

Biodiversity Management Plan

Mexinol, Mexico

Transition Industries

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Basis of Report

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Appendices

- Appendix A Fauna and Flora Protection Plan**
- Appendix B Reforestation Plan with Native species**
- Appendix C Mangrove Restoration Plan**



Acronyms and Abbreviations

AA	Appropriate Assessment
CHG	Green House Gas
CO	Carbon Monoxide
CO2	Carbon Dioxide
E&S	Environmental and Social
EC	European Commission
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
ESIA	Environmental Social Impact Assessment
EQ4	Equator Principals 4
Ha	Hectare
IBA	International Bird Area
IFC	International Finance Corporation
KBA	Key Biodiversity Area
Km	Kilometres
KVA	Kilo Volt
m	Metres
MTPD	Metric Tonnes Per Day
MIA	Mexican equivalent of an “EIA” - Manifestación de Impact Ambiental
MWH	Mega Watt Hour
NB	Note well
NOX	Oxides of Nitrogen
PS6	Performance Standard 6
RoW	Right of Way
SEMARNAT	Mexican Ministry of Environment
SLIP	Supplementary Lenders Information Package
UNESCO	United Nations Educational, Scientific and Cultural Organization
VOC	Volatile Organic Compounds
WBG	World Bank Group
WWTP	Waste Water Treatment Plant



1.0 Introduction

1.1 Background

Transition Industries commissioned SLR to write this Biodiversity Management Plan (BMP) based on the mitigation included in a suite of plans written to support the permit application for the Mexinol Project, but also to create an IFC PS6 compliant document.

1.2 Project Location

In summary, Transition Industries is proposing to construct a 6,130 metric tons per day (mtpd) methanol production unit (the “Mexinol Plant”). The Mexinol Plant site is located in the municipality of Ahome, state of Sinaloa, Mexico and will be in close proximity a major highway, the Port of Topolobampo and the existing PEMEX (Petroleos Mexicanos) export facility. It is located outside of Topolobampo and within a less-populated urban area. Figure 1-1 provides a satellite image of the Project location.

The plant site (94.7 ha) will be erected in an industrial development zone. Approximately 100 hectares (ha) of flat, easily accessible land is available for Project use. The land is currently zoned for agricultural purposes and lies outside of the designated flood zone. Nearby are relevant infrastructure connections (e.g., roads, natural gas, electricity, and water), which the Project intends to utilize.

1.3 Report Aims and Objectives

The mitigation activities presented in this BMP are aligned with the Environmental and Social Standard 6 (ESS6) Biodiversity Conservation and Sustainable Management of Living Natural Resources (WB, 2016) and Performance Standard 6 of the IFC, Biodiversity Conservation and Sustainable Utilization of Living Natural Resources (IFC, 2012). It is anticipated that the BMP will be periodically updated as the Project design advances and as improvements and adaptive management are identified through all stages of the Project. The Project shall provide the monitoring results from all applicable regulations in an annual monitoring report.

The purpose of this Plan is to provide the Project with a framework to achieve compliance with Mexican and International regulatory requirements. This Plan covers all biodiversity related Project activities that will be carried out by the Project, during the site preparation/ pre-construction, construction and operation phases.

Specific objectives of this Plan are to comply with all relevant biodiversity regulations (both Mexican and International) and to implement mitigation measures to control and minimize potential impacts to flora and fauna; therefore, the key objectives are as follows:

- Describe and implement good international industrial practice, both Mexican and international legal requirements and commitments, and to evaluate that these measures are being implemented throughout the lifetime of the Project.
- Define the roles and responsibilities for implementing the described measures, training requirements, and scheduling of the stated measures.
- Define the Key Performance Indicators (KPI) that will be used to assess the effectiveness and success of the BMP at managing biodiversity impacts.

1.4 Source Documents

The information contained within this BMP has been taken from a range of documents submitted either for national permitting requirements in Mexico (MIA); or international Lender’s requirements. The list below shows the source documents used in compiling this BMP.



- SLR (2022) Supplementary Lenders Information Package (SLIP) in Complement of Mexinol's 2021 Manifestación de Impacto Ambiental (MIA). Mexinol Methanol Project Sinaloa Mexico. Prepared for Transition Industries.
 - Volume 1: Non-Technical Summary
 - Volume 2: Project Description
 - Volume 4: Abiotic Impact Assessment
 - Volume 5: Biotic Impact Assessment and Critical Habitat Assessment (CHA)
 - Volume 9: ESMS and ESMP
- E3 (2021) Manifestación de Impacto Ambiental (MIA) for the Mexinol Project. Submitted August 2021 to SEMARNAT by E3 Estrategias Ecológicas Empresariales S.C.
- IGA (2024) Protection, Rescue and Relocation Program of Wild Flora and Fauna. Submitted as a Permit Requirement to SEMARNAT
- IGA (2024) Program for Monitoring, Capture, Conservation and Maintenance of Wildlife Species. Submitted as a Permit Requirement to SEMARNAT
- IGA (2024) Fauna and Flora Protection Plan. Submitted as a Permit Requirement to SEMARNAT
- IGA (2024) Reforestation Program with Native Species
- IGA (2024) Mangrove Management Plan.

The final two plans listed, Reforestation Program with Native Species and the Mangrove Management Plan have been written with the aim of contribute to the net gain for biodiversity. Simply put, the restoration of an area of mangrove, when none was impacted by the project, is considered an alternative conservation action to achieve a net gain. The same is true of the Reforestation Program, once restoration of the temporarily disturbed areas has taken place, the Reforestation Program will aim to provide assurance that no net loss has been achieved, but with the aim of achieving a net gain for native species.

1.5 Layout of Document

This document has been structured into topic related chapters for ease of reading. An outline of the sections is set out below:

Section 1 Introduction and goals of this document

Section 2 Roles and responsibilities for implementing this BMP

Section 3 National and internationally relevant policies and standards to this BMP

Section 4 Summary of the biodiversity baseline and potential sources of impact, essentially a justification for why the BMP is required.

Section 5 Preconstruction phase mitigation actions and a summary table of actions to be implemented.

Section 6 Construction phase mitigation actions and a summary table of actions to be implemented.

Section 7 Operational phase mitigation actions and a summary table of actions to be implemented.



Section 8 No net loss and net gain considerations provides information relating to the implementation of the reforestation program with native species, and the mangrove management plan and how, quantitatively this will achieve a net gain for the project.



Figure 1-1 Site Location



2.0 Roles and Responsibilities

All contractors are required to incorporate these mitigation measures and management controls into their own procedures and work plans. The EPC Contractor will be responsible for all pre-construction, construction, and operation phase mitigation measures recommended in the MIA and this Plan.

TI's EHS Manager will be responsible for verifying monitoring of the mitigation measures implemented. TI will also provide oversight to Contractors, to ensure that the mitigation measures and controls are implemented and that measurements comply with the standards listed in this Plan. These measures will be achieved through planned periodic inspections, audits of the Project sites, and the implementation of monitoring programs. TI's Project Manager and EHS Compliance Manager will be responsible for maintaining records of corrective actions and associated reports. TI's Project Manager and Environmental Coordinator will also be responsible for supervising the implementation of corrective actions and/or training programs to avoid the repetition of nonconformities and non-compliances with the Applicable Standards.

Table 2-1 (below) summarizes the roles and responsibilities, specifically as they relate to biodiversity management and monitoring.

Table 2-1 Roles and Responsibilities for Implementing the BMP Actions

Role/Title	Responsibilities
Executive Chairman and Board of Directors	<ul style="list-style-type: none"> Be familiarized, review, and approve the BMP.
Director of Accounts	<ul style="list-style-type: none"> Ensure the availability of resources necessary for the implementation of the BMP.
Head of ESG	<ul style="list-style-type: none"> Assure the correct implementation of the BMP.
ESG Manager	<ul style="list-style-type: none"> Assure the correct implementation of the BMP; Update the BMP; Respond to detections of contaminants of concern; and Review and approve the contractor Project-specific BMP.
Environmental Coordinator or H&S Construction Manager	<ul style="list-style-type: none"> Provide oversight and approval of the contractors BMP Plan; Ensure the generation of evidence and reports to ensure compliance with the recommended exposure limits, as well as maintaining TI's KPIs. Ensure the internal coordination to follow the BMP.
Contractor	
Contractor	<ul style="list-style-type: none"> Effective execution of the specific tasks assigned in conformity with this Management Plan and with contractual arrangements; Respect of EHS requirements included in the ESMS; Agree with the timing and logistics of the monitoring activities; Provide relevant monitoring data and monitoring reports to as indicated in this plan; Develop a Project-specific Biodiversity Management Plan; Develop and implement additional mitigation measures in the event of exceedances to the recommended limits or if a proposed mitigation measures does not result in sufficient air emissions control; Ensure that workers have access to personal protective equipment (PPE) and are trained in appropriate use and jobs with potential for exposure to elevated air emissions levels; and May propose changes and integrations to the monitoring activities included in the Management Plan; the proposed changes shall be evaluated and approved by HSE Manager and by Management.
Subcontractors	
Subcontractors	<ul style="list-style-type: none"> Effective execution of the specific tasks assigned in conformity with this Management Plan and with contractual arrangements; Respect of EHS requirements included in the ESMS; Agree with the timing and logistics of the monitoring activities; Provide relevant monitoring data and monitoring reports to as indicated in



Role/Title	Responsibilities
	this plan; <ul style="list-style-type: none"> ▪ Understand and carry out the activities set forth in the Biodiversity Management Plan; and ▪ May propose changes and integrations to the monitoring activities included in the Management Plan; the proposed changes shall be evaluated and approved by HSE Manager and by Management.
All Employees and Contractors	
All Employees and Contractors	<ul style="list-style-type: none"> ▪ Comply with environmental management requirements; ▪ Understand and carry out the activities set forth in the Biodiversity Management Plan; ▪ Report any activities which are causing unnecessary air quality Issues; and ▪ Give evidence that the relevant mitigation measures identified in the current Biodiversity Management Plan are being properly considered, implemented and monitored during execution of the works.



