ANNEXURE C

TOGREEN CONSULTING
ENVIRONMENTAL MANAGEMENT SPECIALISTS

2026

APP: 006521

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

PROPOSED ODULA GREEN HYDROGEN AND OXYGEN PROJECT

SWAKOPMUND MUNICIPAL AREA (UNDEVELOPED LIGHT INDUSTRIAL ZONE), ERONGO REGION, NAMIBIA

PROPONENT: ODULA HYDROGEN (PTY) LTD

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3/24/2026

This Environmental and Social Management Plan (ESMP) is prepared as part of the Environmental Clearance Certificate (ECC) application
In terms of the Environmental Management Act (2007) and EIA Regulations (2012). The ESMP also aligns with IFC Performance Standards.

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NON-TECHNICAL SUMMARY

Odula Green Hydrogen and Oxygen project directly supports Namibia's transition to a low-carbon, climate-resilient economy being driven by the national Green Hydrogen Strategy 2022, while contributing to national development priorities - aligned and directly contributing to the realization of the Namibia dream of Vision 2030. Project also contribute to Namibia's global sustainability commitments such as SDG-7 on Affordable and Clean Energy; SDG-9 on Industry, Innovation and Infrastructure; and SDG-13 on Climate Action.

ESMP forms part of the Environmental and Social Impact Assessment (Scoping) Report submitted for the support of the application process for the Environmental Clearance Certificate (ECC). Thereafter, ESMP become a living but binding guiding document to guide the implementation of the various phases of the proposed Odula Green Hydrogen and Oxygen Plant to ensure the project is implemented in an environmentally sound manner.

This ESMP outlines the recommended management actions for identified potential impacts, monitoring requirements, responsibilities, and reporting obligations.

The ESMP finds that with the successful implementation of mitigation measures or management actions, all identified environmental and social negative impacts can be mitigated to low significance; while positive impacts are significantly enhanced and or maintained.

Two specialist studies originally identified as part ESIA process namely the **impact assessment of marine ecology and coastal birds** as well as **detailed risk assessment (HAZOP) for storage of hydrogen gas** which pose a critical risk for both employees and public.

Hence, this ESMP is regarded as comprehensive and adequate at this stage of ESIA process and it is the opinion of the environmental assessment practitioner to recommend to the Environmental Commissioner that this ESMP is adequate and be allowed to proceed to be finalised with updates or input from the recommended measures of outstanding specialist studies – study on marine ecology including impacts on coastal birds associated with seawater abstraction and piping to project site.

1. INTRODUCTION

1.1 Purpose of ESMP

The ESMP forms part of the Environmental and Social Impact Assessment (Scoping) Report submitted for the support of the application for the Environmental Clearance Certificate (ECC). Thereafter, ESMP is a living guiding document to guide the implementation of the various phases of the proposed Odula Green Hydrogen and Oxygen Plant to ensure the project is implemented in an environmentally sound manner. The ESMP outlines environmental and social mitigation measures, enhancement measures for positive impacts, monitoring requirements, institutional responsibilities, and reporting procedures.

1.2 Specific Objectives

- Formulate and customise mitigation actions to prevent, minimize or control the negative impacts, while maintaining and enhancing the positive socio-economic and environmental impacts of the project in line with national laws (EMA 2007) and local authority laws;
- Guide the implementation of mitigation actions to address the identified impacts in terms of clear responsibility and timelines as in relation to various phases of the project;
- Serves as training source material to raise awareness of identified impacts and mitigations with all relevant internal and external stakeholders (workers, contractors, visitors etc.) to aid implementation;
- Form basis for establishment of environmental monitoring programme (including health and safety aspects) to track effectiveness of mitigation measures against set performance targets;
- Set the basis of managing cumulative impacts and strategy for progressive rehabilitation and final closure
- Opportunity to adopt and align with international best practice including IFC Performance Standards

2. PROJECT OVERVIEW

The project involves the construction and operation of a green hydrogen and oxygen production facility within municipal light-industrial-zoned land in Swakopmund. The project footprint is up to 200 hectares but in reality the footprint will be smaller as it is based on the actual available land size which will be finally allocated by the municipal council. Hydrogen and oxygen will be produced through electrolysis method using renewable electricity and seawater.

<u>Key infrastructures</u>:

- *Water supply and treatment system*

Abstraction and filtration of sea water – 11 Million m3 per annum (roughly 30,139 m3/day) for the direct supply to alkaline electrolysis process and another 7 Million cubic meters per

annum (roughly 19,178 m^3/day) of seawater is required for desalination plant. This translates into an overall 18 Million cubic meters per annum of seawater abstraction required. A linear infrastructure comprises of seawater pipeline of less than 7 km and the pumping unit will be constructed in order to supply seawater to the project site – seawater storage reservoirs.

The portable water from Municipal water service and or other sources will be required during construction phase of the phase of the project. Thereafter (i.e. operation phase) the project will be self-sustaining in terms of water supply.

- *Electrolysis units*

The primary hydrogen and oxygen production unit will be installed with an alkaline Electrolyzer which is powered by a 7.4 Gigawatts (capacity of 7.4GW/hr) and with production capacity of 115MT/hr hydrogen and 920MT/hr Oxygen. The 115MT/hr hydrogen is then further converted into various hydrogen products with the following annual production rates:

- 117,840MT/yr compressed H_2 gas,
- 711,360MT/yr H2 fuel cells recharging
- 200,000MT/yr metal urea / urea granular (fertilizer)

Other by-products include extraction of rare earth metals from brine concentrate as well as solid salt powder (i.e. white salt) with production capacity predicted at 2MT/day.

- *Gas purification and compression systems*

Pure hydrogen will be compressed up to 700 bar whereas oxygen gas will be compressed up to 200 bar at the compression rate of up to 3.9 KWh/kg (i.e. compressor capacity).

- *Storage and handling facilities*

For hydrogen and its various products, the storage and handling facilities will be a combination of the following methods:

- Compressed gas up to 700 bar is stored in specialized composite or steel tanks
- Liquid hydrogen is stored in cryogenic tanks
- Metal urea / urea granules storage will ensures that product is kept cool, dry and sealed to prevent product quality degradation. This therefore will require bagging and storage into a cool and dry warehouse.

For oxygen, this will be stored as liquid oxygen after compression and liquefaction into cryogenic LOX tanks (Liquid Oxygen tanks).

- *Storage vessels and distribution systems*

Hydrogen storage vessels will be made up of composite with metal liner (Type III) and /or composite with plastic liner (Type IV) applicable to hydrogen gas. Cryogenic liquid tanks are vacuum-insulated vessels designed to store liquid hydrogen.

Oxygen storage vessels will be made of a vacuum insulated evaporator or cryogenic tanks – double walled vacuum insulated tanks.

- *Electrical infrastructure and control systems*

PV Solar farm with maximum power generation capacity of up to 7.4 Gigawatts. This will supply power to the Electrolyser unit as well as to Reverse Osmosis plant.

