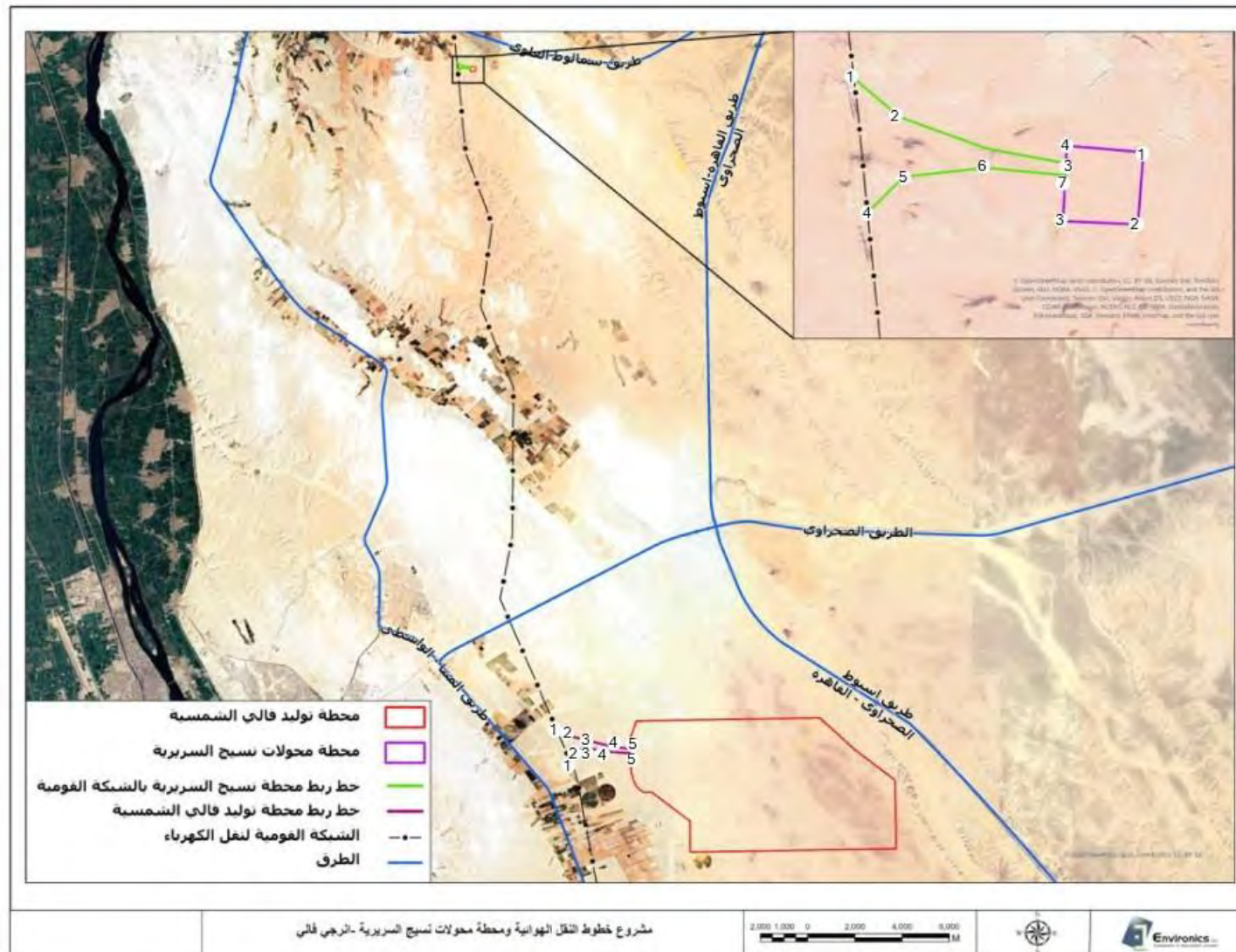
ولأغراض التحديد المكاني والإسناد الجغرافي الدقيق لحدود المشروع، تم استخدام نظام الإحداثيات Africa_Lambert_Conformal_Conic، كما هو موضح في الجدول ادناه.

الجدول ١: إحداثيات موقع المشروع

محطة محولات نسيج السريية		
النقطة	خط العرض	خط الطول
١	٣٠.٦١٧٢٥.٨٦٥٨٢٦.٧٠٣	٦١٨٣٤٠.٢٧٨٥٣١٥٣٣٥
٢	٣٠.٦١٥٤٠.٥٤٨٣٦٤٨١٨	٦١٨٣٢٥.٥٥٤٦١١٣٨٥٣
٣	٣٠.٦١٥٤٩.٣٢٢٧١٥٦٤	٦١٨١٣١.٧٧٢٨٩٧١٧٥٣
٤	٣٠.٦١٧٤٣.٣٧٦٢.٨٦٣٣	٦١٨١٤٢.١١.٥٣٠.٩٤٧
خط ربط محطة محولات نسيج السريية بالشبكة القومية		
١	٣٠.٦١٩٢٠.٢٩٥٩٥٨٧٨٧	٦١٧٥٨٩.٤٤٩٦٧٨١٥٤٩
٢	٣٠.٦١٨١٨.٤٢٠.١٨٥٩٥٣٤	٦١٧٧١٠.٠٦٢٨٦٢١٨٤٦
٣	٣٠.٦١٦٩٧.٥٠٩٢٧٧٩٤	٦١٨١٤٣.٥١٣٢٣٣١٦٤
٤	٣٠.٦١٥٦٩.٠٩٢٨٨٧٤.١٦	٦١٧٦٢٢.٥٨٢٧٩٨٢٥٤٩
٥	٣٠.٦١٦٦٤.٩٦٦٢٨٧١.٦٣	٦١٧٧٢١.٠٤٨٧٠.٣٦٩٢٣
٦	٣٠.٦١٦٨٧.١٤٤٨٠.٨٩٤٨	٦١٧٩٣٣.٨٠.٨٦٦٢٢٤٥٢
٧	٣٠.٦١٦٦٦.٩٧١٦٨٥٢٦.٥	٦١٨١٤٠.٠٧٨٠.٥١٢٢٧
محطة فالي الشمسية - خط النقل الهوائي ١		
١	٣٠.٣٥٣٢٠.٩٦.٢٦٢٥.٧	٦٢١٥٢٠.٩٢٥٢٦.٣٤١٨

٦٢٢٠٧١.٣٢٩٩٤٢٥٠٩١	٣٠٣٥١٠٨.٧٥٧٠٠٢١٧٥	٢
٦٢٢٧٤٦.٧٣٨٣٦.٢٦١٢	٣٠٣٤٩٢٧.١٩٥٦٧٦٩٥٢٦	٣
٦٢٣٧٠٠.٢١٤٤٧٩٥٩٥٨	٣٠٣٤٦٩٥.٨٦٤٦١٥٣٨٠٨	٤
٦٢٤٥٢٢.٢٨٠٢٣٠٨٠٩٨	٣٠٣٤٥٧٤.٧٧٥٨٨٧٦٦٨	٥
محطة فالي الشمسية - خط النقل الهوائي ٢		
٦٢٢٠٢٥.٩٨١٥٨٤٥٦٦٣	٣٠٣٤١٦٩.٨٧٣٩٣٦٩٨١	١
٦٢٢١٨٠.٣٤٠٨٦٢٠٧٧٩	٣٠٣٤٤٥٦.٩٦٩٤٩٤٧٣٠٢	٢
٦٢٢٥٨٣.٦٣٥٨١٩٤٩١٣	٣٠٣٤٦٤٧.٤٠٣٦٩٢٨٤١٥	٣
٦٢٣٦٩٥.٣٥٥٢٦٧٣١٠٥	٣٠٣٤٤٧٦.٧٩٦٤٩٨٣٢٨٤	٤
٦٢٤٤٩٤.٥٠٨٠٩٦٩٦٩٧	٣٠٣٤٤١٩.٠١٨١٠٣٨٠٨	٥

يوضح الشكل ١ أدناه استخدامات الأراضي المحيطة والأنشطة في محيط موقع المشروع المقترح.



الشكل ١: الأنشطة/استخدامات الأراضي المحيطة بالموقع المقترح

يتم الوصول إلى مكونات المشروع عبر شبكة الطرق الإقليمية التي تخدم محافظة المنيا، بما في ذلك طريق رأس غارب- المنيا، وطريق المنيا-أسيوط، وطريق أسيوط-القاهرة الصحراوي، والطريق الصحراوي. ستسهل هذه الطرق حركة نقل مواد الإنشاء والمعدات والقوى العاملة أثناء تنفيذ المشروع، بالإضافة إلى توفير الوصول لأنشطة التشغيل والصيانة طوال دورة حياة المشروع.

مكونات المشروع والأنشطة الرئيسية

يتكون مشروع خطوط النقل الهوائية ومحطة محولات نسيج سريية المقترح من مكونين رئيسيين، هما: محطة محولات نسيج سريية والبنية التحتية المرتبطة بربطها بالشبكة الكهربائية، وخط النقل الهوائي الخاص بربط محطة فالي الشمسية بالشبكة القومية. وتهدف هذه المكونات إلى نقل الكهرباء المولدة من مصادر متجددة من محطة فالي الشمسية إلى الشبكة الكهربائية القومية، بالإضافة إلى توفير التغذية الكهربائية للمنطقة الصناعية بالسريية.

محطة محولات نسيج السريية وخط ربط محطة نسيج السريية بالشبكة القومية: ويشمل هذا إنشاء محطة محولات نسيج السريية بالمنيا جهد ٢٢/٢٢/٥٠٠ كيلوفولت (ك.ف) سعة ٢٠٠×٣٠ ميجا فولت أمبير (م.ف.أ) قابلة للتوسع بمحول رابع من النوع GIS لتوفير التغذية الكهربائية لأحمال بقدرة تصل إلى ٦٠٠ ميجا فولت أمبير (م.ف.أ) وربطها بالشبكة الكهربائية عن طريق فتح الخط الهوائي المزدوج الدائرة جهد ٥٠٠ ك.ف (توليد بني سويف / شرق أسيوط) (د/خ) من النوع (4xACSR490/65) ومده بطول حوالي ٥٠٠×٢ متر من نفس نوع الموصل

خط ربط محطة توليد فالي الشمسية بالشبكة القومية: يشمل إنشاء خط نقل هوائي بجهد ٥٠٠ كيلو فولت يربط محطة فالي الشمسية ٣٣/٣٣/٥٠٠ كيلوفولت بشبكة النقل الكهربائي الموجودة. ويشمل هذا فتح الخط الهوائي المزدوج الدائرة جهد ٥٠٠ ك.ف (نسيج السريية / شرق أسيوط) (د/خ) من النوع (ACSR 4x490/65 mm2) ومده بطول حوالي ٢٥٠×٢ متر من نفس نوع الموصل، يربط محطة توليد فالي الشمسية جهد ٣٣/٣٣/٥٠٠ ك.ف بالشبكة القومية الموجودة ذات الجهد ٥٠٠ كيلو فولت.

البنية التحتية لخطوط النقل الهوائية

ستتكون خطوط النقل الهوائية من أبراج شبكية فولاذية ذاتية الدعم مزدوجة الدائرة، وقواعد خرسانية مسلحة، وموصلات كهربائية، وعوازل، ومباعدات (Spacers)، ومثبطات/ممتص للاهتزاز (Dampers).

سيتم تحديد حرم مسار (Row) لخطوط النقل الهوائية بعرض ٢٥ مترًا على جانبي خط النقل، وذلك وفقًا لأحكام قانون الكهرباء. كما سيتم تحديد العدد النهائي للأبراج ومواقعها خلال مرحلة التصميم التفصيلي للمشروع.

٤. مرافق الإنشاء والتشغيل

تشمل أعمال الإنشاء إجراء الدراسات الجيوتقنية، وأعمال الحفر وإنشاء الأساسات، وتجميع الأبراج وتركيبها، وشد الموصلات الكهربائية، وتركيب المعدات الكهربائية، وإجراء الاختبارات وأعمال التشغيل التجريبي، بالإضافة إلى إعادة تأهيل المواقع بعد انتهاء أعمال التنفيذ.

كما سيتم إنشاء مرافق مؤقتة لدعم أعمال الإنشاء، تشمل مناطق لتجميع وتخزين المواد والمعدات، ومكاتب الموقع، والمرافق الصحية، وخزانات المياه، ومولدات كهرباء تعمل بالديزل لتلبية احتياجات الموقع أثناء التنفيذ.

وخلال مرحلة التشغيل، ستطلب خطوط النقل إجراء أعمال تفتيش وصيانة دورية للأبراج والموصلات والمعدات المرتبطة بها. أما محطة محولات نسيج سريرية، فسيتم تشغيلها باستخدام أنظمة تشغيل آلية، مع تنفيذ برامج دورية لفحص وصيانة المحولات، ومعدات المفاتيح الكهربائية، وأنظمة الحماية، وسائر المعدات الكهربائية المرتبطة بها.

وستتولى الشركة المصرية لنقل الكهرباء (EETC) مسؤولية تشغيل وصيانة المشروع، ومن المتوقع أن يتطلب تشغيل محطة المحولات نحو خمسة أفراد من العاملين.

الظروف البيئية والاجتماعية الأساسية

البيئة الطبيعية

المناخ والأرصاد الجوية

تقع منطقة المشروع ضمن الصحراء الشرقية بمحافظة المنيا، وتتميز بمناخ صحراوي شديد الجفاف، مع درجات حرارة مرتفعة، وانخفاض في الرطوبة النسبية، وشبه انعدام لهطول الأمطار. واستنادًا إلى بيانات الأرصاد الجوية الصادرة عن أقرب محطة رصد في محافظة المنيا، يتراوح متوسط درجات الحرارة الشهرية بين نحو ٨ درجات مئوية في شهر يناير و ٣٧ درجة مئوية في شهري يوليو وأغسطس، بينما يبلغ متوسط الهطول المطري السنوي حوالي ١٢.٦ مم فقط. وتسود المنطقة رياح شمالية وشمالية غربية في معظم الأوقات، وتتراوح سرعتها عادة بين ٢٠ و ٣٠ كم/ساعة. كما تتعرض المنطقة أحيانًا لعواصف ترابية ورملية، لا سيما خلال فصل الربيع.

جودة الهواء

تقع منطقة المشروع في بيئة صحراوية نائية تخلو من الأنشطة الصناعية الرئيسية أو مصادر الانبعاثات الثابتة في محيطها. ومن المتوقع أن تكون جودة الهواء المحيط جيدة جدًا فيما يتعلق بالملوثات الناتجة عن الأنشطة البشرية. وتتمثل السمة الرئيسية لجودة الهواء في المنطقة في وجود الغبار الطبيعي المحمول بالرياح، والذي قد تزداد كثافته خلال فترات الرياح القوية والعواصف الرملية.

الجيولوجيا والجيومورفولوجيا

تقع منطقة المشروع ضمن المناطق الداخلية للصحراء الشرقية بمحافظة المنيا، وتشكل جزءًا من هضبة جيرية متقطعة تشكلت بفعل عمليات التعرية المائية والريحية على مدى فترات زمنية طويلة. وتتميز تربة الموقع بطبيعتها الصخرية شديدة التشقق، مع غطاء تربة ضحل ومحدودية ملاءمتها للأنشطة الزراعية. ولم يتم رصد أي كتبان رملية داخل منطقة المشروع أو في محيطها المباشر. ومن الناحية الطبوغرافية، تتكون المنطقة من تضاريس صحراوية ذات انحدار طفيف، ويتراوح منسوبها بين نحو ١٢٧ و ١٣٢ مترًا فوق متوسط سطح البحر.

البيئة البيولوجية

تقع منطقة المشروع ضمن موطن صحراوي يغلب عليه الجفاف، يتميز بغطاء نباتي متناثر وحساسية بيئية محدودة. وتشمل المنطقة الأوسع موائل صحراوية، وأراضي زراعية مستصلحة، وأراضي وادي النيل الزراعية، بالإضافة إلى تجمعات عمرانية وريفية متفرقة. وقد جُمعت بيانات التنوع البيولوجي من خلال مراجعة الأدبيات العلمية، وفحص قواعد البيانات، والاطلاع على الدراسات البيئية السابقة، إلى جانب المسوحات الميدانية التي أُجريت في فبراير ٢٠٢٦.

تقع أقرب الأراضي الزراعية على مسافة تتراوح بين نحو ٨٠٠ متر و ١ كيلومتر من مكونات المشروع، وتوفر موائل لعدد من الأنواع الشائعة من الحياة البرية المرتبطة بالمناطق الزراعية المستصلحة ووادي النيل. أما منطقة المشروع نفسها فتتميز بموطن صحراوي متجانس نسبياً ذي قيمة بيئية محدودة. وشمل تقييم مستقبلات التنوع البيولوجي النباتات، والثدييات، والزواحف، والطيور، وخدمات النظم البيئية، بالإضافة إلى فحص الموائل الحرجة. وتقع المنطقة ضمن أحد مسارات هجرة الطيور، ولذلك أخذت التفاعلات المحتملة مع الطيور المهاجرة المحلقة بعين الاعتبار أثناء تقييم التنوع البيولوجي.

البيئة الاجتماعية والاقتصادية

الكثافة السكانية والتوزيع السكاني

تقع مكونات المشروع في منطقة صحراوية نائية بمحافظة المنيا، ولا توجد أي تجمعات سكنية داخل نطاق المشروع. وتشمل أقرب التجمعات السكانية إلى محطة محولات نسيج سريرية قرية السريية، وقرية السوايطه، وعزبة الشيخ حسن، والتي تقع على مسافات تقارب ١١ كم و ١٢.٥ كم و ١٣ كم إلى الغرب من موقع المشروع، على التوالي. كما تقع مدينة المنيا الجديدة على بعد نحو ١٢ كم من خط النقل الهوائي للربط بالشبكة الكهربائية الخاص بمحطة فالي الشمسية

القوى العاملة والأنشطة الاقتصادية

تتركز الأنشطة الاقتصادية في المنطقة الأوسع بصورة رئيسية داخل وادي النيل والأراضي الزراعية المستصلحة. وتُعد الزراعة من أهم الأنشطة الاقتصادية في محافظة المنيا، بينما تتركز الأنشطة الصناعية والتجارية في المراكز الحضرية والمناطق الصناعية المخصصة. ومن المتوقع أن يستفيد المشروع من توافر العمالة الماهرة وغير الماهرة داخل محافظة المنيا والمجتمعات المجاورة.

استخدامات الأراضي

تقع مكونات المشروع على أراضي صحراوية غير مطورة مملوكة للدولة. وتشمل استخدامات الأراضي في المنطقة الأوسع المناظر الصحراوية، والأراضي الزراعية المستصلحة، والمناطق الزراعية بوادي النيل، وممرات النقل، إلى جانب تجمعات حضرية وريفية متفرقة. ولم يتم تحديد أي حالات تتطلب نزع ملكية أو استحواداً على الأراضي أو أي استخدامات سكنية قائمة داخل نطاق المشروع.

البنية التحتية والخدمات

يمكن الوصول إلى منطقة المشروع عبر شبكة الطرق الإقليمية، بما في ذلك طريق رأس غارب-المنيا، وطريق المنيا-أسيوط، وطريق أسيوط-الغيزة الصحراوي، والطريق الصحراوي. كما تستفيد المنطقة الأوسع من توافر بنية تحتية قائمة تشمل شبكات

النقل، والمرافق العامة، والمؤسسات التعليمية، والخدمات الصحية، وغيرها من الخدمات العامة المتركة في المدن والتجمعات السكانية القريبة.

واستناداً إلى الظروف البيئية والاجتماعية الأساسية، يتبين أن منطقة المشروع تتمتع ببنية تحتية وخدمات مناسبة لدعم المشروع خلال مرحلتي الإنشاء والتشغيل. ومن المتوقع أن يسهم توافر القوى العاملة المحلية في توفير فرص عمل للسكان المحليين أثناء تنفيذ المشروع. وتقع مكونات المشروع على أراضي صحراوية مملوكة للدولة، ولم يتم تحديد أي احتياجات تتعلق بالاستحواذ على الأراضي أو التهجير المادي للسكان.

التراث الثقافي المادي

لم يتم تحديد أي مواقع أثرية مسجلة أو موارد للتراث الثقافي أو آثار محمية ضمن نطاق المشروع. وتقع أقرب المواقع التراثية المعروفة على مسافة تزيد على ١٦ كم من مكونات المشروع. وتقتصر الآثار المحتملة على احتمال العثور على مكتشفات أثرية بالصدفة أثناء أعمال الحفر، وسيتم تطبيق إجراءات الاكتشافات العرضية للتعامل مع أي مكتشفات من هذا النوع.

٥. تحليل بدائل المشروع

تناول تحليل البدائل دراسة خيارات المشروع الممكنة خلال مرحلتي التصميم المبدئي ودراسة ما قبل الجدوى، مع مراعاة الاعتبارات الفنية والاقتصادية والبيئية والاجتماعية.

أ. بديل عدم تنفيذ المشروع

في إطار بديل عدم تنفيذ المشروع، لن يتم إنشاء خطوط النقل الهوائية المقترحة ولا محطة محولات نسيج سريرية، ونتيجة لذلك، لن يتم ربط الكهرباء المولدة من محطة فالي الشمسية بالمنطقة الصناعية بالسريرية. كما لن تتحقق الفوائد المتوقعة المتمثلة في توفير مصدر موثوق للكهرباء المتجددة لدعم التنمية الصناعية والحد من الاعتماد على توليد الكهرباء القائم على الوقود الأحفوري. لذلك، لم يُعتبر بديل عدم تنفيذ المشروع خياراً مناسباً.

ب. بدائل مسارات خطوط النقل الهوائية

يمتد المسار المختار لخط النقل الهوائي الخاص بربط مشروع فالي الشمسية بالشبكة الكهربائية القومية لمسافة تقارب ٢.٥ كم إلى الغرب من محطة فالي الشمسية حتى نقطة الربط مع الشبكة القومية القائمة. ويقع هذا المسار على بعد نحو ١ كم شمال أقرب الأراضي الزراعية. ونظراً لقصر طول خط النقل الهوائي المقترح وثبات موقعي محطة فالي الشمسية ونقطة الربط الحالية بالشبكة القومية، لم يتم النظر في مسارات بديلة. ومن شأن أي انحراف عن المسار المختار أن يؤدي إلى زيادة طول خط النقل، والحاجة إلى إنشاء أبراج إضافية، وزيادة أعمال الإنشاء والتكاليف، فضلاً عن احتمال زيادة الآثار البيئية والاجتماعية دون تحقيق مزايا واضحة.

ويمتد المسار المختار لخط النقل الهوائي الخاص بربط محطة محولات نسيج سريرية بالشبكة القومية لمسافة تقارب ٠.٥ كم باتجاه الغرب من محطة المحولات المقترحة إلى نقطة الربط القائمة بالشبكة القومية. وبما أن نقطتي البداية والنهاية محددتان

مسبقاً وفقاً لمتطلبات البنية التحتية، فإن خيارات اختيار المسار محدودة. ويتبع المسار المختار أقصر وأفضل مسار من الناحية الفنية، مع تقليل أعمال الإنشاء، وخفض تكاليف الإنشاء، وتجنب المناطق الحساسة بيئياً واجتماعياً.

ج. بديل موقع محطة محولات نسيج سريرية

تقع محطة محولات نسيج سريرية المقترحة داخل المنطقة الصناعية بسريية، وهي منطقة مخصصة لاستيعاب المنشآت الصناعية والمرافق المرتبطة بها. ويسهم الموقع المختار في تقليل فاقد نقل الطاقة نظراً لقربه من المنشآت الصناعية المخطط لها، كما يقلل الحاجة إلى إنشاء بنية تحتية إضافية لشبكات التوزيع، ويتجنب متطلبات الاستحواذ على الأراضي أو التهجير المادي أو الاقتصادي، ويحد من الآثار المحتملة على المستقبلات البيئية والاجتماعية.

د. البدائل التكنولوجية

تمت دراسة تقنيتين لمحطات المحولات خلال مرحلة تخطيط المشروع، وهما محطة المحولات المعزولة بالغاز (GIS) ومحطة المحولات المعزولة بالهواء (AIS). وتتميز تقنية العزل بالغاز بصغر المساحة المطلوبة، وارتفاع مستوى الوثوقية، وانخفاض الحاجة للصيانة بفضل تصميمها المغلق، إلا أنها تتطلب استثمارات رأسمالية أعلى وإدارة خاصة لغاز SF_6 . أما تقنية العزل بالهواء فتتميز بانخفاض تكلفتها وسهولة صيانتها، لكنها تحتاج إلى مساحة أكبر، كما أنها أكثر تأثراً بالظروف الجوية والغبار والتلوث وتداخلات الحياة البرية. ولا تزال كلتا التقنيتين قيد الدراسة، وسيتم اعتماد الخيار النهائي خلال مرحلة التصميم التفصيلي.

٦. تقييم المخاطر والتأثيرات البيئية والاجتماعية

يتناول هذا الفصل تقييم المخاطر والآثار البيئية والاجتماعية المحتملة للمشروع، ويتضمن تحليلاً تفصيلياً للمخاطر والتأثيرات المرتبطة به، مع التأكيد على تطبيق التسلسل الهرمي للتخفيف، والذي يشمل تجنب والتأثيرات، ثم تقليلها، ثم التخفيف منها.

سيعمل المشروع على ربط محطة فالي الشمسية الكهروضوئية بالشبكة الكهربائية القومية، بما يتيح تزويد المنطقة الصناعية بوادي السريية بالكهرباء المتجددة. وسيسهم ذلك في دعم التنمية الصناعية الخضراء من خلال توفير مصدر موثوق للطاقة النظيفة والحد من الاعتماد على الوقود الأحفوري. وخلال مرحلة الإنشاء، سيوفر المشروع فرص عمل مباشرة وغير مباشرة، مع إعطاء الأولوية لتوظيف العمالة المحلية. أما خلال مرحلة التشغيل، فمن المتوقع أن يسهم في تعزيز النمو الاقتصادي على المدى الطويل من خلال جذب الاستثمارات ودعم التوسع الصناعي، إلى جانب توفير عدد محدود من فرص العمل الدائمة في مجالي التشغيل والصيانة.

وتشمل أهم إجراءات التخفيف المقترحة لمعالجة الآثار السلبية ما يلي:

- تقييد أنشطة الإنشاء على مناطق العمل المعتمدة، وتحديد حدود الموقع بوضوح، واستخدام طرق الوصول القائمة كلما أمكن، ومنع القيادة خارج الطرق المخصصة دون مبرر.
- تطبيق إجراءات متكاملة لإدارة المياه، والنفايات الصلبة، والنفايات الخطرة، ومياه الصرف، بما يشمل فرز النفايات وتخزينها وإعادة تدويرها - حيثما أمكن - والتخلص منها من خلال منشآت مرخصة.

- الحد من الاضطرابات البيئية من خلال ترشيد استهلاك المياه، وتقليل العمل الليلي، واستخدام إضاءة موجهة إلى الأسفل عند الحاجة، وتنفيذ إجراءات إدارة حركة المرور، بما في ذلك تحديد السرعات وجدولة عمليات النقل خارج ساعات الذروة.
- إعطاء الأولوية لتوظيف العمالة المحلية، وتوفير أماكن إقامة مناسبة للعمالة الوافدة، وتطبيق مدونة سلوك للعاملين، والحفاظ على آلية فعالة لتلقي شكاوى أصحاب المصلحة والمجتمعات المحلية.
- ضمان حصول أفراد الأمن على التدريب المناسب، والتزامهم بالقوانين ومدونات السلوك المعمول بها، وخضوعهم لآلية التظلمات الخاصة بالمشروع.
- تنفيذ خطة لإدارة الصحة والسلامة المهنية ، وتوفير معدات الوقاية الشخصية المناسبة والتدريب الدوري، وإنشاء مناطق عزل، وتطبيق إجراءات الحماية من السقوط وإجراءات القفل والوسم ، وقصر الأعمال الخطرة على العاملين المؤهلين، مع تطبيق تدابير الوقاية من الحرائق والاستعداد للطوارئ وإدارة الإجهاد الحراري.
- إعداد وتنفيذ إجراءات الاكتشافات العرضية ، وإخطار الجهة المختصة فوراً في حال اكتشاف أي بقايا أثرية أثناء التنفيذ.
- إجراء عمليات تفتيش دورية وصيانة وقائية لمعدات المشروع، بما في ذلك المحولات، وأنظمة التبريد، والمعدات المعزولة بغاز SF_6 (عند الاقتضاء)، وإصلاح أي أعطال أو تسربات فور اكتشافها.
- تطبيق تدابير حماية الطيور على مرافق خطوط النقل، بما في ذلك استخدام عوازل أمانة للطيور وأذرع عرضية معزولة، عند الحاجة، للحد من مخاطر الصعق الكهربائي.
- إنشاء مناطق أمان للمجالات الكهرومغناطيسية ، وتقيد الوصول إلى المعدات المكهربة على العاملين المخولين والمدربين فقط.
- إعداد وتنفيذ خطة تفصيلية لاجتياز التشغيل، وضمان تنفيذ أعمال التفكيك وإدارة النفايات بطريقة سليمة بيئياً، وإعادة تأهيل الموقع، حيثما كان ذلك ممكناً، بعد الانتهاء من أعمال الاجتياز.

ويرد ملخص للأثار السلبية المحتملة على البيئة والمجتمع خلال مراحل الإنشاء والتشغيل والاجتياز في الجدول التالي.

أهمية التأثيرات المتبقية بعد التخفيف	تدابير التخفيف	أهمية التأثير قبل التخفيف	الجانب البيئي والاجتماعي
مرحلة الإنشاء			
جودة الهواء			
غير ملحوظ	- الحد من فترات تشغيل مركبات ومعدات الإنشاء في وضع الخمول. - المحافظة على المركبات ومعدات الإنشاء في حالة تشغيل جيدة. - توعية العاملين بممارسات القيادة الآمنة والاستخدام السليم للمعدات. - تطبيق إجراءات التحكم في انبعاثات الأتربة. - ضمان الالتزام بمتطلبات قانون البيئة رقم ٤ لسنة ١٩٩٤ ولائحته التنفيذية فيما يتعلق بانبعاثات مولدات الكهرباء.	ضئيل	انبعاثات العادم من مركبات الإنشاء والمعدات المتنقلة التي تعمل في الموقع
الضوضاء المحيطة			
غير ملحوظ	- استخدام الآلات ومعدات الإنشاء التي تتوافق مع أحدث الممارسات الفنية المتاحة. - إجراء الصيانة الدورية للمعدات والآلات ذات محركات الاحتراق الداخلي وفقاً لتعليمات الشركة المصنعة. - جدولة الأنشطة مرتفعة الضوضاء لتجنب تزامنهما بما يزيد من مستويات الضوضاء. - توفير وسائل حماية السمع للعاملين المعرضين لمستويات ضوضاء مرتفعة.	ضئيل	- المعدات والآلات - حركة المركبات - مولدات الطاقة
التربة			
غير ملحوظ	- إجراء أعمال الصيانة خارج موقع المشروع للحد من الانسكابات. - استخدام أسطح معزولة في مناطق التزود بالوقود ونقل السوائل. - تنفيذ خطة الوقاية من الانسكابات ضمن خطة الإدارة البيئية والاجتماعية، مع توفير مواد ماصة للانسكابات بالموقع. - توفير وسائل احتواء ثانوية لخزانات الوقود وحوايات المواد الخطرة. - جمع والتخلص الآمن من المواد الملوثة من خلال جهات معتمدة.	ضئيل	- أعمال الحفر والردم - تداول مخلفات الإنشاء - الانسكابات والتسربات العرضية

أهمية التأثيرات المتبقية بعد التخفيف	تدابير التخفيف	أهمية التأثير قبل التخفيف	الجانب البيئي والاجتماعي
	• تطبيق ممارسات النظافة والترتيب الجيدة بالموقع. • تجميع المخلفات الصلبة في أماكن مخصصة. • التخلص من المخلفات غير الخطرة والخطرة بواسطة جهات معتمدة.		
البيئة البيولوجية			
غير ملحوظ	• قصر اعمال الإنشاء فقط على المساحات المحددة للأبراج ومناطق العمل المعتمدة. • استخدام الطرق القائمة والممرات المتأثرة بالأنشطة السابقة كلما أمكن. • منع سير المركبات خارج الطرق المحددة، وتجنب المناطق النباتية التي يتم تحديدها خلال أعمال المسح السابقة للإنشاء. • تحديد حدود مناطق العمل بوضوح قبل بدء الإنشاء لمنع أي تأثير غير ضروري للتربة.	ضئيل	• فقدان الموائل
غير ملحوظ	• إعداد وتنفيذ خطة لإدارة المخلفات الصلبة والخطرة لمنع انجذاب الحياة البرية إلى بقايا الأغذية أو الملوثات. • إعداد خطة لإدارة المخلفات السائلة لمنع تكوّن تجمعات مائية قد تجذب الطيور أو الحيوانات. • تنفيذ برامج توعية بيئية للعاملين، مع التركيز على حماية الحياة البرية ومنع الإزعاج أو الإضرار بها. • تجنب العمل الليلي غير الضروري، واستخدام إضاءة منخفضة الشدة وموجهة إلى الأسفل عند الحاجة. • فرض حدود سرعة لمركبات المشروع للحد من مخاطر التصادم مع الحيوانات.	ضئيل	• إزعاج الحياة البرية
البيئة الاجتماعية والاقتصادية			
غير ملحوظ	• تطبيق برنامج إدارة المياه وضمان الاستخدام الفعال وتجنب الهدر.	غير ملحوظ	• الطلب على المياه للعاملين
غير ملحوظ	• أعط الأولوية لتوظيف العمال المحليين حيثما أمكن. • استيعاب العمال غير المحليين في المناطق السكنية ذات القدرة السكنية والمواد الغذائية الأعلى.	ضئيل	• طلب السكن للعاملين

أهمية التأثيرات المتبقية بعد التخفيف	تدابير التخفيف	أهمية التأثير قبل التخفيف	الجانب البيئي والاجتماعي
غير ملحوظ	- تطوير وتنفيذ مدونة سلوك للعمال تحدد السلوك المناسب، بما في ذلك احترام العادات والممارسات الدينية، والثقافات التقليدية، والأعراف الاجتماعية في المنطقة. - إنشاء آلية شكاوى مجتمعية لمعالجة الشكاوى بشكل فعال.	ضئيل	الصراع الاجتماعي بين القوى العاملة والمجتمع المضيف
غير ملحوظ	- ضمان تدريب أفراد الأمن بشكل كاف على السلوك المهني والعلاقات المجتمعية. - يشترط الامتثال للقوانين الوطنية المعمول بها ومبادئ حقوق الإنسان. - تنفيذ آلية شكاوى متاحة لأعضاء المجتمع.	ضئيل	تعامل أفراد الأمن مع العاملين والمجتمع المحيط
لا يوجد تأثير متبقي	تقع مسارات خطي النقل الهوائي للكهرباء وموقع محطة محولات نسيج السريية في أراضي صحراوية غير مأهولة، ولا تشمل أي استخدامات زراعية أو سكنية أو تجارية أو غيرها من الاستخدامات الإنتاجية للأراضي، وبالتالي لا يُتوقع حدوث أي تأثير مرتبط بتغيير استخدامات الأراضي.	غير ملحوظ	تغيير استخدام الأراضي
غير ملحوظ	- تتسقى تسليم المواد لتجنب ساعات الذروة المرورية حيثما أمكن. - تأكد من سلامة تشغيل المركبات وحدود السرعة داخل الموقع وبالقرب منه.	ضئيل	حركة المرور
الصحة والسلامة المهنية			
ضئيل	- تنفيذ خطة إدارة الصحة والسلامة العامة. - توفير مهمات الوقاية الشخصية المناسبة. - تنفيذ برامج تدريبية في مجال السلامة والصحة المهنية، بما في ذلك اجتماعات التوعية اليومية بالسلامة (Toolbox Talks). - تطبيق حدود السرعة وإجراء الفحص الدوري للمعدات. - ضمان تدريب مشغلي المعدات وتأهيلهم، وإجراء الصيانة الدورية للمعدات، والالتزام بإجراءات السلامة المعتمدة. - تحديد مناطق عزل لعمليات الرفع وتشغيل الرافعات. - تقييد الدخول إلى مناطق العمل وتأمين مواقع الحفريات ووضع العلامات التحذيرية المناسبة.	متوسط	السلامة والصحة المهنية

أهمية التأثيرات المتبقية بعد التخفيف	تدابير التخفيف	أهمية التأثير قبل التخفيف	الجانب البيئي والاجتماعي
	- استخدام وسائل الوقاية من السقوط، بما في ذلك أحزمة الأمان الكاملة وحبال امتصاص الصدمات. - الحفاظ على ممرات وصول آمنة والحد من مخاطر الانزلاق والتعثر. - توفير أماكن استراحة مظلة، وتطبيق التدابير اللازمة للوقاية من الإجهاد الحراري. - تنفيذ تدابير الوقاية من الحرائق، وتوفير وصيانة طفايات الحريق بالموقع، وإجراء تدريبات دورية على الاستجابة لحرائق الموقع. - تطبيق إجراءات العزل ووضع بطاقات التحذير (Lock-out/Tag-out)، وقصر تنفيذ الأعمال الكهربائية على الفنيين الكهربائيين المؤهلين.		
غير ملحوظ	- إعداد وتنفيذ إجراءات التعامل مع الاكتشافات الأثرية العرضية، والتي تحدد الإجراءات الواجب اتباعها في حال العثور على أي مكتشفات أثرية أثناء أعمال تسوية الموقع أو الإنشاء. - إخطار وزارة السياحة والآثار فور العثور على أي مكتشفات أثرية أثناء أعمال الحفر، واتخاذ الإجراءات اللازمة وفقاً للتشريعات المعمول بها.	ضئيل	التراث الثقافي
مرحلة التشغيل			
الهواء المحيط			
غير ملحوظ	- في حال استخدام غاز SF₆ كغاز عازل بدلاً من العزل الهوائي، يتم تطبيق إجراءات الكشف عن التسربات وإصلاحها. - استخدام معدات تفرغ وسحب (Vacuum) مناسبة أثناء تعبئة غاز SF₆ داخل معدات المفاتيح الكهربائية المعزولة بالغاز (GIS) - تدريب العاملين على إجراءات التعامل الآمن مع غاز SF₆.	ضئيل	- نقل العاملين والمستلزمات اللازمة لأعمال الصيانة. - احتمالية انبعاث غاز SF₆ في حال استخدامه كغاز عازل في معدات المفاتيح الكهربائية.

أهمية التأثيرات المتبقية بعد التخفيف	تدابير التخفيف	أهمية التأثير قبل التخفيف	الجانب البيئي والاجتماعي
الضوضاء المحيطة			
غير ملحوظ	- لا يتطلب هذا الأثر تدابير تخفيف إضافية؛ ومع ذلك، سيتم تطبيق الإجراءات الإدارية التالية: - إجراء الصيانة الدورية للمحولات ومراوح التبريد لمنع ارتفاع مستويات الضوضاء بصورة غير طبيعية. - إصلاح أو استبدال المكونات المعيبة التي قد تتسبب في زيادة الضوضاء أو الاهتزازات.	غير ملحوظ	- الضوضاء (الطنين) الناتجة عن خطوط الكهرباء ذات الجهد العالي بسبب ظاهرة الكورونا (Corona) - تشغيل المحولات والمكونات الأخرى للمحطة الفرعية.
التربة			
غير ملحوظ	- تطبيق إجراءات مناسبة لتخزين الزيوت ومواد التشحيم وتداولها. - تنفيذ أعمال الصيانة في مناطق مخصصة لذلك. - توفير مواد ومعدات الاستجابة للانسكابات، وتدريب العاملين على إجراءات التعامل معها.	غير ملحوظ	- الانسكابات المحتملة. - المخلفات الصلبة.
البيئة البيولوجية			
غير ملحوظ	زيادة عدد العوازل عند نقاط اتصال الموصلات بالأبراج لزيادة المسافة الفاصلة بين الموصلات والبرج، واستخدام عوازل تحد من إمكانية وقوف الطيور عليها. • تغطية الأذرع العرضية بمواد عازلة، مثل شرائط PVC، لمنع اكتمال الدائرة الكهربائية عند وقوف الطيور عليها.	ضئيل	مخاطر الصعق الكهربائي للطيور
ضئيل	بالنسبة لمخاطر تصادم الطيور، لا ينصح باتخاذ تدابير تخفيف.	ضئيل	خطر تصادم الطيور
البيئة الاجتماعية			
لا توجد آثار متبقية	- أفراد أمن مدربون يتصرفون بشكل صحيح تجاه العمال والمجتمع، ويعملون ضمن القانون. - تطبيق آلية شكاوى تتيح لأفراد المجتمع الإبلاغ عن أي مخاوف تتعلق بالترتيبات الأمنية أو تصرفات أفراد الأمن.	غير ملحوظ	تعامل أفراد الأمن مع العاملين والمجتمع المحيط

أهمية التأثيرات المتبقية بعد التخفيف	تدابير التخفيف	أهمية التأثير قبل التخفيف	الجانب البيئي والاجتماعي
الصحة والسلامة المهنية			
ضئيل	• الالتزام بجميع اللوائح الوطنية للسلامة والصحة المهنية؛ وقانون العمل ٢٠٢٥/١٤. • تأكد من تدريب عمال الصيانة بشكل صحيح، خاصة للعمل على الارتفاعات • توفير مهمات الوقاية الشخصية المناسبة بالإضافة إلى التدريب المناسب للأنشطة المختلفة.. • تحديد مناطق السلامة ومناطق العمل التي قد تشهد مستويات مرتفعة من المجالات الكهرومغناطيسية عن المناطق المسموح بالتعرض لها، مع قصر الدخول إلى تلك المناطق على العاملين المؤهلين والمدربين	متوسط	• المخاطر الكهربائية • أنشطة الصيانة

٧. مشاركة أصحاب المصلحة

شكّلت مشاورات أصحاب المصلحة جزءاً أساسياً من عملية إعداد دراسة تقييم الأثر البيئي والاجتماعي ، وتم تنفيذها وفقاً لدليل إجراءات تقييم الأثر البيئي الصادر عن جهاز شؤون البيئة المصري ، وبما يتوافق مع الممارسات الدولية الجيدة، بما في ذلك متطلب الأداء رقم (١٠) للبنك الأوروبي لإعادة الإعمار والتنمية بشأن الإفصاح عن المعلومات ومشاركة أصحاب المصلحة. وشملت عملية التشاور تحديد أصحاب المصلحة في مرحلة مبكرة، واستمرار التواصل معهم طوال فترة إعداد الدراسة، والإفصاح عن المعلومات بشفافية لضمان مشاركة فعالة وهادفة.

أنشطة تحديد نطاق الدراسة البيئية والاجتماعية

عُقدت اجتماعات تحديد نطاق الدراسة مع أصحاب المصلحة خلال الفترة من يناير إلى مارس ٢٠٢٦، بمشاركة ممثلين عن الجهات الحكومية، والمجالس المحلية، والسلطات البيئية، ومقدمي خدمات المرافق، ومستخدمي الأراضي الزراعية، والمنظمات غير الحكومية (NGOs) ، وغيرهم من أصحاب المصلحة المعنيين.

وساهمت عملية التشاور في تحديد القضايا البيئية والاجتماعية ذات الصلة بالمشروع، كما أسهمت في تحديد نطاق دراسة تقييم الأثر البيئي والاجتماعي. وبوجه عام، أبدى أصحاب المصلحة دعماً كبيراً للمشروع نظراً لإسهامه المتوقع في تعزيز دمج الطاقة المتجددة في الشبكة الكهربائية، وتحسين موثوقية إمدادات الكهرباء، ودعم المنطقة الصناعية بالسريرية، وتوفير فرص عمل داخل محافظة المنيا.

وشملت أبرز الموضوعات التي أثّرت خلال عملية التشاور ما يلي:

- فرص العمل وإعطاء الأولوية لتوظيف العمالة المحلية.
- ترتيبات إقامة العمال والاعتبارات الاجتماعية المرتبطة بها.
- توفير الكهرباء المتجددة للمنطقة الصناعية بـسريرية.
- فرص بناء القدرات والتدريب للمجتمعات المحلية.
- دعم الفئات الأكثر احتياجاً والتعاون مع منظمات المجتمع المدني.
- آليات إدارة شكاوى المجتمع وإجراءات معالجة التظلمات.
- توافر البنية التحتية لإمدادات المياه، ومعالجة مياه الصرف، وإدارة النفايات لدعم أنشطة المشروع.
- توافر الخدمات الطبية وخدمات الطوارئ داخل محافظة المنيا.
- الآثار المحتملة على الأراضي الزراعية المستخدمة بصورة غير رسمية ضمن المنطقة الأوسع للمشروع.
- احتياجات المشروع من المرافق والخدمات والوقود والموارد الأخرى خلال مرحلتي الإنشاء والتشغيل.

الإفصاح عن دراسة تقييم الأثر البيئي والاجتماعي

وفقاً لمتطلبات جهاز شؤون البيئة المصري ، لا تُعد اجتماعات الإفصاح العام إلزامية للمشروعات المصنفة ضمن الفئة ب محددة، إلا أنه، وامتثالاً لمتطلبات جهات التمويل، سيتم تنفيذ عملية الإفصاح لضمان استمرار مشاركة أصحاب المصلحة وتبادل المعلومات.

وستشمل عملية الإفصاح ما يلي:

- توجيه الدعوات إلى أصحاب المصلحة على المستويات المحلية والبلدية ومستوى المحافظة، بما في ذلك ممثلو الفئات الأكثر احتياجاً.
- الإعلان عن اجتماع الإفصاح قبل موعده بنحو ١٠ إلى ١٥ يوماً.
- توزيع والإفصاح عن الملخص غير الفني (NTS) باللغة العربية، مع إتاحتها إلكترونياً عبر الموقع الإلكتروني للمشروع.
- توفير نماذج لتلقي الملاحظات بما يتيح لأصحاب المصلحة تقديم آرائهم أثناء عملية التشاور ولمدة أسبوعين بعد اجتماع الإفصاح.
- تنظيم اجتماع الإفصاح داخل محافظة المنيا.
- توثيق ملاحظات أصحاب المصلحة، وسجلات الحضور، ونتائج المشاورات لإدراجها ضمن وثائق دراسة تقييم الأثر البيئي والاجتماعي.

وسيتم أخذ جميع الملاحظات الواردة من أصحاب المصلحة خلال مرحلتي التشاور والإفصاح في الاعتبار عند استكمال وتنفيذ تدابير الإدارة البيئية والاجتماعية الخاصة بالمشروع.

٨. خطة الإدارة البيئية والاجتماعية

سيقوم المشروع بإعداد وتنفيذ خطة الإدارة البيئية والاجتماعية (ESMP)، والتي تحدد إجراءات التخفيف والرصد اللازمة لضمان الامتثال لجميع المتطلبات القانونية والمؤسسية ذات الصلة. وتتضمن الخطة تدابير للتخفيف والرصد لضمان تحقيق الأداء البيئي والاجتماعي للمشروع. وتشمل خطة الإدارة البيئية والاجتماعية المكونات الرئيسية التالية:

- ملخصاً للأثار البيئية والاجتماعية، وإجراءات التخفيف، ومتطلبات الرصد، والمسؤوليات.
- خطة الصحة والسلامة والبيئة (HSE).
- خطة إدارة الصحة والسلامة المهنية.
- خطة إدارة النقل وحركة المرور.
- خطة إدارة الضوضاء.
- خطة إدارة المواد الخطرة والنفايات.
- خطة إدارة المياه ومياه الصرف.
- خطة إدارة التنوع البيولوجي وتدابير حماية الطيور.
- خطة الإدارة الاجتماعية، بما في ذلك إدارة العمالة، ومشاركة أصحاب المصلحة، وإدارة التظلمات، والصحة والسلامة المجتمعية، وتدابير الوقاية من الاستغلال والاعتداء والتحرش الجنسي (SEAH) والعنف القائم على النوع الاجتماعي (GBV).
- خطة الاستعداد والاستجابة لحالات الطوارئ.
- إجراءات الاكتشافات العرضية الخاصة بالتراث الثقافي.
- إجراءات الصيانة الوقائية والتوصيحية.
- إجراءات النظافة العامة والمحافظة على نظافة الموقع.

التاريخ	التكلفة المقدرة (دولار)	مؤشر التنفيذ	المسئول	الإجراءات	القضايا محل الاهتمام	الجانب
مرحلة الإنشاء						
خلال فترة مرحلة الإنشاء	٥,٠٠٠ - ١٠,٠٠٠ في السنة	- خطة الرصد. - قياسات جودة الهواء.	مقاول الإنشاء	- خفض فترات تشغيل المركبات والآلات في وضع الخمول. - المحافظة على الآلات والمركبات في حالة تشغيل جيدة. - تطبيق حدود السرعة داخل موقع المشروع. - توعية العاملين بممارسات القيادة الآمنة والاستخدام السليم للمعدات. - إجراء قياسات دورية لانبعاثات مداخل مولدات الكهرباء.	انبعاثات الأتربة	جودة الهواء
	١٥,٠٠٠ - ٣٠,٠٠٠ (متضمن في بدل التشغيل والصيانة من EPC)	- سجلات الصيانة. - خطة السلامة والصحة المهنية.	مقاول الإنشاء	- ضمان كفاءة تشغيل جميع معدات الإنشاء من خلال الفحص الدوري. - تنفيذ خطة السلامة والصحة المهنية.	حالة تشغيل الآلات	
خلال فترة مرحلة الإنشاء	١٠,٠٠٠ - ١٥,٠٠٠ سنويا	- خطة السلامة والصحة المهنية. - قياسات الضوضاء. - سجلات الصيانة.	مقاول الإنشاء	- إجراء الصيانة الدورية لمعدات الإنشاء. - استخدام معدات منخفضة الضوضاء كلما أمكن. - جدولة الأنشطة مرتفعة الضوضاء لتجنب تزامنها بما قد يزيد مستويات الضوضاء. - تنفيذ الأنشطة مرتفعة الضوضاء خلال ساعات النهار، قدر الإمكان. - تنفيذ خطة السلامة والصحة المهنية.	حالة تشغيل الآلات	الضوضاء

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
مرحلة الإنشاء						
	توفير مهمات الوقاية الشخصية	- توفير مهمات الوقاية الشخصية المناسبة للعاملين	مقاوم الإنشاء		١٠,٠٠٠ - ٥,٠٠٠ (إمدادات معدات الحماية الشخصية - إجمالي فترة المشروع)	
التربة	ممارسات النظافة والترتيب بالموقع	- إعداد وتنفيذ خطة إدارة الموقع، وخطة إدارة المخلفات، وخطة إدارة مياه الصرف الصحي، وخطة الوقاية من الانسكابات. - الجمع والاحتواء والتخلص السليم من مياه الصرف الصحي. - تخزين ومناولة المواد الخطرة وفقًا لإرشادات البيئة والصحة والسلامة العامة الصادرة عن مجموعة البنك الدولي. - نقل المخلفات والتخلص منها من خلال جهات معتمدة	مقاوم الإنشاء / شركة فالي للطاقة المستدامة. تتولى شركة فالي للطاقة المستدامة تضمين هذه المتطلبات في عقود الإنشاء ومتابعة التزام المقاولين بها.	- خطط إدارة المخلفات ومياه الصرف الصحي. - عقود إدارة المخلفات ومياه الصرف الصحي. - سجلات متابعة المقاولين. - العقود المبرمة مع جهات معتمدة لإدارة المخلفات.	٢,٠٠٠ - ٨,٠٠٠ (يعتمد على حجم النفايات)	خلال فترة مرحلة الإنشاء
	إدارة المخلفات ومياه الصرف الصحي					

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
مرحلة الإنشاء						
السلامة والصحة المهنية	سلامة العاملين وسلامة موقع العمل	- إعداد خطة السلامة والصحة المهنية وإجراءات البيئة والصحة والسلامة وفقاً للتشريعات الوطنية والمعايير الدولية.	المقاول	خطة وإجراءات السلامة والصحة المهنية. ومتطلبات البيئة والصحة والسلامة ضمن عقود الإنشاء.	١٥,٠٠٠ - ٢٠,٠٠٠	قبل الأنشطة الانشائية
خطط الطوارئ	سلامة العاملين وسلامة موقع العمل	إعداد إجراءات الاستعداد والاستجابة للطوارئ.	المقاول	خطة الاستعداد والاستجابة للطوارئ.	٧,٠٠٠ - ٢٠,٠٠٠	قبل بدء تشغيل المشروع
إدارة المخلفات	صحة العاملين	- إعداد خطط إدارة المخلفات الصلبة والخطرة وفقاً لإرشادات البيئة والصحة والسلامة العامة الصادرة عن مجموعة البنك الدولي. - إعداد خطة السلامة والصحة المهنية. - تخزين أنواع المخلفات المختلفة في أماكن مخصصة، ونقلها بواسطة جهات معتمدة.	مقاول الإنشاء	- عقد إدارة المخلفات مع جهات معتمدة. - سجل المخلفات - خطة السلامة والصحة المهنية.	٢٠٠ - ٦٠٠ يورو/طن (نفايات خطرة) ٨٠ - ١٥٠ يورو/طن (غير خطرة)	خلال فترة مرحلة الإنشاء
البيئة البيولوجية	التأثير على الحياة البرية والصحة والسلامة والأمن	= تنفيذ برامج التوعية البيئية (اجتماعات التوعية اليومية بالسلامة ولوحات التوعية). = تنفيذ تدابير التخفيف المعتمدة. = الإشراف على تنفيذ وسائل ردع الحياة البرية عند الحاجة.	مقاول الإنشاء مقاولو الإنشاء	= الالتزام بالمتطلبات الواردة في العقود.	١٠,٠٠٠ - ٢٥,٠٠٠ (مرة واحدة)	طوال مرحلة الإنشاء طوال مرحلة الإنشاء

التاريخ	التكلفة المقدرة (دولار)	مؤشر التنفيذ	المسئول	الإجراءات	القضايا محل الاهتمام	الجانب
مرحلة الإنشاء						
		= خطة إدارة المرور والإجراءات المرتبطة بها.		= إعداد وتنفيذ خطة إدارة المرور والإجراءات المرتبطة بها.	المجتمعي - مخاطر حوادث المرور	
خلال فترة مرحلة الإنشاء	٢٥,٠٠٠ - ١٠,٠٠٠	الإجراءات المعتمدة. • خطة الرصد. قياسات جودة الهواء.	شركة فالي للطاقة المستدامة / مقاولو الإنشاء مقاول الإنشاء	= إعداد وتنفيذ إجراءات التعامل مع الاكتشافات الأثرية العرضية. = الحد من فترات تشغيل المركبات والآلات في وضع الخمول. • المحافظة على الآلات والمركبات في حالة تشغيل جيدة. • تطبيق حدود السرعة داخل موقع المشروع. • توعية العاملين بممارسات القيادة الآمنة والاستخدام السليم للمعدات. • إجراء قياسات دورية لانبعاثات مداخل مولدات الكهرباء.	التراث الثقافي انبعاثات الأثرية	البيئة الاجتماعية
قبل الأنشطة الانشائية						
	٥,٠٠٠ - ٢,٠٠٠	- سجلات الصيانة. - خطة السلامة والصحة المهنية.	مقاول الإنشاء	- ضمان كفاءة تشغيل جميع معدات الإنشاء من خلال الفحص الدوري. • تنفيذ خطة السلامة والصحة المهنية.	حالة تشغيل الآلات	
	≈ ١٨٠,٠٠٠ دولار أمريكي					التكلفة المقدرة الإجمالية (دولار أمريكي) (EGP)
	≈ ٨,٨٢٠,٠٠٠ جنيه مصري					

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
مرحلة التشغيل						
جودة الهواء	انبعاثات غاز SF_6 أثناء أعمال صيانة وإصلاح معدات المفاتيح الكهربائية المعزولة بالغاز (GIS)	- الحد من تشغيل المولدات الاحتياطية إلى الحد الأدنى اللازم لتقليل الانبعاثات. - إجراء الصيانة الدورية للمولدات، ومراقبة انبعاثاتها بصورة منتظمة لضمان كفاءة التشغيل والحد من انبعاثات الهواء.	الشركة المصرية لنقل الكهرباء	قياسات الانبعاثات سجلات الصيانة	٦,٠٠٠-٣,٠٠٠ سنويا	بشكل دوري طوال مرحلة التشغيل
انبعاثات غاز SF_6 والكشف عن التسريبات	- الانبعاثات العرضية لغاز SF_6 أثناء فتح حبرات معدات المفاتيح الكهربائية المعزولة بالغاز وإجراء أعمال الصيانة. - تسرب غاز SF_6 من الوصلات أو الصمامات أو الخراطيم أو مكونات المعدات أثناء أعمال الصيانة والإصلاح.	- عزل أجزاء المعدات وإزالة الضغط منها قبل بدء أعمال الصيانة. - استخدام وحدات استرجاع غاز SF_6 المعتمدة أثناء تفريغ الغاز وإعادة تعبئته. - إجراء فحوصات للكشف عن التسريبات باستخدام أجهزة كشف غاز SF_6 المحمولة قبل وأثناء وبعد أعمال الصيانة.	الشركة المصرية لنقل الكهرباء (فريق التشغيل / مسؤول السلامة والصحة المهنية)	- سجلات الصيانة متاحة. - تم الانتهاء من سجلات فحص التسرب، ولم يتم تحديد أي تسريبات غير معالجة.	١٠,٠٠٠-٥,٠٠٠	قبل وأثناء أنشطة الإصلاح
الضوضاء	تشغيل المحولات والمعدات المسببة للضوضاء	تزويد العاملين المعرضين للضوضاء بمهمات الوقاية الشخصية المناسبة.	الشركة المصرية لنقل الكهرباء	قياسات الضوضاء	٥,٠٠٠-٣,٠٠٠ سنويا	بشكل دوري طوال مرحلة التشغيل

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
		- المحافظة على الآلات والمعدات في حالة تشغيل جيدة من خلال الصيانة الدورية. - تطبيق آلية الشكاوى للتعامل مع أي شكاوى تتعلق بالضوضاء.				
البيئة البيولوجية	التأثير على الحياة البرية	- تطبيق جميع تدابير التخفيف والإدارة المعتمدة لمرحلة الإنشاء، بما يتناسب مع طبيعة أنشطة التشغيل.	الشركة المصرية لنقل الكهرباء	التقارير	١,٠٠٠-٣,٠٠٠ سنويا	طوال فترة المشروع
التأثير على البيئة الاجتماعية	استهلاك المياه	- يقتصر الطلب على المياه خلال مرحلة التشغيل على كميات محدودة، ويتم توفيرها بالتنسيق مع شركة مياه الشرب، مع تطبيق إجراءات ترشيد استهلاك المياه.	الشركة المصرية لنقل الكهرباء	خطة إدارة المياه	١,٠٠٠-٣,٠٠٠ سنويا	طوال فترة المشروع
	إدارة مياه الصرف الصحي	- جمع مياه الصرف الصحي الناتجة عن التشغيل بواسطة جهة معتمدة، ونقلها إلى محطات معالجة معتمدة للتخلص منها وفقاً للترشيعات المعمول بها.	الشركة المصرية لنقل الكهرباء	خطة إدارة مياه الصرف الصحي		طوال فترة المشروع
حقوق العاملين والرفاهية	ظروف العمل	إعداد وتنفيذ سياسة للموارد البشرية بما يضمن توفير بيئة عمل آمنة وعادلة والامتثال للترشيعات المعمول بها.	الشركة المصرية لنقل الكهرباء	العقود (مع العمال)	٢,٠٠٠-٥,٠٠٠ (مرة واحدة)	طوال فترة المشروع

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
التدريب والتوعية	كفاءة العاملين بالمشروع	تنفيذ برامج تدريبية للعاملين وفقًا لطبيعة مهامهم ومسؤولياتهم، مع تحديثها بصورة دورية.	الشركة المصرية لنقل الكهرباء	خطط التدريب	٨,٠٠٠-٣,٠٠٠ سنويا	طوال فترة المشروع
السلامة والصحة المهنية	سلامة العاملين وسلامة موقع العمل	إعداد وتنفيذ إجراءات البيئة والصحة والسلامة، ومتابعة تطبيقها خلال مرحلة التشغيل.	الشركة المصرية لنقل الكهرباء	تطوير سياسات الصحة والسلامة والصحة والسلامة	٢٠,٠٠٠-١٠,٠٠٠ سنويا	قبل بدء تشغيل المشروع
الاستعداد والاستجابة للطوارئ	إدارة المخاطر التشغيلية	اعتماد إطار لتقييم المخاطر، وتنفيذ خطة الاستعداد والاستجابة للطوارئ، وإجراء التدريبات الدورية عليها.	الشركة المصرية لنقل الكهرباء	خطة الاستجابة للطوارئ	١٠,٠٠٠-٥,٠٠٠ سنويا	قبل بدء تشغيل المشروع
الصحة والسلامة والأمن المجتمعي	مخاطر حوادث المرور. أمن الموقع.	إعداد وتنفيذ خطة لإدارة الأمن والسلامة بالموقع. تطبيق آلية شكاوى تتيح لأفراد المجتمع تقديم الشكاوى والملاحظات ومعالجتها بصورة فعالة.	الشركة المصرية لنقل الكهرباء	خطة الأمان آلية وسجل SEP وشكاوى	٨,٠٠٠-٣,٠٠٠ سنويا	طوال فترة المشروع
التكلفة المقدرة الإجمالية				(دولار أمريكي)	٧٢,٠٠٠≈	
				(EGP)	٣,٦٠٠,٠٠٠≈	
مرحلة الإغلاق						
تخطيط إغلاق المشروع	عدم كفاية التخطيط والتنسيق	إعداد وتنفيذ خطة الإغلاق وفقًا للتشريعات المصرية، ومتطلبات جهات	شركة فالي للطاقة المستدامة / الشركة	اعتماد خطة إغلاق.	١٥,٠٠٠-١٠,٠٠٠ (مرة واحدة)	قبل بدء أعمال الإغلاق

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
		التمويل، وممارسات الصناعة الدولية الجيدة. (GIIP)	المصرية لنقل الكهرباء			
جودة الهواء	- انبعاثات الأتربة والهواء الناتجة عن أعمال التفكيك والهدم	- تطبيق تدابير الحد من الأتربة والالتزام بإجراءات التفكيك المعتمدة.	مقاول الإغلاق	- عدم وجود شكاوى جوهرية متعلقة بالأتربة، وسجلات الرصد البيئي.	٣,٠٠٠-٥,٠٠٠	طوال مرحلة الإغلاق
الضوضاء	- الضوضاء الناتجة عن أعمال الهدم وإزالة المعدات	- الحد من الأنشطة مرتفعة الضوضاء، والمحافظة على المعدات في حالة تشغيل جيدة، وتوفير معدات الوقاية الشخصية عند الحاجة.	مقاول الإغلاق	- الالتزام بالحدود المسموح بها للضوضاء.	٥,٠٠٠-٧,٠٠٠	طوال مرحلة الإغلاق
إدارة المخلفات	- تولد المخلفات الخطرة وغير الخطرة	- فرز المخلفات، وإعادة استخدامها أو تدويرها حيثما أمكن، والتخلص منها من خلال جهات معتمدة.	مقاول الإغلاق	- عقود إدارة المخلفات الصلبة والخطرة ومياه الصرف. - سجلات متابعة المقاول. - عقود مع جهات معتمدة لإدارة المخلفات.	٥,٠٠٠-١٠,٠٠٠	طوال مرحلة الإغلاق

الجانب	القضايا محل الاهتمام	الإجراءات	المسئول	مؤشر التنفيذ	التكلفة المقدرة (دولار)	التاريخ
السلامة والصحة المهنية	- إصابات العاملين أثناء أعمال التفكيك والهدم	- تطبيق إجراءات السلامة والصحة المهنية، وتوفير معدات الوقاية الشخصية، وتنفيذ برامج التدريب، وخطة الاستعداد والاستجابة لحالات الطوارئ.	مقاوم الإغلاق	- عدم وقوع حوادث جسيمة، وسجلات التفقيش الخاصة بالسلامة والصحة المهنية.	٧,٠٠٠-١٠,٠٠٠	طوال مرحلة الإغلاق
إعادة تأهيل الموقع	- التلوث المتبقي والأراضي المتأثرة	- إزالة المنشآت المتبقية، وتنظيف الموقع، وتنفيذ أعمال المعالجة عند الحاجة، وإعادة تأهيل الموقع قدر الإمكان.	مقاوم الإغلاق / شركة فالي للطاقة المستدامة	- استكمال أعمال إعادة تأهيل الموقع واعتمادها.	١٠,٠٠٠-٣٠,٠٠٠	قبل إغلاق المشروع
التكلفة المقدرة				(دولار أمريكي)	٧٧,٠٠٠ ≈	
الإجمالية				(EGP)	٣,٨٥٠,٠٠٠ ≈	

الترتيبات المؤسسية

تحدد خطة الإدارة البيئية والاجتماعية (ESMP) الأدوار والمسؤوليات الخاصة بكل من شركة إنرجي فالي، والمقاولين، والمقاولين من الباطن، والجهات الحكومية المعنية فيما يتعلق بتنفيذ تدابير الإدارة البيئية والاجتماعية ورصدها والإبلاغ عنها ومراجعتها طوال دورة حياة المشروع.

بناء القدرات

- توفير برامج تدريب وبناء قدرات لموظفي المشروع والمقاولين حول أفضل الممارسات في مجال الإدارة البيئية والاجتماعية، بما يعزز قدرتهم على تنفيذ خطة الإدارة البيئية والاجتماعية بكفاءة وفعالية.

٩. الخلاصة

يمثل مشروع خطوط النقل الهوائية ومحطة محولات نسيج سريرية التابعة لمشروع فالي للطاقة المستدامة أحد المكونات المهمة لاستراتيجية مصر للتحول في قطاع الطاقة والتنمية الصناعية، إذ يسهم في دمج الكهرباء المولدة من مصادر الطاقة المتجددة في الشبكة الكهربائية القومية، وتوفير مصدر موثوق للطاقة للمنطقة الصناعية بسيرية. وفي هذا السياق، لا يُعد بديل عدم تنفيذ المشروع خيارًا عمليًا، إذ سيحول دون ربط محطة فالي الشمسية بشبكة النقل الكهربائية القومية، وسيحد من الفوائد البيئية والاقتصادية والاجتماعية المتوقعة للمشروع.

حددت دراسة تقييم الأثر البيئي والاجتماعي (ESIA) الآثار البيئية والاجتماعية المحتملة المرتبطة بمراحل الإنشاء والتشغيل والإغلاق، وقامت بتقييمها. وقد خلصت الدراسة إلى أن معظم هذه الآثار ذات طبيعة مؤقتة ومحددة بالموقع، ويمكن إدارتها بفعالية من خلال تطبيق تدابير التخفيف المناسبة وأفضل الممارسات الدولية المتبعة في هذا المجال.

وقد تم إعداد تدابير التخفيف والإدارة المناسبة بما يتوافق مع المتطلبات التنظيمية المصرية المعمول بها، وكذلك المعايير ذات الصلة المعتمدة من جهات التمويل الدولية. وقد أُدرجت هذه التدابير ضمن خطة الإدارة البيئية والاجتماعية، التي تتضمن متطلبات الرصد، والمسؤوليات المؤسسية، والإجراءات اللازمة لإدارة المخاطر البيئية والاجتماعية طوال دورة حياة المشروع.

ولدعم التنفيذ الفعال لجميع تدابير التخفيف والرصد والإدارة والإبلاغ البيئية والاجتماعية المحددة في خطة الإدارة البيئية والاجتماعية (ESMP)، خصص المشروع الموارد المالية اللازمة لذلك. وتقدر الميزانية المخصصة لتنفيذ الخطة بنحو ١٨٠,٠٠٠ دولار أمريكي خلال مرحلة الإنشاء، ونحو ٧٢,٠٠٠ دولار أمريكي سنويًا خلال مرحلة التشغيل، وحوالي ٧٧,٠٠٠ دولار أمريكي سنويًا خلال مرحلة الإغلاق، وتشمل تكاليف الرصد البيئي، والصحة والسلامة المهنية، وإدارة النفايات، والحفاظ على التنوع البيولوجي، ومشاركة أصحاب المصلحة، والاستعداد للطوارئ، والتدريب، وغيرها من متطلبات الإدارة البيئية والاجتماعية.

ومع تنفيذ تدابير التخفيف المقترحة، وبرامج الرصد، وخطط الإدارة، فمن المتوقع أن تظل الآثار البيئية والاجتماعية المتبقية ضمن مستويات مقبولة. وعليه، يُعد المشروع قابلاً للتنفيذ من الناحيتين البيئية والاجتماعية، شريطة التنفيذ الفعال والالتزام الكامل

بجميع تعهدات دراسة تقييم الأثر البيئي والاجتماعي (ESIA) ومتطلبات خطة الإدارة البيئية والاجتماعية (ESMP)، مع متابعة ورصد تنفيذها خلال مراحل الإنشاء والتشغيل والإغلاق.

Executive Summary

1. Introduction

Energy Valley Company is planning to develop the Energy Valley OHTLs and Naseeg Sarirya Substation Project in Minya Governorate, Egypt. The project forms part of the broader Energy Valley development, which includes a photovoltaic (PV) solar power plant and Battery Energy Storage Systems (BESS) addressed under separate Environmental and Social Impact Assessment (ESIA) studies. The project is intended to support the reliable transmission and distribution of renewable electricity, contribute to Egypt's energy transition objectives, and facilitate the green industrialization of the Sarirya Industrial Zone.

The proposed development comprises the construction of a new Naseeg Sarirya Substation and associated overhead transmission lines (OHTL) infrastructure. The project includes:

- (i) the establishment of the Naseeg Sarirya Substation at a voltage level of 500/220/22 kV, with a capacity of 3×200 MVA and provision for future expansion through the addition of a fourth GIS-type transformer, together with a grid connection OHTL linking the substation to the existing 500 kV national transmission network through a loop-in/loop-out arrangement on the Beni Suef Generation–East Assiut double-circuit transmission line;
- (ii) and (ii) the Energy Valley Facility Grid Connecting OHTL, which will connect the Energy Valley Facility 500/33/33 kV substation to the existing 500 kV national grid through a loop-in/loop-out connection on the Naseeg Sarirya–East Assiut double-circuit transmission line.

The Naseeg Sarirya Substation is designed to supply electrical loads of up to 600 MVA to the Sarirya Industrial Zone, while the Energy Valley Facility Grid Connecting OHTL will facilitate the evacuation of renewable electricity generated by the Energy Valley Facility to the national transmission network. The project includes approximately 0.5 km of transmission line associated with the Naseeg Sarirya Substation connection and approximately 2.5 km of transmission line associated with the Energy Valley Facility grid connection.

The project components are located on publicly owned undeveloped desert land within the eastern desert hinterland of Minya Governorate. The Energy Valley Facility Grid Connecting OHTL is situated west of the Energy Valley Facility boundary, while the Naseeg Sarirya Substation and its associated grid connection OHTL are located approximately 26 km north of the Energy Valley Facility. The project area is characterized by remote desert conditions and the absence of significant residential settlements within the immediate project footprint.

The project is being developed in accordance with the requirements of the Egyptian Environmental Affairs Agency (EEAA), as well as the environmental and social requirements of international financial institutions, including the International Finance Corporation (IFC) Performance Standards, the European Bank for Reconstruction and Development (EBRD) Environmental and Social Requirements, and the African Development Bank (AfDB) Integrated Safeguards System.

According to the initial meeting conducted with the EEAA on 6 January 2026, the Naseeg Sarirya Substation and associated OHTLs were classified as Category Scoped-B projects. In accordance with the EBRD categorization framework, the project could initially be considered a Category A project due to its transmission infrastructure components. However, given the limited length of the proposed OHTLs, their location within state-owned desert land, the absence of significant biodiversity constraints and sensitive social receptors, and the site-specific and readily mitigable nature of the anticipated impacts, a Category B classification may be considered appropriate.

Environics has been commissioned by Energy Valley Company to prepare the ESIA for the Energy Valley OHTLs and Naseeg Sarirya Substation Project in accordance with applicable national regulatory requirements and international lender standards. This ESIA specifically addresses the Naseeg Sarirya Substation and associated OHTLs, while the Energy Valley photovoltaic facility and Battery Energy Storage Systems are being assessed under separate ESIA studies.

Goals and Specific Objectives

The project aims to support Egypt's renewable energy and sustainable industrial development objectives by facilitating the transmission of renewable electricity from the Energy Valley Facility to the national grid and providing a reliable power supply to the Sarirya Industrial Zone through the proposed transmission infrastructure and substation.