3.0 Regulatory Policies and Standards

This section details the relevant policies, standards, and requirements for this Plan that are applicable to the Project during the site-preparation/construction phase. This section includes references to:

- Applicable National Laws and Regulations, including law implementing host-country obligations under international laws and treaties; and
- Applicable International Standards (i.e., those issued by the IFC).

This Project shall achieve compliance with whichever relevant policy, standard, or requirement is more stringent amongst national standards and IFC Performance Standards/EHS Guidelines.

3.1 National Standards and Regulations

The following relevant Mexican regulations (Table 3-1), shall be considered by the Project.

Table 3-1 National Regulations

Federal Regulatory Framework
<ul style="list-style-type: none"> ▪ Law on Ecological Balance and Environmental Protection and its Reglamento in Environmental Impact Assessment (Ley General del Equilibrio Ecológico y la Protección al Ambiente y su Reglamento en Materia de Evaluación de Impacto Ambiental) ▪ General Law of Ecological Balance and Environmental Protection and its Regulations in Maintenance of and Control of Atmospheric Contamination (Ley General del Equilibrio Ecológico y la Protección al Ambiente y su Reglamento en Materia de Prevención y Control de la Contaminación de la Atmósfera) ▪ General Law on Sustainable Forestry Development and its Regulations (Ley General de Desarrollo Forestal Sustentable y su Reglamento) ▪ General Wildlife Law and its Reglamento (Ley General de Vida Silvestre y su Reglamento) ▪ Official Mexican Standards (Normas Oficiales Mexicanas) ▪ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Convención relativa a los humedales de importancia internacional especialmente como hábitat de aves acuáticas)

3.2 International Standards

The international standards set out in Table 3-2 have also been taken into account when writing this document. This is to satisfy some of the Lender’s requirements.

Table 3-2 International Standards

International Regulatory Framework
<ul style="list-style-type: none"> ▪ Convention on Biological Diversity; ▪ Convention on International Trade in Endangered Species (CITES) and CITES list of protected species; ▪ Convention on the Conservation of Migratory Species of Wild Animals; ▪ The Ramsar Convention on Wetlands of International Importance; ▪ International Union for Conservation of Nature (IUCN) and the IUCN Red List of Threatened Species; ▪ Birdlife Important Bird and Biodiversity Areas (IBAs); and ▪ IFC PS 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources.¹ ▪ IFC PS's and Guidance Notes ▪ IFC Guidance Note 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources (2019) ▪ IFC General EHS Guidelines ▪ IFC Sector-specific EHS Guidelines

¹ IFC PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
<https://www.ifc.org/PS6>



4.0 Biodiversity Baseline and Sources of Impact

4.1 Baseline Biodiversity Summary

4.1.1 Flora

The biodiversity and ecology surveys were undertaken in May 2022, January 2022 and December 2023. The survey area included the footprint of the proposed Mexinol Plant, and the pipeline route, but also included a range of sampling points, up to 1km from the Project footprint. The survey area included sampling a range of different habitat types, to inform species presence (fauna and flora) as well as to map habitats. This information was then used to further inform project design, so that the mitigation hierarchy could be implemented, avoiding impacts where possible.

During the surveys, the botanists identified what they called “fragile areas”. These are described as areas that are particularly susceptible to damage or disturbance due to their delicate ecological balance, low resilience, or the presence of sensitive environmental features.

Figure 4-1 below shows where these areas were identified. Please note, that none of these areas will be affected during the construction phase. All of them will remain untouched and intact. They will be used as recipient areas, if fauna needs to be relocated during preconstruction and construction phases of the Project.

The main types of vegetation identified are shown in Table 4-1 Habitat types present in the surveyed area and Figure 4-2 shows the location of these habitat types.

Table 4-1 Habitat types present in the surveyed area

Type of Vegetation	Location within Survey Area	Main Feature
Irrigated Agricultural Land	The Mexinol Plant itself, will be located agricultural land, as will the first 1km of pipeline.	Land farmed for crops such as corn, maize, potatoes, beans and sorghum. Some areas are now using an aquaculture-based system to produce berries such as strawberries and blueberries too.
Sarcocaulle scrub Often as a mosaic with halophytic vegetation	The main area of this habitat type was identified in the conservation area. Small areas were also identified in areas of temporary land use adjacent to the pipeline.	Characterized by the dominance of shrubs with fleshy stems, and some plants with papery bark. It is an open or moderately dense and floristically rich scrub, with typical species of <i>Acacia sp.</i> , <i>Prosopis sp.</i> , <i>Larrea sp.</i> , <i>Celtis sp.</i> , <i>Encelia sp.</i> , <i>Olneya sp.</i> , <i>Ferocactus sp.</i> and many others, with perennial herbaceous plants including ferns and spike mosses (<i>Selaginella</i>).
Sarco-crasicaule scrub	Present in the survey area, but not present within the footprint of the Project.	This plant community is closely related to the Sarcocaulle scrub and has a large number of cacti, of which several are endemic or near-endemic to the region. Representative species include <i>Fouquieria columnaris</i> , <i>Pachycormus discolor</i> , <i>Fouquieria sp.</i> , <i>Pachycereus spp.</i> , <i>Opuntia spp.</i> , <i>Pedilanthus macrocarpus</i> .
Mezquital	This habitat is only evident in a small portion of the study area, to the southwest of the	The main elements are shrubby habit associated with other types of xerophilous scrub such as the microphyllous desert scrub. Species include <i>Prosopis juliflora</i> , <i>Acacia spp.</i> , <i>Opuntia sp.</i> , <i>Jatropha sp.</i> , and <i>Bouteloua spp.</i>



Type of Vegetation	Location within Survey Area	Main Feature
	pipeline.	
Halophytic vegetation	An area of halophytic vegetation was noted in the conservation area. Small areas of this vegetation type are present along the pipeline route,	Dominated by herbaceous or sometimes shrub species in coastal environments (coastal lagoons, salt marshes and beaches) that are adapted to saline water; and typically occurring at low altitude, in warm humid or sub-humid climates, on generally sandy soils with high concentrations of salts, which are at least occasionally subject to wetting by salt water.
Xerophytic vegetation	The pipeline crosses xerophytic vegetation between km 1 (after leaving the Mexinol Plant), to km 4.5. As it runs parallel with the main highway.	Predominantly herbaceous vegetation is often mixed with species of <i>Sarcocaulis</i> scrub, typically located in arid areas away from sea or tidal water and adapted to very dry conditions. Frequently contains bushy elements of the <i>Amaranthaceae</i> family, mainly Green Chamizo <i>Allenrolfea occidentalis</i> , and herbaceous cover dominated by <i>Sesuvium portulacastrum</i> . Further from the coastal edges this type may alternate with grasses ruderal such as <i>Eragrostis pyramidata</i> and <i>Sporobolus pyramidatus</i> .
Mangrove swamp	Mangrove is present within the survey area. No mangrove habitat is present within the project footprint.	Located along the margins of coastal lagoons and estuaries and at the mouths of rivers and streams, but also in the low and muddy parts of the coastline. Typically located in the tidal zone, sheltered from strong waves. Four mangrove species predominate: red mangrove <i>Rhizophora mangle</i> , black mangrove <i>Avicennia germinans</i> , white mangrove <i>Laguncularia racemosa</i> and button mangrove <i>Conocarpus erectus</i> ; often occurring together with different degrees of dominance. Mangroves in the survey area occurred adjacent to the Los Mochis – Topolobampo road and were dominated by black mangrove while white mangrove was scarce, only isolated juvenile red mangrove were recorded. No <i>C. erectus</i> was recorded.