Figure 1 presents the overall schematic process flow diagram for the Odula Green Hydrogen and Oxygen Plant.

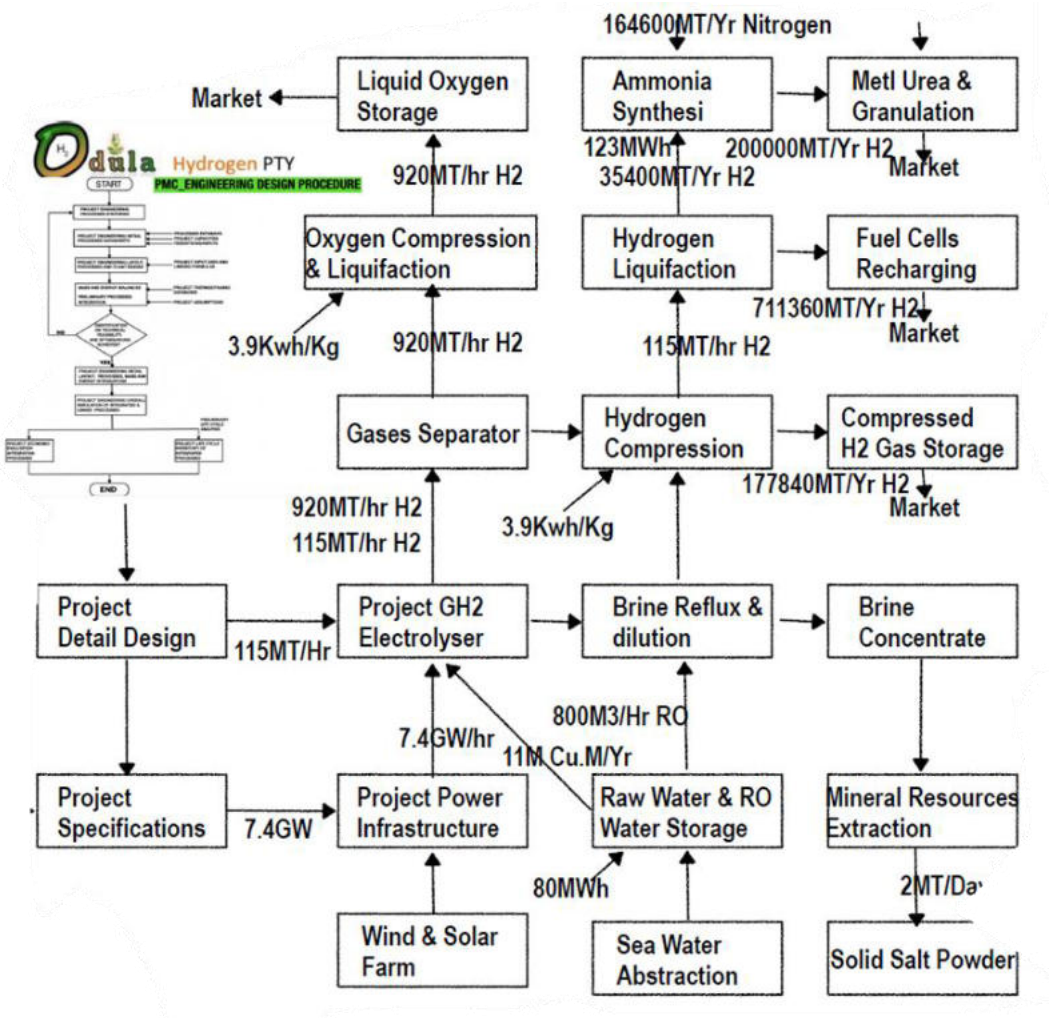

Figure 1: Schematic process flow diagram for the proposed Odula Green Hydrogen and Oxygen Plant, Swakopmund, Erongo Region, Namibia (Source: Odula Prefeasibility Study Report**)**

3. LEGAL, POLICY AND FRAMEWORK

It is a common cause that Namibia does not yet have specific legislation for green hydrogen sector; however it is understood that the government is geared to formalize this sector as far as legislations are concerned. At the current moment, development is taking the lead with application of existing legislative framework governing specific processes which include enacted laws and policies, while the sector specific laws are being formulated. This section presents key applicable legislations by category.

Table 1: List of relevant laws, policies and international guidelines

Regulatory Aspect, Legislations and Policy	Relevance
3.1 General Environmental and Planning	
• Namibian Environmental Management Act, 2007 (Act No. 7 of 2007) (EMA)	Requires all listed activities (i.e. project with potential environmental impacts) to be subjected to a process of an Environmental Impact Assessment (EIA). As a result an Environmental Clearance Certificate (ECC) must be obtained before project commencement
• Environmental Impact Assessment Regulations (February 2012)	Guide the ESIA process of proposed project including the manner of public consultation
• National Heritage Act, 2004 (Act No. 27 of 2004)	Protects potential places and objects of significant heritage importance during the life cycle of the project.
• Local Authorities Act, 1992 (Act No. 23 of 1992)	Governs administration of local government affairs and land within the jurisdiction of local authority (municipal area). The Act give mandate to municipal council to come up with internal laws known as By-Laws on specific aspects or matters such as control of littering and waste disposal within municipal area. The Swakopmund Structure Plan 2020-2040 must be read together with this legislation.
• Nature Conservation Ordinance 4 of 1975	Governs the conservation and management of national parks, game parks, and nature reserves, including the protection of wild animal and plant life. Its relevance to the

Regulatory Aspect, Legislations and Policy	Relevance
	proposed project may relate to the site location in relation to the boundary of Dorob National Park as well as dealing with protected species which may be found in the project site (e.g. protection of wildlife from poaching and/or illegal hunting).
• Public and Environmental Health Act, 2015	Deals with public health matters, including sanitation, waste management, and the prevention of health hazards. Storage of hydrogen and oxygen gases under pressure is a public health hazards which need proper management. The health and safety of workers and the public, especially concerning the industrial risks associated with hydrogen, which is a colorless, odorless, and flammable gas prone to explosions if leaked, may be a trigger to consider the provision of this legislations in the sense of general health and safety standards and especially that there are no specific regulations for the unique safety risks of commercial-scale hydrogen production, distribution, and storage.
• Labour Act No.11 of 2007	The Act governs the health and safety of employees at work place. It defines the responsibility of both employers and employees and mandate the electing and or appointment of safety representatives and area owners in work place
• Mineral (Prospecting and Mining) Act 1992	Potential active EPLs near or cut across the project site and the potential need for servitude for the proposed seawater pipeline as this legislation regulates the activities within the Mining Areas. Lastly proposed project has a an optional component for potential rare earth metals extraction from the brines should this become economical viable, this would fall in

