ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Naruchas 20 MW Solar Photovoltaic Power Plant

Farm Naruchas, Rehoboth Townlands Interface, Hardap Region, Namibia

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Table of Contents

Executive Summary – Environmental Management Plan (EMP)

This Environmental Management Plan (EMP) provides the practical and enforceable framework for managing environmental and social risks associated with the proposed Naruchas 20 MW Solar Photovoltaic Power Plant to be developed by JCM Power Corporation on Farm Naruchas at the interface with the Rehoboth Townlands in the Hardap Region of Namibia. The EMP is designed to ensure that the project is constructed, operated, and ultimately decommissioned in compliance with applicable Namibian legal requirements and authorisation conditions, while applying disciplined mitigation and monitoring measures to prevent pollution, control nuisance effects, protect sensitive receptors, and rehabilitate disturbance to stable post-project conditions.

The EMP applies to all project activities within the approved footprint and associated infrastructure, including the PV array field, mounting structures, inverter stations, transformers, internal electrical reticulation, medium-voltage connection works, and the interface with the Naruchas substation interconnection point. Supporting and temporary infrastructure covered by the EMP includes internal access roads, perimeter fencing and controlled access, laydown and storage areas, refuelling and hazardous storage areas, waste storage and handling areas, stormwater and erosion controls, and any construction camp or temporary facilities used during mobilisation and construction. The indicative project footprint is approximately 50 hectares (±0.5 km²), subject to final engineering design and micro-siting. The EMP is applicable across all lifecycle phases—pre-construction and mobilisation, construction, operations and maintenance, and decommissioning and closure—ensuring continuity of management and accountability throughout the project.

The EMP is aligned with Namibia's Environmental Management Act, 2007 (Act No. 7 of 2007) and the Environmental Impact Assessment Regulations, 2012 (GN 30–32), and incorporates relevant legal requirements relating to public health and sanitation, labour and working conditions, traffic and access management, and water protection, as applicable. Where lender or stakeholder expectations require, the EMP is also consistent with good international industry practice, including the IFC Performance Standards (PS1–PS8), the World Bank Group Environmental, Health and Safety Guidelines, and ISO 14001 principles for management systems and continual improvement.

Key risks addressed by the EMP include unnecessary footprint disturbance and habitat loss, soil compaction and topsoil degradation, erosion and sediment mobilisation during storm events, dust and noise nuisance, pollution from spills or inadequate waste management, fauna entrapment in open trenches, community health and safety risks linked to construction traffic and unauthorised access, and potential chance-finds of heritage resources during earthworks. These risks are managed through the mitigation hierarchy, prioritising avoidance via footprint discipline and no-go zones, minimisation via method statements and operational controls, and restoration through progressive rehabilitation and verified reinstatement at demobilisation and closure. Core measures include strict site demarcation and route control, buffers to drainage features, topsoil segregation and protection, early stormwater and erosion control installation with mandatory post-rainfall inspections, speed limits and dust suppression, bunded storage and controlled refuelling practices, systematic waste segregation with licensed disposal supported by manifests and certificates, trench management procedures that protect fauna, fire prevention and emergency readiness, and a robust heritage chance-find procedure supported by workforce training.

Implementation of the EMP is enabled through defined roles, responsibilities, and governance arrangements. JCM Power retains overall accountability for EMP compliance and performance, while the EPC contractor is responsible for day-to-day implementation and subcontractor management. An independent Environmental Control Officer (ECO) provides oversight through inspections and audits, and a contractor-appointed Site Environmental Officer (SEO) ensures routine site controls, recordkeeping, and workforce awareness. Monitoring and verification requirements are consolidated in the Mitigation & Monitoring Table (Annexure MM-01), which functions as the compliance backbone of the EMP by specifying indicators, responsibilities, monitoring frequencies, and required evidence across all phases. The EMP requires systematic recordkeeping—covering waste manifests and disposal certificates, spill registers and incident reports, stormwater and erosion inspection logs, training registers, grievances, and rehabilitation completion records—to demonstrate compliance and support transparent reporting to JCM Power and the competent authority, while recognising the Rehoboth jurisdiction context and associated stakeholder expectations.

In conclusion, this EMP provides a comprehensive and auditable framework to manage environmental and social aspects of the Naruchas 20 MW Solar Power Plant in the Hardap Region. Through disciplined footprint control, robust pollution prevention, proactive stormwater and erosion management, effective labour and community safeguards, and verified

rehabilitation and closure planning, the EMP ensures that project benefits can be realised while maintaining compliance and protecting environmental and social receptors throughout the project lifecycle.

1. Purpose and Scope

1.1 Purpose

This Environmental Management Plan (EMP) provides the practical and enforceable framework for managing environmental and social risks associated with the Naruchas 20 MW Solar Photovoltaic Power Plant to be developed by JCM Power Corporation on Farm Naruchas, at the interface with the Rehoboth Townlands in the Hardap Region. The EMP translates the commitments made during the environmental assessment and scoping process into clear operational requirements and performance standards that must be implemented by the EPC contractor and the operator. It defines mitigation measures, monitoring requirements, roles and responsibilities, and compliance mechanisms to ensure that impacts are avoided where feasible, minimised where unavoidable, controlled through disciplined site management, and rehabilitated to stable post-disturbance conditions. The EMP is intended to support regulatory compliance and to provide an auditable management tool that enables verification of performance by JCM Power, the Environmental Control Officer (ECO), and relevant authorities throughout the project lifecycle.

1.2 Scope

This EMP applies to all project activities within the approved project footprint and associated infrastructure required to construct, operate, and decommission the facility. The scope includes the PV array field and associated infrastructure such as mounting structures, PV modules, inverter stations, transformers, and internal electrical reticulation. It also includes all works associated with the substation interface and grid connection, including medium-voltage cabling and tie-in works to the Naruchas substation interconnection point. The EMP governs all internal access roads, laydown and storage areas, temporary construction facilities, and any construction camp (if required), as well as storage yards and any batching or concrete works where applicable. In addition, it covers water supply and use, sanitation, waste management (general and hazardous), hazardous substances and fuel handling, stormwater and erosion control measures, and progressive and final rehabilitation. The EMP applies to all personnel and subcontractors operating on the site and remains applicable to ancillary activities that may occur off-site where these are directly attributable to project execution (e.g., transport, waste disposal chain-of-custody, and interface with public roads near Rehoboth).

1.3 Applicable Phases

The EMP is applicable across all phases of the Naruchas 20 MW project. During pre-construction and mobilisation, the EMP focuses on readiness requirements including appointment of environmental personnel, approval of method statements, stakeholder interface protocols, footprint demarcation, induction, and establishment of site systems for waste, fuels, emergency response, and grievance management. During construction, the EMP governs all disturbance-related and pollution-related controls such as clearing, earthworks, traffic, dust and noise management, stormwater and erosion controls, hazardous materials handling, waste management, worker welfare, community health and safety, and heritage chance-find procedures. During operations and maintenance, the EMP applies to ongoing management of stormwater systems, vegetation control, waste and hazardous materials from maintenance, security and access control, emergency preparedness, and periodic auditing. During decommissioning and closure, the EMP sets out requirements for safe dismantling, compliant management of waste streams (including e-waste), reinstatement of landforms and drainage, rehabilitation success verification, and closure audit reporting.