Figure 4-1 Fragile areas identified by IGA during the vegetation surveys

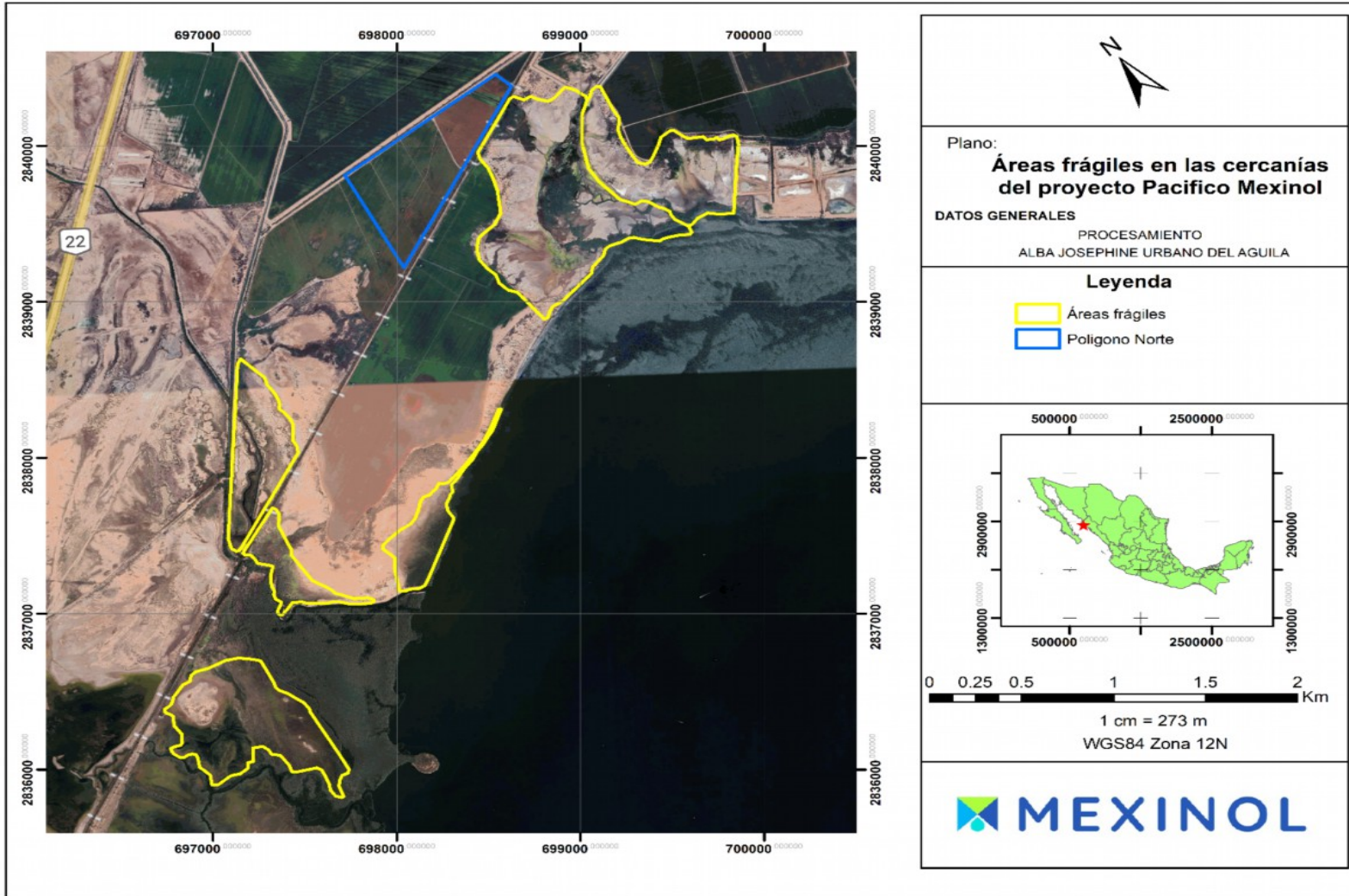


Figure 4-2 Vegetation Map



4.1.2 Fauna

Table 4-2 below provides a list of the faunal species of conservation interest that were confirmed as present, during the surveys. Information relating to suitable habitat has also been provided as this is relevant to the mitigation measures that has subsequently been proposed.

Table 4-2 Faunal species of conservation interest confirmed in the surveyed area

Species	IUCN status	Recorded	Suitable habitat
<i>Egretta rufescens</i> Reddish egret	NT	Yes	Salt pans, coastal lagoons
<i>Fregata magnificens</i> Magnificent frigate bird	LC	Yes	Mangrove and sarcocaulle scrub
<i>Charadrius movosus</i> Snowy plover	NT	Yes	Coastal lagoons, salt flats and seasonal watercourses
<i>Sternula antillarum</i> Least tern	LC	Yes	Rivers, lakes and estuaries
<i>Thalasseus elegans</i> Elegant tern	NT	Yes	Breeds on rocky areas at the coast, sometimes in scrub on the ground
<i>Mycteria americana</i> Wood stork	LC	Yes	Various including wetlands
<i>Vireo pallens</i> Mangrove vireo	LC	Yes	Subtropical dry forest and mangroves
<i>Pelecanus occidentalis</i> Brown Pelican	LC	Yes	Inshore waters, estuaries, bays, breeds on islands
<i>Nannopterum auritus</i> Double-crested cormarants	LC	Yes	Sheltered marine bays, rocky coasts and islands, inland lakes
<i>Anas carolinensis</i> Green winged teal	LC	Yes	Marine and coastal ponds, lagoons and artificial aquatic habitats
<i>Spatula clypeata</i> Northern shoveler	LC	Yes	Freshwater and saltwater lakes, lagoons and marshes
<i>Larus heermannii</i> Heerman's Gull	NT	Yes	Rocky coasts and islets
<i>Lithobates forreri</i> Forrer's grass frog	LC	Yes	Lowland forests and breeds in water bodies
<i>Phyllodactylus homolepidurus</i> Sonoran leaf-toed gecko	LC	Yes	Coastal habitats



Species	IUCN status	Recorded	Suitable habitat
<i>Aspidoscellis costatus</i> Western Mexican whiptail	LC	Yes	Coastal forest and savanna
<i>Ctenosaura macrolopha</i> Sonoran spiny-tailed iguana	LC	Yes	Desert habitats and seasonally dry tropical lowlands
<i>Neotoma phenax</i> Sonoran wood-rat	LC	Yes	Desert scrub and pine/oak forest

4.1.3 Potential Sources of Impact

Direct and indirect impacts to biodiversity can occur during the following Project construction and operation activities. It is important to consider these impacts, so that the mitigation hierarchy can be appropriately implemented.

Construction Phase

The most significant Project impacts on terrestrial biodiversity will occur during the construction phase, which includes onsite vegetation clearing, an increase in noise and vibrations, and the potential for accidental spills. In addition:

- Construction activities for the Project and temporary laydown areas, production pads, pipeline right-of-way (RoW), and access road to Project, which will result in vegetation and habitat loss, fragmentation, noise, erosion and sedimentation, wildlife disturbance and displacement.
- Testing, which will create noise, vibration and related wildlife disturbance.
- Operation of heavy machinery and vehicles for transportation, which will create noise, vehicular mortality, accidental fuel spills, and related wildlife disturbance.
- Accidental spills of uncontrolled discharges of fluids and other hazardous wastes.
- Erosion and sedimentation of water courses.
- Introduction of invasive species during vegetation removal and transportation of vehicles, equipment and soil.
- Use of artificial night light during construction activities, which will create wildlife disturbance and mortality.

Operational Phase

During operations, the most significant Project impacts to flora and fauna biodiversity are noise, fragmentation/reduction in ecological connectivity, and an unlikely scenario of an explosion or other serious emergencies, which will cause additional direct impacts of disturbance, injury and/or mortality of terrestrial wildlife species. In addition:

- Operation of the Plant, which will create continuous noise and related wildlife disturbance.
- Operation of the TL (potential collisions and electrocutions)
- Use of artificial nighttime lighting during operations, which will create wildlife disturbance and mortality.



- Unexpected event of emergencies or spills, which may result in vegetation loss, and disturbance, noise, wildlife displacement, injury, and mortality.



5.0 Preconstruction Phase

The actions and measures detailed in this section are those that will be implemented preconstruction, during ground clearance and site preparation activities. This section also includes preconstruction surveys and monitoring. The mitigation hierarchy will be implemented through the application of good international industry practice for biodiversity. These measures have been described below and summarised in Table 5-2. Most of the measures set out in this chapter have been taken from the Programme for Protection, Rescue and Relocation Programme of wild Fauna and Flora, written by IGA (2024) in response to the SEMARNAT permit requirement.

5.1 Design Mitigation

Avoidance of impacts has been implemented at the design stage, so is embedded in the design of the Mexinol Plant. Avoidance has been achieved, for example, through the use of horizontal direct drilling on the pipeline to avoid vegetation of conservation value. The Mexinol Plant has been sited on arable land, to avoid impacts to vegetation of conservation value too. A conservation area, containing habitats such as sarcocaul vegetation has been delineated, and no construction activities will take place in this area.

5.2 Preconstruction surveys

An updated sampling study was carried out in accordance with what was requested by SEMARNAT (resolution SRA/DGIRA/DG-04243-23), on the flora and fauna present in the study area. This update survey complemented the work previously undertaken by E3 to inform the CHA assessment (SLR 2023). Based on this work, and ongoing monitoring as required by SEMARNAT and International Standards, the survey data will be used to inform the need for mitigation, and further preconstruction surveys. All survey data will be compiled into a single data base, held by the Project. The actions set out below are based on the flora and fauna data gathered to date.

During the preconstruction surveys, prior to any works taking place, all areas due to be cleared of vegetation will be clearly demarcated using visible fencing, or a wildlife friendly ground marking paint. The workforce will then be briefed on the extent of each working area, so that they do not unnecessarily remove vegetation from adjacent areas.

Such surveys will also focus on the presence of species of major conservation importance (KBVs, i.e. species of conservation interest that have been identified as detailed in Table 4-2.