Regulatory Aspect, Legislations and Policy	Relevance
	the controlled minerals or agreeable interpretation need to be achieved between proponent and competent authority
3.2 Water Abstraction, Treatment, Use and Wastewater disposal	
• Water Resources Management Act, 2013 (Act No. 11 of 2013)	Regulate water abstraction (seawater), water treatment (desalination), and the disposal of brine by-product. Domestic wastewater treatment and disposal is also regulated under this law. A water use permit/license as well as license to dispose wastewater will be required from the Ministry of Agriculture, Water and Land Reform (now Ministry of Agriculture, Fisheries, Water and Land Reform).
• Marine Resources Act, 2000 (Act No.27 of 2000)	Regulate fisheries activities, management of marine resources including controlling of human activities in coastal waters. Impacts of abstraction of seawater on marine coastal ecology and potential disposal of brines after desalination (if any)
3.3 Energy and Power Generation	
• Electricity Act, 2007 (Act No. 4 of 2007)	Regulates the generation, transmission, and supply of electricity. Solar farm is the related infrastructure applicable to this legislation
• Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990)	Limited application to green hydrogen, however general provisions may be applied to govern aspects of the energy inputs and outputs in the absence of a specific hydrogen law. Ministry of Industrialization Mines and Energy is competent authority of green hydrogen projects
• National Renewable Energy Policy (2017)	Guides the promotion and development of renewable energy sources like wind power, solar power and hydro power.

Regulatory Aspect, Legislations and Policy	Relevance
• Synthetic Fuels Act (Draft/Proposed)	When in place, aims to specifically regulate the green hydrogen sector and to align with the international standards relates to health, safety, and environmental.
• National Green Hydrogen Policy (draft/proposed)	Currently under review by the Ministry of Industries, Mines and Energy, this will form the basis of future legislation on green hydrogen production
• Feasibility and Implementation Agreement (FIA):	Learning from similar large-scale green hydrogen projects (e.g. the Hyphen project) are currently primarily governed by specific agreements with the Namibian government (such as the FIA), which is understood to bridge the gap until formal legislation is in place.
• National Green Hydrogen Strategy 2022	Strategy positioning green hydrogen as a pillar of the country's energy independence, economic diversification, and export-driven development. This strategy outlines an ambitious roadmap to produce up to 300,000 metric tons of green hydrogen annually by 2040, focusing on building large-scale electrolysis facilities powered by renewable energy and creating a global supply chain targeting energy-thirsty markets such as Europe and Asia.
3.4 National Economic Visions, Policies and Strategies	
• National Vision 2030	National dream for Namibia to become industrialized by year 2030.
• National Development Plans (current NDP 6)	Five-year Implementation plans for Vision 2030
• Harambee Prosperity Plan	Plan or strategy to fast track or speed up the implementation of the development agenda for Namibia

Regulatory Aspect, Legislations and Policy	Relevance
3.5 International policies, conventions and administrative frameworks	
• Applicable IFC Performance Standards (PSs)	PS1 on Assessment and Management of E&S Risks and Impacts and PS2-8 are the performance standards that likely to be triggered by the project. Compliance with these standards ensures that the project meets international benchmarks for environmental and social performance, transparency, and accountability – hence eligible to meet international funding requirements: • PS1: Assessment and Management of Environmental and Social Risks and Impacts • PS2: Labour and Working Conditions • PS3: Resource Efficiency and Pollution Prevention • PS4: Community Health, Safety, and Security • PS5: Land Acquisition and Involuntary Resettlement • PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources • PS7: Indigenous Peoples (if applicable) • PS8: Cultural Heritage
• Paris Agreement and UNFCCC Commitments	Namibia is a signatory to the Paris Agreement and has committed to reducing emissions in line with global climate targets. This project contributes directly to that commitment while supporting the broader goals outlined in Namibia's National Energy Policy, Nationally Determined Contributions

Regulatory Aspect, Legislations and Policy	Relevance
	(NDCs), and the Green Hydrogen Strategy.
• UN Sustainable Development Goals (SDGs)	A green hydrogen project directly supports Namibia's transition to a low-carbon, climate-resilient economy, while contributing to national development priorities and global sustainability commitments. The most relevant SDGs are outlined below. Key SDGs: • SDG 6: Clean Water and Sanitation • SDG 7: Affordable and Clean Energy • SDG 8: Decent Work and Economic Growth • SDG 9: Industry, Innovation and Infrastructure • SDG 12: Responsible Consumption and Production • SDG 13: Climate Action • SDG 14: Life Below Water • SDG 15: Life on Land • SDG 17: Partnerships for the Goals
• International Standards Organisation (ISO)	Alignment with international standards, including ISO 14687 (hydrogen quality), ISO 7396 (oxygen systems), and IEC 60079 (explosive atmospheres).

In summary, the project must navigate a combination of general environmental and water resource laws, existing energy regulations, and the specific contractual agreements established with the Namibian government while anticipating the new hydrogen-specific legislation that is currently being drafted. The international tools such as IFC performance

standards are adopted to also contribute to the international funding eligibility of the proposed project.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM (ESMS)

The proponent by default agrees that implementation of the proposed green hydrogen project will be guided by an environmental and social management system to be designed in alignment with the ISO14001:2015 standards while acknowledging the required compliance with the Namibian Environmental Management Act 2007 and the local authority requirements.

Below is the proposed generic ESMS to serve as the starting point for the establishment of the specific ESMS when the project commence.

4.1 Environmental, Health and Safety (EHS) Policy

The Management (Leadership) of Odula Hydrogen (Pty) Ltd is advised to come up with endorsed EHS Policy or similar related policy with the following commitment:

- **Zero Harm:** commit to protect all employees including contractors and visitors, and general public from potential hazards focusing on strict hydrogen management
- **Regulatory compliance:** commit to maintain compliance with the Namibian Environmental Act 2007, Local Authority (including By-Laws of Swakopmund Municipality) and international available best practice aligned with IFC Performance Standards
- **Sustainability:** commit to promote and utilize renewable energy from solar, minimize water use by leveraging on alternative option of desalination and maintain adopted zero-discharge of brine
- **Stakeholder engagement:** commit to maintain social license to operate through transparency and continuously engagement with community
- **Continuously improvement**: commit to regular audit and update of the ESMS to improve EHS performance

4.2 Organizational structure

EMP and hence ESMS require a dedicated team with clear roles and responsibilities.