The broad goal of the Environmental and Social Impact Assessment is to provide decision-makers and project proponents with information on the potentially significant environmental and social impacts and risks associated with the proposed Energy Valley OHTLs and Naseeg Sarirya Substation Project in Minya Governorate. The ESIA aims to ensure that the project is environmentally and socially sound and sustainable by identifying potential risks and impacts at an early stage and defining the mitigation, monitoring, and management measures required throughout the project lifecycle.

The specific objectives are:

- To identify potential positive and negative impacts of the proposed project.
- To suggest mitigation and enhancement measures for the identified significant adverse and beneficial impacts.
- To provide management and monitoring plans.
- To ensure that the proposed project complies with the national environmental regulations and international funding institutions' requirements.

2. Institutional and Legal frameworks

This framework includes both national legislation and international standards and guidelines.

National Legislation

The project must comply with Egyptian environmental and social laws and regulations, including:

Environmental Impact Assessment (EIA): The national Environmental Law 4/1994 (as amended by Laws 9/2009 and 105/2015) and its Executive Regulations require an EIA study for new projects. The EIA is to be submitted to the environmental authority for review and

approval. According to the national regulations, this project is categorised as a Category Scoped-B projects.

Air Quality and Atmospheric Emissions: Law 4/1994 and its associated regulations set maximum limits for ambient air pollutants and exhaust gases. The project will need to comply with these limits during both construction and operation.

Noise and Vibration: Environmental Law No. 4/1994 specifies maximum permissible noise levels for occupational and ambient environments.

Waste Management: The Waste Management Law 202/2020 and its Executive Regulations set requirements for managing non-hazardous and hazardous waste generated from the different activities.

Biodiversity Protection and Nature Conservation: Article 28 of Environmental Law 4/1994 prohibits activities that harm specific wild animals and plants and their habitats. Annex 4 of this law lists protected species. The project site is located within a desert environment of relatively low ecological sensitivity; however, biodiversity protection measures will be implemented where required.

Cultural Heritage: Law No. 117 of 1983 for the Protection of Antiquities, as amended by Law No. 3 of 2010, protects archaeological and cultural heritage resources. Chance-find procedures will be implemented during construction, and coordination with the Ministry of Tourism and Antiquities will be maintained where necessary.

Occupational Health and Safety: Labour Law No. 14 of 2025 and its associated ministerial decrees establish requirements for worker welfare, occupational health and safety, working hours, emergency preparedness, and the prevention of occupational hazards. These requirements apply to all project contractors and subcontractors.

Land Allocation and Renewable Energy Development: The project is being developed on land allocated by the New and Renewable Energy Authority (NREA) in accordance with national regulations governing renewable energy projects and land use in desert areas.

Community Health and Safety: Relevant provisions of Environmental Law No. 4/1994, Labour Law No. 14/2025, and other applicable legislation establish requirements for protecting nearby communities and road users from construction-related risks, traffic impacts, dust, noise, and emergency situations.

Institutional Framework

Several governmental entities have regulatory and oversight responsibilities for the project, including:

- **Egyptian Environmental Affairs Agency (EEAA):** Responsible for reviewing and approving the ESIA and monitoring environmental compliance.
- **New and Renewable Energy Authority (NREA):** Responsible for land allocation and oversight of renewable energy developments.
- **Egyptian Electricity Transmission Company (EETC):** Responsible for grid connection arrangements and electricity transmission infrastructure.

- **Ministry of Electricity and Renewable Energy (MoERE):** Provides strategic oversight of the electricity sector and renewable energy development.
- **Ministry of Labour:** Responsible for enforcement of labour and occupational health and safety requirements.
- **Minya Governorate and Local Authorities:** Responsible for local administrative coordination and permitting requirements.
- **Ministry of Tourism and Antiquities (MOTA):** Responsible for the protection of archaeological and cultural heritage resources.

International Standards and Guidelines

In addition to national legislation, the project will align with international standards and guidelines, particularly those of international financing institutions:

IFC Performance Standards (PS): The project will align with the International Finance Corporation's Performance Standards on Environmental and Social Sustainability, covering environmental and social assessment and management, labour and working conditions, resource efficiency, community health and safety, land acquisition, biodiversity conservation, cultural heritage, and stakeholder engagement.

EBRD Performance Requirements: The project will adhere to the EBRD Environmental and Social Policy and associated Performance Requirements governing environmental and social management, labour, resource efficiency, biodiversity, cultural heritage, and stakeholder engagement.

African Development Bank Group's Operational Safeguards (AFDB OS): The project will comply with the African Development Bank's Operational Safeguards and Environmental and Social Assessment Procedures, including requirements relating to environmental and social risk management, labour conditions, biodiversity conservation, pollution prevention, community health and safety, and stakeholder engagement.

European Investment Bank (EIB) Environmental and Social Standards: The project will be designed and implemented in accordance with applicable EIB Environmental and Social Standards, including those relating to environmental assessment, biodiversity, climate action, labour standards, and community health and safety.

World Bank EHS Guidelines: The General EHS Guidelines and relevant sector-specific guidance will be applied as Good International Industry Practice (GIIP) throughout the project lifecycle.

International Labour Organization (ILO) Conventions: The project will respect applicable ILO conventions ratified by Egypt, including those relating to occupational health and safety, non-discrimination, forced labour, child labour, freedom of association, and collective bargaining.

3. Project Description

Project location

The proposed OHTLs and Naseeg Sarirya Substation project sites are located west of the East Minya NREA concession (hereinafter referred to as the "East Minya Region"). The Energy Valley facility Grid Connection OHTL site is situated in the eastern part of Minya Governorate, east of the Nile River, approximately 9.5 km east of New Minya city. The Naseeg Sarirya

substation and Naseeg Sarirya Substation-Grid Connecting OHTL are located about 26 km north of the Energy Valley facility Grid Connection OHTL. Both sites lie within a remote and uninhabited part of the governorate. The nearest residential settlements to the Naseeg Sarirya Substation are Sarirya, El-Sawaita Village and Ezbet El-Sheikh Hassan, located at distances of approximately 11 km, 12.5 km and 13 km west of the Project Site respectively. For spatial definition and accurate georeferencing of the Project boundary, the coordinate system used is Africa_Lambert_Conformal_Conic, as presented below.

Table 1: Coordinates of the Project Site

Naseeg Sarirya Substation		
Point	Northing (Latitude)	Easting (Longitude)
1	3061725.8658260703	618340.2785315335
2	3061540.548364818	618325.5546113853
3	3061549.32271564	618131.7728971753
4	3061743.376208633	618142.1105300947
Naseeg Sarirya Substation-Grid Connecting OHTL		
1	3061920.295958787	617589.4496781549
2	3061818.4201859534	617710.0628621846
3	3061697.50927794	618143.513233164
4	3061569.0928874016	617622.5827982549
5	3061664.9662871063	617721.0487036923
6	3061687.144808948	617933.8086622452
7	3061666.9716852605	618140.0780051227
Energy Valley Facility-Grid Connecting OHTL 1		
1	3035320.960262507	621520.9252603418
2	3035108.757002175	622071.3299425091
3	3034927.1956769526	622746.7383602612
4	3034695.8646153808	623700.2144795958
5	3034574.775887668	624522.2802308098
Energy Valley Facility-Grid Connecting OHTL 2		
1	3034169.873936981	622025.9815845663
2	3034456.9694947302	622180.3408620779
3	3034647.4036928415	622583.6358194913
4	3034476.7964983284	623695.3552673105
5	3034419.018103808	624494.5080969697

Figure 1 below illustrates the surrounding land uses and activities in the vicinity of the proposed Project Site.

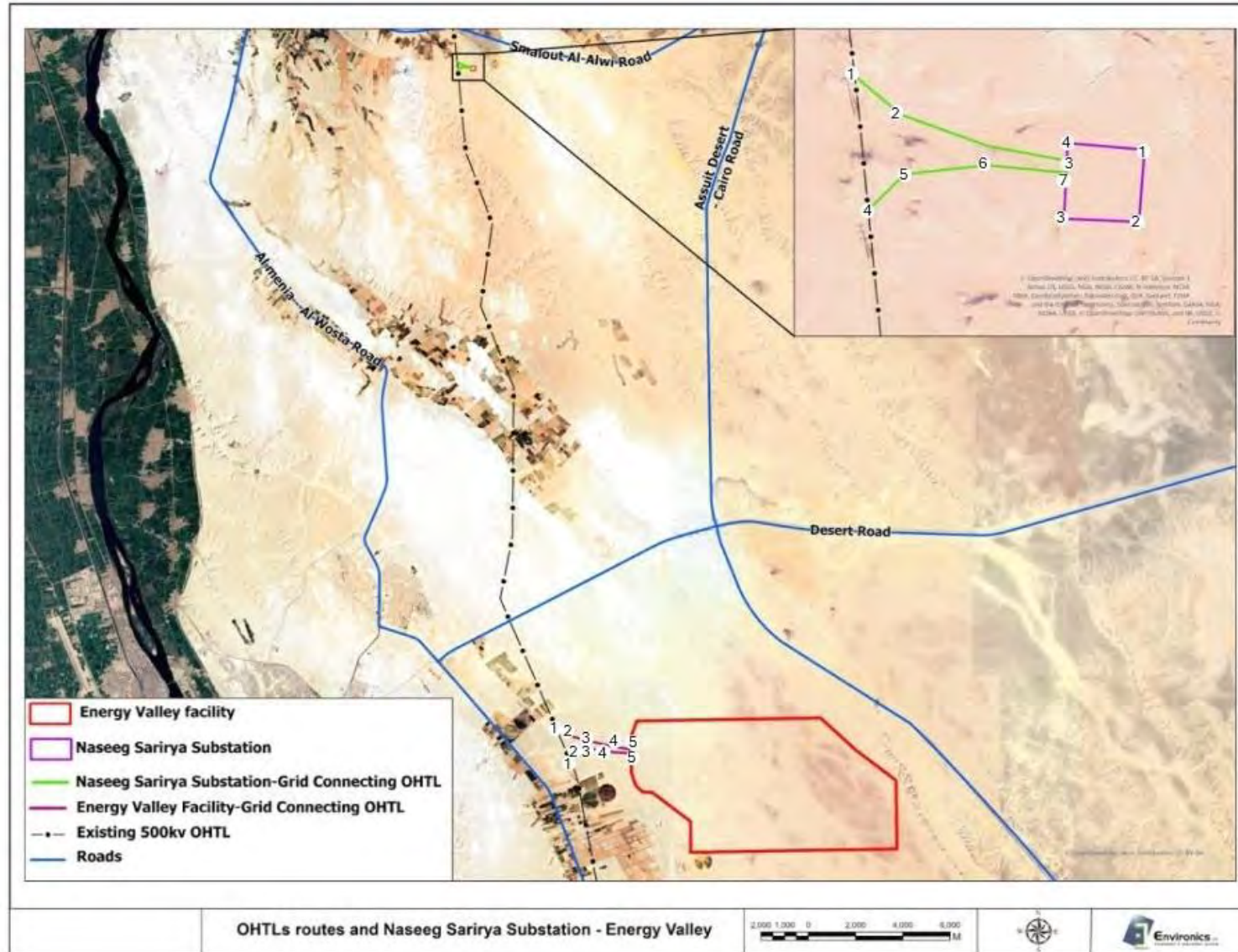


Figure 1: Activities/land uses surrounding the proposed site

Access to the project components is provided via the regional road network serving Minya Governorate, including the Ras Gharib–Minya Road, Minya–Assiut Road, Assiut–Cairo Desert Road, and the Desert Road. These transport corridors will facilitate the movement of construction materials, equipment, and workforce during project implementation, as well as provide access for operation and maintenance activities throughout the project lifecycle.

Project components and main activities

The proposed Energy Valley OHTLs and Naseeg Sarirya Substation Project comprises two main components, including the Naseeg Sarirya Substation and associated grid connection infrastructure, and the Energy Valley Facility Grid Connecting Overhead Transmission Line (OHTL). These facilities will enable the transmission of renewable electricity from the Energy Valley Facility to the national grid and provide power supply to the Sarirya Industrial Zone.

Naseeg Sarirya Substation and Grid Connecting OHTL: The Project includes the construction of the Naseeg Sarirya Substation at a voltage level of 500/220/22 kV with a capacity of 3 × 200 MVA and provision for future expansion through the addition of a fourth GIS-type transformer. The substation is designed to supply electrical loads of up to 600 MVA to the Sarirya Industrial Zone. The component also includes a grid connection OHTL established through a loop-in/loop-out arrangement on the existing 500 kV double-circuit Beni Suef Generation–East Assiut transmission line using 4×ACSR 490/65 conductors, with an extension of approximately 2 × 500 m using the same conductor type.

Energy Valley Facility Grid Connecting OHTL: The Project includes a 500 kV grid connection OHTL linking the Energy Valley Facility 500/33/33 kV substation to the existing national transmission network. The connection will be established through a loop-in/loop-out arrangement on the existing Naseeg Sarirya–East Assiut double-circuit transmission line using ACSR 4×490/65 mm² conductors, with an extension of approximately 2 × 2,500 m using the same conductor type. This infrastructure will facilitate the evacuation of renewable electricity generated by the Energy Valley Facility to the national grid.

Overhead Transmission Line Infrastructure: The OHTLs will comprise lattice steel self-supporting double-circuit transmission towers, reinforced concrete foundations, conductors, insulators, spacers, and dampers. The transmission corridors will be subject to a statutory Right-of-Way (RoW) extending 25 m on each side of the transmission line in accordance with the Electricity Law. The final number and locations of towers will be determined during the detailed design stage.

Construction and Operational Facilities

Construction activities will include geotechnical investigations, foundation excavation and construction, tower assembly and erection, conductor stringing, installation of electrical equipment, testing and commissioning, and site restoration. Temporary construction facilities will include laydown and storage areas, construction offices, sanitary facilities, water storage tanks, and diesel-powered generators required to support site activities.

During operation, the transmission lines will require periodic inspection and maintenance of towers, conductors, and associated equipment. The Naseeg Sarirya Substation will be operated through automated systems supported by routine inspections and maintenance of

transformers, switchgear, protection systems, and associated electrical equipment. Operation and maintenance activities will be undertaken by EETC personnel, with approximately five staff expected to be required for the substation.

Baseline conditions

Physical Environment:

Climate and Meteorology

The project area is located within the Eastern Desert of Minya Governorate and is characterized by an extremely arid climate, with high temperatures, low relative humidity, and negligible rainfall. Based on meteorological data from the nearest monitoring station in Minya, average monthly temperatures range from approximately 8°C in January to 37°C in July and August, while annual rainfall is limited to approximately 12.6 mm. The prevailing wind direction is predominantly from the north and north-northwest, with wind speeds generally ranging between 20 and 30 km/h. The area is also subject to occasional dust and sandstorm events, particularly during the spring season.

Air Quality

The project area is located within a remote desert environment with no significant industrial activities or stationary emission sources in the vicinity. Ambient air quality is generally expected to be very good with respect to anthropogenic pollutants. The primary air quality characteristic of the area is the presence of naturally occurring windblown dust, which may increase during periods of strong winds and sandstorm events.

Geology and Geomorphology

The project area is situated within the eastern desert hinterland of Minya Governorate and forms part of a dissected limestone plateau shaped by long-term water and wind erosion processes. Site soils are characterized by a highly fractured rocky nature with shallow soil cover and limited agricultural suitability. No sand dunes were identified within or in the immediate vicinity of the project area. Topographically, the area consists of gently sloping desert terrain with elevations generally ranging from approximately 127 m to 132 m above mean sea level.

Biological Environment:

The project area is located within a predominantly arid desert habitat characterized by sparse vegetation and limited ecological sensitivity. The wider area includes desert habitats, reclaimed agricultural lands, Nile Valley farmlands, and scattered urban and rural settlements. Biodiversity information was compiled through literature review, database screening, previous ecological studies, and field surveys conducted in February 2026.

The nearest agricultural lands are located approximately 800 m to 1 km from the project components and provide habitat for a range of common wildlife species associated with reclaimed agricultural areas and the Nile Valley. The project area itself is characterized by relatively uniform desert habitat with limited ecological value. Assessment of biodiversity receptors included flora, mammals, reptiles, avifauna, ecosystem services, and critical habitat screening. The area is located within a migratory bird flyway region; therefore, potential interactions with migratory soaring birds were considered during the biodiversity assessment.

Socio-Economic Environment:**Population Density and Distribution**

The project components are located within a remote desert area of Minya Governorate with no residential settlements within the project footprint. The nearest communities to the Naseeg Sarirya Substation include Sarirya Village, El-Sawaita Village, and Ezbet El-Sheikh Hassan, located approximately 11 km, 12.5 km, and 13 km west of the project site, respectively. New Minya City is located approximately 12 km from the Energy Valley Facility Grid Connection OHTL.

Labour Force and Economic Activities

Economic activities within the wider area are primarily concentrated within the Nile Valley and reclaimed agricultural lands. Agriculture remains one of the principal economic activities in Minya Governorate, while industrial and commercial activities are concentrated in urban centres and designated industrial zones. The project is expected to benefit from the availability of skilled and unskilled labour within Minya Governorate and nearby communities.

Land Use

The project components are located on publicly owned undeveloped desert land. Land uses within the wider area include desert landscapes, reclaimed agricultural lands, Nile Valley agricultural areas, transportation corridors, and scattered urban and rural settlements. No physical displacement, land acquisition requirements, or existing residential land uses were identified within the project footprint.

Infrastructure and Services

The project area is accessible through the regional road network, including the Ras Gharib–Minya Road, Minya–Assiut Road, Assiut–Cairo Desert Road, and the Desert Road. The wider area benefits from existing transportation infrastructure, utilities, educational facilities, healthcare services, and other public services concentrated within nearby urban centres and communities.

Based on the review of the socio-economic baseline, the project area presents adequate infrastructure and services to support the project during construction and operation. The availability of local labour resources is expected to facilitate local employment opportunities during project implementation. The project components are located on publicly owned desert land and no land acquisition or physical displacement requirements have been identified.

Tangible Cultural Heritage

No registered archaeological sites, cultural heritage resources, or protected monuments were identified within the project footprint. The nearest known heritage sites are located more than 16 km from the project components. Potential impacts are limited to the possibility of chance finds during excavation activities, for which a Chance Find Procedure will be implemented.

4. Analyses of Project Alternatives

The analysis of alternatives considered feasible project options during the conceptual and pre-feasibility design stages, taking into account technical, economic, environmental, and social considerations.

A. No Development Alternative

Under the No Development Alternative, the proposed OHTLs and Naseeg Sarirya Substation would not be constructed. Consequently, the electricity generated by the Energy Valley PV Facility would not be connected to the Sarirya Industrial Zone. In addition, the anticipated benefits of providing a reliable renewable electricity supply to support industrial development and reducing reliance on fossil-fuel-based electricity generation would not be realized. Therefore, the No Development Alternative was not considered suitable.

B. Alternative OHTL Alignments

The selected alignment for the Energy Valley Facility Grid Connecting OHTL extends approximately 2.5 km west of the Energy Valley Facility to connect with the existing national grid. The alignment is located approximately 1 km north of the nearest agricultural lands. Given the short length of the proposed transmission line and the fixed locations of the Energy Valley Facility and the existing grid connection point, no alternative route options were considered. Any deviation from the selected route would increase the transmission line length, require additional towers, increase land disturbance and costs, and potentially result in greater environmental and social impacts without providing clear advantages.

The selected alignment for the Naseeg Sarirya Substation Grid Connecting OHTL extends approximately 0.5 km westward from the proposed substation to the existing national grid connection point. As both endpoints are predetermined by infrastructure requirements, there is limited flexibility in route selection. The selected alignment follows the most direct and technically feasible route, minimizes land disturbance, reduces construction costs, and avoids environmentally and socially sensitive areas.

C. Alternative Naseeg Sarirya Substation

The proposed Naseeg Sarirya Substation is located within the Sarirya Industrial Zone, which is designated to accommodate industrial facilities and associated utilities. The selected location minimizes transmission losses due to its proximity to the planned industrial facilities, reduces the need for additional distribution infrastructure, avoids land acquisition and physical or economic displacement, and minimizes potential impacts on environmental and social receptors.

D. Technological Alternatives

Two substation technologies were considered during the project planning stage: Gas-Insulated Substation (GIS) and Air-Insulated Substation (AIS). GIS technology offers a compact footprint, high reliability, and reduced maintenance requirements due to its enclosed design, although it involves higher capital costs and requires management of SF₆ gas. AIS technology is less costly and easier to maintain but requires a larger land area and is more susceptible to weather conditions, dust, pollution, and wildlife interference. Both technologies remain

under consideration, and the preferred option will be confirmed during the detailed design stage.

5. Assessment of Environmental and Social Risks and Impacts

This chapter evaluates the potential environmental and social risks and impacts of the project. It includes a detailed analysis of the project's risks and impacts and emphasizing the mitigation hierarchy: avoiding, minimizing, mitigating for impacts.

Positive impacts include the production of a clean, renewable solar energy from a 1,950 MWp (DC) plant, reducing GHG emissions by approximately 1.22 million tCO₂e per year compared to fossil fuel-based grid generation, and avoiding air pollutants. Additionally, the project conserves water resources in this desert area, integrates renewable energy into the national grid via a BESS, and provides approximately 5,000 direct construction jobs at peak, with more than 50% targeted from local Minya communities, approximately 30 permanent operational positions, and more than 500 indirect jobs in the supply chain.

The key mitigation measures proposed to address the negative impacts are:

- Restrict construction activities to approved work areas, clearly demarcate site boundaries, utilize existing access roads where feasible, and prohibit unnecessary off-road driving.
- Implement integrated water, solid waste, hazardous waste, and wastewater management measures, including waste segregation, storage, recycling (where feasible), and disposal through licensed facilities.
- Minimize environmental disturbance by conserving water, limiting night-time work, using downward-directed lighting where required, and implementing traffic management measures, including speed limits and scheduling deliveries outside peak hours.
- Prioritize local employment, accommodate non-local workers in suitable locations, implement a Workers' Code of Conduct, and maintain an effective stakeholder/community grievance mechanism.
- Ensure security personnel are appropriately trained, comply with applicable laws and codes of conduct, and are subject to the project's grievance mechanism.
- Implement an Occupational Health and Safety (OHS) Management Plan, provide appropriate PPE and regular training, establish exclusion zones, apply fall protection and lock-out/tag-out procedures, restrict hazardous work to qualified personnel, and maintain fire prevention, emergency preparedness, and heat stress management measures.
- Develop and implement a Chance Find Procedure and immediately notify the competent authority if archaeological remains are discovered.
- Conduct regular inspection and preventive maintenance of project equipment, including transformers, cooling systems, and SF₆-insulated equipment (where applicable), and promptly repair defects or leaks.
- Implement bird protection measures on transmission infrastructure, including bird-safe insulation and insulated crossarms, where required to reduce electrocution risk.

- Establish EMF safety zones and restrict access to energized equipment to authorized and trained personnel only.
- Prepare and implement a detailed Decommissioning Plan, ensure environmentally sound dismantling and waste management, and restore the site, where feasible, following completion of decommissioning activities.

Summary of the potential negative impacts on the environment and society during the construction, operation and decommissioning phases of the project illustrated in table below.

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Construction phase			
Air quality			
Exhaust emissions from construction vehicles and mobile equipment operating on-site	Minor	- Minimize idling times of construction vehicles and machinery. - Maintain vehicles and construction equipment in good working condition. - Ensuring workers' awareness of safe driving and maintaining good practices in machinery usage. - Implement dust control measures. - Ensuring compliance with law 4/1994 and its relevant ERs regarding emissions from power generator stacks.	Insignificant
Ambient noise			
- Equipment and machinery - Vehicle Movement - Power Generators	Minor	- Machines and construction equipment must comply with the best practice technical developments - Periodical maintenance of machines and equipment with an internal combustion engine according to the manufacturer's instructions. - Schedule high-noise activities to avoid simultaneous operations that could amplify noise levels. - Provide hearing protection equipment to workers exposed to high noise levels	Insignificant
Soil			
- Earthworks - Excavation activities - Construction waste handling - Accidental spills and leakages	Minor	- Off-site maintenance to minimize spills and effluents. - Using impervious surfaces for refueling areas and other fluid transfer areas - Implement Spill Management Plan (within ESMP), including the availability of on-site spill kits - Provide a secondary containment for fuel storage tanks and other hazardous material containers. - Proper collection/disposal of spillages or contaminated materials via licensed contractors. - Good housekeeping practices on-site. - Solid waste collected at designated points. - Licensed contractors for non-hazardous and hazardous waste disposal.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Biological Environment			
Habitat loss	Minor	- Restrict construction activities strictly to the defined tower footprints and approved working areas. - Utilize existing tracks and previously disturbed corridors wherever possible. - Prohibit uncontrolled off-road driving and restrict vehicle movement to designated access routes, avoiding any vegetation patches identified during pre-construction inspections. - Clearly demarcate construction boundaries prior to work to prevent unnecessary ground disturbance.	Insignificant
Disturbance to wildlife	Minor	- Prepare and enforce a solid and hazardous waste management plan to prevent attraction of wildlife to food waste or contaminants. - Implement a liquid waste management plan to avoid the formation of artificial water sources that could attract birds or terrestrial fauna. - Conduct environmental awareness training for all construction personnel, with specific emphasis on wildlife protection and avoidance of harassment. - Avoid unnecessary night-time work, where lighting is required, use low-intensity, downward-directed lighting to minimize light spill. - Enforce strict speed limits for all project vehicles to reduce collision risk and disturbance to fauna.	Insignificant
Socio Economic Environment			
Water Demand for the workforce	Insignificant	Adopt water management practices to ensure efficient use and avoid water wastage.	Insignificant
Accommodation Demand for the workforce	Minor	- Prioritize hiring local workers where possible. - Accommodate the non-local workers in residential areas with higher housing capacity and food supplies.	Insignificant
Social Conflict between the workforce and the hosting community	Minor	- Develop and implement a code of conduct for workers that outlines appropriate behaviour, including respect for religious customs and practices, traditional cultures and social norms of the region. - Establish a community grievance mechanism to address any issues promptly.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Interaction of security personnel with workers and the surrounding community	Minor	- Ensure security personnel are adequately trained in professional conduct and community relations. - Require compliance with applicable national laws and human rights principles. - Implement a grievance mechanism accessible to community members.	Insignificant
Change in land use	Insignificant	The routes of the two OHTL, as well as the Naseeg Sarirya substation site, are in desert and unoccupied land with no existing agriculture, residential purposes, commercial activities, or other productive land uses. No risk is anticipated in this regard	No residual Impact
Traffic	Minor	- Coordinate material deliveries to avoid peak traffic hours where feasible. - Ensure safe vehicle operation and speed limits within and near the site.	Insignificant
Occupational health and safety			
OHS risks	Moderate	- Implement OHS Management Plan. - Provide appropriate PPE. - Conduct safety training and toolbox talks. - Enforce speed limits and equipment inspections. - Ensure proper training for operators, regular maintenance of equipment, and implementation of safety protocols. - Establish crane/lifting exclusion zones. - Restrict access to work zones and mark excavations. - Use fall protection measures (full body harnesses and energy-absorbing lanyards) - Maintain safe access and control slip/trip risks. - Provide shaded rest areas and heat stress measures. - Implement fire prevention measures, maintain fire extinguishers on-site, and conduct fire safety training. - Apply lock-out/tag-out procedures and restrict electrical works to qualified electricians	Minor
Cultural Heritage	Minor	- Develop and implement Chance Find Procedures, indicating the actions to be taken in case of any significant findings during site leveling and construction activities. - Notify the Ministry of Tourism and Antiquities (MOTA) if an archaeological artifact is discovered during excavation.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Operation phase			
Ambient Air			
- Transport of people and supplies for maintenance - Potential emission of SF6, if utilized for insulation of the switchgear.	Minor	If SF6 is used as an insulator instead of air insulation, the mitigation measures will include leak detection and repair, use proper chamber vacuums during filling the SF6 into the GIS, and employee education/training.	Insignificant
Ambient noise			
- Noise (buzzing or humming) from high-voltage power lines producing corona - Operation of the transformer and other components of the substation	Insignificant	No mitigation measures are required; however, the following management measures are proposed - Regular maintenance of transformers and cooling fans to prevent abnormal noise levels. - Prompt repair or replacement of faulty components causing excessive hum or vibration.	Insignificant
Soil			
- Potential spills - Solid waste	Insignificant	- Implement proper storage and handling procedures for oils, and lubricants. - Conduct maintenance activities in designated areas. - Provide spill response materials and train staff in spill management.	Insignificant
Biological environment			
Birds Electrocutation Risks	Minor	- Increase the number of insulators where conductors connect to each tower (to increase the gap between the conductor and the tower), using insulators that prevent birds from landing on them. - Cover the crossarms with insulating materials such as PVC strips to ensure that birds are not earthed when perched.	Insignificant
Birds Collision Risk	Minor	For bird collision risk, no mitigation measures are recommended.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Social environment			
Presence and interaction of security personnel with workers and the surrounding community	Insignificant	- Trained security personnel with proper conduct toward workers and the community, operating within the law. - Grievance mechanism for the community to report concerns about security arrangements and personnel actions.	No residual impacts
Occupational Health and Safety			
- Electrical hazards - Maintenance activities	Moderate	- Abide by all national occupational health and safety regulations; Labour Law 14/2025. - Ensure that the maintenance workers are properly trained, especially for working at height training - Provision of suitable PPE as well as training suitable for different activities. - Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers.	Minor
Decommissioning Phase			
Soil, Water, Air, Noise, OHS	MINOR	- Ensure that the removal of all above-ground structures, equipment is performed is carried out in accordance with approved procedures that minimize impacts on air quality, soil, and water resources, - Focus on proper handling, management, and disposal of hazardous and non-hazardous waste streams to reduce impacts on the soil - Ensure all workers comply with occupational health and safety (OHS) requirements and are provided with and use appropriate personal protective equipment (PPE). - Restore the site to its original condition where feasible	Insignificant
Waste Management End-of-Life and Hazardous Waste	MINOR	- Temporary storage in dedicated hazardous waste areas. - Reuse and recycled (where possible), or disposed of in accordance with regulatory - Use of licensed hazardous waste transporters and recyclers.	Insignificant

6. Stakeholders Engagement

Stakeholder consultation formed an integral part of the ESIA process and was undertaken in accordance with the EEAA ESIA Procedures Guidelines and international good practice, including the EBRD Performance Requirement 10 on Information Disclosure and Stakeholder Engagement. The consultation process included early stakeholder identification, continuous engagement during ESIA preparation, and transparent information disclosure to ensure meaningful stakeholder participation.

E&S Scoping Activities

Stakeholder scoping meetings were conducted between January and March 2026 with representatives of government authorities, local councils, environmental authorities, utility providers, agricultural land users, non-governmental organizations (NGOs), and other relevant stakeholders.

The consultation process supported the identification of environmental and social issues relevant to the Project and contributed to defining the scope of the ESIA. Overall, stakeholders expressed strong support for the Project due to its expected contribution to renewable energy integration, improved electricity supply reliability, support to the Sarirya Industrial Zone, and creation of employment opportunities within Minya Governorate.

Key issues raised during the consultation process included:

- Employment opportunities and prioritization of local labour recruitment;
- Labour accommodation arrangements and associated social considerations;
- Provision of renewable electricity to the Sarirya Industrial Zone;
- Capacity building and training opportunities for local communities;
- Support to vulnerable groups and cooperation with local NGOs;
- Community grievance management and complaint resolution procedures;
- Availability of water supply, wastewater treatment, and waste management infrastructure to support project activities;
- Availability of medical and emergency services within Minya Governorate;
- Potential implications for informally used agricultural lands within the wider project area; and
- Project requirements for utilities, services, fuel, and other resources during construction and operation.

ESIA Disclosure

According to EEAA requirements, public disclosure meetings are not mandatory for Scoped-B projects. However, in line with lender requirements, a disclosure process will be undertaken to ensure continued stakeholder engagement and information sharing.

The disclosure process will include:

- Invitations to local, municipal, and governorate-level stakeholders, including representatives of vulnerable groups;
- Public announcement of the disclosure meeting approximately 10–15 days prior to the event;

- Distribution and disclosure of an Arabic Non-Technical Summary (NTS), including online access through the Project website;
- Provision of comment forms allowing stakeholders to submit feedback during the consultation process and for a period of two weeks following the disclosure meeting;
- Organization of the disclosure meeting within Minya Governorate; and
- Documentation of stakeholder comments, attendance records, and consultation outcomes for inclusion in the ESIA documentation.

Stakeholder feedback received during the consultation and disclosure processes will be considered in the finalization and implementation of the Project's environmental and social management measures.

7. Environmental and Social Management Plan

The project will develop and implement an Environmental and Social Management Plan (ESMP) outlining specific mitigation and monitoring measures to ensure compliance with all applicable legal and institutional requirements.

It includes mitigation and monitoring measures to ensure environmental and social performance.

The ESMP encompasses the following key components:

- Summary of Environmental and Social Impacts, Mitigation Measures, Monitoring Requirements, and Responsibilities;
- Health, Safety and Environment (HSE) Plan;
- Occupational Health and Safety Management Plan;
- Transportation and Traffic Management Plan;
- Noise Management Plan;
- Hazardous Materials and Waste Management Plan;
- Water and Wastewater Management Plan;
- Biodiversity Management and Avifauna Protection Measures;
- Social Management Plan, including labour management, stakeholder engagement, grievance management, community health and safety, and SEAH/GBV prevention measures;
- Emergency Preparedness and Response Plan;
- Chance Find Procedure for cultural heritage;
- Preventive and Corrective Maintenance Procedures; and
- Housekeeping and Site Cleanliness Procedures.

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
Air Quality	Dust emissions	- Reduce idling times for vehicles and machinery; - Maintaining machinery and vehicles in good working order - Speed restriction on sites; - Ensuring workers are aware of safe driving and maintaining good practices in machinery usage; and - Periodic measurements for stacks of generators	Construction contractor	- Monitoring plan - Air quality measurements	5,000 – 10,000 / year	Throughout the construction phase period
	working conditions of machinery	- Ensure good working conditions through frequent inspection of all construction equipment - Implementation of OHS plans	Construction contractor	Maintenance logs OHS plan	15,000 – 30,000 (included in EPC O&M allowance)	
Noise Level	working conditions of machinery	- Regular maintenance of construction equipment - Use low-noise equipment, where possible; - Schedule high-noise activities to avoid simultaneous operations that could amplify noise levels; - Schedule high-noise activities to take place in morning hours - Implementation of OHS plans	Construction contractor	OHS plan Noise measurements and Maintenance logs	10,000 – 15,000 / year	Throughout the construction phase period
	Provision of PPEs	- Providing necessary PPE for workers	Construction contractor		5,000 – 10,000 (PPE supply - total project period)	
Soil	housekeeping practices	- Develop and implement site management plan, solid waste management and wastewater	Construction contractor-Energy Valley	-Waste and wastewater management plans	2,000 – 8,000 (depends on waste volume)	Throughout the construction phase period

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
	Waste/wastewater management	management plans and spill prevention plans - Proper collection, containment, and disposal of sanitary wastewater - Proper collection, containment, and disposal of sanitary wastewater - hazardous materials storage and handling according to the WBG General EHS Guidelines, - Transportation and disposal to be carried out through authorized waste contractors	Energy Valley company (include provisions in the construction contracts. Developers to ensure contractors' compliance)	- Solid/hazardous waste and wastewater management contract - Contractor follow-up documents - Contracts with authorized waste contractors		
Occupational Health and Safety	Site Staff and Workplace Safety	- Developing OHS plan and HSE procedures according to national requirements and international standards	Contractor	OHS plan and procedures HSE provisions in the construction contracts	15,000 – 20,000	Before construction activities
Emergency Response plans	Site Staff and Workplace Safety	- Develop procedures for emergency control	Contractor	Emergency response plan	7,000 – 20,000	Before project commissioning
Waste management	Worker's health	- Developing a solid and hazardous waste management plans in line with the WBG General EHS Guidelines." - Developing OHS plans - Different types of waste to be stored in designated waste areas, and transported by licensed contractors	Construction contractor	Solid waste management contract with authorized contractors Waste manifest OHS plan	200 – 600 EUR/ton (hazardous waste) 80 – 150 EUR/ton (non-hazardous)	Throughout the construction phase period

Aspect		Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase							
Biological Environment		Disturbance to wildlife	- Awareness (toolbox talks and awareness signs) - Implementation of mitigation measures - Supervision and implementation of deterring measures	Construction contractor	Requirements specified in contracts	10,000 – 25,000 (one-time)	Throughout the construction phase
							Throughout the construction phase
Social Environment		Community health, safety and security- risks from road traffic accidents	- Develop Traffic Management Plan (TMP) and associated procedures	Construction contractors	TMP and procedures	10,000 – 25,000	Throughout the construction phase period
		Cultural heritage	- develop chance find procedure	Energy Valley company/Construction contractors	Developed procedures	2,000 – 5,000	Before construction activities
Total Estimated Cost	(USD)					≈ 180,000 USD	
	(EGP)					≈ 8,820,000 EGP	

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
Operation Phase						
Air quality	Release of SF ₆ gas during GIS maintenance and repair activities	- Optimize the operation of backup generators to reduce usage and emissions. - Conducting regular maintenance and periodic emissions monitoring of generators to ensure efficient operation and minimize air emissions	EETC/Energy Valley	Emission measurements Maintenance records	3,000-6,000/year	Periodically throughout the operation stage
SF ₆ emissions/Leak detection	- Accidental release of SF₆ during opening of GIS compartments and gas handling operations - Undetected gas leaks from flanges, valves, hoses, and GIS components during repair activities	- Isolate and depressurize GIS compartments prior to maintenance. Use approved SF₆ recovery units during gas evacuation and refilling. - Conduct leak inspections using calibrated portable SF₆ leak detectors before, during, and after maintenance activities.	EETC (O&M Team/HSE officer)//Energy Valley	- Maintenance records available. - Leak inspection records completed, and no unaddressed leaks identified.	5,000-10,000	Before and throughout repair activities
Noise	Transformers	- Worker work with noise generating machinery and equipment will be provided with suitable (PPEs). - A grievance mechanism will be adopted for assessing complaints,	EETC//Energy Valley	Noise measurements	3,000–5,000/year	Periodically throughout the operation stage
Biological Environment	Same as for the construction phase	- Same as for the construction phase	EETC//Energy Valley	Reports	1,000–3,000/year	Throughout the project lifetime

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
Impact on the social environment	Water consumption	- Water demand during the operation phase is minimal and will be supplied in coordination between the project and the water company to plan the sources of water by an approved contractor and discharged to designated treatment plants	EETC//Energy Valley	Water management plan	1,000–3,000/year	Throughout the project lifetime
	Wastewater management	- Wastewater generated during the operation phase is minimal and will be collected by an approved contractor and discharged to designated treatment plants	EETC//Energy Valley	Wastewater management plan		Throughout the project lifetime
Labour rights and welfare	working conditions	Develop Human Resources policy	EETC//Energy Valley	Contracts (with workers)	2,000–5,000 (one-time)	Throughout the project lifetime
Training and Awareness	competence of the project personnel	Training for the personnel according to their responsibilities	EETC//Energy Valley	Training plans	3,000–8,000/year	Throughout the project lifetime
Occupational Health and Safety	Site Staff and Workplace Safety	- Developing HSE procedures	EETC//Energy Valley	Development of HSE policies	10,000–20,000/year	Before project commissioning
Emergency Preparedness and Response	Operational risk management	- Adopt a probabilistic risk assessment framework	EETC//Energy Valley	Emergency response plan	5,000–10,000/year	Before project commissioning
Community health, safety, and site security	- risk of road traffic accidents - Site security	- Develop site security and safety plan - Develop a grievance mechanism	EETC//Energy Valley	- security plan - SEP and grievance mechanism and register	3,000-8,000/year	Throughout the project lifetime
Total Estimated Cost				(USD)	≈72,000	
				(EGP)	≈3,600,000	
Decommissioning Phase						

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
Decommissioning Planning	- Inadequate planning and coordination	- Prepare and implement a Decommissioning Plan in accordance with Egyptian regulations, lender requirements, and GIIP.	(EETC/Energy Valley)	- Approved Decommissioning Plan	10000–15,000 (one-time)	Prior to decommissioning
Air Quality	- Dust and air emissions from dismantling and demolition	- Apply dust suppression measures and follow approved dismantling procedures.	Decommissioning Contractor	- No significant dust complaints; monitoring records	3,000-5,000	Throughout decommissioning
Noise	- Noise from demolition and equipment removal	- Limit noisy activities, maintain equipment in a good working conditions , and provide PPE where required.	Decommissioning Contractor	- Compliance with applicable noise requirements	5,000-7,000	Throughout decommissioning
Waste Management	- Generation of hazardous and non-hazardous waste	- Segregate, reuse/recycle where feasible, and dispose of wastes through licensed facilities.	Decommissioning Contractor	-Solid/hazardous waste and wastewater management contract -Contractor follow-up documents -Contracts with authorized waste contractors	5,000-10,000	Throughout decommissioning
Occupational Health and Safety	- Worker injuries during dismantling and demolition	- Implement OHS procedures, provide PPE, training, and emergency preparedness.	Decommissioning Contractor	- No major incidents; OHS inspection records	7,000-10,000	Throughout decommissioning
Site Restoration	- Residual contamination and disturbed land	- Remove remaining structures, clean up the site, remediate if required, and restore the site where feasible.	Decommissioning Contractor / Project Proponent	- Site restoration completed and approved	10,000-30,000	Before project closure
Total Estimated Cost				(USD)	≈77,000	
				(EGP)	≈3,850,000	

Institutional Arrangements:

The ESMP defines the roles and responsibilities of Energy Valley, contractors, subcontractors, and relevant governmental authorities for implementation, monitoring, reporting, and auditing of environmental and social management measures throughout the project lifecycle.

Capacity Building:

- Provisions for training and capacity building for project staff and contractors on best practices in environmental and social management, enhancing their ability to effectively implement the ESMP.

8. Conclusion

The Energy Valley OHTLs and Naseeg Sarirya Substation Project represents an important component of Egypt's energy transition and industrial development strategy by facilitating the integration of renewable electricity into the national grid and providing a reliable power supply to the Sarirya Industrial Zone. In this context, the No-Development Alternative is not considered a viable option, as it would prevent the connection of the Energy Valley Facility to the national transmission network and limit the anticipated environmental, economic, and social benefits associated with the project.

The ESIA has identified and evaluated the potential environmental and social impacts associated with the construction, operation, and decommissioning phases of the project. The assessment concluded that most potential impacts are temporary, site-specific, and can be effectively managed through the implementation of appropriate mitigation measures and good international industry practices.

Appropriate mitigation and management measures have been developed in accordance with applicable Egyptian regulatory requirements and relevant international lender standards. These measures are incorporated within ESMP, which includes monitoring requirements, institutional responsibilities, and procedures for managing environmental and social risks throughout the project lifecycle.

To support the effective implementation of all Environmental and Social (E&S) mitigation, monitoring, management, and reporting measures identified in the Environmental and Social Management Plan (ESMP), the Project has allocated adequate financial resources. The estimated ESMP implementation budget is approximately USD 180,000 during the construction phase and approximately USD 72,000 per year during the operation phase, and about 77,000 per year during decommissioning phase covering environmental monitoring, occupational health and safety, waste management, biodiversity conservation, stakeholder engagement, emergency preparedness, training, and other environmental and social management requirements.

With the implementation of the proposed mitigation measures, monitoring programmes, and management plans, the residual environmental and social impacts are expected to remain at acceptable levels. Accordingly, the project is considered environmentally and socially feasible, provided that all ESIA commitments and ESMP requirements are effectively implemented and monitored throughout the construction, operation, and decommissioning phases.

1. Introduction

1.1 Background

Energy Valley Company intends to establish an integrated solar energy project “Energy Valley”. The Energy Valley project involves the development of Energy Valley facility (photovoltaic solar plant and BESS) (1.7 GWac + 100 MW base load) located in Minya Governorate. It will be complemented by two Battery Energy Storage Systems (BESS), located in Qena, and Alexandria. These projects are addressed in separate ESIA, to be submitted to EEAA. Moreover, the project will include the establishment of Consumer substation (i.e. Naseeg Sarirya substation) in Minya at a voltage level of 500/220/22 kV, with a capacity of 3×200 MVA, and provision for future expansion by adding a fourth GIS-type transformer. The substation is intended to provide electrical supply for loads of up to 600 MVA and to connect to the national power grid by looping in/out the 500 kV double-circuit overhead transmission line (Beni Suef Generation / East Assiut) using (4×ACSR 490/65) conductors, with an extension of approximately 2×500 meters using the same type of conductor. In addition, the 500 kV double-circuit overhead transmission line (Naseeg El-Seririya / East Assiut) using ACSR $4 \times 490/65$ mm² conductors will also be looped and extended for approximately 2×2,500 meters using the same conductor type, in order to evacuate 1,700 MW from the 500/33/33 kV Energy Valley facility to the existing national grid. The purpose of constructing the electrical transmission lines and the substation is to supply power to the industrial zone in Wadi El-Sarirya.

The Energy Valley project will provide a constant output of 100 MWac over 24 hours every day of the week to EETC, where EETC can utilize the renewable energy to support the green industrialization of the Sarirya Industrial Zone, reducing reliance on fossil fuels, and enhancing grid reliability. The overall project also includes the establishment of Naseeg Sarirya substation for, which will enable the supply of electricity to the Industrial Zone in Wadi El-Sarirya. and facilitate reliable access to electricity, supporting further economic development and delivering broader benefits to the local and Egyptian economy.

This study will cover the Overhead Transmission Lines (OHTLs) and the Naseeg Sarirya Substation project located in Minya Governorate, while the PV plant and BESS are covered in separate ESIA. The components of the project are:

- i. **Consumer (Naseeg Sarirya) Substation (500/22/22kV), and Naseeg Sarirya Substation-Grid Connecting OHTL**, this component includes the establishment of Naseeg Sarirya substation in Minya at a voltage level of 500/220/22 kV, with a capacity of 3×200 MVA and provision for future expansion by adding a fourth GIS-type transformer. The substation is intended to provide electrical supply for loads of up to 600 MVA and to connect to the national power grid by looping in/out the 500 kV double-circuit overhead transmission line (Beni Suef Generation / East Assiut) using 4×ACSR 490/65 conductors, with an extension of approximately 2×500 meters using the same type of conductor.
- ii. **Energy Valley Facility -Grid Connecting OHTL**, this includes looping in/out the 500 kV double-circuit overhead transmission line (Nasij El-Sarirya / East Assiut) using ACSR $4 \times 490/65$ mm² conductors, and extending it for approximately $2 \times 2,500$ meters using

the same type of conductor. Serving as the grid connection line linking Energy Valley Facility 500/33/33 kV to the existing 500 kV national grid.

The project is implemented according to the national requirements, as well as the international financing institutions, including the European Bank for Reconstruction and Development (EBRD), International Finance Corporation (IFC) and the African Development Bank (AfDB).

According to the initial meeting conducted with the Egyptian Environmental Affairs Agency (EEAA) on 6 January 2026, the Naseeg Sarirya substation and the OHTLs for Energy Valley Project have been classified as Category Scoped-B projects.

According to EBRD categorization list, the project seemingly is a Category A project (High E&S risk), such projects are associated with many potential adverse impacts.. However, the OHTLs under study extended over relatively short distances (2.5 and 0.5 km) and located in state-owned desert areas with sensitivity, lacking significant biodiversity features or important social receptors. . The associated substation also has a limited footprint and site-specific impacts. Accordingly, the potential impacts are expected to be localized and readily mitigable, therefore, category B classification may be appropriate.

The location of the Naseeg Sarirya Substation and the two OHTL routes are presented in the Figure 1-1 below

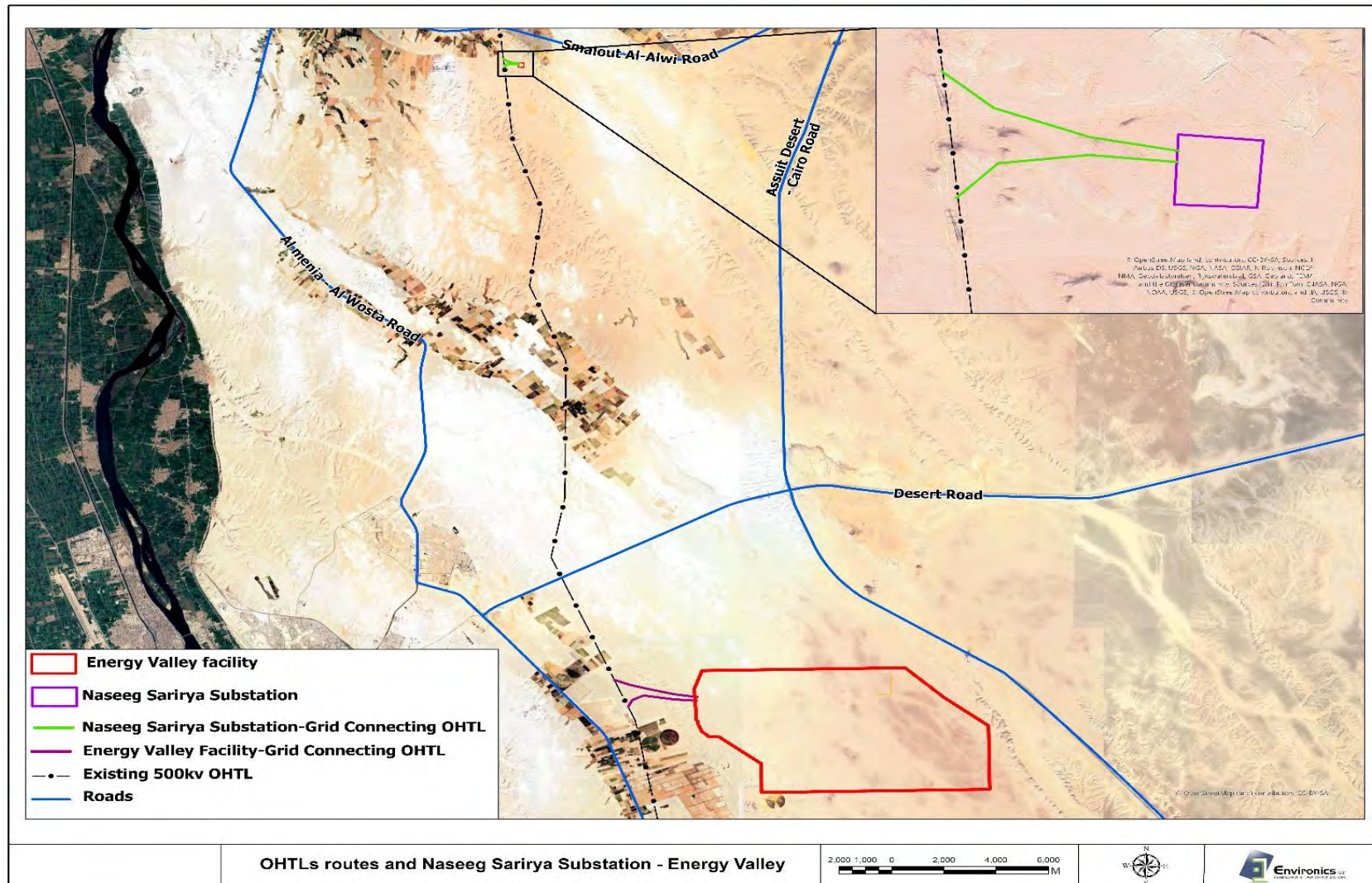


Figure 1-1: OHTLs routes and Naseeg Sariya Substation location

1.2 Objective of the ESIA

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

Moreover, the ESIA also intends to satisfy the environmental and social requirements of the international financial institutions, namely the IFC, EBRD, and AfDB.

1.3 Scope of Work

The ESIA of the proposed project would assess the potential environmental and social risks and impacts across all project stages, including construction, operation, and decommissioning. The assessment will establish baseline environmental and social conditions within the project's area of influence, covering air, water, soil, biodiversity, noise, waste, land use, and socio-economic aspects.

The assessment will review relevant national, international standards and lender requirements. Potential impacts will be identified, evaluated and addressed through mitigation measures documented in an Environmental and Social Management Plan (ESMP), including monitoring and responsibilities.

1.4 Outline of the ESIA Report

This ESIA report includes:

- **Chapter 1 (the current chapter):** Introduction and Background on the project for which the ESIA is developed, as well as the scope and objectives of the ESIA study
- **Chapter 2:** Description of the intended Naseeg Sarirya substation and OHTL construction and operation phases, and the expected environmental and social aspects
- **Chapter 3:** Description of the environmental baseline and social context in the project area
- **Chapter 4:** Description of the local regulatory framework as well as the International Environmental and Social standards and requirements applicable to the project activities
- **Chapter 5:** Discussion of alternatives for different project components.
- **Chapter 6:** Assessment of the potential environmental and social risks and impacts and their mitigation measures.
- **Chapter 7:** The environmental and social management and monitoring plan for the OHTLs and Substation
- **Chapter 8:** Stakeholder Consultation

2. Project Description

The electricity generated from Energy Valley Facility (photovoltaic solar plant and BESS) at Energy Valley project, addressed in a separate ESIA, will supply the Industrial Zone in Wadi El-Sarirya. through overhead transmission lines (OHTLs) and a step-down substation. The details of these components are:

- i. **Naseeg Sarirya Substation (500/22kV), and Naseeg Sarirya Substation-Grid Connecting OHTL**, this component includes the establishment of Naseeg Sarirya substation in Minya at a voltage level of 500/220/22 kV, with a capacity of 3×200 MVA and provision for future expansion by adding a fourth GIS-type transformer. The substation is intended to provide electrical supply for loads of up to 600 MVA and to connect to the national power grid by looping in/out the 500 kV double-circuit overhead transmission line (Beni Suef Generation / East Assiut) using 4×ACSR 490/65 conductors, with an extension of approximately 2×500 meters using the same type of conductor.
- ii. **Energy Valley Facility -Grid Connecting OHTL**, this includes looping in/out the 500 kV double-circuit overhead transmission line (Nasij El-Sarirya / East Assiut) using ACSR 4×490/65 mm² conductors and extending it for approximately $2 \times 2,500$ meters using the same type of conductor. Serving as the grid connection line linking Energy Valley Facility 500/33/33 kV to the existing 500 kV national grid.

2.1 Project Location

The project components are located in the eastern desert hinterland of Minya Governorate, and the project area can be accessed through the nearest paved roads, including Ras Gharib-Minya Road, Minya-Assiut Road, Assuit-Cairo Desert Road and Desert Road.

- i. **Naseeg Sarirya Substation (500/22kV), and Naseeg Sarirya Substation-Grid Connecting OHTL**, Naseeg Sarirya Substation Connection OHTL, with an approximate length of 0.5km, will connect the existing national grid to the Naseeg Sarirya substation. The proposed Naseeg Sarirya substation will be a step-down substation located within Industrial zone in Wadi El-Sarirya. Its primary function is to reduce the transmission voltage (500kV) to the distribution level (22kV).
- ii. **Energy Valley Facility -Grid Connecting OHTL**
The alignment for the OHTL connecting Energy Valley Facility at Energy Valley project with the national grid, is situated to the west of the Energy Valley PV facility boundary. The transmission line extends for approximately 2.5km in a westward direction, traversing undeveloped desert land until it reaches the designated interconnection point of the national transmission network.

Both the connection line and the substation are situated approximately 26 km north of Energy Valley Facility at Energy Valley project, on publicly owned, undeveloped desert land.

Figure 2-1, below shows the proposed OHTL routes, and the Naseeg Sarirya substation and the surrounding area.

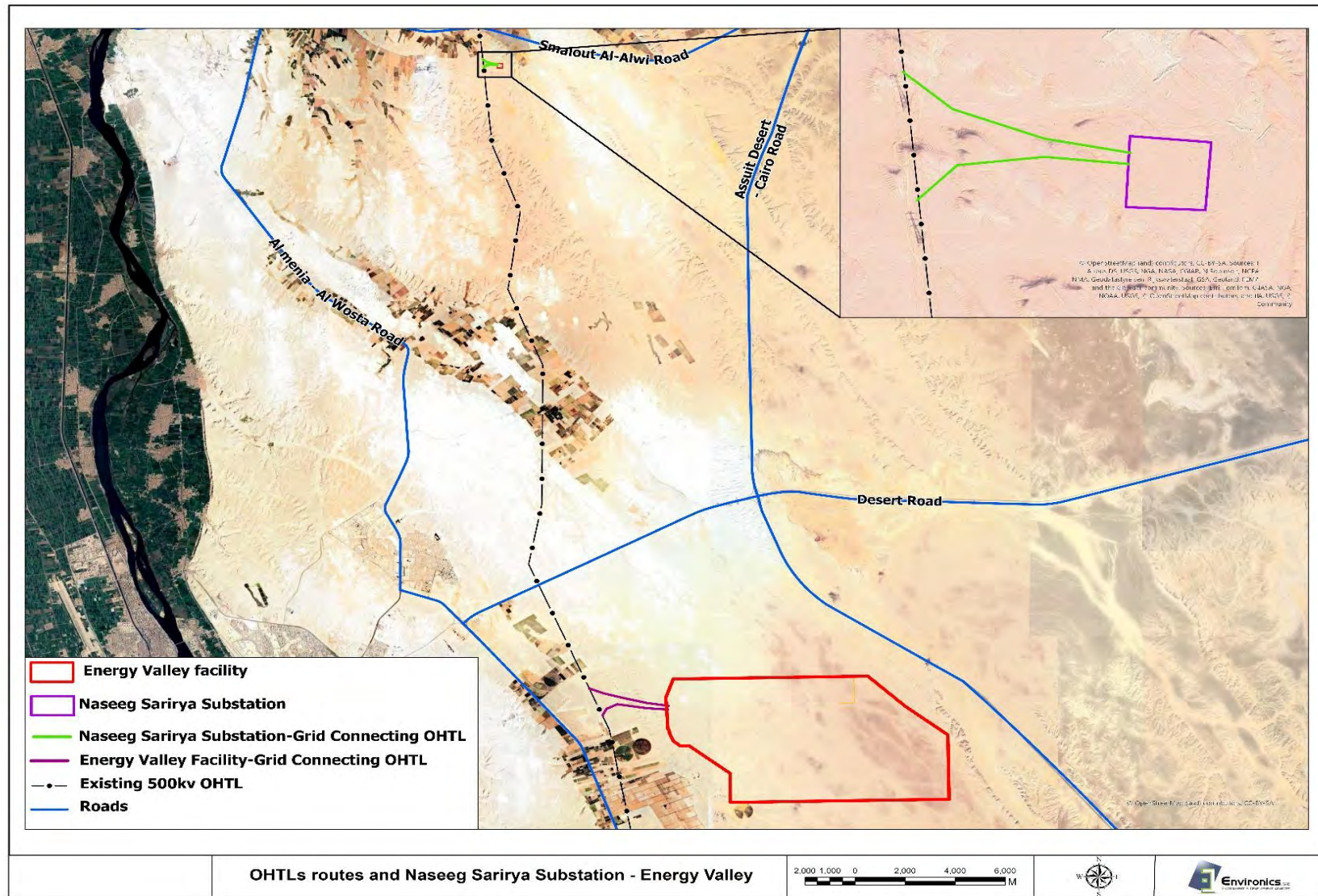


Figure 2-1: Project Component and Surroundings

2.2 Construction Phase

The construction of OHTLs and the substation typically involves planning and design, procurement and site preparation (1-2 months), followed by actual construction which is estimated to be 18 months.

The construction activities for the project components are described below:

1. 500kV OHTL (Energy Valley facility Grid Connection OHTL and Naseeg Sarirya Substation Connecting OHTL)

The **Energy Valley facility** Grid Connection OHTL the 500 kV double-circuit overhead transmission line (Nasij El-Sarirya / East Assiut) and Naseeg Sarirya Connecting OHTL, looping in/out the 500 kV double-circuit overhead transmission line (Nasij El-Sarirya / East Assiut). Both OHTLs operate at 500kV and will therefore have the same construction activities. The two OHTLs are composed of the following elements:

i. Structure

- Towers or poles

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

The exact number of towers and the spacing between the towers will be determined by the construction contractors, during the detailed design phase. Typically, an average distance of 400 to 600 meters is maintained between each tower. In this respect, approximately 5 towers are expected to be constructed for the Energy Valley facility Grid Connection OHTL, and around one to two towers for the Naseeg Sarirya Substation Connecting OHTL.

- Foundations

The tower foundations will be constructed using reinforced concrete pads.

ii. Conductors, insulators, spacers and dampers

These components are installed to serve various purposes:

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

- Spacers: They are installed to keep partial conductors of the bundle line spaced to prevent their damage. The spacer is designed to maintain the bundle spacing of 450mm under all normal operating conditions and to effectively control aeolian vibrations as well as sub span oscillations.
- Dampers: They reduce oscillations and vibrations caused by wind.

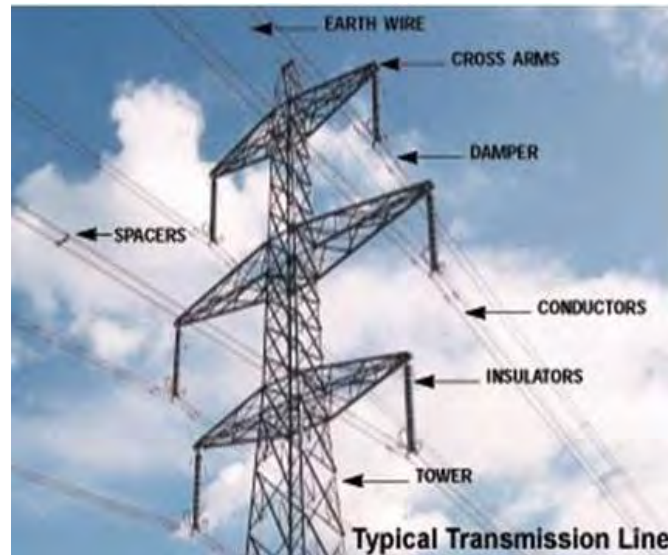


Figure 2-2: Main Tower Components

iii. Rights-of-Way (RoW)

Overhead transmission requires designated right of way area to safeguard the system from hazards that may result in damage to the system, power failures, or fires and protect the public from the electro-magnetic field emitted by OHTLs. Rights-of-way are also utilized to access, service, and inspect transmission system. The RoW for high voltage overhead transmission line will be 25m from each side of the transmission line.¹

Main Construction Activities

The preconstruction activities can be summarized as follows:

- Geotechnical investigations;
- Design of tower foundations;
- design, including number and types of towers, relevant earthing, sag and tension calculations, creepage distance, etc.
- Detailed survey and finalization of the selection of the HV and MV towers' specific locations.

Construction activities can be summarized as follows:

- Excavation for foundations;
- Construction of tower foundations;
- Assembly of HV and MV transmission line towers;
- Cabling stringing and installations of electrical components;
- Commissioning and testing the HV and MV OHTLs;
- Site restoration.

¹ As per article (55) of the Electricity Law (87/2015) the right of way for ultra-high voltage OHTL (>132 KV) extends 25m on each side of the transmission line.

The construction equipment will include:

- Mobile cranes and crane-mounted trucks;
- Excavators;
- Roller compactors;
- Concrete mixer trucks and vibrators.

OHTL Stringing

Stringing includes all activities associated with the installation of the primary conductors onto the transmission line structures. Wire stringing involves the following operations:

- Looping in/out the 500 kV double-circuit overhead transmission line (Beni Suef Generation / East Assiut) using 4×ACSR 490/65 conductors, with an extension of approximately 2 × 500 meters using the same type of conductor to connect Naseeg Sarirya substation to the existing 500 kV national grid .
- Looping in/out the 500 kV double-circuit overhead transmission line (Naseeg Sarirya / East Assiut) using 4×ACSR 490/65 conductors, with an extension of approximately 2 × 5500 meters using the same type of conductor to connect Energy Valley facility 500/33/33kV to the existing 500 kV national grid .
- Stringing the pilot line to install the conductor: A light-weight sock line (pilot line) is flown from tower to tower, threading the sock line through wire rollers attached to the insulators on each structure. A device lock is used to secure the sock line in the rollers.
- Pulling: The sock line is attached to a conductor pulling rope or cable, which is connected to a tensioning machine mounted on a truck. The conductors are then pulled through using a pulling machine (Fig 2-3).
- Sagging and dead-ending: Once the conductor is pulled through the length of the line, the tensioner is then used to sag the conductors to the proper tension. As conductors expand and shrink with changes in temperature (they are longest at high temperatures), they need to be installed at the proper tension so that they do not sag too low when temperatures are at a maximum.

Figure 2-4 below presents the process of line stringing².



Figure 2-3: Example of Puller Machine

²-https://www.youtube.com/watch?v=xuWB9CodHIM&ab_channel=ElectricalPowerSystem
https://hnlongreen.en.made-in-china.com/product/LdsAHWoUAVYq/China-115-Kv-Transmission-Line-for-Hv-Electric-Powerlines-Conductor-Stringing-and-Pulling.html?pv_id=1imfe70l4e5d&faw_id=1imfe73ql2a6



Figure 2-4: Example for line stringing

2. Construction Activities for the Naseeg Sariya Substation

The Naseeg Sariya Step-down Substation near the Industrial Zone in Wadi El-Sariya, working at a voltage (500/22/22kV) with apparent power³ of 600 MVA and a capacity of 3 × 200 MVA, provision for future expansion by adding a fourth GIS-type transformer. Usually Step-down transmission substations are located at switching points⁴ in an electrical grid. They connect different parts of a grid and are a source for distribution lines.

The proposed substation will reduce the transmission voltage from 500kV to 22 kV to enable connecting it to the existing distribution grid inside the Industrial Zone in Wadi El-Sariya. A typical step-down substation is shown in Figure 2-5 below.

The main electrical substation components are:

- **Transformers:** These are the primary components that lower the voltage coming from the grid, which can be used in industry or sent to a distribution substation.
- **Circuit breakers:** They protect the substation from faults by interrupting the flow of electricity.
- **Switchgear:** This equipment is used to isolate faulty parts of the substation or electrical grid during maintenance.
- **Busbars:** These conduct electricity throughout the substation, distributing power where needed.
- **Protection systems:** These safeguard the substation and the electrical grid from overloads and other issues.

The combination of these components allows the substation to manage power flow, prevent faults, and protect equipment.⁵

³ Apparent power (measured in volt-amperes, VA) represents the total power flowing in an AC circuit.

⁴ Switching points are locations in an electrical power system—such as substations, switching stations, equipped with switches, circuit breakers, and isolators that enable the connection, disconnection, isolation, or redirection of power flows for operation, maintenance, or fault management.

⁵ <https://kpgreenengineering.com/blog/complete-guide-to-electrical-substations>



Figure 2-5: Typical Step-down Substation

2.2.1 Utilities

Temporary Laydown Areas

During construction, temporary laydown areas will be identified along the alignment of the two OHTLs, as well as the step-down substation.

Water

The concrete for foundations and pads for the new towers will be supplied as ready-mixed concrete. However, water will still be needed for concrete curing, brick construction and plastering. Additionally, water will be required for sanitary purposes, during the construction phase. This water is expected to be supplied by a licensed subcontractor and stored in an onsite PVC water tank. Moreover, bottled water will be supplied for drinking

Electricity

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

2.2.2 Construction phase labour requirements

During the construction phase, the project will need both skilled labour, including engineers and technicians, and unskilled labour. The expected workforce is about 200 workers, most of which could be provided by nearby communities.

2.3 Operation Phase

2.3.1 Main Operational Activities

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

With respect to the step-down substation, regular inspections and maintenance for the components of the substation to ensure they function efficiently. Maintenance can include several types, such as preventive, corrective, and scheduled maintenance.

2.3.2 Operation phase labour requirements

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

Regarding the operation of the Naseeg Sarirya substation, the workforce is limited in number as most operational functions will be automated and supported by remote monitoring systems. Approximately five personnel will be needed. These staff members will be responsible for the routine monitoring of electrical equipment, preventative and corrective maintenance.

2.4 Decommissioning Phase

The OHTL and substation are long-term infrastructure with an expected lifespan extending over several decades. Accordingly, decommissioning activities are anticipated to take place in the distant future. The OHTL decommissioning activities may include

- De-energize the transmission line.
- Dismantle the conductors and other electrical components from the tower.
- Removal of towers.
- Backfilling and levelling of areas disturbed by foundation removal.
- Site restoration.

For the substation

- De-energizing and isolation of all electrical systems
- Disassembling and removal of electrical equipment.
- Segregation, handling and disposal of hazardous and non-hazardous solid waste.
- Demolition of structures (control buildings, foundations, fencing, etc.)
- Site restoration

2.5 Project Environmental and Social Aspects

An initial step in assessing potential changes to the baseline conditions resulting from the project and its activities is to identify its Environmental and Social (E&S) aspects. E&S aspects are defined as elements of an organisation's activities, products, or services that can interact with the baseline physical, biological, or social environments (ISO, 2015).

The construction and Operation and Maintenance (O&M) phases of OHTLs and substation will have specific E&S aspects resulting from activities that may lead to potential changes to baseline environmental and social systems. The E&S aspects of the proposed project during its construction and O&M phases, along with the sources of these aspects, are outlined in Table 2-1 below.

Table 2-1: E&S aspects of Project Component

E&S Aspect	Primary Source(s)	
	Construction	O&M
OHTLs		
Land uptake and Physical Transformation	- Site clearing within Rights-of-way corridor, leveling, grading, and compaction - Excavation for OHTL tower foundations - Establishment of laydown area	No further land take; continued restricted use along RoW
Land Acquisition	N/A	N/A
Dust, Particulate Matter, and Gaseous Emissions	- Site clearing, leveling, grading, and compaction activities - Exhaust from Vehicles transporting construction materials and equipment, and workers to sites during tower construction - On site diesel power generator emissions	Minimal from maintenance activities
Noise & Vibration	- Site preparation grading, leveling, clearing, concrete mixing, trucks, piling/ramming works. - Incoming vehicles to deliver construction materials, components, and workers to the site - Equipment used for towers erection/installation	Low-level noise (buzzing from OHTL producing corona)
Visual Aspect	- Heavy construction machinery, equipment, and vehicles	landscape intrusion
Workers Influx	- Skilled and non-skilled construction workers (Site preparation activities, technical installations, etc.)	Limited work force for O&M
Water Demand	- Potable water for construction (workers' drinking water and sanitation facilities) - Construction works	N/A
Waste Generation	Non-hazardous - Domestic waste from workforce - Construction material packaging and waste Non-hazardous off-cuts Hazardous - hazardous liquids (e.g., oils, paints, solvents, and coatings)	Non-hazardous Minor waste from maintenance activities (spare parts packaging, etc) Hazardous - Cleaning solvents from maintenance
Avifauna	N/A	Potential Collision/electrocution risk for migratory birds (if any)
Electromagnetic Waves	N/A	EMF from conductors
Transportation Demand	- Equipment and tower transport. - Transportation of workers to and from project sites.	Limited transportation requirements of the workforce and potentially for maintenance.
Step-down substation		
Land Take and Physical Transformation	- Site clearing, leveling, grading, and compaction - Excavation for foundation	Maintained project footprint

E&S Aspect	Primary Source(s)	
	Construction	O&M
	- Construction and installation of substation components - Establishment of laydown area	
Land Acquisition	N/A	N/A
Dust, Particulate Matter, and Gaseous Emissions	- Site clearing, leveling, grading, and compaction and foundation activities - Exhaust from Vehicles transporting construction materials and equipment, and workers to sites. - Generators emissions	Minimal from maintenance activities
Noise & Vibration	- Site preparation grading, leveling, clearing, concrete mixing, trucks, piling/ramming works. - Incoming vehicles to deliver construction materials, components, and workers to the site	Operational hum (low-level) from transformers
Visual Aspect	- Heavy construction machinery, equipment, and vehicles	landscape intrusion (transformers)
Workers Influx	- Skilled and non-skilled construction workers (Site preparation activities, technical installations, etc.)	Limited work force for O&M
Water Demand	- Potable water for construction (workers' drinking water and sanitation facilities) - Construction work	N/A
Waste Generation	Non-hazardous – Domestic waste from workforce (food waste, bottles, cans, paper) – Packaging, concrete debris – Non-hazardous off-cuts – Excavated soil and concrete debris from foundations Hazardous hazardous liquids (e.g., oils, paints, solvents, and coatings)	Non-hazardous Minor waste from maintenance activities (spare parts packaging) Hazardous – Used oil, cleaning solvents from maintenance – Lubricants, and hydraulic Oils used in circuit breakers and mechanical parts
Electromagnetic Waves	N/A	EMF from transformers, switchgear
Transportation Demand	Equipment and component delivery Transportation of workforce	Limited transportation requirements of the workforce and potentially for maintenance.
Avifauna	N/A	Potential Collision/electrocution risk for migratory birds (if any)

2.6 Area of Influence

The area of influence (Aol) includes regions likely to be affected by the project and its directly managed activities and facilities. The Aol accounts for both direct and indirect impacts of the project. It also encompasses areas impacted by unplanned but predictable developments caused by the project, which may occur later or at different locations. Additionally, it covers areas where the project indirectly affects biodiversity or ecosystem services that are crucial to the livelihoods of local communities. The identified project E&S aspects within the project's direct area of influence are described in the Table 2-2 and Table 2-3. Impacts within the potential indirect area of influence, if any, would be addressed in the impact assessment section.