5.3 Vegetation Clearance

5.3.1 Flora Rescue

During the period of vegetation clearance, a technical execution manager, henceforth referred to as the biodiversity manager, will be hired, and will be in charge of coordinating and supervising the implementation of the flora rescue and relocation programme. The manager will have the necessary knowledge and experience in basic taxonomy of regional flora to be able to advise the work teams on good practice. The biodiversity manager will be supported by a team of people, selected from the community closest to the project site, who will be provided with training, so that they can rescue botanical specimens as required.

A standard operating procedure (SOP) leaflet will be written, that will provide detail on the methods to be used of the flora rescue and relocation work. The leaflet will include detail such as materials required, including PPE, timing of works, species to be targeted for removal, and location for replanting. Fire will not be used as a means of removing vegetation.



A list of botanical species identified during the surveys to date has been compiled and presented in Annex A. Based on this list the species presented in Table 5-1 below will be targeted. For the woody species listed here, they will be rescued if they are 80cm or less in height (please note no trees will be removed). For the species in the genus *Parkinsonia* seeds or young individuals less than 30cm will be rescued and relocated. Herbaceous species will not be rescued and replanted as it is considered that their seed bank will remain in the soil and will naturally regenerate in the next years. The species *Tamarix chinensis* known as the salt pine, is considered to be a harmful and invasive species; therefore this species will be removed and not replaced (RNR).

Table 5-1 Species due for removal and relocation

Location and baseline habitat	Species listed as NOM-059-SEMARNAT-2010	Species	Total N°N°. species and individuals to relocate
Mexinol Plant Arable land	None	N/A	N/A
Pipeline Km0 to Km1+000 Arable land	None	N/A	N/A
Pipeline Km1+000 to Km3+800 Xerophytic Vegetation	Habitats of conservation concern avoided through horizontal direct drilling. Therefore, no translocation required.		
Pipeline Km3+800 to Km10+000 Human settlement, bare ground isolated vegetation patches.	None	<i>Parkinsonia aculeata</i> <i>Vachellia farnesiana</i> <i>Tamarix chinensis</i> <i>Allenrolfea occidentalis</i>	2 1 12 RNR 1232
Temporary disturbance area adjacent to pipeline.	None	<i>Allenrolfea occidentalis</i>	544
Temporary laydown area 1 Agricultural area, halophytic vegetation and sarcocaulle shrubland		<i>Allenrolfea occidentalis</i> <i>Tamarix chinensis</i>	544 8 RNR
Temporary laydown area 2 Halophytic vegetation and sarcocaulle shrubland	None	<i>Allenrolfea occidentalis</i> <i>Tamarix chinensis</i>	306 12 RNR
Temporary laydown area 3 Halophytic vegetation and sarcocaulle shrubland	None	<i>Allenrolfea occidentalis</i> <i>Tamarix chinensis</i>	14 18 RNR
Temporary laydown area 4 Halophytic vegetation and sarcocaulle shrubland	None	<i>Allenrolfea occidentalis</i> <i>Tamarix chinensis</i>	32 6 RNR
Temporary laydown area 5 Halophytic vegetation and sarcocaulle shrubland	None	N/A	
Temporary laydown area 6 Halophytic vegetation and	None	NA	



Location and baseline habitat	Species listed as NOM-059-SEMARNAT-2010	Species	Total NºNº. species and individuals to relocate
sarcocaule shrubland			
Temporary laydown area 7 Halophytic vegetation and sarcocaule shrubland	None	<i>Allenrolfea occidentalis</i>	22
Temporary laydown area 8 Halophytic vegetation and sarcocaule shrubland	None	<i>Allenrolfea occidentalis</i> <i>Tamarix chinensis</i> <i>Parkinsonia aculeata</i>	128 22 RNR 5
Temporary laydown area 9 Halophytic vegetation and sarcocaule shrubland	None	<i>Tamarix chinensis</i> <i>Allenrolfea occidentalis</i>	8 RNR 78
Temporary laydown area 10 Halophytic vegetation and sarcocaule shrubland	None	<i>Allenrolfea occidentalis</i>	66
Temporary laydown area 11 Halophytic vegetation and sarcocaule shrubland	None	<i>Allenrolfea occidentalis</i> <i>Tamarix chinensis</i>	23 2 RNR
Temporary laydown area 13 Halophytic vegetation and sarcocaule shrubland	None	Urban Area N/A	

5.3.2 Flora relocation

The relocation will only be temporary, therefore it is assumed that the flora that is rescued can be temporarily planted in areas adjacent to the pipeline, before being moved back again, once works have finished. As there are no deep-rooted tree species present, it is acceptable for the temporarily removed vegetation to be placed back where it came from, even if this was the right of way of the pipeline. The key points for the relocation (off the pipeline and back on post construction are as follows:

- Evaluate the health and structure of the specimens to be rescued and relocated, to determine the viability for the transfer, since not all species will be suitable/sufficiently intact.
- Excavate the roots of the specimen. This will need to be done carefully to minimize damage to the roots and support system of the specimen. A root ball, with sufficient soil will be created around the specimen.
- The individual will then be placed in a vehicle that will take it to the new planting site. During transport, the root ball will be protected to minimize stress to the plant. If there are no adjacent areas to plant the rescued plan, then it will be placed provisionally in a nursery area.
- In the new site, a suitable hole will be prepared for the specimen to be replanted. The hole will then be filled with suitable soil and the individual is cared for during its adaptation period.
- After transfer, careful monitoring will be undertaken as a suitable watering and maintenance regime will be essential during this translocation period.



5.4 Ground Preparation – Fauna

Wildlife rescue will be carried out simultaneously with the removal of vegetation on the project site. Selective clearings will be carried out in accordance with the development phases of the Project. The biodiversity manager will oversee the faunal rescue. They will either have sufficient knowledge to undertake and advise on such work or will engage a subconsultant that does have sufficient knowledge to manage the faunal surveys and clearance.

A standard operating procedure (SOP) leaflet will be written, that will provide detail on the methods to be used of the fauna rescue and relocation work. The leaflet will include detail such as materials required, including PPE, timing of works, species to be targeted for relocation, and location for release.

The following procedures will be used in respect of fauna:

- **Scaring** – the wildlife team will walk over an area prior to vegetation clearance to scare away mobile fauna. The team will hit the ground with sticks to generate noise. At the same time, if any nests, burrows, or resting places are identified, they will be treated as described in the following points.
- **Vegetation removal** – as described in the previous section, preconstruction vegetation removal will take place. This will discourage fauna from returning prior to the commencement construction.
- **Removal of food remains** – once an area has been cleared of vegetation, food remains will also be removed, such as trash and food scraps. This will discourage the return of fauna to the cleared area.
- **Removal of shelter** – once an area has been cleared of vegetation, shelters will also be removed, this may include piles of brush, wood, stones or fly tipping. This will discourage species such as reptiles from remaining on the cleared areas.

Where faunal species are encountered in an area prior to vegetation clearance (or construction, the following procedures will be implemented:

- **Birds** – nesting birds will be left in situ until their fledglings have hatched and naturally left the nest. Although a protocol has been developed for the capture of birds, it is considered unlikely that this would be required, as birds will naturally disperse from areas of disturbance.
- **Large mammals** – not actions considered necessary as large mammals will move of their own accord.
- **Small mammals** – traps (e.g. tomahawk traps) will be placed in areas prior to vegetation clearance. At a minimum of 50 metres spacing and baited with peanut butter or another attractant. All traps will be live traps, allowing the entrapped mammal to be carefully freed in a safe place. Once mammals have been removed the entrances to holes can then be blocked to discourage return.
- **Herptiles** – prior to vegetation clearance pit-fall type traps will be used to catch herptiles, prior to removal. At the same time, a search of suitable habitat for a range of reptiles and amphibians will be undertaken, so that species such as frogs may be removed by hand, or with an adapted pole (reptiles). If ponded areas with eggs are noted, then amphibian eggs will be collected.

For all species of fauna, it is assessed that the number of species and individuals that may need to be relocated prior to vegetation clearance and site works will be minimal. As a result, relocation will take place, to suitable areas within 1km of where the individuals have been found. Due to the low numbers of individuals considered likely to be involved, the application



of individual markers, and ongoing survey of the relocated individuals will not be implemented.

5.5 Invasive Species Management

Clearance of natural vegetation can also give invasive species opportunity to spread. The early detection and control of invasive species will be more effective and sustainable than reactive measures. Following with Article 8 of the Convention of Biological Diversity, the Project will implement measures to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species” (CBD, 1992).

In addition to following Mexican entry port control measures and regulations against pests and invasive species, the Project will implement the following measures to avoid and mitigate possible introductions of invasive flora and fauna:

- Machinery and vehicles will be cleaned upon entry/exit (as needed).
- Disturbed areas will be rehabilitated at the earliest opportunity with native and endemic species to minimize the establishment of invasive plant species.
- Source areas such as vehicle parking and construction lay down areas will be kept clean of invasive plants to minimize the presence of seeds that can be dispersed unintentionally.
- Regular and ongoing monitoring of the presence of invasive plant species will be conducted within construction and rehabilitated sites on a monthly basis with the ongoing botanical monitoring of rehabilitated areas and removal operations implemented according to the results.