General Manger – Accountable person for EHS performance

EHS Manager – Responsible person for developing, implementing and monitor EHS Policy and Procedures

Site Technical Team – Responsible team for operational controls and implementation

Environmental Control Officer (ECO) – Responsible person for daily monitoring, compliance, auditing, waste management and liaison with regulatory authorities

Process Safety Officer (PSO) – Responsible person for daily risks and hazards identification and reporting or field rectification

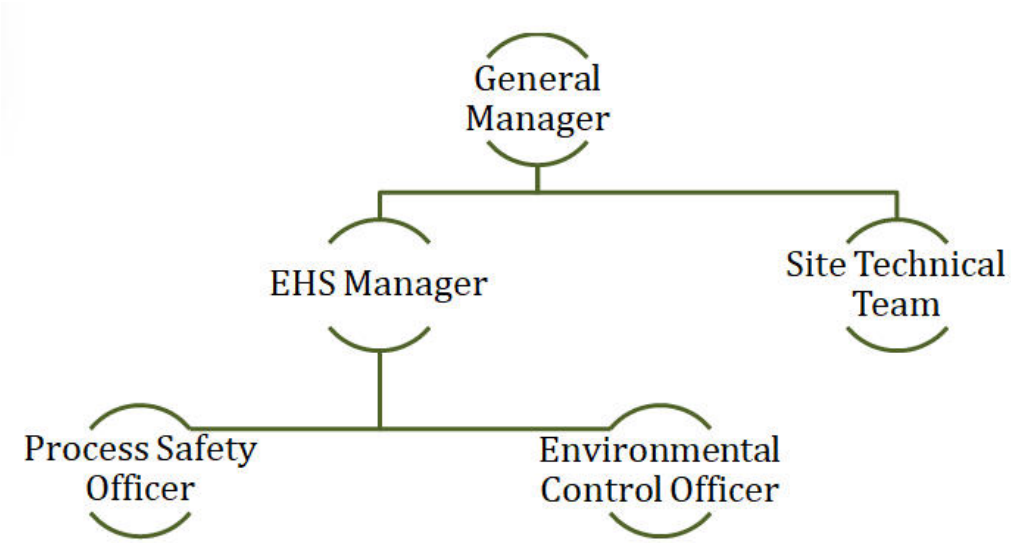

Figure 2: Proposed default organisational structure

4.3 Roles and Responsibilities

Management | Leadership: provide resources, set performance targets and review the Environmental Health and Safety Performance on a periodical basis.

Environmental Control Officer (ECO): Ensures adherence to the Environmental Management Plan, conduct internal audits and inspection and coordinate external audits and handles waste management.

Site Technical Team (Engineers and Operational Supervisors): Monitor contractor compliance, develop standard operating procedures (SOPs), manage environmental health and safety related incidents and report to Environmental Health and Safety Manager.

Employees: Adhere to Environmental Health and Safety procedures, use prescribed and minimum required PPEs, and report all observed potential hazards include "Near-misses".

4.4 Contractor Management System (CSMS)

It is hereby proposed that all contractors must comply with the same standards just as the plant operators and other employees.

Proposed criteria to ensure realization:

- ***Pre-qualification at procurement*** – contractors are to be vetted on the basis of their EHS records, own EHS policies and competencies.

- ***Induction and training*** – all contractors to be subjected to site EHS induction and training including hydrogen hazards before allowed to commence with work
- ***Contractual obligation***: EMP provisions must be part of the contract and with outlined penalties for non-compliance.
- ***Monitoring*** – Regular inspection of contractor's performance, waste management and equipment certification.

4.5 Reporting

The reporting lines will follow the guideline below:

- ***Internal lines of reporting*** – workers, Supervisors, ECO/EHS Manager/PSO, General Manager.
- ***External line of reporting*** – EHS Manager to report incidents and accidents to relevant regulatory authorities including Environmental Commissioner and Labour Commissioner.

4.6 Incident reporting and Emergency Response System

There shall be an incident reporting and emergency response system which covers the following:

- ***Hazard and Near-Miss Report*** – Establish a proactive program to encourage the workforce to report observed hazards before these become real accidents or incidents.
- ***Incident Investigation*** – all EHS incidents must be investigated to determine the root causes and allow implementation of corrective actions.
- ***EHS Emergency response*** – develop a dedicated emergency response plan for the following aspects:
    - *Hydrogen Leakage*: Immediate detection and shutdown protocols
    - *Desalination (Reverse Osmosis) Plant Failure*: Mitigation for brine holding onsite to avoid need for disposal at sea
    - *Spill containment*: Proper handling of chemicals of chemicals and hydrocarbons
- ***Complaints Register***: establish a system to document (i.e. to record and resolve) all received concerns from the Swakopmund community

4.7 Key Environmental and Social Focus Areas and precautionary statements

This sub-section focuses mainly on key focus areas which can potentially and negatively affected by the proposed project.

- ***Biodiversity*** – Establish a program aiming at protecting the sensitive coastal desert flora and fauna such as the existing bird conservation area.
- ***Marine Water quality and marine life*** – design seawater abstraction infrastructure with incorporated operation features aiming at protecting marine life in and around the abstraction points and seawater pipeline route(s).

- **Potable Water** – track the consumption of potable water during construction and develop targets for water conservation throughout the project lifecycle.
- **Waste Management** – establish a waste management program that embraces the concepts of integrated waste management, waste management hierarchy, circular economy and or cradle to grave.
- **Air quality and Noise** – protect the ambient and occupational air quality by establishing a program aiming at limiting noise and dust emission during construction.
- **Aesthetic value | Tourism attraction-sense-of-place** – aim to blend in the infrastructure installations with the natural environment e.g. where practical possible leave some of the desert plants under the solar panels.
- **Corrosive environment | hydrogen sulphide phenomenon** – aim for infrastructure designs which are compatible with surrounding environmental conditions to prevent integrity deterioration and or operational disruption.
- **Land use coexistence management** – establish stakeholder engagement mechanism and promote collaboration between adjacent land users.
- **Labour Practices** – establish sound labor practice system to promote fair recruitment and procurement processes.
- **Hydrogen safety** – internationally sound practice for hydrogen gas storage and handling.
- **Migration and associated social issues** – incorporate these issues in the project impacts and mitigations.
- **Public awareness | information disclosure** – establish information sharing and dissemination.
- **Overall regulatory compliance** – establish an updateable legal register for the project.
- **Cumulative environmental and social impact** – establish a monitoring and review system for project impacts which continuously track impacts on a cumulative basis.

5. ENVIRONMENTAL AND SOCIAL MANAGEMENT MATRIX

The actual environmental and social management plan is presented in a tabular form for easy of reference during the various phases of project implementation.

The tabulated ESMP presents the impact theme or impact category as originally identified in the ESIA Scoping report and with their respective recommended mitigation actions. EMP matrix also extends to include the respective project phase, responsibility, indicator and cost provisions.

The significance ratings for the negative and positive impacts in the matrix are guided by the following color coded criteria.

Significance Rating – Color Coding Criteria for Negative Impact (-):

Low | Insignificant	Moderate	High

Significance Rating –Color Coding for Positive Impact (+):

Low | Insignificant	Moderate	High

The matrix is presented in Table 2.