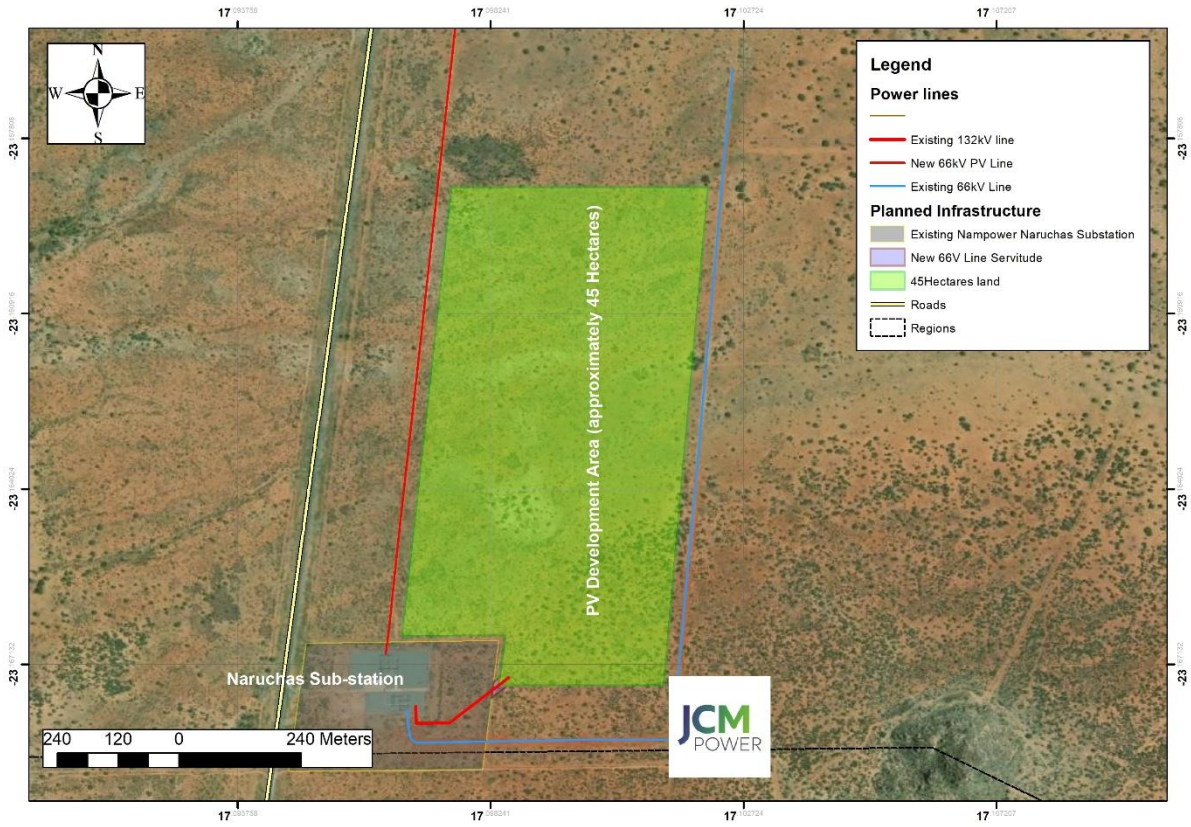

Figure 1. Location Map for the 20MW Naruchas Solar power plant in close proximity to Rehoboth.

2. Policy, Legal and Standards Framework

2.1 Namibian Legal Framework

This EMP is prepared to demonstrate compliance with Namibia's environmental management and permitting framework and to support implementation of the Naruchas 20 MW Solar Power Plant in the Hardap Region in accordance with applicable authorisations and conditions. The EMP aligns with the Environmental Management Act, 2007 (Act No. 7 of 2007) and the Environmental Impact Assessment Regulations, 2012 (GN 30–32), which establish requirements for environmental authorisation, public participation, implementation of mitigation measures, and monitoring and reporting. Provisions relevant to public health and sanitation—including waste handling, hygiene, and management of nuisances—are addressed in line with applicable requirements and local arrangements. Labour and working conditions are governed in terms of the Labour Act, including protections for worker welfare, non-discrimination, and access to grievance mechanisms. Traffic management and access control measures are designed to comply with applicable roads legislation and local authority by-laws, particularly where construction traffic interfaces with the B1 and local roads and where activities may affect road users and communities in and around Rehoboth. Water sourcing and protection measures are addressed in a manner consistent with relevant provisions of the Water Act and any applicable permits or approvals, ensuring that water is lawfully sourced, used efficiently, and protected from contamination.

2.2 International Good Practice

Where financing arrangements or stakeholder expectations require alignment with international standards, this EMP is designed to be consistent with Good International Industry Practice (GIIP). In such cases, the EMP aligns with the IFC Performance Standards (PS1–PS8), including requirements for risk-based management systems, labour and working conditions, community health and safety, biodiversity conservation, and cultural heritage protection (including chance-find protocols). The EMP also reflects the intent of the World Bank Group Environmental, Health and Safety (EHS) Guidelines—particularly the General EHS Guidelines and relevant guidance for electrical infrastructure—by incorporating controls for pollution prevention, occupational health and safety, emergency preparedness, and traffic management. ISO 14001 principles are applied to structure the EMP as a management system

with defined responsibilities, operational controls, monitoring and auditing, corrective actions, and continual improvement throughout construction and operations.

3. Project Description

3.1 Key Components

The Naruchas 20 MW Solar Photovoltaic Power Plant is a utility-scale PV generation facility to be developed by JCM Power Corporation on Farm Naruchas at the interface with the Rehoboth Townlands in the Hardap Region. The project will occupy an indicative footprint of approximately 50 hectares (±0.5 km²), subject to confirmation through the final engineering layout and micro-siting. The facility will comprise PV modules mounted on suitable support structures (fixed-tilt or tracking, as applicable), inverter stations and transformers for conversion and step-up of power, and internal electrical reticulation connecting PV strings to the site's electrical collection system. The project includes the medium-voltage connection infrastructure required to deliver power to the Naruchas substation interconnection point, including cabling, protection systems, and interface works as required by the grid operator. Supporting infrastructure will include internal access roads, perimeter fencing and controlled access points for security and safety, and stormwater drainage features designed to maintain drainage integrity and prevent erosion. Temporary construction infrastructure may include laydown and storage areas, temporary site offices and ablutions, and where necessary a construction camp and associated service areas, all of which fall under this EMP.

3.2 Construction Activities

Construction will typically commence with surveying, pegging, and demarcation of the approved footprint and all ancillary areas, including designated access routes, laydown areas, storage areas, refuelling zones, waste storage points, and no-go zones (including buffers to drainage features). Vegetation clearance, where required, will be undertaken in a controlled and minimal manner strictly within the demarcated footprint, followed by topsoil stripping and stockpiling only where earthworks and foundation installation necessitate it. Earthworks will include formation and stabilisation of access roads, preparation of equipment pads and working surfaces, and installation of stormwater controls early to reduce erosion risk. Foundation works may involve piling or other suitable methods depending on geotechnical conditions, after which PV mounting structures and modules will be installed. Electrical works will include trenching

and cabling, installation of inverters and transformers, and completion of the medium-voltage reticulation and substation interface. Commissioning and testing will then be undertaken to verify electrical performance and safety compliance, followed by demobilisation of temporary works and completion of progressive rehabilitation to stabilise disturbed areas and reinstate drainage function.