5.6 Recording Protocols

5.6.1 Wild Flora Recording

For each plant that is relocated a record will be kept. These records will provide data that can then be used to realise the efficacy of the rescue and relocation process, and to implement adaptive management if required. The following data will be noted:

- Date, time, rescue location
- Species and component rescued e.g. seed, stem, whole plant, cutting.
- Relocation location and reason for rescue
- Any other supporting information

All data will be compiled into a wildlife data base, in excel (or similar format) to be held by the Project.

5.6.2 Faunal Recording

Throughout the wildlife rescue period, data will be collected. This data will be collected for all faunal species seen, captured, or just rescued during the preconstruction phase (but will continue to be implemented during the construction and operational phases too. The data recorded will include the following elements:

- Date, time, location and photograph
- Species and physical condition e.g. healthy, dead, injured, dehydrated.
- Capture method or rescue if injured or dead
- Location, time and date of subsequent release



- Treatment/time in captivity if relevant

As above, all data will be compiled into a wildlife data base, in excel (or similar format) to be held by the Project. A specific note will be made when recording KBVs.

5.7 Monitoring

5.7.1 Flora Monitoring

All rescued and transferred individuals will be monitored monthly, with the aim of recording survival rate. It will be considered a successful translocation, when 80% of the rescued individuals have survived. The translocated species will be monitored both in their temporary recipient site, and when they have been returned to the pipeline, post construction. If the survival rate is below 80% then adaptive management will be required and the reason for likely failure will be examined. It may be that additional irrigation is required, or a stock of seedlings from a nursery. The main aim is that coverage of the pipeline route will be as a minimum 80% of what it was before, regarding woody and other translocated species.

During these monitoring sessions, the surveyor will also check for the establishment of non-native and/or invasive species. If such species are noted, then a targeted invasive species management plan will be written and implemented.

5.7.2 Faunal Monitoring

At the current time there is no intention to mark individuals and to monitor them with a mark recapture programme. If this is to be implemented in the future, then this section will be updated.

5.7.3 Quarterly Monitoring

As part of the SEMARNAT permit requirements, surveys will be undertaken within the survey area. Figure 5-1 shows the survey points that will be used. The methodology for monitoring has been set out in the IGA (2024) Fauna and Flora Protection Plan. Submitted as a Permit Requirement to SEMARNAT. The main goals of the monitoring are as follows:

- Carry out a detailed inventory that identifies not only the species of fauna in the area of influence of the project, but also categorises their conservation status and evaluates their importance in that space.
- Implement a monitoring system with 13 strategic points, guaranteeing representative coverage of the various habitats in the area of influence. The goal is to obtain accurate data on the distribution and abundance of wildlife.
- Execute four sampling periods throughout the year, ensuring that they cover all four seasons to record seasonal variations in wildlife diversity and abundance within the project's catchment area.
- Apply statistical analysis to identify seasonal patterns in wildlife populations.
- Prepare a detailed semi-annual report.

The monitoring plan is presented in Appendix A for completeness and should be referred to during the implementation of the monitoring. Monitoring will be ongoing through the preconstruction phase, and into the operational phase too.

Figure 5-1 shows the location of the monitoring points, some of which are located in the IBA - Bahia Lechuguilla and the RAMSAR site Lagunas de Santa María-Topolobampo-Ohuira for completeness. This will allow evaluation of this area, and to detect any change should they arise during the construction phase. If adaptive management of the conservation area is needed, then this can be implemented where required. Methodology for the analysis of



monitoring results will follow the one outlined in the fauna and flora monitoring report. The results of the monitoring surveys will be presented bi-annually to the project by the consultant team undertaking the surveys.



Figure 5-1 Quarterly Monitoring Locations

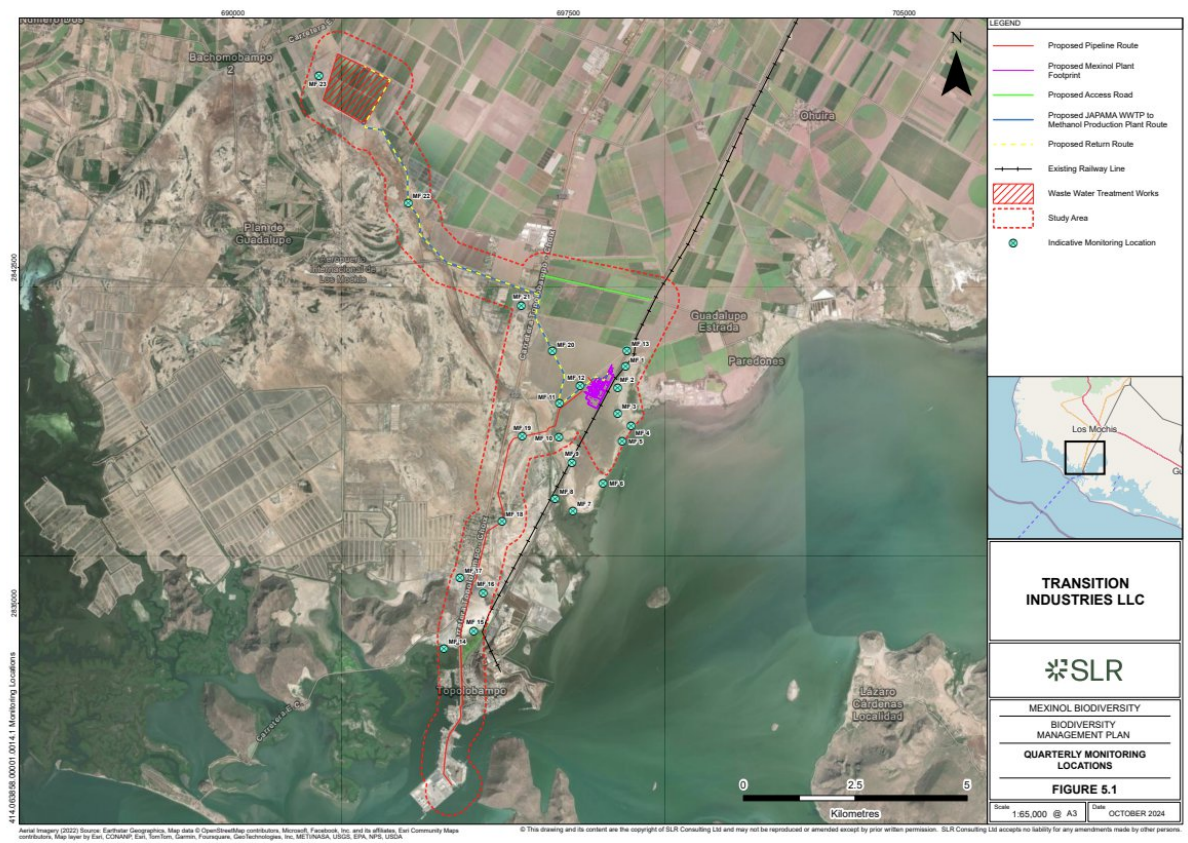


Table 5-2 Summary of Preconstruction Phase Measures

Item Ser.	Action/Measure	Timeline and Frequency	KPI	Responsibility
Bio 1 CHA 5	Appoint a biodiversity Manager. This will be a suitably qualified person, with knowledge of fauna and flora, as well as working on construction projects.	Prior to works starting.	Suitably knowledgeable individual hired.	Mexinol Project management
Bio 2 CHA 4, CHA 47, MIA 55	Undertake biodiversity surveys prior to vegetation removal. Record all species seen (fauna and flora). Methodology for this is set out in the Programa De Protección, Rescate y Reubicación de Flora y Fauna Silvestre.	Prior to vegetation clearance works. Prior to site works if site has lain fallow for 2 weeks or more.	Fauna and flora species recorded in wildlife database excel spreadsheet. Biodiversity surveys should also focus on the presence of KBVs (identified in Table 4-2).	Biodiversity manager.
Bio 3 CHA 1, CHA 45	Vegetation clearance – prior to works commencing clearly demarcate working areas to minimise working footprint.	Prior to vegetation clearance works	Areas will be clearly marked on the ground, or using fences.	Biodiversity manager
Bio 4 CHA 6, CHA 48	Vegetation clearance – flora rescue. Target species removed from each target area, and moved to temporary planting area. Methodology for this is set out in the Programa De Protección, Rescate y Reubicación de Flora y Fauna Silvestre.	Prior to vegetation clearance works	Standard operating procedure to be written for vegetation clearance and relocation. All relocated flora records submitted to wildlife record spreadsheet.	Biodiversity manager
Bio 5 CHA 7	Vegetation reinstatement – flora replanted where it originally came from, once pipeline works have been completed. Monitoring then to commence, both for establishment rates, and for presence of non-native/ invasive species. Methodology for this is set out in the Programa De Protección, Rescate y Reubicación de Flora y Fauna Silvestre.	Reinstatement as soon as possible. Monitoring on a monthly basis.	80% re-establishment rate required, with habitat quality exceeding condition of that of cleared areas or adaptive management will be implemented.	Biodiversity manager