Table 2-2: Environmental and Social Aspects Aol during the construction phase

Environmental & Social Aspects		Area of Influence (Aol)
		Construction phase
Energy Valley Facility -Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)		
Land uptake	Land Development Restriction	The project footprint (OHTL and RoW corridor)
	Land Transformation	The project footprint (OHTL and RoW corridor)
	Land Acquisition	NA
Dust/Particulate Matter/Gaseous Emissions		The immediate project vicinity
Noise & Vibration		The immediate project vicinity
Worker influx		The nearest community is New Minya City located approximately 12 km from the project site.
Water Demand		Water would be trucked from the closest water plant
Waste Generation		To be trucked from project site to the nearest waste management facility
Biodiversity Disturbance		Desert habitat along the OHTL alignments
Avifauna		N/A
Community Health & Safety		Roadside communities along transport routes.
Transportation Demand		The project can be accessed through several regional roads such as Desert Road, Assuit Cairo Desert Road, and Minya Alwasta Road. These main corridors and options are relevant for the transportation of imported equipment and materials.
Naseeg Sarirya Step-down Substation and Naseeg Sarirya Substation -Grid Connecting OHTL,by 500 kV double-circuit (Beni Suef Generation / East Assiut)		
Land uptake	Land Access/land Development Restriction	The substation boundaries, along the OHTL and RoW corridor
	Land Transformation	The substation boundaries, along OHTL and RoW corridor
	Land Acquisition	NA

Environmental & Social Aspects	Area of Influence (AoI)
	Construction phase
Energy Valley Facility -Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)	
Dust/Particulate Matter/Gaseous Emissions	The immediate project vicinity
Noise & Vibration	The immediate project vicinity
Worker influx	The nearest community is Sarirya village at about 11 km, however, worker will be accommodated in New Minya
Water Demand	Water would be trucked from the closest water plant
Waste Generation	To be trucked from project site to the nearest waste management facility
Biodiversity Disturbance	Desert habitat along the site footprint
Avifauna	N/A
Community Health & Safety	Roadside communities along transport routes.
Transportation Demand	The project can be accessed through several regional roads: Ras Garib -Minya Road and Assuit Cairo Desert Road. These main corridors and options are relevant for the transportation of imported equipment and materials.

Table 2-3: Environmental and Social Aspects AoI during the operation phase

Table 2-3: Environmental and Social Aspects AoI during the operation phase		
Environmental & Social Aspects		Area of Influence (AoI)
		Operation phase
Energy Valley Facility -Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)		
Land Uptake	Land Development Restriction	Along the RoW
	Land Transformation	No additional land transformation
	Land Acquisition	N/A
Dust/Particulate Matter/Gaseous Emissions		Vehicles during inspection and maintenance activities
Noise & Vibration		Immediate vicinity
Visual Aspects		N/A, as relatively short connection to existing OHTL
Worker influx		Limited workers for O&M
Water Demand		Limited needs during O&M; supply to be secured through trucking
Waste Generation		N/A
Avifauna		Along the OHTL corridor, with the area potentially extended depending on the presence of sensitive species such as migratory birds
Community Health & Safety		N/A

Environmental & Social Aspects		Area of Influence (AoI)
		Operation phase
Energy Valley Facility -Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)		
Electromagnetic waves		Along the OHTL corridor: within a Right of Way (RoW) of 25 m for HV on each side of the transmission line
Transportation Demand		Limited needs for the same roads as for construction for transportation during O&M
Naseeg Sarirya Step-down Substation and Naseeg Sarirya Substation -Grid Connecting OHTL,by 500 kV double-circuit (Beni Suef Generation / East Assiut)		
Land Uptake	Land Access Restriction	Project footprint
	Land Transformation	Project Footprint
	Land Acquisition	N/A - no new land anticipated during O&M.
Noise & Vibration		Immediate vicinity
Dust/Particulate Matter/Gaseous Emissions		N/A
Visual Aspects		Project site
Worker influx		Limited workers for O&M
Water Demand		Limited needs during O&M; supply to be secured either through trucking
Waste Generation		N/A
Avifauna		Along the OHTL corridor with the area potentially extended depending on the presence of sensitive species such as migratory birds
Community Health & Safety		N/A
Electromagnetic waves		Immediate vicinity of the substation and along the OHTL corridor within a Right of Way (RoW) of 25 m
Transportation Demand		Limited needs for the same roads as for construction for transportation during O&M

3. Environmental and Social Baseline

The proposed OHTLs and Naseeg Sarirya Substation project sites are located west of the East Minya NREA concession (hereinafter referred to as the “East Minya Region”). The Energy Valley facility Grid Connection OHTL site is situated in the eastern part of Minya Governorate, east of the Nile River, approximately 9.5 km east of New Minya city. The Naseeg Sarirya substation and Naseeg Sarirya Substation-Grid Connecting OHTL are located about 26 km north of the Energy Valley facility Grid Connection OHTL. Both sites lie within a remote and uninhabited part of the governorate. The nearest residential settlements to the Naseeg Sarirya Substation are Sarirya, El-Sawaita Village and Ezbet El-Sheikh Hassan, located at distances of approximately 11 km, 12.5 km and 13 km west of the Project Site respectively.

3.1 Physical Baseline

Information was gathered from published material, previous reports, online meteorological data such as Meteoblue and Weatherbase, interpretation of geological and hydrogeological maps, analysis of satellite images and application of GIS analysis tools. Topographic maps are based on the Digital Elevation Model extracted from global mapper. Regional geology is acquired from Alsayyad et al. (2024). Groundwater information is obtained from the Geotechnical Encyclopedia (2003) and other local sources.

3.1.1 Climate and Meteorology

An extremely arid climate prevails in the Eastern Desert, characterized by high temperatures, low relative humidity, and negligible rainfall. Climatic aridity gradually increases towards the east away from the Nile Valley. However, there is no access to meteorological stations in the desert. Therefore, the information in this section relies on data from Meteoblue database and CAPMAS Statistical Yearbook - Geography & Climate (2020) based on the nearest meteorological station, Minya Station is located about 26 km to the southwest of the Naseeg Sarirya Substation Project Site, and 16 Km west of the Energy Valley facility Grid Connection OHTL. The expected climatic features are as follows.

a) Temperature

Air temperature recorded from Minya meteorological station over a period of 30 years, and the average monthly temperature reaches its maximum value in July and August (37°C) and its minimum value in January (8°C), while the annual average is 20°C (Meteoblue, 2026).

b) Day Length

The Project components lie within Egypt’s subtropical desert zone and experiences typical day-length variations for their latitude, which are critical for solar energy generation modeling, construction logistics, and operational planning.

Based on sunrise and sunset data compiled from MAPLOGS solar tables for Minya Governorate, the region experiences the following daylight characteristics across the year.

Table 3-1: Seasonal Daylight Duration at East Minya Project Site

Date	Daylight Duration	Comment
21 December (Winter Solstice)	~10 hours 35 minutes	Shortest day of the year
21 March / 21 September (Equinoxes)	~12 hours 10 minutes	Equal day and night globally
21 June (Summer Solstice)	~13 hours 54 minutes	Longest day of the year

The data shows that the difference between the shortest and longest days in East Minya is approximately 3.3 hours. This seasonal variation in day length—between winter and summer—is considered normal and expected at latitude 28° North (where the project site is located).

c) Rainfall

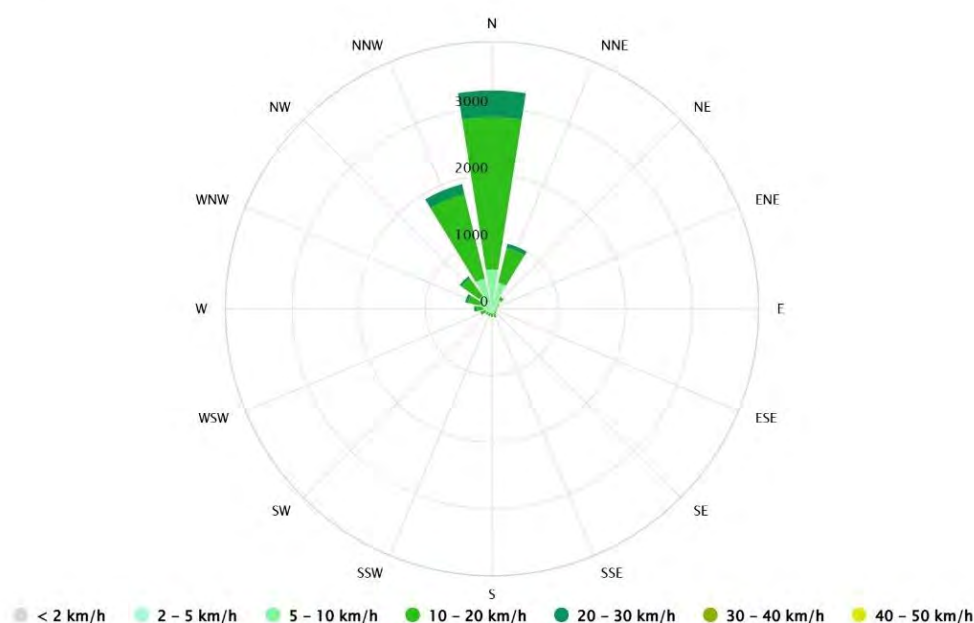
Rainfall is very limited. The distribution of rainfall in Egypt shows a maximum over the Mediterranean coast with a rapid decrease towards the south. The average monthly rainfall is about 1.05 mm and the annual rainfall is about 12.6 mm. The rainfall reaches its maximum value in March (11.8 mm) followed by February (0.8 mm). While the rainfall is almost null over the rest of the year (CAPMAS, 2020).

d) Wind Speed and Direction

According to Meteoblue's wind data for a period of 30 years, the wind direction in the Minya Region is northern and north-northwest most of the year, while it is Northeast in few periods, (Figure 3-1). As for wind speed rates, The highest wind speed blows in a speed ranging from 20 to 30 km/h.

Minya

28.09°N, 30.76°E (52 m asl).
Model: ERA5T.

**Figure 3-1: Wind direction in Minya Governorate**

Source: Meteorological website – Meteoblue

e) Sandstorms

A Sandstorm Frequency and Wind Regime Assessment was conducted by Environics (2023), in order to identify the sandstorm frequency at the East Minya Region. The assessment was based on a data extracted from Assiut weather monitoring station located at about 127 km south of the East Naseeg Sarirya Substation and 101 km south of the Energy Valley facility grid connection OHTL. It is the nearest station providing data for Dust/Sand events frequency, since Minya station does not provide long term records for sandstorms. Storm data of 11 years (2012 to 2022) indicate that the maximum number of events of sandstorms (SA), dust storms (DU) or strong sandstorms (SS) during the 11 years occurred in March for 39 days and 227 hours, while the minimum occurring events were recorded in August for 1 day and 1 hour.

Overall, the total number of sandstorms (SA), dust storms (DU) or strong sandstorms (SS) are 741 hours in 155 days during 11 years, as shown in Table 3-2 and Table 3-3.

Table 3-2: Assiut monthly SA/DU/SS hour's events during 2012-2022

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%Ratio
Hours	47	87	227	139	80	17	16	1	38	9	16	64	741	0.77%

Source: Assiut meteorological station

Table 3-3: Assiut monthly SA/DU/SS day's events during 2012-2022

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%Ratio
Days	13	20	39	28	18	6	2	1	4	6	6	12	155	3.86%

Source: Assiut meteorological station

f) Air Quality

The Naseeg Sarirya Substation Project Site, covering 32.235 m², is located west of the East Minya Region within the desert hinterland of Minya Governorate. It lies 8.5 km east of the Minya-El Wosta Road and 10 km west of Cairo-Assiut Road. The site of the Energy Valley facility Grid Connection OHTL extends for approximately 2.5 km and is located about 9.5 from New Minya City, and lies 1.6 km east of the Cairo – Assiut Road.

The area is remote, with no industrial or stationary emission sources nearby. The closest human activity includes the agricultural lands, about 0.8 km and 1 km away from the sites of the Naseeg Sarirya Substation (500/220/22 kV, and a capacity of 3 × 200 MVA) and Energy Valley facility Grid Connection OHTL, respectively. Minor emissions may arise from occasional vehicle use on unpaved access roads. Overall, ambient air quality is expected to be excellent with respect to anthropogenic pollutants. However, the desert setting leads to naturally high levels of windblown dust. Particulate matter (PM₁₀, PM_{2.5}) may peak during storm events.

XXX

3.1.2 Topography

Generally, the elevations in the East Minya Region increase towards the east and decrease in west towards the Nile River. The project sites is located in a wide range of elevations various

from 127 - 132 m (above main sea level) with the highest elevation located in the northeastern part while the lowest elevation is located on the western side (Figure 3-2).

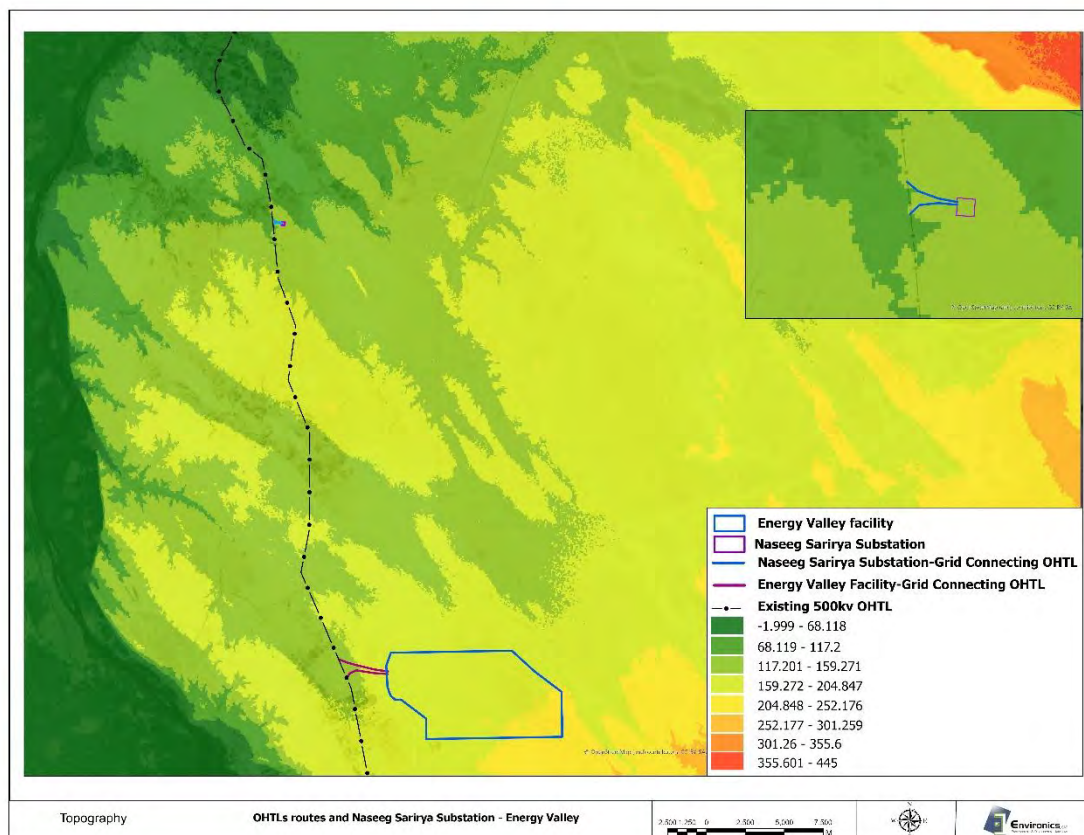


Figure 3-2: Topography of the East Minya Region

3.1.3 Geomorphology and Soils

The geomorphology of the East Minya Region is characterized by a dissected limestone plateau composed primarily of limestone shaped by the erosional forces of water and wind over time (Hammad, 1975).

The project area soil is characterized by a highly fractured rocky nature, with rock dominating the ground surface and a shallow soil cover.⁶ This reflects prolonged exposure to erosion processes, limiting its suitability for agricultural use. No sand dunes are present within or in the vicinity of the project site.

3.1.4 Hydrology

a) Groundwater

As mentioned above, the main aquifer underlying Minya Governorate is the Quaternary aquifer, which comprises two hydrological units (Geotechnical Encyclopedia, 2003; Moneim *et al.*, 2016) as follows:

- The Pleistocene sub-aquifer, covering the Nile valley and desert fringes, with high groundwater productivity, and

⁶ Soil Survey Map of the Samalut–Fayoum Area, United Arab Republic, Sheet 5, 1962

- The Eocene sub-aquifer, underlining the eastern and western sides (desert hinterland) of the Governorate. This sub-aquifer has low groundwater productivity.

The main source of groundwater in the East Minya Region originates from the Eocene sub-aquifer (Figure 3-3).

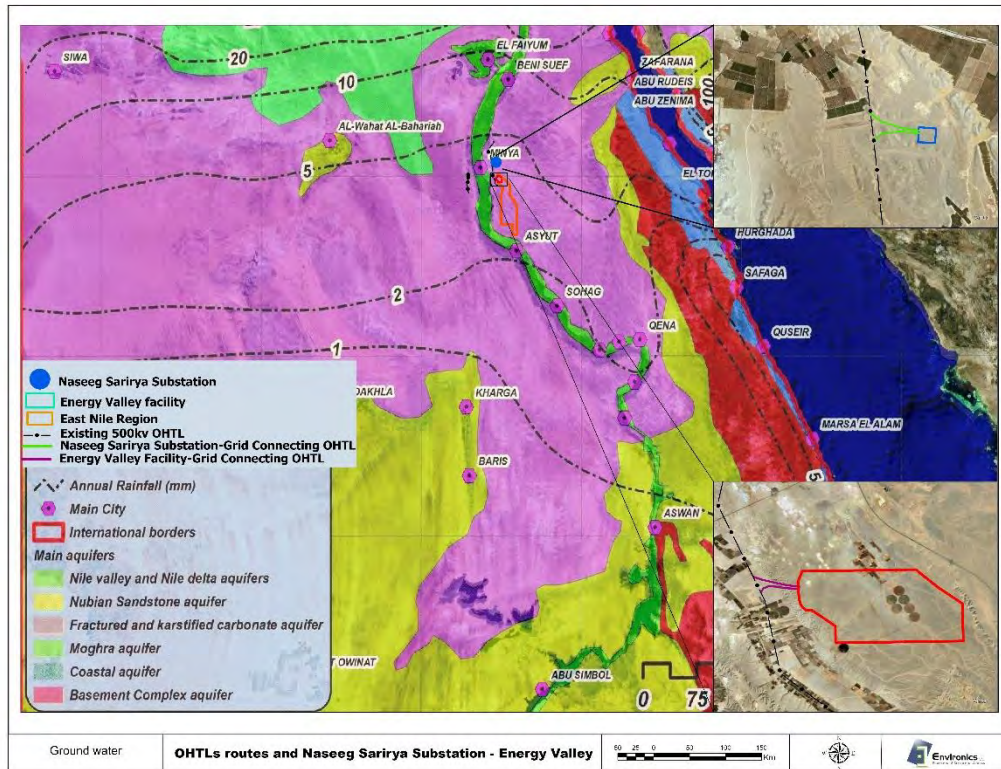


Figure 3-3: Groundwater system in East Minya Region

Source: Geotechnical Encyclopedia (2003)

A levels range from 21.59 meters to 30.08 meters (Habibah *et al.*, 2022). Information obtained during the site visit from agriculture land operators indicated that the depth of groundwater in the area ranges between 120m up to about 180m below ground

Salinity levels vary across the different locations within the area covered by the study, spanning from 349.7 mg/L to 2043.9 mg/L, resulting in a range from fresh-to-brackish water types. Notably, the average salinity in the area is around 1000 ppm, making the groundwater suitable for drinking and irrigation purposes (Habibah *et al.*, 2022). This level of salinity complies with the acceptable limits set by the World Health Organization (WHO) guidelines for drinking water quality (WHO, 2003) and is also consistent with Health Ministry Decree No. 458 of 2007 (FAO, 2007).

b) Surface Waters

• Rivers, canals and drains

The nearest major source of surface water is the Nile River located about 15km and 11.5 west of the Naseeg Sariya Substation and Energy Valley facility Grid Connection OHTL, respectively.

- **Flash Floods**

Preliminary topographic Analysis (Figure 3-4) indicates that the project is away from potential drainage channels.

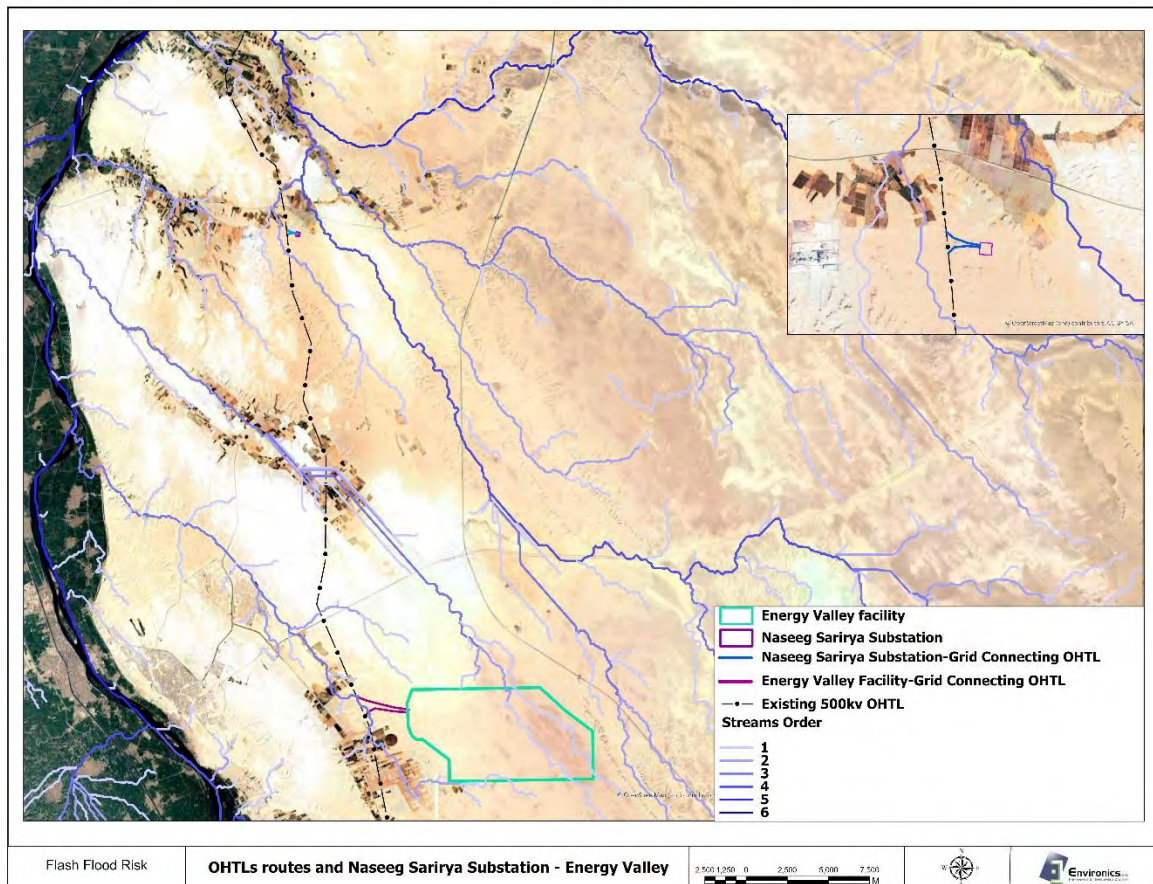


Figure 3-4: Flash Flood Risk at the East Minya Region

Moreover, a hydrological study and storm drainage management assessment was conducted for the Minya Naseeg Sarirya Substation. The study includes a preliminary hydrological assessment and the site's exposure to flood risks assessment.

Watershed Modeling System (WMS) was used to delineate the wadi flow paths and identify the drainage basins affecting the project site. Figure 3-5 illustrates the derived drainage basins superimposed on aerial imagery.

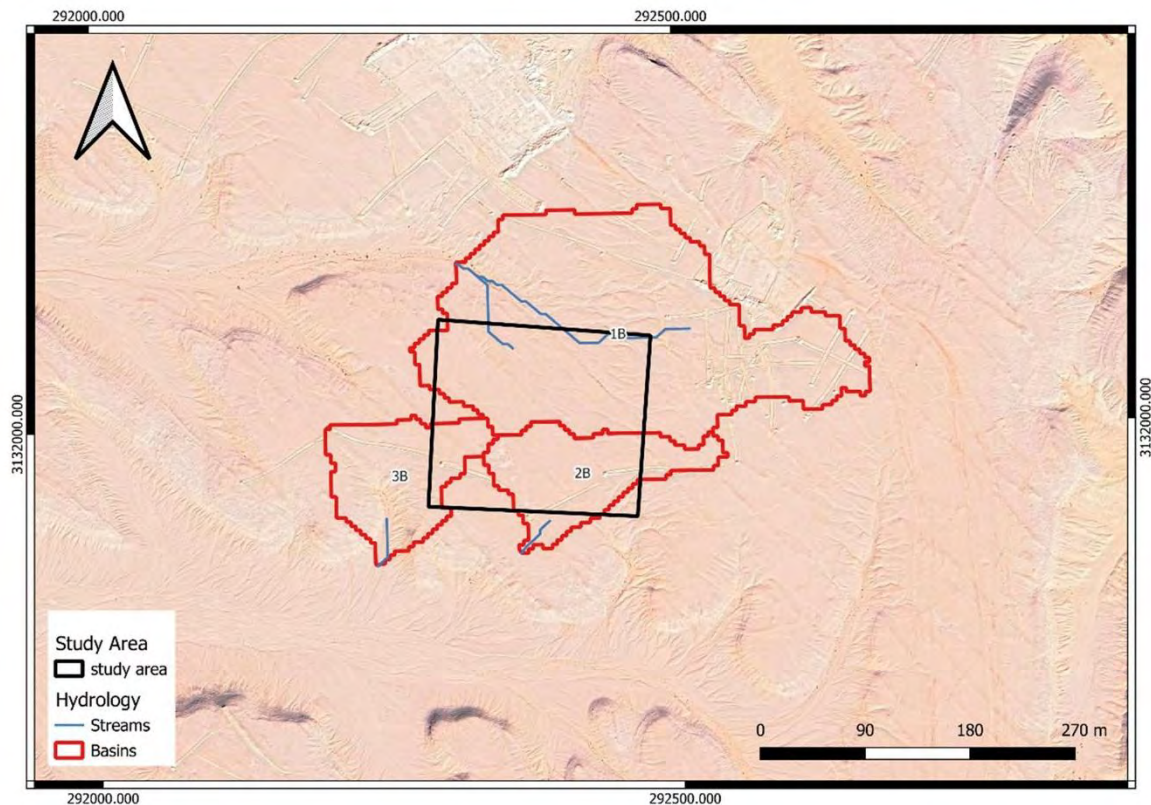


Figure 3-5: Drainage Basins and stream affecting the Naseeg Sariya Substation

The hydrological assessment confirmed that:

- There are no defined wadies or concentrated flow paths crossing the site.
- Flooding results primarily from direct precipitation over the site area.
- Flow behavior is characterised by shallow sheet flow rather than confined or high velocity channelized flow

Accordingly, the study confirmed that the project site is not affected by flood or flash flood hazards, as shown in Figure 3-6.

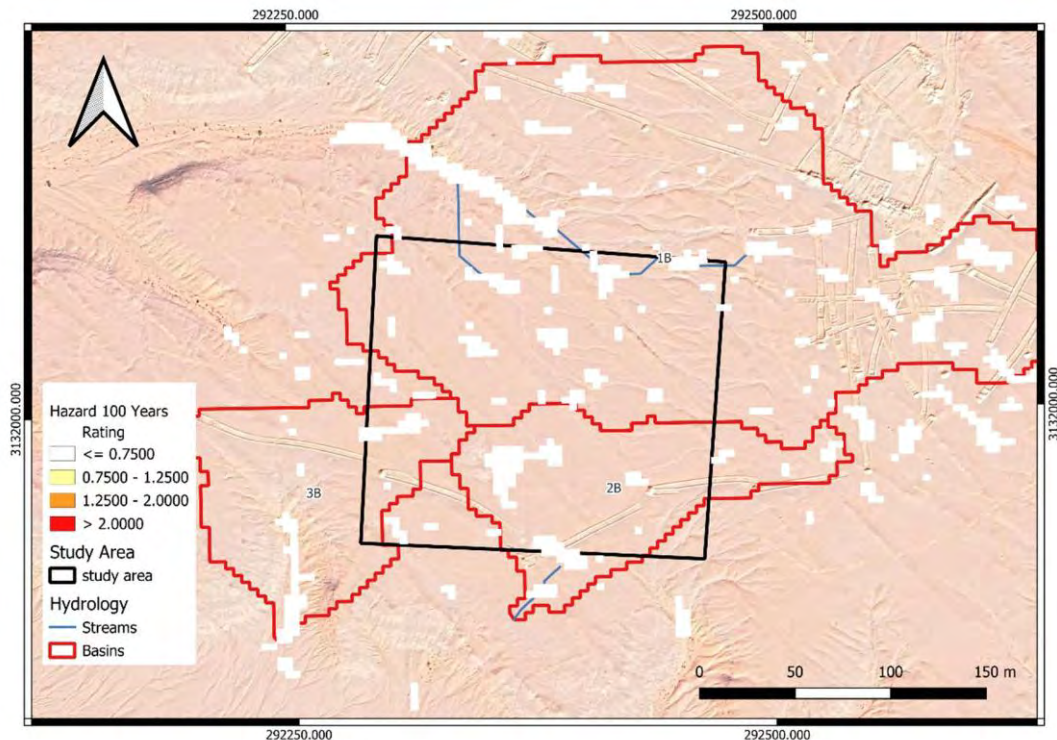


Figure 3-6: Flood Hazard Map for 100 Years return period

The full hydrological and flash flood study is included as Annex 1 of this ESIA.

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3.2 Biological Environment

Information and data on the species/features of the wider area⁷ that could be also present in the project's Area of Influence were gathered from direct observations, published material and previous reports, analysis of satellite images and from recent studies performed by Environics and other entities.

Accordingly, data and information on biodiversity of the Project Site and surroundings were mainly obtained through:

- Published material and previous reports, analysis of satellite images and recent studies performed by Environics and other entities;
- A field survey performed by Ecodia (2018), targeting the entire East Minya Region;
- References with maps showing empirical records and projected species' range, such as Baha El Din (2006) for herpetofauna, BirdLife International (2025) for avifauna and Basuony *et al.* (2010) and Hoath (2009) for mammals;
- BirdLife International database;
- The IUCN Red List of Threatened Species;

⁷ The wider area includes the area surrounding the project site which encompasses the same habitat and features of the project site and having a reasonable geographical extent to include all environmental and social aspects/receptors that might interact with project activities.

- Integrated Biodiversity Assessment Tool (IBAT)⁸;
- Migratory Soaring Birds Tool (MSBT);
- Avian Sensitivity Tool for Energy Planning (AVISTEP)⁹; and
- Professional judgment based on analysis of information obtained from literature on the wider area.

Gathered data and information were confirmed and/or refined through field visits of the Project Site and surroundings carried out by Environics' team on the 15th of February 2026.

Given the extent of the project area, Environics carried out an initial assessment based on analysis of satellite images before undertaking the field survey. This step resulted in the preliminary identification of the land use sets and habitat types of the entire study area and provided an initial identification of the area features and landmarks. Accordingly, a number of locations were preliminarily selected for field investigations, representing the different habitat types of the area.

The visit was not limited to the Project Site, but included other habitat types within the wider area, in order to document the ecological difference and variation between other habitat types (particularly the nearby reclaimed agricultural lands) versus the arid desert habitat characterizing the Project Site.

Moreover, as Energy Valley Company's field visit was conducted earlier, it informed the planning of Environics' survey. The latter therefore focused on validating those findings while also examining key areas not previously covered.

Accordingly, the entire project site, its Area of Influence (AoI), and an Ecologically Appropriate Area of Analysis (EAAA; see Section 3.2.6), were covered by the two complementary surveys.

Figure 3-7 shows Energy Valley and Environics field visit routes, visited locations and the area main landmarks.

⁸ IBAT is a web-based map and reporting tool developed as partnership among BirdLife International, Conservation International, IUCN, and UN Environment World Conservation Monitoring Centre. The tool provides a metric of "biodiversity significance", namely, Rarity-weighted species richness. It is visualized through a map that shows the relative importance of each ~10km (30 arc-seconds) grid cell in terms of its aggregate contribution to the global distribution of species of mammals, birds, amphibians, crabs, crayfishes and shrimps.

⁹ BirdLife International has developed AVISTEP to identify where renewable energy could impact birds and should therefore be avoided.

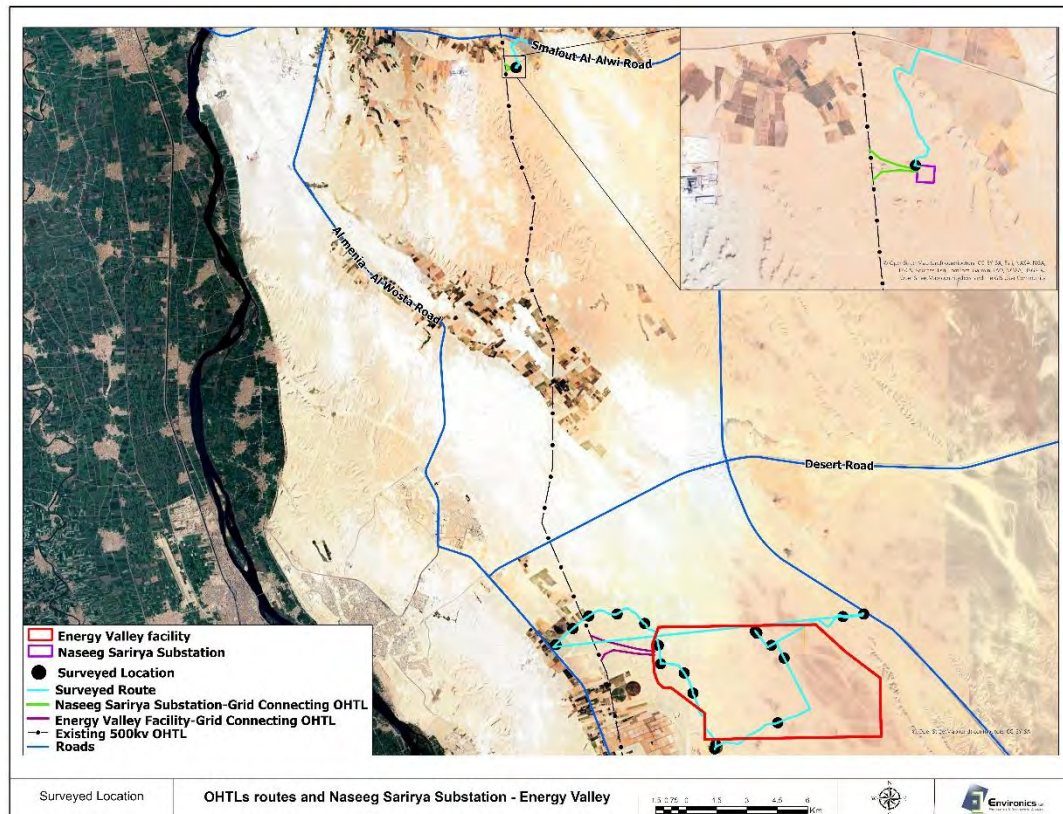


Figure 3-7: Location of surveyed location in the project Site

The location of each visited place was recorded using a GPS. At each point, a quick assessment methodology, covering a radius of approximately 500 meters around each point, was used to assess the main ecological features of the site. Moreover, the route connecting the different points was also visually inspected from the car to identify potential variations or other points of interest. The survey included an active search to record the main species of flora and signs indicating the presence of fauna (markings, urine, scats, tracks, trails, burrows and dens, carcasses, remains of prey or direct observation of the animal). Field notes were taken, and photographic records of flora and fauna were obtained, whenever possible.

Based on the collected information, valuable habitats, sensitive areas as well as species of concern have been highlighted, to include threatened and/or protected species as well as species of ecological and/or economic importance. The Red List issued by the International Union for the Conservation of Nature (IUCN) is used to determine the international status of species. The national status, whenever available, has been obtained from local literature on the Egyptian biodiversity. As many of these references are not very recent and require updates, the local status obtained from literature has been sometimes modified to reflect the actual status of animals, based on professional judgment. Moreover, if status differs from one source to another, the more stringent classification is applied. The status of species is determined following the IUCN Red List categories¹⁰.

¹⁰ EX: Extinct; EW: Extinct in the Wild; CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated; NA: Not Applicable

3.2.1 Project wider area

A description of the main habitats of the wider area and their characteristic biodiversity is herein provided.

a) Nile Valley Farmlands

The Nile Valley farmlands, located approximately 11.5 km west of the project site, are intensively cultivated and anthropogenically altered habitats (Fig 8). Despite being highly modified, these areas support a diverse assemblage of weedy vegetation, naturalized exotic species, and foreign-origin crops. Vegetation along canal and drain banks contributes to habitat heterogeneity, which in turn supports a wide range of fauna. The Nile Valley is almost connected to the Project Site through a corridor of reclaimed agricultural lands.



Figure 3-8: View of the Nile at Minya
Taken during the site visit 15th February

Amphibians typical of the Nile Valley include the African Common Toad (*Sclerophrys regularis*), Nile Ridged Frog (*Ptychadena nilotica*), and Bedriaga's Frog (*Pelophylax bedriagae*), which thrive in irrigated fields and water bodies. Reptiles found in the area include geckos such as the Turkish Gecko (*Hemidactylus turcicus*) and White Spotted Gecko (*Tarentola annularis*), skinks, and snakes such as the Egyptian Cobra (*Naja haje*), Diced Snake (*Natrix tessellata*), and Striped Sand Snake (*Psammophis sibilans*) (IUCN, 2025; Baha El Din, 2006).

The farmlands host numerous resident breeding birds, including Cattle Egret (*Bubulcus ibis*), Common Kestrel (*Falco tinnunculus*), Spur-winged Lapwing (*Vanellus spinosus*), Palm Dove (*Spilopelia senegalensis*), and Graceful Warbler (*Prinia gracilis*), among others. Mammals commonly observed in the Nile Valley include small and medium-sized generalist species such as the Long-eared Hedgehog (*Hemiechinus auritus*), African Grass Rat (*Arvicanthis niloticus*), Red Fox (*Vulpes vulpes*), Egyptian Mongoose (*Herpestes ichneumon*), and Afro-Asiatic Wildcat (*Felis lybica*).

Due to agricultural expansion and habitat connectivity, several of these species—particularly adaptable generalists—are likely to colonize nearby reclaimed agricultural lands within the broader project area. This includes species such as Cattle Egret, Black Rat (*Rattus rattus*), and Red Fox, which are already observed in similar landscapes (EEAA, 1993; IUCN, 2025).

b) Urban and Rural Habitats

There are urban and man-made habitats scattered throughout the Nile Valley farmlands and reclaimed agricultural lands, such as towns and villages, banks of canals and drains, roadsides, railways and wastelands. These habitats are mainly home to exotic plants and trees introduced for ornamental purposes or as windbreakers, as well as opportunistic fauna associated with human activities such as feral dogs and cats, rats, mice, and several species of birds.

c) Reclaimed Agricultural Lands

Several reclaimed agricultural areas, exist near both the Naseeg Sarirya substation and the Energy Valley facility Grid Connection OHTL Sites. The nearest agricultural area is situated approximately 800 m northwest of the substation site and about 1 km from the OHTL alignment.

These irrigated and vegetated lands serve as ecological attractors, drawing species from the nearby Nile Valley that would not typically inhabit the arid desert environment. The expansion of agriculture has thus created a vegetated corridor extending from the Nile Valley into the desert, enhancing local biodiversity in proximity to the project site.

Wildlife from the Nile Valley is expected to gradually disperse into these newly formed agrarian habitats. Pioneer species are typically birds and large mammals with high dispersal capacity. Common avian colonizers include the Palm Dove (*Spilopelia senegalensis*), Cattle Egret (*Bubulcus ibis*), House Sparrow (*Passer domesticus*), and Hooded Crow (*Corvus cornix*). Among mammals, the Red Fox (*Vulpes vulpes*) and African Wolf (*Canis lupaster*) are expected to have already established themselves in nearby reclamation zones.

The ongoing transformation of desert lands into agricultural use facilitates the spread of Nile Valley mesic species into formerly arid ecosystems. This includes commensal and invasive species that can outcompete and displace native desert fauna. For instance, the Red Fox has been documented replacing the native Rüppell's Sand Fox (*Vulpes rueppellii*) in various reclamation zones such as the New Valley, Fayum Depression, and Bahariya Oases. Similarly, species like the House Mouse (*Mus musculus*) and Cairo Spiny Mouse (*Acomys cahirinus*) have been observed displacing indigenous desert rodents, even in remote areas like the Acacia groves of the Western Desert.

In addition, these irrigated lands may offer suitable stopover habitats for migratory birds due to the availability of food, water, and shelter.

d) Middle Section of the Inland Eastern Desert (Beni Sueif – Qena Desert)

The inland part of the Eastern Desert comprises the area between the Red Sea coastal mountains in the east and the Nile Valley in the West, covering a total area of about 223,000 km². The inland desert can be sub-divided from north to south into five sections as follows:

- Cairo – Suez Desert;
- Northern Limestone Plateau;
- Middle Section (Beni Sueif – Qena Desert), where the East Minya Region site is located;
- Idfu – Kom Ombo Section; and
- Southern Nubian Section.

The middle section of this desert extends approximately between Wadi Tarfa in the north, and the valley occupied the main channel of Wadi Qena with its north-south direction (different from other wadis that run east to west). Wadi Qena separates the Eocene limestone formations to its west and the sandstone basement formations to the east (EEAA/UNEP, 1993).

This section is located in the extreme arid part of Egypt and is practically rainless. Perennial plant growth is confined to run-off collecting wadis. The type of vegetation relates to the catchment area of the site and differences are noted between the plant growth in the main channel of a wadi and that of the tributary branches and finer runnels.

The area between latitude 27°30' and 25°30' N (Assiut – Qena Desert) represents the transition between the predominantly limestone country and the southern non-calcareous country (separated by Wadi Qena). Several wadis dissect the limestone plateau but do not reach the Red Sea coastal mountains.

3.2.2 The Project Site

The Project Site lies within a hyper-arid desert landscape that differs markedly from surrounding ecological regions, such as the Nile Valley farmlands and reclaimed agricultural corridors. These contrasting habitat types highlight the need for site-specific ecological investigation, particularly because most prior biodiversity surveys in the region have focused on areas of known or expected ecological richness, often overlooking the harsh, arid desert ecosystems.

To address this gap and ensure that the ESIA baseline reflects true on-ground conditions, the environmental team conducted a targeted *in situ* biodiversity field survey. This was designed to validate or correct regional biodiversity assumptions derived from literature and secondary sources.

To support accurate spatial referencing of the Project Site, the coordinate system used is Africa_Lambert_Conformal_Conic, as presented below.

Table 3-4: Coordinates of the Project Site

Naseeg Sarirya Substation		
1	3061725.8658260703	618340.2785315335
2	3061540.548364818	618325.5546113853
3	3061549.32271564	618131.7728971753
4	3061743.376208633	618142.1105300947
Naseeg Sarirya Substation-Grid Connecting OHTL		
1	3061920.295958787	617589.4496781549
2	3061818.4201859534	617710.0628621846
3	3061697.50927794	618143.513233164
4	3061569.0928874016	617622.5827982549
5	3061664.9662871063	617721.0487036923
6	3061687.144808948	617933.8086622452
7	3061666.9716852605	618140.0780051227
Energy Valley Facility-Grid Connecting OHTL 1		
1	3035320.960262507	621520.9252603418
2	3035108.757002175	622071.3299425091
3	3034927.1956769526	622746.7383602612
4	3034695.8646153808	623700.2144795958
5	3034574.775887668	624522.2802308098
Energy Valley Facility-Grid Connecting OHTL 2		
1	3034169.873936981	622025.9815845663
2	3034456.9694947302	622180.3408620779
3	3034647.4036928415	622583.6358194913
4	3034476.7964983284	623695.3552673105
5	3034419.018103808	624494.5080969697

Before field deployment, a detailed analysis of recent satellite imagery was undertaken to assess habitat structure and homogeneity across the project footprint. The analysis confirmed that the site almost consists of a single, uniform, arid desert habitat, lacking distinct natural ecological micro-zones.

To effectively sample this relatively homogeneous landscape, the site was visited, and a single representative survey point—covering the most significant area of the project—was selected for ecological and geomorphological assessment (see Figure 3-5)

3.2.3 Ecology and Biodiversity

Desktop information on biodiversity specific to the project area is mainly based on the field surveys performed by Ecodia (2018), which covered the entire East Minya Region, as well as other sources. Desktop information was complemented by the results of the field survey carried out by Environics team.

a) Habitats

The proposed Naseeg Sarirya Substation and the Energy Valley facility Grid Connection OHTL are located in the middle inland section of the Eastern Desert, which stretches from the Nile Valley to the Red Sea mountains. Numerous canyon-like depressions (wadis) extending to the Red Sea eastwards, or the Nile Valley westwards, cut across the Eastern Desert.

Wadis are typically the main place where plants and animals can be found. After rain, water pours into the wadi systems from the eastern mountains. Floods are less common in lower reaches of wadis because they are less steep and spread out, which allows any remaining water to soak into the ground and support vegetation in the main wadi streams. Therefore, the value of wadis as a habitat for both plants and animals might vary. Two main wadis cut across East Minya Region, namely, Wadi Ibadah and Wadi al-Birshawhi (Ecoda, 2018). However, these wadis do not cross the Project Site.

Figure 3-9 shows the main habitat types in the East Minya Region at the Naseeg Sarirya Substation area and OHTL lines.

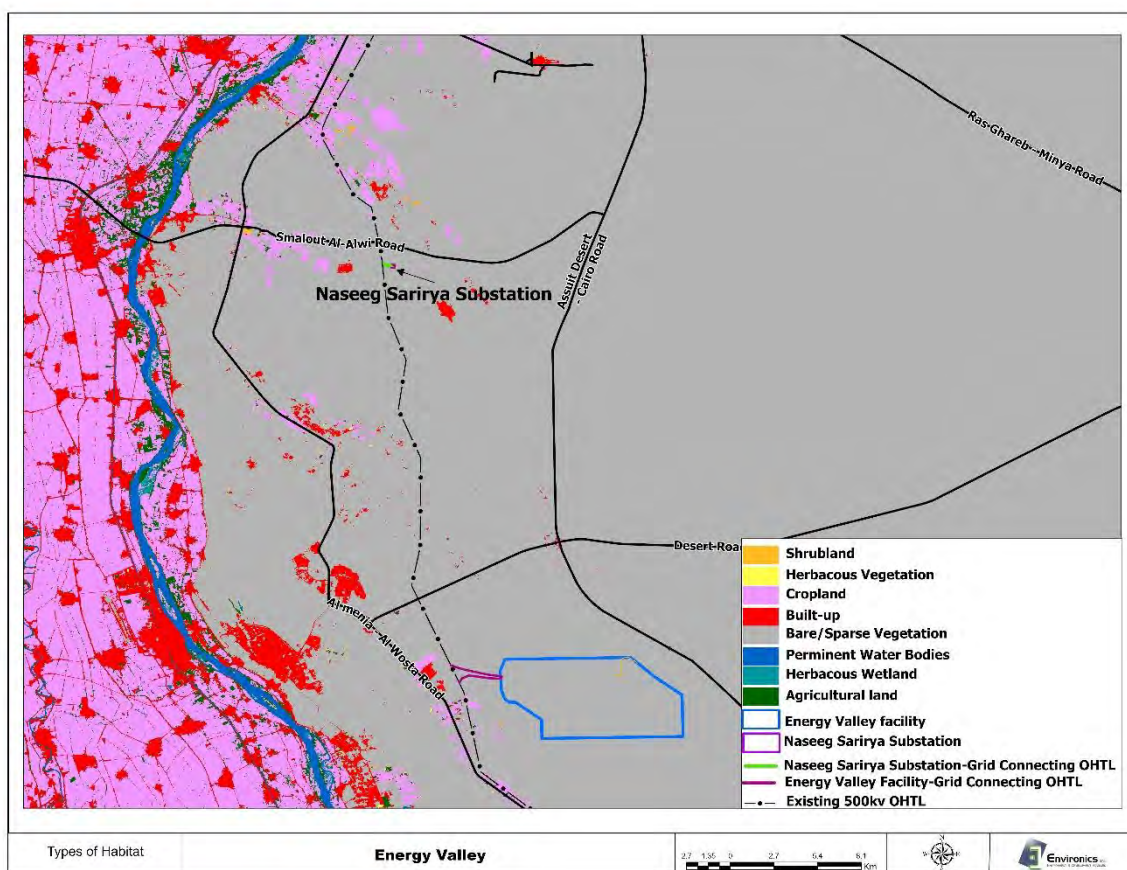


Figure 3-9: Main habitat types in the East Minya Region

The field visit confirmed that the Project Site is part of the desert area described in Section 3.2.1 - d) Middle Section of the Inland Eastern Desert (Beni Sueif – Qena Desert). Its natural habitats mostly consist of a flat, homogeneous, arid desert habitat entirely composed of bare sandy soil.

At the macro level, the landscape and the natural habitats of the Project Site and surrounding desert are overall similar and repetitive, with no significant variation in landscape features at the micro level. The landscape is flat with limited altitudinal variabilities, providing easy access to the site.



Figure 3-10: View of the natural desert habitat at the proposed substation site at different locations showing its uniformity

Natural and modified habitats

In accordance with EBRD ESR6 (EBRD, 2024) and IFC PS6 (IFC, 2012), habitat types are categorized into natural and modified habitats. The Project Site is categorized as “natural habitat”.

b) Flora

During the February 2026 site visit, no vegetation was found at the Project Site.

In the wider area of the Eastern Desert, flora is neither rich in species, nor dense in populations. Based on the latitudinal variation and floristic composition, the Eastern Desert is divided into two phytogeographic sub-territories: Northern Galala Desert and Southern Arabian Desert. Northern Galala Desert, where the East Minya Region is located, extends from the northern limits at 30°N latitude southward to Minya-Assiut desert at 27°N latitude. This sub-territory is relatively rich in plant species and the occurrence of numerous plant families (15 families) (Ecoda, 2018; Abd El-Ghani *et al.*, 2017). According to IUCN (2023), more than 98 plant species are likely to be found in the Galala sub-territory, none of which is threatened.

The wadies tend to support most vegetation due to generally higher soil moisture levels mainly after heavy rainfall. On local basis, during previous field surveys in the East Minya Region, 19 plant species belonging to 12 families were recorded (Ecoda, 2018). None of the recorded species is endemic or threatened.

Table 3-5 shows the list of plant species recorded in the survey performed by Ecoda (2018) targeting the entire East Minya Region.

Table 3-5: List of plant species previously recorded in the East Minya Region

Species	Family	IUCN status
<i>Acacia tortilis ssp. raddiana</i>	Acacieae	LC
<i>Anastatica hierochuntica</i>	Brassicaceae	NE
<i>Diplotaxis acris</i>		NE
<i>Farsetia aegyptia</i>		NE
<i>Zilla spinosa</i>		NE

Species	Family	IUCN status
<i>Trigonella stellata</i>	Fabaceae	NE
<i>Fagonia arabica</i>	Zygophyllaceae	NE
<i>Zygophyllum coccineum</i>		NE
<i>Trichodesma africanum</i>	Boraginaceae	NE
<i>Echinops spinose</i>	Asteraceae	NE
<i>Launaea nudicaulis</i>		NE
<i>Pulicaria incisa</i>		NE
<i>Senecio glaucus</i>		NE
<i>Salsola aegyptiaca</i>	Amaranthaceae	NE
<i>Panicum turgidum</i>	Poaceae	NE
<i>Ochradenus baccatus</i>	Resedaceae	LC
<i>Neurada procumbens</i>	Neuradaceae	NE
<i>Erodium sp.</i>	Geraniaceae	NE
<i>Astragalus caprinus</i>	Leguminosae	NE

Source: Ecoda (2018)

c) Fauna

- No faunal species were recorded by Environics within the Project Site during the February 2026 survey.

A number of species might be possibly encountered based on the intersection of the East Minya Region with their distribution range. Among the different categories of fauna species that might be encountered in the Northern Eastern Desert, only three bird species are EN according to the IUCN (2023).

In the East Minya Region, Wadi Ibadah and Wadi Al Birshaw, are the main habitats to be likely considered as suitable habitats for animal species from different groups, including invertebrates such insects and spiders, reptiles, birds and mammals (Ecoda, 2018). However, these wadis do not intersect with the Project Site.

Moreover, the results of a previous fauna survey of the East Minya Region clearly show that the local fauna is poor in species diversity. The recorded species are quite widespread and can be found in several desert habitats in Egypt. Except for some migratory birds, none of the recorded species is known to be threatened. The different faunal groups recorded during the previous survey carried out by Ecoda (2018) are herein provided.

- **Invertebrates**

During previous surveys, seven swarming and migrating insects were recorded in the area encompassing the East Minya Region, with obvious migration of two species of butterflies (Ecoda, 2018).

- **Herpetofauna**

At least 10 species of reptiles were recorded in the East Minya Region. Table 3-6 shows the list of reptiles recorded by Ecoda (2018).

Table 3-6: List of reptiles recorded in a previous survey

Species		IUCN status
English name	Scientific name	
Horned Viper	<i>Cerastes cerastes</i>	LC
Sahara Sand Snake	<i>Psammophis aegyptius</i>	LC
Saharan Fan-toed Gecko	<i>Ptyodactylus siphonorhina</i>	LC
Species not determined	<i>Tarentola</i> sp.	--
Species not determined	<i>Trapelus</i> sp.	--
Sinai Agama	<i>Pseudotrapelus sinaitus</i>	LC
Bosc's fringe-toed Lizard	<i>Acanthodactylus boskianus</i>	LC
Nidua fringe-fingered Lizard	<i>Acanthodactylus scutellatus</i>	LC
Red-spotted Lizard	<i>Mesalina rubropunctata</i>	LC

Source: Ecoda (2018)

- Avifauna**

A total of 45 species has been recorded during previous bird surveys carried out in 2016 and 2017 (Ecoda, 2018) targeting the entire East Minya Region.

Resident birds

Resident birds were represented by 14 species. Table 3-7 shows the list of local birds recorded during the previous bird survey.

Table 3-7: List of local birds recorded in the previous survey (2016-2017)

species		IUCN status
English name	Scientific name	
Barbary Falcon	<i>Falco peregrinoides</i>	LC
Brown-necked Raven	<i>Corvus ruficollis</i>	
Desert Lark	<i>Ammomanes deserti</i>	
African Desert Warbler	<i>Sylvia deserti</i>	
Desert Wheatear	<i>Oenanthe deserti</i>	
Greater hoopoe Lark	<i>Alaemon alaudipes</i>	
Hooded Wheatear	<i>Oenanthe monacha</i>	
Isabelline Wheatear	<i>Oenanthe isabellina</i>	
Mourning Wheatear	<i>Oenanthe lugens</i>	
Northern Wheatear	<i>Oenanthe oenanthe</i>	
Rock Dove	<i>Columba livia</i>	
Rock Pipit	<i>Anthus petrosus</i>	
Spotted Sandgrouse	<i>Pterocles senegallus</i>	

Source: Ecoda (2018)

Migratory birds

A previous migratory bird survey for the East Minya Region recorded 15 large soaring bird species during spring migration (2016 and 2017) and 21 large soaring bird species during spring migration for the same two years (Ecoda, 2018). Among the recorded migratory species, two species are globally EN (IUCN, 2023), namely the Steppe Eagle (*Aquila nipalensis*) and Egyptian Vulture (*Neophron percnopterus*), while the Sooty Falcon (*Falco concolor*) is categorized as VU at the global level, while Montagu's Harrier (*Circus pygargus*) is VU at the Mediterranean level.

According to a report on risk assessment to migratory soaring birds from proposed OHTL in the Gulf of Suez area (Environics, 2024), flight altitude was categorized into two relevant

categories: one below 120 m above ground level, and one above 120 m. The < 120 m altitude was considered as a high-risk band for collision with electrical transmission infrastructure in the Gulf of Suez region. Although this altitude is somewhat higher than most power transmission lines, the cut off takes a precautionary approach accounting for the limits in visual estimates in flight altitude of birds, particularly at a distance, and also takes into account the fact that birds change their altitude as they fly through.

Although the Gulf of Suez area is a much more important area for bird migration compared to the current project location, data from this report are herein used to provide an indicative percentage of PBF birds (see Section 3.2.6) potentially flying below 120 m.

Accordingly, the following Table provides the percentage of PBF bird species observed above and below 120 m above ground based on monitoring activities at five wind farms in the Gulf of Suez area between 2019 and 2023 (representing results from 20 seasonal studies from both spring and autumn). Note that bird numbers in the two altitudinal categories might not always add up to the total birds observed, as some birds observed at one altitude are often subsequently observed at a different, higher or lower, altitude. This is also reflected in the percentage reported in the table.

The following table shows the numbers of birds recorded during standardized observations in Autumn 2016 (Ecoda, 2018).

Table 3-8: Numbers of birds recorded in autumn 2016

English name	Scientific name	IUCN Status	Recorded number	Estimated global population	% of global population
Short-toed Snake Eagle	<i>Circetus gallicus</i>	LC	381	290000 - 430000	0.1314
Marsh Harrier	<i>Circus aeruginosus</i>	LC	90	4000000 - 5700000	0.0023
European Honey Buzzard	<i>Pernis apivorus</i>	LC	76	50000 - 99999	0.1520
Steppe Buzzard	<i>Buteo buteo</i>	LC	76	2000000-3500000	0.0038
Black Kite	<i>Milvus migrans</i>	LC	73	4000000 - 5700000	0.0018
Steppe Eagle	<i>Aquila nipalensis</i>	EN	42	50000-75000	0.0840
Pallid Harrier	<i>Circus macrourus</i>	NT	15	18000-30000	0.0833
Montagu's Harrier	<i>Circus pygargus</i>	LC (glob.) VU (Med.)	14	300000-550000	0.0047
Booted Eagle	<i>Hieraaetus pennatus</i>	LC	14	150000-195000	0.0093
Common Kestrel	<i>Falco tinnunculus</i>	LC	12	4300000-6700000	0.0003
Sooty Falcon	<i>Falco concolor</i>	VU (glob.) CR (Med.)	11	2800-4000	0.3929
Egyptian Vulture	<i>Neophron percnopterus</i>	EN	7	12400-36000	0.0565

Other birds of species deemed of minor relevance recorded by chance in spring 2016 are shown in the following table.

Table 3-9: Random records of birds from species of minor relevance in spring 2016

English name	Scientific name	IUCN Status	Recorded number	Estimated global population	% of global population
European Bee-eater	<i>Merops apiaster</i>	LC	1,279	14000000 - 25999999	0.0091
House Sparrow	<i>Passer domesticus</i>	LC	180	896000000-1310000000	0.0000
Barn Swallow	<i>Hirundo rustica</i>	LC	133	290000000-487000000	0.0000
Common swift	<i>Apus apus</i>	LC	91	95000000-164999999	0.0001
Pallid Swift	<i>Apus pallidus</i>	LC	37	800000-1499999	0.0046
Northern House Martin	<i>Delichon urbicum</i>	LC	29	10000000-50000000	0.0003

Area assessment using Migratory Soaring Birds Tool

On the other hand, based on the Migratory Soaring Birds Tool, the sensitivity of the site of the Naseeg Sarirya Substation and its connected OHTL, along with 5 km buffer area are classified as “Potential, score: 0.000”. The same result was obtained for the Energy Valley facility Grid Connection OHTL site, meaning that the sites of East Minya substation and all of the OHTL lines have the least sensitivity to soaring migratory birds (Figure 3-11 and Figure 3-12).

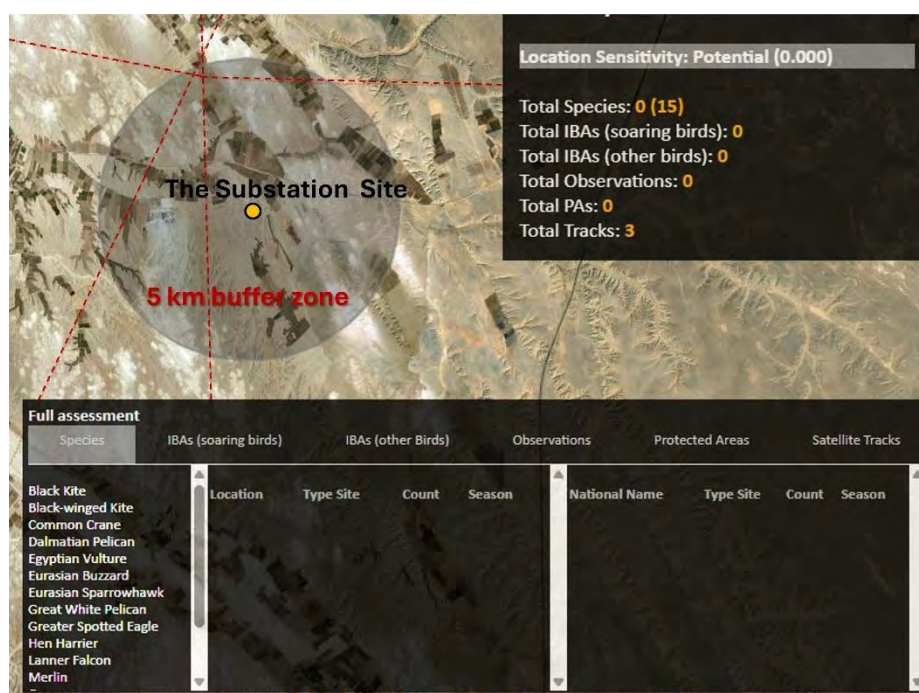


Figure 3-11: Sensitivity of the MinyaNaseeg Sarirya Substation Site & the attached OHTL to migratory soaring birds

Source: Migratory Soaring Birds Tool

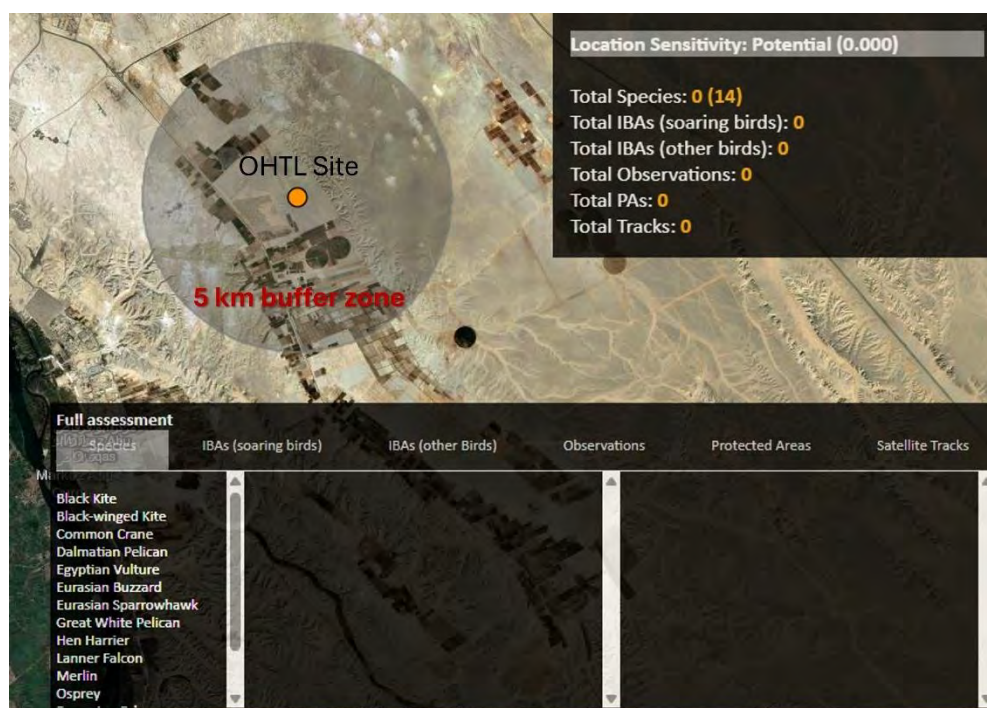


Figure 3-12: Sensitivity of the Energy Valley facility Grid Connection OHTL site to migratory soaring birds for 2 Km zone

Source: Migratory Soaring Birds Tool

According to the assessment, 3 migration tracks for migratory soaring birds (White stork and Egyptian Vulture) are intersecting the 5 km buffer area around the Naseeg Sariya Substation site, the nearest one is located at about 1km away from the Naseeg Sariya substation and 650 m away from the northern OHTL. Based on the MSBT results, about 15 migratory bird species crossing over the at or around the Naseeg Sariya Substation and its connecting OHTL within 5 km diameter buffer (see Table 3-10).

With respect to the southern Energy Valley facility Grid Connection OHTL site, the MSBT assessment revealed that there are no tracks for migratory soaring birds crossing this site or its surrounding area within 5 km diameter. The MSBT indicated that 14 migratory bird species may cross over the OHTL or its surrounding area, which are also represented in Table 3-10 excluding the Greater Spotted Eagle.

Table 3-10: Migratory birds potentially occurring in and around the Project Site using MSBT

Species		IUCN status
English name	Scientific name	
Black Kite	<i>Milvus migrans</i> (Boddaert, 1783)	LC
Black-winged Kite	<i>Elanus caeruleus</i> (Desfontaines, 1789)	LC
Common Crane	<i>Grus grus</i> (Linnaeus, 1758)	LC
Dalmatian Pelican	<i>Pelecanus crispus</i> Bruch, 1832	NT
Egyptian Vulture	<i>Neophron percnopterus</i>	EN
Eurasian Buzzard	<i>Buteo buteo</i> (Linnaeus, 1758)	LC
Eurasian Sparrowhawk	<i>Accipiter nisus</i> (Linnaeus, 1758)	LC
Great White Pelican	<i>Pelecanus onocrotalus</i> Linnaeus, 1758	LC
Greater Spotted Eagle	<i>Clanga clanga</i>	VU
Hen Harrier	<i>Circus cyaneus</i> (Linnaeus, 1766)	LC

Species		IUCN status
English name	Scientific name	
Lanner Falcon	<i>Falco biarmicus</i>	LC
Merlin	<i>Falco columbarius</i> Linnaeus, 1758	LC
Osprey	<i>Pandion haliaetus</i> (Linnaeus, 1758)	LC
Peregrine Falcon	<i>Falco peregrinus</i>	LC
Western Marsh-harrier	<i>Circus aeruginosus</i>	LC

Source: Migratory Soaring Birds Tool

Assessment of avian sensitivity in relation to (transmission powerlines) using AVISTEP

BirdLife International has developed AVISTEP – the Avian Sensitivity Tool for Energy Planning to identify where renewable energy project components could impact birds and should therefore be avoided. AVISTEP provides users with spatial heat maps depicting potential avian sensitivity in relation to the several types of energy infrastructure including Transmission Powerlines. Each 5km x 5km cell within the heatmaps has a sensitivity score. These scores have been grouped into four categories of sensitivity, namely: Low, Moderate, High and Very High.

Based on AVISTEP the Sites of the Naseeg Sariya Substation and the Energy Valley facility Grid Connection OHTL fall within a yellow zone of moderate risk to bird populations, with sensitivity scores equal to 45% and 48% respectively. (Figure 3-13).



Figure 3-13: Area sensitivity to bird populations based on AVISTEP

Given the arid nature of the desert environment, with limited vegetation, food and shelter, and due to the proximity of the Nile Valley and close vicinity of reclaimed agricultural lands, it is highly unlikely that most of the species listed earlier would intentionally land in this location. In fact, the environment of the project components sites is not likely to be a "migration bottleneck," where birds would actively avoid flying over or landing in the area due to its harsh conditions.

However, it is possible that some bird species might still be seen in the wider desert area (and possibly at the project site), albeit rarely, and usually under specific circumstances, as follows:

- Accidental landings: Birds migrating or traveling through the area might be forced to make an emergency landing due to exhaustion, bad weather, or injury.
- Stopovers during migration: Some bird species, especially raptors and waders, might use this area as a brief stopover during their migration, even if it is not an ideal habitat.
- Birds blown off course: Strong winds or sandstorms could blow birds off their intended course, leading them to land in this area unintentionally.

In normal conditions, given the scarcity or even absence of attractive features for birds, such as food sources, water, shelter or perching and roosting sites, it is reasonable to predict that bird presence in this area will be extremely low. References supporting this prediction include:

- A study on bird migration patterns in the Sahara Desert found that "*birds tend to fly around or over the desert rather than crossing it directly due to the harsh environmental conditions*" (Biebach, 1990);
- A study on the ecology of desert birds found that "*bird density and diversity are typically low in desert environments due to the limited availability of resources*" (MacLean, 2004);
- "Birds and Climate Change" by the IUCN states that "*birds tend to avoid areas with extreme temperatures, lack of water, and poor habitat quality*" (IUCN, 2010); and
- "BirdLife International" website states that "*deserts are generally avoided by birds due to the lack of food, water, and shelter*".

These references support the idea that birds tend to avoid areas with harsh environmental conditions, such as the harsh sandy desert environment of the Project Site and its AoI.

• Mammals

Few mammals have been documented in the East Minya Region during the survey carried out by Ecoda (2018) indicating that mammal diversity and density is very low due to the harsh living conditions in the desert (Table 3-11). Wadis mainly serve as a habitat for mammal species (mostly night active rodents). However, the number of recorded mammal species is low and the number of individuals per species is very low. Hence, the East Minya Region is not deemed to constitute an important habitat for mammals.

According to Hoath (2009), the occurrence of most bat species in Egypt is restricted to vegetated areas, namely the Nile Valley. Activity of bats within the East Minya Region was found to be very low during previously conducted bat monitoring survey. The East Minya Region was reported as insignificant habitat for bats (Ecoda, 2018).

Table 3-11: List of mammals recorded previously in the East Minya Region

Species		IUCN status
English name	Scientific name	
Rüppell's Sand Fox	<i>Vulpes rueppellii</i>	LC
Red Fox	<i>Vulpes vulpes</i>	LC
Wildcat	<i>Felis silvestris</i>	LC
Lesser Egyptian Jerboa	<i>Jaculus jaculus</i>	LC
Lesser Egyptian Gerbil	<i>Gerbillus gerbillus</i>	LC
Sundevall's jird	<i>Meriones crassus</i>	LC

3.2.4 Ecological Sensitivities

a) Species of Concern

The following sections identify and describe species of conservation concern (i.e., threatened, endemic, highly sensitive, keystone species) from the above-mentioned species that could potentially inhabit or visit the Project Site or localities in close proximity to it.

Moreover, it should be taken into consideration that the size of the Project Site is negligible when compared to the vast geographical size of the Eastern Desert, in addition to the fact that the species mentioned above are listed based on their habitat preferences and species distribution maps, and none have been formally recorded from within the Project Site or from areas in close proximity to it. Thus, the probability of their actual occurrence within the Project Site is considerably low and, even if one or more of these species were present onsite, alternative habitats would be readily available, and their avoidance of the Project Site is not likely to cause any significant effect on their population levels.

On the other hand, according to the previous surveys carried out by Ecoda (2018) targeting the entire East Minya Region, complemented by the February 2026 site visit, no threatened plants, herpetofauna or mammals have been recorded. The only threatened species of the area are represented by five migratory birds potentially passing over the Project Site, based on the Ecoda survey and results of the MSBT assessment, as shown in Table 3-12.