4. Environmental and Social Baseline Summary

The EMP-level baseline highlights the key environmental and social sensitivities relevant to the Naruchas project location on Farm Naruchas at the interface with the Rehoboth Townlands in the Hardap Region, and it provides the rationale for the controls defined in this EMP. The local climate and wind regime can drive dust generation during dry periods and can influence the effectiveness of dust suppression, while episodic storm events may result in rapid runoff and increased erosion risk; accordingly, the EMP prioritises speed control, dust management, early stormwater measures, and post-rainfall inspections. Topography and drainage are typically characterised by subtle gradients and ephemeral drainage features that concentrate flow during rainfall events; these conditions require careful maintenance of natural flow paths, protection of drainage buffers, and installation of stable cross-drainage structures where internal roads intersect runoff pathways. Soil characteristics, including erodibility, compaction sensitivity, and topsoil depth, influence rehabilitation success and long-term stability; the EMP therefore emphasises topsoil segregation and protection, controlled trafficking, decompaction, and progressive rehabilitation to prevent persistent degradation.

Biodiversity considerations focus on the presence of habitat types within and adjacent to the footprint and the potential for protected species or sensitive ecological features; the EMP responds through strict footprint control, prohibition of hunting and resource collection, trench management to prevent fauna entrapment, and measures to prevent introduction or spread of invasive species via vehicles and disturbance. Land use in the surrounding area may include grazing and other rural land uses, and the site's proximity to Rehoboth and associated infrastructure creates a receptor context in which traffic, dust, and safety require heightened management; the EMP therefore includes traffic controls, access management, and a functional grievance mechanism. Community and receptor sensitivity is addressed by focusing on public road users, nearby land users, and workers, with controls for road safety, nuisance management, worker conduct, and consistent engagement through the Rehoboth Town Council and Hardap

Regional Council jurisdictional context. Heritage sensitivity is managed through recognition that archaeological materials or graves could be encountered during excavations; the EMP therefore includes a defensible chance-find procedure, stop-work controls, and workforce awareness training to ensure that heritage resources are protected if discovered.

5. Impact Pathways and Management Philosophy

5.1 Impact Pathways

The environmental and social impacts associated with the Naruchas 20 MW Solar Power Plant arise through a defined set of "impact pathways" that link project activities to receptors via physical, biological, and social mechanisms. During construction, the primary pathway is direct disturbance from footprint establishment, clearing, grading, trenching, and traffic movement, which can result in vegetation loss, habitat fragmentation, soil compaction, and altered surface conditions. A second major pathway is erosion and sediment transport, where exposed soils and modified drainage patterns can concentrate runoff during storm events, mobilising sediments into nearby drainage features and causing localised gullying, instability of access roads, or off-site sedimentation. A third pathway relates to pollution and nuisance, including dust generation from earthworks and vehicle traffic, noise from machinery, and potential contamination from fuels, oils, concrete wash water (if relevant), and poorly managed waste. These impacts can affect both environmental receptors (soil and water quality, vegetation health, fauna) and human receptors (road users, adjacent land users, and workers). Additional pathways include occupational health and safety risks associated with heavy equipment, working at height, excavations, and high-voltage electrical works—particularly in proximity to the substation interface—where inadequate controls can lead to serious injury or fatality. Social impacts may occur through community interaction and access-related risks, such as increased traffic volumes, unauthorised site entry, theft or vandalism, and potential conflicts with land users if boundaries, access routes, or behaviour standards are not properly managed. In the unlikely event that heritage resources are present within the disturbance area, chance-find impacts may occur during excavations, trenching, or grading, requiring immediate stop-work controls to avoid irreversible loss. During operations, impact pathways generally reduce in intensity but continue through routine access and maintenance, stormwater system performance, vegetation management, handling of oils and lubricants, security operations, and the management of waste streams from maintenance activities. During decommissioning, pathways can re-intensify temporarily through dismantling, increased traffic, bulk waste handling, and civil reinstatement activities, making disciplined waste chain-of-custody, spill prevention, and rehabilitation quality critical to achieving closure objectives.

5.2 Mitigation Hierarchy and Management Philosophy

The EMP is grounded in the mitigation hierarchy of avoidance, minimisation, restoration/rehabilitation, and—only where necessary—offsetting, applied in a manner consistent with Namibian legal requirements and good international industry practice. Avoidance is implemented primarily through site design controls and footprint discipline, including demarcation of approved work areas, establishment of no-go zones, and protection of drainage buffers and any sensitive features identified during pre-start walkdowns. Where avoidance is not feasible, impacts are minimised through operational controls such as controlled clearing, topsoil segregation, erosion and stormwater measures, speed limits, dust suppression, noise management, and disciplined hazardous materials handling. The EMP's philosophy is that mitigation must be embedded into routine work practices through approved method statements, inductions, supervision, and measurable monitoring indicators, rather than treated as an afterthought. Restoration and rehabilitation are applied progressively during construction and comprehensively during demobilisation and closure, with clear requirements for reinstating stable landforms, restoring drainage function, ripping compacted areas, re-spreading topsoil, and stabilising disturbed surfaces to reduce erosion risk. Where residual impacts remain after mitigation, the EMP requires that they be explicitly identified, evaluated, and managed through adaptive measures and, where applicable, further management commitments agreed with the competent authority. Underpinning this philosophy is a continuous improvement approach: monitoring results are reviewed routinely, non-conformances are recorded and investigated, corrective actions are implemented within defined timeframes, and recurring issues trigger changes to procedures or retraining. The EMP is therefore designed as a living management tool that converts environmental performance into auditable controls, clear accountability, and demonstrable compliance outcomes throughout the project lifecycle.

6. Roles and Responsibilities

6.1 Accountability and Governance Structure

Effective EMP implementation depends on a clear governance structure that assigns accountability at the correct levels and ensures adequate resourcing, competency, and authority to enforce controls. JCM Power, as the proponent, retains overall accountability for environmental and social performance and for ensuring that all project activities are executed in compliance with the Environmental Clearance Certificate conditions and applicable legal requirements. This accountability is operationalised through the appointment of a designated JCM Power Project Manager or Owner's Representative who has the authority to instruct the EPC contractor, allocate resources, and ensure that environmental and social obligations are integrated into procurement, contractor management, scheduling, and decision-making. The EPC contractor holds direct responsibility for implementing all day-to-day mitigation measures on site, ensuring that subcontractors comply with the EMP, and maintaining site systems—such as waste segregation, hazardous storage, stormwater control, and incident response—in a functional and auditable manner. The EMP requires that environmental controls be treated as core construction deliverables, with the same level of planning and supervision as safety and quality systems.