Table 2: Environmental and Social Management Action Plan

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
<u>Impact 1: Disturbance to local biodiversity – flora and fauna (Negative)</u> • Removal or damage to desert plants (namely *coastal saltwort*, *bushman's candle* and *dollar plants*) • Migration of animals such as antelope/springbok, black-backed jackals and desert birds "the dune lark"				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
1.	Incorporate some of the desert plants into the plant landscape e.g. under the solar panel infrastructure.	**Construction** | ground preparation and unit installations	Number of plant specimen left undisturbed per species	Site technical team
2.	No disturbance outside the project footprint.	**Operation** | unscheduled and unpermitted activities	Zero incidents of disturbance outside project site	General Manager
3.	Chemical Spill containment.	**Operation** | chemical - reagents handling	• Spill incident reports • % spill successfully contained	Process Safety Officer
4.	Stormwater quality protection – contain onsite stormwater and prevent clean storm entering site (result from rare rainfall occurrences)	**Operation** | Surface water management	Clean water diversion channel constructed and operational	General Manager
5.	Lighting pollution control – not to confuse migratory birds from their routes.	**Operation** | design, installation and operation of lighting	• Lighting standards • Illumination surveys compliance to lighting standard	Site technical team
6.	Adopt anti-poaching policy to prevent illegal hunting of wild life fauna – springbok, jackals and birds including the IUCN listed "Near Threaten" dune lark.	**Construction, Operation** | contractor's camp operation	Zero incident of illegal hunting	EHS Manager
<u>Impact 2: Disturbance to of birds conservation area and coastal marine environmental water (Negative)</u> • Damage to habitants (coastal plants, bird nests) for the bird conservation area around salt work area "Salt Company operation"				

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
• Impact on coastal ecology through Entrainment, Impingement and habitant disruption				
Rating Before Mitigation	***H***			
Rating After Mitigation	***M***			
7.	The route of seawater pipeline should avoid (wholly or partly) the bird conservation area.	**Construction** | trenching, digging and seawater pipe installation	Zero disturbance to bird conservation area	Site technical team
8.	Design seawater abstraction infrastructure with incorporated design or operation features aiming at protecting and preventing marine life (e.g. **Design**: subsurface intake, low-velocity open water intakes, screens; **operational**: siting away from productive area and with reduced flow)	**Construction** | specific siting, pumping unit design and installation	Zero incident of marine entrainment and impingement	Site technical team
Impact 3: Potable water abstraction and consumption (Negative) • Pressure (increased demand) from municipal water sources				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
9.	Track the water consumption	**Construction** | water utilisation	Daily water usage record	ECO
10.	Set internal conservation targets and track compliance during the lifecycle of the project	**Operation** | utilization of water from desalination reverse osmosis plant	% water saving records or EHS Dashboard	ECO
11.	Utilize seawater for dust suppression using corrosion resistant water boozer (e.g., plastic water boozer)	**Construction and Operation** | dust suppression	Zero records of potable water used in dust suppression	ECO
Impact 4: Waste Generation, Treatment and disposal (Negative) • Solid waste | litter pollution				

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
• Wastewater | Sewage Treatment Plant				
Rating Before Mitigation	***H***			
Rating After Mitigation	***L***			
12.	Establish onsite waste management plan and removal procedure	**Construction & Operation** | Contractor s camp	Compliance to waste management plan and removal procedure	EHS Manager
13.	Design, construct and operate a pollution control dam for process wastewater	**Operation** | discharge of process water	100% containment by pollution control dam	Site Technical Team
14.	Design, construct and operate a sewage treatment plant	**Operation** | treatment, discharge	% compliance of effluent with national discharge limits	Site Technical Team
15.	Utilise the semi-purified effluent for onsite garden/landscape irrigation	**Operation** | landscape irrigation	Recorded quantity of effluent used	ECO
Impact 5: Impact on local soil and air quality (Negative) • Dust generation • Increased ambient noise • Ground vibration • Soil contamination due to oil or chemical spill or uncontrolled release of contaminated stormwater water				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
16.	Implement dust suppression program on all access roads to the site with enforced speed limit of 20km/h	**Construction** | driving on unpaved access roads	Dust suppression schedule and compliance	ECO
17.	Install noise barrier around construction site	**Construction & Operation** | mobile equipment and motors	Noise level limited to site	Process Safety Officer
18.	Routine maintenance for all mobile equipment to reduce excess engine vibration	**Construction** | site excavation and leveling	Zero incident of ergonomics or public complaints	Process Safety Officer

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
19.	Develop and implement spill prevention and clean-up procedure	**Construction & Operation** | onsite servicing of mobile equipment	Zero oil or chemical spill incident	Process Safety Officer
<u>Impact 6: Reduction of aesthetic value | Tourism attraction sense-of-place (Negative)</u> • Undeveloped land to developed land with physical infrastructure • Reduced tourism attraction of the area e.g. looking at endemic plants such as bushman's candle and dollar plant and avifauna such as the dune lark bird				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
20.	Explore opportunity to partly blend in the infrastructure layout with the natural surrounding e.g. leave some desert plants to form part of the site landscape	**Construction & Operation** | land clearing and infrastructure installation	Site landscape including leisure park or garden incorporated local desert plants	EHS Manager
<u>Impact 7: harsh coastal environment on infrastructure and operation of desalination (Negative)</u> • Corrosive environment • Impact of red tides (Sulphur eruption) on the seawater quality and operation of desalination plant				
Rating Before Mitigation	***H***			
Rating After Mitigation	***L***			
21.	Infrastructure design compatibility with corrosive environmental condition	**Construction** | adopting infrastructure design standards	Corrosion resistant infrastructure	Site Technical Team
22.	Install additional seawater reservoir capacity to act as emergency seawater supply to desalination plant during events of Sulphur eruption	**Construction & Operation** | Seawater abstraction and supply	Adequate seawater storage capacity to sustain desalination plant for 14 days (without seawater pumping)	General Site Manger

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
Impact 8: Climate Change Mitigation through Green Energy Transition (Positive) • Carbon reduction • Clean production of hydrogen				
Rating Before Mitigation	***H***			
Rating After Mitigation	***H***			
23.	Sustainability report – carbon reduction	**Operation** | Public disclosure	Data verification and successful sustainability data audit	EHS Manager
24.	Create public awareness initiatives to encourage other investors to follow-suit	**Operation** | Participation in marketing events – Trade Fairs and Mining Expo	Marketing content creation and participation	General Manager
Impact 9 : Desalination of seawater reduce demand pressure on available scarce fresh water sources (Positive) • Produce potable water from seawater • Self-sustain water supplier and consumption				
Rating Before Mitigation	***M***			
Rating After Mitigation	***H***			
25.	Design capacity to ensure self-sustaining of water supply to green hydrogen plant	**Construction** | sizing of the Reverse Osmosis Plant	Sustainable potable water production	Site Technical Team
26.	Explore option for community investment through donation of excess potable water	**Operation** | potable water from seawater purification	Reliable Excess water trend before decision to donate	EHS Manager
Impact 10 : Competing or perceived competing land uses (Negative) • Potential interception of project site boundary and existing mining & mineral exploration area (ML-66E-L and EPL-4185) • Automatic stoppage of informal/district access roads that runs through (ad hock) project site				
Rating Before Mitigation	***M***			