Table 3-12: Threatened migratory species potentially passing over the Project Site

English name	Scientific name	IUCN Status
Steppe Eagle	<i>Aquila nipalensis</i>	EN
Pallid Harrier	<i>Circus macrourus</i>	NT
Montagu's Harrier	<i>Circus pygargus</i>	LC (glob.) VU (Med.)
Sooty Falcon	<i>Falco concolor</i>	VU (glob.) CR (Med.)
Egyptian Vulture	<i>Neophron percnopterus</i>	EN
Dalmatian Pelican	<i>Pelecanus crispus</i>	NT
Greater Spotted Eagle	<i>Clanga clanga</i>	VU

In terms of the Project Site's value to migratory avifauna, a key point relevant to considering the airspace utilized by avifauna is that the airspace is "anchored" to an important terrestrial area from which avifauna could take advantage. In other words, the airspace is typically considered with respect to the ecological use of terrestrial habitat and not "on its own" (IFC, 2023). In the present case, the Project Site does not provide any resources to avifauna "on its own". Moreover, potentially "attractive" areas to migratory birds, such as reclaimed agricultural lands, have been dismantled. As such, the Project Site and the surrounding desert environment are of no ecological use to migrating avifauna. On the other hand, avifauna

might utilize the reclaimed agricultural lands located outside the sites of East Minya Naseeg Sarirya substation and OHTLs as fueling and resting stations.

b) Key Biodiversity Areas

The Project Site is not located within or near any nationally and/or internationally recognized Protected Area or Key Biodiversity Area. The closest ecologically sensitive area is Wadi Sannour Cave Protected Area, located 50 km to the Northeast of the substation.

3.2.5 Ecosystem Services

Paragraph 2 of IFC Performance Standard 6 (PS6) defines ecosystem services as the benefits that people, including businesses, derive from ecosystems (IFC, 2012; 2019). Ecosystem services are organized into four types:

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

a) Provisioning services

No reclaimed agricultural lands are present within the proposed substation site.

b) Regulating services

The site's contribution to ecosystem processes (such as pollination, seed dispersion, etc.) is insignificant, again, due to its barren, species poor nature, particularly in terms of its lack of vegetation cover.

c) Cultural services

The Project Site does not entail any elements that would allow for recreational use, aesthetic enjoyment, and there are no indications of its current or historical use by humans for spiritual or other cultural purposes. This has been confirmed by interviewees during the site visit.

d) Supporting services

The Project Site's contribution to nutrient cycling processes and primary production are insignificant, given its lack of vegetation cover. Moreover, its contribution is further limited by the sites hyper-aridity and the Project Site's geographical size compared to vastity of the Eastern Desert.

3.2.6 Critical Habitats

Critical habitat (CH) refers to the most sensitive biodiversity features in a defined area, regardless of whether these habitats are natural or modified. Both EBRD ER6 and IFC PS6 and AfDB OS 6 have similar criteria for defining critical habitat.

In this respect, a CH is an area with high biodiversity value, which meets at least one of the following criteria (EBRD, 2019):

- (i) Highly threatened or unique ecosystems;
- (ii) Habitats of significant importance to endangered or critically endangered species;
- (iii) Habitats of significant importance to endemic or geographically restricted species;
- (iv) Habitats supporting globally significant migratory or congregatory species; or
- (v) Areas associated with key evolutionary processes.

The occurrence of the above features does not automatically qualify a habitat as critical, and this is dependent on the proportion of such a CH-triggering species/feature being present in a project area. Numerical thresholds are applied to the first four critical habitat criteria to determine whether any of the species/features are likely to qualify habitats as critical, while there are no numerical thresholds for Criterion V. In this respect, the best available scientific information and expert opinion should be used to guide decision-making with respect to the relative “criticality” of a habitat in these cases.

EBRD ESR6 also considers Priority Biodiversity Features (PBF), which are features that are considered particularly irreplaceable or vulnerable, but at a lower priority level than critical habitats. On the other hand, PBFs are not considered in IFC PS6¹¹. PBF includes:

- (i) Threatened habitats;
- (ii) Vulnerable species;
- (iii) Significant biodiversity features identified by a broad set of stakeholders or governments; and
- (iv) Ecological structure and functions needed to maintain the viability of priority biodiversity features.

As for CH, PBF criteria III and IV have no predetermined conditions. For these criteria, the assessment must rely on expert judgement.

a) Ecologically Appropriate Area of Analysis

The scale at which a CH determination takes place depends on underlying ecological processes for the habitat in question and is not limited to the Project Site boundaries or its Area of Influence (AoI).

EBRD Guidance Note (EBRD, 2023) mentions that the study area may need to be expanded to fully encompass the Ecologically Appropriate Area of Analysis (EAAA) for features that require additional focused study. In most cases, that will mean the landscape-level distribution of the feature requiring study, again considering the ecological patterns, processes and functions that are necessary to maintain it. The EAAA should consider the distribution and connectivity of such features in the landscape and the ecological processes that support them.

In addition, Paragraph 59 of IFC Guidance Note (IFC, 2019) states *“the project should identify an ecologically appropriate area of analysis to determine the presence of critical habitat for each species with regular occurrence in the project’s area of influence, or ecosystem, covered*

¹¹ Other items and requirements included in both EBRD ESR6 and IFC PS6, including Biodiversity Conservation, Protected Areas, Invasive Alien Species, Sustainable Management of Living Natural Resources and Supply Chains, are highly similar.

by Criteria 1-4. The client should define the boundaries of this area considering the distribution of species or ecosystems (within and sometimes extending beyond the project's area of influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining them".

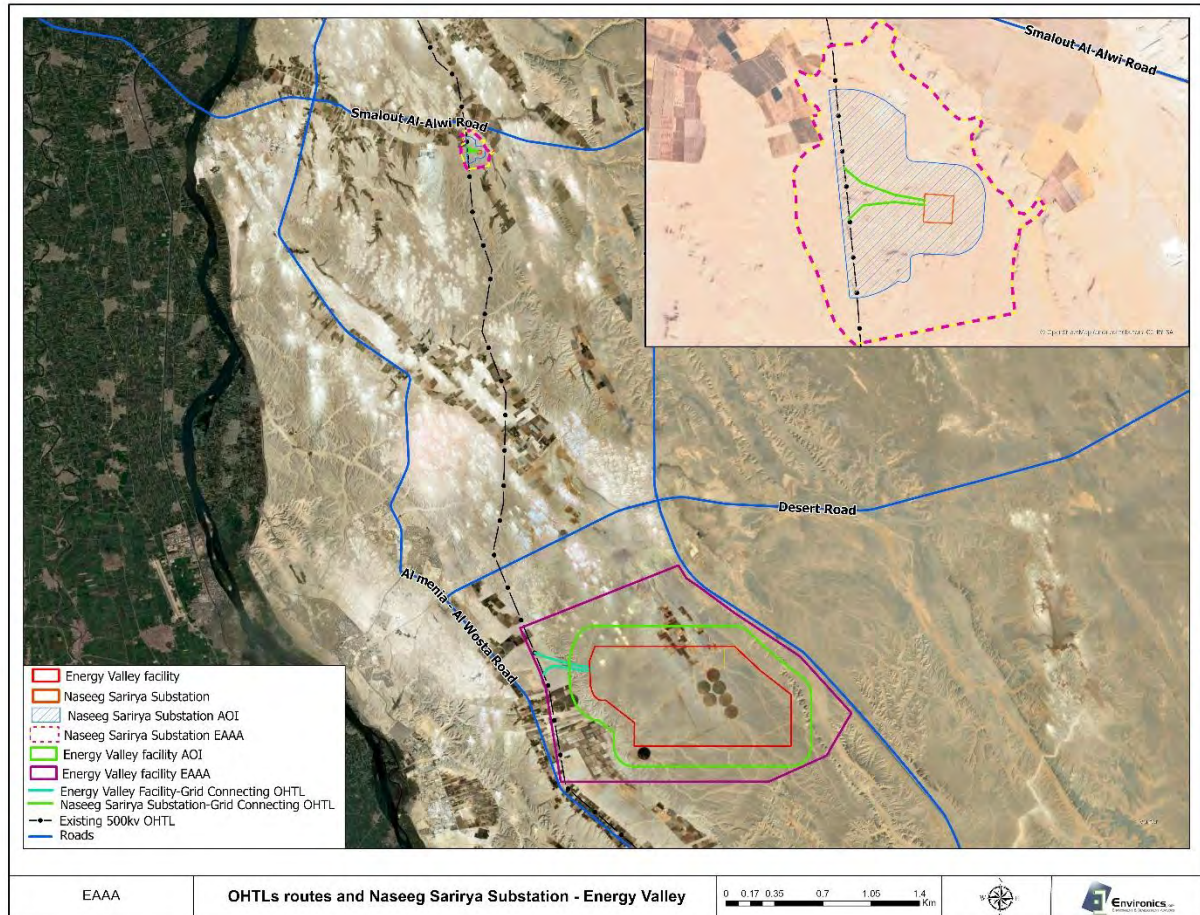


Figure 3-14: Ecologically Appropriate Area of Analysis (EAAA) for the Project Component Sites

b) Results of the Screening Exercise

Potential PBF- and CH-triggering species/features have been screened against the PBF/CH criteria and thresholds.

• Identification of potential Priority Biodiversity Features

The species/features of the EAAA do not meet any of the PBF criteria except for Criterion ii (VU species). The thresholds for this criterion are as follows:

- EAAA supports < 0.5% of global population OR < 5 reproductive units of a CR or EN species.
- EAAA supports VU species; and
- EAAA for regularly occurring nationally or regionally listed EN or CR species

The thresholds for this criterion also consider CR and EN species, although the criterion mentions VU species only. These thresholds are less stringent than those applied to

qualify an area as CH. In this respect, in addition to VU species, CR and EN species have also been screened against the PBF thresholds for Criterion ii.

Accordingly, the following threatened species (VU, EN and CR) have been identified as PBFs:

- Steppe Eagle (*Aquila nipalensis*), EN (globally);
- Montagu's Harrier (*Circus pygargus*); VU (Mediterranean);
- Sooty Falcon (*Falco concolor*), VU (globally) CR (Mediterranean); and
- Egyptian Vulture (*Neophron percnopterus*); EN (globally).

All identified PBFs are migratory birds that could occur under specific circumstances. In this respect, although the EAAA cannot be considered to "support" these species, there is a possibility of their occurrence in the area and are herein considered PBFs using a precautionary approach.

- **Identification of potential CH triggering species and/or features**

Based on their compliance with the definition of each criterion, potential CH triggering species and/or features present or potentially present within the project wider area have been identified, as follows:

Criterion 1: Highly Threatened and/or Unique Ecosystems

The area ecosystems do not meet the definition of Highly Threatened and/or Unique Ecosystems stated in IFC GN6 (IFC, 2019).

Criterion 2: Critically Endangered and/or Endangered Species

CR species

- Sooty Falcon (*Falco concolor*), CR at the Mediterranean level.

EN species

- Egyptian Vulture (*Neophron percnopterus*), EN at the global level; and
- Steppe Eagle (*Aquila nipalensis*), EN at the global level.

Criterion 3: Endemic and/or Restricted-range Species

None present.

Criterion 4: Migratory and/or Congregatory Species

During a previous bird survey, migratory birds have been recorded flying over the project area and surroundings (see Table 3-8 and Table 3-9).

Criterion 5: Key Evolutionary Processes

None of the features mentioned in IFC GN6 (IFC, 2019) apply to the area and, therefore, the area is not deemed of particular importance for key evolutionary processes.

The species/features of the EAAA meet the CH criteria for Criteria 2 and 4. Therefore, the identified potential CH triggering species have been screened against the thresholds for CH Criteria 2 and 4.

Thresholds for Criterion 2:

- (a) EAAA supports $\geq 0.5\%$ of the global population AND ≥ 5 reproductive units of a CR or EN species;
- (b) EAAA supports globally significant population of VU species necessary to prevent a change of IUCN Red List status to EN or CR, and satisfies threshold (a); and
- (c) EAAA for important concentrations of a nationally or regionally listed EN or CR species.

Thresholds for Criterion 4:

- (a) EAAA sustains, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population at any point of the species' lifecycle; and
- (b) EAAA predictably supports ≥ 10 percent of global population during periods of environmental stress.

Results of the CH screening exercise indicate that none of thresholds of CH criteria apply to the biodiversity and/or features of the project area and surroundings. The EAAA neither supports globally important concentrations of these species nor nationally/regionally important concentrations qualifying the area to meet the thresholds for Critical Habitat. Therefore, the project area and surroundings do not qualify as critical habitat.

Results of the CH screening process are presented in Table 3-13.

Table 3-13: Screening of CH triggering species and features potentially present within the East Minya Region

Species/Features	Rationale	Qualifies the area as CH (Yes/No)
CRITERION 1 – HIGHLY THREATENED OR UNIQUE ECOSYSTEMS		
None present	The habitats within the project's EAAA are found in the Western Desert across a large expanse of Egypt and beyond within the Saharan desert eco-region.	No
CRITERION 2 – CRITICALLY ENDANGERED AND ENDANGERED SPECIES		
Egyptian Vulture (<i>Neophron percnopterus</i>) - IUCN global status: EN	A very preliminary estimate of the global population size is 18,000-57,000 individuals, roughly equivalent to 12,000-38,000 mature individuals, although further validation of this estimate is needed. Global population estimates for the species are crude, but 3,000-4,700 pairs are estimated in Europe (equating to 6,000-9,400 mature individuals), forming 25-49% of the total species' population, and perhaps 1,000-2,000 pairs in Africa (BirdLife International, 2019). The species has been recorded in the project area by Ecoda (2018), but only seven individuals were recorded in autumn 2016. Therefore, the presence of small numbers as passage migrants does not qualify the animal to meet the thresholds for Critical Habitat.	No
Steppe Eagle (<i>Aquila nipalensis</i>) - IUCN global status: EN	According to BirdLife international (2021), combined totals from across the whole range estimate the number of pairs at 31,372 (26,014-36,731), which equates to 62,744 (52,028-73,462) mature individuals or 94,116 (78,042-110,193) individuals (I. Karyakin in litt. 2015). The global population is hence below 37,000 pairs (Karyakin et al. 2016). Regular wintering or passage populations in Egypt are concentrated along the Gulf of Suez migration corridor. Tharwat (1997) indicates the species as "common passer and rare winter visitor" and occurring in the Eastern Desert and Sinai. Ecoda (2018) recorded 42 individuals in the area in autumn 2016. However, the recorded number does not qualify the bird to meet the thresholds for Critical Habitat.	No
Sooty Falcon (<i>Falco concolor</i>) - IUCN Mediterranean Status: CR	The global population is estimated at 2,800-4,000 mature individuals. Ecoda (2018) recorded 11 individuals in the area in autumn 2016. Therefore, this number does not qualify the animal to meet the thresholds for Critical Habitat.	No
CRITERION 3 – ENDEMIC/RESTRICTED RANGE SPECIES		
None present	No endemic or restricted range species are known to occur within the project's EAAA.	No
CRITERION 4 – MIGRATORY/CONGREGATORY SPECIES		
Migratory birds	A number of migratory birds flying over the area have been recorded. On the other hand, the numbers recorded by Ecoda (2018) indicate that none of the migratory birds occur in such numbers and/or concentrations able to qualify the EAAA as CH. Moreover, the East Nile Region sensitivity is classified as "potential, score: 0.000", indicating that the region has a very low sensitivity to soaring migratory birds.	No
CRITERION 5 – KEY EVOLUTIONARY PROCESSES		
None present	This part of the Western Desert does not support features and has no structural attributes deemed of particular importance for key evolutionary processes.	No

3.3 Socio-economic Baseline

This section describes the socio-economic baseline and demographic characteristics of the Project Site's wider area, focusing, as possible, on the closest and most accessible areas to the Project Site. In this respect, the socio-economic baseline information is mainly provided at the governorate level, unless otherwise indicated.

This baseline information includes general information on the labor force, population, transportation and health infrastructure, sewage disposal and treatment facility availability, and potable water supply sources in the Project Site's wider area. The cultural heritage of the wider area is also briefly summarized. Furthermore, land use types within the Project Site and its immediate vicinity are also described.

The majority of the information described below is derived from secondary sources including the Center for Documentation of Cultural and Natural Heritage (CULTNAT), the Central Agency for Public Mobilization and Statistics (CAPMAS), the official media and public relations apparatus of the Egyptian state and the official Minya Governorate website. However, two primary sources of data were also used to compile information on the nearest inhabited areas to the Project Site; the first being data acquired during consultation meetings with the project's stakeholders, and the second being data obtained during site visits.

Additional contextual information was derived from primary sources, including a site visit and stakeholder consultations conducted on 15 February 2026.

To ensure accuracy and relevance, this report relies on multiple official sources for demographic data. The 2017 population census and the 2025 Statistical Yearbook were used to provide the most up-to-date population figures, while the 2016 labor force data, the 2018 education data, the 2016 and 2017 unemployment data, and the 2017 income data were used in sections requiring detailed and segmented information, ensuring the integration of accurate structural information with up-to-date indicators.

As the project site is situated away from residential communities and no settlements are present within its direct area of influence, the project is not expected to cause any lasting disruption to people's access to these essential services.

3.3.1 Governorate Background and Administrative Divisions

The proposed project is located in the Eastern Desert of Minya Governorate, at about 50 km from Minya city. The total area of Minya Governorate covers 32,279 km², representing about 3.22% of Egypt. The populated area is around 5,293.88 km², representing 16.4% of the total governorate area. The governorate is divided administratively and encompasses nine administrative centers (*Markaz*, plural *Marakez*), nine cities, 61 rural local units, 360 villages and 1,715 hamlets (*Kafr*) and settlements (*Nagaa*). The nine *Marakez* of Minya Governorate are: Al Adwah, Maghagha, Bani Mazar, Matay, Samalut, El-Minya, Abu Qurqas, Mallawi and Deir Mawas.

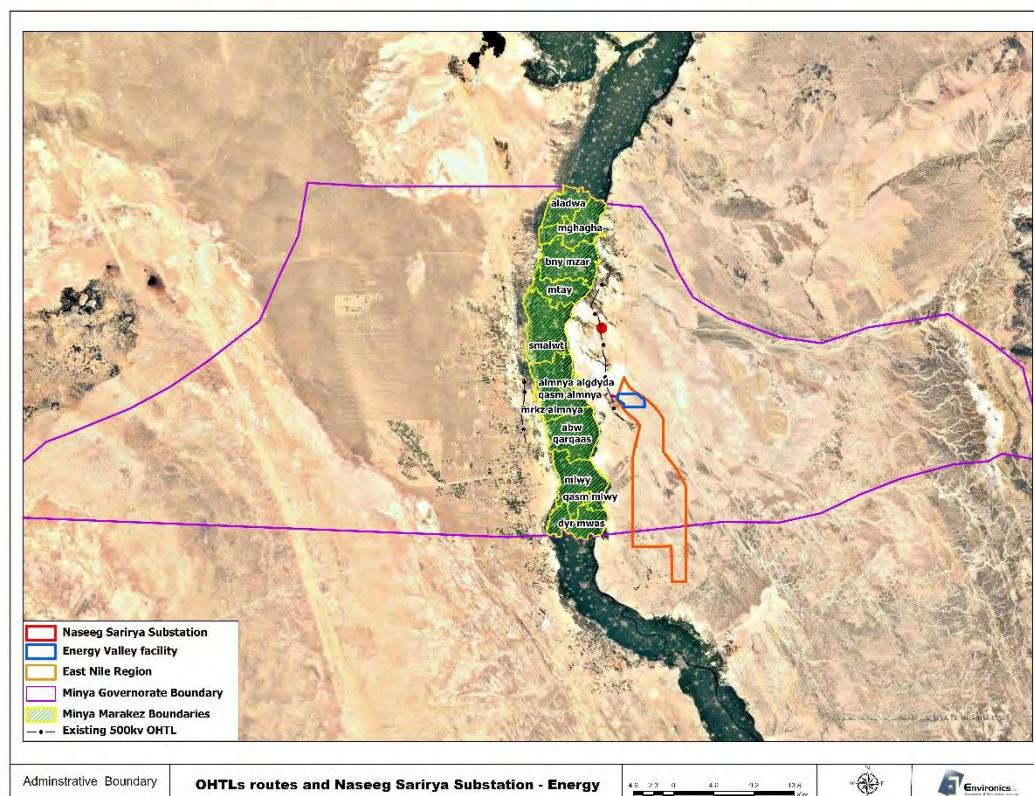


Figure 3-15: Minya Governorate borders and administrative centers in relation to the East Minya Region and the Project Site

The nearest residential settlements to the Naseeg Sarirya substation are Sarirya, El-Sawaita Village, and Ezbet El-Sheikh Hassan, situated at distances of approximately 11 km, 12.5 km, and 13 km west of the Project Site, respectively. And for the Energy Valley facility Grid Connection OHTL site the closest settlements are New Minya City and Zawya Sultan Basha located at a distance of about 9.5 km and 9 km respectively.

3.3.2 Population

The population of Minya Governorate has grown significantly since the 2017 census. As of 2025¹², the governorate boasted an estimated 6,511,377 inhabitants, up from 5,497,095 in 2017¹³—a rise of approximately 18.5% over six years. The governorate covers approximately 32,279 km², yielding an average density of 202 people per km² FOR 2025. Rural residency continues to dominate: an estimated 81% of Minya's population lives in rural areas, compared to Egypt's national average of 57%.

The nearest residential communities, Deir Abu Hinnis and Deir Al Barsha, are located approximately 13.5 km west of the Naseeg Sarirya Substation area. Additionally, the substation site is located roughly 20 km from **New Minya City**.

¹² Central Agency for Public Mobilization and Statistics (CAPMAS). Annual Statistical Yearbook of the Arab Republic of Egypt, 2025.

¹³ Central Agency for Public Mobilization and Statistics (CAPMAS). *Population Census of the Arab Republic of Egypt, 2017*.

a) Urban/Rural Distribution

Table 3-14 provides an estimate of the urban/rural distribution in Minya Governorate. Urban/rural percentages are based on CAPMAS estimates for Minya Governorate as of 2023.

Table 3-14: Estimated urban/rural distribution

Area Type	Approximate %	Estimated Population
Urban	19%	1,226,239
Rural	81%	5,227,653

Source: CAPMAS (2023a)

b) Population by Gender

The gender ratio is approximately 107 males per 100 females. The population distribution by gender and residence is shown in Table 3-15.

Table 3-15: Population distribution by gender and residence in Minya Governorate

Residence	Male	Female	Total
Rural	2,625,418	2,458,160	5,083,578
Urban	608,031	587,426	1,195,457
Governorate Total	3,233,449	3,045,586	6,279,035

Source: CAPMAS (2023a)

c) Age Structure

Table 3-16 shows the age structure in Minya Governorate. Percentages are based on national totals; actual Minya distribution is assumed as proportional.

Table 3-16: Age structure in Minya Governorate

Age Group	Male	Female	Total	% of Total
0 to 4	417,107	392,404	809,511	14.7%
5 to 14	639,729	294,258	1,233,987	22.4%
15 to 44	1,299,503	1,228,344	2,527,847	46.0%
45 to 59	355,502	280,434	582,160	10.6%
Up to 60	176,883	166,707	343,590	6.3%
TOTAL	2,888,724	2,362,147	5,497,095	100%

Source: CAPMAS (2024).Population Age Census 2017

d) Households

There are no settlements within the East Minya Region itself, with human habitats predominantly concentrated along the Nile Valley and its surrounding areas. Table 3-17 presents the estimated number of households in both urban and rural areas in Minya Governorate.

Table 3-17: Estimated households in Minya Governorate

Residence	Population	Estimated Households	% of Total Households
Rural	5,083,578	1,058,544	80%
Urban	1,195,457	253,508	20%
Total	6,279,035	1,312,052	100%

Source: CAPMAS (2023a)

3.3.3 Education

Minya Governorate mirrors national educational patterns in Egypt, with high enrolment at the primary level but a notable drop at secondary and tertiary stages. Illiteracy rate among those over 10 years reached 37% in Minya in 2017, which is higher than the national average of 25%. Illiteracy rate among females is (45%) higher than males (29%) in the governorate (CAPMAS, 2017).

Some children drop out of school as sometimes low-income families encourage their children to work for extra income. Table 3-18 shows the number and percentage of the labor force in Minya Governorate.

Table 3-18: Number and percentage of the labor force (10 years & above) by education status and gender in Minya Governorate, 2016

Gender	Illiterate	Read & write	Below intermediate	Intermediate	Above intermediate	University degree	Above university degree	Total
Males	2938	1458	1534	141	4398	468	1343	12218
Females	1576	333	412	45	1321	86	715	4489
total	4554	1792	1947	186	5718	553	6958	16707
Total (%)	27.3	10.7	11.6	1.1	34.2	3.3	11.7	

Source: CAPMAS (2016b)

Table 3-19 below shows the number of different secondary education schools, and their enrolment

Table 3-19: Secondary education types across the governorate by number and sex of students for 2015/2016

#		General secondary education	Industrial secondary education	Business Secondary education	Hotel secondary education	Agricultural secondary education
Number of schools		105	45	16	2	90
Number of Students	Males	29235	39441	9173	401	2612
	Females	22662	27159	27890	128	0

Source: CAPMAS (2018)

Minya Governorate includes primary, preparatory, and secondary education schools. The number of schools in the governorate reached 3,005 in 2016/2017, totaling up to 28,250 classes. Despite this expansion, Minya's Gross Enrolment Ratio (GER) for general secondary education has historically remained low at 13%, significantly below the national average of 36% and Cairo's 43.7% (World Bank, 2011).

The low GER is closely tied to poverty and gender disparities. In Upper Egypt, poverty rates exceed 54% (UNDP, 2011). This has direct implications on retention, especially for girls in rural households, who often leave school due to financial constraints and sociocultural pressures (Save the Children, 2020). Overcrowded classrooms, underpaid teachers, and infrastructure gaps further strain education quality (Ministry of Education, 2022).

Efforts to bridge the gap include the 2023–2024 Citizen Investment Plan which earmarked EGP 362 million (8% of the total) to pre-university education and EGP 736 million (16%) to higher education infrastructure (Ministry of Planning and Economic Development, 2023a).

There is also one public and two private universities in Minya. Minya University (public University), remains the governorate's central higher education institution, enrolling approximately 57,930 students in 2019 (Minya University, 2019). The recently established Lotus University, inaugurated in 2019, has introduced additional faculties to expand access to higher education, alongside the establishment of Deraya University, which has further diversified academic offerings in the governorate

3.3.4 Economy and Employment

Minya's employment landscape is shaped by structural constraints typical of Upper Egypt. Nationally, unemployment stood at 7.1% in 2023 (CAPMAS, 2023c), with higher rates among women and youth. Regional data suggests Minya's rate may exceed 10%, particularly for young graduates and female job seekers (World Bank, 2022a).

Employment in Minya remains predominantly informal and heavily concentrated on agricultural. Nationally, 25% of Egypt's workforce is engaged in agriculture; this figure is likely higher in Minya due to its rural dominance (CAPMAS, 2022). Female labor force participation remains low ($\approx 15\%$ nationally), and lower still in conservative, rural regions like Minya (UN Women, 2021).

The informal economy is driven by agriculture, construction, retail, and family-owned trades. Public sector jobs continue to dominate formal employment, particularly in education and healthcare. To address underemployment and skills gaps, programs like the World Bank's Upper Egypt Local Development Program (UELDP) support entrepreneurship and vocational training (World Bank, 2022b).

In the 2023–2024 Investment Plan, EGP 445 million was allocated for industrial and employment infrastructure, with a focus on youth and women (Ministry of Planning and Economic Development, 2023b).

On the other hand, although Minya is mainly an agriculture-oriented governorate, various industrial activities have been established, particularly in food processing, spinning and textile, and chemical industries.

a) Key Economic Sectors

- **Agriculture**

Agriculture is considered the main economic activity in the governorate of Minya. It is known for cultivating cotton, onions, wheat, maize, clover and sugar cane. Clover and wheat are the most important crops, representing 80% of the total winter crops. Maize is the main summer crop, representing 67% of the summer crops' cultivations (Information & Decision Support Center, 2014). Moreover, Minya represents one of the top four major producers of sugar cane (El-Sharif et al., 2009). In 2016, the agriculture sector employed about 32% of the labor force in the governorate (CAPMAS, 2016b). Large parts of desert land around the Project Site have been reclaimed for agriculture, relying on groundwater resources for irrigation.

- **Mining and Mineral Industries**

- Calcium Carbonate: The region is the heart of Egypt's calcium carbonate production, offering some of the purest limestone worldwide, used in plastics, rubber, paper, and paints.
- Other Minerals: The governorate also mines and processes talc powder, dolomite, silica sand, and kaolin.

- **Manufacturing and Industrial Zones**

- Textiles and Garments: Minya is becoming a major center for spinning, weaving, and ready-made clothing. A new dedicated textile city is under development in Minya as **part of a \$3 billion investment project to establish integrated textile hubs in Upper Egypt.**
- Food and Beverage: A significant portion of light manufacturing consists of food processing.
- Manufacturing Facilities: The Industrial Zones in Minya (like Matahra) focus on manufacturing industries, including chemicals, pharmaceuticals, marble, and building materials

- **Transportation:** Due to its central location, Minya serves as a logistics hub with road connections to both the Mediterranean and Red Sea ports.

- **Emerging Sectors**

Renewable Energy: Solar energy is increasingly used in the agricultural sector to address water scarcity and enhance sustainability.

b) Main Occupations

The total labor force was 1,670,700 in 2016; those employed were 1,475,800 while 194,900 were unemployed. This unemployment rate of 11.6% is relatively lower than the national rate of 12.5% according to CAPMAS. The rate of unemployed males in Minya Governorate is 44.54% of the total unemployed persons (CAPMAS, 2017; 2016b). Table 3-20 shows the age structure of the unemployed people in Minya.

Table 3-20: Age structure of the unemployed persons (10 years & above) in Minya Governorate (hundreds) in 2016

Gender	Up to -15	-20-24	-25-29	-30-34	-40-44	-50-54	60-64	Total
Males	154	509	98	65	28	12	2	868
Females	215	371	212	242	33	6	0	1081
Total	369	881	310	308	61	18	2	1949
Total (%)	18.9	45.2	15.9	15.8	3.1	0.9	0.1	100

Source: CAPMAS (2017)

Table 3-21 presents the education level of unemployed people across the governorate. It shows that more than half of the unemployed people are of intermediate technical education and 20% are university graduates, implying a negative relationship between the level of education and employment. This might be related to the fact that the governorate is mostly rural and relies on agricultural activities, which may not be providing opportunities to people with other types of higher education.

Table 3-21: Education level of unemployed persons (10 years & above) in Minya Governorate (hundreds) in 2016

Gender	Illiterate	Read & write	Below intermediate	Intermediate	Intermediate technical	Above intermediate (technical but precollege)	University degree & above	Total
Males	66	20	88	40	441	21	194	868
Males (%)	3.386352	1.0261673	4.515136	2.0523345	22.626988	1.0774756	9.9538225	
Females	182	37	25	4	595	22	215	1081
Females (%)	9.3381221	1.8984094	1.2827091	0.2052335	30.528476	1.128784	11.031298	
Total	247	57	114	44	1036	43	409	1949
Total (%)	12.7	2.9	5.8	2.3	53.2	2.2	21	100

Source: CAPMAS (2016b)

Table 3-22 presents the main characteristics of Minya Governorate's labor market.

Table 3-22: Main characteristics of the labor market in Minya Governorate in 2016

Item	Value
Total labor force (thousand persons)	16707
Number of employed persons (thousand persons)	14759
Number of unemployed persons (thousand persons)	1949
Labor force (% of population)	30
Rate of unemployment (%)	11.6
Females (% of work force)	29
Unemployment rate of higher education graduates (%)	21
Unemployment rate of intermediate and above intermediate education graduates (%)	57.7

Source: CAPMAS (2016b)

c) Labor force engagement in economic activities and women participation in the workforce

As previously mentioned, agriculture is the main economic activity and employs a considerable portion of the labor force (about 44%). Agriculture also represents the highest portion of female employment. Table 3-23 presents the distribution of employment in Minya in different economic activities.

Table 3-23: Distribution of labor force in economic activities by sex (hundreds) in Minya in 2016

Labor force	Agriculture & Fishing	Mining & Quarrying	Manufacturing	Electricity	Water services
Male	4749	89	587	48	146
Female	1864	0	87	3	5
Total	6613	89	674	51	151
Labor force	Construction & Building	Trade, retail, wholesale & repair	Transportation & Storage	Hotel & restaurants	Communication
Male	1500	1035	729	262	27
Female	20	327	0	17	4
Total	1520	1362	729	279	31

Labor force	Finance & insurance	Real estate	Scientific & technical specialties	Administrative	Social services
Male	50	13	72	43	771
Female	4	0	18	2	211
Total	54	13	90	45	982
Labor force	Education	Health	Arts & Culture	Other services	Domestic for other families
Male	747	165	25	228	64
Female	506	128	8	24	181
Total	1253	293	33	252	245

Source: CAPMAS (2016b)

Minya has a low female participation rate in the governorate's labor market of 29%. Moreover, they are underpaid where the Gender Pay Gap (GPG) is equal to 44.5% in favor of males which is considered the highest across Egypt (IARIW & CAPMAS, 2015).

d) Child labour

Poor families tend to have their children work to gain extra income. Exact figures are not available as surveys are not conducted in that matter, which will still be deceiving due to its illegal nature. Although there are many laws that regulate child labor under certain conditions, specifying ages and standards, agricultural children's workers are not addressed within the national labor laws (Sekeeker, 2008).

XXX

3.3.5 Land Uses

No land uses are present within the Project Site. On the other hand, proximity to agricultural land is approximately 800 m to the northwest of the substation site, with a distance of 1 km maintained from the Energy Valley facility Grid Connection OHTL alignment (Figure 3-16).

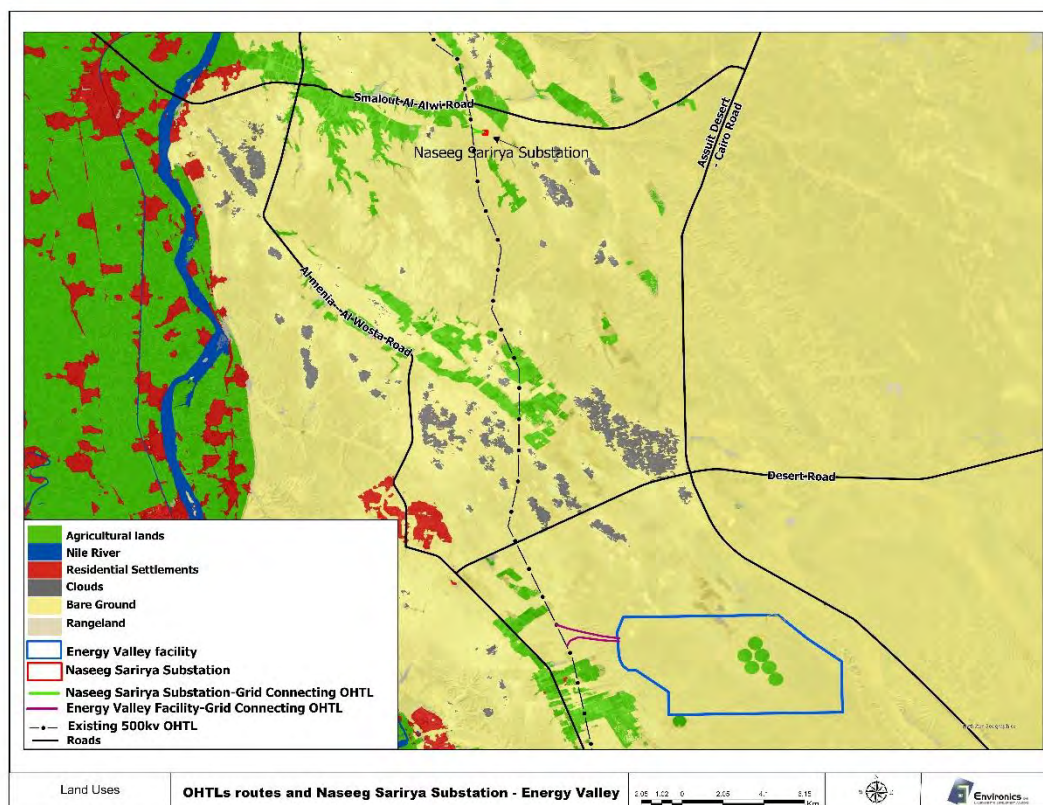


Figure 3-16: Land uses within the East Minya Region

3.3.6 Infrastructure, Utilities and Services

The Naseeg Sariya Substation and its connecting OHTL currently lacks direct access roads. However, for the Naseeg Sariya Substation the nearest roads are the Ras Ghareb –El Menia Road, El Menia-El Wosta Road and Assiut-Cairo Desert Road. Ras Ghareb –El Menia Road is located approximately about 1.8 km north of the Naseeg Sariya Substation El Menia-El Wosta Road is located approximately 8.5 km west of the Naseeg Sariya Substation and intersects with a crossroad, which is extending 1 km north to the substation. As for Assiut-Cairo Desert Road, it is located about 10 km to the east of the Naseeg Sariya Substation.

For the Energy Valley facility Grid Connection OHTL, the nearest roads are El Menia-El Wosta Road, it is located about 2 km to the west of the Project Site.

In terms of essential services, both project sites do not have access to communication, water network, or a sewerage network. These services are available the nearby residential areas . Furthermore, existing transmission lines (The national grid) run close to the substation, approximately 0.5 km to the west, while it is approximately about 2.5 km from the Energy Valley facility Grid Connection OHTL.

a) Potable Water Supply

Table 3-24 shows the production and consumption rates of potable water across the governorate as well as the number of water stations.

Table 3-24: Total potable water stations, sources, production and consumption in Minya (1000 m³/day) in 2015/2016

Number of stations		Total quantity of water produced (million m ³)		Total water produced	Total water consumed
Surface water	Groundwater	Surface water	Groundwater		
80	119	228.5	59.2	287.7	186.7

Source: CAPMAS (2016c)

b) Sewage Disposal and Wastewater Treatment

About 25% of the population living in Minya has access to sewage systems, while 13% have no access to any kind of sanitation. The rest of the governorate mainly depends on open-bottom tanks or septic tanks to dispose of sanitary waste (General Authority for Urban Planning, 2017).

c) Solid Waste

Minya Governorate is implementing several municipal waste management projects. Three sanitary landfills are currently under construction in the districts of, Tuna El-Gabal and Al-Adwa (Egyptian Cabinet Presidency website, 2025). In addition, discussions with the New Menia Urban Authority indicated that there exist two waste dumpsites for solid and construction wastes within New Menia area.

Moreover, a contract has been recently signed with a private sector company for the management and operation of a municipal waste recycling plant in the Al-Adwa district, with a minimum processing capacity of 150 tons per day (Egyptian Cabinet Presidency website, 2025).

d) Health Infrastructure

There are five governmental and 6 private hospitals in Markaz Minya (Minya Governorate Information Center, 2025).

Table 3-25: Types of hospitals in Markaz Minya

Hospital name	Type	Address	Number of beds	Specialization
Minya General Hospital	Governmental	Ibn Khassib Street, Minya	0	External clinics only
Misr El Horra Hospital	Governmental	Misr – Aswan Agricultural Road, in front of the Old Mansoura Bridge	67	General
Minya Chest Hospital	Governmental	Misr – Aswan Agricultural Road, Western District, Minya	82	Chest
Minya Ophthalmology Hospital	Governmental	Saad Zaghloul Street, Minya	25	Ophthalmology
Minya Fever Hospital	Governmental	Hommeyat Square, Minya	87	Infectious diseases
Sharia Society Hospital	Private	Abu Hilal, Minya	41	All specializations
Omar Ibn El Khattab Hospital	Private	Abu Hilal, Minya	40	All specializations
Horus Hospital	Private	Wabour El Nour Street, Minya	15	Ophthalmology
Abu El Seoud Hospital	Private	Al Shorafaa Village, Minya	54	All specializations

Hospital name	Type	Address	Number of beds	Specialization
Minya National Hospital	Private	Saad Zaghloul Street, Minya	42	All specializations
Dar Al Hilal Hospital	Private	Tahnasha Village, Minya	42	All specializations

Source: Minya Governorate Information Center (2025)

e) Transportation Infrastructure

The transportation network available within Minya Governorate includes 1,828 km of main paved roads and 565 km of unpaved ones. The project is located about 138 km northeast of Assiut International Airport.

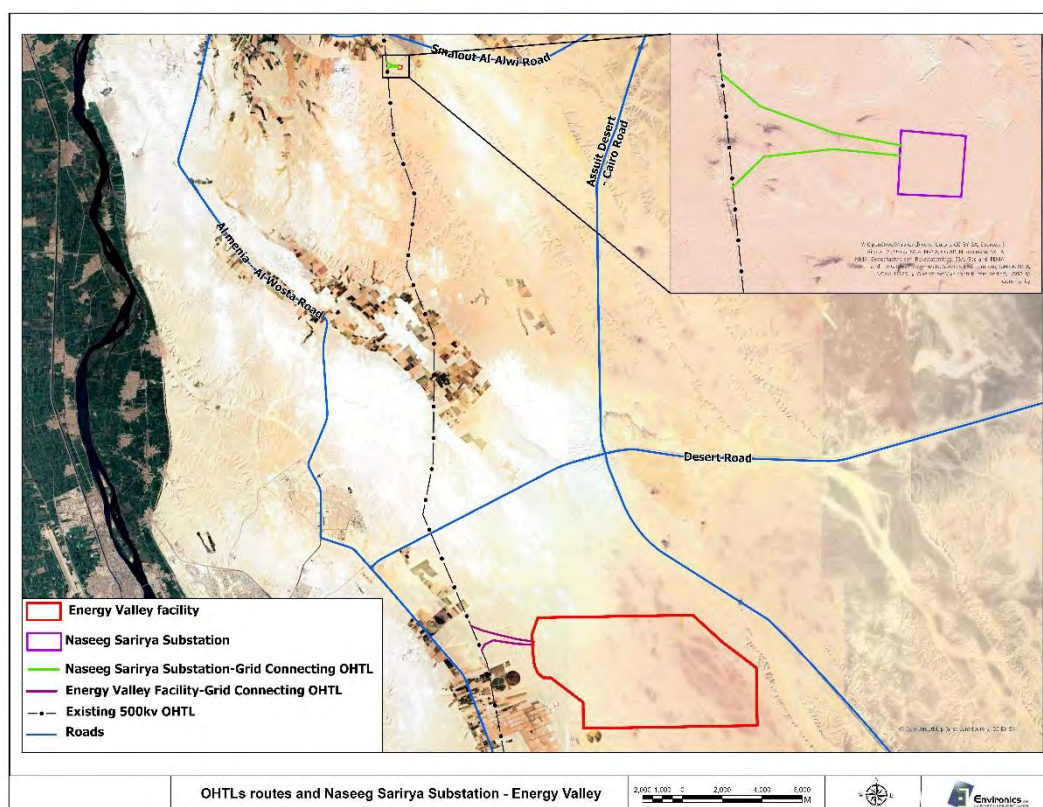


Figure 3-17: Road network of the Project Area

3.3.7 Archeology and Cultural Heritage

Minya Governorate is rich in historical heritage, with 39 recorded archaeological sites. According to the Archaeological Atlas issued by the Geographical Information Center of the Supreme Council of Antiquities, there are neither known nor indications of the potential presence of archaeological sites within the East Minya Region. The nearest archaeological sites are Gebel El-Tayr church, Beni Hassan Rock-Cut Tombs Tel El Amarna located respectively at 13.35, 40 km and 70 km southwest of the substation, along the River Nile's eastern bank (Kwok and Peters, 2020). As the substation is located within an already approved industrial zone, the necessary clearance has been obtained from the relevant antiquities authorities. Therefore, no additional cultural heritage investigations are required, and only chance find procedures will be implemented in the event that any previously unrecorded or unexpected cultural heritage resources are encountered during construction activities. , a s.

- **Gebel Al-Tayr Church:** also known as the Virgin Mary Church, holds great significance as one of the important stops during the Holy Family's journey to Egypt. Situated atop a mountain on the eastern side of the Nile River in Samalout, Minya Governorate.
- **Beni Hassan: Historical Rock-Cut Tombs**
It is situated south of Minya and features a cluster of significant rock-cut tombs from Dynasties XI and XII. These tombs are intricately carved into the elevated limestone cliffs on the river's eastern side. Access requires ascending a steep flight of stone steps, offering panoramic views of the river valley.
- **Tal El Amarna: Ancient Capital**
It holds the remnants of a city established in the 14th century BC by King Akhenaten. This historical city once spanned 15 square kilometers and housed numerous temples, palaces, and fortified walls. Today, only a few structures and artifacts remain, with two sets of cliff tombs found at its northern and southern entrances.

4. Policy, Legal, and Administrative Framework

This section summarizes the environmental and social legislation and regulations of relevance to the project. They were identified according to the type of the proposed activity (described in detail in chapter 2), its geographic location, and the expected risks and impacts. Consideration is first given to the national legislation pertaining to the execution of the ESIA, followed by a review of guidelines of international financing institutions for environmental requirements relevant to the project, as well as the Company's sustainability, environmental, health, and safety framework requirements.

4.1 National Legislation Pertaining to EIA

In accordance with Article 29 of the Law of the Environment No. 4/1994, as amended by Laws No. 9/2009 and No. 105/2015, and its Executive Regulations (ERs), the project proponent is required to prepare an EIA for new projects and expansions or modifications within existing facilities.

Pursuant to Law No. 4/1994 and its ERs, the proponent is required to submit an EIA study to the Competent Administrative Authority (CAA) or the licensing authority prior to the commencement of the project. The CAA or the licensing authority is responsible for verifying all required data, before forwarding the study to EEAA for review.

For the OHTLs and Naseeg Sariya substation project, the CAA is the Egyptian Electricity Transmission Company (EETC), located at the Ministry of Electricity & Renewable Energy.

EEAA may request the proponent to provide additional data, or clarifications, only once, and if the required data isn't provided within 15 working days, the EEAA will return the study to the CAA for completion and resubmission.

EEAA will provide its opinion within 30 working days from the date of receipt of all required data.

The CAA shall notify the project proponent of the results of EEAA assessment.

The project proponent has the right to appeal in writing the result of the assessment within 30 days from the date of his notification following which non-response constitutes implicit approval.

Based on the EEAA projects categorization lists issued in June 2023, projects are classified into four categories according to their environmental impacts:

- **Category A:** Projects with minor or limited environmental impacts.
- **Category B:** Projects that may result in moderate environmental impacts.
- **Category Scoped B:** Projects with potentially significant environmental impacts due to certain components, but not the project type itself. An EIA study is required, focusing on the major component, but without public consultation.

- **Category C:** Projects with potentially significant environmental impacts This category requires a full-scale EIA study, including public consultation and disclosure as a main component.

According to the initial meeting conducted with the Egyptian Environmental Affairs Agency (EEAA) on 6 January 2026, the Naseeg Sarirya substation and the OHTLs for Energy Valley Project have been classified as Category Scoped-B projects.

While the project could initially be classified as Category A under EBRD criteria due to potential high E&S risks, the OHTLs are short (2.5 km and 0.5 km) and located in low-sensitivity, state-owned desert areas with no significant biodiversity or social receptors. The substation footprint is also limited and impacts are site-specific. Therefore, impacts are expected to be localized and easily mitigated, making a Category B classification more appropriate.

According to the African Development Bank's (AfDB) Integrated Safeguards System (ISS), the Energy Valley Programme is classified as Category 1 (High risk) due to its scale and complexity, comprising multiple components, including a utility-scale photovoltaic (PV) power plant, overhead transmission lines, a step-down substation, and battery energy storage systems (BESS).

4.2 Applicable Egyptian Environmental Regulations pertaining to the project

4.2.1 Air Quality

Article 36 of Law 4/1994 and Article 37 of ER 1095/2011 set the maximum permissible limits for exhaust gases from engines and vehicles.

Article 35 of Law 4/1994, Article 34 of its modified ER 1741/2005, and Annex (5) of modified ER 710/2012 provide the maximum limits for ambient air pollutants. The applicable limits are summarized in the Table 4-1 below. Besides emissions of diesel generator are provided in Table 4-2.

Table 4-1: Maximum Limits of Ambient Air Pollutants according to Annex (5) of the Modified ERs of Law 4/1994 as well as the EU Maximum Limits

Pollutant	Area	Maximum Allowable limits			
		1 hr	8 hrs	24 hrs	1 year
Sulfur Dioxide ($\mu\text{g}/\text{m}^3$)	Industrial Areas	350	-	150	60
EU ¹⁴		350	-	125	20
WHO		-	-	125	-
WB EHS		-	-		
Carbon Monoxide (mg/m^3)	Industrial Areas	30	10	-	-
EU		-	10	-	-
WHO		-	-	7	-

¹⁴ <https://www.europarl.europa.eu/factsheets/en/section/193/environment-policy>

Pollutant	Area	Maximum Allowable limits			
		1 hr	8 hrs	24 hrs	1 year
<i>WB EHS</i>	-	-	-	-	-
Nitrogen Dioxide ($\mu\text{g}/\text{m}^3$)	Industrial Areas	300	-	150	80
<i>EU</i>		200	-	-	40
<i>WHO</i>		-		120	40
<i>WB EHS</i>		200			40
Total Suspended Particles ($\mu\text{g}/\text{m}^3$)	Industrial Areas	-	-	230	125
<i>EU</i>		-	-	-	-
<i>WHO</i>		-	-	-	-
<i>WB EHS</i>	-	-	-	-	-
PM_{10} ($\mu\text{g}/\text{m}^3$)	Industrial Areas	-	-	150	70
<i>EU</i>		-	-	50	40
<i>WHO</i>		-		150	70
<i>WB EHS</i>	-	-	-	150	70
$\text{PM}_{2.5}$	Industrial Areas			80	50
<i>EU</i>		-	-	-	-
<i>WHO</i>		-	-	-	-
<i>WB EHS</i>	-	-	-	75	35
Soot	<i>Industrial Areas</i>			150	60
<i>EU</i>	-	--	--	--	--
<i>WHO</i>	-	-	-	-	-
<i>WB EHS</i>	--	--	--	-	-
Lead	<i>Industrial Areas</i>			-	1
<i>EU</i>	-	--	--	--	--
<i>WHO</i>	-	-	-	-	-
<i>WB EHS</i>	--	--	--	-	-
Ammonia	<i>Industrial Areas</i>			120	-
<i>EU</i>	-	--	--	--	--
<i>WHO</i>	-	-	-	-	-
<i>WB EHS</i>	--	--	--	-	-

* The specified maximum limits of ambient air pollutants outlined above apply mainly to the construction phase of the proposed project.

* In cases where discrepancies exist between the national regulations and the EU Maximum Limits, projects are required to adhere to the more stringent standards.

Table 4-2: Maximum limits of air pollutants from generators

Pollutant	IFC Standards			Egyptian Standards	
	Maximum Limit for Emissions (mg/m³ from exhaust)			Maximum Limit for Exhaust Emissions (mg/m³)	
	Natural Gas	Diesel		Natural Gas	Diesel
Carbon monoxide (CO)	N/A	N/A		150	250
Sulphur dioxide (SO₂)	N/A	3%		100	400
Nitrogen oxides (NOx)	200 (spark ignition)	Bore Size Diameter < 400 mm	1,600	600	600
	400 (dual fuel)	Bore Size Diameter ≥ 400 mm	1,850		
	1,600 (pressure ignition)				
Total Particulates	N/A	100%		50	100

The specified maximum limits outlined above are mainly relevant to the construction phase of the proposed Project, during which these air pollutants are expected to be emitted.

4.2.2 xxx Electromagnetic Field (EMF)

Egyptian regulations do not establish specific exposure limits for electric and magnetic fields (EMF). Therefore, the project adopts the exposure limits for the general public provided in the IFC Environmental, Health, and Safety (EHS) Guidelines for Electric Power Transmission and Distribution, which are based on the recommendations of the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

Table 4-3::ICNIRP exposure limits for general public exposure to electric and magnetic fields.

Frequency	Electric Field (V/m)	Magnetic Field (μT)
50 Hz	5000	100
60 Hz	4150	83
Source: ICNIRP (1998) : "Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz).		

4.2.3 Noise

Article 42 of Law 9/2009 and Article 44 of its modified ER (1095/2011), provide the maximum permissible limits for noise levels. Table 4-4 below provides the maximum permissible limits for noise intensity in different areas according to Annex 7 of the ER replaced by Decree 2466/2024, and the EU Environmental Noise Directive 2002/49/EC.

Table 4-4: Maximum Limit Permissible for Noise Level in the Different Zones according to Annex (7) of the Modified ERs of Law 4/1994 as well as EU Maximum Limits

Type of zone	The permissible limit for noise level, dB (A)	
	Day time 7 am – 10 pm	Night 10 pm – 7 am
Areas on roads whose width is 12 m or more, or industrial areas which comprise light industries and other activities	70	60

Type of zone	The permissible limit for noise level, dB (A)		
	Day time 7 am – 10 pm	Night 10 pm – 7 am	
EU (Mixed commercial and industrial areas)	Day-time	Evening-time	Night-time
	68	63	58
	During Construction Activities: Up to 70 dBA during the day.		
WB EHS (industrial areas)	70	70	

* The specified maximum limits outlined above apply to the construction phase of the Proposed Project.

* In cases where discrepancies exist between the national regulations and the EU and WB Maximum Limits, projects are required to adhere to the more stringent standards.

4.2.4 Non-Hazardous Solid Wastes

Chapter 4 of Egypt's Waste Management Law 202/2020 and its ERs 722/2022 and 1113/2024 address the requirements for the solid waste management framework, including collection, transportation, storage, and disposal:

- Article 15: Waste generators must minimize waste, promote reuse, ensure recycling and safe disposal, and manage waste without harming public health or the environment.
- Article 16: Waste generators bear the cost of integrated, safe waste management.
- Article 20: Open burning of waste is prohibited.

Article 36 of the executive regulation addresses construction waste management through contracting licensed contractors and proper storage of construction material/waste.

Additionally, Law 9/2009 and its ERs (Articles 39 and 41) address precautionary measures, ensuring proper waste handling and environmental protection.

Non-hazardous waste management requirements apply throughout the project lifecycle, from construction through operation and decommissioning phases.

4.2.5 Hazardous Materials and Wastes

Law No. 202/2020 and its ERs, Nos. 722/2022 and 1113/2024, introduced specific requirements for hazardous waste management.

Chapter Five of Law No. 202/2020, in conjunction with Articles 50 to 54 of ERs No. 722/2022, delineates the protocols for hazardous waste management process, including comprehensive record-keeping and disposal methodologies.

Hazardous material management apply throughout the construction and operation phases of the proposed project.

Hazardous waste management requirements apply throughout the lifecycle of the proposed project. Yet, larger quantities of hazardous waste are expected to be generated during construction phase compared to the operation phase.

4.2.6 Registers/ Records

Environmental Register:

According to Article 22 of Law No. 9 of 2009, amending Law No. 4 of 1994, and Article 17 of its modified ER 2466/2024, all establishments are mandated to maintain comprehensive

environmental registers. The specific content of these registers is outlined in Article 17 and Annex 3 of the Executive Regulation.

Hazardous Materials & Waste Register:

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

In addition, in accordance Appendix (3) of the ERs of Law No. 4/1994, and Article 50 and Appendix (7) of the ER of Law No. 202/2020 on waste management and its ERs (654/2021), establishments generating hazardous waste shall maintain a register of this type of waste that explains the method of disposal and the companies responsible for waste management.

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4.2.7 Biodiversity Protection

Article 28 of the Environmental Law No. 4 of 1994 is a crucial provision for wildlife protection. It explicitly prohibits the hunting, killing, or capturing of specific wild animals and plants, particularly those that are endangered or essential for maintaining the natural ecological balance.

This article aims to safeguard biodiversity by preventing the depletion of species at risk of extinction or those playing a critical role in their ecosystems.

The protection measures extend to habitats and ecosystems, ensuring the preservation of both flora and fauna that contribute to environmental stability. Additionally, this article empowers authorities to enforce these prohibitions and take necessary actions to protect wildlife from illegal activities.

Furthermore, Annex 4, as amended by ERs 1095 of 2011 of the Environmental Law No. 4 of 1994, lists the specific species of wild animals and plants protected under the law. These species are prohibited from being hunted, killed, or captured due to their ecological importance and the need for their conservation.

▪ **First:**

Wild birds, animals, and other terrestrial or aquatic creatures, or any parts or derivatives thereof, are prohibited from being hunted, killed, traded, bred, possessed, transported, exported, or imported, whether alive or dead prohibition specifically includes:

- All wild birds, except those that are permitted under clause (1) of article 28 to be hunted in accordance with their designated seasons and within the allowed quantities.
- The Prohibited Animal Species (Mammals) under clause (1) of Article 28
- The Prohibited Animal Species (Amphibians and Reptiles) under clause (1) of Article 28:

Additionally, it is prohibited to kill or capture wild birds, animals, and aquatic creatures in areas where such actions would result in the destruction or alteration of their natural habitats. This includes areas of significant importance for resident and migratory wild birds,

such as wetlands, natural lakes, the Nile River system, migration routes, and movement corridors of resident birds. The prohibition also applies to areas designated under the Ramsar Convention, to which the Arab Republic of Egypt is a party, as well as currently declared nature reserves and those that may be declared in the future by a decision from the Prime Minister under Law No. 102 of 1983.

- **Second:** Flora is forbidden to be collected, imported, exported, cultivated, or commercialized. This includes wild plant species related to trade, specifically those listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to which the Arab Republic of Egypt is a party, according to Article 28.
- **Third:** Endangered Animal or Plant Species or Those Cultivated Outside Their Natural Habitats Without a License:

According to Article 28 of the law, it is prohibited to cultivate or breed endangered animal or plant species, or those that are grown or raised outside their natural habitats, without obtaining a license from the Environmental Affairs Agency. This provision ensures that such activities are regulated to prevent potential harm to the species and their ecosystems.

Furthermore, in accordance with Article 3 of Law 102 of 1983 Concerning Natural Protected Areas, it is strictly prohibited to undertake any activities, actions, practices, or experiments in the zones surrounding a protected area. These zones are designated by a decision from the competent minister, following a proposal from the Environmental Affairs Agency at the Council of Ministers. Such activities are only permissible if a permit has been granted by the relevant administrative authority, particularly if they have the potential to impact the environment of the protected area or its natural features.

In addition, Law 53 of 1966 (the Law of Agriculture) is also concerned with biodiversity. Article 117 prohibits the hunting of birds and other wild animals useful to agriculture. It also bans the trading, killing, and destruction of their nests. Minister of Agriculture Decree 28 of 1967 (amended by Decree 1227 of 1988) specifies the species of birds and other wild animals under protection covered by Article 117 of Law 53/1966.

These requirements apply to the proposed project, although, as described in Chapter 4, the proposed project area does not include a significant biodiversity.

4.2.8 Cultural Heritage

Law 117 of 1983 promulgating the Antiquities' Protection Law, as amended by Law 3/2010, 61/2010, 91/2018, and 20/2020, serves as the cornerstone for safeguarding archaeological and historical sites.

The Ministry of Tourism and Antiquities (MOTA) is the primary authority responsible for overseeing all archaeological activities.

This legislation provides the primary legal framework for the preservation of archaeological and historical sites.

According to Article 5 of the law, MOTA is the designated authority responsible for supervising all archaeological activities and sites within the country.

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

These requirements do not apply to the proposed project. No cultural heritage components are expected. Moreover, there are no registered archeological sites within or in close proximity to the proposed project location. However, chance finds plan would be developed for the construction activities.

4.2.9 Work Environment

A. Workplace emissions

The new Egyptian Labor Law 14/2025¹⁵, alongside Minister of Manpower and Immigration's Decisions 134/2003 and 211/2003, establish comprehensive guidelines in Egypt for occupational safety, health, and a secure work environment.

The Ministerial Decree 134/2003 requires that facilities hiring more than 50 employees to establish an occupational health and safety department to be responsible for the workplace and employees' safety and provide the necessary equipment for measuring and monitoring pollution in the work environment.

Besides, Ministerial Decree 211/2003 of the Ministry of Manpower addresses the requirements to prevent adverse physical, chemical, and mechanical hazards and dynamic electricity hazards in the workplace and requires keeping medical surveillance records for the employees.

B. Workplace Noise

Table 4-5 provides the maximum noise levels in the workplace, as indicated in Table 1 in Annex 7 of the ER 710/2012 of Law 4/1994.

Table 4-5: Maximum Noise Levels within Workplace (dB (LAeq))

Type of Place and Activity	Exposure Period (hours)	Maximum Noise Level dB (LAeq)
Workplace (workshops and factories) (licensed starting from 2014)	8	85
Administrative offices - Workrooms for computers, typewriters, and similar equipment	--	65
Workrooms for activities requiring routine mental concentration - control rooms	--	60

¹⁵ The new labor law 14/2025 is entered into force by 1 September 2025, replacing the previous Law No. 12 of 2003. The updated executive decrees of the law are not issued yet.

C. Occupational health and safety

Based on the Ministerial Decree 134/2003, facilities with more than 50 workers should establish an occupational health and safety structure/department, which is responsible for health and safety issues and will undertake all related responsibilities, and should undertake daily inspections to detect hazards and risks.

D. Work Environment Health and Safety

The Egyptian Labour Law number 14/2025 organizes working conditions and management of worker relationships. The law in its different articles; addresses the individual labour contracts, terms of employment, wages and leaves, collective negotiations and collective labour agreements, and litigations as well as vocational training are addressed in sections one to four. The occupational health and safety requirements are addressed in Book Four of the Labour Law.

E. Noise in the workplace

Law 4 /1994 (amended by Law 105/2015) sets the maximum permissible noise levels within the workplace (in dB) in Annex 7 of the Executive Regulation (amended by decrees 710/2012, 964/2015, and 2466/2024).

If the noise level is more than 85 dB in workplaces with up to 8 working hours, the facility is obliged to reduce the exposure time by half with each increase in noise level by 3 dB with appropriate earplugs.

F. Employment organization

The Egyptian Labour Law 14/2025 organizes employment terms, working conditions, and management in Book 2 and Book 3 of the Labour Law, as follows:

Book 2 – Employment Organization:

- Definition and classification of employment contracts (fixed-term, unlimited-term)
- Conditions for employment and required contract formalities
- Work patterns including emerging/non-traditional forms (e.g., part-time, remote, job-sharing)
- Employer and employee registration obligations, data submission, and record-keeping
- Equal opportunity, non-discrimination, and prohibition of forced labour
- Employee file maintenance, electronic format recognition, retention periods
- Working hours, overtime arrangements, rest periods
- Leave entitlements (annual leave, maternity, paternity, casual)
- Health, safety, and welfare obligations of the employer toward employees
- Provisions concerning disabled groups or “people of determination”

Book 3 – Termination, Disputes & Special Employment Cases:

- Termination of employment contracts: notice periods, severance, end-of-service benefits
- Grounds for summary dismissal (gross misconduct) and procedural safeguards
- Resignation procedures and right of withdrawal
- Treatment of absence without justification (voluntary resignation concept)
- Recognition of work arrangements in the context of termination and rights

- Labour dispute resolution: specialized labour courts, timelines, and processes
- Employment of foreign workers: permits, terms, regulations
- Special employment categories and protections (women, minors, workers with disabilities)
- Employer obligations in organizational changes (downsizing, restructuring)
- Transitional provisions and application of the law to existing contracts

G. Child labour

According to Articles 62, 63, 64, and 65 of the Labor Law 14/2024, Chapter 4 of Book 2: Rules for the Employment and Training of Children, it is prohibited to employ children before the age of 15. However, they may be trained once they reach the age of 14, provided that this does not prevent them from continuing their education. The employment or training of children must be in accordance with a decree issued by the competent minister in coordination with the National Council for Childhood and Motherhood.

It is also prohibited to employ or train children in jobs, professions, and industries that may endanger their physical or psychological health, safety, or morals. These jobs, professions, and industries, according to different age groups, will be issued by the decree of the competent minister, in coordination with the National Council for Childhood and Motherhood. Until the updated decree is issued, Decree 215/2021 regarding the child employment and training system is implemented.

According to Article 66 of Labour Law 14/2025, It is the responsibility of the employer who employs one or more children to consider the following:

1. To post a copy of the provisions of this chapter in a visible place at the workplace.
2. To prepare a record indicating working hours and rest periods, approved by the relevant administrative authority (labour office).
3. To inform the relevant administrative authority of the names of the working children, the tasks assigned to them, and the names of the individuals responsible for monitoring their work.
4. To provide separate accommodation for children away from adults, in accordance with the regulations and provisions issued by the competent minister, and it is strictly prohibited for the child to stay overnight at the workplace.

H. Disabled groups

Egyptian Law No. 10 of 2018 amended by Law 156/2021 on the Rights of Disabled groups aims to ensure the rights and inclusion of disabled groups in society. The law mandates non-discrimination, equal opportunities equal employment opportunities based on their qualifications, and accessibility in various aspects of life, including education, employment, and public services. Key provisions of articles 21,22, and 23 from Law No. 10 of 2018, include:

- o Job Placement: The Ministry of Manpower is responsible for creating a registry of job-seeking individuals with disabilities and assisting them in finding suitable employment.
- o Employer Quotas: Employers with 20 or more employees must hire at least 5% of their workforce from people with disabilities.
- o Tax Incentives: it includes a 50% increase in the personal exemption for disabled groups or their caregivers. Employers who hire beyond the 5% quota receive additional tax benefits.

In addition, Article 37 of Labour Law 14/2025 requires facilities to keep a special register of disabled groups and dwarfism and report on their employment and wages. The facility must also notify the authority with a statement that includes the total number of employees, the number of jobs occupied by people with disabilities and dwarfism, and the wages they receive, following a template and schedule set by the minister.

I. Equal opportunities

Article 9 of the Egyptian Constitution stipulates that the country is committed to achieving equal opportunities for all citizens, without any form of discrimination.

Article 35 of Labour law 14/2025 states that it is prohibited to cluster wages based on cultural, religious, or gender.

Law 10/2018 related to the rights of people with disabilities is concerned with provision of equal rights to this group. It includes their rights to have a life insurance, social insurance, freedom in choices, chances of work opportunities that do not surpass their physical disability limit.

J. Women's Workplace Safety and Night Shifts

According to the Labour Law 14/2025:

Article 53: Applies all employment provisions to women without discrimination; mandates equal pay for equal value of work among men and women.

Article 59: Requires employers who employ one or more female workers to post the "Women's Employment Regulations" in the workplace, which must address flexible working hours or remote work for women caring for children with disabilities or dwarfism.

In addition, Decree No. 44 of 2021 issued by Egypt's Ministry of Manpower permits women, upon their request, to work night shifts in any establishment, provided that employers implement appropriate health, safety and transportation measures.

K. Protection from Harassment

Article 254 of Labour Law 14/2025 stipulates that facilities and their branches shall be obligated to provide a safe and non-hostile work environment, free from harassment, bullying, and violence, and to ensure the availability of effective means for prevention against such behaviours.

Anti-harassment Law No. 141/2021: This law, which modifies the 58/1937 Penal Law, strengthens legal protections against sexual harassment. It provides comprehensive safeguards for women against various forms of harassment, including unwanted sexual advances, physical or verbal conduct, online and electronic harassment, stalking behaviours, workplace harassment, and public transportation harassment. It also imposes stricter penalties on perpetrators, reflecting a growing recognition of the seriousness of this issue in Egypt.

L. Grievance

Article 103 of the Environmental law 4/1994

Grants every citizen and organization concerned with environmental protection the right to report any violations of the provisions of this law.

Article 85 of the Egyptian Constitution

All citizens have the right to address public authorities in writing and signed, but should not address it on behalf of groups, only as juridical persons.

M. Community Investment:

According to the Egyptian Investment Law 72/2017 indicated that towards achieving the goals of the sustainable development, investors may dedicate a percentage of their annual profits for social developments in one or more of the following fields:

- Environmental protection
- Areas of healthcare, social care, or cultural care;
- Support the technical education or the funding of research, studies in cooperation with any of the universities or scientific research institutions; and
- Training and scientific research.

Where investors have undertaken/implemented any community development investments, investors are required to submit to the General Authority for Investment and Free Zones an annual report supported by documents on community development activities.

N. Stakeholders Engagement**i) Public Consultation during ESIA Scoping**

The stakeholders consultation is to be undertaken twice during the ESIA preparation process for Category C projects (Category A according to international systems). The ESIA scoping phase aims to agree on the aspects and impacts that will be addressed and analysed in the ESIA study. Stakeholders' meetings could be held with each concerned party individually or can take the form of a unified meeting where the concerned parties are invited to attend the meeting together. The scoping stage is to result in:

- Obtaining the opinion of the concerned parties regarding the environmental and social aspects to be addressed by the project ESIA
- Indicate if there is a need to address additional E&S issues in the ESIA
- Identify additional concerned parties to be consulted, if any

ii) ESIA disclosure

After the draft ESIA is prepared and before its submission to the environmental authority, the ESIA disclosure is to take place¹⁶. The aim of disclosure is to present the result of the ESIA to the concerned parties with the opportunity to be reassured that their relevant concerns, raised during the scoping stage, have been addressed in the ESIA, as relevant, and to be comfortable with the proposed mitigation measures.

According to the national system, the disclosure meeting is to be held in a form of a unified meeting (a public hearing session) to which the representatives of all concerned parties are to be invited, and as a minimum those who have participated in the scoping stage. These include:

- Representatives of the EEAA

¹⁶ Other lower category projects are not required undertake public disclosure meetings

- Related government authorities
- Representatives of the Governorate and local units where the project is located
- Representative of affected groups including local businesses and communities, NGOs and civil society groups (as relevant to the project location, type and resulting impacts)
- Media representatives

iii) **Continuous Engagement**

The EIA guidelines emphasise on the importance of continual consultation/engagement with the surrounding community. It, however, does not specify/recommend the means for engagement.

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4.3 Strategic National Initiatives

▪ **Egypt National Climate Change Strategy (NCCS) 2050**

Egypt launched on 19/5/2022 the National Climate Change Strategy 2050. NCCS is a comprehensive roadmap designed to guide Egypt's efforts in addressing climate change. The strategy lays out five overarching goals, encompassing mitigation, adaptation, governance, financing, and scientific research. These goals are further divided into objectives and specific directions, each with corresponding performance indicators to track progress.

▪ **Nationally Determined Contribution (NDC)**

After Egypt signed the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement on the 22nd of April 2016 and ratified it on the 29th of June 2017, the Intended Nationally Determined Contribution (INDC) was considered Egypt's first NDC.

Egypt's updated NDC to the UNFCCC. It outlines Egypt's commitments to reducing GHG emissions and adapting to the effects of climate change between 2020 and 2030.

The NDC highlights Egypt's national circumstances, including its vulnerability to climate change impacts, especially in the Nile Delta, and its ambitious economic development goals. It presents a series of mitigation actions, focused on energy, oil and gas, transport, industry, buildings and urban cities, waste management, and tourism, with projected emission reductions for each sector.

In June 2023, Egypt revised its NDC. As part of its second revised NDC, Egypt has committed to reducing GHG emissions in the oil and gas sector by 2030 from 2,575 GgCO₂-eq under a business-as-usual (BAU) scenario to 0,89 GgCO₂-eq under a mitigation scenario. Egypt intends to reach this target through improving access to clean fuel in households and increasing the production and use of alternative green fuels (such as biofuels).

▪ **Egypt's National Strategy for the Empowerment of Egyptian Women 2030:**

Launched in 2017, this comprehensive strategy aims to advance women's empowerment across political, economic, and social domains, aligning with national and international development goals. Key pillars include:

- Political Empowerment: Increasing women's representation in leadership and decision-making positions.
- Economic Empowerment: Expanding economic opportunities for women through improved employment prospects and support for female entrepreneurship.
- Social Empowerment: Enhancing women's access to quality education, healthcare, and social services.
- Protection and Response: Preventing and addressing violence against women through multi-stakeholder efforts.

4.4 International Conventions

Egypt has been among the first countries to take an active interest in conserving biodiversity and preserving natural resources and heritage. In 1936, Egypt became a participant in the "Convention Relative to the Preservation of Fauna and Flora in their Natural State", London 1933. This was later followed by signing and ratifying conventions and agreements pertaining to the various aspects of biodiversity conservation. Those potentially relevant to the site include:

4.4.1 Biodiversity

- **Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), 1995**

The convention emphasizes the importance of migratory birds on the global biological diversity and that they highly depend on wetlands. Parties of this convention are expected to minimize disturbances as much as possible that can negatively impact migratory water birds when planning and constructing. Egypt ratified the convention on the 1st of January 1999.