Item Ser.	Action/Measure	Timeline and Frequency	KPI	Responsibility
Bio 6 <small>CHA 6, CHA 15, MIA 60, MIA Add 17</small>	<p>Fauna prior to vegetation clearance will need to be cleared too, through natural dispersion (primary aim); then by capture and release if required (secondary option).</p> <p>Methodology for this is set out in the Programa De Protección, Rescate y Reubicación de Flora y Fauna Silvestre.</p>	Prior to vegetation clearance works, where practicable	<p>Standard operating procedure to be written for vegetation clearance and relocation.</p> <p>All relocated fauna records submitted to wildlife record spreadsheet.</p>	Biodiversity manager
Bio 7	For all actions undertaken during the vegetation clearance information will be provided in the form of an annual report.	<p>Within 12 months of works commencing.</p> <p>Annually</p>	Report provided to stakeholders	Biodiversity Manager.
Bio 8	<p>Quarterly monitoring as set out in the flora and fauna protection plan written by IGA.</p> <p>Methodology for this is set out in the Programa De Protección, Rescate y Reubicación de Flora y Fauna Silvestre.</p>	Quarterly throughout duration	<p>Submission of a detailed by-annual report, by the sub-consultant containing the monitoring results.</p> <p>Specific analysis of monitoring results for KBVs should be included.</p>	Biodiversity Manager
Bio 9	<p>Quarterly monitoring at IBA - Bahia Lechuguilla and the RAMSAR site Lagunas de Santa María-Topolobampo-Ohuira</p> <p>The monitoring strategy and methodology has been set out in the Programa de Monitoreo y Vigilancia de la Avifauna. It is a general monitoring strategy for the Project area of influence but includes monitoring points within the IBA and Ramsar sites.</p>	Quarterly throughout duration	Submission of an annual report by the sub-consultant containing specific analysis of monitoring results at the IBA - Bahia Lechuguilla and the Ramsar site Lagunas de Santa María-Topolobampo-Ohuira	Biodiversity Manager

NB the small script underneath the Bio Tags, indicates the serial number of the action or measure as stated previously in the MIA document or the CHA document.



6.0 Construction Phase

There will likely be some overlap between the preconstruction phase, and the construction phase. When this occurs, e.g. if vegetation clearance is required once the pipeline has begun being laid, the standard operating procedures (SOPs) for vegetation removal and/or flora removal will still be fully implemented.

6.1 Good International Industry Practice

During the construction phase, the following generic good international industry practice (GIIP) will be implemented.

- Tool box talk to be given as part of the induction to all people working on the Project, so that they are aware of the working practices and sensitive areas with respect to biodiversity.
- All working areas to be delineated prior to works commencing, and the work force to be briefed on keeping machinery and work activities within these delineated areas.
- Areas of sensitive sarcocaulle vegetation and mangrove trees within 20m of working areas, will be further delineated with marking pegs or tape to alert workforce to the need for their preservation.
- Minimize the duration that trenches, or pits are left open, where possible aim to open lay and close in sections, to limit time trenches remain open.
- If trenches are to remain open over night, place a log or other rough escape measure (such as an earth ramp) every 100 - 200 m inside trenches to allow animals to escape.
- Conduct daily checks of trenches, prior to works commencing, so that if required animals can be caught and removed by hand/trap. Any animals caught in trenches shall be removed to an adjacent natural area with ground cover (to minimize predation) at least 250m away from the construction area or preferably released into the "conservation area".
- Topsoil management plan to be written and implemented. This will include detail on the storage or management of the removed material that is not required as backfill for the pipeline.
- Wheel/vehicle washes to be installed at the entrance/exit of all working areas that are not sited on hard standing or tarmac. This is to prevent the excess movement of soils, which may spread invasive or non-native species.
- Monitor the construction area for any spills of oils, fuel or lubricants, and ensure any spills detected are cleaned up immediately, and the spill site is monitored for remaining contaminants. Any contaminated material shall be disposed of appropriately as hazardous waste.

6.2 Revegetation of Temporary Areas

The Project will support measures designed to conserve and re-vegetate as much cleared vegetation as possible within the Project area. The details of these measures are described in section 5.3 Vegetation Clearance and relate to the pipeline and revegetation of the 12 proposed temporary laydown/work areas. The aim for these areas is to return them back to their baseline state, where possible. The process of revegetation will continue throughout the construction phase, and likely into the early years of the operational phase. As a recap, the following will be implemented:

- Rehabilitation of all disturbed areas (e.g., temporary laydown areas) will be undertaken following cessation of works in that area.
- Where possible the original vegetation will be translocated away from the temporary area, then replanted when work has ceased in that area. Table 5-1 lists the target species.
- For herb species, these will be allowed to naturally regenerate, as part of the seed bank, once the topsoil has been returned to the temporarily disturbed areas.
- Monitoring will be undertaken at each site, where an 80% success rate for translocated species has not been achieved, then adaptive management will be implemented. Habitat quality should also achieve better quality than originally recorded as a baseline. Additional species from a nursery may be planted, or irrigation installed. The remedial actions required will be assessed on a case-by-case basis.

6.3 Roads and Traffic

Increased traffic during construction and operation phases can lead to wildlife/vehicle collisions, resulting in mortality and/or injury to fauna. Wildlife-vehicle collisions will be minimized through a range of actions as follows:

- As part of standard training, all Project personnel will receive instruction on the rules associated with driving on Project roads, as part of the Traffic Management Plan.
- Speed limits will be posted along relevant Project roads, prior to the start of construction, 30kmph or less.
- Personnel and drivers will be instructed to report and wildlife-vehicle collision, and sightings to the Environmental Department, as soon as possible. All data received will be entered into the wildlife data excel spreadsheet.
- The Project will demarcate vehicle access routes, turning circles and parking areas on existing tracks, degraded routes, or sites where possible. Staff will be instructed not to traverse areas outside of these designated areas.
- For unsurfaced roads and areas being used by vehicles, implement dust suppression such as water spray, during dry and windy weather.

6.4 Artificial Lighting Management

Artificial nighttime lighting can attract and cause disturbance to nocturnal and/or migrating fauna, as well as invertebrates. During the construction phase the Project will implement measures to minimize the impacts of lighting. The following measures will be implemented to minimize the impacts of artificial nighttime lighting:

- Reduce the duration of light to the extent possible, via the use of timers and motion detectors.
- Use yellow light or red light that does not contain blue, violet, or UV wavelengths, as these attract fewer insects than UV or bluish/white lights.
- Plan and design light intensity and configuration, spacing, height, and directionality to reduce the intensity and spillage of light to minimize overall illumination of areas outside of the Project boundary.
- Use light only when needed and if practicable reduce lighting during times of peak bird migration in spring and autumn.
- Adapt mitigation measures if lights are shown to have impact based on bird, bat, or invertebrate monitoring reports following subsequent monitoring.

6.5 Noise and Vibration Mitigation

During the construction phase, the noise from machinery and equipment working on the Mexinol Project site and the pipeline may disturb, scare or displace wild fauna. One way to mitigate impacts is to plan noise-generating construction activities outside of the bird breeding season if required. Preconstruction surveys will be undertaken, and if nesting birds are noted, then a suitable exclusion zone will be placed around their nest, until the young has fledged. The exact size of the exclusion zone would depend on the species involved, as some species are highly tolerant of noise, as they will be habituated to the use of tractors and other machinery in the agricultural landscape of the Project area.

To limit negative impacts due to noise during both construction and operation phases, the Project will implement noise management measures as described in the Air Quality and Noise Management Plan. In addition to the noise monitoring stations described in the Air Quality and Noise Management Plan, the Project will maintain a noise monitoring station within (< 1 km) the natural habitat found within the Aol. This will allow monitoring of noise and estimation of noise impacts to biodiversity receptors and application of corrective measures, if necessary.

6.6 Subsurface and Surface Hydrology

During the construction phase, rainwater will be collected at a low point of excavations and discharged to adjacent irrigation channels or to the ground so that it infiltrates. The Project will also ensure that this activity will not obstruct the flow of the neighbouring irrigation channels or agricultural plots. The Project will not make any additional modifications to other irrigation channels, other than those on its own site, which will be filled in. If they are affected by the Project, they will be repaired immediately.

Rainwater collected or other water generated during construction projects often become contaminated with significant concentrations of silt which if discharged to irrigation channels, or to ground for infiltration may cause blockages. To prevent this from happening, water will be managed, so that the silt is removed before discharge.

During the construction phase, the Project will need to evaluate the requirement for installing subsurface drainage measures where the pipeline crosses wet areas to reduce the risk of ponding/ water collection upslope of the pipeline.

6.7 Quarterly Monitoring

As discussed in Section 5.7.3, quarterly monitoring surveys will be undertaken using the methodology as set out in the IGA (2024) Fauna and Flora Protection Plan. One of the outputs of the quarterly monitoring will be to prepare a detailed semi-annual report.

The monitoring plan is presented in Appendix A for completeness and should be referred to during the implementation of the monitoring. Monitoring will be ongoing through the preconstruction phase, and into the operational phase. Figure 5-1 shows the location of the monitoring points, some of which are located in the conservation area. This will allow evaluation of this area, and to detect any change should they arise during the construction phase. If adaptive management of the conservation area is needed, then this can be implemented where required. The results of the monitoring surveys will be presented bi-annually to the project by the consultant team undertaking the surveys.