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
Rating After Mitigation	***L***			
27.	Appoint a town planner for the clear subdivision of the specific project site within Zone-M	**Construction** | Erven creation – land subdivision	Town planner appointed, application approved	General Manager
28.	Appoint a land surveyor for the actual project site measurement including the buffer zone	**Construction** | Land surveying	Land surveyor appointed, town map updated	General Manager
29.	Establish stakeholder engagement mechanisms to encourage collaboration and proactive communication between proponent and adjacent land owners	**Construction & Operation** | land surveying and subdivision	Increased understanding, less or no misunderstanding-conflict related	EHS Manager
30.	Where possible, boundary interceptions should be avoided and if not possible, engagement for collaboration is encouraged and to be spearhead by the Municipality at land allocation	**Construction** | Erven creation – land subdivision	Affected adjacent land owners included in the discussion on the outcome of the land survey	EHS Manager
Impact 11: Unfair labour practices (Negative) • Disregard consideration for local • Potential political influences on recruitment processes and tenders for contractors • Poor communication to public about project progress /update (i.e. public miss-out on opportunities)				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
31.	Develop clear policy on recruitment which is non-discriminatory and auditable	**Construction** | recruitment of workers	Recruitment Policy approved	General Manager
32.	Special clause in recruitment policy which provide preferential to locals	**Construction** | recruitment of workers	Number of local people employed	General Manager
33.	Above to extend to local contractors with technical capacity	**Construction** | outsourcing of services	Number of local contractors appointed	General Manager

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
34.	Establish worker grievance mechanism	**Construction & Operation** | monitoring of workers moral and satisfaction	Number of grievances received, resolved and recorded	EHS Manager
35.	Develop and communicate Code of Conduct to promote fair labour practice	**Construction & Operation** | implementation of HR processes	Zero incident of unfair labour practice	General Manager
<u>Impact 12: Migration associated impact on municipal services (Negative)</u> • Potential increase in cost and pressure on municipal services (water, electricity, accommodation, and waste) due to urban population increase • Potential expansion of informal settlements and increased risk of fire incidents				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
36.	Engage municipality to ascertain suitable approach to immigrant workers accommodation provisions (e.g. contractor 's camp versus own accommodation)	**Construction & Operation** | migration to Swakopmund due availability of opportunities	Actual number people employed on the project communicated to the municipality	EHS Manager
37.	Establish policy that encourage recruitment of locals for general work – directly or through contractors	**Construction & Operation** | Recruitment and tendering process	Number employment and tenders awarded to local people & contractors	General Manager
<u>Impact 13:</u> Support to local, regional and national economy (Positive) • Possible construction tenders of goods and services • Enhanced purchasing power (local markets) • Contribution to state revenue through taxes and levies				
Rating Before Mitigation	***H***			

No.	Management Action		Project Phase | Activity	Indicator | Result	Responsibility
Rating After Mitigation		***H***			
38.	Preferential procurement policy		**Construction & Operation** | goods and services supply	Number of specific opportunities for locals	General Manager
39.	Create SME supplier registration system		**Construction & Operation** | tenders advertisement	Registration system operational and marketed	General Manager
<u>Impact 14: Employment creation - about 4000 direct employment anticipated throughout the whole project life-cycle (Positive)</u> • Potential job opportunities for locals • Skilled job opportunities for Namibians and beyond					
Rating Before Mitigation		***H***			
Rating After Mitigation		***H***			
40.	Implement skills transfer programmes such as understudy for expatriates		**Operation |** in-service training	Local or Namibian employees identified for understudy program	General Manager
41.	Explore opportunities for technical training partnership – collaboration with local Municipality and vocational training institutions to upgrade the skills of local people targeting youth		**Operation |** implementation of sponsored training	Engagement initiated, steering committee constituted, progress meeting held and actions taken forward	General Manager
42.	Offer general work opportunities to locals		**Construction & Operation |** recruitment	Number of locals employed	General Manager
<u>Impact 15: Knowledge transfer and Skill upgrade opportunity for locals (Positive)</u> • Potential collaboration on local capacity • Direct skill transfer -					
Rating Before Mitigation		***M***			
Rating After Mitigation		***H***			

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
43.	Implement continuity program on this initiative	**Construction & Operation |** on-job skill transfer or upgrade	Continuity mechanism established	General Manager
44.	Entry level Jobs for local	**Construction & Operation |** skill transfer targeted jobs	Number of entry level jobs filled	General Manager
Impact 16: Improved capacity for regional oxygen availability (Positive) • Production of oxygen contribute to adequate regional capacity for supply of medical oxygen • Industrial diversification				
Rating Before Mitigation	***H***			
Rating After Mitigation	***H***			
45.	Establish collaboration with emergency services requiring oxygen including hospitals	**Operation |** oxygen supply	Market established	General Manager
46.	Maintain hydrogen value chain development including identifying market for other by-products (metal urea, salts)	**Operation |** product sales	Market established	General Manager
Impact 17: Ambient and occupational noise, vibration and dust emission (Negative) • Machinery noise • Ground vibration • Dust emission (PM10 and PM2.5)				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
47.	Establish and implement dust suppression program on unpaved surfaces including roads	**Construction |** driving and machinery movement	Dust source areas/sites identified and mapped. Compliance to daily dust suppression schedule	EHS Manager
48.	Adopt preventative maintenance of mobile equipment	**Construction |** routine service of mobile equipment	Preventative maintenance plan	General Manager

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
49.	Install noise barriers around construction sites	**Construction |** site preparation and digging	Noise measurements outside barrier are within limits	EHS Manager
<u>Impact 18: Storage of bulk compressed hydrogen and oxygen – an inherent safety hazard (Negative)</u> • Incompatibility storage of hydrogen and oxygen especially in presence of sparks • Potential hydrogen leaks and mixture of the hydrogen and oxygen gases in presence of sparks – leads to violent combustion known as "detonating gas" • Dangerous gas and dangerous loud sound – explosion risks				
Rating Before Mitigation	***H***			
Rating After Mitigation	***M***			
50.	Design leak free bulk storage facility in line with international sound practice for storage and handling hydrogen gas	**Construction |** installation of storage facilities	Approved design based on internationally accepted standards	Site Technical Team
51.	Develop and comply to the operational manual based on the outcome of HAZOP study and design provisions	**Operation |** storage of compressed hydrogen and oxygen gases	Comprehensive Operational and maintenance manual, routinely audited and action implemented	EHS Manager
52.	Classification of hazardous areas within plant site	**Operation |** installation of safety signage	Clearly marked safety signage installed	EHS Manager
53.	Leak detection system	**Construction & Operation |** leak system testing	Leak system tested and connected to central system (control room)	Site Technical Team
54.	HSE Induction for employees – extend to visitors and contractors	**Operation |** onboarding of new employees, contractors and visitors	Attendance register signed and kept, 100% pass rate	EHS Manager
55.	Emergency Drills	**Operation |** emergency readiness check and balance	Number of drills conducted, 100% compliance to drill	EHS Manager