- **United Nations Convention on Biological Diversity (UNCBD), Rio de Janeiro, 1992**

It recognizes the importance of biological diversity in offering ecosystem services such as recreational, ecological, economic, educational services, etc., and its importance in maintaining life. The convention emphasizes that countries and States are responsible for preserving their biological diversity and that specific human activities negatively affect their presence. Parties are expected to sustainably manage the surroundings of protected areas. Egypt signed this convention on the 9th of June 1992, ratified it on the 2nd of June 1994, and it entered into force on the 31st of August 1994.

- **Convention on the Conservation of Migratory Species of Wild Animals (CMS), Bonn Convention. 1979**

Globally, conserve aquatic, terrestrial, and avian migratory animals and it recognize their crucial role in the stability of the ecosystem. It also recognizes that all boundaries where the species occur or pass through need to be managed. Egypt ratified it on the 2nd of November 1982, and it entered into force on the 11th of January 1983.

- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973**

It is an international agreement between states that aims to ensure that international trade does not affect their survival. It recognizes the importance of international cooperation in controlling animal trade to avoid over-exploitation. It was put in effect on 1 July 1975. Egypt ratified the convention on 4 January 1978 and was put into force on 4 April 1978.

- **African Convention on the Conservation of Nature and Natural Resources, Algiers, 1968**

The convention recognizes the economic, social, cultural and environmental importance of natural resources including renewable and non-renewable resources as well as the soil, water, flora and fauna. It aims to promote and enhance environmental protection and to encourage sustainable use of natural resources and to synchronize policies in different fields. It requires all parties to adopt measures to reach these aims. It requires all parties to implement preventative measure to avoid land degradation and soil deterioration. It also requires parties to sustainably manage their water resources and to prevent pollution and excessive abstraction of the water. In addition, it requires that parties maintain and enhance genetic diversity and floral cover. Egypt signed this convention on the 15th of September 1968, ratified it on the 12th of April 1972 and it entered into force on the 12th of May 1972.

4.4.2 Climate change

- **Paris Agreement for strengthening global response to climate change threats, 2016**

Brings together nations to fight climate change and adapt to it while helping developing countries to do so without ignoring their national objectives. It globally aims to keep an overall temperature rise of less than 2° C this year and to pursue more efforts to lower the increase of rise even further by 1.5 ° C. Although the agriculture sector is not mentioned explicitly in the agreement, it does mention efforts to adapt to climate change and resilience in a manner that do not hinder food production. Egypt signed the agreement on the 22nd of April 2016 and ratified it on the 29th of June 2017.

- **United Nations Framework Convention on Climate Change, 1992**

It provides an intergovernmental framework to face climate change issues. Recognizing that the climate is a common shared resource affected by anthropogenic human emissions. It recognizes the importance of marine environments as well as terrestrial ones in acting as reservoirs for Carbon and GHG. It also emphasizes the importance of scientific, economic and practical sectors in tackling climate change problems and the importance of continuous monitoring and assessment. In addition, it promotes the diffusion and transfer of technologies that reduce anthropogenic emissions of GHG in sectors including agriculture and industry. Egypt signed this convention on the 9th of June 1992 and ratified it on the 5th of December 1994. It entered into force on the 5th of March 1995.

- **Kyoto Protocol setting internationally binding emission reduction targets, 1997**

The protocol aims to commit its joined parties to specific international emission targets and aims to strengthen the global response to the temperature rise. It recognizes that currently developed countries are the main cause of the presently high emissions of GHG in the atmosphere, a result of 150 years. It provides flexibility on how the countries reach

their target (e.g., increase in forests to compensate for their emissions). In addition, the protocol requires parties to promote sustainable agriculture practices while taking into consideration the climate change factor. Egypt signed this protocol on the 15th of March 1999 and ratified it on the 12th of January 2005. It entered into force on the 12th of April 2005 as an agreement to the UNFCCC convention.

4.4.3 Cultural Heritage

- **Convention for the Safeguarding of the Intangible Cultural Heritage, 2003**

The Convention for the Safeguarding of the Intangible Cultural Heritage is a UNESCO treaty adopted by the UNESCO General Conference on 17 October 2003, which entered into force in 2006. The “intangible cultural heritage” means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artifacts, and cultural spaces associated therewith – that communities, groups, and in some cases, individuals recognize as part of their cultural heritage. The purposes of the convention are: (a) to safeguard the intangible cultural heritage; (b) to ensure respect for the intangible cultural heritage of the communities, groups, and individuals concerned; (c) to raise awareness at the local, national, and international levels of the importance of the intangible cultural heritage, and of ensuring mutual appreciation thereof; and (d) to provide for international cooperation and assistance. Egypt ratified the convention on 3 August 2005. Article 13 of the convention states that “to ensure the safeguarding, development, and promotion of the intangible cultural heritage present in its territory, each State Party shall endeavor to adopt a general policy aimed at promoting the function of the intangible cultural heritage in society, and at integrating the safeguarding of such heritage into planning programs”.

- **Convention for the Protection of the World Cultural and Natural Heritage, 1972**

The General Conference of the UNESCO meeting was held in Paris from 17 October to 21 November 1972, at its seventeenth session.

- Egypt ratified the convention on the 7th of February 1974.
- The convention sets guidelines for parties to help them identify locations that can be world heritage sites and means to conserve them.
- The convention provides management guidelines and possibly financial assistance.
- Moreover, raising awareness and education is also encouraged to improve the protection of those sites.

4.4.4 Work Environment

The ILO conventions are international standards that complement national labor laws. The following international standards are crucial in creating a safe, fair, and non-discriminatory work environment that respects and protects the rights of all workers.

Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87):

This convention guarantees workers and employers the right to form and join organizations of their choosing without prior authorization.

Right to Organise and Collective Bargaining Convention, 1949 (No. 98):

This convention provides protection against anti-union discrimination and promotes voluntary negotiations between employers and workers to determine wages and working conditions through collective bargaining.

Forced Labour Convention, 1930 (No. 29) and its 2014 Protocol:

This convention aims to suppress all forms of forced or compulsory labour. The 2014 Protocol strengthens the measures to prevent forced labour and provides protection and remedies for victims.

Abolition of Forced Labour Convention, 1957 (No. 105):

This convention calls for the immediate and complete abolition of forced or compulsory labour in all its forms, particularly for political coercion, economic development, labour discipline, or racial, social, national, or religious discrimination.

Minimum Age Convention, 1973 (No. 138):

This convention sets the minimum age for admission to employment and work, ensuring that children are not exposed to work environments that can harm their health, safety, or morals.

Worst Forms of Child Labour Convention, 1999 (No. 182):

This convention focuses on eliminating the worst forms of child labour, including slavery, forced labour, trafficking, prostitution, and any work that is likely to harm the health, safety, or morals of children.

Equal Remuneration Convention, 1951 (No. 100):

This convention mandates equal remuneration for men and women workers for work of equal value, aiming to reduce gender pay gaps and promote economic justice.

Discrimination (Employment and Occupation) Convention, 1958 (No. 111):

This convention seeks to eliminate discrimination in employment and occupation based on race, color, sex, religion, political opinion, national extraction, or social origin.

Occupational Safety and Health Convention, 1981 (No. 155):

This convention aims to ensure that occupational safety and health measures are in place to protect workers from workplace hazards and promote safe working environments.

Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187):

This convention provides a framework for continuously improving occupational safety and health systems to prevent workplace accidents and diseases, fostering a culture of prevention.

4.5 International Standards and Guidelines

In addition to complying with Law 4/1994, the ESIA study has been prepared in accordance with the requirements of international financial institutions, particularly the EBRD and the AfDB for projects seeking funding.

The sections below provide a summary of the International E&S Requirements.

4.5.1 African Development Bank Group's Operational Safeguards (AFDB OS)

The Bank has defined the E&S Operational Safeguards (OSs), as part of its Integrated Safeguards System (ISS 2023), which are designed to maximize positive impacts and to avoid, minimize, reduce, mitigate or compensate for the adverse E&S risks and impacts of projects, including those related to climate change.

OS1: Assessment and Management of Environmental and Social Risks and Impacts

It addresses how the borrower will address the environmental and social risks and impacts of the project throughout the project life cycle to meet the requirements of the Environmental and Social Safeguards (ESSs) in a manner and within a time frame acceptable to the Bank.

This safeguard is applicable to most projects and applies to the proposed project.

OS2: Labor and Working Conditions

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

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

OS3: Resources Efficiency and Pollution Prevention and Management

It recognizes that economic activities often cause air, water, and land pollution and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. It sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle in a manner consistent with GIIP.

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

OS4: Community Health, Safety and Security

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

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

OS5: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement

It recognizes that involuntary resettlement should be avoided, and where involuntary resettlement is unavoidable, it will be minimized, and appropriate measures to mitigate adverse impacts on displaced persons (and on host communities receiving displaced persons) will be carefully planned and implemented.

This safeguard does not apply to the proposed project since the activities will not involve any involuntary resettlement or change in the land use.

OS6: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources

It recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. Also, recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support in a changing climate, and the need to consider the livelihoods of project-affected parties. Also, addresses the sustainable management of primary production and harvesting.

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

OS7: Vulnerable Groups

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

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

OS8: Cultural Heritage

It sets out measures designed to protect cultural heritage throughout the project life cycle.

In case of chance finds, the procedures outlined in the Egyptian Antiquities Law No. 117 of 1983 will be followed.

Although no cultural heritage components are anticipated within the project site, the archaeological sites near the proposed project location will be addressed in the ESIA.

OS9: Financial Intermediaries

It recognizes that strong domestic capital and financial markets, and access to finance are important for economic development, growth, and poverty reduction. Also, it addresses the E&S requirements associated with intermediated financing through financial and nonfinancial institutions.

This safeguard is not applicable to the present project.

OS10: Stakeholder Engagement and Information Disclosure

It recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice.

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

Table 4-6 summarizes the applicability of AfDB OS

Table 4-6: Applicability of AfDB OS

AfDB OS Standard	Applicability
OS 1: Assessment and Management of Environmental and Social Risk and Impact	OS1 Applicable, as the project requires assessment and management of environmental and social risks and impacts.
OS 2: Labour and Working Conditions	OS2 Applicable due to occupational health and safety risks, traffic safety concerns, labour management requirements, and the need to prevent child labour.
OS 3: Resources Efficiency and Pollution Prevention and Management	OS3 Applicable as the project may generate air emissions, noise, waste (including hazardous waste), and involve the use of hazardous materials.
OS 4: Community Health, Safety and Security	OS4 Applicable due to potential impacts on nearby communities and road users during construction and operation..
OS 5: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement	OS5 Not applicable, as no physical or economic displacement is anticipated
OS 6: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources	OS6 Applicable due to potential impacts on habitats, flora, and fauna within the project area.
OS 7: Vulnerable Groups	OS7 Not applicable, as no Indigenous Peoples, as defined by AfDB, are present in Egypt.
OS 8: Cultural Heritage	OS8 Applicable. Chance find procedures will be implemented during construction.
OS 9: Financial Intermediaries (NEW STANDALONE OS — ISS 2023)	OS9 Not applicable, as the project does not involve financial intermediaries.
OS 10: Stakeholder Engagement and Information Disclosure	OS10 Applicable, as stakeholder consultation and information disclosure are required throughout the project lifecycle.

A gap analysis between the applicable African Development Bank (AfDB) Operational Safeguards (OSs) under the Integrated Safeguards System (ISS, 2023) and the relevant Egyptian environmental and social regulatory framework is presented in Annex (2).

4.5.2 EBRD Environmental and Social Requirements

The Project will comply with the European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy (2024). The project is anticipated to be classified as a Category A undertaking, due to the potential for significant environmental and social risks. Accordingly, a full ESIA, robust stakeholder engagement process, and public disclosure are required.

Below summarizes the relevance and applicability of each EBRD Environmental and Social Requirement (ESR) to the proposed project.

ESR 1: Assessment and Management of Environmental and Social Risks and Impacts

This requirement establishes the overarching framework for identifying, evaluating, and managing environmental and social risks. It mandates the development of an Environmental and Social Management System (ESMS), supported by an ESIA and Environmental and Social Management Plan (ESMP). Stakeholder engagement and application of the mitigation hierarchy are fundamental components.

This requirement is relevant to most projects and applies to the proposed project.

ESR 2: Labour and Working Conditions

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

This ESR applies to the proposed project during the different phases; more specifically regarding employment opportunities as well as ensuring the safe environment of the workplace. The PR also addresses suppliers and contractors monitoring¹⁷. In this respect, companies should identify the roles, impacts, and risks associated with their supply chain concerning labour issues (child and forced labour and significant occupational health and safety risks).

ESR 3: Resource Efficiency and Pollution Prevention and Control

This ESR promotes pollution prevention, efficient resource use, and adherence to Good GIIIP. It addresses air and water emissions, waste management, and greenhouse gas mitigation.

The requirement applies to the potential emissions and wastes (solid and liquid) of the proposed project from different sources during the construction and operation phases and their potential impacts.

ESR 4: Health, Safety, and Security

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

The nearest community to the proposed Energy Valley facility Grid Connecting OHTL is New Minya City, located approximately about 12 km from the project site. And the nearest

¹⁷ Where the companies can reasonably exercise control, the client should collaborate with its primary suppliers to propose mitigation measures proportionate to identified risks on a case-by-case basis, while recognizing that assessing and addressing supply chain implications beyond the first or the second-tier suppliers may not be practical or meaningful to the client or the supplier. IFC Guidance Note 1, 2012

community to the Naseeg Sarirya substation and its connecting OHTL is Sarirya village situated at about 11 km. This ESR applies to the proposed project.

ESR5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement

This ESR ensures that any displacement is minimized and that affected individuals are compensated fairly. It mandates meaningful consultation and livelihood restoration where applicable.

The provisions of this requirement do not apply to the proposed project, as the activities will not involve any involuntary resettlement or changes in land use.

ESR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

This performance requirements addresses how projects¹⁸ can avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources.

As a significant part of the ESIA, the biological baseline in the project area is to be described. Preliminary information about the proposed project area indicates the absence of significant ecological diversity. Yet, the ESIA will describe the different habitats and biodiversity surrounding the area and investigate the potential project impact on them, where/if applicable. This ESR applies to the proposed project

ESR 7: Indigenous Peoples

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

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

ESR8: Cultural Heritage

The objective of this performance standard is to protect the cultural heritage from the adverse impacts of the project activities and support its preservation.

This ESR applies to the proposed project. Although there are no registered antiquities or cultural heritage sites within the Project Site. However, the archaeological sites and monuments located in close proximity to the Project Site will be addressed in the ESIA.

ESR10: Information Disclosure and Stakeholder Engagement

Sets out the principles and requirements for meaningful stakeholder engagement throughout the lifecycle of a project. It aims to ensure transparency, inclusivity, and responsiveness by requiring the early disclosure of relevant project information, ongoing consultation with affected communities and stakeholders, and the establishment of accessible grievance mechanisms.

¹⁸ Where a client is purchasing primary production (especially but not exclusively food and fiber commodities) that is known to be produced in regions where there is a risk of significant conversion of natural and/or critical habitats, systems and verification practices will be adopted as part of the client's ESMS to evaluate its primary suppliers.²¹

This ESR applies to the proposed project.

4.5.3 European Investment Bank (EIB)

The European Investment Bank (EIB) applies eleven Environmental and Social Standards (2023) to ensure that projects it finances are environmentally sound, socially responsible, and aligned with EU and international commitments.

Standard 1: Environmental and Social Impacts and Risks

This Standard promotes an integrated approach to impact assessment and risk management, ensuring environmental, climate, social, and human rights considerations are addressed in decision-making. It mandates the establishment of an ESMS by the promoter. The process involves: Identifying and assessing likely significant effects, including direct, indirect, secondary, cumulative, and transboundary effects. Applying the mitigation hierarchy (avoid, prevent, reduce, and, if necessary, remedy/compensate) to manage adverse effects. Integrating human rights risks into the assessment. Ensuring consistency with the "Do Not Significant Harm" (DNSH) and "Minimum Safeguards" (MS) principles. Projects likely to have significant impacts must undergo an EIA (in the EU) or ESIA (in the rest of the world).

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

Standard 2: Stakeholder Engagement

This Standard recognizes the importance of stakeholder engagement for effective assessment, management, and monitoring of risks, enhancing project sustainability. It outlines the promoter's responsibility for transparent and continuous engagement. The core objectives are: Adopting an inclusive and systematic approach to engaging constructively with affected persons and communities. Ensuring stakeholders have timely access to information about project risks/impacts in a culturally appropriate and understandable manner. Promoting meaningful and free participation in decision-making. Providing rights-holders with effective grievance and remedy mechanisms. The nature and extent of engagement must be commensurate with the project's likely impacts and risks.

This standard is relevant to the current one.

Standard 3: Resource Efficiency and Pollution Prevention

This Standard promotes the goal of zero pollution and transitioning to a circular economy. The primary responsibility is ensuring an integrated approach to resource efficiency and control of emissions (air, water, land, noise). Key areas of focus include: Assessing the effectiveness and efficiency of resource use (materials, land, soil, water, energy). Promoting waste prevention, reuse, and recycling in accordance with the waste hierarchy. Using Best Available Techniques (BAT). Establishing management systems for Emergency Prevention, Preparedness and Response to major accidents (e.g., related to dangerous substances). Ensuring the sound management of hazardous substances and materials.

The standard applies to the potential emissions and wastes (solid and liquid) from different sources during the construction and operation phases and their potential impacts.

Standard 4: Biodiversity and Ecosystems

This Standard focuses on protecting and conserving biodiversity and maintaining ecological functions. It recognizes the link between ecosystem degradation and disproportionate impacts on vulnerable communities. The objectives are: Applying the precautionary approach to avoid irreversible impacts. Applying the mitigation hierarchy (avoid, minimize, restore,

compensate) to achieve No Net Loss or a Net Positive Impact (NPI) on biodiversity where required. Promoting the use of an ecosystem-based approach. Prohibiting project-related activities in areas of critical habitat unless rigorous conditions are met, ensuring no measurable adverse impacts or net reduction in vulnerable species population.

Standard 5: Climate Change

This Standard addresses the urgency of combating climate change through mitigation (reducing GHG emissions) and adaptation (building resilience). It promotes alignment with the Paris Agreement goals. Promoter responsibilities include: Assessing project-related GHG emissions and alignment with low-carbon pathways. Assessing the project's resilience to physical climate risks (acute and chronic hazards). Where a project is at risk, carrying out a Climate Risk and Vulnerability Assessment (CRVA) to identify commensurate adaptation measures. Ensuring consistency with the "Do No Significant Harm" (DNSH) principle to climate objectives.

Standard 6: Involuntary Resettlement

This Standard applies to displacement—both physical displacement (loss of residence) and economic displacement (loss of income/livelihood)—resulting from involuntary land acquisition or use restriction. The primary goals are: To avoid or minimize involuntary resettlement. To avoid any forced evictions (which are considered a gross violation of human rights). To improve or at least restore displaced persons' livelihoods and living standards to pre-project levels. Mandating timely compensation for loss of assets at the full replacement cost. Planning documents must be prepared, such as a Resettlement Action Plan (RAP) or Livelihood Restoration Plan (LRP).

This standard does not apply to the proposed project.

Standard 7: Vulnerable Groups, Indigenous Peoples, and Gender

This Standard addresses individuals and groups who may be disproportionately affected by risks due to systematic discrimination, marginalisation, and/or exclusion based on socioeconomic characteristics (e.g., gender, age, disability, ethnicity). The objectives are: To address inequalities and facilitate equitable access to mitigation and benefits. Requiring promoters to adopt a gender-responsive approach to identifying, managing, and monitoring impacts. For Indigenous Peoples: Ensuring respect for their rights, identity, culture, and livelihoods. In required cases (e.g., impacts on customary lands or cultural resources), promoters must obtain Free, Prior, and Informed Consent (FPIC).

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

Standard 8: Labour Rights

This Standard establishes minimum requirements aligned with the principles of the ILO Fundamental Conventions and the European Pillar of Social Rights. It applies to direct workers, third-party workers (contractors/intermediaries), and supply chain workers. Key requirements include: Ensuring non-discrimination and equal opportunity in employment decisions. Implementing zero tolerance for forced labor and child labor. Respecting the rights to freedom of association and collective bargaining, and establishing a written employment contract for all workers. Setting up an effective, gender-responsive grievance mechanism for workplace concerns.

This standard applies to the proposed project during the different phases, more specifically regarding employment opportunities, as well as ensuring the safe environment of the workplace.

Standard 9: Health, Safety, and Security

This Standard covers occupational and public health, safety, and security risks arising from project activities. It requires promoters to put in place a Health and Safety Management System (HSMS). The objectives focus on: Protecting the health, safety, and security of project workers (including third parties and considering gender-specific risks). Managing risks to project-affected people and communities (including sexual harassment, exploitation, and abuse). Ensuring the use of public or private security forces is consistent with international human rights standards (e.g., the UN Voluntary Principles on Security and Human Rights)

This standard is relevant to the current one

Standard 10: Cultural Heritage

This Standard emphasizes the protection and conservation of both tangible and intangible cultural heritage. The core objective is the application of a precautionary approach to managing and protecting cultural heritage. Key actions include: Avoiding significant adverse impacts on cultural heritage; if unavoidable, minimizing them and providing compensation as a last resort. Engaging professionals to compile a baseline inventory and assess cultural significance. Establishing chance finding procedures for unexpected discoveries during implementation. Ensuring equitable sharing of benefits when commercializing cultural resources used by local communities

There are no registered antiquities or cultural heritage sites within the Project Site. However, the archaeological sites and monuments located in close proximity to the Project Site will be addressed in the ESIA.

Standard 11: Intermediated Finance

This Standard applies when EIB financing is channelled through Financial Intermediaries (FIs) to support smaller sub-projects. The FI's process for assessing, managing, and monitoring ECS risks must be commensurate with the sub-project's risk level. General requirements for FIs include: Respecting their own employees' labour rights and providing a safe working environment and requiring final beneficiaries to comply with applicable national and EU legislation (or EIB ESS outside the EU). Operating processes to screen sub-projects against the EIB's excluded activities list. Ensuring rights-holders have access to stakeholder engagement and grievance mechanisms.

This standard is not applicable to the present project.

4.5.4 IFC E&S Performance Standards**PS1: Social and Environmental Assessment and Management System**

This performance standard establishes the importance of:

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

This PS is relevant to the proposed project. The current ESIA report is prepared satisfying PS 1.

PS2: Labor and Working Conditions

This performance standard emphasizes the relation between the economic growth and the well-being of a company in one side, and establishing a relationship with the workers as a valuable asset that requires a healthy and safe work environment as well as protection for basic rights of workers. It also recognizes the need for employment creation and income generation as an approach for economic growth.

This PS applies to the proposed project; more specifically related to the creation of job opportunities as well as ensuring the safe environment of the workplace.

PS3: Pollution Prevention and Abatement

This performance standard recognizes that industrial activities often generate increased levels of pollution to air, water, and land, which can have a potential adverse impact on the surrounding environment.

This PS applies to the potential generation of wastewater from different sources of the proposed project.

PS4: Community Health, Safety, and Security

This performance standard recognizes that the project activities and infrastructure can increase the potential for community exposure to risks and impacts arising from equipment accidents, structural failure, and releases of hazardous materials. Impacts may also arise from exposure to diseases and the use of safety and security personnel.

This PS applies to the proposed project during the construction and operation phase of the project.

PS5: Land Acquisition and Involuntary Resettlement

This performance standard recognizes that the project design minimizes economic and physical displacement, balancing social, environmental, and financial costs and benefits.

This PS does not apply to the proposed project since the activities will not involve any involuntary resettlement.

PS6: Biodiversity Conservation and Sustainable Natural Resource Management

This performance standard addresses how projects can avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources.

This PS applies to the proposed project, as the OHTLs are located in undeveloped desert area. Chapter 6 of this study discusses the mitigation measures needed for the biodiversity environment concerning the proposed project.

PS7: Indigenous Peoples

This performance standard aims at preventing adverse impacts of the projects on communities of Indigenous peoples and to provide opportunities for development benefits.

This PS does not apply to the proposed project since there are no indigenous communities in Egypt.

PS8: Cultural Heritage

The objective of this performance standard is to protect the cultural heritage from the adverse impacts of the project activities and support its preservation.

This PS does not apply to the proposed project as there are no recorded archaeological sites within the Project site.

4.5.5 Relevant World Bank ESS

E&S Standard	Applicability
1. Assessment and Management of Environmental and Social Risks and Impacts	ESS1 is relevant for the project activities
2. Labor and Working Conditions	ESS2 is relevant to the project in terms of (i) occupational health and safety risks, (ii) traffic and road safety issues, (iii) potential child labour, and (iv) employment terms
3. Resource Efficiency and Pollution Prevention and Management	ESS3 is relevant for project because it can involve generation of noise and air emissions, utilization of chemicals and hazardous materials and may generate considerable quantities of waste potentially including hazardous waste.
4. Community Health and Safety	ESS4 is relevant as the proposed project as is would directly interact with the communities.
5. Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS5 does not apply to the project
6. Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS6 applies to the project
7. Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	ESS7 does not apply since in Egypt there are no indigenous peoples as per the definition of the World Bank
8. Cultural Heritage	ESS8 applies to the project for new constructions. For those, chance find procedures should be developed.
9. ESS9: Financial Intermediaries	ESS9 does not apply
10. Stakeholder Engagement and Information Disclosure	ESS10 applies to the project given the need to engage with stakeholders on development activities that affect their lives.

4.5.6 World Bank EHS Guidelines

The World Bank Group members are committed to abiding by the general EHS Guidelines for different projects where they are involved. These are complemented by industry-specific guidelines for complex projects.

The EHS Guidelines are technical reference documents with general and industry-specific examples of GIIP. These industry sector EHS guidelines are designed to be used together with

the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors.

The EHS Guidelines include performance measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables, such as host country context, assimilative capacity of the environment, and other project factors, are taken into account.

4.5.7 IFC Guidelines for Transmission lines

The EHS Guidelines for Electric Power Transmission and Distribution ¹⁹ outline key EHS issues related to electric power transmission, distribution and substation with a focus on those arising during the construction and operation phases of a facility. Recommendations for effectively addressing these issues were also included. Additionally, further guidance on managing environmental impacts during the construction and decommissioning phases of power transmission and substation systems could be found in the General EHS Guidelines.

¹⁹ <https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf>

5. Analysis of Alternatives

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

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

5.1 “No Development” Alternative

The OHTLs and the substation project will connect Energy Valley Facility to industrial zone in Wadi El-Sarirya.. This connection will provide a stable and reliable renewable power supply for the industrial area and support green industrialization. The project will contribute to a significant reduction in reliance on fossil fuel-based power generation, hence lowering greenhouse gas emissions and associated air pollutants.

Choosing the “No Development” alternative for this project would mean that the generated solar power by the Energy Valley PV plant would not be connected to the Industrial zone in Wadi El-Sarirya.

5.2 Alternative OHTL Alignment

i. Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)

The selected alignment for the OHTL connecting Energy Valley facility by 500 kV double-circuit (Naseeg Sarirya / East Assiut) with the national grid is located to the west of Energy Valley facility, extending 2.5 km further west until it connects with the national grid. The alignment is situated approximately 1 km north of the nearest agricultural lands.

Given the short length of the proposed OHTL alignment, no alternative route options were considered for the following reasons:

- The locations of energy valley facility and the existing grid connection points are fixed, and the proposed alignments provide the shortest and most direct connection between them.
- Any deviation from the selected direct route would increase the line length, require additional transmission towers, and result in greater land disturbance, higher costs, and potentially increased environmental and social impacts without offering any clear advantages.

The proposed alignment is considered the only practical route and the option with the least potential impacts. Therefore, a detailed assessment of alternative routes was not considered necessary.

Moreover, the alignment for the OHTL has been selected by considering the following technical, environmental and social:

- The OHTL route will avoid the reclaimed agricultural land to prevent potential conflicts with landowners and minimize land acquisition/compensation requirements.
- The OHTL route follows the flat land and avoids sloped areas, therefore minimizing the earthwork activities.

ii. Naseeg Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The selected OHTL alignment connected the Naseeg Sarirya substation by 500 kV double-circuit (Naseeg Sarirya / East Assiut) to the existing national grid extending about 0.5 km westward to the point of interconnection.

The alignment for the OHTL has been selected for favourable technical and economic reasons as outlined below:

- The OHTL connects the proposed Naseeg Sarirya Substation to a fixed existing grid connection point. As both endpoints are predetermined by infrastructure requirements, there is no feasible corridor-level alternative to consider. Therefore, there is limited flexibility in route selection, and the alignment follows the most direct and technically feasible path between the two locations.
- Given the short length of the line, adopting a direct route is considered the most practical approach, as it reduces construction costs, minimizes the amount of land affected, and limits potential environmental and social impacts.
- The selected alignment does not pass through any environmentally or socially sensitive areas that would require avoidance or route modifications.

5.3 Alternative Naseeg Sarirya Substation

5.3.1 Location Alternatives

The substation site is selected to be within Industrial zone in Wadi El-Sarirya which is intended to accommodate industrial facilities as well as utilities. This location is selected for favorable technical and economic reasons:

- Minimize the transmission losses due to the short distance between the substation and industrial facilities.
- Reduce the need for additional distribution infrastructure, e.g. OHTL.
- Avoidance of land acquisition and eliminate the risk of physical or economical displacement as the site is located within a designated industrial area.
- Avoid the disturbance of undeveloped land and minimize potential impacts on nearby environmental and social receptors.

5.3.2 Technological Alternatives

Power substations has two alternatives based on the insulation medium used: Gas-Insulated Substation (GIS) and Air-Insulated Substation (AIS)

GIS technology offers a compact footprint and high reliability due to its enclosed design, making it well suited for areas with limited space. The enclosed equipment is less affected by dust, moisture, and other environmental conditions, resulting in improved performance and reduced maintenance. However, GIS has higher capital costs and requires careful

management of SF₆ gas due to its environmental implications. On the other hand, AIS technology uses air as the insulation medium, making it less costly and easier to maintain. However, it requires a larger land area and is more susceptible to weather conditions, dust, pollution, and wildlife interference.²⁰

Both options will remain under consideration and the preferred option will be determined at a later stage.

²⁰ Babaei, Reza. (2025). Chapter 4: Advantages and Disadvantages of Gas Insulated Switchgear (GIS) Compared to Air-Insulated Substations (AIS).

6. Environmental Impacts Assessment and Mitigation Measures

6.1 Methodology

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

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

- **Identification and Classification of Impacts**

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

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

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

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

- **Assessment of Negative Impacts**

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

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

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

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

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

Assessment of the overall significance of impacts			
Magnitude of aspect	Susceptibility / Vulnerability / Value of Resource / Receptor		
	Low	Medium	High
Negligible	Insignificant	Insignificant	Insignificant
Small	Insignificant	Minor	Moderate
Medium	Minor	Moderate	Major
Large	Moderate	Major	Extreme

- **Mitigation Measures**

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

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

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

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

- **Residual Impacts**

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

6.2 Impacts Identification of the Proposed Project

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

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

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

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

6.2.1 Scoped Out Impacts

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

- Type of project
- Location
- Characteristics of the surrounding environment

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

Impact on Land Acquisition

The Energy Valley facility Grid Connecting OHTL, Naseeg Sarirya Substation, and Naseeg Sarirya Substation Connecting OHTL sites are entirely located on government-owned land. No physical or economic displacement is anticipated. Therefore, the impact on land acquisition is scoped out.

Impacts on surface water quality and aquatic life

For Energy Valley facility Grid connecting OHTL, the nearest water body, River Nile, is located approximately 11 km away, while it is about 13 km from the Naseeg Sarirya Substation and its connecting OHTL. Given this distance and the nature of the project, there will be no anticipated interaction with surface water. Therefore, impacts on surface water and aquatic life can be excluded from assessment.

Impact on groundwater

There are no interactions between the project and groundwater, as groundwater in the OHTL corridor and substation location is found at depths ranging from 120 m to 180 m. Therefore, impacts on groundwater can be excluded from the assessment.

6.2.2 Positive Impacts

Connecting Energy Valley project to the Industrial zone in Wadi El-Sariya.

The project will connect the PV Project to the national grid, enabling the evacuation of renewable energy generated and further supplies to the Industrial zone in Wadi El-Sariya. This connection is important to support green industrialization of Sariya Industrial Zone, and it will provide a reliable supply of clean electricity and reduce the dependence on fossil fuel-based power sources.

Employment

The project's construction phase is expected to create direct job opportunities for the local community, including both skilled and unskilled labour. Priority will be given to local workforce members. In addition to direct employment, the project may create indirect economic benefits through increased demand for local goods and services, including transportation, equipment supply, accommodation, catering, and other support services. These activities can provide additional income-generating opportunities for local businesses and service providers.

During operation, the project will support the long-term development of the Wadi El-Sariya Industrial Zone by providing reliable renewable electricity. This will help attract new investments, support the growth of existing industries, and encourage the establishment of new businesses. Although employment opportunities during operation will be limited, a small number of permanent jobs will be created for operation and maintenance activities.

6.3 Assessment of Potential Negative Impacts and Proposed Mitigation Measures

6.3.1 Potential Impacts during Construction Phase

In general, mitigation measures at the construction phase of any project depend mainly on environmental management procedures, which include preventive maintenance procedures for construction equipment, and material transport trucks, proper waste management procedures, continuous and follow-up procedures.

As indicated previously in the project description chapter, the project components are:

- i. Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sariya / East Assiut)
- ii. Naseeg Sariya Substation (500/22kV), and Naseeg Sariya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The area of the two components is government-owned vacant desert land. Privately reclaimed agricultural lands are at a considerable distance, including lands located approximately 1 km northeast of Sariya Industrial Area, while additional reclaimed plots are located approximately 0.5 km northwest of the industrial area. With respect to the Energy Valley facility Grid connecting OHTL, reclaimed agriculture lands are located about 1 km to the south.

A. Potential Impact on the Physical Environment

- Impacts on Air Quality

For both project monitoring, supervision components, the construction activities may impact air quality through emissions from construction equipment and transport vehicles, dust/particulate matter from soil levelling, as well as from the use of mobile diesel generator(s). As a result, the air emissions generated during this period are expected to include dust, nitrogen oxides, sulphur oxides, and carbon monoxide.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sariryra / East Assiut)

The aspect of air emission from construction activities of the OHTL will be *localized* as these activities will be implemented along the 2.5 km OHTL alignment. The duration of the construction activities will be short-term (18 months), and the intensity of the aspect is expected to be slight; therefore, the magnitude of the aspect is considered **SMALL**.

Currently, only agricultural activities are approximately 1km south and north of Energy Valley facility Grid OHTL route. Additionally, the nearest residential area is New Minya City, located about 12 Km northwest of the route.

Given the absence of industrial operation or other activities with potential to generate air pollutants, the susceptibility of the local air quality is considered **MEDIUM**, the resulting significance of impact is deemed **MINOR**.

Naseeq Sariryra Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Air emissions associated with the construction of the Naseeq Sariryra substation and its connecting OHTL will be site-specific, as the work will take place only within the substation location and along the 0.5 km transmission line alignment. The construction phase will be temporary, lasting for a few months, and the intensity of emissions is anticipated to be slight. Accordingly, the overall magnitude of this aspect is considered **SMALL**.

For the Naseeq Sariryra Substation and its connecting OHTL, the nearest residential area is Sariryra village, located approximately 11 Km from the site. Reclaimed agricultural lands are situated about 1 km to the northeast of Sariryra Industrial Area, while additional reclaimed plots are located approximately 0.5 km northwest of the industrial area.

Accordingly, the susceptibility of air quality in the surrounding area is **MEDIUM**, thus, this impact is assessed as **MINOR**.

Mitigation Measures

The following mitigation measures will minimize the impacts of construction activities on the air quality for the two components of the project:

- Implementing policies/procedures to reduce idling times for vehicles and machinery.
- Maintaining machinery and vehicles in good working conditions to minimize fugitive emissions and exhaust.
- Ensuring workers' awareness of safe driving and maintaining good practices in machinery usage.
- Implement dust control measures such as spraying water over exposed soil surfaces, stockpiles, and unpaved roads, particularly during dry and windy conditions.
- Ensuring compliance with law 4/1994 and its relevant ERs regarding emissions from power generator stacks.

Residual Impacts

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

• **Impacts on Ambient Noise**

Regarding the two project components, noise will originate from similar activities, involve site preparation, foundation work, and the installation of steel structures and electrical equipment. Noise generation during construction will primarily result from the operation of construction equipment, including excavators, loaders, backhoes, cranes, concrete work, vehicle movement, and power generators.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

Noise generation will be localized, as it is confined to the OHTL alignment and its immediate vicinity. Due to the limited construction duration, this aspect is expected to be short-term and of low intensity, resulting in a **SMALL** magnitude.

Given the absence of noise-generating activities near the project site, and considering that agricultural activities do not produce significant noise, the susceptibility of the primary receptor is assessed as **MEDIUM**, the significance of the impact is assessed as **MINOR**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Naseeq

The resulting noise from construction activities will be localized to the substation site, along the OHTL alignment, and the area immediately surrounding them. Given the short construction schedule, this aspect is expected to be short-term and of low intensity; therefore, the magnitude of the aspect is classified as **SMALL**

As no current activities are generating noise near the project site, the susceptibility of the primary receptor is assessed as **MEDIUM** the low intensity of the source ensures the final impact remains **MINOR**.

Table 6-1 shows typical noise levels, in decibels, expected at various distances from construction machinery.

Table 6-1: Average Noise Levels from Construction Equipment

Equipment Type	Distance from Noise Source (dBA)		
	10m	50m	100m
Bulldozer	74	60	54
Generator	76	62	56
Backhoe	79	65	59

Mitigation Measures

The following mitigation measures will be applied to both project components Machines and construction equipment must comply with the best practice technical developments

- Periodical maintenance of machines and equipment with an internal combustion engine according to the manufacturer's instructions.

- Schedule high-noise activities to avoid simultaneous operations that could amplify noise levels.
- Machines and construction equipment must comply with the best practice technical developments
- Provide hearing protection equipment to workers exposed to high noise levels

Residual Impacts

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

• **Impacts on Soil**

During the construction phase, potential impacts on soil may result from earthworks and excavation activities, the handling of construction waste, as well as the risk of accidental spills from the diesel generator fueling, or leakages of fuels, oil, lubricants and other chemicals from construction machinery and vehicles operating on site.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

These potential aspects are expected to be localized, along the OHTL, and short-term, considering the limited duration of construction activities. The intensity of these aspects is assessed as moderate, which leads to classification of **SMALL** for the magnitude of the aspect.

As the proposed project will be carried out on a desert site with minimal vegetation cover, the susceptibility of the receptors is **MEDIUM**. Therefore, the overall significance of the impact is assessed as **MINOR**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut) OHTL

These aspects are localised, as they remain confined to the substation site and OHTL route. The aspects are moderate in intensity and short-duration, and they are assessed as **SMALL** in magnitude.

Based on the combination of a **SMALL** magnitude of aspect and **MEDIUM** receptor susceptibility (arid desert with sparse vegetation), the overall significance of the potential soil impacts during construction is assessed as **MINOR**.

Mitigation Measures

- Conduct maintenance of vehicles, trucks, and construction equipment off-site where practicable, to minimize on-site spills.
- Using impervious surfaces for refueling areas and other fluid transfer areas,
- Develop and implement a spill management plan, including the availability of spill kits on-site.
- Provide a secondary containment for fuel storage tanks and other hazardous material containers.²¹

²¹ Appropriate secondary containment structures consist of berms, dikes, or walls capable of containing the larger of 110 percent of the largest tank

- Collect and dispose of any spillages or contaminated materials through licensed and authorized waste contractors.
- Maintain good housekeeping practices to ensure a clean and orderly construction site.
- Provide training to workers in handling and storage of hazardous waste as well as the response to spills.
- Collect and store solid waste in appropriate containers at designated points.
- Provide clearly marked and segregated storage areas for hazardous waste.
- Use licensed contractors for the collection and disposal of both non-hazardous and hazardous waste.

Residual impacts

The impact on soil during construction activities will be **INSIGNIFICANT** after implementing the management measures.

B. Potential Impacts on Biological Environment

• **Habitat**

Both project components' locations lie within an arid desert ecosystem characterized by extremely low annual precipitation, sparse and discontinuous vegetation cover, and low primary productivity. Vegetation is largely restricted to scattered drought-tolerant shrubs and ephemeral species that appear only following rare rainfall events.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

Construction activities associated with the project include Right-of-Way (RoW) preparation, excavation, installation of concrete foundations for transmission towers, and temporary access for construction equipment. These activities will result in direct but highly localized habitat disturbance and loss, primarily confined to the footprints of tower foundations, temporary access tracks, and limited working areas around tower locations.

The loss of habitat at tower foundation locations is permanent and irreversible, as these areas will remain occupied by concrete structures throughout the operational life of the project. However, the spatial extent of permanent habitat loss is very small, given the limited footprint of individual towers and the linear nature of the OHTL.

The project site and surrounding areas do not overlap with Key Biodiversity Areas (KBAs), Protected Areas (PAs), critical habitats, or habitats of high conservation value. Therefore, while the nature of the impact is permanent, its intensity is low to moderate, and the sensitivity of the affected receptors is **LOW**, due to the predominance of bare sandy soils, the absence of confirmed populations of threatened or endemic species, and the low species abundance and richness.

Accordingly, the overall significance of habitat loss is assessed as **MINOR**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The Naseeg Sarirya Substation is located within or adjacent to Sarirya Industrial Area on publicly owned desert land. Construction activities at the substation site include site clearance, excavation for foundations, concrete works, installation of equipment, and limited grading within a defined footprint. In addition to the limited construction activities associated with its OHTL that include Right-of-Way (RoW) demarcation, excavation for tower foundations of about 2 towers, concrete pouring, and limited grading. The disturbance will occur within a fixed and confined site boundary, along with 0.5 km linear alignment of the OHTL.

The habitat within the substation footprint consists primarily of bare desert soil with sparse vegetation. No ecologically sensitive areas, wetlands, or biodiversity hotspots are present within or adjacent to the site. Permanent habitat loss will occur within the substation footprint and the tower's foundation; however, the overall footprint is small relative to the surrounding desert.

Considering the short construction duration, confined spatial extent, and low to moderate intensity of habitat removal. Receptor susceptibility is **LOW** due to the degraded and low-productivity nature of the habitat and absence of conservation-priority features. Accordingly, the overall impact significance is **MINOR**.

Mitigation Measures

Although permanent habitat loss associated with tower foundations as well as substation footprint cannot be fully mitigated, the following measures will be implemented to minimize the spatial extent of disturbance:

- Restrict construction activities strictly to the defined tower footprints and approved working areas.
- Utilize existing tracks and previously disturbed corridors wherever possible.
- Prohibit uncontrolled off-road driving and restrict vehicle movement to designated access routes, avoiding any vegetation patches identified during pre-construction inspections.
- Clearly demarcate construction boundaries prior to work to prevent unnecessary ground disturbance.

Residual Impacts

Following implementation of the above measures, residual impacts on habitat are expected to remain localized, very limited in extent, and of **LOW** significance, and are therefore considered **INSIGNIFICANT**.

- ***Disturbance to wildlife***

During the construction phase, wildlife may experience temporary disturbance due to increased human presence, operation of construction machinery, noise, vibration, artificial lighting, and vehicle movement. These factors may lead to short-term behavioral avoidance and displacement of fauna from the immediate construction areas.

In addition, construction activities may result in:

- Localized soil compaction, potentially affecting burrowing species such as reptiles and arthropods.

- Temporary disruption of movement patterns.
- A marginal increase in the risk of wildlife collisions with construction vehicles.

Given the arid nature of the environment, wildlife populations are naturally sparse and widely distributed, and animals are adapted to moving across large areas in response to disturbance. Although certain species of conservation interest may occur in the wider region, particularly resident and migratory birds, as well as fauna associated with nearby cultivated lands, their sensitivity to construction-related disturbance is considered **LOW**. This is due to:

- The absence of critical or attractive habitats within the project area.
- The availability of extensive alternative habitats in the surrounding area.
- The temporary nature of the disturbance.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

The anticipated disturbance effects are temporary, reversible, and spatially limited to the construction phase and footprint. The severity of disturbance at a local scale may be moderate, due to its short duration and limited spatial extent, and the overall magnitude of impact is considered **MEDIUM**.

Accordingly, the overall significance of wildlife disturbance is assessed as **MINOR**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Disturbance effects are expected to be temporary, reversible, and spatially limited to active construction areas for the substation and its OHTL. Considering the short-term duration, limited spatial footprint, and moderate intensity of disturbance during active works, the magnitude of the aspect is assessed as **MEDIUM**. Receptor susceptibility is considered LOW due to the absence of sensitive habitats; the overall significance of wildlife disturbance is assessed as **MINOR**.

Mitigation Measures

To minimize disturbance to wildlife during construction of the two project sites, the following measures should be implemented:

- Prepare and enforce a solid and hazardous waste management plan to prevent attraction of wildlife to food waste or contaminants.
- Implement a liquid waste management plan to avoid the formation of artificial water sources that could attract birds or terrestrial fauna.
- Conduct environmental awareness training for all construction personnel, with specific emphasis on wildlife protection and avoidance of harassment.
- Avoid unnecessary night-time work, where lighting is required, use low-intensity, downward-directed lighting to minimize light spill.
- Enforce strict speed limits for all project vehicles to reduce collision risk and disturbance to fauna.

Residual Impacts

With effective implementation of the above mitigation measures, residual impacts related to wildlife disturbance are expected to be very limited, temporary, and of LOW significance, and are therefore considered **INSIGNIFICANT**.

C. Impact on Socio-economic Environment

• *Impact on Community and Community Resources*

Water Demand

During the construction phase, bottled water for drinking will be provided for the workforce. Additionally, water for sanitation purposes and construction activities will be trucked from a licensed supplier and stored in on-site tanks.

Daily water consumption for both project components is expected to be 1 m³/ day for drinking water (bottled water), about 5 m³/ day for sanitary municipal water²², and a limited amount of water for concrete curing and other building purposes.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

Construction activities for the OHTL include excavation for tower foundations, concrete works, limited compaction, and workforce sanitation needs. These activities generate temporary water demand for minor dust suppression, and domestic and sanitation use by workers. Due to the linear and sequential nature of OHTL construction, activities will be dispersed along the alignment rather than concentrated at a single location. Water will be supplied by licensed tankers and stored temporarily on-site.

The aspect of water demand during the construction phase is short-term, and localized, within the study area. As a limited number of workers will be needed for the construction activities, the intensity is expected to be slight, the overall magnitude of the aspect is considered **SMALL**.

The susceptibility of the receptor, hosting community's local water resources in the project area, is considered **LOW**, given the existing water treatment capacity in the City of New Menya.

Therefore, the significance of the impact on water demand is **INSIGNIFICANT**.

Naseeq Sarirya Substation-Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Substation construction involves more concentrated concrete works, equipment installation, and a relatively continuous workforce presence compared to the linear OHTL. Water will be required for construction works, sanitation, and limited dust control. Similar to the Energy Valley facility Grid connecting OHTL component, water will be trucked from licensed suppliers.

Although activities are more concentrated at a fixed site, the overall workforce size remains limited, and the duration is short-term. The spatial extent is confined to the substation

²² Assuming: Water consumption for drinking: 5 l/person/day; and for sanitary: 25 l /person/day

boundary and along the short alignment of its OHTL. Therefore, the magnitude of this aspect is assessed as **SMALL**.

The water demand aspect is categorized as **SMALL** in magnitude, as the requirement is short-term and limited to the immediate study area. Given the moderate size of the workforce, the consumption intensity is expected to be slight. Although the host community's water supply has **LOW** susceptibility, the limited scale of the project's requirements results in the overall significance of the impact on water demand being **INSIGNIFICANT**.

Mitigation Measures

Regarding both project components, adopt water management practices to ensure efficient use and avoid water wastage.

Residual Impact

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

Accommodation Demand

The construction phase will involve a temporary workforce comprising both skilled and unskilled labour. Priority will be given to local employment where possible; however, specialized positions (skilled technicians) may be assigned to non-local workers, if necessary. No permanent worker camps will be established.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

The OHTL construction requires small, mobile teams operating along the 2.5 km alignment. . Although the alignment is in a relatively remote desert area, non-local workers are expected to reside in New Minya and commute daily, with transportation provided as needed. The limited number of non-local workers is not expected to place stress on the availability of rental units, amenities and food supply.

Given the relatively small scale and short duration of the construction activities and the preference given to local workforce, this aspect is short-term and slight in intensity. The spatial extent of this aspect is expected to be within the study area (nearest residential with sufficient rental accommodation capacity), the magnitude of the aspect is **SMALL**.

New Minya city has the capacity to accommodate non-local workers due to its planned urban infrastructure, availability of housing, and existing service provision. Accordingly, the susceptibility of the local community is **MEDIUM**. Accordingly, the significance of the impact is **MINOR**

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The substation and its connecting OHTL construction workforce will be situated at a fixed site, potentially increasing localized accommodation demand compared to the OHTL. New Minya housing will be utilized, and daily transit will be provided for the workforce.

Given the limited timeframe of the construction, this aspect is short-term, and of slight intensity. The spatial extent will be confined to the study area (nearest residential with sufficient rental accommodations capacity), and the overall magnitude of the aspect is assessed as **SMALL**.

Local community susceptibility, particularly concerning local housing and food supply resources, is considered MEDIUM. Accordingly, the resulting significance of the impact is assessed as **MINOR**.

Mitigation Measures

To minimize potential pressure on local housing and food supply resources due to the presence of non-local workers, the following measures will be implemented for the two components of the project:

- Prioritize hiring local workers where possible.
- Accommodate the non-local workers in residential areas with higher housing capacity and food supplies.

Residual Impact

With mitigation measures in place, residual impacts on the community are expected to be **INSIGNIFICANT**.

Social Conflict

The temporary workforce may include a small number of non-local workers and security personnel who will be accommodated in New Minya. Daily interactions between workers and the host community are anticipated to take place in routine urban settings, including local markets, parks, public transport, etc. Potential interactions may arise from in the construction vehicle movements near reclaimed agricultural lands and limited engagement with land users accessing surrounding desert plots.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

The absence of settlements along the alignment and the 1 km distance from agricultural lands significantly reduces direct social interaction. This aspect occurs in the relatively short duration of construction activities and the limited number of non-local workers compared to the local population. The aspect is short-term, and within the study area, the intensity is considered moderate, and the overall magnitude of the aspect is assessed as **SMALL**.

As a newly developed urban area, new Minya city hosts a mixed population of local residents and people who have relocated from other areas. This creates a social environment that is less sensitive to the presence of non-local groups compared to more traditional or rural community. Accordingly, the susceptibility of the local community to potential social tension or disturbance is assessed as **MEDIUM**.

Thus, the overall significance of the impact on social relations with community is **MINOR**

Naseeq Sarirya Substation-Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The presence of construction workers and security personnel at the substation site may result in limited interaction with road users, as the site is located away from residential communities, and the industrial area is not yet developed.

Considering the short-term duration and site-specific nature of activities, the magnitude is **SMALL**. Community susceptibility is **MEDIUM**, therefore, the overall impact significance is **MINOR**.

Mitigation Measures

- Develop and implement a code of conduct for workers that outlines appropriate behaviour, including respect for religious customs and practices, traditional cultures and social norms of the region.
- Establish a community grievance mechanism to address any issues promptly.

Residual impact

With the mitigation measures in place, residual impacts on social cohesion are expected to be **INSIGNIFICANT**.

XXX

- **Impact of site security**

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)

No site security is expected for the OHLT alignment.

Naseeg Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

For security measures, the project will assign security personnel to provide security services for the Naseeg Sarirya substation site premises, materials and equipment. The security company will provide security guards on-site, exchanging shifts. The presence of guards may harm the community if not properly trained, equipped and monitored.

Due to the short duration of the construction activities, and the small size of the substation site, which requires a small number of security personnel, the aspect of guard presence on-site is considered short-term and slight in intensity. The spatial extent of this aspect is expected to be within the study area, and thus its overall magnitude of the aspect is **SMALL**.

The receptor (local community), located at a considerable distance from the substation site, is considered to have a **MEDIUM** level of susceptibility. The significance of the impact will be **MINOR**.

Mitigation measures

The security personnel will be adequately trained, have appropriate conduct toward workers and community and act within the applicable law. Furthermore, a grievance mechanism will be developed to allow the potentially affected community to express concerns about the security arrangements and acts of security personnel.

Residual impacts

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

D. Impacts on infrastructure and land use

- **Impacts on land use**

The routes of the two OHTL, as well as the Naseeq Sarirya substation site, are in a desert and unoccupied land with no existing land use patterns identified. The area is not currently used for agriculture, residential purposes, commercial activities, or other productive land uses

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

Construction activities will involve excavation for tower foundations and development of temporary access tracks. Permanent land occupation will be limited to tower footprints, while temporary disturbance will occur within defined working areas. The environmental aspect related to land use changes will be localized, along with the OHTL alignment and will not extend into adjacent areas.

Given the relatively small footprint changes tower's foundation, the intensity of this aspect is considered slight. The duration is short-term, as land disturbance will be limited to the construction phase, and the magnitude of the aspect is assessed as **SMALL**. Considering the low sensitivity of the affected land (undeveloped desert land), the significance of the impact is evaluated as **INSIGNIFICANT**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The substation will permanently occupy a defined footprint within undeveloped desert land inside an industrial area. No agricultural land conversion or displacement will occur. The limited footprint and compatibility with surrounding land use result in a **SMALL** magnitude. Given the low sensitivity of the land, susceptibility is **LOW**. The overall impact significance is **INSIGNIFICANT**.

The susceptibility and value of land resources are considered **LOW**. Consequently, the overall significance of the impact on land use is assessed as **INSIGNIFICANT**, with no further reduction required.

- **Traffic**

Construction activities will require transportation of equipment, materials, and personnel to and from the project site using existing road infrastructure, including Minya Alwasta Road, Desert Road, Ras Garib Minya Road and Assuit Cairo Desert Road.

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

The nearest roads to the Grid connection OHTL are Minya Alwasta Road and the Desert Road. The equipment and materials are expected to be limited due to the small scale of the OHTL.

The aspect (traffic volume) is expected to be slight as it is very limited in scale, short-term over the construction period. The geographical scale is expected to be within the district, and the magnitude of traffic is assessed as **SMALL**.

The susceptibility of receptors (road users) is **MEDIUM**. Therefore, the overall significance of traffic impacts during construction is assessed as **MINOR**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Construction activities will require the delivery of heavy equipment, including transformers and structural components. Although some of this equipment and components may be oversized, the nearby roads have adequate capacity, Ras Garib-Minya Road and Assuit-Cairo Desert Road. Given the short duration and limited increase in traffic volume, the magnitude is **SMALL**. Road user susceptibility is **MEDIUM**. Accordingly, the impact significance is **MINOR**.

Mitigation Measures.

- Coordinate material deliveries to avoid peak traffic hours where feasible.
- Ensure safe vehicle operation and speed limits within and near the site.

Residual Impacts

With mitigation measures implemented, residual traffic impacts are expected to be **INSIGNIFICANT**.

E. Occupational Health and Safety

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

Construction activities for the OHTL include excavation for tower foundations, concrete pouring, steel structure assembly, conductor stringing, and installation works. These activities may expose workers to hazards such as dust emissions from excavation, welding fumes during tower assembly, elevated noise levels from machinery, and emissions from material handling and diesel-powered equipment.

Significant safety risks are associated with working at heights during tower erection and conductor installation, including fall hazards. Manual handling of tower components, use of cranes for lifting steel structures, and cable stringing operations present potential for musculoskeletal injuries and mechanical accidents. Electrical risks may arise during testing and commissioning phases. Additional hazards include exposure to fuels, lubricants, and chemicals used for machinery, as well as fire risks associated with hot works.

The temporal scale of these risks is limited to the construction period. Spatially, risks are localized along the alignment at active tower locations. The intensity of hazards is considered moderate due to the inherent risks of high-voltage transmission line construction, particularly work at height and lifting operations.

Based on short-term duration, localized spatial extent, and moderate intensity, the magnitude of the aspect is assessed as **MEDIUM**. The susceptibility of receptors (construction workers) is assessed as **MEDIUM**, as they are trained and adequately aware of the potential occupational exposure to construction-related hazards in a controlled work environment. According to the impact significance matrix, the overall OHS impact significance is therefore assessed as **MODERATE**.

Potential impacts during construction could arise from:

- Hazards from exposure to dust, welding fumes, emissions from material handling and noise.
- Risks associated with working at heights, such as fall risks.
- Injuries from manual handling of tools, cables, auxiliary equipment, heavy lifting, and crane operations.
- Electrical hazards during installation, testing, and commissioning of electrical systems.
- Exposure to fuels, oils, lubricants, and other chemicals used for construction equipment.
- Fire risks associated with hot works, electrical activities, and flammable materials.

The aspect relevant to construction activities' risks is *short-term*, limited to the construction period, and *localized* within the project footprint. Their intensity is considered *moderate*, the magnitude of this aspect is **MEDIUM**.

The susceptibility of receptors (workers) is **MEDIUM**. In this context, the potential occupational health and safety impacts can be considered **MODERATE**.

Naseeg Sariya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The risk of the OHTL activities is similar to that of connecting the OHTL to the Energy Valley facility grid. Additionally, the construction of the Naseeg Sariya Substation involves site clearance, excavation, extensive concrete works, equipment installation, transformer placement, cable laying, and testing and commissioning of electrical systems. Compared to the linear OHTL, activities at the substation are more concentrated within a fixed site, with increased interaction between multiple work teams and heavy equipment.

The risks associated with OHTL are the same as stated in the Energy Valley facility Grid connecting OHTL. Additional risks will result from substation construction activities such as

- Lifting operations for heavy transformers and electrical components that present significant mechanical hazards.
- Electrical installation and commissioning activities introduce electrocution risks.
- Fire risks are associated with hot works, temporary power supplies, and flammable materials.

The temporal scale is limited to the construction period. Spatially, risks are confined within the defined substation footprint and along the OHTL alignment. The intensity of risk is considered moderate due to the complexity of electrical installation works and heavy lifting activities.

Accordingly, considering short-term duration, localized spatial extent, and moderate intensity, the magnitude of the aspect is **MEDIUM**. Receptor susceptibility (workers) is **MEDIUM**, therefore, the overall OHS impact significance is assessed as **MODERATE**.

Mitigation Measures

- Implement an Occupational Health and Safety Management Plan .
- Provide appropriate personal protective equipment (PPE).
- Ensure proper training for operators, regular maintenance of equipment, and implementation of safety protocols.
- Conduct regular safety training and toolbox talks.
- Enforce site speed limits and equipment inspection before use.
- Establish exclusion zones during crane and lifting operations.
- Restrict access to active work zones and clearly mark excavation areas.
- Use fall protection measures (full body harnesses and energy-absorbing lanyards)
- Provide shaded rest areas, hydration, and heat stress management measures.
- Implement fire prevention measures, maintain fire extinguishers on-site, and conduct fire safety training.
- Apply lock-out/tag-out procedures and restrict electrical works to qualified electricians.

Residual impacts

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

F. Impact on Cultural Heritage

Energy Valley facility Grid Connecting OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

Based on the baseline findings, there are no registered antiquities or known cultural heritage sites within the OHTL alignment or its immediate surroundings. The nearest recognized heritage site, the Beni Hasan Tombs, is located more than 17 km southwest of the alignment. Given this substantial distance and the localized nature of excavation works at tower foundations, no direct or indirect interaction with known heritage resources is anticipated.

Construction activities involve localized excavation at discrete tower locations in desert terrain not previously identified as archaeologically sensitive. The temporal scale is short-term, the spatial extent is highly localized, and intensity of ground disturbance is limited to foundation footprints. The magnitude of the aspect is **SMALL** while the susceptibility of the resource “Cultural heritage” is **HIGH**. In this respect, and given the low probability of encountering cultural heritage, the potential impact **MINOR**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The Naseeq Sarirya Substation site is located on publicly owned desert land within or adjacent to an industrial area. There are no registered heritage sites within the project footprint. The nearest known heritage location, Dehenet, lies more than 16 km southeast of the site.

Construction activities involve excavation within a previously undeveloped desert area. Given the short-term duration, confined spatial extent, and absence of recorded archaeological resources, the magnitude of potential impact is **SMALL**. Receptor susceptibility is **HIGH**.

Accordingly, and given the low probability of encountering cultural heritage, the potential impact **MINOR**.

Mitigation Measures

- Develop and implement Chance Find Procedures, indicating the actions to be taken in case of any significant findings during site leveling and construction activities.
- Notify the Ministry of Tourism and Antiquities (MOTA) if an archaeological artifact is discovered during excavation.

Residual Impacts

By applying the Chance Find Procedure the residual impacts of construction activities on cultural heritage are expected to be **INSIGNIFICANT**.

Table 6-2 shows the impact assessment matrix for the construction phase for the Energy Valley facility Grid connecting OHTL.

Table 6-2: The Impact Assessment Matrix for Energy Valley facility Grid Connection OHTL, Naseeg Sariya Substation and its Connecting OHTL

Impacts/Riks			Without Mitigation					Level of Residual Impacts after mitigation	
			Temporal scale	Spatial Scale	Intensity	Magnitude	Susceptibility / Vulnerability / Value of Resource / Receptor		Significance of Impact before Mitigation
Physical Environment	Air Quality		<u>Short term</u>	Localized	Slight	Small	Meduim	Minor	Insignificant
	Ambient Noise		<u>Short term</u>	Localized	Slight	Small	Meduim	Minor	Insignificant
	Soil		<u>Short term</u>	Localized	Moderate	Small	Meduim	Minor	Insignificant
Biological Environment	Habitat		<u>Permenant</u>	Localized	Low to Moderate	Small	Low	Minor	Insignificant
	Wildlife Disturbance		<u>Short term</u>	Localized	Moderate	Small	Low	Minor	Insignificant
Socioeconomic Environment	Community Resources	Water Demand	<u>Short term</u>	Study area	Slight	Small	Low	Insignificant	Insignificant
		Accommod ation Demand	<u>Short term</u>	Study area	Slight	Small	Meduim	Minor	Insignificant
		Social Conflict	<u>Short term</u>	Study area	Moderate	Small	Meduim	Minor	Insignificant
	Site security		<u>Short term</u>	Study area	Slight	Small	Meduim	Minor	Insignificant
Infrastructure & land use	Land use		<u>Short term</u>	Localized	Slight	Small	Low	Insignificant	Insignificant
	Traffic		<u>Short term</u>	District	Slight	Small	Meduim	Minor	Insignificant
Occupational Health and Safety			<u>Short term</u>	Localized	Moderate	Meduim	Meduim	Moderate	Minor
Impact on Cultural Heritage			<u>Short term</u>	Localized	Slight	Small	High	Minor	Insignificant

XXX

6.3.2 Potential Impacts during Operation Phase

A. Potential Impact on the Physical Environment

- Impacts on Air Quality

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

The operational phase will have minimal emissions mainly due to the transport of people and supplies for periodical inspection and maintenance activities.

This aspect has a slight intensity as it occurs intermittently through the project's operational lifetime. This aspect will be localized; thus, the magnitude is **SMALL**.

The susceptibility of receptors "air quality" is MEDUIM. In this context, the potential impact on air quality is considered MINOR to **INSIGNIFICANT**. Mitigation measures are, therefore, not required and the residual impacts are **INSIGNIFICANT**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The operational phase will have emissions mainly due to the transport of people and supplies for periodical inspection and maintenance activities. Potential emission from of SF6, if utilized for insulation of the switchgear. SF6, a GHG, is the most used insulation material in medium and high voltage systems.

In this respect, SF6 containing equipment is designed to avoid emitting any of this gas into the atmosphere mainly during maintenance and servicing, and decommissioning. However, although small amounts of SF6 may escape the atmosphere, these could be controlled through cost-effective operational improvements and equipment upgrades. No GHG will result in the case of using air insulation systems.

The aspect has a slight intensity as it occurs intermittently and is long-term for the project operation lifetime. This aspect will be localized within the immediate surroundings of the substation; the magnitude of the aspect is **SMALL**. The susceptibility of receptors is **MEDIUM**. In this context, the potential impact on air quality can be considered **MINOR**.

Mitigation Measures

If SF6 is used as an insulator instead of air insulation, the mitigation measures will include leak detection and repair, use proper chamber vacuums during filling the SF6 into the GIS, and employee education/training.

Residual Impacts

By implementing the above mitigation measures, the residual impacts on the air quality will be **INSIGNIFICANT**.

- **Impacts on Ambient Noise**

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

During the operational phase, the Energy Valley facility Grid Connecting OHTL noise in the form of buzzing or humming can often be heard from high-voltage power lines producing corona. Noise from transmission lines reaches its maximum during periods of precipitation, or as a result of fog. The noise will be *localized* along the limited OHTL route and its immediate surroundings, *and long-term* due to long operation period. The intensity of the aspect is expected to be slight; thus, the magnitude of the aspect is considered **SMALL**.

No permanent operation staff for the OHTL, and no sensitive receptors. The potential receptors are transient individuals passing near or along the transmission line route. The susceptibility of the receptors is **LOW** as the exposure is expected to be infrequent. Thus, the impact is considered **INSIGNIFICANT**. Therefore, mitigation measures are not required, and the residual impacts are **INSIGNIFICANT**.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

During operation, the primary noise source is transformer operation, which generates continuous low-frequency hum. The noise is steady and long-term, corresponding to the operational lifetime of the substation.

The noise source will be *localized* within substation location and its immediate surroundings, *and long-term* due to long operation period. The intensity of aspect is expected to be slight; thus, the magnitude of the aspect is considered **SMALL**.

A limited number of staff (5 workers) are present during operation (emergency and security personnel), as the Naseeq Sarirya substation is fully automated and remotely controlled. The susceptibility of the receptors is **LOW**. Thus, the impact is considered **INSIGNIFICANT**.

Mitigation Measures

No mitigation measures are required. However, the following management measures are proposed

- Regular maintenance of transformers and cooling fans to prevent abnormal noise levels.
- Prompt repair or replacement of faulty components causing excessive hum or vibration.

Residual Impacts

The implementation of management measures will ensure that impact remain **INSIGNIFICANT**.

- **Impact on Soil**

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

No anticipated impacts.

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

During the operational phase, waste generation is generally limited and occurs mainly during routine maintenance, equipment servicing, or component replacement. The expected waste includes non-hazardous waste such as spare parts, packaging damaged or replaced components. Hazardous waste such as cleaning solvents, lubricants and hydraulic oils. In addition to the domestic waste generated by the operation staff.

Based on the localized spatial extent, long-term duration, and slight intensity of waste generation during operation, the overall magnitude of waste-related impacts is assessed as **SMALL**.

The susceptibility of the receptor (soil) is considered **LOW**. Given the low probability of spills, and the presence of foundation, the significance of the impact on soil is assessed as **INSIGNIFICANT**.

With the implementation of appropriate waste segregation, storage, and disposal measures in accordance with applicable regulations and Good International Industry Practice, the residual impacts of both hazardous and non-hazardous waste generation during operation are assessed as **INSIGNIFICANT**.

Residual Impacts

No residual impacts

B. Potential Impacts on Biological Environment

• **Habitat**

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

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

Naseeq Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Similar to the Grid connecting OHTL.

• **Interaction with birds -Electrocution Risks**

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

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

Both resident and migratory birds can be affected:

- Resident birds may be exposed year-round, particularly when perching or nesting on towers.
- Migratory birds are at risk during seasonal passages, although exposure is typically brief.

The risk is localized around the towers and lines, permanent in duration, and the potential intensity is low because electrocution events occur only in specific situations, when bird perches on a grounded part of the tower (tower body or cross-arm) and touches an energized conductor. Considering **MEDIUM** sensitivity of bird receptors, the overall impact of electrocution on both resident and migratory birds is considered **MINOR**.

Naseeg Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The assessment conducted for the Energy Valley facility Grid Connecting OHTL is applicable for Naseeg Sarirya Substation and its Connecting OHTL, given the similarity in location, operation conditions and avifauna presence within the project area

Mitigation Measures

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

The following measures are recommended:

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

Residual Impacts

Through implementation of the above mitigation measures, the expected residual impact on is **INSIGNIFICANT**.

- **Birds Collision Risk**

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)

Bird collisions with overhead transmission lines (OHTL) occur when birds fail to detect or avoid the wires during flight. The risk depends on multiple factors, including species, behavior, flight height, landscape, and line design.

Species at Higher Risk

- Large-bodied birds (e.g., raptors, storks, cranes, pelicans) are particularly vulnerable because of slower maneuverability.
- Migratory birds traveling in flocks at dawn/dusk or during poor visibility conditions may be more prone to collisions.

- Resident birds are generally at lower risk if they are accustomed to local structures, though fledglings and juvenile birds are more susceptible.

Based on the assessment conducted in the baseline chapter using Migratory Soaring Birds Tool (MSBT), no migration track appears within a 5Km buffer zone. However, several soaring birds could potentially occur within the Project Site.

The intensity of bird collision risk is high, and it increases with reduced visibility (like at night and in foggy days). Although this risk is permanent, the spatial extent is small reflecting the limited length of the OHTL. Accordingly, the Magnitude of the aspect is **MEDIUM**. The susceptibility of the receptor birds is **LOW**, due to the relatively small number of birds, including migratory birds, passing through the OHTL location which falls in a habitat generally unattractive to them. Therefore, the overall impact is assessed as **MINOR**.

Naseeg Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

Based on the assessment conducted in the baseline chapter using the Migratory Soaring Birds Tool, three tracks of the soaring bird migration intersect the 5 km buffer around the Naseeg Sarirya Substation; the nearest lies approximately 1km m from the substation and 650 m from the northern OHTL

The assessment conducted for the Energy Valley facility Grid Connecting OHTL is considered applicable for Naseeg Sarirya Substation Connecting OHTL, given the similarity in design, operation conditions and avifauna presence within the project area.

Mitigation Measures

For bird collision risk, no mitigation measures are recommended:

Residual Impacts

- The residual impact will remain **MINOR**

C. Impact on Socio-economic Environment

Impact of site security

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeg Sarirya / East Assiut)

None.

Naseeg Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

For security measures, the project will assign an annually contracted security company to provide security services for the site premises. Security guards will be stationed on site and will operate on a shift basis to control access and protect project assets and personnel.

Security activities will continue throughout the long-term operational period. However, as these are localized to the substation area, the intensity is considered Slight. Therefore, the magnitude of site security aspect is assessed as **SMALL**.

Sensitive receptors include onsite workers and nearby communities. Given the controlled nature of security arrangements and the limited interaction with external receptors, susceptibility is considered **LOW**. Therefore, the overall significance of site security impacts is assessed as **INSIGNIFICANT**.

Mitigation measures

The security personnel will be adequately trained, have appropriate conduct toward workers and community and to act within the applicable law. Furthermore, a grievance mechanism will be developed to allow the potentially affected community to express concerns about the security arrangements and acts of security personnel.

Residual impacts

No residual impacts

D. Occupational Health and Safety

Energy Valley facility Grid Connection OHTL by 500 kV double-circuit (Naseeq Sarirya / East Assiut)

During operation, the Grid Connecting OHTL does not require continuous human presence; however, periodic inspection, preventive maintenance, and emergency repair activities are necessary throughout its operational lifetime. These activities expose maintenance personnel to occupational hazards primarily associated with high-voltage transmission systems.

Key risks include electrocution due to accidental contact with energized conductors, electrical arc flashes during fault conditions, falls from height during tower climbing and conductor maintenance, and injuries from falling tools or materials. Maintenance works may also expose workers to electromagnetic fields (EMF) generated by energized conductors. Although EMF levels in public areas are typically within internationally accepted exposure limits, maintenance personnel working in proximity to energized components may experience elevated exposure levels if safety procedures are not properly implemented.

The aspects relevant to the OHS extend throughout its entire lifetime; thus, the duration is long-term. Aspect is *localized* with *medium* intensity and considered **SMALL** in significance.

The maintenance personnel are typically trained, and experienced in working with high-voltage systems, and are expected to follow established occupational health and safety (OHS) procedures, accordingly the susceptibility of receptors is **MEDIUM**. In this context, the potential workplace impacts can be considered **MODERATE**.

Naseeg Sarirya Substation -Grid Connecting OHTL by 500 kV double-circuit (Beni Suef Generation / East Assiut)

The Naseeg Sarirya Substation is designed to operate automatically with remote control systems; however, periodic inspection, preventive maintenance, testing, and occasional equipment replacement are required throughout its operational lifetime. Compared to OHTL, maintenance activities within the substation involve closer interaction with energized switchgear, transformers, protection panels, and auxiliary systems.