6.2 Environmental Control Officer (ECO) and Site Environmental Officer (SEO)

The Environmental Control Officer (ECO) provides independent oversight and assurance that EMP requirements are being implemented effectively and that compliance evidence is adequate for regulator and stakeholder review. The ECO's role typically includes conducting scheduled inspections and audits, verifying the implementation of method statements, identifying non-conformances and corrective actions, advising on improvements, and escalating material compliance issues to JCM Power where required. The ECO must have access to the site, the authority to recommend stop-work in the event of serious environmental risk, and a direct reporting line to the proponent to preserve independence. In parallel, the EPC contractor must appoint a Site Environmental Officer (SEO) who is responsible for the routine, on-site integration of the EMP into daily construction activities. The SEO conducts daily inspections, maintains registers (waste, spills, erosion, training, grievances, chance-finds), ensures that demarcation and no-go zones remain intact, coordinates toolbox talks and inductions from an

environmental perspective, and works with construction supervisors to prevent non-compliance before it occurs. Together, the ECO and SEO form the operational backbone of the EMP, providing both proactive site control and independent verification.

6.3 Health and Safety, Quality, and Contractor Supervision

Because environmental performance is closely linked to site discipline and risk management, the EMP assigns specific responsibilities to the Health and Safety Officer (HSE) and construction supervision teams. The HSE Officer ensures that occupational health and safety procedures—such as permit-to-work systems, working near live electrical infrastructure, excavation safety, traffic control, and emergency preparedness—are implemented in alignment with environmental controls, particularly where failures could cause both environmental harm and safety incidents (for example, fuel handling, spill response, fire management, and uncontrolled vehicle movements). Construction supervisors and foremen are responsible for ensuring that work crews comply with demarcations, method statements, and site rules, and that environmental requirements are integrated into daily planning, sequencing, and toolbox talks. The Quality function, where present, supports the EMP by ensuring that required documentation is controlled, revisions are managed, and records are complete and retrievable for audits, thereby enabling traceable compliance.

6.4 Operations Phase Responsibilities

During operations and maintenance, accountability transitions from the EPC contractor to the operations function under JCM Power or its appointed operator. The Operations Manager is responsible for maintaining the environmental controls relevant to routine site activities, including stormwater system upkeep, vegetation management, housekeeping, waste handling from maintenance activities, spill prevention and response for oils and lubricants, and security controls that protect the public and prevent unauthorised access. The operator must maintain a simplified but robust environmental file containing the EMP, maintenance procedures, inspection schedules, emergency contacts, and reporting templates, and must ensure that staff and service providers working on site are inducted and competent. Where periodic independent audits are required by the Environmental Clearance Certificate or lender requirements, the ECO (or a similarly qualified auditor) may be retained to provide scheduled assurance and to verify closure of corrective actions.

6.5 Individual Responsibilities, Code of Conduct, and Enforcement

All employees, subcontractors, and visitors have a duty to comply with the EMP, site rules, and instructions issued by the SEO, ECO, HSE Officer, and site management. This includes adherence to footprint controls, speed limits, waste segregation requirements, spill prevention measures, wildlife protection rules, and chance-find procedures. The EMP requires that a clear Code of Conduct be implemented and enforced, covering respectful community interaction, prohibition of hunting or collection of natural resources, responsible waste behaviour, and adherence to safety and environmental reporting requirements. Non-compliance must be addressed through a graded enforcement process—ranging from corrective instruction and retraining to disciplinary action and removal from site—depending on severity and recurrence. This enforcement mechanism is essential to ensure that environmental and social performance is not reliant on goodwill alone, but is maintained through a structured system of accountability, monitoring, and corrective action.

7. Method Statements and Contractor Deliverables

7.1 Purpose and Role of Method Statements

To ensure that the EMP is implemented consistently and in a manner that is auditable, all high-risk or high-disturbance activities for the Naruchas 20 MW Solar Power Plant must be governed by written method statements prepared by the EPC contractor and approved prior to commencement. Method statements serve as the practical link between the EMP's performance requirements and the contractor's daily construction procedures, specifying how works will be undertaken, what controls will be applied, who is responsible for implementation and supervision, what resources will be available on site, and how compliance will be verified. Method statements must be site-specific, reflect the final layout and constraints, and be written in a way that can be enforced through inspections and non-conformance management. No work may commence for an activity covered by a method statement until the relevant method statement has been reviewed and accepted by JCM Power and the Environmental Control Officer (ECO), and communicated to supervisors and work crews through induction and toolbox talks.

7.2 Minimum Method Statements (Construction)

As a minimum, the EPC contractor shall develop and submit method statements covering the following activities and controls. A method statement for site establishment and footprint control must describe demarcation procedures, signage, establishment of no-go areas, route controls, and management of laydown and storage areas, including how boundaries will be maintained and repaired if disturbed. A method statement for vegetation clearing and topsoil management must specify clearing limits, buffers to drainage features, equipment to be used, topsoil stripping triggers, separation of topsoil and subsoil, stockpile management measures, and progressive reinstatement requirements. A method statement for earthworks, stormwater management, and erosion control must describe sequencing of works, temporary and permanent drainage features, road drainage crossings, sediment control measures, inspection requirements after rainfall, and repair procedures for erosion features. A method statement for dust and traffic management must define speed limits, watering practices, haul routes, signage, driver induction requirements, management of abnormal loads, and corrective measures triggered by dust exceedances or complaints. A method statement for fuel storage, refuelling, and spill prevention/response must describe bunding standards, hazardous store requirements,

refuelling procedures, spill kit locations and contents, emergency shutdown procedures, reporting requirements, and contaminated soil handling. A method statement for waste management must establish segregation streams, container specifications, storage arrangements, collection schedules, approved disposal facilities, chain-of-custody documentation, and housekeeping responsibilities. A method statement for excavations and trenching must address open trench management, fauna escape measures, inspection schedules, backfilling procedures, and reinstatement of disturbed surfaces. Where concrete is used, a method statement for concrete works and washout management must define lined washout locations, prohibition of wash-water discharge to soil, and disposal procedures. Finally, a method statement for rehabilitation and demobilisation must specify ripping and decompaction requirements, topsoil re-spreading, re-contouring, erosion stabilisation, removal of temporary infrastructure, and completion criteria supported by photographic evidence and sign-off.

7.3 Supporting Contractor Deliverables and Management Plans

In addition to method statements, the contractor shall submit a set of supporting deliverables that enable structured implementation and verification of EMP performance. These deliverables include a Construction Environmental Management File (hard copy and/or controlled digital format) containing the EMP, approved method statements, permits and approvals, Safety Data Sheets (SDS), emergency contacts, and relevant correspondence. The contractor shall provide a site layout plan showing the final footprint, internal roads, laydown areas, fuel storage, hazardous store, waste storage, camp (if applicable), drainage features, and no-go areas. A Traffic Management Plan shall be submitted describing vehicle movements, signage, speed enforcement measures, and interaction with public roads. A Waste Management Plan shall identify waste streams, storage, transport arrangements, and disposal facilities, including commitments to provide disposal certificates and manifests. A Spill Prevention and Response Plan shall include the spill response procedure, spill kit inventory, training requirements, and reporting triggers. A Training and Induction Plan shall provide the induction content, schedule for toolbox talks, a training matrix, and recordkeeping templates. Where a camp is used, a Camp Management Plan shall cover sanitation, potable water, housekeeping, waste removal, worker welfare, and community interaction rules. If relevant, a Working Near Electrical Infrastructure Procedure (or permit-to-work integration plan) shall be provided to manage high-voltage hazards and coordination with the substation operator.