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
			schedule and type	
Impact 19: Spread of HIV / AIDS (Negative) • Migration coupled with increased purchasing power and local prostitution • Ignorance due to use of drugs and alcohol • Unplanned pregnancies and babies (or without fathers)				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
56.	Create HIV/AIDS awareness among employees and community	**Construction & Operation |** information sharing	HIV/AIDS program at workplace	EHS Manager
57.	Create awareness of health relationship and planning (e.g. know your potential partner and background first)	**Construction & Operation**	Health lifestyle program	EHS Manager
58.	Promote safe sex by forming partnership with local health institutions such as hospitals in distribution of free condoms and femidoms	**Construction & Operation**	Health lifestyle program	EHS Manager
Impact 20: Public misinformation and under-information about safety impacts (Negative) • Lack of awareness about the hazards and risk for the workforce • Lack of awareness about the hazards and risks for public on the outskirt of project boundary				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
59.	Create an outreach program to disseminate information to both public and employees regarding potential hazards	**Operation |** employee and community engagement	Number of engagement conducted	EHS Manager
60.	Inform the public and employees about different sirens that need to be aware off in case of emergency related hydrogen leaks and explosion events	**Operation |** employee and community engagement	Number of engagement and awareness conducted	EHS Manager
Impact 21: Increased traffic on C34 (Negative)				

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
• Traffic safety on C34 roads from Swakopmund up to turn off to project site • Traffic safety on the B2 road from Walvis Bay to Swakopmund – transportation of modular units of proposed green hydrogen plant				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
61.	Liaise with local traffic office to arrange for traffic coordination when abnormal loads are to be transported	**Construction |** abnormal loads transportation	Memorandum of understanding with local traffic office	EHS Manager
62.	Liaise with local traffic to coordinate traffic on the C34 road when it become necessary in future (short-term); and apply from Traffic Office/Municipality for installation of traffic lights at the turn off to project site	**Operation |** traffic flow from/to project site	Memorandum of understanding with local traffic office	EHS Manager
63.	Traffic management plan	**Construction & Operation |**	Plan developed and approved	EHS Manager
<u>Impact 22: New skills or improved capacity for local emergency response (Positive)</u> • New hazard (bulk hydrogen and oxygen storage) require upgrade of local skills in the field of emergency response – a long term benefit despite short-term negative impact of cost implication • Upgrade of emergency response capacity – a long term benefit despite a short-term negative impact of cost implication				
Rating Before Mitigation	***M***			
Rating After Mitigation	***H***			
64.	Build in-house capacity for emergency preparedness and response to onsite hydrogen related emergencies	**Operation |** capacity building	Emergency team and training records	EHS Manager
65.	Extend this upgraded skill to the local emergency response team through collaborated upskill training to handle hydrogen related emergencies	**Operation |** capacity building within community	Identification of local teams and completion of training	EHS Manager

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
66.	Conduct joint regular emergency drills	**Operation |** capacity building within community	Number of drills compliance to schedule and type	EHS Manager
Impact 23: Disturbance and or damage to objects/sites of cultural and heritage significance (Negative) • Uncover potential cultural or heritage sites especially underneath ground in and around the project site • Impact on cultural value of the land				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
67.	Develop and maintain a heritage and cultural discovery register	**Construction |** Excavation and site preparation	Heritage Register	EHS Manager
68.	Develop an internal procedure for reporting object, place or site of potential heritage cultural value	**Construction |** excavation and site preparation	Heritage and Culture Reporting Procedure	EHS Manager
Impact 24: Future local tourism attraction (Positive) • Green hydrogen and oxygen plant as new technology present future attraction for local tourism • New attraction spot for academic visitation purpose (e.g. school tours)				
Rating Before Mitigation	***M***			
Rating After Mitigation	***H***			
69.	Explore option to promote the facility as new tourism attraction in town to add to places like aquarium, jetty, museum – adopt initiative such as "Hydrogen Open Day Tour" for interested community members to register and visit the plant	**Operation |** empower community with new knowledge and awareness	Open visit program launched, thereafter number of visit recorded	EHS Manager
70.	Extend the above to school as an initiative to boost learners confident to choose hydrogen related careers	**Operation |** empower community with new knowledge and awareness	Number of school visit	EHS Manager

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
Impact 25: Conflicting land uses from a regulatory perceptive • Proposed project site boundary potentially intercept with boundaries of existing mining license • There is existing exploration license running through the project site • Other existing agreements regarding land-use				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
71.	Avoid mining license area as first preferred option and only alternative option obtain auxiliary permit for servitude (e.g. seawater pipeline route) in consultation with responsible regulatory authority (i.e. Mines and Energy)	**Construction |** seawater pipeline mapping and installation	Zero boundary encroachment, approved servitude	EHS Manager
72.	Maintain good communication with adjacent land owners and explore opportunity for collaboration	**Construction & Operation |** stakeholder engagement	Records of engagement include zero complaints	EHS Manager
Impact 26: Required permits (show stoppers – Negative) • Potential required servitude for pipeline construction through mining area – ML66E-L • Abstraction of sea water regulated under the current Water Resources Management Act 2013 • Authorization required to cut cross the C34 Road and Namwater bulk pipeline by the seawater pipeline				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
73.	Where necessary, engage owner of ML66E-L for consent and formally apply for auxiliary permit for servitude	**Construction |** seawater pipeline route actual mapping	Authorization granted	EHS Manager
74.	Apply for abstraction permit for seawater or obtain regulatory clarification from Department of Water Affairs	**Construction |** seawater pipeline route actual mapping	Authorization granted	EHS Manager
75.	Engage and obtain authorization from Road Authority for seawater pipeline crossing of C34	**Construction |** seawater pipeline route actual mapping	Authorization granted	EHS Manager

No.	Management Action	Project Phase | Activity	Indicator | Result	Responsibility
76.	Engage and obtain authorization to intercept with Namwater Bulk Pipeline	**Construction |** seawater pipeline route actual mapping	Authorization granted	EHS Manager
<u>Impact 27: Cumulative Negative impacts in relation to another proposed similar project</u> • Habitant destruction in particular from multiple seawater bulk pipeline from sea to these two project sites • Increased Safety hazards of bulk storage of hydrogen • Traffic increase on C34 • Impact on cultural and heritage • Increased pressure on the capacity of municipal services				
Rating Before Mitigation	***M***			
Rating After Mitigation	***L***			
77.	Engage the developer of second project and identify opportunities for collaboration (e.g. construction one seawater pipeline and abstraction unit and pipeline only split into two lines at junction to respective plants – share construction and maintenance cost	**Construction |** seawater abstraction and piping to project site	Conversation initiated and memorandum of understanding /commitment	General Manager
<u>Impact 28: Cumulative Positive impacts in relation to another similar proposed project</u> • Enhanced investment in local economy and improving livelihood through business opportunities and job creations				
Rating Before Mitigation	***H***			
Rating After Mitigation	***H***			
78.	Develop hydrogen sector standards for enhance positive impacts associated with the sector	**Construction & Operation |**	Approved sector standard	General Manager
79.	Implement the standard	**Construction & Operation |**	100% compliance	General Manager
80.	Establish a joint committee or independent review committee to assess compliance with hydrogen sector standard	**Construction & Operation |**	100% compliance audit	General Manager

6. STAKEHOLDER ENGAGEMENT PLAN

The stakeholders of Odula Green Hydrogen and Oxygen Plant which are presently identified as well as those that will be continuously identified (in future) are diverse in nature. To ensure that all stakeholders are kept informed about the progress of the project, there is a need to develop a stakeholder engagement plan (SEP) to be used in maintaining good communication with all stakeholders.