In addition to the identified risks relevant to the operation phase of OHTL, there are some specific risks relevant to the operation of the substation, such as electrical fires, exposure to EMF generated by transformers and switchgear, and mechanical hazards during maintenance of heavy components

The temporal scale of this aspect is long-term, corresponding to the entire operational life of the facility. Spatially, risks are localized within the substation boundary and along OHTL. The intensity is considered medium due to the inherent hazards of high-voltage equipment and transformer systems, even though maintenance frequency is relatively low. Thus, the overall magnitude is assessed as **SMALL**

Receptor susceptibility (maintenance personnel and authorized operational staff) is **MEDIUM** due to the potential risks of direct exposure to high-voltage systems and energized components, however, the staff are adequately trained. According to the impact matrix, the overall operational OHS impact for the Naseeg Sarirya Substation is assessed as **MODERATE**.

Mitigation Measures

- Abide by national occupational health and safety regulations, including Law 14/2025.
- Provision of personnel protective equipment (PPE) as well as training suitable for different activities.
- Training of workers in the identification of occupational EMF levels and hazards;
- Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers.

Residual Impacts

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

Table 6-3: The Impact Assessment Matrix for the Operation Phase

Impacts/Riks		Without Mitigation						Level of Residual Impacts after Mitigation
		Temporal scale	Spatial Scale	intensity	Magnitude	Susceptibility / Vulnerability / Value of Resource / Receptor	Level of Impact Before Mitigation	
Energy Valley facility Grid Connecting OHTL								
Ambient Air		Long term	Localized	Slight	Small	Medium	Minor to Insignificant	Insignificant
Ambient Noise		Long term	Localized	Slight	Small	Low	Insignificant	Insignificant
Biological Environment (Birds)	Electrocution	Long term	Localized	Low	Small	Medium	Minor	Insignificant
	Birds Collision Risk	Long term	Localized	High	Small	Medium	Moderate	Minor
Occupational Health and Safety		Long term	Localized	Slight	Small	Medium	Moderate	Minor
Naseeg Sariya Substation and its Connecting OHTL								
Ambient Air		Long term	Localized	Slight	Small	Low	Minor	Insignificant
Ambient Noise		Long term	Localized	Slight	Small	Low	Insignificant	Insignificant
Soil		Long term	Localized	Slight	Small	Low	Insignificant	Insignificant
Biological Environment (Birds)	Electrocution	Long term	Localized	Low	Small	Medium	Minor	Insignificant
	Birds Collision Risk	Long term	Localized	High	Medium	Low	Minor	Minor
Site Security		Long term	Localized	Slight	Small	Low	Insignificant	Insignificant
Occupational Health and Safety		Long term	Localized	Slight	Small	Medium	Moderate	Minor

6.3.3 Potential Impacts during decommissioning

The anticipated impacts during the decommissioning phase are similar to the impacts assessed during the construction phase. This includes disassembling and removal of electrical equipment, demolition of structures (control buildings, towers and substation equipment foundations), disposal of material and site restoration. The key impacts associated with these activities are air emissions, noise generation, solid waste generation, and OHS risks.

The mitigation measures for these potential impacts during decommissioning are also similar, specifically related to proper management and disposal of nonhazardous and hazardous waste. Nevertheless, the project will be committed to follow the detailed decommissioning plan (section 8.3.3) to be developed by Energy Valley prior to the commencement of decommissioning activities. The plan will define the procedures, responsibilities, mitigation measures, and monitoring requirements necessary to ensure that decommissioning is carried out in a safe and environmentally sound manner.

6.4 Impact of the Environment on Project the

6.4.1 Potential Impact of Extreme Heat

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

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

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

Mitigation Measures:

Construction:

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

Operation

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

Residual Impacts:

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

6.4.2 Potential impact of Flash Flood

According to the flash flood study included as Annex 1 of this ESIA. The site is not exposed to flash floods, based on the following:

- The Site is almost flat, and the entire study area lies between contour elevations of 127 m and 131 m above mean sea level.
- In addition, the substation site is at the higher elevations (Figure 6-1), and thus is upstream drainage paths. Therefore, the site does not require any flood protection measures against flash floods or inundation.
- Accordingly, water accumulation in specific spots might result primarily from direct precipitation over the site area, and possibly minor run-off.

Figure 6-1 presents the drainage basins influencing the project site overlaid on the Digital Elevation Model (DEM). The figure indicates that the site is situated on higher ground, minimising potential exposure to surface water accumulation or flooding from the surrounding.

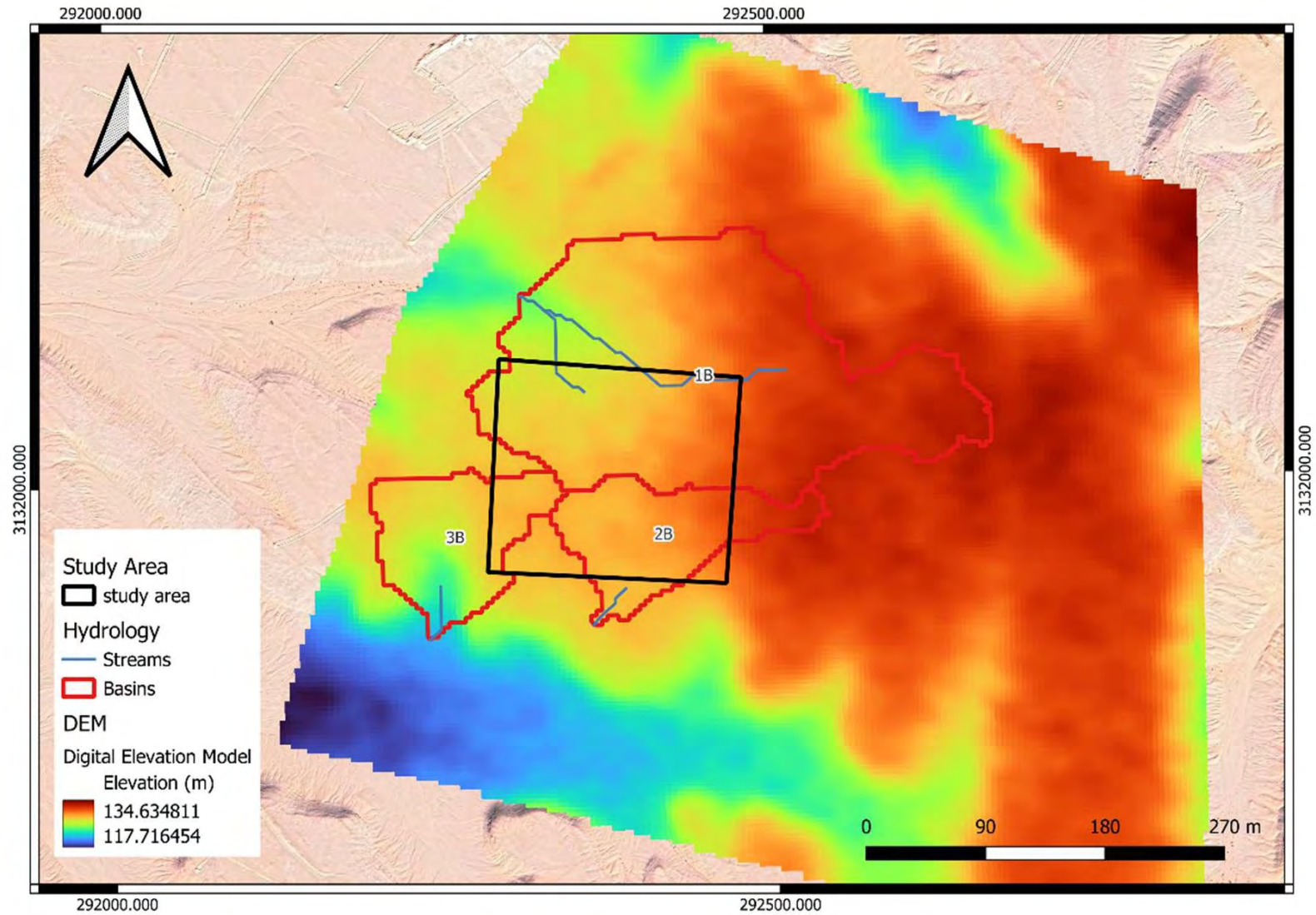


Figure 6-1: Elevations and Drainage Basins on substation site

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6.5 Cumulative Impacts XXX

The cumulative impacts associated with the Minya project components (Hybrid PV plant and BESS Facility, Consumer Substation, and associated OHTLs) are expected to be insignificant. This is primarily because the Hybrid PV and BESS Facility represent the dominant construction activity, while the Consumer Substation and OHTLs involve a substantially smaller footprint, workforce, and construction intensity. Furthermore, the Consumer Substation is located approximately 25 km from the Hybrid facility, limiting the potential for cumulative effects on local receptors.

Potential interactions are therefore expected to be limited to shared transport routes and workforce accommodation arrangements if construction activities occur simultaneously. Nevertheless, the Project will develop and implement coordinated Traffic Management and Labour Influx / Accommodation Management Plans covering the Minya components. These plans will consider cumulative workforce numbers, transport movements, accommodation arrangements, local recruitment procedures, worker code of conduct, and grievance management.

7. Stakeholders Engagement

Consultation with the community and stakeholders is an important element in the ESIA process. The current chapter presents the details of the individual consultations carried out during preparation of the ESIA.

The consultation methodology followed for the proposed project complies with both national requirements, as outlined in the ESIA Procedures Guidelines issued by the Egyptian Environmental Affairs Agency (EEAA) in January 2010, and international best practices, particularly the European Bank for Reconstruction and Development (EBRD) Performance Requirement 10: Information Disclosure and Stakeholder Engagement.

In accordance with these guidelines and standards, the consultation process included:

- Early identification of stakeholders during the scoping phase of the ESIA;
- Ongoing consultation throughout the preparation of the ESIA to ensure stakeholder concerns were adequately addressed;
- Transparent information disclosure tailored to the local context, ensuring accessibility and meaningful participation.

7.1 E&S Scoping activities

The stakeholders scoping meetings with different stakeholders categories took place at the E&S scoping phase to support the process of assessing the effects of the different projects' aspects on the environmental and social attributes within the project Area of Influence (AoI) and the determination of the irrelevant impacts (scoped out) and relevant impacts (scoped in) to be further considered in the project's detailed ESIA.

The Project's Area of Influence (AoI), associated infrastructure, the extent of the anticipated impacts, and the areas potentially affected by the induced and cumulative impacts of the Project were considered to identify stakeholders at this scoping stage. Stakeholder groups can broadly be divided into stakeholders who:

- May be directly and/or indirectly affected by the project.
- May have an interest in the project or the areas that may be affected.
- Have the potential to influence project outcomes or operations.

A first set of scoping consultation meetings took place with different stakeholders during the period 6th of January 2026 and 15-16th of February 2026 with the purpose of scoping the ESIA activities and identifying potential additional stakeholders. A second set of meetings took place on Monday 16th March 2026

The scoping meetings took place with various categories of stakeholders including:

- Minya Governorate; General Secretary of Minya Governorate; Minya Governor;;
- General Agency of the Public Property Protection – Minya governorate.
- New Minya Urban Authority
- Minya City Council
- Samalout City Council
- Minya local council environmental units

- Minya Drinking Water and Sanitation Company
- Environmental Unit of Minya Governorate
- EEAA Regional Branch office
- Operators of agricultural farms at the eastern part of the site
- Non-Governmental Organizations (NGOs)

Key Discussion Points:

All discussions with the stakeholders were conducted in Arabic and all stakeholders had the opportunity to ask questions and express their view regarding the project.

The key message received from all attendees, that all were supporting the national efforts taken to enhance the infrastructure that would secure the national energy supply to meet the domestic and industrial growing needs. Meeting this growing demand with energy generated from renewable sources was specifically welcome as it cleaner and more reliable. Stakeholders also supported the project as it will provide work opportunities to the community members.

The topics raised by the stakeholders during discussions can be categorized as follows:

- **General feedback on the project**

- The project is highly welcomed, not only because of its benefits on the national level, but will also contribute to reducing power outage in the region. The Governor of Minya showed strong positive intention to cooperate and facilitate the resolution of any challenges that may face the project implementation

- **Socio-economic issues:**

- Labour and job opportunities: provision of job opportunities was the dominant topic in all stakeholders meetings. Stakeholders expressed satisfaction regarding the significant economic value of the project and its positive future impacts on investment opportunities within Minya Governorate
- The provision of renewable energy to Sirarya industrial area
- Stakeholders emphasised on the importance of provision of work opportunities for the communities and required that El Minya people should have the priority in employment.
- Labour accommodation: was also discussed.
- Provision of job opportunities in the project may affect availability of workers for other small economic activities in the area.
- The project's grievance mechanism and complaint resolution procedures
- Provision of capacity building and training to the communities on PV
- Potential support to vulnerable groups in the communities
- Role of NOGs in cooperation with the project.
- Ability of water and wastewater treatment plants to meet the project demand during construction activities
- Available waste management infrastructure within Minya governorate
- Medical facilities in Minya governorate
- Evacuation campaigns of informally used agricultural land within the site

- **Impacts of the project on the environment:** Issues related to project's need for utilities and services including quantities and sources of water, wastewater and fuel.

Annex (3) presents the detailed minutes of meetings of the stakeholders' consultation process.

7.2 ESIA Disclosure

According to the national EIA guidelines, the stakeholders consultation is to be undertaken twice during the ESIA preparation process for Category (C) projects (High Risk, corresponding to Category A according to international systems). Consultation during the ESIA scoping phase aims to agree on the aspects and impacts that will be addressed and analysed in the ESIA. Stakeholders' meetings could be held with each concerned party individually or can take the form of a collective meeting where the concerned parties are invited to attend the meeting.

However, since the Energy Valley PV and BESS Project is categorised under “**Scoped Category B**” according to the national system, it will not require undertaking public disclosure meetings, according to EEAA guidelines, and the consultation already undertaken during the scoping phase is sufficient. However, as per the Client/Lenders, a public disclosure meeting is to be organised.

Within the above context, the approach to undertake the disclosure meeting was based on:

1. Focus on Local Stakeholders

The stakeholders to which invitations to be sent will be limited to those on the local level, the municipal level and the governorate level. Representatives of national organizations (such as EEAA and EETC) on the local/regional levels have also been invited. The public disclosure made ensure that vulnerable groups such as women and special needs were particularly invited to the meeting.

2. Announcement

In addition to invitation of targeted stakeholders, the meeting will be open to other local stakeholders. Announcements will be issued within 10-15 days before the meeting date.

3. Material for Consultation

A Non-Technical Summary (NTS) in Arabic will be attached to invitations and will be made accessible through a link advertised on the Project website.

In addition, a comment form will be prepared to be filled by stakeholders and submitted either in person or through mail/WhatsApp, for a period of 2 weeks after the meeting.

4. Venue of Public Disclosure

Location of the disclosure venue will take place in Minya governorate (Location of venue to determined).

5. Meeting outputs

The outputs and results of the stakeholders scoping and disclosure meeting and all comments and contribution are provided in Annex (4) includes the discussion register together with the attendance sheets.

8. Environmental and Social Management Plan

This ESMP has been developed in accordance with national laws and international standards for the proposed OHTL and Naseeg Sarirya Substation.

The project's ESMP consists of a set of mitigation and monitoring measures that will be considered during the construction, operation, and decommissioning phases to ensure the sound environmental and social performance of the project. The plan also includes the actions needed to be taken to implement these measures.

Decommissioning considerations are integrated into the overall environmental and social management framework, ensuring that potential impacts are minimized throughout the project lifecycle, from initial construction to final site restoration.

The purpose of the project's ESMP is to:

- Ensure continuing compliance with the relevant legislation and laws;
- Outline the ways in which the potential impacts identified in this ESIA report will be managed;
- Provide assurance to regulators and other stakeholders that the local requirements with respect to environmental and social performance are being met;
- Ensure that appropriate monitoring is undertaken, including the establishment of a monitoring plan; and
- Provide a framework for the compliance auditing programs that ensures the efficient environmental and social performance of the Project.

In general, the project's ESMP consists of the following components:

- **Summary of Impacts and Mitigation Measures** as identified in Chapter (6) of the ESIA.
- **Environmental and Social Organizational Arrangements** identify the components of the Environmental and Social Management System (ESMS), as well as the roles and responsibilities for its implementation.
- **Environmental and Social Management Plans** to ensure environmental protection and maintain efficient environmental and social performance and compliance with the relevant legislation, laws and international E&S standards.
- **Environmental Monitoring Plan** during project implementation to provide information of the key environmental aspects of the project.

8.1 Summary of Risks and Impacts, and Mitigation Measures

Table 8-1 below summarizes the social and environmental aspects, mitigation measures, and residual impacts as assessed for the different project phases.

Table 8-1: Summary of the social and Environmental Aspects, Mitigation Measures, and Residual risks and Impacts

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Construction phase			
Air quality			
Exhaust emissions from construction vehicles and mobile equipment operating on-site	Minor	- Minimize idling times of construction vehicles and machinery. - Maintain vehicles and construction equipment in good working condition. - Ensuring workers' awareness of safe driving and maintaining good practices in machinery usage. - Implement dust control measures. - Ensuring compliance with law 4/1994 and its relevant ERs regarding emissions from power generator stacks.	Insignificant
Ambient noise			
- Equipment and machinery - Vehicle Movement - Power Generators	Minor	- Machines and construction equipment must comply with the best practice technical developments - Periodical maintenance of machines and equipment with an internal combustion engine according to the manufacturer's instructions. - Schedule high-noise activities to avoid simultaneous operations that could amplify noise levels. - Provide hearing protection equipment to workers exposed to high noise levels	Insignificant
Soil			
- Earthworks - Excavation activities - Construction waste handling - Accidental spills and leakages	Minor	- Off-site maintenance to minimize spills and effluents. - Using impervious surfaces for refueling areas and other fluid transfer areas - Implement Spill Management Plan (within ESMP), including the availability of on-site spill kits - Provide a secondary containment for fuel storage tanks and other hazardous material containers. - Proper collection/disposal of spillages or contaminated materials via licensed contractors. - Good housekeeping practices on-site. - Solid waste collected at designated points. - Licensed contractors for non-hazardous and hazardous waste disposal.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Biological Environment			
Habitat loss	Minor	- Restrict construction activities strictly to the defined tower footprints and approved working areas. - Utilize existing tracks and previously disturbed corridors wherever possible. - Prohibit uncontrolled off-road driving and restrict vehicle movement to designated access routes, avoiding any vegetation patches identified during pre-construction inspections. - Clearly demarcate construction boundaries prior to work to prevent unnecessary ground disturbance.	Insignificant
Disturbance to wildlife	Minor	- Prepare and enforce a solid and hazardous waste management plan to prevent attraction of wildlife to food waste or contaminants. - Implement a liquid waste management plan to avoid the formation of artificial water sources that could attract birds or terrestrial fauna. - Conduct environmental awareness training for all construction personnel, with specific emphasis on wildlife protection and avoidance of harassment. - Avoid unnecessary night-time work, where lighting is required, use low-intensity, downward-directed lighting to minimize light spill. - Enforce strict speed limits for all project vehicles to reduce collision risk and disturbance to fauna.	Insignificant
Socio Economic Environment			
Water Demand for the workforce	Insignificant	Adopt water management practices to ensure efficient use and avoid water wastage.	Insignificant
Accommodation <u>Demand for the workforce</u>	Minor	- Prioritize hiring local workers where possible. - Accommodate the non-local workers in residential areas with higher housing capacity and food supplies.	Insignificant
Social Conflict between the workforce and the hosting community	Minor	Develop and implement a code of conduct for workers that outlines appropriate behaviour, including respect for religious customs and practices, traditional cultures and social norms of the region.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
		Establish a community grievance mechanism to address any issues promptly.	
Interaction of security personnel with workers and the surrounding community	Minor	- Ensure security personnel are adequately trained in professional conduct and community relations. - Require compliance with applicable national laws and human rights principles. - Implement a grievance mechanism accessible to community members.	Insignificant
Change in land use	Insignificant	The routes of the two OHTL, as well as the Naseeg Sarirya substation site, are in desert and unoccupied land with no existing agriculture, residential purposes, commercial activities, or other productive land uses. No risk is anticipated in this regard	No residual Impact
Traffic	Minor	- Coordinate material deliveries to avoid peak traffic hours where feasible. - Ensure safe vehicle operation and speed limits within and near the site.	Insignificant
Occupational health and safety			
OHS risks	Moderate	- Implement OHS Management Plan. - Provide appropriate PPE. - Conduct safety training and toolbox talks. - Enforce speed limits and equipment inspections. - Ensure proper training for operators, regular maintenance of equipment, and implementation of safety protocols. - Establish crane/lifting exclusion zones. - Restrict access to work zones and mark excavations. - Use fall protection measures (full body harnesses and energy-absorbing lanyards) - Maintain safe access and control slip/trip risks. - Provide shaded rest areas and heat stress measures. - Implement fire prevention measures, maintain fire extinguishers on-site, and conduct fire safety training. - Apply lock-out/tag-out procedures and restrict electrical works to qualified electricians	Minor
Cultural Heritage	Minor	Develop and implement Chance Find Procedures, indicating the actions to	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
		- be taken in case of any significant findings during site leveling and construction activities. - Notify the Ministry of Tourism and Antiquities (MOTA) if an archaeological artifact is discovered during excavation.	
Operation phase			
Ambient Air			
- Transport of people and supplies for maintenance - Potential emission of SF6, if utilized for insulation of the switchgear.	Minor	If SF6 is used as an insulator instead of air insulation, the mitigation measures will include leak detection and repair, use proper chamber vacuums during filling the SF6 into the GIS, and employee education/training.	Insignificant
Ambient noise			
- Noise (buzzing or humming) from high-voltage power lines producing corona - Operation of the transformer and other components of the substation	Insignificant	No mitigation measures are required; however, the following management measures are proposed - Regular maintenance of transformers and cooling fans to prevent abnormal noise levels. - Prompt repair or replacement of faulty components causing excessive hum or vibration.	Insignificant
Soil			
- Potential spills - Solid waste	Insignificant	- Implement proper storage and handling procedures for oils, and lubricants. - Conduct maintenance activities in designated areas. - Provide spill response materials and train staff in spill management.	Insignificant
Biological environment			
Birds Electrocuting Risks	Minor	- Increase the number of insulators where conductors connect to each tower (to increase the gap between the conductor and the tower), using insulators that prevent birds from landing on them. - Cover the crossarms with insulating materials such as PVC strips to ensure that birds are not earthed when perched.	Insignificant

Environmental and social aspect	Significance of Impact before Mitigation	Mitigation measures	Significance of Residual Impacts after Mitigation
Birds Collision Risk	Minor	For bird collision risk, no mitigation measures are recommended.	Insignificant
Social environment			
Presence and interaction of security personnel with workers and the surrounding community	Insignificant	- Trained security personnel with proper conduct toward workers and the community, operating within the law. - Grievance mechanism for the community to report concerns about security arrangements and personnel actions.	No residual impacts
Occupational Health and Safety			
- Electrical hazards - Maintenance activities	Moderate	- Abide by all national occupational health and safety regulations; Labour Law 14/2025. - Ensure that the maintenance workers are properly trained, especially for working at height training - Provision of suitable PPE as well as training suitable for different activities. - Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers.	Minor
Decommissioning Phase			
Soil, Water, Air, Noise, OHS	MINOR	- Ensure that the removal of all above-ground structures, equipment is performed is carried out in accordance with approved procedures that minimize impacts on air quality, soil, and water resources, - Focus on proper handling, management, and disposal of hazardous and non-hazardous waste streams to reduce impacts on the soil - Ensure all workers comply with occupational health and safety (OHS) requirements and are provided with and use appropriate personal protective equipment (PPE). - Restore the site to its original condition where feasible	Insignificant
Waste Management End-of-Life and Hazardous Waste	MINOR	- Temporary storage in dedicated hazardous waste areas. - Reuse and recycled (where possible), or disposed of in accordance with regulatory - Use of licensed hazardous waste transporters and recyclers.	Insignificant

8.2 Environmental and Social Organisational Arrangements

Several governmental entities have regulatory and oversight responsibilities for the project, including:

- **Egyptian Environmental Affairs Agency (EEAA):** Responsible for reviewing and approving the ESIA and monitoring environmental compliance.
- **New and Renewable Energy Authority (NREA):** Responsible for land allocation and oversight of renewable energy developments.
- **Egyptian Electricity Transmission Company (EETC):** Responsible for grid connection arrangements and electricity transmission infrastructure.
- **Ministry of Electricity and Renewable Energy (MoERE):** Provides strategic oversight of the electricity sector and renewable energy development.
- **Ministry of Labour:** Responsible for enforcement of labour and occupational health and safety requirements.
- **Minya Governorate and Local Authorities:** Responsible for local administrative coordination and permitting requirements.
- **Ministry of Tourism and Antiquities (MOTA):** Responsible for the protection of archaeological and cultural heritage resources.

8.2.1 Environmental and social management system and HSSE responsibilities

Scatec has an established Environmental and Social Management System (ESMS) that applies to all Scatec employees and projects. The ESMS is aligned with international good practice and incorporates corporate-level environmental and social policies that define Scatec's commitments to environmental protection, social responsibility, and risk management. The ESMS provides a structured framework for identifying, assessing, managing, and monitoring potential environmental and social risks and impacts, with the objective of avoiding, minimizing, mitigating, and, where feasible, enhancing positive impacts .

For the OHTLs and Naseeg Sarirya Substation, Scatec will implement the ESMS, according to the nature and scale of the Project, throughout the project lifecycle, including the construction, operation, and decommissioning phases .

During the construction phase, the EPC contractor will be required to establish, implement, and maintain a construction-phase ESMP that is consistent with international Requirements and aligned with Scatec's corporate ESMS .

During the operation and maintenance (O&M) phase, Energy Valley Company will implement and maintain its corporate ESMS, adapted as necessary to address Project-specific risks and impacts. The project ESMS will comprise, at a minimum: (i) environmental and social policies; (ii) procedures for the identification and assessment of environmental and social risks and impacts; (iii) management plans and operational controls; (iv) organizational capacity and defined roles and responsibilities; (v) training and competency requirements; (vi) grievance management mechanisms; (vii) emergency preparedness and response; and (viii) monitoring, reporting, and corrective action processes.

International standards require a clear definition of roles and responsibilities for the implementation and oversight of the Project's ESMS. According to the nature and scale of the project, HSSE supervisor will be appointed for the project.

The HSSE personnel will be responsible for daily safety work (walks-over) at the site, for inspecting safety, housekeeping, personal protection, controlling unsafe practices/conditions, updating the environmental register, and assessing the environmental performance of the facility. When construction and operation work pose a high risk that threatens the workers' safety and health, the HSSE officer has the right to end the activity in order to prevent a potential hazard. The HSEE Officer will also be responsible for follow-up on compliance with labour issues as part of their role regarding contractors' monitoring and management.

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In accordance with Law No. 4/1994 and its Executive Regulations, as amended, the Project will be subject to routine and ad hoc environmental inspections by the Egyptian Environmental Affairs Agency (EEAA) and relevant competent authorities to ensure compliance with the environmental permit conditions and applicable national environmental regulations during all project phases.

8.2.2 Environmental and Social Policy

An overarching policy will be developed defining the environmental and social (E&S) objectives and principles in order to achieve a sound E&S performance. The E&S policy may include environmental and social commitments of the project, such as compliance with international protocols or industry-specific codes of practice.

In this context, the outline of the E&S policy requirements is summarized as follows:

- Ensuring that all HS personnel responsible are properly trained and competent to fulfill their respective duties.
- Ensuring the availability of adequate resources and continuous support from top management.
- Communicating E&S policy to all employees and other relevant stakeholders.
- Ensuring the provision of safe working conditions for all employees.
- Evaluating HS risks and taking appropriate action to minimize potential risks.
- Setting up objectives with the aim of reducing and eliminating HS related incidents.
- Ensuring that all labor rights stipulated in Egyptian laws, as well as the ILO requirements and the international PSs are fulfilled for all employees. This, in addition to implementing a grievance mechanism for all workers.
- Ensuring the continuous monitoring and assessment of HS performance, both internally and through third-party external audits/monitoring.

8.2.3 Environmental and Social Reporting to AfDB

Energy Valley shall establish and implement a periodic Environmental and Social (E&S) reporting mechanism throughout the construction and operation phases of the Project. The reporting process shall document the implementation status of mitigation measures, environmental and social monitoring results, stakeholder engagement activities, grievance

management, occupational health and safety performance, incidents and accidents, corrective actions, and compliance with applicable national requirements and lender standards.

E&S Team of Energy Valley shall be responsible for the preparation of the reports, while the E&S Manager shall review and approve the reports prior to submission.

Periodic E&S performance reports shall be submitted to AfDB in accordance with the reporting requirements specified in the Financing Agreement and applicable AfDB requirements. In addition, any significant environmental, social, health and safety incidents shall be reported to AfDB promptly in accordance with lender notification requirements.

8.2.4 Risk assessment and hazard identification

The Contractor and the Subcontractors performing construction work shall carry out risk assessments prior to the commencement and during the construction works.

The risk assessments shall form part of the HS plan to be implemented on the site and shall include at least:

1. The identification of the risks and hazards to which workers may be exposed;
2. The analysis and evaluation of the risks and hazards identified;
3. A documented plan of safe work procedure to mitigate, reduce, or control the risks and hazards that have been identified;
4. A monitoring plan.

Hazards shall be eliminated when possible and can be minimized through awareness training, engineering controls, the use of personal protective equipment, and/or monitoring devices.

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

A pre-task risk assessment must be completed prior to the start of any job/task by those involved in the task.

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8.3 Environmental and Social Management Plans (ESMPs)

Within its commitment to ensure environmental protection and maintain efficient environmental performance as well as social integrity, the company will develop various environmental and social management plans addressing the different E&S aspects and impacts of the project during its construction, operation and decommissioning phases.

Decommissioning considerations are integrated into the overall E&S management framework, ensuring that potential impacts are minimized throughout the project lifecycle, from initial construction to final site restoration.

In this regard, the ESMPs to be developed will address:

8.3.1 Environmental Management Plans During the Construction Phase

The engineering, procurement and construction (EPC) contractor will develop Construction Environmental and Social Management Plan (CESMP) and submit it for energy Valley before starting construction. The main objectives of the Construction Environmental and Social Management Plan (CESMP) are to:

- Address environmental, cultural and social issues identified as part of the present ESIA study and any additional issues considered to be important;
- Minimize the residual environmental impacts of construction activities;
- Prepare an achievable environmental management plan for implementation;
- Detail management and monitoring tasks to be completed;
- State the timing for implementation of each task;
- Provide details of reporting requirements;
- Identify roles and responsibilities for ensuring that relevant tasks are completed;
- Provide contingency plans that can be followed in an event of non-compliance or complaint; and
- Detail registers and standards reporting forms for documenting complaints, non-compliances, unplanned exceedances and discharges etc.

For each plan the following structure will be followed:

- Scope and objective of the ESMP;
- Compliance Requirements and regulatory requirements;
- Roles and Responsibilities;
- Communication, training and awareness;
- Record Keeping;
- Monitoring;
- Reporting.

8.3.1.1 OHS Management Plan

A comprehensive OHS Management Plan will be developed and implemented for the construction phase by the Contractor, based on detailed task-specific risk assessments. This plan will be separate from, but aligned with, the Construction Environmental and Social Management Plan (CESMP), which focuses on broader environmental and social mitigation measures.

The OHS Management Plan will provide a structured framework to ensure the health and safety of all workers and will address, inter alia:

- Identification, assessment, and control of construction-related occupational health and safety risks;
- Definition and enforcement of OHS requirements applicable to contractors and subcontractors;
- Workforce health and safety arrangements, including training, supervision, and provision of appropriate PPE;
- Safe management of activities undertaken in close proximity to workers, including the storage, handling, and use of hazardous substances and materials; and
- Emergency preparedness and response procedures for construction-related incidents.

All contractors and subcontractors will be informed of, and required to comply with, the provisions of the OHS Management Plan. The Project HSE Manager will be responsible for

overseeing contractor compliance, monitoring OHS performance, and ensuring that construction activities are conducted in a safe and environmentally sound manner. Contractors will also be required to regularly report on OHS performance as part of the periodic construction progress reporting process, enabling continuous monitoring and improvement throughout the construction phase.

8.3.1.2 Air emission management

- Restrict unnecessary idling of construction vehicles and mobile equipment through site rules and supervision.
- Ensure all construction vehicles and machinery are regularly inspected and maintained in accordance with manufacturers' specifications to minimize exhaust emissions.
- Use well-maintained, low-emission equipment that complies with applicable national air quality and emission standards.
- Cover trucks transporting fine, loose, or friable materials to prevent dust dispersion during transport.
- Implement effective material handling and storage practices, including minimizing drop heights and limiting the size and duration of temporary stockpiles.
- Apply good housekeeping measures across the site, including regular cleaning of work areas and prompt removal of excess materials and waste.
- Limit vehicle speeds within the construction site to reduce dust generation.
- Conduct periodic visual inspections to identify excessive exhaust emissions or dust generation and implement corrective actions as required.

8.3.1.3 Noise Management

- Compliance with the requirements of Law 4/1994 regarding the exposure period to different levels of noise, whether continuous or intermittent;
- Ensuring regular maintenance of construction equipment and machinery to minimize noise emissions.
- Schedule high-noise activities to avoid simultaneous operations that could amplify noise levels.
- Workers shall be provided with adequate PPE (earplugs), and ensure that workers are always wearing PPE while working near equipment that emits high noise levels.

8.3.1.4 Solid waste management

Construction waste will be collected in a separate onsite location and periodically disposed of off-site by the contractor and will be safely transported to officially designated sites. Recyclable wastes will be reused by the contractor at other construction sites.

Solid waste management will be conducted in accordance with the requirements of laws 4/1994 and 202/2020.

8.3.1.5 Hazardous waste management

The following briefs the management plan concerning hazardous waste (HW) of the proposed project.

HW generation

Hazardous wastes potentially generated during the construction phase may include solvents, paints, and other chemicals associated with construction activities.

HW segregation and on-site storage

HW will be separated from other types of non-hazardous waste. Proper identification of hazardous waste forms a basis for waste segregation. It is therefore essential that all personnel are familiar with waste identification.

HW will be stored in the storage area in a specifically categorized zone (e.g. labelled HW zone, providing secondary containment where necessary), which would be provided with suitable fire extinguishers and other safety equipment. Furthermore, each HW type will have color-coding and will be labelled with the container's content and the required precaution instructions.

HW disposal

The HW will be transported to a WMRA/EEAA licensed facility., such as El Nassreya HW landfill in Alexandria, via a certified contractor.

8.3.1.6 Spill Prevention Management Plan

The Spill Prevention Management Plan will address spill prevention, preparedness, and response requirements to ensure the safe and effective management of accidental spills, leaks, or releases of fuels, lubricants, and other hazardous substances associated with diesel generators and construction equipment during the construction phase. The Plan aims to prevent spills where possible and, in the event of an incident, to promptly contain and remediate releases in order to minimize adverse impacts on the environment and protect the health and safety of workers.

8.3.1.7 Emergency Response Plan

The contractors will have a written Emergency Response Plan to respond to and mitigate any incident to minimize its impact on employees, community, and environment. Employees will be trained in the implementation of the plan and on response activities that could be required in the event of an emergency.

The project company will ensure that the contractors have developed preparedness programme to respond to and mitigate any emergency situation to minimize the impact on employees, community, and environment according to national laws and the international EHS guidelines.

The contractor will be committed to the following:

- A knowledgeable, highly trained, and motivated employee group;
- A safety and accident record;
- Preparation and training for emergency response and mitigation measures; and
- Awareness among the workforce through education and training.

In addition, the written emergency plan will be prepared to address the following phases:

- Preparedness: the activities that are communicated for rescuing and minimizing damage.
- Response: the actions necessary to minimize loss of life and property damage and provide emergency assistance.
- Recovery: short- and long-term activities which restore the construction activities and help return it to its normal state.

- Mitigation: the activities that eliminate or reduce the probability of disaster.

8.3.1.8 Chance Find Procedure

As indicated in chapter 3 above, there are no registered antiquities or cultural heritage sites within the project site based on the Egyptian Archeological Map (2022) and the UNESCO World Heritage List of Egypt. However, Although the site is located on previously disturbed land, chance find procedures will be developed to address potential cases of encountering cultural heritage components during the project's construction activities.

The chance find procedure defines the actions to be taken in case of any finds during the construction activity excavations. Such finds could include Non-archaeological/Natural/Cultural Find, Insignificant Chance Finds, Potentially Significant Archaeological Finds or Human remains and/or Burial-related Material.

In general, the Ministry of Tourism and Antiquities (MOTA) has the responsibility for the discovery and exploration of antiquities across Egyptian territory. According to Law No. 117 of 1983, as amended by Law No. 3 of 2010, any person who discovers an unregistered archaeological artifact is obligated to notify the MOTA. The artifact shall be considered state property, and the MOTA must take the necessary measures to preserve it. Within three months, the MOTA must either remove the artifact found on private property or take the necessary procedures to expropriate the land on which it was found, or leave it in place and register it following the provisions of this law.

8.3.1.9 Staff Training and Awareness

Construction workers will be trained and educated according to their respective responsibilities and assigned tasks. A workers' training program will involve training staff on safe handling of equipment, wastes, and on the use of equipment. Moreover, they will be trained on the safe operation of equipment and spill clean-up. They will also be trained on the use of fire hose reels and fire extinguishers. The training program will also tend to increase workers' awareness of the potential environmental impacts of various construction activities. Awareness will also include issues related to GBVH / SEAH, and developing measures for reporting these cases needs to be established.

The project will undertake an induction program to advise contractors and site visitors of basic health, safety, and emergency procedures, such as emergency signals and evacuation routes. Contractors and vendors on short-term assignments that do not have safety and emergency response training will work under the supervision of the Company staff.

8.3.2 Environmental Management Plans During the Operation Phase

The company will be responsible for the preparation, implementation, and monitoring of the environmental management plan during the operation phase. The management plan will also comply with the world Bank E&S "General Environmental, Health, and Safety Guidelines".

The following shows the minimum set of environmental management procedures that the facility operator will establish and follow.

- **Environmental Register**

During the operation phase, an Environmental Register will be developed for the project activities and the compliance status. The Environmental Register and the Hazardous Materials and Waste Register will be prepared in accordance with the requirements of Annex 3 of the ERs of Law 4/1994 and its amendments, as relevant to the project nature and activities.

8.3.2.1 OHS Management Plan

During the operation phase, the company will implement an OHS Management Plan to ensure the health and safety of all employees, contractors, and visitors. The plan will be aligned with the international Standards, and applicable national legislation.

The OHS Management Plan will be based on hazard identification and risk assessment for operational activities, including electrical works, routine and non-routine maintenance, waste handling, and emergency situations. It will define safe operating procedures, permit-to-work systems where required, and the mandatory use of task-specific PPE.

The plan will also include OHS training and induction, incident and near-miss reporting, emergency preparedness coordination, and periodic inspections to monitor compliance. Overall responsibility for implementation and monitoring will rest with project 's designated OHS/HSE Officer.

8.3.2.2 Hazardous Wastes (HW) Management

Hazardous wastes generated from maintenance activities of the proposed project will be collected by an authorized contractor to be disposed of in designated safe disposal sites. HW will be stored in a specific storage area until safe disposal.

HW will be recorded in the hazardous wastes register in accordance with the legal requirements stipulated in Article 33 of the Environment Law 4/1994.

8.3.2.3 Solid Wastes Management

solid waste generation will be limited and mainly associated with routine site activities. This includes small quantities of domestic waste generated by operational staff, as well as packaging waste such as cardboard, plastic wrapping, and wooden pallets arising from the delivery of spare parts and routine maintenance materials.

8.3.2.4 Preventive and corrective maintenance

The main objective of maintenance is to maximize the utilization of the equipment in its proper operating conditions.

Planned maintenance

Maintenance will be carried out in accordance with:

- Equipment manufacturers' suggested requirements.
- Scheduled inspections according to good maintenance practices.
- Maintenance programs and procedures developed by the company.

Preventive Maintenance

The preventive maintenance guidelines are based on:

- A general maintenance plan according to which all maintenance activities are scheduled.
- Regular visual inspections will be conducted for the transformer, switchgear, the electric system, the monitoring system, and the security system to detect existing and potential defects. It is particularly important to inspect all plant equipment exposed to the weather.

Corrective Maintenance Plan and Response Times

Preventive maintenance reduces the frequency of breakdowns, but cannot avoid them. Unplanned maintenance involves corrective maintenance and emergency repairs resulting from equipment problems, required as a result of equipment breakdowns or deficiencies. Once a problem occurs, the plant maintenance staff is trained enough to carry out the repairs in a quick response time in order to return to normal operation levels. Corrective maintenance may involve the participation of specialized maintenance contractors.

8.3.2.5 Spill Prevention Management Plan

The plan will address the spill prevention, preparedness, and response requirements to support the safe response to accidental spills, leaks, or releases of both hazardous and non-hazardous materials to the environment to eliminate or minimize the adverse effects should a spill occur and to protect the health and safety of employees.

8.3.2.6 Training and Capacity Building

To ensure the competence of the project's employees in undertaking the environmental management procedures and plans, training will be delivered by the HSSE supervisor to the maintenance personnel according to their particular responsibilities.

A workers' training program will cover key thematic areas such as occupational health and safety (OHS), safe handling of equipment and material, waste management, emergency preparedness and response, fire safety (including the use of fire hose reels and fire extinguishers), and environmental awareness related to project operations. Workers will also be informed of potential health and safety risks associated with project activities. Training plans will be put in place to:

- Ensure that all visitors and site personnel undergo a site-specific HSE Induction training session;
- Ensure that all records of attendance are kept on file.
- Ensure that all visitors and personnel are issued with an access card as proof of site induction.
- Provide a list of site-specific hazards identified.
- Ensure that Sub-Contractors will conduct their own task-specific risk assessments and keep records in the Health and Safety file.

8.3.2.7 Emergency response plans

Identify specific risks

The identification of risks includes potential risks related to equipment, devices, materials, buildings, and operation procedures. Risk identification is carried out to estimate the type, quantity, and magnitude of risks that could induce fire, personnel fatality, or building collapse.

These risks include the following:

- Activities that may pose risks to the workers;

- Quantities and types of hazardous materials/wastes used or stored; and
- Potential failure of the safety measures and procedures

Preparedness

Identify human, administrative, and organizational resources, as well as equipment and sites needed to combat risks. The following activities will be carried out:

- Identify the required training for staff and implementation schedule;
- Identify the essential tools/procedures for the protection of individuals and groups, and also determine the requirements for rescue and medical treatment;
- Prepare maps and detailed plans that include gathering points and escape routes, and evacuation plans in case of emergency, and determine the timeline for implementation;
- Identify the affected parties and stakeholders, provide the emergency support and services, and determine the type of assistance needed; and
- Determine fire prevention and control requirements.

Implementation

The plan should include the level of implementation carried out by individuals or groups according to the following steps:

Warning and alarm plan

The selected warning method should be effective in terms of communicating the warning message to all employees of the site and making sure that they are aware of the nature of the risk and provide them with the opportunity to confront or escape from it. The alarm must be visible and audible to reach all employees on the site.

Response

Responses are carried out according to the type, rate of spread, damages and consequences of the hazard through trained personnel, either directly or manually, using smart devices or through offsite control.

Medical assistance and services

A communication line for access to ambulance shall be available to provide medical care for the potential injured workers and transfer them immediately to hospitals, if needed.

Documentation

A record/report including time, duration of implementation, cost, expenditure, efficiency, effectiveness, and responsible personnel of each of the above measures shall be maintained. The company will develop a reporting system for accidents, including injuries, damage to property, and environmental damage. The information and records mentioned will be used to improve response procedures and to decrease and control potential hazards. General information to be recorded is as follows:

- Date, place of incident or emergency;
- The affected individual or groups;
- Description of the situation and conditions surrounding the site;
- Identify and assess the magnitude of injury, loss, damage or pollution;
- Actions taken to reduce the severity and degree of the situation; and
- Record the treatment or cleaning procedures that have been carried out.

Follow-up procedures

Once the hazard is managed, a throughout survey of the affected site must be carried out to ensure that the hazard is eliminated, and that the situation is restored to its original state. Follow-up procedures include the following:

- Identify the causes of the emergency.
- Assess the efficiency of emergency response procedures;
- Propose corrective action and remedial measures necessary to prevent recurrence of such incidents; and
- Identify the level of need to implement any treatment and/or monitor procedures to restore the site to its original state;

Update the emergency response plan and staff training program

The emergency plan will be updated every year or at the event that needs improvement of the plan and the staff training program.

a. Biodiversity Management

The Project will ensure that personnel are aware of the importance of the biological environment. Strict measures will be in case of non-compliance with the laws and regulations.

In order to raise the awareness of the onsite personnel with regards to issues relevant to the protection and preservation of biodiversity, the following activities will be carried out:

- Display posters demonstrating the Project's commitment to the conservation of biodiversity throughout the site;
- Increase the number of insulators to prevent birds from landing on conductors and forcing birds to perch on crossarms only.
- Cover the crossarms of pylons with insulating materials to ensure that birds are not earthed.

8.3.3 Environmental Management Plans During the Decommissioning phase

Decommissioning is defined as the close down of operations, the removal of process equipment, buildings, and structures, and carryout site cleanup and remediation, if required. The expected lifetime of the project ranges between 30 to 40 years²³, which could be extended as long as the proper predictive maintenance measures are taken, and all the necessary revamps and upgrades are done.

Prior to commencement of decommissioning activities, EETC will prepare and implement a detailed Decommissioning Plan in accordance with applicable Egyptian regulations, lender requirements, equipment supplier recommendations, and Good International Industry Practice (GIIP). The Decommissioning Plan will define the decommissioning methodology, health and safety requirements, waste management procedures, recycling and disposal arrangements, transportation requirements, and site restoration measures applicable at the time of decommissioning.

The following are the main issues addressed by the facility's decommissioning plan:

²³

<https://library.e.abb.com/public/88c8466db0d54a998cf07404549a884d/Substation+Assessment+flyer.pdf?x-sign=T8vcgRVVdwzGLmrsfJOWFzj0fC141jgAmxFL7LUKHZG6VkytTYozlYq7z5NCxHJe#:~:text=%E2%80%94%20Substation%20performance%20deteriorates%20and%20its,loss%20due%20to%20power%20outages.>

- Development of the decommissioning plan according to international and best practices guidelines.
- Removal procedures for all above-ground structures, equipment, and infrastructure associated with the substation and the OHTL.
- Disassemble project components, including transformers, switchgear, circuit breaker conductors and other electrical components from the tower.
- Reuse and recycled (where possible) or disposed of in accordance with regulatory requirements.
- Final site clean-up to ensure that no residual contamination or safety hazard remains.

8.3.4 Social Management Plan During Construction and Operation Phases

It is of key importance for the company to have close and proactive communication with the local community and to disclose the project information for transparency and to enhance credibility. A detailed stakeholder engagement and management plan (SEP) will be developed for the project. Main aspects of the plan are summarized in the following sections.

b. Labour and Working Conditions

Recruitment procedures for the Energy Valley project will be implemented by contractors in accordance with principles of equal opportunity, transparency, and non-discrimination, promoting local employment and female inclusion where feasible. During Construction, the Project will ensure that contractors apply appropriate occupational health and safety measures and fully prohibit forced, compulsory, and child labour during construction. During operation, labour and workplace health and safety practices will comply with Egyptian Labour Law No. 14/2025 and relevant international occupational health and safety guidelines.

c. Site Security Management

Site security during the construction phase will be provided by a licensed contractor-appointed security company under the supervision of the Energy Valley, while responsibility during operation will rest with Energy Valley through an annually contracted licensed security provider. Security personnel will control access to the fenced premises and operate on a shift basis. Although interactions with workers, nearby communities, and road users are expected to be limited and localized, inappropriate conduct could create community concerns if not properly managed. Accordingly, all security personnel will receive training on professional conduct, community relations, applicable national laws, and relevant human rights principles consistent with GIIP.

d. Grievance Management

A Grievance Management Plan will be developed for both construction and operation phases to address both internal and external grievance mechanisms, as applicable.

Minimizing grievances is realized through managing impacts and through pre-emptive stakeholder engagement designed to anticipate and address potential issues before they become grievances.

A grievance is defined as an issue, concern, problem or claim (perceived or actual) that an individual or community group wants a company or contractor to address and resolve. In alignment with the EBRD PRs (2019), the Grievance Mechanism (GM) will “seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate and readily accessible, and at no cost and without retribution to the

party that originated the issue of concern"²⁴. The mechanism will also allow for anonymous complaints to be raised and addressed.

The process covers all components and activities of the Project, including those activities undertaken by contractors and subcontractors on behalf of the Project. A detailed Stakeholders engagement plan including details of the GRM has been prepared for the overall Energy Valley project.

Figure 8-1 shows the proposed project's grievance mechanism system.

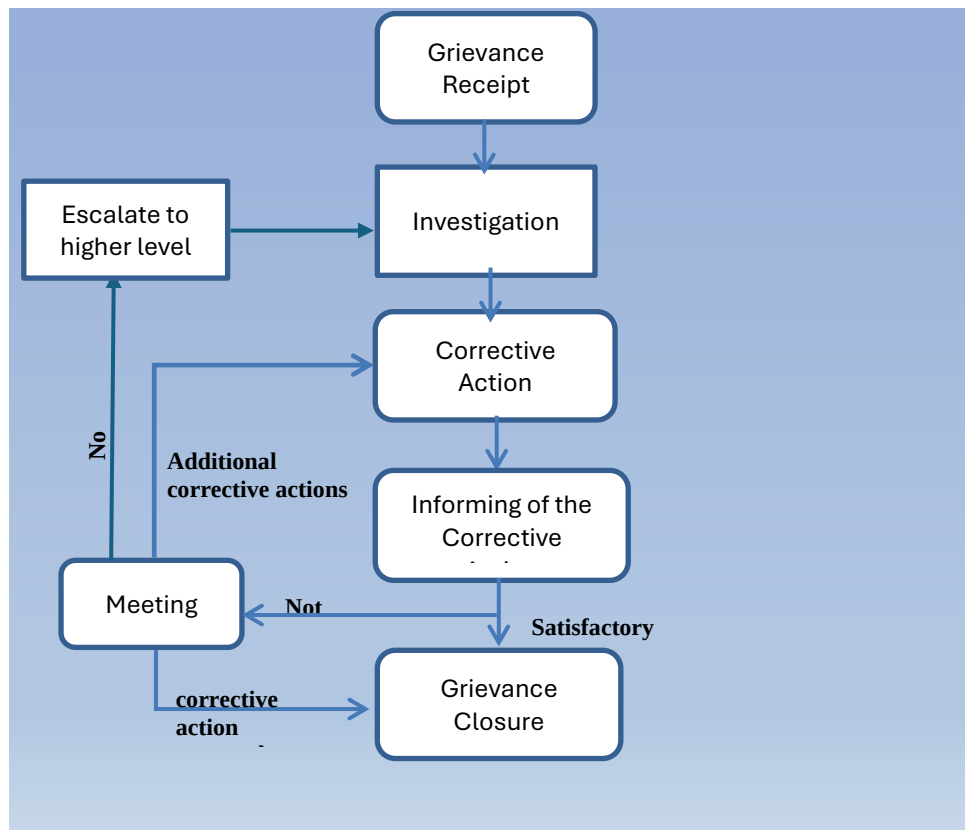


Figure 8-1: Proposed grievance mechanism system

- Grievances can be lodged in writing or verbally, as appropriate.
- Grievances may be submitted anonymously through multiple channels. For workers, a grievance box will be installed at the construction site and other designated project locations to allow submission of written complaints. For surrounding communities, grievances may be submitted through the project website and/or other established communication channels to ensure accessible and transparent grievance handling.
- A Grievance form will be disclosed at key locations as well as on the company website. The Grievance form will inform the communities on how and where to submit a grievance.
- Women will be offered the opportunity to report grievances to and receive feedback from a female representative.

²⁴ IFC PS 2012, para. 35 (Grievance Mechanism for Affected Communities)

- All grievances will be recorded in the grievance register, indicating details of the grievant, status and address of the person, type of stakeholder, the date on which the grievance happened and was recorded, a brief description of the grievance, detail on whether the grievance is a once-off or ongoing / repeated matter, and the outcome that is being sought;
- Grievance investigation will be recorded.
- After the grievance has been resolved, the resolution will be communicated to the grievant. The date on which the matter was resolved and a summary of the resolution will be recorded in the grievance register. Should the complainant still be dissatisfied, the complainant may appeal.
- The GRM will be communicated to all stakeholders.
- All grievances received will be recorded in a Grievance Register and assigned a unique reference number. The register will include details of the complainant (where disclosed), stakeholder category, date received, nature of the grievance, actions taken, current status, and resolution outcome.
- On a monthly basis, the grievance register will be reviewed to ensure all grievances are captured, and responded to. Implementation of the measures proposed to address the grievance should be checked and the close-out of the grievance monitored.

Grievance Handling Process

The grievance management process will include the following steps:

Step	Responsibility	Timeframe
Receipt and registration of grievance	CLO ²⁵ / Site HSE Officer	Within 2 working days
Acknowledgement of receipt to the complainant	CLO	Within 5 working days
Assessment, investigation, and assignment of responsibility	Contractor and Project E&S Team	Within 10 working days
Development and communication of the proposed resolution	Project E&S Manager	Within 30 calendar days
Implementation of corrective actions	Responsible Department / Contractor	As agreed during the resolution process
Close-out and documentation	Project E&S Team	Following the complainant's acceptance
Appeal and escalation (if required)	Project Management	Within 15 working days of appeal submission

²⁵ The Community Liaison Officer (CLO) will serve as the primary focal point for receiving, recording, and communicating grievances.

The GRM will be monitored through regular stakeholder engagement meetings. During these meetings, community members will be asked for feedback on the stakeholder engagement program. The indicators that will be used to monitor the implementation of the GRM will include, but not be limited to the following:

- Issues raised by NGOs and other Stakeholders, actions agreed and status of those actions
- Number of grievances received from affected people and from external stakeholders
- Number of community grievances (i) open, (ii) open during more than 30 days, (iii) resolved, (iv) closed, and (v) number of responses that satisfied the complainants, during the reporting period disaggregated by category of grievance, gender, age and location of complainant.
- Categorization of grievances (by topic – e.g. noise/ safety), disaggregated by complainant's gender
- Number of grievances raised by workers, disaggregated by gender of workers and worksite
- Number of workers grievances (i) opened, (ii) open during more than 30 days, (iii) resolved, (iv) closed, and (v) number of responses that satisfied the workers, during the reporting period disaggregated by category of grievance, gender, age of workers and worksite.

Table 8-2 : Overview of the ESMP Plans

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
Air Quality	Dust emissions	- Reduce idling times for vehicles and machinery; - Maintaining machinery and vehicles in good working order - Speed restriction on sites; - Ensuring workers are aware of safe driving and maintaining good practices in machinery usage; and - Periodic measurements for stacks of generators	Construction contractor	- Monitoring plan - Air quality measurements	5,000 – 10,000 / year	Throughout the construction phase period
	working conditions of machinery	- Ensure good working conditions through frequent inspection of all construction equipment - Implementation of OHS plans	Construction contractor	Maintenance logs OHS plan	15,000 – 30,000 (included in EPC O&M allowance)	
Noise Level	working conditions of machinery	- Regular maintenance of construction equipment - Use low-noise equipment, where possible; - Schedule high-noise activities to avoid simultaneous operations that could amplify noise levels; - Schedule high-noise activities to take place in morning hours - Implementation of OHS plans	Construction contractor	OHS plan Noise measurements and Maintenance logs	10,000 – 15,000 / year	Throughout the construction phase period
	Provision of PPEs	- Providing necessary PPE for workers	Construction contractor		5,000 – 10,000 (PPE supply - total project period)	
Soil	housekeeping practices	- Develop and implement site management plan, solid waste management and wastewater	Construction contractor-Energy Valley	-Waste and wastewater management plans	2,000 – 8,000 (depends on waste volume)	Throughout the construction phase period

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
	Waste/wastewater management	management plans and spill prevention plans - Proper collection, containment, and disposal of sanitary wastewater - Proper collection, containment, and disposal of sanitary wastewater - hazardous materials storage and handling according to the WBG General EHS Guidelines, - Transportation and disposal to be carried out through authorized waste contractors	Energy Valley company (include provisions in the construction contracts. Developers to ensure contractors' compliance)	- Solid/hazardous waste and wastewater management contract - Contractor follow-up documents - Contracts with authorized waste contractors		
Occupational Health and Safety	Site Staff and Workplace Safety	-Developing OHS plan and HSE procedures according to national requirements and international standards	Contractor	OHS plan and procedures HSE provisions in the construction contracts	15,000 – 20,000	Before construction activities
Emergency Response plans	Site Staff and Workplace Safety	-Develop procedures for emergency control	Contractor	Emergency response plan	7,000 – 20,000	Before project commissioning
Waste management	Worker's health	-Developing a solid and hazardous waste management plans in line with the WBG General EHS Guidelines." -Developing OHS plans -Different types of waste to be stored in designated waste areas, and transported by licensed contractors	Construction contractor	Solid waste management contract with authorized contractors Waste manifest OHS plan	200 – 600 EUR/ton (hazardous waste) 80 – 150 EUR/ton (non-hazardous)	Throughout the construction phase period

Aspect		Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase							
Biological Environment		Disturbance to wildlife	- Awareness (toolbox talks and awareness signs) - Implementation of mitigation measures - Supervision and implementation of deterring measures	Construction contractor	Requirements specified in contracts	10,000 – 25,000 (one-time)	Throughout the construction phase
							Throughout the construction phase
Social Environment		Community health, safety and security- risks from road traffic accidents	- Develop Traffic Management Plan (TMP) and associated procedures	Construction contractors	TMP and procedures	10,000 – 25,000	Throughout the construction phase period
		Cultural heritage	- develop chance find procedure	Energy Valley company/Construction contractors	Developed procedures	2,000 – 5,000	Before construction activities
Total Estimated Cost	(USD)					≈ 180,000 USD	
	(EGP)					≈ 8,820,000 EGP	

Aspect		Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
Operation Phase							
Air quality		Release of SF ₆ gas during GIS maintenance and repair activities	- Optimize the operation of backup generators to reduce usage and emissions. - Conducting regular maintenance and periodic emissions monitoring of generators to ensure efficient operation and minimize air emissions	EETC	Emission measurements Maintenance records	3,000-6,000/year	Periodically throughout the operation stage

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
SF ₆ emissions/Leak detection	- Accidental release of SF₆ during opening of GIS compartments and gas handling operations - Undetected gas leaks from flanges, valves, hoses, and GIS components during repair activities	- Isolate and depressurize GIS compartments prior to maintenance. Use approved SF₆ recovery units during gas evacuation and refilling. - Conduct leak inspections using calibrated portable SF₆ leak detectors before, during, and after maintenance activities.	EETC (O&M Team/HSE officer)	- Maintenance records available. - Leak inspection records completed, and no unaddressed leaks identified.	5,000-10,000	Before and throughout repair activities
Noise	Transformers	- Worker work with noise generating machinery and equipment will be provided with suitable (PPEs). - A grievance mechanism will be adopted for assessing complaints,	EETC	Noise measurements	3,000–5,000/year	Periodically throughout the operation stage
Biological Environment	Same as for the construction phase	- Same as for the construction phase	EETC	Reports	1,000–3,000/year	Throughout the project lifetime
Impact on the social environment	Water consumption	- Water demand during the operation phase is minimal and will be supplied in coordination between the project and the water company to plan the sources of water by an approved contractor and discharged to designated treatment plants	EETC	Water management plan	1,000–3,000/year	Throughout the project lifetime
	Wastewater management	- Wastewater generated during the operation phase is minimal and will be collected by an approved	EETC	Wastewater management plan		Throughout the project lifetime

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
		contractor and discharged to designated treatment plants				
Labour rights and welfare	working conditions	Develop Human Resources policy	EETC	Contracts (with workers)	2,000–5,000 (one-time)	Throughout the project lifetime
Training and Awareness	competence of the project personnel	Training for the personnel according to their responsibilities	EETC	Training plans	3,000–8,000/year	Throughout the project lifetime
Occupational Health and Safety	Site Staff and Workplace Safety	- Developing HSE procedures	EETC	Development of HSE policies	10,000–20,000/year	Before project commissioning
Emergency Preparedness and Response	Operational risk management	- Adopt a probabilistic risk assessment framework	EETC	Emergency response plan	5,000–10,000/year	Before project commissioning
Community health, safety, and site security	- risk of road traffic accidents - Site security	- Develop site security and safety plan - Develop a grievance mechanism	EETC	- security plan - SEP and grievance mechanism and register	3,000-8,000/year	Throughout the project lifetime
Total Estimated Cost	(USD)				≈72,000	
	(EGP)				≈3,600,000	
Decommissioning Phase						
Decommissioning Planning	- Inadequate planning and coordination	- Prepare and implement a Decommissioning Plan in accordance with Egyptian regulations, lender requirements, and GIIP.	(EETC/Energy Valley)	- Approved Decommissioning Plan	10000–15,000 (one-time)	Prior to decommissioning
Air Quality	- Dust and air emissions from dismantling and demolition	- Apply dust suppression measures and follow approved dismantling procedures.	Decommissioning Contractor	- No significant dust complaints; monitoring records	3,000-5,000	Throughout decommissioning
Noise	- Noise from demolition and equipment removal	- Limit noisy activities, maintain equipment in a good working conditions , and provide PPE where required.	Decommissioning Contractor	- Compliance with applicable noise requirements	5,000-7,000	Throughout decommissioning

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
Waste Management	- Generation of hazardous and non-hazardous waste	- Segregate, reuse/recycle where feasible, and dispose of wastes through licensed facilities.	Decommissioning Contractor	-Solid/hazardous waste and wastewater management contract -Contractor follow-up documents -Contracts with authorized waste contractors	5,000-10,000	Throughout decommissioning
Occupational Health and Safety	- Worker injuries during dismantling and demolition	- Implement OHS procedures, provide PPE, training, and emergency preparedness.	Decommissioning Contractor	- No major incidents; OHS inspection records	7,000-10,000	Throughout decommissioning
Site Restoration	- Residual contamination and disturbed land	- Remove remaining structures, clean up the site, remediate if required, and restore the site where feasible.	Decommissioning Contractor / Project Proponent	- Site restoration completed and approved	10,000-30,000	Before project closure
Total Estimated Cost	(USD)				≈77,000	
	(EGP)				≈3,850,000	

8.4 Environmental Monitoring Plan

Once the risks are identified and assessed, appropriate mitigation measures are defined to minimize or eliminate the potential hazards. For each risk that has been evaluated, specific controls are established to ensure that risks are managed effectively and consistently throughout project activities.

To support this, technical instructions and procedures will be developed to monitor, control the following activities:

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

8.4.1 Monitoring Plan during Construction

8.4.1.1 Monitoring Air Quality

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

The following parameters shall be measured:

- Carbon monoxide, CO
- Sulfur dioxide, SO₂
- Nitrogen oxides, NO_x
- PM₁₀

8.4.1.2 Workplace Noise

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

8.4.1.3 Solid and Hazardous Wastes

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

8.4.1.4 Workplace Monitoring

HSE Audit

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

- Audits: Contractor's safety and environmental officers shall perform periodic site audits (minimum bi-weekly) to verify the implementation of the HS plan and EOP. Jointly they shall perform a documentation review.

- The company HSE team will perform periodic audits on the site and documentation. Contractors are required to ensure the prompt resolution of any evidence found
- Inspections: Contractor and subcontractors shall ensure that visual inspections of tools and vehicles are performed daily or prior to the start of each shift.
- Monthly documented inspections of tools, equipment, and vehicles shall be performed.
- The contractor and subcontractors shall perform daily visual inspections of the workplace as required by the project of the workplace to identify potential hazards and work process verification.
- HSE Meetings: Contractor shall hold weekly HSE meetings, in the presence of EETC and subcontractors' representatives, in order to manage ongoing activities, and to avoid any interference.
- HSE Meeting shall be held whenever a new contractor starts to work.

Health monitoring

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

Personal protective equipment

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

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

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

Health and safety technician, qualified personnel

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

8.4.2 Monitoring Plan during Operation

Workplace Noise

Sources of noise are from equipment, including power transformers and the cooling system. Additionally, noise may be generated due to the corona effect of the OHTL and maintenance activities, which will be compared to the noise levels set in Annex (7) of the Modified ERs of Law 4/1994.

Electromagnetic Field (EMF)

Workers typically have a higher exposure to EMF than the public due to working in proximity to electric power lines and the substation; however, this exposure is limited to the time of inspection and maintenance activities. Workers' exposure to electromagnetic fields (EMF) shall be monitored to ensure compliance with internationally recognized occupational exposure limits, such as those issued by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

Table 8-3: Proposed Environmental Monitoring Plan

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Construction phase								
Workplace	Noise measurements	Project site	- Compliance of noise intensity with standards	Law No. 4/1994 (Annex 7); IFC/WBG General EHS Guidelines; EBRD PR4; AfDB OS4; EIB ESS3	Measurement at one locations quarterly	All contractors and subcontractors , supervised by Energy Valley	Third party (research entity or certified lab)	~5,000 EGP
	Air emissions	Project site	- Compliance with air emission standards	Law No. 4/1994 (Annex 6); IFC/WBG General EHS Guidelines; EBRD PR3; AfDB OS4; EIB ESS3	Measurement at one locations quarterly	All contractors and subcontractors , supervised by Energy Valley	Third party (research entity or certified lab)	~ 17,000 EGP
Biodiversity	Habitats and biodiversity	Project site and Vicinity (Aol)	- Absence of hazards to wildlife and habitats - Proper implementation of mitigation measures	Law No. 4/1994; IFC PS6; EBRD PR6; AfDB OS3; EIB ESS3	Daily	All contractors and subcontractors , supervised by Energy Valley	Energy Valley Company /EETC and contactors EHS personnel	6,000 – 12,000
	Fauna		- Number of fauna encounters - No or reduced number of fatalities (such as road mortalities)		Chance encounters			
	Pests		- Good housekeeping - Absence of pests		Daily			

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Social management	Waste management	Project site and waste storage areas	Proper management of the different types of waste	Waste Management Law No. 202/2020; Law No. 4/1994; IFC PS3; EBRD PR3; AfDB OS4; EIB ESS3	Regular	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company/EETC and contractors EHS personnel	200 – 600 USD/ton (hazardous waste) 80 – 150 USD/ton (non-hazardous)
	Wastewater management	Project site	- Good housekeeping Absence of alien vegetation		Regular	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company/EETC and contractors EHS personnel	10,000–30,000 EGP/ year (mainly contractor fees)
	Workers influx	Offsite accommodation	Number of community grievance	Egyptian Labour Law No. 14/2025; IFC PS2; EBRD PR2; AfDB OS5; EIB ESS8	Regular	All contractors and sub-contractors, supervised by the Energy Valley company	Energy Valley Company/EETC and contractors' EHS personnel	USD 5,00–1,000/year
	Traffic management	Project site and Vicinity (Aol)	- No road accidents - No community grievances - Proper implementation of traffic management plan	IFC PS4; EBRD PR4; AfDB OS4; EIB ESS9	Regular during construction phase	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company/EETC and contractors EHS personnel	USD 5,00–1,000/year
Operation phase								

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Workplace	Noise measurements	Transformers	Compliance of noise intensity with standards	Law No. 4/1994 (Annex 7); IFC/WBG General EHS Guidelines; EBRD PR4; AfDB OS4; EIB ESS3	Annually	Energy Valley company/EETC	Third party (research entity or certified lab)	~10,000 EGP
Project site and vicinity	Biodiversity (same as for the construction phase)	Same as for the construction phase	Same as for the construction phase	Law No. 4/1994; IFC PS6; EBRD PR6; AfDB OS3; EIB ESS3	Same as for the construction phase	Energy Valley company/EETC	Project personnel	10,000 – 25,000 EGP
Overall Project E&S Performance	Independent Environmental and Social Performance Audit	Project site	– Compliance with ESMP commitments. – ESMS requirements. – lender requirements. – corrective actions. – stakeholder engagement. – Grievance management. – OHS performance. – incident management and applicable legal requirements	AfDB Integrated Safeguards System (ISS); AfDB OSs; IFC Performance Standards; EBRD PRs; Applicable National Legislation	Annually	Energy Valley company/EETC	Independent external E&S consultant/auditing firm	USD 3,000–8,000 per audit
Decommissioning phase								
Air quality (dust from demolition and dismantling)	Visual inspections and dust monitoring (if required)	Active decommissioning areas, access roads, nearby sensitive receptors	– No excessive dust emissions or dust-related complaints; implementation of dust suppression measures	Law No. 4/1994 (Annex 6); IFC/WBG General EHS Guidelines; EBRD PR3; AfDB OS4; EIB ESS3	Weekly and following complaints	Energy Valley company/EETC	Decommissioning Contractor	10,000 EGP

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Noise from dismantling activities	Noise monitoring and site inspections	Site boundary and nearest sensitive receptors (where applicable)	– Compliance with applicable noise limits; no justified complaints	Law No. 4/1994 (Annex 7); IFC/WBG General EHS Guidelines; EBRD PR3; AfDB OS4; EIB ESS3	Monthly and following complaints	Energy Valley company/EETC	Qualified Environmental Consultant / Contractor	5,000 EGP
Hazardous and non-hazardous waste	Waste management inspections and documentation review	Waste storage areas and disposal/recycling facilities	– Proper segregation, storage, transport, recycling, and disposal; waste manifests maintained	Waste Management Law No. 202/2020; Law No. 4/1994; IFC PS3; EBRD PR3; AfDB OS4; EIB ESS3	Weekly	Energy Valley company/EETC	Decommissioning Contractor	45,000 EGP
Soil contamination from waste, fuels, oils, or transformer components	Site inspections and spill monitoring	Fuel storage areas, dismantling areas, transformer removal locations	– No evidence of spills or contamination; spill response records available	Law No. 4/1994 and law 202/2020 / IFC/WBG General EHS Guidelines; EBRD PR3; AfDB OS4; EIB ESS3	Weekly and after any spill	Energy Valley company/EETC	Decommissioning Contractor	6,000 EGP
Occupational Health and Safety (OHS)	OHS inspections and incident reporting	Entire project site	– PPE compliance; work permits; training records; number of incidents/LTIs	Egyptian Labour Law No. 14/2025; IFC PS2; IFC PS4; EBRD PR2 & PR4; AfDB OS5; EIB ESS9	Daily inspections; monthly reporting	Energy Valley company/EETC	Decommissioning Contractor	45,000 EGP
Community Health and Safety	Inspection of traffic management, access control, and public safety measures	Site entrances, access roads, surrounding communities	– No unauthorized access; effective traffic management; no community incidents	IFC PS4; EBRD PR4; AfDB OS4; EIB ESS9	Weekly	Energy Valley company/EETC	Decommissioning Contractor	10,000 EGP
Consolidated Estimated Annual Environmental and Social Monitoring Budget								
		Construction Phase	Operation Phase	Decommissioning phase				

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Estimated Total Annual Cost*	(USD)	Approx. USD 1,000–4,000	Approx. USD 3000–8,000	Approx. 2,420USD				
	(EGP)	Approx. EGP 50,000–200,000	– Approx. EGP 150,000–400,000	Approx.121.0000				

**The above costs are indicative estimates intended to provide an order-of-magnitude assessment of environmental and social monitoring expenditures.*

Table 8-4: Proposed Social Monitoring Plan

Receptors / Source of impact/risk	Monitoring location	Target / Indicators	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Labour and Working Conditions	Project site	– Health and safety measures – No instances of forced or child labour reported.	Ongoing during construction and operation	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company and contactors EHS/HR personnel	Included in staff salaries
Information Disclosure	Project's Disclosure channels	– Publicly available information. – Semi-annual updates provided. – Information in Arabic with infographics where beneficial.	On-going basis during construction and operation and updated semi-annually	Energy Valley company	Energy Valley Company EHS personnel	Included in staff salaries
Grievance Management	Project site	– Grievance management plan developed for internal and external grievances. – Compliance with EBRD good practice for GBV and SEAH grievances.	Ongoing during construction and operation	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company and contactors EHS/HR personnel	Included in staff salaries

9. Conclusion

The Energy Valley OHTLs and Naseeg Sarirya Substation Project represents an important component of Egypt's energy transition and industrial development strategy by facilitating the integration of renewable electricity into the national grid and providing a reliable power supply to the Sarirya Industrial Zone. In this context, the No-Development Alternative is not considered a viable option, as it would prevent the connection of the Energy Valley Facility to the national transmission network and limit the anticipated environmental, economic, and social benefits associated with the project.