7.4 Review, Approval, and Change Control

Method statements and contractor deliverables must be treated as controlled documents. Each document shall include a version number, date, responsible author, and approval signatures. Any changes to construction methodology, layout, work sequencing, or materials that could affect environmental or social risk—such as relocation of laydown areas, changes to access routes, extended working hours, or increased water demand—must be managed through a formal Management of Change (MoC) process. Under MoC, the contractor shall submit the proposed change, assess the environmental and social implications, propose additional mitigation measures where required, and obtain written approval from JCM Power (and ECO where relevant) before implementing the change. This ensures that the EMP remains valid and that environmental performance is not undermined by unreviewed design or method changes.

7.5 Records, Reporting, and Demonstrating Compliance

The contractor shall maintain complete, auditable records demonstrating implementation of all method statements and EMP requirements. These records include induction and toolbox talk attendance registers, daily inspection checklists, waste registers and disposal certificates, spill registers and incident reports, stormwater and erosion inspection logs (including post-rainfall inspections), training matrices, grievance registers, and rehabilitation completion records supported by geotagged photographs where feasible. Weekly or monthly summary reports (as agreed with JCM Power) shall present key indicators, non-conformances, corrective actions, and trends. The ECO's inspection and audit reports provide independent confirmation of compliance and must be retained as part of the project's environmental record for regulatory and stakeholder review.

8. Management Measures

8.1 Footprint Control, Access Management, and No-Go Areas

Strict footprint control is the primary means of avoiding unnecessary disturbance and preventing secondary impacts. Prior to commencement of any earthworks or clearing, the approved project footprint, internal routes, and all ancillary areas (laydown yards, storage, refuelling areas, waste areas, parking and turning circles) shall be clearly demarcated with visible markers, fencing or tape, and signage. No-go areas—such as drainage buffers, any identified sensitive vegetation patches, and areas outside the authorised footprint—shall be marked in the field and incorporated into inductions, toolbox talks, and daily pre-task briefings. Vehicle movement shall be restricted to approved routes, with off-road driving prohibited except in genuine emergencies, and any emergency deviations recorded and rehabilitated. Footprint integrity shall be verified through routine inspections by the Site Environmental Officer (SEO) and independent audits by the Environmental Control Officer (ECO), with corrective actions implemented immediately where encroachment is observed. This approach ensures that avoidance is achieved by design and enforced operationally through supervision, signage, and discipline.

8.2 Vegetation Clearing and Fauna Protection

Vegetation clearing shall be minimised and limited strictly to areas necessary for safe construction and operation. Clearing shall not extend beyond pegged boundaries, and buffers shall be maintained around natural drainage lines and any sensitive features identified during the pre-clear walkdown. Clearing activities shall be sequenced to allow fauna to move away from disturbance, with personnel instructed not to harm, harass, or capture wildlife. Hunting, trapping, or collection of plants or animals is prohibited on site. Where excavations or trenches are open, the contractor shall implement fauna protection measures such as limiting open trench lengths, providing escape ramps, and conducting early-morning checks to prevent entrapment. Any incident involving injury or mortality of fauna shall be recorded, investigated, and used to strengthen site controls. By applying disciplined clearing and active fauna protection, the project reduces habitat impacts and ensures compliance with biodiversity-related commitments.

8.3 Soil Conservation, Topsoil Handling, and Rehabilitation Readiness

Soil is a critical resource for successful rehabilitation and long-term site stability. Topsoil stripping shall only occur where necessary and shall be done in a manner that preserves soil structure and seed banks where feasible. Topsoil shall be stockpiled separately from subsoil and protected from erosion and contamination by fuels, cement wash water, or waste. Stockpiles shall be placed away from drainage pathways, shaped to stable profiles, and managed to reduce wind and water erosion. Compaction shall be minimised through controlled vehicle movements and avoidance of unnecessary trafficking of undisturbed areas. Rehabilitation shall be implemented progressively throughout construction, including ripping or decompaction of compacted surfaces, re-spreading of topsoil, re-contouring to stable landform, and reinstatement of natural drainage patterns. Rehabilitation quality and completeness shall be verified through inspections and photographic records, with any failure—such as ongoing erosion, rutting, or unstable drainage—triggering corrective works.

8.4 Stormwater Management, Drainage Integrity, and Erosion Control

The EMP requires that the project maintain drainage integrity and prevent erosion and sediment transport both during and after construction. Works must be planned and sequenced so that stormwater controls are installed early, particularly where access roads and pads may intercept natural runoff. Natural drainage lines shall not be blocked, diverted, or infilled without approved design measures that maintain equivalent flow capacity and stability. Where roads intersect flow paths, appropriate cross-drainage features shall be installed, and disturbed surfaces shall be stabilised to prevent scouring. Temporary measures, such as berms, cut-off drains, check dams, or sediment traps, shall be used where required to manage runoff during construction. Routine inspections shall be conducted, with mandatory inspections after rainfall events, and any evidence of gully formation, sediment movement, or blocked drainage shall be addressed promptly. This approach reduces the risk of downstream sedimentation, protects infrastructure integrity, and ensures the site remains stable under storm conditions.

8.5 Dust and Air Quality Management

Dust management is essential to reduce nuisance impacts, protect worker health, and maintain safe visibility on site. Dust suppression measures shall include enforced speed limits, strategic watering of haul roads and active work areas when required, and the covering or securing of dusty loads during transport. Dust suppression must be applied responsibly to avoid creating runoff or contributing to erosion, and water use shall be managed efficiently to prevent

unnecessary abstraction. Earthworks and clearing activities should be scheduled to avoid peak wind conditions where practicable, and equipment and road surfaces should be maintained to reduce dust generation at source. Dust conditions shall be monitored through routine visual observations, records of watering activities, and tracking of any complaints. Where dust becomes excessive or complaints are received, the contractor shall implement immediate corrective actions, including additional watering, traffic restrictions, or temporary suspension of high-dust activities until conditions are controlled.

8.6 Noise Management

Noise sources during construction typically include earthmoving equipment, vehicles, generators (if used), and mechanical works. Noise shall be managed through equipment maintenance, proper mufflers and silencers, minimisation of idling, and restriction of high-noise activities to daytime hours where feasible. Where work must occur outside normal hours for technical or safety reasons, affected stakeholders shall be notified in advance where appropriate, and additional controls shall be considered. Worker exposure to high noise levels shall be managed through task-based risk assessments, provision of hearing protection, and supervision to ensure correct PPE use. Noise-related complaints shall be recorded, investigated, and addressed through adaptive measures. During operations, noise is generally low; however, maintenance activities shall still follow the same principles of equipment maintenance and considerate scheduling.