Table 6-1 Summary of construction phase measures

Item ident	Action/Measure	Timeline and Frequency	KPI	Responsibility
Bio 9 <small>CHA 2, CHA 3, CHA 9, CHA 11, CHA 14, MIA 52, MIA 57, MIA 60, MIA 61, MIA 63</small>	Good international industry practice to be implemented and the workforce to be informed of these measures on induction.	Throughout construction period	Measures being followed, low/no infringements reported. Induction records kept.	The Project
Bio 10 <small>CHA 8, CHA 10, CHA 49, CHA 50, MIA 51</small>	Topsoil management plan to be written and implemented.	Prepare plan before construction commences, implement during construction phase.	Plan written and implemented.	The Project
Bio 11 <small>CHA 15</small>	Revegetation and monitoring of temporary areas to continue. Where success rate of planting is below 80% adaptive management toto be implemented.	Monthly surveys throughout construction period.	80% success rate for revegetated areas where shrub/replanting has occurred.	Biodiversity manager
Bio 12 <small>CHA 12, CHA 13, MIA 56, MIA 58</small>	The traffic management plan is to include both speed limits to reduce Wildlife collision, but also a mechanism so that wildlife collisions, and sightings can be reported.	Plan to be written before construction commences. All staff inducted prior to starting on site work.	Plan has been written. Speed limits in evidence. Section on driving within induction package.	The Project
Bio 13	Artificial lighting management will be implemented to reduce potential impacts to wildlife. Light spillage will be reduced and when not required, lights will be switched off.	During the construction phase. Temporary lighting to be checked for compliance on a monthly basis.	Monthly checks show lighting is compliant with wildlife friendly recommendations.	The Project



Item ident	Action/Measure	Timeline and Frequency	KPI	Responsibility
Bio 14	Noise and vibration management will be achieved through adaptive management. Noise monitoring will be undertaken as set out in the air quality and noise management plan.	Management during construction phase. Monitoring during construction phase, and into operational phase.	No nests or dens abandoned by species due to noise/vibration disturbance. Noise and vibration levels kept within management Plan limits.	Biodiversity manager The Project
Bio 15 CHA 11	Evaluate the requirement for installing subsurface drainage measures where the pipeline crosses wet areas to reduce the risk of ponding / water collection upslope of the pipeline.	During the ground preparation phase/early construction	Production of a subsurface drainage plan.	The Project
Bio 16 CHA 19	Transmission line – bird deflectors to be installed on any new transmission lines, as well as the section of transmission line that is to be moved.	Install during construction	Bird deflectors have been installed	Biodiversity manager
Bio 17 MIA 58, MIA Add 16 CHA 21, MIA 53, MIA 54	Quarterly monitoring as set out in the flora and fauna protection plan written by IGA.	Quarterly throughout duration	Submission of a detailed bi-annual report, by the sub-consultant containing the monitoring results. Specific analysis of monitoring results for KBVs should be included.	Biodiversity Manager



7.0 Operational Phase

During the operational phase, earth moving and construction will have been completed. The measures below therefore focus on the Mexinol Plant itself, associated facilities as well as some measures to be implemented in the port area.

7.1 Noise and Vibration Mitigation

To limit negative impacts due to noise during the operation phases, the Project will implement noise management measures as described in the Air Quality and Noise Management Plan. In addition to the noise monitoring stations described in the Air Quality and Noise Management Plan, the Project will maintain a noise monitoring station within (< 1 km) the natural habitat found within the Aol. This will allow monitoring of noise and estimation of noise impacts to biodiversity receptors and application of adaptive management, if necessary.

Good practice measures to be implemented by the Project for general environmental parameters (including noise) are incorporated into the Project's design and apply to both the construction and operational phases.

7.2 Flaring

During the operational phase, the Mexinol Plant will have a 75 metre stack that will incorporate a flare system. A pilot light, burning natural gas will be permanently lit, then during flaring events, the flare will burn a mix of argon, hydrogen and nitrogen.

During the first few weeks of operation, quite a bit of flaring will occur during the testing phase. After that it will be limited to when required. During the daytime, the flame will be invisible, but during the nighttime visible. This represents a potential hazard to birds, if flying during the day, when they cannot see the flame, and fly through it. Or during the night if the flame attracts birds, due to the light it emits.

With respect to minimising impacts on birds, the Mexinol Plant has been built in an area of arable land, rather than adjacent to the bays and lagoons of the coast. The location of the plant, c. 1km inland from the bay of Ohuria, should limit the number of migratory birds passing over the flare stack.

As the potential for impacts on birds is not known, ongoing monitoring will take place. The environmental team will record any bird deaths noted (if they occur) on a daily basis. After six months, the results will be analysed (as this period will include for one migration event). If more than two deaths per month on average are occurring, then adaptive management will be implemented. This may include the use of a siren prior to flaring or adding bird deterrents to the tower. The exact methods will be decided based on the evidence gathered.

7.3 Lighting

Artificial nighttime lighting can attract and cause disturbance to nocturnal and/or migrating fauna, as well as invertebrates. Therefore, the Project will implement measures to minimize the impacts of artificial nighttime lighting. A lighting plan will be written which will consider light intensity and configuration, spacing, height, and directionality to reduce the intensity and spillage of light to minimize overall illumination.

The Project will implement measures to minimize the impacts due to artificial nighttime lighting during the operational phase as designed in mitigation where practical. The Project will consider light intensity and configuration, spacing, height, and directionality to reduce the intensity and spillage of light to minimize overall illumination. The following measures will be implemented to minimize the impacts of artificial nighttime lighting:



- Reduce the duration of light to the extent possible, via the use of timers and motion detectors.
- Use yellow light or red light that does not contain blue, violet, or UV wavelengths, as these attract fewer insects than UV or bluish/white lights.
- Plan and design light intensity and configuration, spacing, height, and directionality to reduce the intensity and spillage of light to minimize overall illumination of areas outside of the Project boundary.
- Use light only when needed and if practicable reduce lighting during times of peak bird migration in the spring and autumn.
- Implement adaptive measures if lights are shown to have impact based on bird, bat, or invertebrate monitoring reports following subsequent monitoring.

7.4 Port and Shipping

Most of the measures that are applicable to the port and shipping will be implemented as part of the international maritime law requirements. These measures include:

- Observing speed limits where applied.
- Sending onboard waste (e.g. grey water/sewerage) to an appropriate facility when docked.
- Use of shore power, over ship based diesel generator when available.
- Discharge of ballast tanks to be undertaken as per the Ballast Water Management Convention (2004). Each boat to have a Ballast water Management Plan, and to only discharge ballast water 200nm from land in water over 200m depth.
- Port area to be kept clean and tidy, with no refuse build up to discourage scavengers, or entrapment of scavengers in packets, bottles or string ties.
- Any collisions with cetaceans to be reported to the Project's biodiversity manager, so that a record can be kept of such incidences.

7.5 Associated Facilities – Transmission line

As discussed in the Critical Habitat and Biodiversity Impact Assessment (ref: 20240830 Mexinol CHA IA V1b.pdf), the main potential impact identified is the risk of birds electrocution and collision. The use of Bird Flight Diverters (BDFs) as well as design changes to the pylons and overhead lines will be implemented. These will include:

- The use of pylons which carry all cables on a single horizontal plane
- Number of cable levels to be reduced from three to two
- Guard wires to be moved or removed to make it more visible to birds
- Implement a safe distance between the energised conductors or a wire and any ground element of the pylon, based on the wingspan of the largest species present in the area (100-150cm)
- BDFs must be as large as possible to increase the visible thickness of the line by at least 20cm to allow the birds to see the line and to avoid it in good time
- BDFs and line markers should be spaced at no more than 5-10m apart and devices that are nocturnally visible should be used.

BDFs should be free to rotate to make them more noticeable. As the transmission line is an associated facility, any of the proposed mitigation measures identified above are preliminary



and subject to the biodiversity impact assessment which will be undertaken specifically for the transmission line.

- Based on tailored ToRs, the Project will conduct an electrocution and collisions risk assessment of the transmission line, as part of the IFC-aligned ESIA to determine potential mitigation measures (i.e. optimal location of birds' deterrents on the line).
- The studies and mitigations will be focused on the natural habitats and areas of bird specific susceptible collision risks, after an ecological features identification (landscape level versus electrocution/collision vulnerable species).

7.6 Quarterly Monitoring

As discussed in Section 5.7.3, quarterly monitoring surveys will be undertaken using the methodology as set out in the IGA (2024) Fauna and Flora Protection Plan. One of the outputs of the quarterly monitoring will be to prepare a detailed semi-annual report.

The monitoring plan is presented in Appendix A for completeness and should be referred to during the implementation of the monitoring. Monitoring will be ongoing through the preconstruction phase, and into the operational phase. Figure 5-1 shows the location of the monitoring points, some of which are located in the conservation area. This will allow evaluation of this area, and to detect any change should they arise during the operational phase. If adaptive management of the conservation area is needed, then this can be implemented where required. The results of the monitoring surveys will be presented bi-annually to the project by the consultant team undertaking the surveys.