The ESIA has identified and evaluated the potential environmental and social impacts associated with the construction, operation, and decommissioning phases of the project. The assessment concluded that most potential impacts are temporary, site-specific, and can be effectively managed through the implementation of appropriate mitigation measures and good international industry practices.

Appropriate mitigation and management measures have been developed in accordance with applicable Egyptian regulatory requirements and relevant international lender standards. These measures are incorporated within ESMP, which includes monitoring requirements, institutional responsibilities, and procedures for managing environmental and social risks throughout the project lifecycle.

To support the effective implementation of all Environmental and Social (E&S) mitigation, monitoring, management, and reporting measures identified in the Environmental and Social Management Plan (ESMP), the Project has allocated adequate financial resources. The estimated ESMP implementation budget is approximately USD 180,000 during the construction phase and approximately USD 72,000 per year during the operation phase, and about 77,000 per year during decommissioning phase covering environmental monitoring, occupational health and safety, waste management, biodiversity conservation, stakeholder engagement, emergency preparedness, training, and other environmental and social management requirements.

With the implementation of the proposed mitigation measures, monitoring programmes, and management plans, the residual environmental and social impacts are expected to remain at acceptable levels. Accordingly, the project is considered environmentally and socially feasible, provided that all ESIA commitments and ESMP requirements are effectively implemented and monitored throughout the construction, operation, and decommissioning phases.

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Annex (1): Hydrological Study

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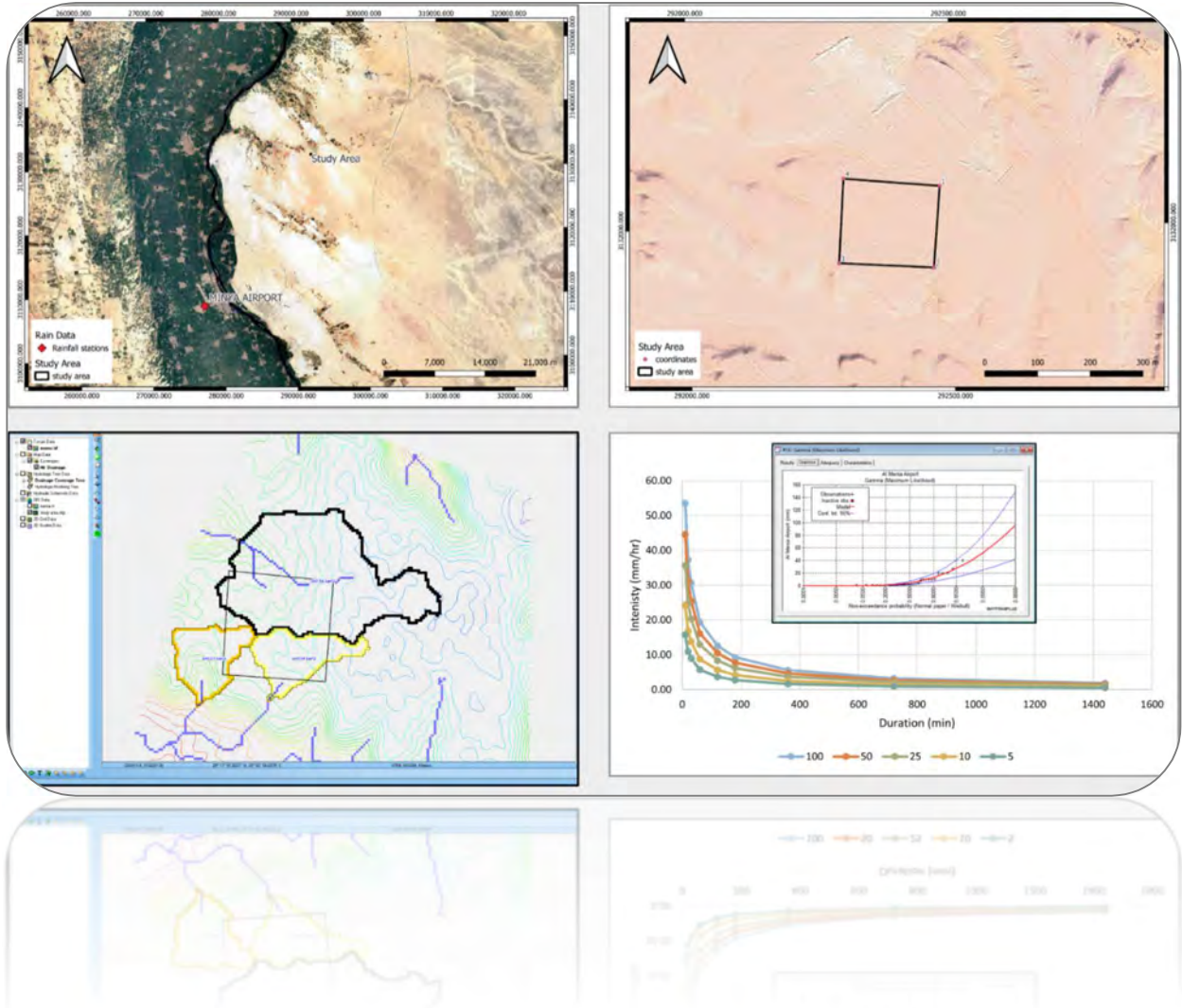


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1 Introduction

This report presents the findings of the hydrological study and storm drainage management assessment conducted for the Minya Consumer Substation located east of Minya. The study includes a preliminary hydrological assessment. The primary objective of this assessment is to analyze the existing and anticipated hydrological conditions that may affect the safety, functionality, and long-term sustainability of the proposed infrastructure. The study evaluates rainfall characteristics, drainage patterns, catchment properties, and potential runoff impacts to ensure that the site development complies with applicable technical standards and design criteria.

Flash floods are among the most widespread and destructive hazards, causing significant damage to lives, property, and infrastructure. Geological, geomorphological, and climatic studies, in addition to historical records, have demonstrated that geomorphological risks increase with the intensification of human activities. Numerous lines of evidence indicate that human interventions over recent decades in most regions have been a decisive factor in raising risk levels and accelerating geomorphological processes. Studies have also shown that flash floods commonly defined as intense surface runoff generated following heavy rainfall events over drainage basins are among the costliest disasters in terms of loss of life and property damage. Flash floods have both direct and indirect impacts on communities, including fear and panic, destruction of assets, and fatalities. Flash floods are particularly frequent in arid and semi-arid regions. Several key factors play a fundamental role in their occurrence, including topographic factors (elevation and slope), geomorphological factors (drainage networks, stream order, channel density, and frequency), climatic factors especially rainfall intensity and duration—water losses (evaporation and infiltration), and the efficiency of infrastructure systems. One of the primary reasons for the worsening of flood-related problems in many Arab countries is the scarcity of rainfall and flood monitoring data, limited data sharing, and, in some cases, restricted accessibility. Moreover, the number of rainfall gauges and flood measurement stations in many regions is insufficient for adequate assessment and management.

Many locations worldwide in general, and in the Arab Republic of Egypt in particular, experience severe damage because of flash flood events. These damages affect residential areas, road networks, and agricultural lands. The primary causes of flash floods include encroachment onto wadi channels and construction within their beds, the absence of adequate

drainage systems, increased rainfall intensity, alteration of natural wadi courses, construction of embankments, and the dumping of waste within drainage paths. Accordingly, it is essential to prepare comprehensive hydrological studies to protect existing residential areas and future development plans from flood hazards and their adverse impacts.

This report aims to study the flood discharge for the Jeddah Cemetery Master Plan in Jeddah City and to assess the site's exposure to flood risks, while proposing the necessary protection measures if required. All surrounding conditions within the study area will be taken into consideration. The volume and magnitude of flood flows within the project area will be estimated using appropriate and applicable mathematical equations for calculating runoff quantities and design discharges.

Many locations worldwide in general, and in the Arab Republic of Egypt in particular, experience significant damage because of flash flood events. These damages affect residential areas, road networks, and agricultural lands. The primary causes of flash floods include encroachment upon wadi channels and construction within their beds, the absence of adequate drainage systems, increased rainfall intensity, alteration of natural wadi courses, construction of embankments, and the disposal of waste within drainage paths. Therefore, comprehensive hydrological studies must be prepared to protect existing residential areas and future development plans from flood hazards and their adverse impacts.

This report aims to study the flood discharge for the El-Minya Consumer Substation Master Plan, located east of Minya, and to assess the extent to which the site is exposed to flood risks.

Where necessary, appropriate protective measures will be proposed, taking into consideration all surrounding conditions within the study area. The volume and magnitude of flood flows within the project area will be estimated using appropriate and applicable mathematical equations to calculate runoff quantities and design discharges.

The report includes the following:

- **Topographic Study and Surveying Works:** This includes plotting the project site on topographic maps and Digital Elevation Models (DEMs), as well as preparing contour maps for the study area.
- **Geological Study and Land Use Assessment:** This involves classifying the drainage basins from a geological perspective, identifying soil types and land use patterns, and

determining the composite Curve Number (CN) for each basin, which directly influences surface runoff rates from rainfall events.

- **Meteorological Study:** This includes compiling and analyzing all available rainfall data from rain gauge stations located near the study area to estimate rainfall depth, return periods, and spatial distribution over the study area.
- **Morphological Study:** This involves identifying flow paths and drainage basins within the study area, deriving the natural characteristics of the catchments affecting the project site (if any), and correcting flow paths to reflect natural terrain conditions.
- **Hydrological Study:** This includes developing the hydrological model and calculating peak flood discharges within the study area.
- **Hydraulic Study:** This involves evaluating existing flood protection structures surrounding the study area and designing the proposed mitigation measures and recommendations.

1.1 Study Objectives and Requirements

The present study aims to achieve the following objectives:

- Conduct site visits and perform topographic surveying works.
- Prepare hydrological studies for the study area.
- Assess the potential impact of flash floods on the project site.
- Develop the necessary solutions and recommendations to protect the study site.

2 Description of the Study Area and Site Visits

2.1 General Location Map of the Study Area

The project under study is located in Minya Governorate. The total area of the master plan is approximately **32,470 m²**. Figure 1 illustrates the general location of the project site as well as the coordinates of the master plan boundaries.

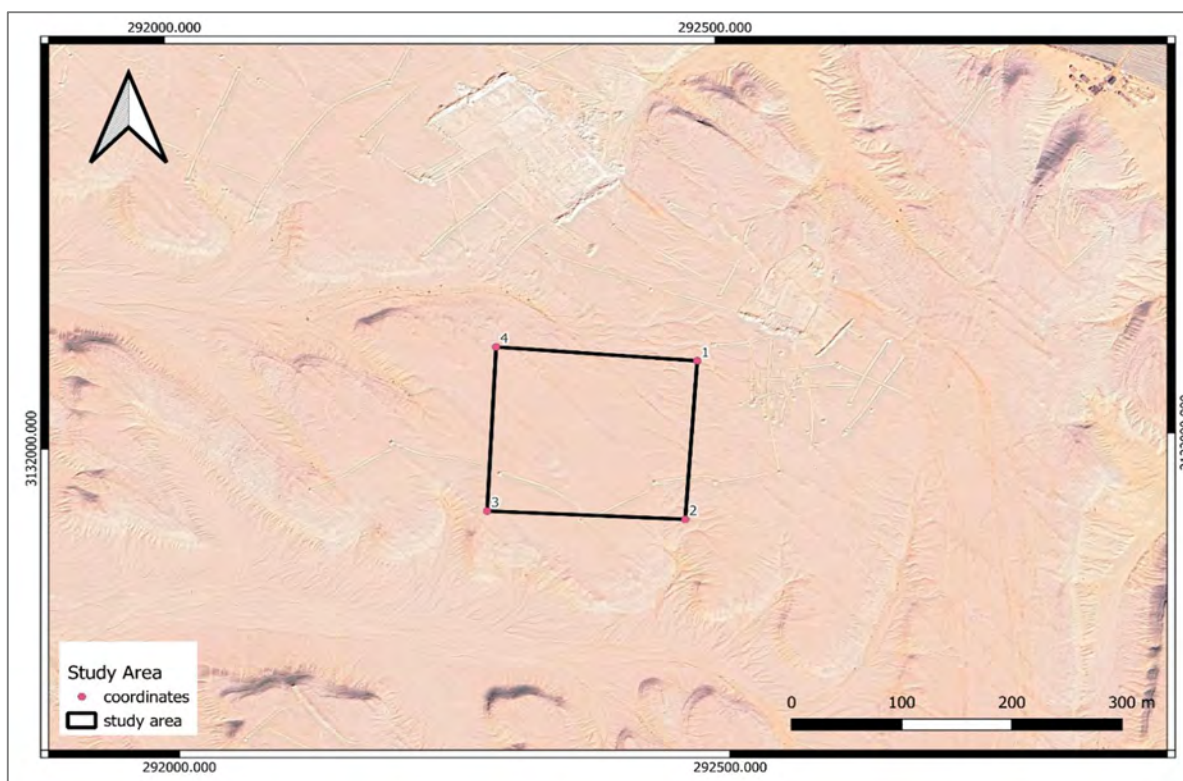


Figure 1: General Location and Coordinates of the Study Area (Minya Consumer Substation, Egypt).

Table 1: Coordinates of the Study Area

Point	East (UTM)	North (UTM)
1	292477.72	3132086.82
2	292463.74	3131911.54
3	292284.08	3131923.93
4	292295.44	3132105.41

3 Software and Models Used

The latest approved software and digital models will be utilized to perform the hydrological and hydraulic calculations and analyses for the drainage basins and the proposed protection structures. The following is a summary of the main software and models to be used in this study:

- **Global Mapper:** This software is used to process various types of survey data and convert them into multiple formats. It also enables analysis of field data, extraction of Digital Elevation Models (DEMs), generation of contour maps, and visualization of different spatial layers within the study area, among other capabilities.
- **Watershed Modeling System (WMS):** This program is used to analyze survey data, contour maps, and Digital Elevation Models (DEMs), and to delineate wadi flow paths, drainage channels, and catchment basins.
- **AutoCAD Civil 3D:** This software handles a wide range of survey data and supports conversion into various formats. It also facilitates terrain analysis, generation of Digital Elevation Models (DEMs), contour mapping, and other engineering functionalities.
- **HyFran Plus:** This program processes rainfall data and estimates extreme rainfall depths for different return periods using the most appropriate statistical methods and probability distributions. It is widely recognized for conducting statistical hydrological analyses.
- **HEC-HMS:** This software is used to calculate peak discharge, generate flood hydrographs, and compute other required hydrological characteristics using built-in hydrological models.
- **Culvert Master and FlowMaster:** Culvert Master is used for the hydraulic evaluation of existing culverts and the design of proposed culverts, while FlowMaster is used for the hydraulic design of proposed open channels.
- **HEC-RAS 2D:** This software is used to determine the boundaries of wadi protection corridors affecting the study area and to assess embankment elevations, if present.

4 Topographic Study and Surveying Works

The Consultant has carried out topographic studies for the project area to analyze the nature of the ground surface and its slopes, and to identify the locations and flow paths of wadis in order to delineate the drainage basins and wadi channels affecting the master plan under study. The morphological parameters influencing the estimation of flood discharge volumes and peak flow values will be determined, including: flood flow directions, wadi slopes, catchment slopes, flow path lengths, and drainage basin areas. The following maps and tools will be utilized in the topographic studies at this stage:

- **Digital Elevation Models (DEMs)** for the study area (5×5 resolution).
- **Satellite imagery**

4.1 Methodology Adopted in the Topographic Study

Field investigations and on-site reconnaissance of the existing conditions within the project area, together with topographic maps and aerial imagery, form the basis of the topographic and geomorphological studies. Digital Elevation Models (DEMs) will provide the fundamental framework for initiating preliminary planning activities, identifying wadi flow paths, and delineating the total and sub-catchment boundaries for each wadi affecting the village under study. In addition, field surveys and multiple site visits conducted by the Consultant's technical team were utilized to verify and update the data obtained from topographic maps and aerial imagery. This was undertaken to ensure that the wadi channels and drainage basin boundaries within the study area do not exhibit any unusual conditions that would require special engineering considerations.

4.2 General Topography of the Study Area

Figure 2 illustrates the project site overlaid on the Digital Elevation Model (DEM), which indicates that the study area is located within a nearly flat terrain. The entire study area lies between contour elevations of 127 m and 131 m above mean sea level.

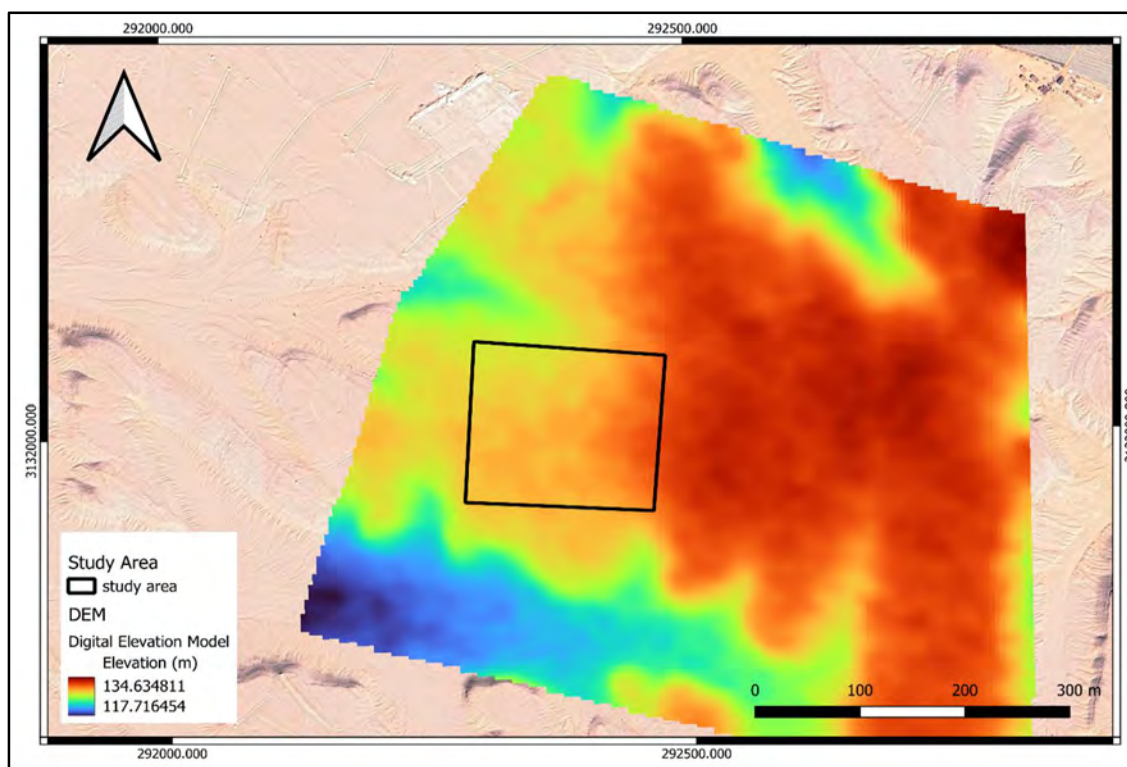


Figure 2: Project boundary on the Digital Elevation Model (DEM)

4.3 Topographic Survey

The surveying team mobilized to carry out a detailed topographic survey using the **WGS84–UTM coordinate system** and the latest **Global Positioning System (GPS)** equipment for the project site. However, it was not possible to conduct the internal topographic survey within the site. Accordingly, the survey was limited to the external boundaries of the site, as illustrated in Figure 3.



Figure 3: Site Survey for the study area.

5 Geological Study and Land Use

5.1 Geology of the Study Area

Minya Governorate, often referred to as the “Bride of Upper Egypt,” represents an open geological museum, as its terrain and geology are predominantly characterized by sedimentary formations dating back to ancient geological eras.

Rock Formations (Eocene Epoch):

Most of the rock formations in Minya belong to the **Eocene Epoch** (approximately 35–55 million years ago). The governorate is particularly known for:

- **Limestone:** The primary component of both the Eastern and Western Plateaus. It is distinguished by its high quality and bright white color and is widely used in the cement, paint, and marble industries.
- **Samalut Formation:** A well-known limestone formation rich in microfossils (such as Nummulites).

Major Physiographic Units

The geology of Minya extends across three longitudinal zones:

- **The Nile Valley and Floodplain:** Composed of recent Nile alluvial deposits (Holocene age), characterized by highly fertile soils.
- **The Eastern Plateau:** Characterized by steep escarpments and dry valleys (wadis), and rich in quarrying resources.
- **The Western Plateau:** Extends toward the Western Desert and is characterized by sandy and rocky formations that are generally less steep compared to the eastern side.

Karst Features (Caves)

Due to the nature of limestone and its historical interaction with infiltrating rainwater, karst dissolution features have developed. A notable geological example in Minya is:

- **Wadi Sannur Cave Protected Area:** A rare cave formed as a result of chemical interactions between groundwater and limestone, leading to the development of impressive stalactites and stalagmites.

The following section outlines the four Hydrologic Soil Groups (HSGs) according to the Soil Conservation Service (SCS) classification system. These groups are defined as follows:

Group A (Low Runoff Potential): Soils with low surface runoff rates, typically representing extensive floodplain deposits. These soils are deep, coarse-textured sandy soils with high infiltration capacity (infiltration rate > 7.62 mm/hr).

Group B (Moderate Runoff Potential): Moderately shallow soils with coarse texture, consisting of a mixture of gravel, rock fragments, and cobbles bound together primarily by silty materials. These soils have moderate infiltration capacity (3.81–7.62 mm/hr).

Group C (Low Infiltration Rate): Soils with slow infiltration rates, generally consisting of a layer that impedes downward water movement. They are typically dark-colored, fine- to medium-textured soils, with infiltration rates ranging from 1.27–3.81 mm/hr.

Group D (High Runoff Potential): Soils characterized by very slow infiltration rates. This group mainly consists of clayey soils with high swelling potential or shallow soils underlain by an impermeable layer. These soils have the lowest infiltration capacity, with rates not exceeding 1 mm/hr.

According to Figure 20, the soils forming the catchment area belong to **Hydrologic Soil Group (A)** under the Hydrologic Soil Groups (HSG) classification system.

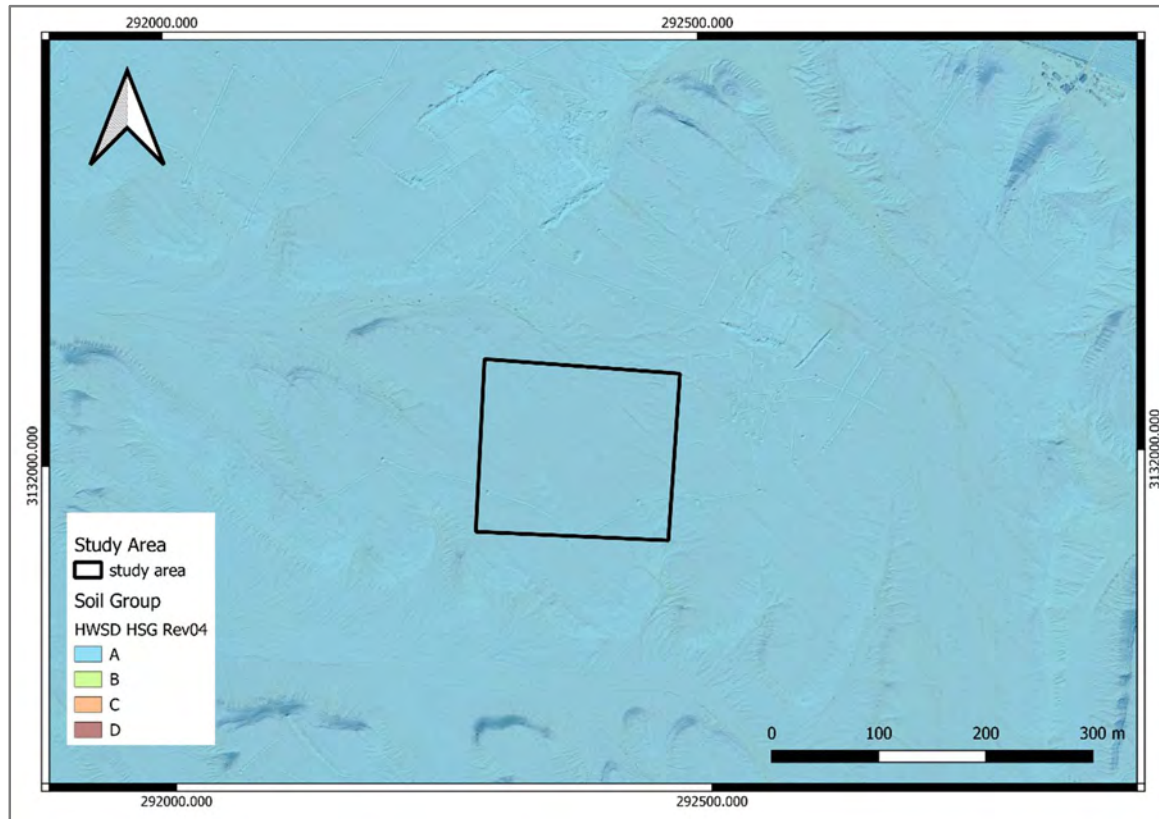


Figure 4: Soil Classification according to Geology

5.2 Land Use in the Study Area

Land Use is a global term that refers to the various ways in which land is utilized. It aims to organize and manage land efficiently in order to prevent conflicts between different land uses. To achieve this objective, a systematic evaluation of land capabilities, alternative land uses, and prevailing economic and social conditions is conducted to determine and adopt the most appropriate land use options. In most cases, land use planning provides a vision for future development potential within regions, cities, or designated planning areas. A significant portion

of land use planning focuses on urban planning and often results in regulations and guidelines governing land utilization, commonly referred to as zoning.

Since the **Curve Number (CN)** depends on both soil type and land use, it was necessary to identify the land use characteristics within the study area. The following figure presents the **Land Use Map** of the study area. As shown in Figure 5, the project site is located within an entirely open (undeveloped) land area.

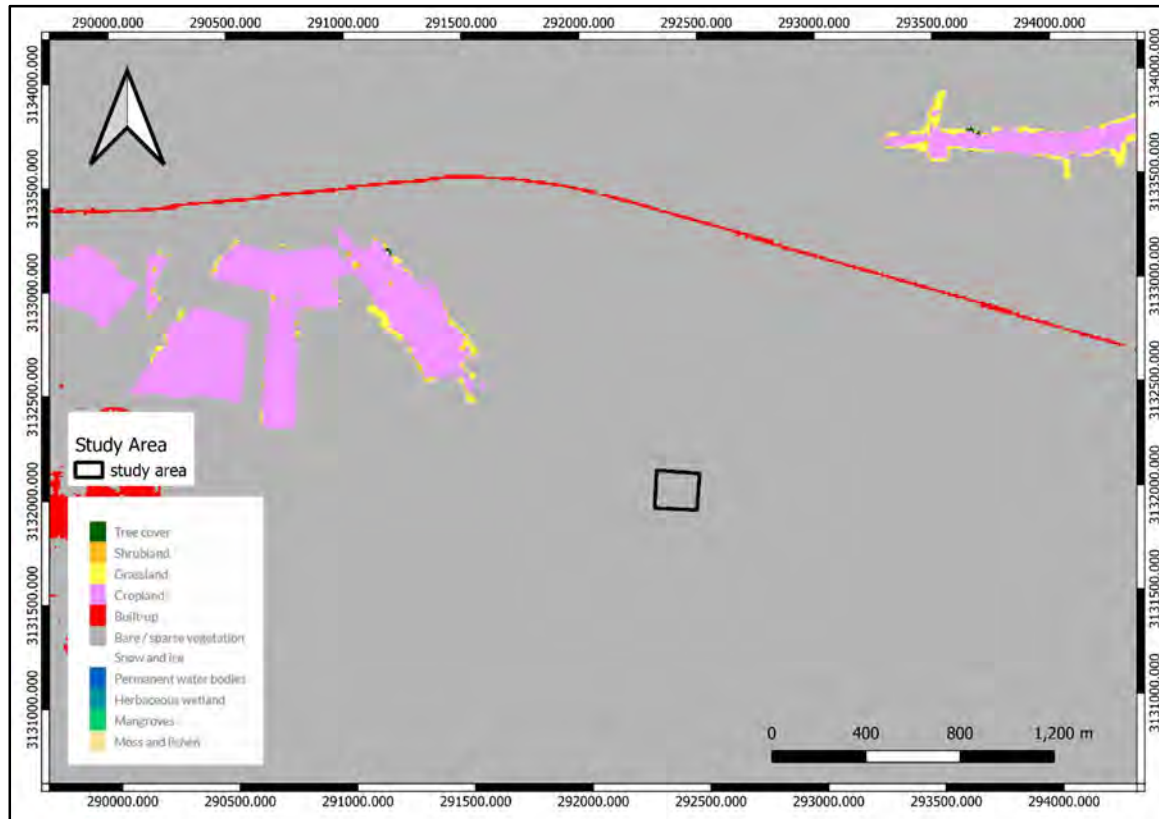


Figure 5: Land Use Map of the Study Area

Land use patterns and the activities carried out on the land surface are considered important factors, as the Runoff Curve Number (CN) is determined based on both land use and soil type.

Table 2 presents the Runoff Curve Number (CN) values for different soil groups and various land use categories.

Table 2: Curve Number (CN) Values for Different Soil Groups and Various Land Use Categories.

Type of Vegetative Cover and Hydrologic Conditions of the Drainage Basin	Percentage of Impervious Area	Soil Classification			
Open Areas (parks, playgrounds, golf courses, cemeteries, etc.)		A	B	C	D
• Open Areas – Poor condition (grass < 50%)		68	79	86	89
• Open Areas – Fair condition (grass 50–75%)		49	69	78	84
• Open Areas – Good condition (grass > 75%)		39	61	74	80
Paved parking lots, roofs, driveways		98	98	98	98
Streets – Paved (with storm drains)		98	98	98	98
Streets – Paved (with open ditches)		83	89	92	93
Gravel roads		76	85	89	91
Earth roads		72	82	87	89
Desert urban areas – Natural desert		63	77	85	88
Desert urban areas – Industrial desert		96	96	96	96
Urban districts – Commercial & business	85	89	92	94	95
Urban districts – Industrial	72	81	88	91	93
Residential – 1/8 acre ($\approx 500 \text{ m}^2$ or less)	65	77	85	90	92
Residential – 1/4 acre ($\approx 1000 \text{ m}^2$)	38	61	75	83	87
Residential – 1/3 acre ($\approx 1350 \text{ m}^2$)	30	57	72	81	86
Residential – 1/2 acre ($\approx 2000 \text{ m}^2$)	25	54	70	80	85
Residential – 1 acre ($\approx 4000 \text{ m}^2$)	20	51	68	79	84
Residential – 2 acre ($\approx 8000 \text{ m}^2$)	12	46	65	77	82

The surface runoff coefficient depends on the characteristics of the drainage basin and is directly related to the level of urban development, land use patterns, soil cover, vegetation cover, soil infiltration capacity, and other hydrological constraints.

The runoff coefficient may increase to as high as 0.90 in highly developed urban areas, whereas in undeveloped, open, and natural terrain areas, it may be as low as 0.20 or even less.

Accordingly, the Consultant's team recommends adopting the surface runoff coefficients presented in Table 3.

Table 3: Surface Runoff Coefficient Values

Land Use and Surface Cover Type	Surface Runoff Coefficient
Commercial – Central Business District	0.70 – 0.95
Commercial – Adjacent Areas	0.50 – 0.70
Residential – Single Family	0.30 – 0.50
Residential – Detached Units	0.40 – 0.60
Residential – Attached Units	0.60 – 0.75
Residential – Suburban	0.25 – 0.40
Residential – Apartments	0.50 – 0.70
Industrial – Light	0.50 – 0.80
Industrial – Heavy	0.60 – 0.90
Parks, Cemeteries	0.10 – 0.25
Playgrounds	0.20 – 0.35
Railway Areas	0.20 – 0.40
Unimproved Areas	0.10 – 0.30
Roads – Asphalt	0.70 – 0.95
Roads – Concrete	0.80 – 0.95
Roads – Cobblestone	0.70 – 0.85
Walkways and Sidewalks	0.75 – 0.85
Building Roofs	0.75 – 0.95
Sandy Soils	0.20 – 0.40
Sandy Grassland – Slope $\leq 2\%$	0.05 – 0.10
Sandy Grassland – Slope 2–7%	0.10 – 0.15
Sandy Grassland – Slope $\geq 7\%$	0.15 – 0.20
Rocky Grassland – Slope $\leq 2\%$	0.13 – 0.17
Rocky Grassland – Slope 2–7%	0.18 – 0.22
Rocky Grassland – Slope $\geq 7\%$	0.25 – 0.35

Since the catchment basin includes more than one land use activity, the weighted runoff coefficient was calculated as shown in Table 4. It should be noted that the drainage basins affecting the project site have areas of less than 81 hectares.

Table 4: Surface Runoff Coefficient Value for Drainage Basin

Drainage Basin	Soil Type and Percentage Coverage (%)	Land Use	Runoff Coefficient (C)
B1 / B2 / B3	100%	Open Area	0.2

6 Meteorological Study

6.1 Station Affecting the Study Area

The **Minya Airport Rainfall Station** (Figure 6) was utilized, as it is the closest station to the drainage basin affecting the project site. The station provides rainfall records from 1995 to 2025, which enhances the accuracy and reliability of the climatological analysis.

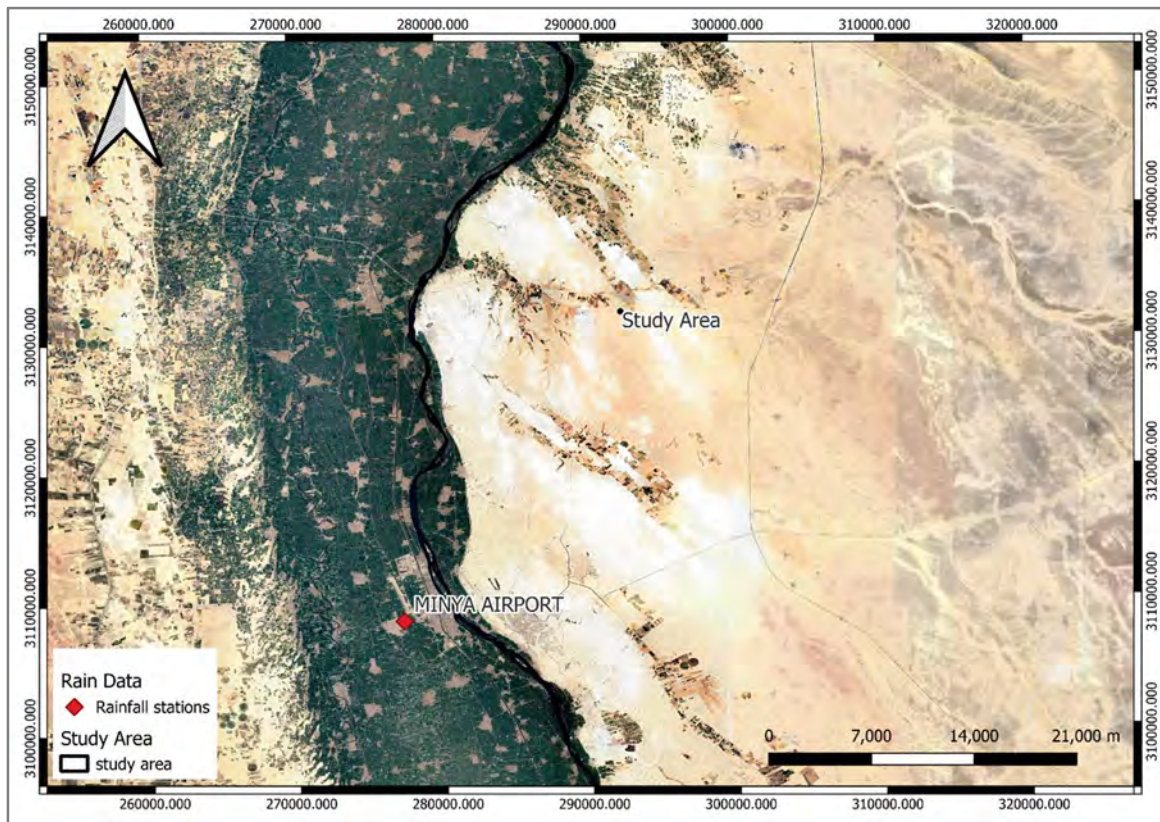


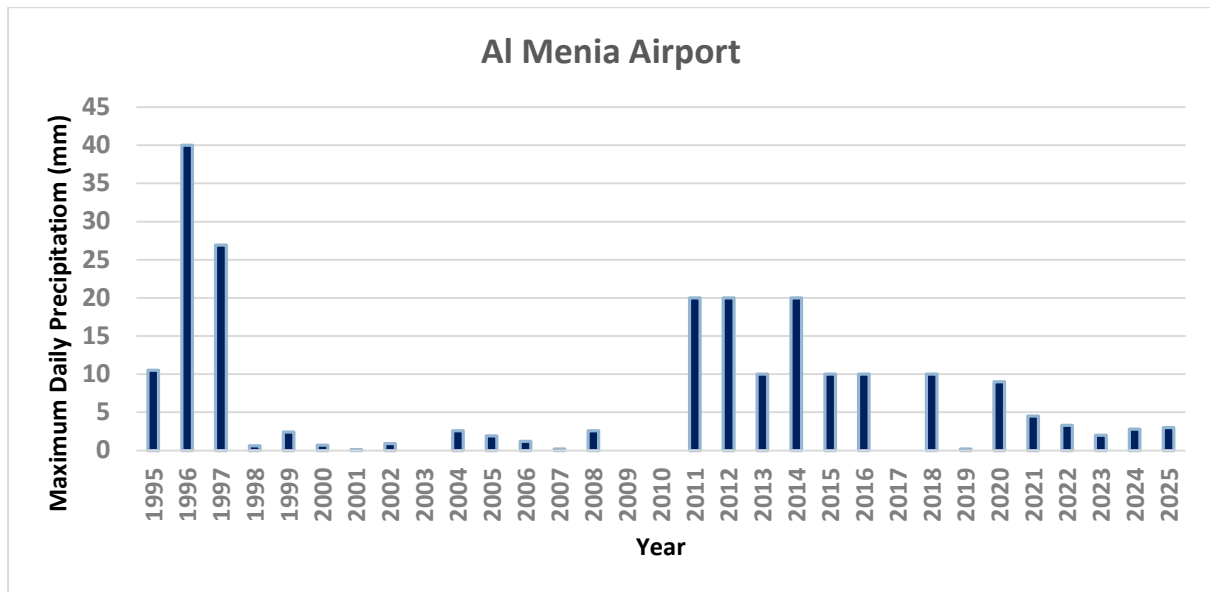
Figure 6: Rainfall Station Affecting the Study Area

6.2 Statistical Analysis of Rainfall Data

Table 5 presents the rainfall depth data for the Minya Airport Station used in this study.

Table 5: Rainfall Depth Data for Minya Airport Station

Year	Rainfall Depth (mm/day)	Year	Rainfall Depth (mm/day)
1995	10.5	2011	20
1996	40	2012	20
1997	26.9	2013	10
1998	0.6	2014	20
1999	2.4	2015	10
2000	0.7	2016	10
2001	0.1	2017	0
2002	0.9	2018	10
2003	0	2019	0.2
2004	2.6	2020	9
2005	1.9	2021	4.5
2006	1.2	2022	3.3
2007	0.2	2023	2
2008	2.6	2024	2.8
2009	0	2025	3
2010	0		



The maximum daily rainfall depths for the standard design return periods of 5, 10, 25, 50, and 100 years were estimated using the HYFRAN software. Several internationally recognized statistical distributions were tested and compared in order to select the most appropriate best-fit distribution. Figure 7 illustrates the statistical distribution adopted for calculating the maximum daily rainfall depth corresponding to each return period. Table 6 presents the calculated values of maximum daily rainfall depths, which will be used in the hydrological analysis.

Comparison criteria of the distributions						
Return period :	T= 100	WARNING ! The decision-support system (comparison criteria as described in the HYFRAN menu) is still being developped. It should therefore only be used as an indication.				
Sample size :	27					
Model	Nb param.	XT	P(Mi)	P(Mi x)	BIC	AIC
Gamma (Maximum Likelihood)	2	44.617	16.67	60.29	169.872	167.281
Lognormal (Maximum Likelihood)	2	129.456	16.67	27.12	171.470	168.879
Exponential (Maximum Likelihood)	2	37.471	16.67	7.32	174.088	171.496
3-parameter lognormal (Maximum Likelihood)	3	119.707	16.67	5.27	174.747	170.859
Gumbel (Maximum Likelihood)	2	30.721	16.67	0.00	191.065	188.473
Normal (Maximum Likelihood)	2	30.677	16.67	0.00	205.218	202.627

P(Mi) : A priori probability	P(Mi x) : A posteriori probability (Method of Schwarz)	BIC : Bayesian information criterion	AIC : Akaike information criterion
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Ponderated mean by A posteriori probability of quantiles : 71.0572

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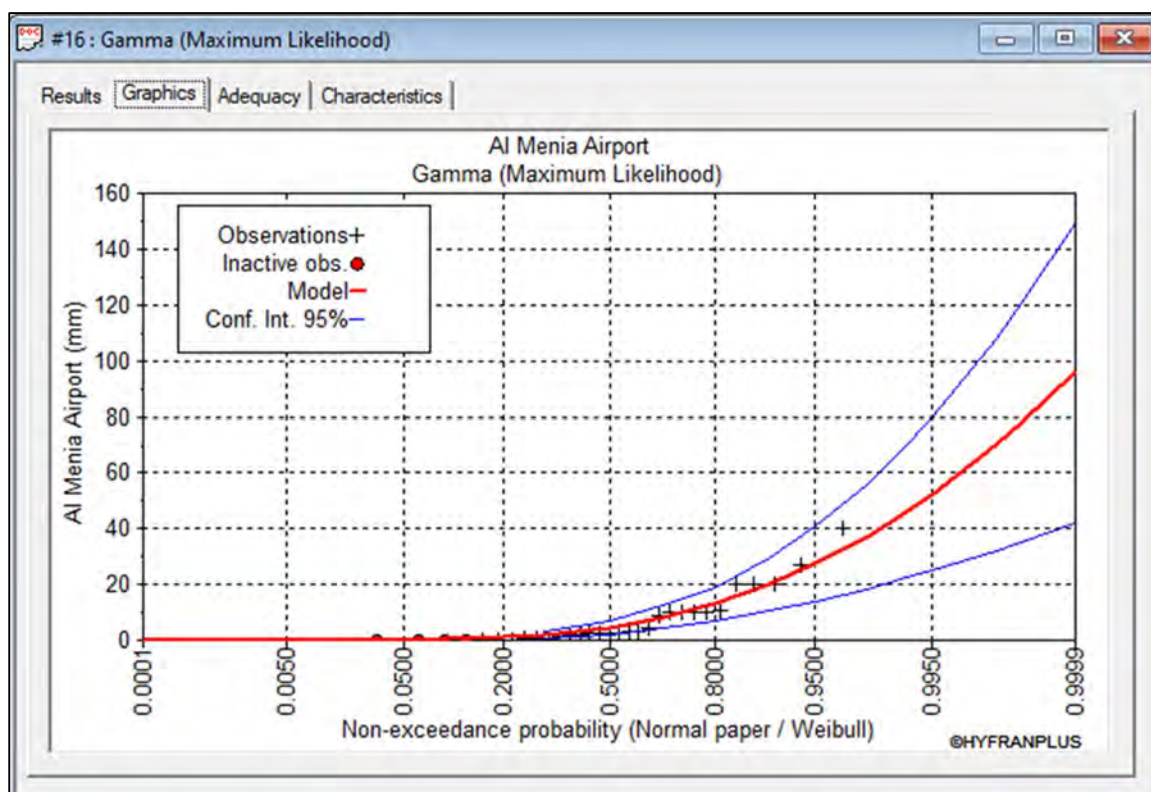


Figure 7: Statistical Distribution Adopted for the Analysis

Table 6: Maximum Daily Rainfall Depth over the Study Area for the Standard Return Periods (Gamma ML Distribution)

Return Period (Years)	Maximum Daily Rainfall Depth (mm)
5	13.1
10	20.1
25	29.7
50	37.1
100	44.6

6.3 Intensity–Duration–Frequency Curves (IDF Curves)

The rainfall intensity–duration–frequency (IDF) curve represents the relationship between storm characteristics (storm duration and intensity) and the probability of recurrence of a storm with the same intensity, expressed as the return period (or recurrence interval). It should be noted that storm intensity increases as the return period increases; in other words, a storm with a 100-year return period is more intense than one with a 10-year return period.

The design rainfall IDF curves were developed for return periods of 5, 10, 25, 50, and 100 years, based on the analysis of rainfall data for the period 1995–2025. These curves were analyzed and presented in digital form to facilitate their application, as shown in Figure 8. Table 8 presents the Bell's coefficients used to derive the Intensity–Duration–Frequency relationships, while Table 9 presents the calculated rainfall intensity values corresponding to the design return periods.

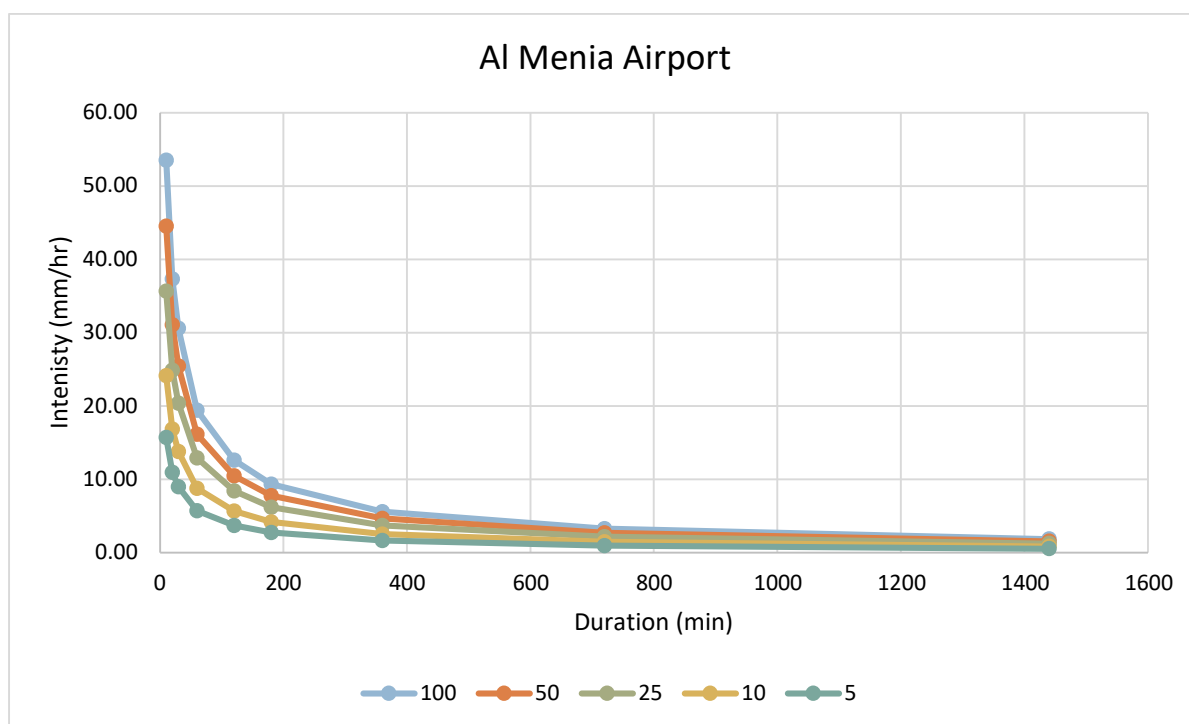


Figure 8: Derived Rainfall Intensity Curve for Minya Airport Meteorological Station

Table 7: Bell's Coefficients Used in the Calculation of Rainfall Intensity Values

Duration (min.)	10	15	30	60	120	180	360	720	1440
Ratios	0.2	0.279	0.343	0.435	0.565	0.626	0.75	0.877	1

Table 8: Rainfall Intensity Values for the Design Return Periods

Years	Duration (min.)								
	10	15	30	60	120	180	360	720	1440
100	53.52	37.33	30.60	19.40	12.60	9.31	5.58	3.26	1.86
50	44.52	31.05	25.45	16.14	10.48	7.74	4.64	2.71	1.55
20	35.64	24.86	20.37	12.92	8.39	6.20	3.71	2.17	1.24
10	24.12	16.82	13.79	8.74	5.68	4.19	2.51	1.47	0.84
5	15.72	10.96	8.99	5.70	3.70	2.73	1.64	0.96	0.55

7 Morphological Study

7.1 Objectives of the Morphological Study

These studies involve the collection and analysis of topographic and geomorphological maps, as well as Digital Elevation Models (DEMs), using Geographic Information Systems (GIS) and satellite imagery. The objective is to assess the nature of the land surface, slopes, elevation variations, and the areas of wadis affecting the study area, along with their various characteristics, which are reflected in the flood discharge values resulting from the design storm events. Through the integration of topographic and geomorphological maps, watershed divides between different drainage basins are identified, and morphological maps are generated to delineate the catchment areas of wadis influencing the study area. Qualitative and quantitative analyses of the wadi drainage network are also conducted, including the calculation of average topographic slope, maximum and minimum wadi elevations, and the longest flow path within each basin. All these morphological characteristics contribute to determining the parameters of the unit hydrograph used to estimate flood runoff affecting the study area.

Given the importance of drainage basins and the wadis through which runoff flows—and their role in directing flood and rainwater toward natural channels according to surface slopes—they are delineated using the Digital Elevation Model (DEM). The DEM consists of a three-dimensional grid representing the land surface, derived from aerial imagery of the study area. These models are essential for visualizing surface topography and accurately defining drainage pathways. It is worth noting that all spatial modeling processes related to identifying floodwater accumulation zones are based on the fundamental assumption that water flows from higher to lower elevations, following the steepest descent path. Accordingly, the delineation of flow paths and drainage channels relies on the DEM structure, which consists of uniform grid cells, each assigned a specific elevation value.

Several specialized software programs are used for data analysis and processing to extract wadi channels, tributaries, watershed boundaries, flow directions, and morphological characteristics. One of the most widely used programs for this purpose—also adopted in this study—is the Watershed Modeling System (WMS).

Subsequently, the modeled drainage paths are verified using topographic maps, recent satellite imagery, and precise field survey data for the study area.

7.2 Major Morphological Characteristics of Drainage Basins

7.2.1 Drainage Area

The drainage area is one of the most important areal characteristics widely used in hydrological models. It is essential for calculating several key parameters, such as drainage density. The drainage area represents the total surface area bounded by the watershed divide.

It can be measured using various methods (manual and automated), including:

- Planimeter measurements on contour maps,
- Aerial photographs or satellite imagery,
- Grid (square) methods,
- Surveying instruments, or
- Computer-based GIS software (most accurate method).

7.2.2 Basin Length

Basin length refers to the straight-line distance drawn between the farthest point on the basin boundary and the outlet (mouth).

Several methods are used to measure basin length, depending on the nature of the main channel (meandering, irregular, or straight). Commonly, it is measured along the line parallel to the principal drainage channel from the outlet to the most upstream point in the basin.

7.2.3 Shape Factor

The shape factor describes the degree of uniformity of basin width along its extension from the headwaters to the outlet. The shape and drainage pattern of a basin are influenced by factors such as rock type and slope gradient. Basin shape also affects geomorphological processes, particularly the basin's hydrological response efficiency and drainage network characteristics.

Horton (1932) introduced the shape factor to characterize river basin forms. It is calculated using the equation:

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$$F = A/2L$$

Where: A = Basin Area ,L = Basin Length

Where:

- A = Basin Area
- L = Basin Length

A low value indicates a relatively small basin area compared to its length, suggesting a basin shape approaching a triangular form.

7.2.4 Circularity Ratio

The circularity ratio expresses how closely the basin shape approaches a perfect circle. The value ranges between 0 and 1.

- Values closer to 1 indicate a more circular basin.
- Values closer to 0 indicate an elongated or irregular basin.

An elongated basin may lead to increased channel length and delayed peak discharge.

7.2.5 Slope

Slope represents the inclination of the land surface relative to the horizontal plane or the gradient between two points of different elevations.

Slope is of great importance in geographical and geomorphological studies, as it is a fundamental surface characteristic analyzed using quantitative and analytical methods. It strongly influences human activities such as urban development, road construction, and bridge design.

7.2.6 Stream Order

Streams within a basin are classified into hierarchical orders, where the number of channels decreases and their size increases with higher order.

- First-order streams are the smallest and most numerous.
- When two first-order streams join, they form a second-order stream.
- Two second-order streams form a third-order stream, and so on.

The highest order represents the main channel of the basin.

7.2.7 Sinuosity Factor

The sinuosity factor is an indicator of the geomorphic stage of a wadi and its capacity for lateral migration, which may affect land use patterns.

This factor reflects the degree of channel meandering and its impact on water flow characteristics. Increased meandering generally increases evaporation and infiltration losses due to reduced flow velocity, while straighter channels promote faster flow and reduced losses. It is calculated as:

$$VI = VL / Air$$

Where:

- VL = Actual channel length
- Air = Shortest straight-line distance between the source and the outlet

A value greater than 1.0 indicates increasing channel sinuosity.

7.2.8 Drainage Basins Affecting the Project Site

The Consultant used the Watershed Modeling System (WMS) to delineate the wadi flow paths and identify the drainage basins affecting the project site, as illustrated in Figure 9.

Figure 10 presents the drainage basins and wadi flow paths influencing the project site overlaid on the Digital Elevation Model (DEM), while Figure 11 shows the derived drainage basins superimposed on aerial imagery.

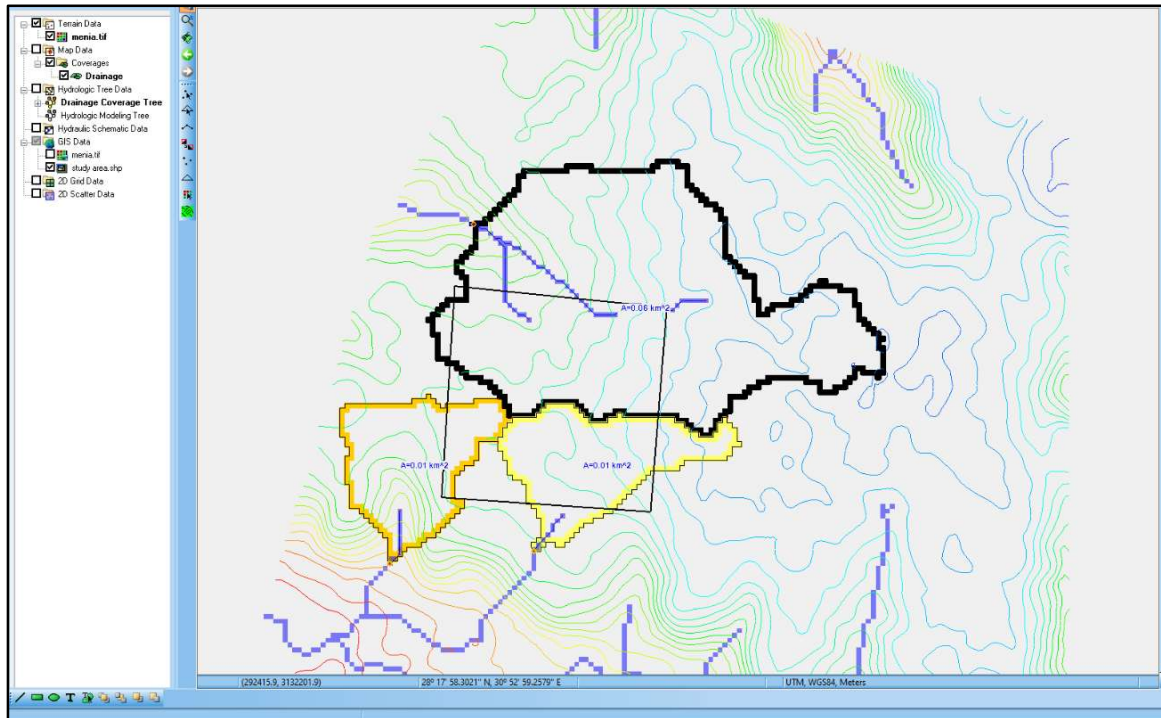


Figure 9: Drainage Basins Delineated Using WMS

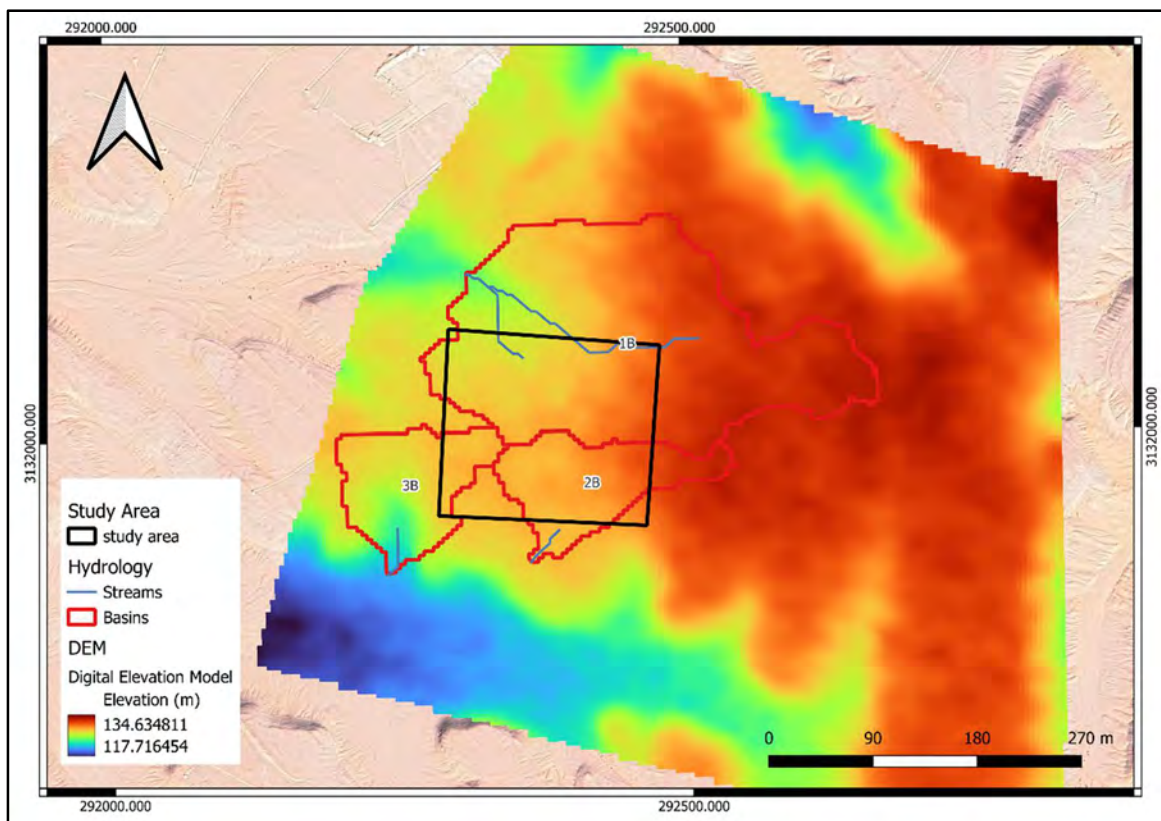


Figure 10: Drainage Basins Overlaid on the Digital Elevation Model (DEM)

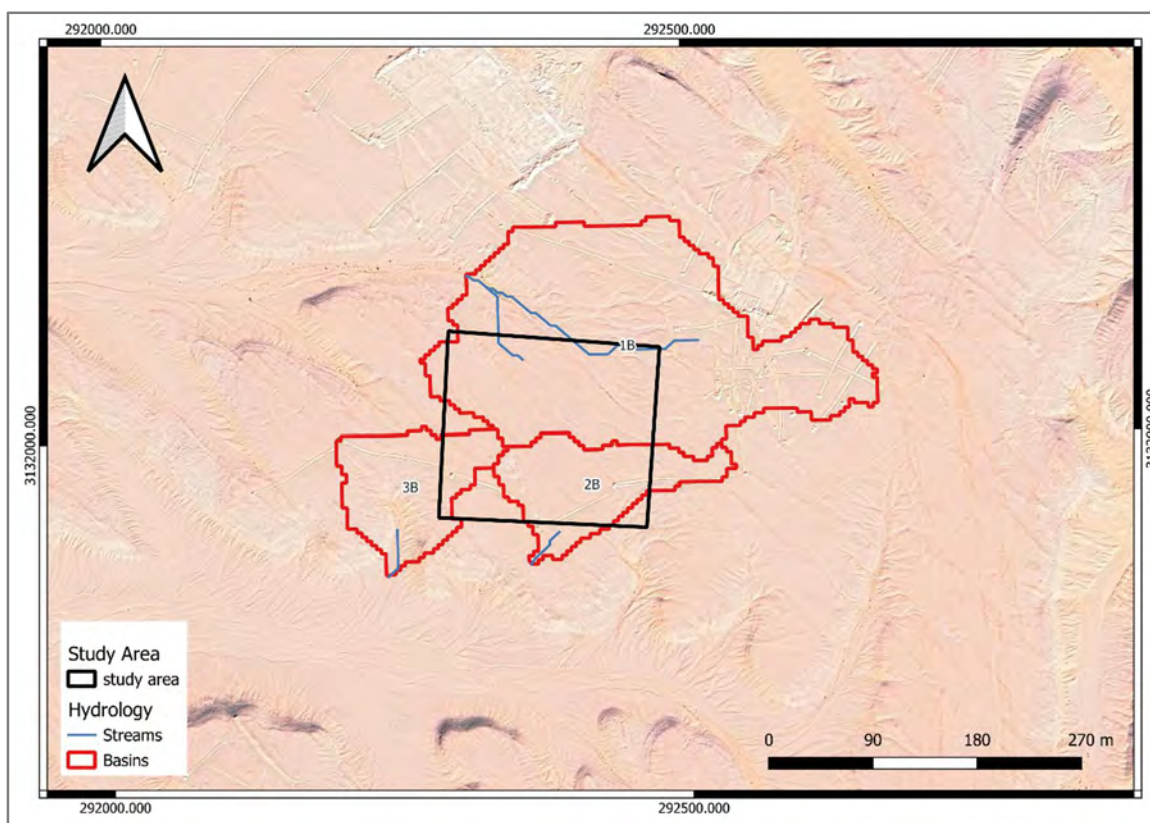


Figure 11: Drainage Basins Overlaid on Aerial Imagery

8 Hydrological Modeling

Hydrological modeling represents the core component of this study. The results of the meteorological, morphological, geological, and land use studies serve as input parameters to the hydrological model. The primary outputs of the hydrological modeling process are the estimation of runoff discharge from the drainage basin and the generation of the surface runoff hydrograph. These outputs are subsequently used in the hydraulic design of flood protection structures or for evaluating existing facilities (if any).

According to the approved design standards of the Ministry of Municipal and Rural Affairs and Housing, several methods are available for calculating surface runoff rates and estimating peak flood discharges. The most applied methods include:

- The Rational Method
- The SCS Curve Number (CN) Method

Each method has its specific assumptions, limitations, and conditions of application.

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Table 9: Morphological Characteristics and Flow Values of the Drainage Basins

BASIN NAME	BASIN AREA	BASIN SLP	MFDISTSLP	MFDIST	Runoff Co.	intensity	Time of Conc	Lag time	Used TOC	Flow	Flow
	Km^2	(%)	(%)	Meter	(C)	mm/hr	(min)	(min)	(min)	(m3/s)	(L/s)
3B	0.012	0.057	0.038	200.61	0.2	53.52	4.05	2.43	10	0.04	37.76
1B	0.057	0.032	0.018	471.27	0.2	53.52	10.39	6.23	10	0.17	171.00
2B	0.013	0.025	0.015	313.72	0.2	53.52	8.17	4.9	10	0.04	38.62

9 Hydraulic Analysis and Modeling

Hydraulic calculations represent the final stage of the hydrological study and are divided into two main components:

1. Evaluation of Existing Structures: This includes assessing existing flood protection structures or stormwater drainage networks (if any) to determine their adequacy in conveying the design flood discharges.
2. Hydraulic Design of Proposed Solutions: This component involves the hydraulic design of the proposed mitigation measures and recommendations (if required). These designs will be presented and discussed in detail following the development of the proposed solutions and recommendations.

The flood depth and velocity maps for 100-Year Return Period are shown in Figure 12 and Figure 13 respectively. For 50 and 20 -Year Return Periods the flood depths and velocities are clarified from Figure 14 to Figure 19. While the flood hazard maps have been developed for the 20-, 50-, and 100-year return periods as shown from Figure 20 to Figure 22.

For scour analysis at the current stage, the site consists of undeveloped natural terrain with no hydraulic structures (e.g., culverts, bridges, channels, foundations, or protection works) that would be susceptible to localized scour. Furthermore, hydrological assessment confirms that:

- There are no defined wadies or concentrated flow paths crossing the site.
- Flooding results primarily from direct precipitation over the site area.
- Flow behavior is characterized by shallow sheet flow rather than confined or high-velocity channelized flow.

Under such conditions, scour mechanisms associated with structural interaction or concentrated hydraulic action are not applicable. Accordingly, no scour calculations are required at this stage.