8.7 Waste Management (General and Hazardous)

Waste management shall be implemented using the waste hierarchy: prevent, reduce, reuse, recycle, and dispose. The site shall provide labelled and covered receptacles for waste segregation, including general waste, recyclables, scrap metal, and hazardous wastes such as oily rags, filters, contaminated absorbents, and chemical containers. Waste shall be stored securely to prevent windblown litter and wildlife scavenging, and no waste may be burned or buried on site. Hazardous waste shall be stored in a bunded and controlled area with clear labelling and Safety Data Sheets available. Disposal shall only occur through authorised transporters and licensed disposal facilities, and the contractor shall retain disposal certificates, manifests, and weighbridge slips as proof of compliance. Housekeeping shall be treated as a daily operational requirement, with routine inspections and corrective actions where litter or

improper storage is observed. Waste performance shall be reported periodically to JCM Power and verified through ECO audits.

8.8 Hazardous Substances, Fuels, and Spill Prevention and Response

The handling of fuels, oils, and chemicals presents one of the most significant pollution pathways if not tightly controlled. Fuel storage must be bunded to appropriate capacity, secured, and clearly signed, and refuelling shall take place only in designated areas using drip trays and appropriate supervision. Spill kits shall be available at all refuelling points and within service vehicles, and staff shall be trained in spill response procedures. In the event of a spill, the priority is to stop the source, contain the spill, prevent migration toward drainage lines, and recover contaminated material for appropriate disposal. Contaminated soils shall be excavated where necessary, stored as hazardous waste, and disposed of through authorised pathways. All spills, including minor spills, shall be recorded in a spill register, investigated to identify root causes, and followed by corrective actions to prevent recurrence. Where incidents meet reporting thresholds or trigger conditions under regulatory approvals, they shall be reported to the competent authority in accordance with permit requirements.

8.9 Water Use, Sanitation, and Water Quality Protection

Water use during construction is typically associated with dust suppression, concrete works (if applicable), and workforce needs. Water shall be sourced from authorised supplies, and consumption shall be managed to avoid wastage. Sanitation facilities shall be adequate for workforce numbers and maintained through a formal servicing schedule, with service records retained. Open defecation is prohibited. Greywater and wash water shall be controlled to prevent ponding, odours, or contamination, and no contaminated water may be discharged into drainage features. Where concrete works occur, cement washout shall be contained in lined washout areas, and wash water shall not be released to soil. Routine inspections of water storage and sanitation areas shall be conducted to ensure hygiene and compliance, and any failures shall trigger immediate rectification.

8.10 Community Health and Safety, Security, and Grievance Management

The project shall implement measures to protect community health and safety, particularly where construction traffic interfaces with public roads or where unauthorised access could

create safety risks. Perimeter fencing, signage, and controlled entry points shall be maintained to reduce the likelihood of trespass, theft, or injury. Traffic controls and driver behaviour requirements shall be enforced to protect other road users and nearby land users. The project shall maintain an accessible grievance mechanism that enables stakeholders to raise concerns and receive responses within defined timeframes. All grievances shall be recorded, investigated, and closed out with documented actions and feedback to the complainant where contact details are available. Community-facing communications should be respectful, consistent, and coordinated through JCM Power, with worker conduct managed through a Code of Conduct and disciplinary procedures where necessary.

8.11 Cultural Heritage (Chance-Find Procedure)

Although solar projects typically have limited excavation depths, earthworks, trenching, and foundation installation can expose heritage materials unexpectedly. The EMP requires a clear chance-find procedure: if any suspected archaeological artefacts, palaeontological material, or graves are encountered, work must stop immediately in the affected area, the area must be cordoned off, and the ECO must be notified without delay. No artefacts may be removed or disturbed. The ECO will advise on notification to the appropriate heritage authority and on the conditions under which work may resume. Workers shall be trained on chance-find awareness during induction so that potential finds are recognised and reported promptly. This procedure is essential to prevent irreversible heritage loss and to ensure compliance with applicable heritage requirements.

8.12 Fire Prevention and Emergency Preparedness

Fire prevention is addressed through controlled site behaviour, appropriate equipment, and emergency readiness. Open fires are prohibited except where explicitly authorised and controlled. Hot work activities, if any, must be managed through a permit system and appropriate fire watches. Fire extinguishers shall be available, correctly rated, and inspected regularly, with servicing records retained. Vegetation management and housekeeping reduce fuel loads, and emergency access routes and muster points shall be established and communicated to all personnel. Emergency preparedness includes an emergency contact list, first aid capability, incident reporting procedures, and periodic drills to test readiness. Emergencies and near misses shall be recorded and investigated, with corrective actions implemented to strengthen controls.

8.13 Labour and Working Conditions

The Naruchas 20 MW Solar Power Plant will be implemented in a manner that protects worker rights, health, safety, and welfare, recognising that labour and working conditions are both a legal requirement and a core determinant of overall project performance. All workers, including subcontractors, shall be engaged under terms consistent with the Labour Act and applicable Namibian requirements, with clear written conditions of employment, fair working hours, and transparent payment arrangements. The project shall prohibit child labour and forced labour in all forms and shall apply non-discrimination principles in recruitment, remuneration, and workplace practices. Workers shall have access to a confidential and accessible grievance mechanism that enables them to raise concerns without fear of retaliation, with grievances recorded, investigated, and closed out within defined timeframes.

Occupational health and safety requirements shall be implemented through a formal HSE system integrated with environmental controls, including risk assessments, task-specific procedures, competent supervision, and provision and enforcement of appropriate personal protective equipment (PPE). Particular attention shall be given to high-risk activities typical of PV projects, including vehicle and plant movement, lifting operations, working at height, excavations and trenching, hot works, and electrical works associated with installation and substation interface activities. Fitness-for-work requirements shall be applied, including prohibition of alcohol and drug impairment on site, and fatigue management for drivers and critical tasks. Emergency preparedness measures—including first aid coverage, incident response arrangements, and access to emergency contacts—shall be established prior to commencement and maintained throughout construction and operations.

Where worker accommodation is used (construction camp or temporary facilities), minimum standards shall be applied to ensure adequate sanitation, potable water, waste removal, lighting, security, and acceptable living conditions. Ablution facilities shall be sufficient for workforce numbers and serviced according to a defined schedule, with service records retained. Housekeeping standards shall be enforced to prevent vector attraction, odours, and health hazards. Worker conduct shall be managed through a formal Code of Conduct communicated during induction and reinforced through toolbox talks, covering respectful behaviour, prohibition of harassment, prohibition of hunting or interference with wildlife, and responsible interaction with local communities. Where relevant based on workforce composition and labour influx risk, the project shall implement measures aligned with good practice on

prevention of gender-based violence and harassment, including awareness training, reporting channels, and disciplinary processes. By establishing these labour and welfare measures, the project reduces both social risk and operational disruption and supports a stable, compliant workforce capable of implementing the EMP effectively.

8.14 Operations-Specific Controls (Operations & Maintenance)

During the operations and maintenance phase, the intensity of disturbance is generally lower than during construction; however, the EMP remains applicable because key risk pathways persist and must be managed to maintain long-term environmental stability and compliance. Operations controls focus on maintaining drainage integrity, preventing pollution from oils and lubricants, managing waste streams generated by maintenance activities, controlling vegetation in a manner that avoids erosion and biodiversity impacts, ensuring site security and community safety, and sustaining emergency readiness. Routine operations activities—such as inspections, vegetation trimming, inverter and transformer servicing, periodic civil maintenance of access roads, and security patrols—shall be planned and executed using approved procedures that incorporate environmental safeguards and clear accountability.