Table 7-1 Summary of operational phase measures

Item ident	Action/Measure	Timeline and Frequency	KPI	Responsibility
Bio 18	Noise and vibration management plan to be implemented. Noise monitoring to be ongoing.	Management plan to continue to be implemented from construction phase.	Results of noise monitoring to be within acceptable limits.	The Project
Bio 19	The potential for flaring impacts to me monitored. Any injured birds or carcasses noted to be recorded. Need for adaptive management to be assessed after first six months of operation.	Monitoring will be on a daily basis and records collated. Results reviewed after 6 months.	Ideal outcome is that no injured or dead birds are noted. If more than two deaths per month, on average are noted, then adaptive management will be implemented.	Biodiversity manager, Environmental team.
Bio 20	A lighting management plan will be implemented to reduce potential impacts to wildlife. Most mitigation will be designed in, to reduce light spillage and when not required, lights will be switched off.	During the operational phase. Temporary lighting to be checked for compliance on a monthly basis. Permanent lighting to be signed off once inspected at the start of the operational phase.	The lighting plan has been written and implemented. Permanent lighting on site is “wildlife friendly”	The Project
Bio 21	Although not strictly within the management of the Project; the ships which the Project uses should abide by international shipping laws. This includes ballast tank disposal and speed limits.	All shipping related to the Project, throughout the lifetime of the Project.	Ships have up to date, ballast water management plans. No human/grey water waste is disposed of in the harbour waters. Any cetacean collisions are reported.	The Project
Bio 22	BFDs and design changes to the transmission line will be implemented to mitigate for potential impacts on birds	To be implemented during construction	Ideal outcome is that no bird collision/electrocution is reported. If more than two deaths per month, on average are noted, then adaptive management will be implemented.	The Project
Bio 23	Quarterly monitoring as set out in the flora and fauna protection plan written by IGA.	Quarterly throughout duration	Submission of a detailed bi-annual report, by the sub-consultant containing the monitoring results. Specific analysis of monitoring	Biodiversity Manager



Item ident	Action/Measure	Timeline and Frequency	KPI	Responsibility
			results for KBVs should be included.	



8.0 No Net Loss / Net Gain Considerations

8.1 Natural Habitats

Following successive design reviews and route adjustments, much of the route of the pipeline and footprint of the methanol plant affects areas that have been substantially modified by farming including irrigated agricultural land (annual and semi-permanent) as well as bare areas with no vegetation and urban built-up areas. Some areas of Natural Habitat (NH) do however remain.

This chapter gives an overview of biodiversity affected by the project requiring action in accordance with IFC PS6 including:

- Natural habitat defined by IFC PS6 as *‘areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area’s primary ecological function and species composition’*.

Natural Habitat is not restricted to untouched or pristine habitats. It is assumed that the majority of habitats designated as natural will have undergone some degree of historic anthropogenic impact (IFC, 2012). As such, even habitats with a degree of ‘modification’ are defined as NH if they retain capacity to recover the characteristics of NH and support important biodiversity.

Terrestrial and marine habitats have been mapped and classified across a minimum of 500m RoW corridor along the length of the pipeline RoW and is delineated in Figure 4-2 including the quantification of the extent of each type. The quantification of natural habitat types within the 500m Study Area is shown at Figure 4-1 in the Critical Habitat Assessment (SLR, 2024) and summarised in Table 8-1 below.

Table 8-1 Summary of Spatial Cover of Natural Habitats in the Study Area

Vegetation Community / Habitat	Total Footprint	
	Ha	%
Mangrove Swamp	0.98	0.03
Sarcocaula Scrub	29.26	0.9
Xerophytic Vegetation	706.51	21.73
Marine Water	182.62	5.61
Waterbody	55.84	1.72

8.1.1 Impact

Pre-construction activities will include the clearance of all vegetation across the construction right of way (RoW) for the pipeline route, access roads and footprint of the methanol plant. The temporary loss of natural habitat will occur on the RoW of the pipeline, as the proposed methanol plant and new access road are located within areas of modified habitats. This loss of natural habitat is classified as temporary, because the land along the pipeline route, which solely comprises Xerophytic vegetation, will be reinstated as part of the construction phase. A small area of permanent loss of Xerophytic vegetation has been noted in the footprint of the Plant. This is associated with the railway line, so may not actually be lost as a result of the construction of the footprint of the Plant, however for completeness it has been included here as a permanent loss of 0.04ha. The mangrove habitat that was recorded



within the study area is located on the western side of the Los Mochis-Topolobampo road and no loss of mangrove is anticipated.

There are also some aquatic habitats within the 50m RoW of the pipeline including a waterbody and some marine water habitat; however, it is assumed that these habitats will remain unaffected because the pipeline does not directly cross these areas. This will result in no loss, either temporary or permanent, of aquatic habitat.

Table 8-2 Temporary and Permanent Loss of Natural Habitat

Natural Habitat	Habitat Loss (ha)		
	Permanent Loss	Temporary Loss	Total Loss
Mangrove Swamp	0	0	0
Sarcocaulle Scrub	0	0	0
Xerophytic Vegetation	0.04	18.28	18.32
Marine Water	0	0	0
Waterbody	0	0	0

8.1.2 Mitigation

IGA produced two managements plans to address impacts to natural habitat which can be found at Appendix B and C at the end of this report. Of note is that there Could be up to 0.04 ha of permanent loss of natural habitat, The two plans listed below are expected to contribute to the biodiversity no net loss and net gain strategy. As there will be no impact at all on mangrove habitat, the Mangrove Management Plan could be described as an alternative conservation action, with the overall aim of providing additionality for the Project.

- IGA (2024) Reforestation Program with Native Species
- IGA (2024) Mangrove management Plan

These two management plans contribute to the strategy for the restoration and compensation of natural habitats and are complemented by the following actions to seek no net loss and net gain of priority biodiversity values:

- Prior to construction commencing, areas which will be subject to habitat loss will be mapped. Information on species and habitat condition will be used to update the management plans and monitoring reports and determine the extent and target condition for reinstatement and replanting if necessary.
- Following construction, compensatory planting should be undertaken through replanting either in another suitable location or in situ. Details of planting strategies and monitoring measures can be found at Appendix B and C.
- For all planting strategies, failures of plants do occur, either due to disease, environmental stress, or for other reasons. To ensure the best possible success of the mangrove swamp restoration, an aftercare programme should be implemented. This would be in place for at least 5 years post construction. The aftercare programme will involve an annual survey of the revegetated areas to establish if any vegetation failures have occurred (and to undertake remedial planting where required).
- For other NH types, monitoring of the reinstated areas will be undertaken annually and a comparison made with the condition of the habitat at baseline. It will focus on



vegetation composition, diversity and structure and will action any remedial measures if invasive plant species are noted for example.

- After the first five years of monitoring of each reinstated area, the need for and frequency of monitoring will be reviewed, and the monitoring plans updated as required. As areas of the route will be reinstated sequentially taking into consideration the construction schedule, the timing of monitoring will change slightly. Additionally, some habitats will recover more rapidly after construction (Xerophytic Vegetation) and may therefore require a shorter period of monitoring. As such the monitoring programme for natural habitats will be adjusted to meet the project schedule and habitat requirements.
- Although the KBA crossed by the Project is a Critical Habitat, it is not expected to cause negative impacts on the triggering biodiversity value (*Sterna forsteri*), therefore an offset won't be a requirement.

The natural habitat loss will be 18.32 ha of Xerophytic vegetation, the project will develop a strategy to meet NNL of this habitat, considering habitat quality metrics. In addition, the Project plans to provide compensation equating to an area that is at least 10% of the Project footprint, even if the impacted/lost habitat type is less than this. These measures are expected to include approximately 6 ha of reforestation (i.e., scrubbing) and cactus planting, plus 6 ha of mangrove restoration. The reforestation/restoration locations, and details of land ownership and access, are yet to be determined.

As part of the implementation of the Mitigation Hierarchy, and specifically as a measure to avoid impacts, the project will implement a set aside. A 15 ha 'conservation area' on the south tract of the methanol production plant (between the railroad and the Ohuira Bay) will be delimited. This area has natural vegetation and will not be developed or subject to land use change. It can also be used to translocate native flora outside of the Project footprint, if determined appropriate by the ecologist (2022; 2021). The areas of the south tract that have been developed for agricultural use will be used to deposit topsoil removed during early works from the north tract and will remain in agricultural use.

Due the overlapping of the Project with Internationally Recognized Areas, provisions of GN Par 20 applies. In this context some of the requirements are in place (Demonstrate that the proposed development in such areas is legally permitted; Act in a manner consistent with any government recognized management plans for such areas; and Consult protected area sponsors and managers), and as specific requirement for the conservation of biodiversity, the Project will implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the Bahia Lechuguilla KBA – IBA.

The points listed above provide a general summary of the proposed mitigation. For more detail on the key performance indicators, goals and monitoring approach to track performance, please refer to the individual plans (Annex B and Annex C of this report). In addition, for more information on the reporting requirements for the key performance indicators required under Resolution number SRA/DGIRA/DG-04243-23, please also refer to these plans for further detail. It is intended that these plans will be iterative and will be updated as required. They will then act as a stand-alone guide/reference for the Reforestation Program with Native Species and the Mangrove Restoration.



8.1.2.1 Residual Impact

Following the implementation of the mitigation hierarchy, and the proposed compensation measures detailed above; it is considered that the Project will achieve no net loss of natural habitat, through in situ and ex situ replacement of habitats.





Appendix A Fauna and Flora Protection Plan

Biodiversity Management Plan

Mexinol, Mexico

Transition Industries

SLR Project No.: 414.063858.00001

3 April 2025



Appendix B Reforestation Plan with Native species

Biodiversity Management Plan

Mexinol, Mexico

Transition Industries

SLR Project No.: 414.063858.00001

3 April 2025



Appendix C Mangrove Restoration Plan

Biodiversity Management Plan

Mexinol, Mexico

Transition Industries

SLR Project No.: 414.063858.00001

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