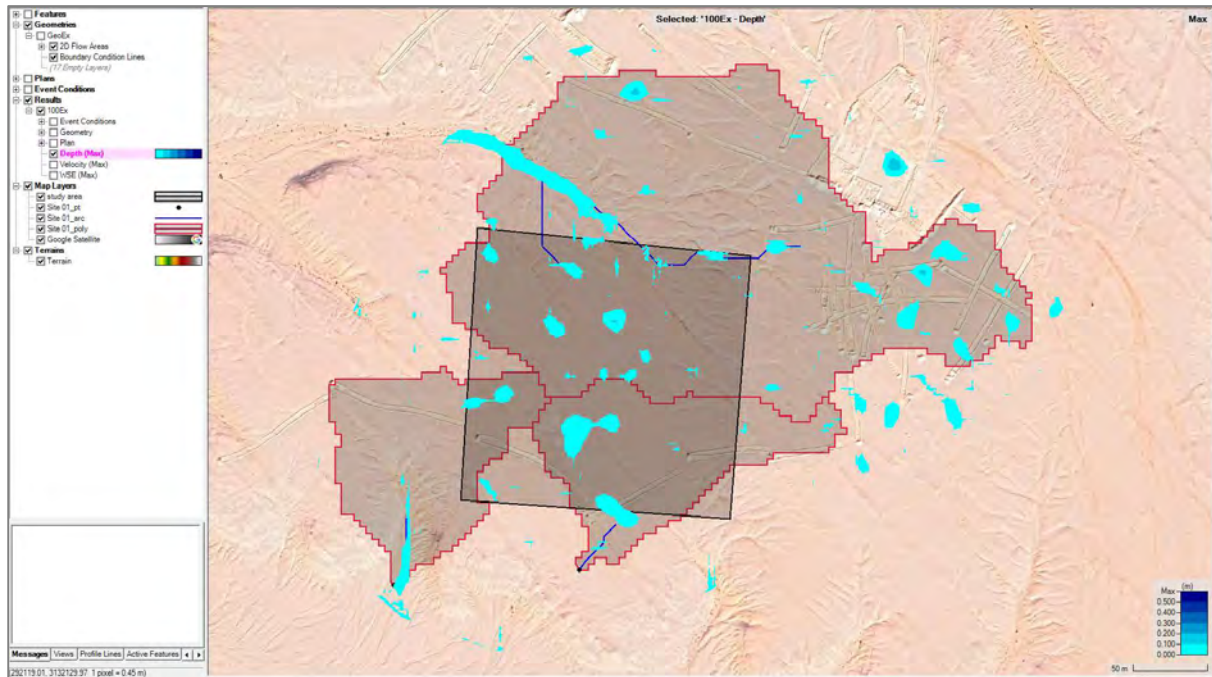


Figure 12: Flood Depth Results for the 100-Year Return Period from Hydraulic Modeling

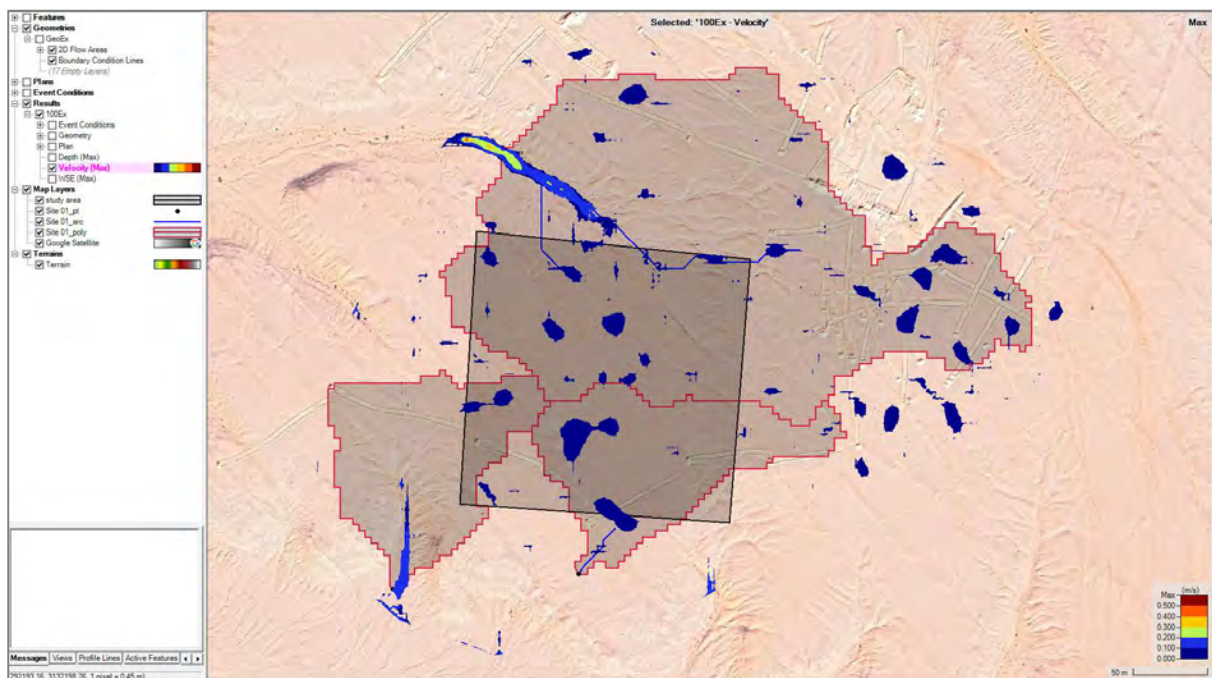


Figure 13: Flood Velocity Results for the 100-Year Return Period from Hydraulic Modeling

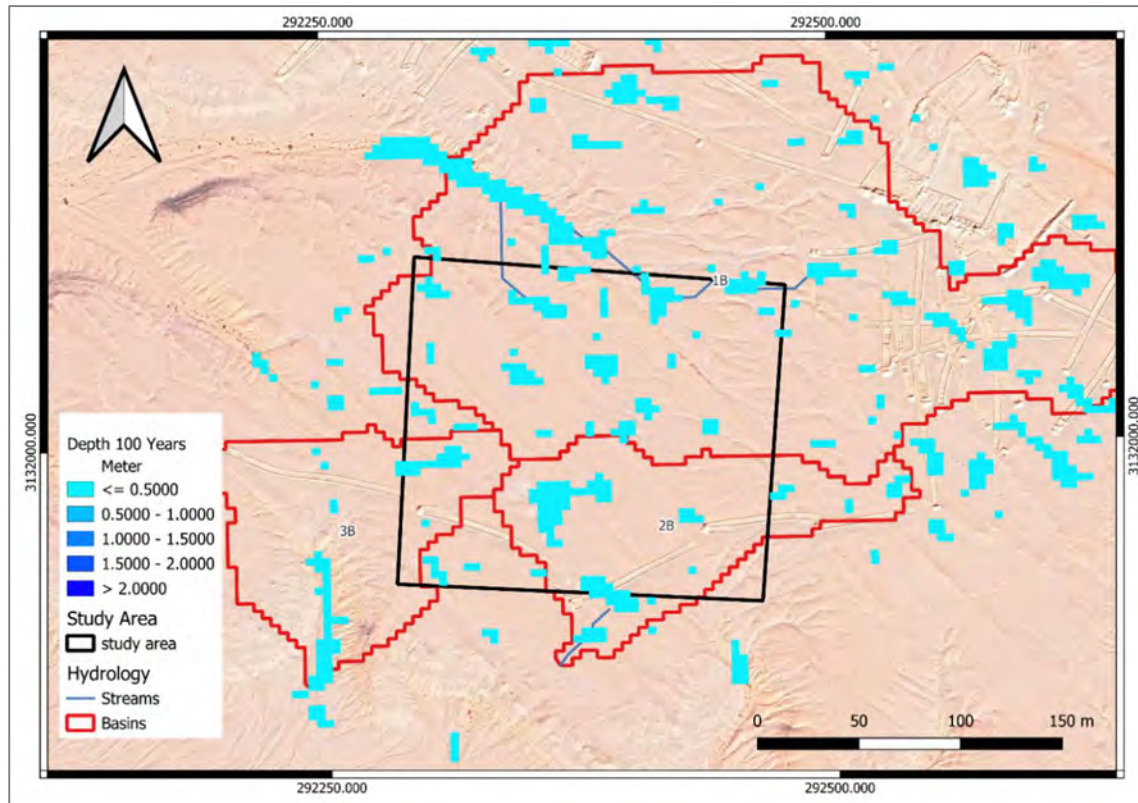


Figure 14: Flood Depth Results for 100 Years

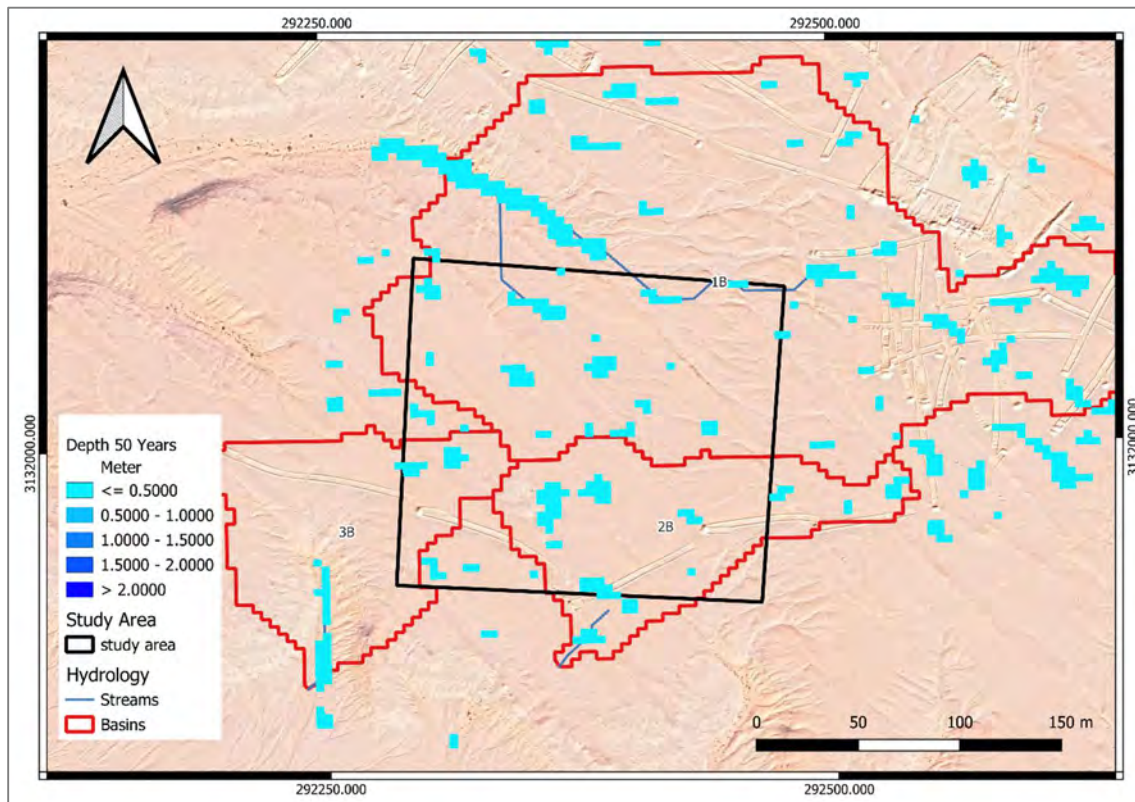


Figure 15: Flood Depth Results for 50 Years

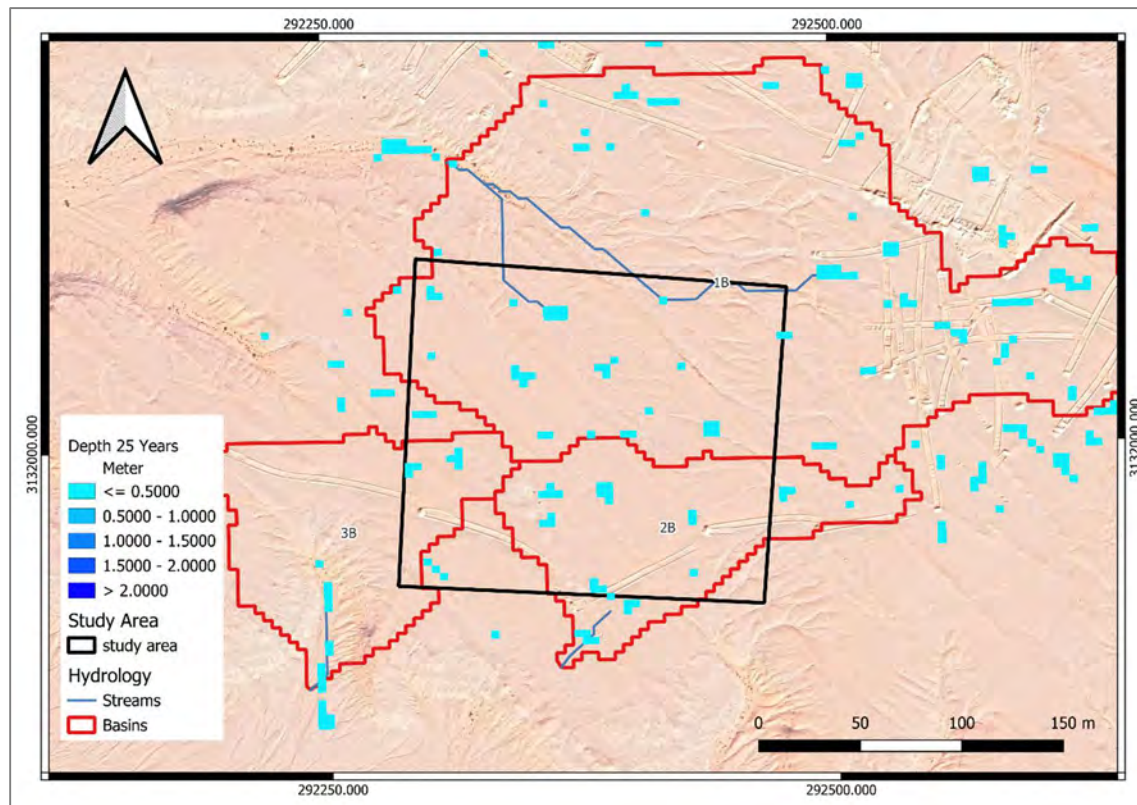


Figure 16: Flood Depth Results for 20 Years

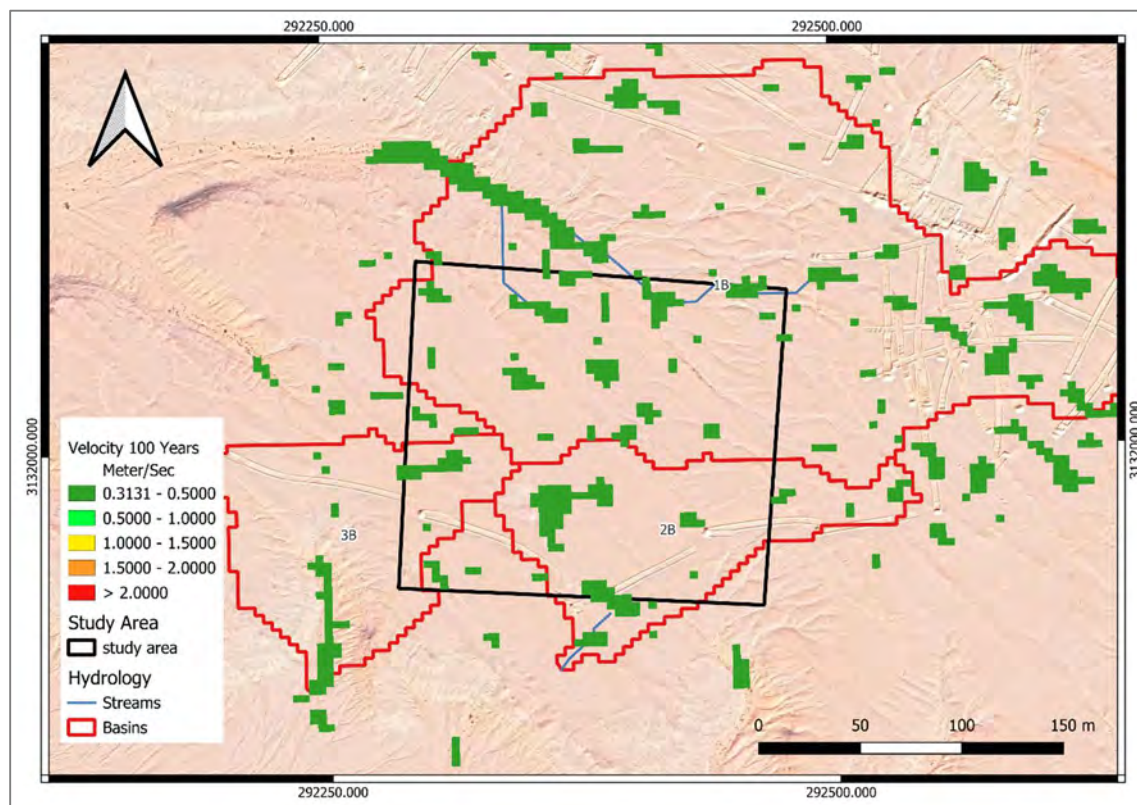


Figure 17: Flood Velocity Results for 100 Years

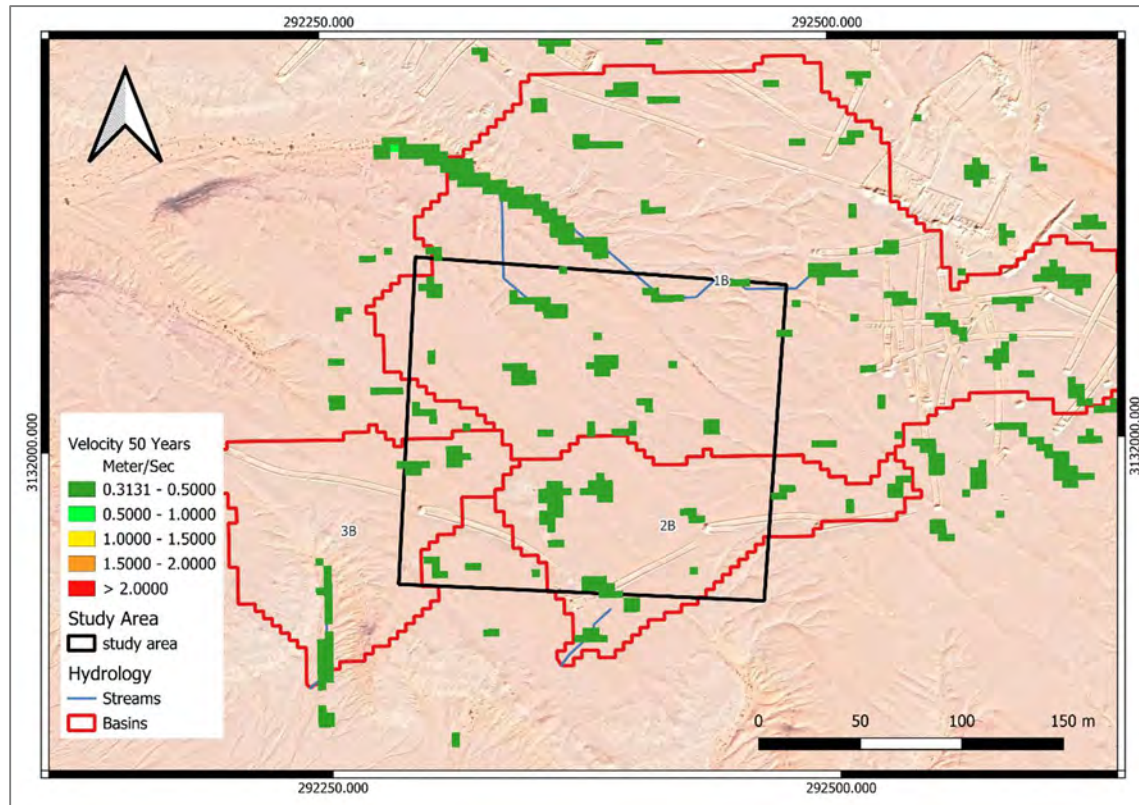


Figure 18: Flood Velocity Results for 50 Years

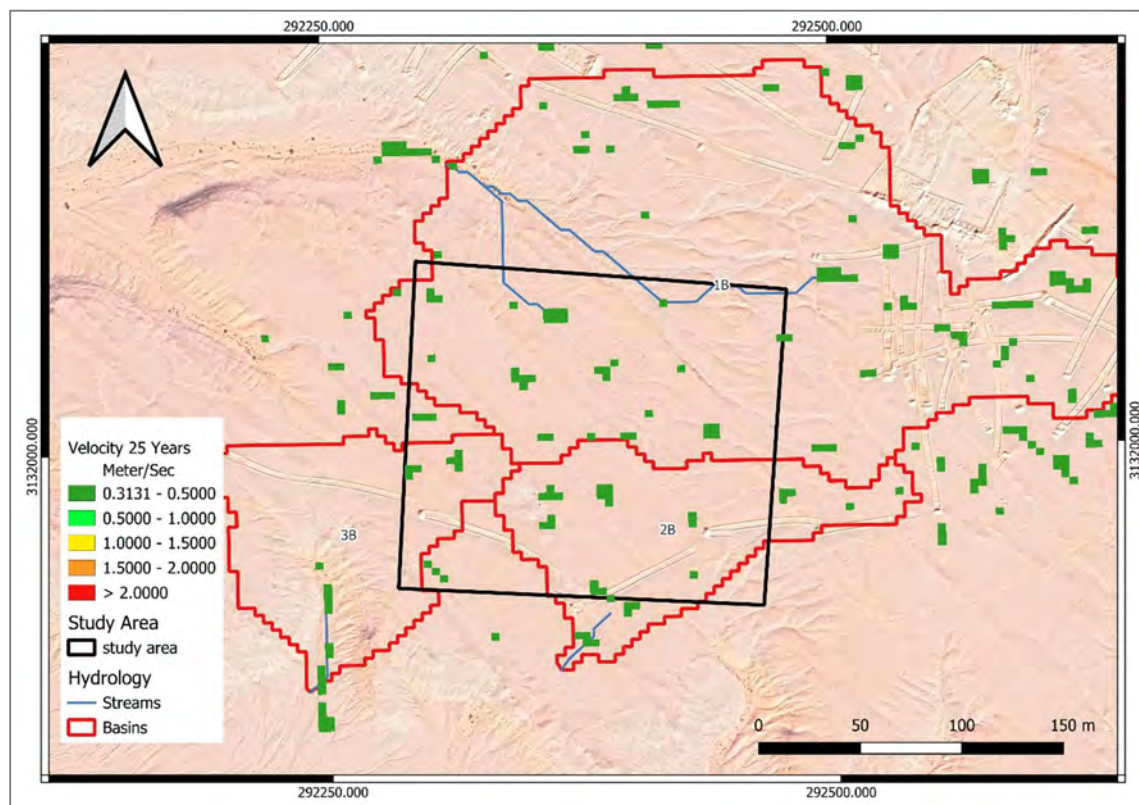


Figure 19: Flood Velocity Results for 20 Years

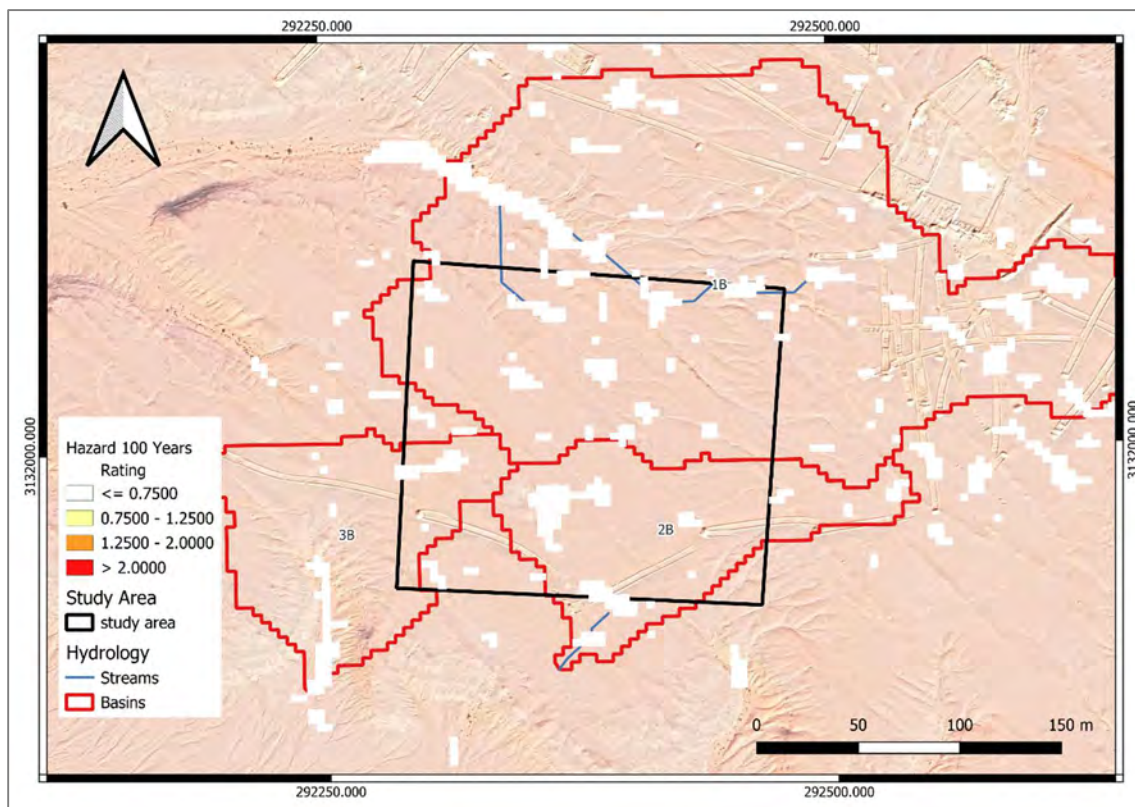


Figure 20: Hazard Results for 100 Years

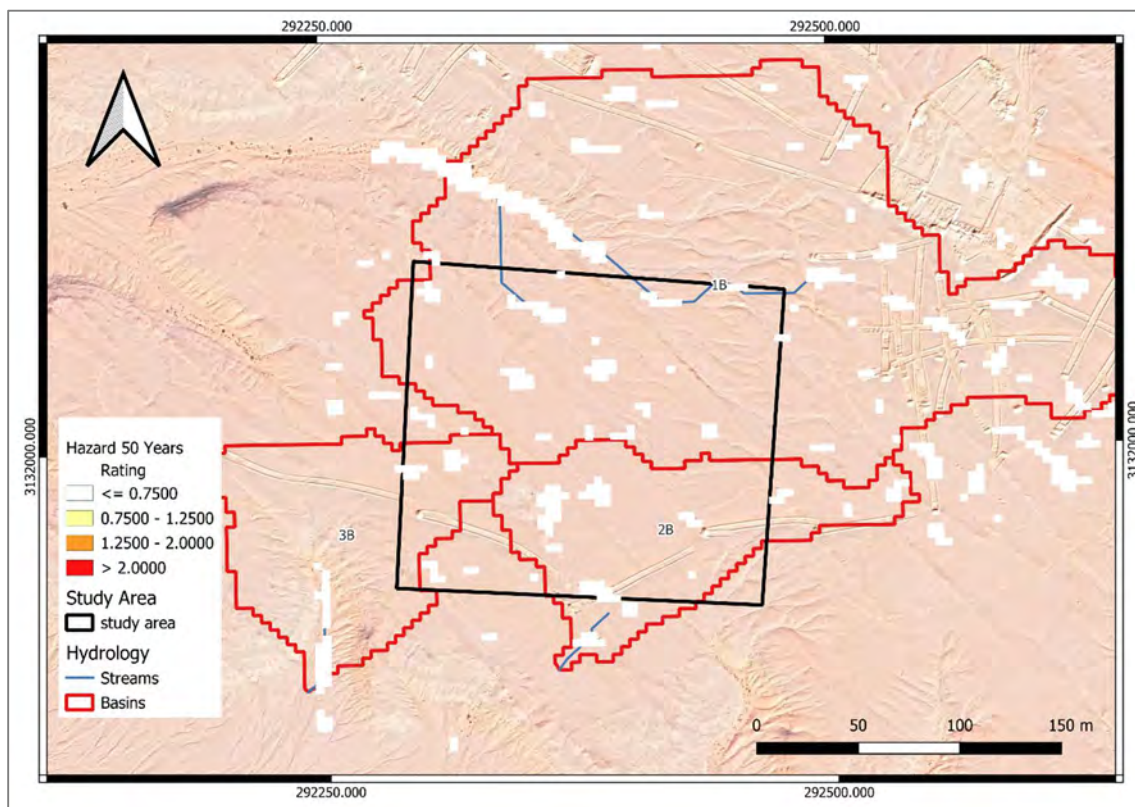


Figure 21: Hazard Results for 50 Years

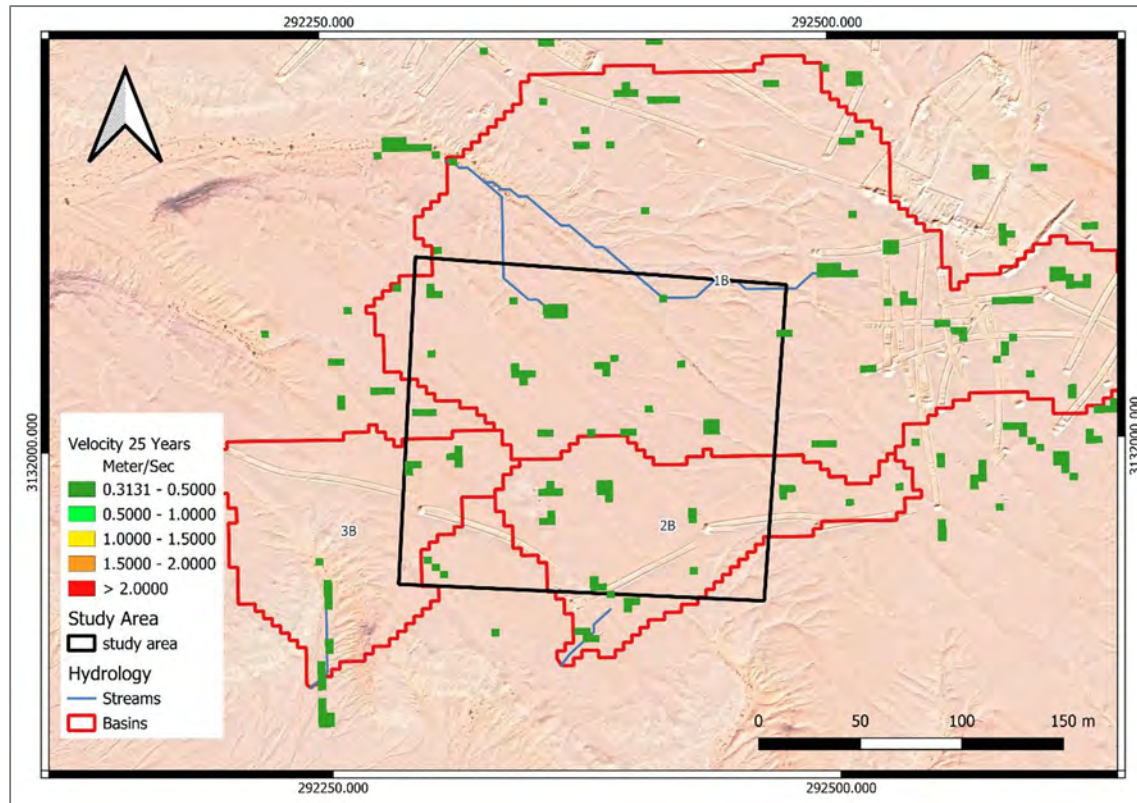


Figure 22: Hazard Results for 20 Years

9.1 Assessment of Existing Conditions and Flood Boundaries

It has been confirmed that there are no flood or flash flood hazards affecting the project site under study.

9.2 Evaluation of Existing Flood Protection Structures

There are no existing flood protection structures within the project site.

9.3 Proposed Solutions

The project site is located near an open desert area, and no distinct wadi flow paths have been identified within the study area. Therefore, the project master plan does not require any flood protection measures. This conclusion is further supported by:

- The absence of any existing flood protection structures at the site, and
- The lack of identifiable wadi channels in the available aerial imagery.

10 Conclusions and Recommendations

Based on the previous studies, it has been concluded that the project site is located within an open desert area and there is no evidence of wadis strike the site. Therefore, the site does not require any flood protection measures against flash floods or inundation.

However, the Consultant generally recommends the following:

- The hydrological and hydraulic studies, along with the proposed internal drainage system for the site, should be completed during the detailed design phase of the project after approval of this preliminary study.
- Surface drainage within the master plan should be considered up to the allowable flood limits through the internal road network. This should be based on the finalized road cross-sections for the developed site. Where necessary, stormwater drainage networks should be designed in accordance with approved flood discharge values and applicable design standards, and then connected to existing or proposed drainage networks in the surrounding area, subject to approval by the relevant authorities.
- The road levels should be designed with appropriate levels to facilitate surface drainage as much as possible. The proposed grading will consider minimum longitudinal slopes up to 0.3-0.5% and minimum cross slopes of approximately 2-3% to ensure proper surface runoff.
- To minimize potential flood impacts, it is recommended to implement an appropriate mitigation measure to protect buildings and equipment. These measures include raising finished floor levels above potential flood levels, grading the site to direct surface runoff away from structures, and providing adequate stormwater drainage systems. In addition, critical equipment such as pumps, electrical panels and control units may be installed on elevated platforms to lift water. Where required, local protective measures such as curbs or barriers may also be considered to further reduce flood risk.
- The proposed drainage system will consist of a network of grated inlets located along the lowest side of the road that discharge into catch basins, which act as connection points between the drainage pipes. The grated inlets and catch basins will be spaced at intervals of approximately 25 m. The connecting pipes shall have a minimum diameter of 300 mm to ensure adequate conveyance capacity and to facilitate maintenance.

- The collected stormwater shall be directed to a storage tank to allow for reuse for irrigation purposes as part of sustainable water management. If the accumulated water volume exceeds the storage capacity, or depending on the site topography, pumping units may be installed to discharge the excess water to a designated outlet point to be determined by the client.
- Compliance with the applicable design standards and criteria must be ensured.

Annex (2): Gap analysis between AfDB Operational Safeguards (OSs) and the National Regulation

**National and AfDB's Environmental and Social
Operational Safeguards Requirements Gap Analysis**
Updated in Accordance with the AfDB Integrated Safeguards System (ISS) 2023

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
OS 1: Assessment and Management of Environmental and Social Risk and Impact			
Environmental and Social Assessment (ESA)	An integrated ESA shall be conducted for the project encompassing direct, indirect, and cumulative E&S risks and impacts throughout the project life cycle (OS1, para. 19). The ESA must address all relevant OSs (OS1–OS10), including climate change vulnerability, gender inequalities, and impacts on vulnerable groups. The updated ISS 2023 expands the ESA scope to include: contextual risk assessment covering human rights, SEAH/GBV risks, labour influx, and conflict dynamics (OS1, Annex 1). For high-risk (Category 1) projects, independent specialists must conduct the ESA (OS1, para. 21).	According to Law 4/1994 and its Amendments Law 9/2009 and Law 105/2015, an Environmental Impact Assessment (EIA) should be prepared before project execution to assess the potential impacts resulting from the project.	The national EIA framework is largely aligned with the basic requirement for pre-project assessment. However, significant gaps remain: (i) national law does not require explicit assessment of cumulative or indirect impacts; (ii) climate change vulnerability assessment is not mandated; (iii) gender and vulnerability screening are not required under national law; (iv) contextual risk assessment covering SEAH/GBV, labour influx, and human rights is not addressed by Egyptian legislation. The updated ISS 2023 strengthens these requirements beyond what is captured in national law.
Environmental and Social Management Systems (ESMS)	An ESMS shall be in place to address E&S issues across the project life cycle (OS1, para. 12). ESMS requirements shall be incorporated into third-party contracts. The updated ISS 2023 requires the ESMS to include procedures addressing SEAH, GBV, modern slavery, and labour influx risks (OS1, Annex 2). Contractor compliance shall be monitored against contractual conditions.	--	The national laws do not obligate facilities to develop a documented ESMS. Such systems are usually voluntarily developed by facilities aiming to obtain international quality management certification (e.g. ISO). The updated ISS 2023 adds new requirements for the ESMS to explicitly address SEAH, GBV, and modern slavery — areas not covered by Egyptian law. This gap is significant for projects with large contracted workforces.
Environmental and Social Policy	An overarching E&S policy shall be in place to define the environmental and social objectives and principles guiding the project's E&S performance. This policy shall be communicated to all employees. The updated ISS 2023 requires the policy to explicitly address non-	--	The national laws do not obligate facilities to develop an E&S policy. However, such policies are usually developed for facilities seeking international quality management certification. The updated ISS 2023 adds

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	discrimination, gender equality, and protection from SEAH/GBV (OS1, para. 12; OS2).		a specific requirement to address SEAH/GBV and gender equality in E&S policies — a gap relative to Egyptian national requirements.
Environmental and Social Management Plans (ESMP)	An ESMP shall be developed to address identified environmental and social risks and impacts, appropriate to the nature and scale of the project. The ESMP is binding and referred to in the financing agreement (Bank Policy, para. 54). It shall include: mitigation and monitoring measures, climate adaptation measures, and measures to address SEAH/GBV and labour influx risks. Requirements shall be communicated to all levels of the organization including contractors.	According to the Egyptian Guidelines for EIA (EEAA, 2009), an ESMP should be developed as an essential part of the EIA. The ESMP should consist of a set of mitigation, monitoring and institutional measures to be performed during different phases of the project. Responsibilities for mitigation and monitoring should be clearly defined in the ESMP.	There is no binding law requiring communication of the ESMP to all workers, and no penalties in national law for non-compliance. The updated ISS 2023 adds new ESMP requirements covering climate adaptation and SEAH/GBV management — areas not addressed by Egyptian law. Since the ESMP is part of the EIA, environmental approval implies approval of the ESMP from the competent authority, but enforcement mechanisms remain weak.
Organizational E&S Capacity and Commitment	Specific in-house personnel with clear lines of responsibility and authority shall be designated for E&S issues. The E&S representative shall possess the requisite knowledge, skills, and experience. Relevant training programmes shall be conducted, including on SEAH/GBV prevention (updated ISS 2023).	Articles 1, 2 of Decree 134/2003 of Labour Law 14/2025 set the required number of responsible personnel for managing H&S aspects. Article 5 of Decree 134/2003 requires facilities employing more than 50 employees to establish a Safety Committee. Articles 14, 15, and 16 of Decree 134/2003 address qualifications of HSE responsible persons.	Egyptian legislation establishes responsibilities for OH&S personnel and committee but does not require dedicated H&S personnel with clearly defined responsibilities covering the full spectrum of environmental and social risks. Furthermore, national requirements do not include training on SEA/GBV prevention and response as required under AfDB ISS 2023.
Contextual Risk Assessment	The updated ISS 2023 introduces a new requirement for a contextual risk assessment to complement ESDD (OS1, Annex 1). This assessment covers: political economy dynamics; SEAH and GBV risks; labour influx and conflict risks; limitations on free speech and reprisal risks; corruption and rule of law issues; and land access and tenure conflicts.	--	There is no national legislative requirement for a contextual risk assessment covering SEAH/GBV, political economy, reprisal risks, or labour influx dynamics. This is an entirely new requirement introduced by the updated ISS 2023 that is not reflected in Egyptian environmental or social law. Projects will need to conduct this assessment as an additional step beyond national EIA requirements.

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
Supply Chain Management	Where there is a high risk of significant E&S issues in the supply chain (child labour, forced labour/modern slavery, significant OHS risks, biodiversity), primary suppliers shall be required to introduce corrective measures. The updated ISS 2023 explicitly adds 'modern slavery' and 'human trafficking' as supply chain risks to be assessed and managed (OS2, paras. 41–44). Where remedy is not possible, the Borrower shall within a reasonable period shift to compliant suppliers.	--	Supply chain E&S management is not addressed by Egyptian national law. The updated ISS 2023 has strengthened this requirement by explicitly adding modern slavery and human trafficking — not covered in either the 2013 ISS or Egyptian legislation. This represents a significant new compliance obligation for projects with complex supply chains.
Project Monitoring and Reporting	Procedures shall be in place to track and evaluate E&S performance throughout the project life cycle. The Borrower shall promptly notify the Bank within three working days of any materially adverse E&S event (updated ISS 2023, OS2, para. 45). E&S performance information shall be periodically reported internally to senior management and, as appropriate, to investors and affected communities.	The Egyptian Environmental Law 4/1994 requires activities with potential environmental impacts to maintain records/registers and report on their environmental performance. Records must be available for inspection by the competent authority. The Egyptian Guidelines for EIA (EEAA, 2009) require the ESMP to include monitoring and reporting provisions.	No requirements exist for periodic reporting to affected communities. The updated ISS 2023 introduces a new mandatory requirement to notify the Bank within three working days of materially adverse events — a stricter standard than Egyptian law. National law also does not require a systematic ESMP compliance monitoring system for the operational phase.
OS 2: Labour and Working Conditions			
General	Working conditions shall comply with national labour and employment laws and the requirements of OS2. The updated ISS 2023 introduces new Labour Management Procedures (LMPs) as a mandatory management tool, replacing less structured approaches. LMPs shall cover all categories of workers including direct workers, contracted workers, community workers, and primary supply workers.	The Egyptian Labour Law No. 14/2025 addresses working conditions and management of worker relationships, covering rights, duties, and occupational health and safety requirements.	The national law is broadly aligned with the general requirement, but does not mandate the preparation of formal Labour Management Procedures (LMPs). The LMP concept is new to the updated ISS 2023 and represents a gap relative to both the 2013 ISS and Egyptian law.
Human Resources Policies	HR policies shall be consistent with national law and international standards, and shall be clearly accessible to all employees. Policies shall cover: protection from SEAH and GBV (new requirement under updated ISS 2023); non-discrimination; and management of third-party labour. Procedures	According to Article 58 of Labour Law (14/2025), internal regulation lists shall be in place covering rules of work and disciplinary sanctions. Decree 185/2003 describes the work regulation policy components including workers' complaints.	The national laws do not specifically require development of procedures for managing and monitoring third-party employer performance. The updated ISS 2023 adds an explicit requirement for HR policies to address SEAH and GBV — a gap not covered by Egyptian labour law.

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	shall be implemented for managing and monitoring third-party employers.		
Working Relationships	Terms and conditions of employment shall be documented and communicated in understandable language to all workers. The updated ISS 2023 requires this to include community workers and workers in fragile or conflict contexts. All wages, social security benefits, and entitlements shall be paid on termination of employment (OS2, para. 13).	Book 2 of Labour Law 14/2025 includes requirements for working relationships. Article 32 addresses contracts specifying job type, hours, rest days, wages, and vacations. Decree 211/2003 requires notification to labour offices prior to subcontracting. Article 36 addresses minimum wages. Social insurance is regulated under Law 63/1964, amended by Law 148/2019.	--
Child Labour and Forced Labour / Modern Slavery	The HR policy shall clearly prohibit child labour and forced labour. The updated ISS 2023 explicitly adds 'modern slavery' and 'human trafficking' as prohibited practices (OS2, para. 23). Young workers (under 18) shall not be employed in hazardous work. Regular monitoring of young workers' health, conditions, and hours is required. LMPs shall specify the minimum age for employment (14 unless national law specifies higher).	Article 2 of Child Law 126/2008 and Article 98 of Labour Law 14/2025 define a child as a person under 18. Article 99 of Labour Law 14/2025 prohibits engagement of children under 14. Decree 118/2003 lists work prohibited for children under 16 and 18. Article 12 of the Egyptian Constitution 2014 prohibits forced labour.	Egyptian legislation prohibits child labour and forced labour and includes provisions addressing human trafficking through separate legislation. However, it doesn't explicitly require employers to address modern slavery risks through labour management procedures, supply chain management, or project specific policies as required under AfDB ISS 2023.
SEAH and GBV Prevention	The updated ISS 2023 introduces explicit requirements for the Borrower to protect workers and communities from Sexual Exploitation, Abuse and Harassment (SEAH) and Gender-Based Violence (GBV). This includes: developing a SEAH/GBV prevention and response plan; integrating SEAH/GBV requirements into contractor contracts (OS1, Annex 2); training for workers; and establishing confidential reporting mechanisms (OS2; OS4).	--	There is no national legislative requirement in Egypt addressing SEAH and GBV in the context of project operations and labour management. This is an entirely new requirement introduced by the updated ISS 2023 and represents a significant compliance gap relative to Egyptian law. Projects will need to develop specific SEAH/GBV prevention and response frameworks.
Non-Discrimination and Equal Opportunity	Employment decisions shall not be made on the basis of personal characteristics unrelated to job requirements. The updated ISS 2023 expands protected characteristics to explicitly include sexual orientation and gender identity (OS2;	Article 35 of Labour Law 14/2025 prohibits discrimination against employees on grounds of gender, origin, culture, politics, religion, or beliefs.	Egyptian law addresses basic non-discrimination but does not explicitly cover sexual orientation and gender identity as protected characteristics — a gap relative to the updated ISS 2023 requirements.

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	OS7). Gender-responsive approaches shall be adopted throughout project implementation.		
Workers' Organizations	Workers shall be allowed to form and join workers' organizations. The Borrower shall not interfere with or control these organizations, and shall engage with workers' representatives for collective bargaining. The updated ISS 2023 clarifies that the Borrower shall not discriminate against or retaliate against workers participating in unions (OS2, para. 20).	Article 4 of Law 213/2017 (amended by Law 142/2019) concerning trade union organizations states that workers have the right to form trade union organizations and freely join or withdraw from them.	--
Retrenchment	Prior to implementing collective dismissals, the Borrower shall carry out an analysis of alternatives to retrenchment. A retrenchment plan shall be developed based on non-discrimination principles, consultation with workers, and compliance with national law (OS2, para. 18). This is a new explicit requirement under the updated ISS 2023.	Egyptian Labour Law provides for dismissal procedures and severance entitlements under Labour Law 14/2025.	While Egyptian law covers aspects of dismissal, it does not mandate a specific analysis of alternatives to retrenchment or a formal retrenchment plan as required by the updated ISS 2023. This represents a gap requiring additional management procedures.
Worker Accommodation	Worker accommodation shall be clean, safe, and meet basic needs, including water, sanitation, and medical care where appropriate. The updated ISS 2023 specifies that accommodation shall not restrict workers' freedom of movement or association, and shall provide segregated facilities for women and men (OS2, para. 14).	Article 221 of Labour Law 14/2025 requires projects in remote areas to provide accommodation and meals. Ministry of Labour Decree 200/2003 provides specifications.	Egyptian law addresses accommodation provisions in remote areas. The updated ISS 2023 adds requirements on non-restriction of freedom of movement and gender-segregated facilities — elements not explicitly covered by Egyptian law.
Grievance Mechanism (Workers)	A workers' grievance mechanism shall be in place, accessible to all project workers including contracted and non-employee workers, and shall be communicated at recruitment. The updated ISS 2023 requires the mechanism to operate without reprisal, independently and objectively, and to not impede access to judicial remedies (OS2, paras. 24–26).	According to Article 19 of Decree 185/2003, workers' complaints shall be raised to the head of department and then to management. All complaints shall be documented.	Egyptian legislations provides mechanisms for workers to submit complaints through management channels; however, it does not require a dedicated, confidential, independent, and non-retaliatory grievance mechanism accessible to all categories of project workers, including contracted and non-employee workers, as required by AfDB ISS 2023.
Labour Influx Management	The updated ISS 2023 introduces explicit provisions for managing the influx of project labour (OS4, paras. applicable). Where significant	--	Labour influx is not addressed in Egyptian national law. This is a new requirement introduced by the updated ISS 2023 that

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	labour influx is anticipated, the Borrower shall prepare a Labour Influx Management Plan covering: community health impacts; SEAH/GBV risks; provision of services for incoming workers; and measures to avoid conflicts between workers and host communities.		was not present in the 2013 ISS and is entirely absent from Egyptian legislation. For projects involving significant labour influx, a dedicated management plan will be required.
Non-Employee Workers	Contractors shall have their own policies and procedures addressing non-employee workers aligned with OS2. Risks associated with non-employee workers shall be assessed. Contracted workers shall have access to a grievance mechanism. The updated ISS 2023 requires explicit contractual provisions for SEAH/GBV protection and modern slavery prevention for contracted workers.	According to Decree 162/2019, the employer using non-employee workers (including contractors such as carpenters, welders, electricians) shall notify the labour office within ten days of commencement of work.	Egyptian legislation requires notification of labour authorities regarding the use of contractors and non-employee workers; however, it does not require contractors to implement labour management procedures, provide dedicated grievance mechanisms, address SEAH/GBV risks, prevent modern slavery, or demonstrate compliance with environmental and social requirements as required by AfDB ISS 2023.
Occupational Health and Safety	A safe and healthy work environment shall be provided. Workers shall receive PPE at no cost. OHS procedures shall be established per Good International Industry Practice (GIIP). The updated ISS 2023 requires workplace processes to allow workers to report unsafe conditions without reprisal, and prohibits retaliation against workers who remove themselves from imminent danger (OS2, para. 30). OHS records shall include injury rates, occupational diseases, and fatalities.	Article 1 of Decree 211/2003 requires safe working areas. Decree 126/2003 addresses incident investigation and reporting. Article 217 of Law 14/2025 requires hazard awareness and PPE provision. Article 1 of Decree 211/2003 requires owners and contractors to ensure OHS conditions.	--
Security Personnel Requirements	Where security personnel are engaged, contract provisions shall include guidelines on their interaction with communities. A grievance mechanism shall allow affected communities and workers to express concerns about security arrangements. The updated ISS 2023 additionally requires that security personnel training include provisions on the use of force, non-discrimination, and SEAH/GBV prevention.	Law 86/2015 and its Executive Regulation 133/2016 define conditions for security personnel. Security companies are responsible for addressing grievances and compensating potentially affected persons.	--

OS 3: Resources Efficiency and Pollution Prevention and Management

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
Resource Efficiency	Measures shall be adopted to minimize consumption and improve efficiency in the use of energy, water, and other resources. The updated ISS 2023 strengthens this requirement by linking it to climate change mitigation commitments and Sustainable Development Goals (SDGs). Use of resources and material inputs shall be tracked.	Articles 49 and 50 of Electricity Law No. 87/2015 concern annual energy efficiency planning and policies. No specific regulation for water resources efficiency exists, although a national water resources plan (2017) was developed. The Environmental Register required by Law 4/1994 requires facilities to record resource consumption.	--
Pollution Prevention and Control	Air, land, and water releases of pollutants shall be monitored. Procedures, practices, and techniques shall be introduced to avoid, or where avoidance is not feasible, minimize and/or control the intensity and mass flow of pollutant releases. The updated ISS 2023 requires explicit consideration of greenhouse gas (GHG) emissions as part of pollution management.	Law 4/1994 (amended by Laws 9/2009 and 105/2015) and its Executive Regulations (Decree 338/1995 and amendments) address pollution prevention to air, soil, and water. Law 93/1962 and Decree 44/2000 address discharge to public sewer networks.	No written management procedures are required by national law. The updated ISS 2023 adds an explicit requirement to account for GHG emissions — not addressed in Egyptian environmental law.
Waste Management	Procedures for storage, handling, and disposal of solid and hazardous wastes shall be in place. Third-party waste disposal contractors shall be reputable and licensed. Chain of custody documentation shall be maintained to the final destination. The updated ISS 2023 aligns waste management with the circular economy approach and SDGs.	Article 37 of Law 4/1994 (amended) and Articles 38 and 39 of its ERs address solid waste management. Articles 30 and 28 address hazardous waste. Law 202/2020 and its ER 722/2022 regulate solid and hazardous waste management. Article 49 requires segregation and delivery to authorized collectors. Chapter Five and Articles 50–54 of ER 722/2022 regulate hazardous waste.	No written management procedures are required by national law beyond compliance with waste regulations. Waste management plans are not mandated.
Safe Use and Management of Hazardous Substances	Procedures for storage, handling, transportation, and use of hazardous materials shall be in place. The updated ISS 2023 references the Stockholm Convention and Rotterdam Convention as international benchmarks for hazardous substances management.	Articles 29–33 of Law 4/1994 (amended) and Article 31 of its ERs address hazardous materials. Article 34 of Decree 211/2003 requires selection of chemicals that reduce hazard risk.	No written management procedures are required by national law. International conventions (Stockholm, Rotterdam) referenced in the updated ISS 2023 have not been fully integrated into Egyptian regulatory requirements.
Greenhouse Gas (GHG) Emissions Assessment	The updated ISS 2023 introduces an explicit requirement to assess and quantify GHG emissions associated with the project, including indirect emissions (OS1, para. 24). This is consistent with the Bank's Climate Change and	--	There are no national legislative requirements in Egypt for GHG emissions quantification or reporting for project-level activities. This is a new requirement introduced by the updated ISS 2023 that

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	Green Growth Strategic Framework (2021) and aligns with Sustainable Development Goals.		creates a gap relative to Egyptian environmental law. Projects will need to develop GHG assessments as a supplementary requirement.
OS 4: Community Health, Safety and Security			
General Requirements for Health and Safety Management	Preventive measures and plans shall be prepared and implemented to manage health and safety risks using the mitigation hierarchy approach and Good International Industry Practice (GIIP). The updated ISS 2023 adds requirements to address: risks from labour influx on community health (communicable diseases, SEAH/GBV); and risks from large-scale emergency/pandemic situations.	The Egyptian Civil Law 131/1948 addresses community safety and security. Law 4/1994 also addresses community safety aspects related to hazardous waste management.	No written management procedures are required by national law. The updated ISS 2023 expands the scope of community health and safety management to include labour influx risks and pandemic preparedness — areas not addressed by Egyptian law.
Community Health and Safety	Procedures shall be implemented to address community health and safety issues in the context of operations. Safety procedures shall deal with hazardous material release, transport, and disposal. The updated ISS 2023 adds an explicit requirement for Dam Safety Plans where applicable, and for community health risk management plans where labour influx could introduce communicable diseases.	Law 4/1994 requires projects to monitor pollutants to air and water to protect the surrounding environment and community. Article 34 of Decree 211/2003 requires selection of less hazardous chemicals.	No written management procedures required in national law to address community health and safety issues. The updated ISS 2023 introduces new requirements on dam safety and communicable disease management from labour influx — gaps not covered by Egyptian law.
Exposure to Hazardous Materials	Appropriate measures shall be taken to prevent or minimize potential worker and community exposure to hazardous materials released by the project.	Article 34 of Decree 211/2003 requires selection of less hazardous substances and evaluation of chemical risks with air concentration monitoring.	--
Traffic and Road Safety	Potential traffic and road safety risks shall be evaluated and monitored for workers and communities. The updated ISS 2023 requires this to include assessment of heavy vehicle traffic impacts on community roads and vulnerable road users.	Egyptian Guidelines for EIA (EEAA, 2009) require assessment of infrastructure use and traffic in the EIA.	No written management procedures required by national law. The updated ISS 2023 provides more detailed requirements for traffic management planning than current Egyptian requirements.
Exposure to Disease	Procedures shall deal with avoiding/minimizing communicable diseases (including those related to influx of project labour) that could result from the project. The updated ISS 2023 strengthens	--	Labour influx and disease exposure are not addressed in Egyptian national law. The updated ISS 2023 significantly expands this requirement — particularly

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	this to include epidemic and pandemic preparedness measures, informed by COVID-19 experience (OS1, para. 3; OS4).		regarding pandemic preparedness — creating a gap relative to Egyptian legislation.
Emergency Preparedness and Response	Emergency Preparedness and Response Plans (EPRPs) shall be developed considering risks and impacts from the project on local communities. The updated ISS 2023 requires EPRPs to include provisions for natural disasters, climate-related events, and pandemic situations as new explicit requirements.	Article 215 of Law 14/2025 and Article 3 of Decree 211/2003 require each facility to prepare an emergency response plan.	--
OS 5: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement			
Avoid or Minimize Displacement	Plans/procedures shall be developed to avoid or minimize economic and physical displacement, considering alternative designs. The updated ISS 2023 maintains this principle and emphasizes avoiding displacement as the highest priority, with compensation at full replacement cost as a last resort (OS5).	Law 10/1990 (amended by Laws 1/2015 and 24/2018) enables land acquisition for public investment projects. Compensation is estimated at prevailing market prices plus 20% based on Law 24/2018. Article 8 of Law 10/1990 allows affected communities to object to compensation values. The Egyptian Survey Authority is responsible for land acquisition and compensation estimation.	National laws do not include requirements for developing a written Land Acquisition and Resettlement Management Plan. Procedures are handled by government authorities. Eligibility criteria differ — Egyptian regulations assume legal titles, while the updated ISS 2023 requires compensation for property AND livelihood, regardless of legal title. The 20% premium under Egyptian law falls short of the full replacement cost standard required by the ISS. The updated ISS 2023 strengthens requirements for vulnerable group consideration in resettlement — a significant gap.
Consultation in Resettlement	All relevant information shall be disclosed and affected persons consulted. The updated ISS 2023 requires that consultation be conducted in a safe environment, free of reprisal, and in a culturally appropriate manner (OS5; OS10). Particular attention shall be given to vulnerable groups in consultation design.	--	There is no explicit consultation requirement in Egyptian law for resettlement. However, affected communities are usually informed about the project. The updated ISS 2023 introduces stronger requirements on the quality and safety of consultation, free of coercion or reprisal — a gap relative to Egyptian law.
Socio-Economic Assessment and Census	A detailed census shall be carried out to: identify displaced persons; determine eligible persons for	--	Egyptian law provides for a census/inventory through the Survey

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	compensation; and develop an inventory of affected land and property. The updated ISS 2023 requires the census to include documentation of informal land rights and customary tenure arrangements.		Authority. However, informal land rights and customary tenure are not recognized in Egyptian law — a gap relative to the updated ISS 2023 requirements.
Compensation for Displaced Persons	Compensation for loss of assets shall be provided at full replacement cost. The updated ISS 2023 clarifies that 'full replacement cost' means the market value of the assets plus transaction costs, and shall not be reduced by depreciation or salvage value (OS5).	--	Compensation under Egyptian law is based on market prices plus 20% premium, which does not necessarily equal full replacement cost as defined by the updated ISS 2023. This gap is particularly relevant when market prices undervalue affected assets.
Income Restoration	Loss of income resulting directly from project implementation shall be compensated. The updated ISS 2023 requires income restoration programmes to bring affected persons to pre-displacement income levels or better.	--	Egyptian regulations do not specify income restoration allowances for losses of business income. This is a gap relative to the ISS requirements.
Cut-Off Date	A cut-off date is required to prevent opportunistic in-migration to the project area. The updated ISS 2023 maintains this requirement and specifies that it shall be communicated publicly and transparently.	--	There is no cut-off date mechanism under Egyptian law. This is a gap relative to ISS requirements.
Grievance Mechanism (Resettlement)	An effective grievance mechanism shall be established for affected communities, accessible to all including vulnerable groups. The updated ISS 2023 requires the mechanism to operate without reprisal and to be linked to the Bank's Independent Recourse Mechanism (IRM).	--	No specific resettlement grievance mechanism is required by Egyptian law. The updated ISS 2023 introduces additional requirements regarding the IRM linkage that are entirely absent from Egyptian law.
Vulnerable Groups in Resettlement	Special attention shall be given to vulnerable groups affected by resettlement. Differentiated measures shall be provided to ensure adverse impacts do not fall disproportionately on the vulnerable. The updated ISS 2023 expands the definition of vulnerable groups to include those marginalized on the basis of sexual orientation and gender identity.	--	Egyptian regulations have not addressed how vulnerable groups affected by expropriation should be treated. The updated ISS 2023 expands the definition of vulnerability and strengthens protection requirements — a significant gap relative to Egyptian law.

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
Resettlement Action Plan (RAP) / Livelihood Restoration Plan	A RAP (if physical displacement) or Livelihood Restoration Plan (if economic displacement) shall be developed. The updated ISS 2023 clarifies that RAP costs must be fully integrated into project costs and either bank-financed, co-financed, or confirmed as counterpart funding before disbursement (Bank Policy, para. 54 footnote).	--	National law does not require a RAP or Livelihood Restoration Plan. The updated ISS 2023 strengthens financial arrangements for resettlement cost coverage — a gap relative to Egyptian law and practice.
OS 6: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources			
Assessment of Issues and Impacts on Biodiversity	Impacts on biodiversity shall be identified and assessed as part of the ESIA. The updated ISS 2023 requires assessment to include ecosystem services, and to consider climate change impacts on biodiversity (OS6). The Bank exercises a precautionary approach to biodiversity offsets (OS1, footnote 68).	According to the EIA guidelines issued in 2009, the biological environment shall be described in the baseline EIA, covering fauna and flora, terrestrial and marine. Law 102/1983 addresses protection of natural protectorates.	--
Biodiversity Conservation Requirements	Types of habitats shall be identified by in-house or external experts. The ESIA shall study alternatives and include mitigation measures. In the case of critical habitat, a Biodiversity Management Plan (BMP) or Biodiversity Action Plan shall be developed. The updated ISS 2023 maintains the distinction between natural habitat, modified habitat, and critical habitat, and aligns with CITES requirements.	Law 4/1994 (amended by Laws 9/2009 and 105/2015) addresses biodiversity protection. Article 28 (as amended) and Annex 4 of the ERs define wild animals and plants prohibited from hunting, killing, or capturing.	National laws do not require a written BMP or Biodiversity Action Plan. The updated ISS 2023 maintains this requirement and adds explicit reference to climate change impacts on biodiversity assessment — a gap relative to Egyptian law.
Ecosystem Services	The updated ISS 2023 introduces an explicit requirement to assess and manage impacts on ecosystem services that underpin human well-being (OS6). This includes provisioning services (water, food), regulating services (flood control, carbon sequestration), and cultural services.	--	Ecosystem services assessment is not required under Egyptian environmental law. This is a new requirement introduced by the updated ISS 2023 that creates an additional compliance obligation not reflected in national legislation.
OS 7: Vulnerable Groups			
Identification and Protection of Vulnerable Groups	As early as possible in project planning, the Borrower shall identify individuals and groups who might be vulnerable, including: female-headed households, the landless, the elderly, youth and children, persons with disabilities,	Egyptian law does not contain specific provisions for protecting vulnerable groups in the context of project development.	This OS was absent from the original Gap Analysis and represents a significant area where Egyptian law has no equivalent provisions. The updated ISS 2023 has substantially expanded OS7, introducing

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
	groups marginalized by ethnicity, religion, language, sexual orientation, and gender identity, and Highly Vulnerable Rural Minorities (HVRM) (OS7, para. 5). The updated ISS 2023 significantly expands this OS, introducing a comprehensive framework for HVRM and Indigenous Peoples management, including FPIC requirements.		formal identification and management requirements for vulnerable groups — including women and girls, minorities, and HVRM. FPIC requirements for HVRM are entirely absent from Egyptian law.
Free, Prior, and Informed Consent (FPIC) for HVRM	Where Highly Vulnerable Rural Minorities (HVRM) are present in or have collective attachment to the project area, the Borrower shall obtain their Free, Prior and Informed Consent (FPIC) in three specific circumstances: (i) commercial use of cultural resources; (ii) physical relocation; and (iii) significant adverse impacts on critical cultural heritage (OS7, para. 36 as referenced in OS7).	--	There are no FPIC requirements under Egyptian law. HVRM groups are not recognized as a legal category in Egyptian legislation. This is a comprehensive new requirement under the updated ISS 2023 with no national law equivalent.
Gender-Responsive Approach	The updated ISS 2023 requires the Borrower to adopt a gender-responsive approach to E&S impact management, explicitly addressing the differentiated burden of impacts on women and girls (OS7, objective). Gender assessments shall be carried out for every project (Bank Vision, para. 7). This is a significantly expanded requirement compared to the 2013 ISS.	--	Egyptian law does not require gender impact assessment or gender-responsive project management in the context of E&S safeguards. This represents a gap relative to the updated ISS 2023 requirements.
Vulnerable Group Plans	Where project impacts on vulnerable groups are identified, the Borrower shall prepare a Vulnerable Group Plan or equivalent management plan detailing measures to avoid, minimize, or mitigate adverse impacts and ensure equitable benefit-sharing.	--	No equivalent requirement exists under Egyptian law. Vulnerable group plans are an entirely new requirement with no national law basis.
OS 8: Cultural Heritage			
Assessment of Cultural Heritage	The ESIA shall include assessment of cultural heritage in the project area. The updated ISS 2023 expands the scope to include intangible cultural heritage (living heritage, traditional knowledge, cultural practices) in addition to physical/tangible heritage (OS8).	According to EIA guidelines (EEAA, 2009), the baseline environment including tourist attractions shall be described in the EIA.	--

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
Managing Impacts on Cultural Heritage	Where cultural heritage may be found, a Chance Find Procedure shall be established. The updated ISS 2023 expands requirements for cultural heritage management to include explicit protection of intangible heritage and traditional knowledge associated with project activities (OS8).	Law 117/1983 (amended by Law 3/2010) addresses protection of antiquities. It requires that works stop and the archaeological authority be promptly informed in case of chance finds.	--
OS 9: Financial Intermediaries (NEW STANDALONE OS — ISS 2023)			
Financial Intermediary (FI) ESMS	Where the Bank provides support to a Financial Intermediary (FI), the FI shall put in place and maintain an Environmental and Social Management System (ESMS) to identify, assess, manage, and monitor E&S risks and impacts of FI subprojects on an ongoing basis (OS9; Bank Policy, para. 38). The updated ISS 2023 has elevated FI requirements into a standalone OS (OS9), reflecting their increased importance. The ESMS must be in place and reviewed by the Bank before any lending takes place.	--	Financial Intermediary E&S requirements are not addressed in Egyptian national law. OS9 is a new standalone safeguard in the updated ISS 2023, representing a new compliance category not addressed in the original Gap Analysis document and absent from Egyptian legislation.
FI Subproject Risk Categorization	The FI shall develop and maintain a risk rating/categorization system for subprojects (high, moderate, low risk). Subprojects involving resettlement, adverse impacts on vulnerable groups, or significant biodiversity or cultural heritage impacts shall be categorized as high risk regardless of the FI's own system (OS9, para. 19).	--	No equivalent requirement exists under Egyptian law.
OS 10: Stakeholder Engagement and Information Disclosure			
Stakeholder Identification	The Borrower shall have a mechanism to identify stakeholders (project-affected parties and other interested parties). The updated ISS 2023 requires early identification of vulnerable individuals and groups who may require differentiated engagement approaches (OS10, para. 13). Stakeholder identification and analysis shall be sufficiently detailed to determine appropriate communication levels.	According to EIA Guidelines 2009, public involvement is mandatory for Category C projects through public consultation with concerned parties. Formal public consultation is not required for Category A or B projects.	Egyptian EIA requirements for public consultation are limited to Category C projects. The updated ISS 2023 requires comprehensive stakeholder engagement for all project categories — a significant gap relative to Egyptian law.

African Development Bank's Environmental and Social Operational Safeguards requirements	International Requirements (AfDB ISS 2023)	National Requirements	Gap Description
Stakeholder Engagement Plan (SEP)	The Borrower shall develop and implement a Stakeholder Engagement Plan (SEP) proportionate to project risks and impacts. The SEP shall be disclosed as early as possible and before appraisal. The updated ISS 2023 requires the SEP to include specific provisions for: safe consultation free of reprisal; engagement with vulnerable groups; and a sufficient budget for all stakeholder engagement activities throughout the project life cycle (OS10, para. 15).	--	Egyptian law does not require a Stakeholder Engagement Plan. The SEP concept with its detailed requirements on budget, vulnerable group engagement, and reprisal-free consultation is entirely new in the updated ISS 2023 and represents a gap relative to Egyptian legislation.
Information Disclosure	Relevant E&S information shall be disclosed to affected communities in a timely, understandable, accessible, and appropriate manner. For high-risk (Category 1) projects, ESA documentation shall be disclosed at least 120 days before Board consideration (Bank Policy, para. 59). The updated ISS 2023 requires disclosure through the Integrated Safeguards Tracking System (ISTS).	EIA guidelines require publication of EIA results, but specific timelines for public disclosure are not clearly defined in national law.	Egyptian disclosure requirements are less prescriptive than the updated ISS 2023, which specifies the 120-day advance disclosure requirement for high-risk projects and mandatory ISTS use. These requirements represent a gap relative to Egyptian law.
Grievance Redress Mechanism (Community)	The Borrower shall provide a grievance mechanism to receive and facilitate resolution of concerns from project-affected parties. The updated ISS 2023 links this to the Bank's Independent Recourse Mechanism (IRM) and requires the mechanism to operate safely, without reprisal (OS10; Bank Policy, paras. 73–75). The mechanism shall be communicated to communities clearly, including information on the IRM.	Egyptian law does not require a dedicated community grievance mechanism for project operations beyond general civil litigation recourse.	No written community grievance mechanism is required by Egyptian law. The updated ISS 2023 strengthens this requirement by: (i) requiring linkage to the Bank's IRM; (ii) mandating reprisal-free operation; and (iii) requiring communities to be informed of the IRM. All of these are gaps relative to Egyptian law.
Reprisal-Free Engagement	The updated ISS 2023 introduces an explicit requirement that all consultation and stakeholder engagement activities be conducted in an environment free of reprisal, intimidation, coercion, manipulation, or discrimination (OS10, para. 9). The Bank is committed to protecting all stakeholders against reprisals at any time during the project life cycle (Bank Policy, para. 27).	--	Protection against reprisals in the context of project consultations is not addressed by Egyptian law. This is a new explicit requirement in the updated ISS 2023 that creates an additional compliance obligation beyond Egyptian legal requirements.

Annex (3): Stakeholders scoping meetings for Consumer Substation

Stakeholders Scoping meetings

Topic	Discussions
8/6/2026	
Head of Samalout City	A meeting took place between the CLO and the Head of Samalout City, the following topics were discussed: – A comprehensive orientation was provided regarding the project location within Samalout City, with the accurate coordinates of the consumer substation from Sryriya village. – Key project stakeholders were identified and formally assigned to ensure coordinated engagement throughout the project lifecycle. The following stakeholders were designated for active participation and dialogue: • Local Unit of Beni Khaled Village (The mother village) • Syriya Community Leaders A structured communication framework was established to ensure regular and transparent dialogue between the project team and these stakeholder groups. – The project's hiring procedures were presented to the Head of Samalout City with specific emphasis on local workforce engagement. It was emphasized that project contractors have been instructed to give high priority to residents of neighboring villages during recruitment and employment processes, ensuring that local communities directly benefit from employment opportunities created by the project. The project's grievance mechanism and complaint resolution procedures were discussed in detail. The Head of Samalout City was provided with the contact information of the project Community Liaison Officer (CLO), including phone number and email address, to facilitate direct community access to grievance redressal and project support services. This ensures that concerns and complaints from community members can be promptly addressed and resolved
17/5/2026	
Meeting with Minya Governor General Secretary of Minya Governorate	A meeting took place with the General Secretary of Minya Governorate during which the following topics were discussed: – Project Components and Orientation: A comprehensive orientation was provided regarding the project components, technical capacities, and project locations across the governorate, including the main PV facility, BESS installations, and associated substations. – Hiring Procedures and Workforce Engagement: The recruitment mechanisms and project employment procedures were discussed, with specific reference to the intervention and support of the Youth Employment Administration in sourcing and facilitating local workforce engagement. – Grievance Redressal Mechanism: The project's grievance mechanism and complaint resolution procedures were presented, establishing a framework for addressing community concerns and worker-related issues throughout the project lifecycle. Social Engagement and Community Relations: A strategy for meaningful community engagement and stakeholder dialogue was outlined to ensure sustained local support and effective project integration within the governorate. A second meeting took place with the Minya Governor during which the following topics were discussed: – The Governor expressed a strong positive intention to cooperate and facilitate the resolution of any challenges that may face the project implementation. – The Governor expressed his satisfaction regarding the significant economic value of the project and its positive future impacts on investment opportunities within Minya Governorate. The project is anticipated to stimulate economic growth, attract further investment, and enhance the governorate's position as a renewable energy hub. Regarding employment procedures, the Governor affirmed that the Governorate would provide all required support through the Youth Employment Administration to announce job vacancies and facilitate workforce recruitment.

Topic	Discussions
6/1/2026: EEAA	
EEAA- Central EIA department	A meeting took place with the head of energy projects at the central EIA department of EEAA during which the categorization of the PV project and its different related projects including the PV and BESS in NREA East Menya concession, the consumer substation in Menya, the standalone BESS projects in Abou Qir and Nagaa Hammadi was discussed. It has been advised that the projects are to be categorised as Scoped B, that do not require organizing public disclosure meetings. As per the national environmental law, EEAA is to issue its opinion on the ESIA within 30 days from receipt of the ESIA for review.
15/2/2026: Informal agricultural operators at the Energy Valley site	
Farms operators at the site	During the site visit, a number of agricultural farms operators met while dismantling their infrastructure to evacuate the lands. Discussions indicated that they have been informally using land since 2023, despite it having been allocated for NREA since 2016. The agriculture operators indicated that since January 2025, the Menya governorate has been notifying and warning farmers to evacuate the lands, while some farmers claimed that no warnings took place by the governorate before undertaking the evacuation campaigns. As indicated by the interviewed farmers, the majority of farmers came from other governorates mostly from Gharbeia governorate. The farmers advised that they had submitted applications to the governorate regarding acquiring the lands area for agricultural activities. As they received no feedback to their applications, they assumed that the applications were accepted and moved forward with their projects. They have also applied to the Egyptian Electricity Transmission company and got connected to the electricity grid and they pay monthly electricity bills. This provided support to their assumption.
16/2/2026: General Agency of the Public Property Protection	
Head of the General Agency of the Public Property Protection – Menya governorate	Dr. Mohamed Shoeib, the Head of the General Agency of the Public Property Protection who advised that agency undertakes regular evacuation campaigns to acquire back public lands from illegal transgression. The evacuation campaign for the NREA concession took place as part of the 28th campaign undertaken within the Menya governorate. As indicated by Dr. Shoeib, in light of the amendments of Law 144/2017 with Law 168/2025, for some cases where the land transgression does not conflict with other planned uses of the area, legal reconciliation can take place. Since this is not the case for the NREA concession, no reconciliation or compensation has been considered
16/3/2026 Menya City Councils	

Topic	Discussions	
Attendees – Deputy Head of Menya City Council – Head of environmental department –Menya city	• Issues discussed included the following: – The project's water demand and the capacities of existing water treatment companies within Menya and Abo Qurkas cities. The head of Menya city council indicated that the project needs to apply to the Menya water company indicating the required water demand. He advised that the water company will be able to secure the required water demand. – The Menya city waste management capacity: The head of Menya council environmental department advised that a solid waste landfill is currently under development at Toukh El Kheil area. Another waste dumpsites exist in Balansoura in Abo Qurkas and Mallawi. – The workforce required: It was advised that job advertisements, labour qualifications of and receipt of workers applications can be done through the Menya governorate labour office. – Workers accommodation: it was advised that accommodation within the closest villages is not a preferred option mainly because housing in the villages are mostly family homes and do not offer renting for foreigners from outside the village. In this respect, accommodation would be recommended to take place within Menya of Abo Qurkas urban areas where renting is available – The wastewater of the town of Meny is treated in the Talla Wastewater treatment plant which has a capacity of 53,600 m3/day and could accommodate the wastewater generated by the project in its peak construction period. .	
Chairman of Menya Water and Wastewater company	– The total water design capacities of the water treatment plants in Menya and Abo Qurkas are 313,240 and 106,320 m3/day respectively. – The Markaz of Menya has a total of 15 water treatment plants. Their capabilities vary from 2000 to over 100,000 m3/.day of which only 5 have capacities of more than 20,000 m3/day – On the other hand, Markaz Abo Qukas has only 2 treatment plants of capacities of 4,320 and 102,000 m3 /day. – Discussions focused on the ability of the nearest water treatment plants to meet the project water demand. Eng. Yehia advised that the daily water needs, about 500m3/day, cannot be met through one of the nearby water treatment plants. – In this respect, the project needs to coordinate with the water company in advance to enable planning the supply from different water treatment plants within the governorate. – There are two options to acquire water, namely this could be through direct contract with the water company for water supply. In this case, water could be provided from the plants in which capacity permits, and the water company would use its own trucks. Alternatively, the project could contract a private company using its own trucks to acquire water from points specified by the water company.	

Topic	Discussions	
– Head of EEAA Menya RBO – Head of environmental department- Menya governorate	Discussions included the following topics: – The categorisation of the project where it was indicated that project is categorised as Scoped B project according to the national EIA system. – Accommodation of workers: Eng. Eftat advised that accommodation can be provided within Menya urban centres. In addition, considering workers camps on site, similar to the practice of the agricultural projects in the area, will reduce the costs of extensive transportation given the significant distances between the site and the Menya city centres. – Transportation: it was indicated that the new Sammalout and Mallawi axes can be used for transportation of imported PV modules and BESS components whether from Sokhna or Safaga ports. – Labour: It was advised that unskilled labour are available in Menya governorate, while highly skilled technical and specialised labour will need to be sought from outside the governorate.	
NGOs	A meeting took place with various NGOs working in different community support areas. Discussions included the following issues: – Labour: the project may attract skilled construction workers in the governorate, thus potentially adversely affecting other construction activities. However, it was clarified that the temporary nature of construction activities is not expected to have significant impact on the other construction activities – Capacity building: an issue was raised regarding the potential provision of capacity building to the technical school students to qualify them to work for the project. It was clarified that due to the relatively limited project construction time frame, provision of capacity building can be provided within the scope of the project CSR plans. – Workers code of conduct is emphasized where accommodation of workers would take place within urban communities to control for potential frictions with the community including GBV. – Role of NGOs: attendees indicated that NGOs may play a role in providing awareness to the communities with regard to the project and information about the skills needed by the project. They can also play a role with regards to potential areas of community supporting the project 's CSR plans. Moreover, NGOs can support the project through monitoring many issues including e.g. workers' conduct or impact on rental costs Agreement with the project on issues to monitor could be discussed in due time NGOs can also contribute to training personnel on general skills such as first aid. Employment of physically or mentally disabled individuals: Although a 5 % share of employment is required by law, this is not expected to apply to individual projects especially in the construction phase but rather on the total employment of the contractors. During operation, more permanent jobs could be available depending on the specific conditions of individuals.	

Topic	Discussions	
17/3/206- New Menya Urban Authority		
Deputy Head of New Menya Urban Authority	Discussions included the following topics: – Water treatment capacity: it was indicated that the design capacity of new Menya city is about 95,000m3/day to be operated in two phases of 45,000 and 50,000 m3/day. The current production of the first phase is 36,000m3/day – It was advised the construction activities within the new Menya city are still on going and have not yet reached its maximum capacity. Accordingly, the current excess capacity makes it easy to supply the water needs of the project. Wastewater treatment capacity is also available – It was also indicated that large number of the existing buildings are not yet occupied, thus providing sufficient workers accommodation. However, it was recommended to avoid concentrating large number of workers (especially unskilled workers), in one neighbourhood to avoid potential disturbances to the communities. – Potential adverse impacts of the project may include increasing the cost of construction labour. However, due to the temporary nature of the construction activities, such impacts would not be significant. – Waste management: there are two waste dumpsites for solid and construction wastes. – Regarding medical services, there is only one specialized hospital, Cardiothoracic Hospital, within new Menya city. Plans for construction of a Central Hospital are underway expected to be established in 2027. In addition, a number of small health units exist that can provide first aid services.	