The immediate stakeholders to be considered in the SEP include the following:

- Current and future industrial neighbours (i.e. adjacent land users)
- Swakopmund Municipality (relevant departments: Environment, Engineering Services)
- Emergency services
- Nearby residents
- Regulators: Office of Environmental Commissioner, Ministry of Industrialisation, Mines and Energy, Officer of Labour Commissioner, Ministry of Agriculture Fisheries Water and Land Reform – Department of Water Affairs

Embedded in the SEP, is an engagement strategy which defines the needs for engagement, the frequency of engagement and the content of engagement.

A **complaint and/ grievance register** shall be established and maintained throughout the project life cycle - to record all the complaints received with various stakeholders and how these were resolved. An action tracker should also be developed to follow-through the unresolved issues till their closure within specified time and assigned responsibility.

The SEP is subject to scheduled reviews to ensure its continued relevance and validity.

7. MONITORING AND REPORTING PLAN

Once Environmental Clearance Certificate (ECC) is issued / granted, this environmental management plan automatically become a legally binding document. This implies that the recommended mitigation and enhancement measures (actions) ought to be adequately implemented as per indicated schedules (i.e. during construction, operation or closure).

Further it is a common condition of the ECC that the proponent is expected to set environmental and social performance targets which need to be tracked and for the purpose of identifying and implementing further improvements.

It is then against this background that monitoring and reporting plan need to be established and implemented. Establishment of monitoring plan involves and include setting the following aspects:

- Parameter
- Key Performance Indicator (Target)
- Standards or threshold
- Frequency
- Reporting

Below are recommended and non-exclusive monitoring parameters

Environmental parameters

- Biodiversity mortality (number of dead animals)
- Water intensity Water consumption (m^3/kg H_2)
- Waste recycled (%)
- Air quality (PM10 and PM2.5)
- Noise level (number of exceedance)
- Carbon reduction reporting

Socio economic parameters

- Number of local people employed
- Number of local contractor appointed

Health and safety parameters

- Lost Time Injury Frequency Rate (LTIFR)
- Number of First Aid cases
- Number of Near-Miss report and investigated

Social license related parameters

- Number of grievances resolved

Regulatory permits and license validity

- % validity of required permits and licenses
- % expired permit and renewal application submitted

Lastly, the data generated from the monitoring program is to be analysed, verified and various performance reports will be compiled for submission to the relevant stakeholders and purposes:

- Quarterly Performance Report – internal report for management review and action
- Bi-annual Performance Report – external report for regulator review and feedback

8. EMERGENCY PREPAREDNESS AND RESPONSE PLAN

The critical hazard of proposed hydrogen and oxygen plant is the bulk storage of hydrogen gas. Therefore it is recommended that a thorough emergency preparedness and response plan must be developed to guide and manage the following potential incidents and required response:

- Hydrogen leak response
- Fire/explosion response
- Chemical spill response
- Evacuation procedure

Emergency preparedness and response plan shall have a map for stakeholders (involved parties) and clear communication protocol.

9. DECOMMISSIONING PLAN

At this stage, it is not the intention of proponent to allocate life of plant for the proposed green hydrogen and oxygen production, but that the project will continue indefinitely focusing on production and preventative maintenance.

However the need for decommissioning the plant should become imminent, then a decommissioning plan shall be developed to ensure the following closure objectives are achieved:

- Safe dismantling
- Hazardous material removal
- Waste disposal
- Site restoration

It is also a default assumption, that the design and construction strategies incorporate the closure aspects to ensure smooth development and implementation of closure plan.

10. BUDGET COMMITMENT FOR ESMP IMPLEMENTATION

ISO14001:2015 recommends that leadership and/management must allocate adequate resources to ensure the implementation of environmental and social management system and achievement of performance objectives. This further extends to the implementation of this environmental management plan as a whole.

It is therefore recommended that management of Odula Hydrogen (Pty) Ltd approve and allocate financial resources specifically for the implementation of this ESMP. And that this becomes part of the annual budget to cover the following budgetary items:

- Environmental monitoring costs
- Social development initiatives costs
- Training costs
- Emergency preparedness costs
- Reporting and auditing costs

11.CONCLUSION AND RECOMMENDATION

This draft ESMP for a green hydrogen and oxygen production plant generally concludes that, while the project involves establishment of industrial-scale infrastructure within Swakopmund – one of the known tourist destination in Namibia, the project is equally very crucial for Namibia's transition to a sustainable, low-carbon economy which is being currently driven by the National Green Hydrogen Strategy with overall annual production target of 12 million tons of hydrogen by year 2050. The project is equally aligned and directly contributing to the realization of the Namibia dream of Vision 2030. The project also aligns well with national commitments toward achieving the UN Sustainable Development Goals such as affordable and clean energy, climate action among others.

The ESMP outlines the following project benefits and risks which come also come with recommended mitigation measures:

- **Environmental and Social Impact Mitigation:** Successful implementation of the recommended management actions ensures that the potential negative impacts on the biophysical environment such as biodiversity disturbance, water consumption, dust emission, waste generation among others can be reduced to acceptable, low levels.

- **Socio-Economic Benefits:** The project is recognised to have significant potential for economic growth, employment creation, local procurement, and technical skill transfer, which align with Namibia's National Development Plan (NDP6) and Vision 2030.

- **Suitability of Site:** The proposed project site is within a municipal land currently zoned as light-industrial area. The site is found to be suitable due to availability of solar and reasonable safe proximity to the sea which allows smooth sourcing of seawater for desalination component of the plant. The fact that the site is currently undeveloped, this create flexibility for creation of buffer zones around the plant – enhances capacity to manage hydrogen related hazards and risks. The suitability is

also influenced by the high-level assessment outcome of alternative site which fall within Dorob National Park which is a more sensitive area.

Two specialist studies are identified namely on the **impact assessment of marine ecology and coastal birds** as well as **detailed risk assessment for storage of hydrogen gas** which pose a critical risk for both employees and public. However it is recommended (as per industry practice) that the latter study require detailed and final plant design (design for construction) which is currently not available, therefore it is further recommended that this specialist study be part of the license condition to be completed before project commences.

Hence, this ESMP recommend that the Environmental Commissioner grant permission to finalize ESIA process on the basis of completing the outstanding marine ecology and coastal birds study.

End.