Stormwater and erosion performance remains a primary operational control because poorly maintained drainage features can gradually degrade and create chronic erosion issues over time. The operator shall therefore inspect drains, culverts, and crossings on a defined schedule and after significant rainfall events, clearing blockages, repairing scoured areas, and reinstating stable flow paths where needed. Vegetation management shall be implemented conservatively to maintain ground cover and reduce erosion risk; clearing shall be limited to what is necessary for access, fire risk reduction, and equipment protection, and drainage buffers shall be maintained. If herbicide use is contemplated, it shall be subject to strict controls, including selection of approved products, trained applicators, wind limitations, buffer distances to drainage features, and complete recordkeeping.

Maintenance-related hazardous materials—particularly oils, greases, and any chemicals associated with electrical equipment—shall be stored in appropriate bunded containment, and maintenance tasks shall use drip trays and spill kits to prevent releases to soil. Spill response capability shall remain active throughout operations, with staff trained and spill kits maintained and inspected. Waste from operations, including general waste, scrap metal, packaging, and any hazardous waste such as oily rags or contaminated absorbents, shall be segregated, stored securely, and disposed of through authorised channels, with disposal certificates retained to

demonstrate compliance. Security controls, including perimeter fencing, signage, and controlled access, shall be maintained to prevent unauthorised entry and to protect public safety, particularly in areas near electrical infrastructure. The operator shall maintain emergency preparedness arrangements, including updated emergency contacts, available first aid, maintained fire equipment, and periodic drills. Environmental performance during operations shall be verified through scheduled internal inspections and periodic audits, with corrective actions tracked to closure to sustain continuous improvement and to prevent gradual performance decline.

Bridging Paragraph (End of Section 8) – Compliance Backbone

The management measures described in Section 8 set out the required controls by environmental and social aspect and are intended to be implemented through approved method statements, daily supervision, and disciplined recordkeeping.

Mitigation & Monitoring Table (Expanded, Detailed) – All Phases

Roles: JCM PM (Owner), EPC (Contractor), SEO (Site Environmental Officer), ECO (Independent Environmental Control Officer), HSE (Health & Safety), OM (Operations Manager), SM (Security)

A. CONSTRUCTION PHASE

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Pre-start (mobilisation readiness)	EMP implementation	Non-compliance due to poor setup	(1) Appoint SEO (contractor) and ECO (independent) before mobilisation. (2) Hold a pre-start compliance meeting (JCM, EPC, ECO) to confirm: footprint boundaries, no-go zones, method statements, emergency procedures, communication protocol, grievance channels. (3) Issue Site Environmental Rules (one-page) posted at site offices.	SEO & ECO appointed (Y/N). Pre-start minutes signed (Y/N). EMP file complete (≥95% checklist). Site rules posted (Y/N).	JCM PM, EPC, ECO	Once pre-start; weekly in first month	Appointment letters; minutes; EMP file checklist; photos

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			(4) Compile “EMP Compliance File” on-site: ECC, EMP, method statements, SDS, permits, licences, contacts.				
Method statements	Contractor controls	Mitigation not embedded into work methods	Contractor submits and obtains approval for method statements: clearing/topsoil, erosion/stormwater, refuelling/spills, waste management, traffic plan, trenching, concrete washout, working near live substation, rehab. ECO reviews for practicality and enforceability. No work begins in relevant activity until approved.	Approved method statements available on site (Y/N). Revisions tracked (Y/N).	EPC, ECO, PM SEO, JCM	Once per activity; update as needed	Approved method statements; revision log

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Induction training	& Workforce competency	Unsafe acts; environmental damage	All personnel receive induction covering: no-go zones, speed, waste rules, spill response, wildlife protection, cultural heritage chance-finds, community interaction code, grievance process, alcohol/drugs, reporting of incidents/near misses. Toolbox talks weekly; targeted training after incidents.	% inducted = 100% before start. Toolbox talks ≥1/week. Training close-outs after incidents ≤7 days.	EPC, HSE, SEO	Induction before work; toolbox weekly	Induction registers; toolbox attendance; training matrix
Site demarcation	Footprint control	Disturbance beyond approved footprint	Peg and mark footprint using high-visibility tape/fencing, signage, and GPS control points. Identify and mark: laydown areas, parking, refuelling area, hazardous store, waste area, camp (if any), drainage buffer zones. Establish “no-go” areas with clear	Footprint and all ancillary areas demarcated prior to works (Y/N). No encroachment incidents (# = 0).	EPC, SEO, ECO	Daily during setup; weekly audit	Demarcation plan; GPS points; inspection checklist; photos

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			signage and physical barriers where feasible.				
Vehicle movements	Traffic & access	Dust; road damage; accidents; off-road impacts	Implement Traffic Management Plan: speed limits (e.g., 30–40 km/h on site), driver induction, restricted routes, signage, reversing alarms, spotters, designated parking, vehicle maintenance (no oil leaks). Prohibit off-road driving except emergency with ECO/SEO notification. Restrict heavy movements to agreed times; escort abnormal loads.	Speed compliance (random checks). Off-road driving incidents (#=0). Incidents/near misses logged (100% reporting).	EPC, HSE, SEO	Daily; weekly reviews	Driver induction; vehicle logs; incident reports; photos
Vegetation clearing	Biodiversity	Habitat loss; unnecessary clearing;	(1) Minimise clearing: only within pegged footprint. (2) Pre-clear walkdown by SEO/ECO to	Cleared area ≤ approved footprint (100%).	EPC, ECO	SEO, Daily while clearing	Clearing register; GPS/photo

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
		sensitive species impact	confirm no sensitive features. (3) Maintain buffers around drainage lines/ephemeral channels. (4) Prohibit collection of wood/plants. (5) Implement fauna protection: no harassment; remove brush in staged manner to allow fauna escape. (6) If protected species encountered: stop and consult ECO; relocate only if authorised.	Buffers intact (Y/N). Fauna mortality (#=0 target).			evidence; incident log
Topsoil management	Soils	Erosion, loss of productivity, dust	Strip topsoil only where required; store separately from subsoil; place stockpiles away from drainage lines; limit height (e.g., ≤2 m); shape to stable profile; protect with berms/silt fencing where needed. Prevent	Topsoil stockpile register complete (Y/N). No contamination signs (Y/N). Stockpiles	EPC, SEO	Weekly; after rainfall	Topsoil register; photos; inspection checklist

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			contamination by fuels/waste. Reuse topsoil for progressive rehab.	protected (≥90% compliance).			
Earthworks, grading, roads	Erosion & sediment	Gully erosion; sedimentation; unstable surfaces	Avoid steep cuts/fills; follow natural contours; install erosion controls (berms, check dams, riprap where necessary). Stabilise exposed surfaces promptly (compaction control, gravel, ripping and reseeding if applicable). Progressive rehabilitation: close redundant tracks and reinstate drainage.	Post-rain erosion score within acceptable limits. Erosion features repaired within 7 days (minor) / 48 hrs (major).	EPC, ECO	SEO, After rainfall; weekly	Erosion log; corrective action register; before/after photos
Stormwater controls	Hydrology	Changed flow causing flooding/downstream impacts	Maintain natural drainage lines. Keep channels free of spoil. Use cut-off drains, cross drains, culverts where roads intersect	No blocked drains (target 0). No visible sediment	EPC, ECO	SEO, Weekly; after rainfall	Stormwater inspection sheets;

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			flow paths. Construct temporary sediment traps if runoff is turbid. Inspect immediately after storms and repair promptly.	discharge beyond site (Y/N).			maintenance log; photos
Dust (roads, trenching)	Air quality	Nuisance; visibility hazard; vegetation dusting	Dust suppression via water carts where needed; restrict speeds; schedule earthworks to avoid peak winds if feasible; cover trucks transporting fines; avoid overwatering that causes runoff/erosion; maintain safe sight distances.	Visible dust plumes controlled within 15–30 min of detection. Dust complaints = 0 target (or resolved within 48 hrs).	EPC, SEO	Daily	Dust log; watering records; complaint register
Noise	Noise	Nuisance; worker hearing risks	Maintain equipment; avoid unnecessary idling; limit high-noise works to daytime; use silencers; provide hearing protection per risk assessment;	Complaints tracked; PPE compliance rate ≥95%.	EPC, HSE, SEO	Daily checks; monthly review	PPE register; maintenance logs; complaint register

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			manage generator placement (if used).				
Fuel storage	Spills/fire	Soil/groundwater contamination; fire	Bunded storage sized to ≥110% of largest container. Locked hazardous area with signage. Spill kits available at fuel point and vehicles. Refuelling only in designated area with drip trays. Daily inspections for leaks. SDS accessible. Emergency shutdown and fire extinguishers at fuel point.	Bund intact (Y/N). Spill kits stocked (Y/N). Leaks corrected within 24 hrs.	EPC, SEO, HSE	Daily; weekly audit	Bund inspection log; spill kit checklist; SDS file; photos
Spill response	Pollution	Uncontrolled release; secondary impacts	Spill procedure: stop source, isolate area, deploy absorbents, prevent migration to drains, excavate contaminated soil if needed, store contaminated	Spill response time ≤15 min (on-site). All spills logged (100%).	EPC, SEO, ECO	As needed; monthly review	Spill register; incident reports; waste manifests

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			material as hazardous waste, notify SEO/ECO, investigate root cause, implement corrective actions. Reportable spills communicated per ECC/permit conditions.	CAPA closeout ≤14 days.			
Waste management	Waste	Litter, wildlife scavenging, pollution	Implement segregation: general, recyclables, scrap metal, hazardous. Covered bins with labels. No burning/burying. Secure storage to prevent windblown litter. Weekly waste collection schedule. Licensed disposal with certificates.	Housekeeping score ≥90%. Disposal certificates available monthly (Y/N). No litter beyond site (Y/N).	EPC, SEO	Daily housekeeping; weekly	Waste register; disposal slips; photos
Hazardous waste	Hazardous waste	Long-term contamination; legal non-compliance	Store oily rags/filters/absorbents in sealed containers within bunded hazardous store. Clearly label and	Manifests complete (100%). No leaking	EPC, SEO	Weekly; monthly reporting	Hazardous waste register;

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			record accumulation dates. Use licensed transporter and approved facility. Maintain chain-of-custody.	containers (Y/N). Storage time within agreed limits.			manifests; facility receipts
Sanitation & potable water	Public health	Disease, odours, contamination	Provide adequate toilets (ratio per workforce). Service at defined intervals; keep service records. No open defecation. Greywater controlled (soakaways or removed). Potable water supplied and stored hygienically.	Toilet servicing on schedule (≥95%). No sanitation complaints.	EPC, HSE, SEO	Weekly	Service certificates; camp inspection records
Trenching / excavations	Fauna safety	Entrapment; injury	Limit open trench length; cover overnight or install escape ramps every 25–50 m; daily inspections early morning; rescue protocol; backfill promptly.	Trench inspections daily (100%). Entrapment incidents (#=0 target).	EPC, SEO	Daily while open	Trench register; photos; biodiversity log

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Working near substation	Electrical safety	Serious injury/fatality	Permit-to-work; lockout/tagout; competent electricians only; exclusion zones; coordination with utility/substation operator; signage.	PTW compliance (100%). No unauthorised entries.	EPC, HSE, OM (if involved)	Daily	PTW logs; training certificates; incident reports
Heritage chance finds	Heritage	Damage to cultural resources	Stop work; cordon; notify ECO; notify heritage authority if required; only resume after clearance. Include chance-find training in induction.	Chance-find procedure awareness (Y/N). Correct handling (100%).	EPC, SEO, ECO	As needed	Chance-find register; photos; correspondence
Fire management	Fire	Injury; property damage; veld fires	No open fires; hot work permits; clear combustibles; maintain extinguishers; emergency drills; firebreaks if required.	Extinguisher checks weekly; drill completion (at least quarterly during construction).	EPC, HSE, SEO	Weekly; quarterly drills	Fire logs; hot work permits; drill reports

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Progressive rehabilitation	Closure readiness	Persistent disturbance; erosion	Close redundant tracks; rip compacted areas; re-contour; topsoil re-spread; stabilise slopes; remove waste; monitor after storms.	% rehab completed vs disturbance. No active erosion left untreated.	EPC, SEO, ECO	Monthly; demob	Rehab register; completion certs; photos

B. OPERATION PHASE

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Routine access patrols	& Traffic/dust	Dust nuisance; road wear	Maintain internal roads; speed limits; restrict unnecessary driving; keep drainage crossings intact; repair potholes and rutting.	Road condition rating acceptable; no repeated dust complaints.	OM, SM	Monthly; after storms	Maintenance logs; patrol logs
Vegetation control	Biodiversity/erosion	Erosion from over-clearing; habitat disturbance	Use minimal vegetation control; avoid drainage buffers; prefer mechanical trimming over herbicides. If herbicides used: approved products, trained applicators, no	Clearing limited to defined zones; herbicide records complete (if used).	OM	Quarterly	Vegetation log; herbicide log; photos

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
			spray in wind, buffer to drains, records.				
Stormwater upkeep	Hydrology	Drain blockage; erosion	Inspect drains and culverts; remove sediment; repair erosion; maintain check dams/berms; post-rain inspections.	No blocked drains; erosion repaired within 7 days.	OM	Monthly; after rain	Inspection forms; maintenance work orders
Waste from maintenance	Waste	Litter; pollution	Segregate and store securely; recycle scrap metal/cables; dispose at licensed facilities; keep manifests.	Manifests available (100%). Waste housekeeping ≥90%.	OM	Monthly	Waste register; disposal certificates

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Oils & lubricants	Spills	Contamination	Bunded containment; drip trays; spill kits; maintenance procedures; immediate clean-up and reporting.	Spill incidents (#); bund integrity (Y/N).	OM	Monthly	Spill register; inspection logs
Security	Community safety	Vandalism; unauthorised access	Maintain perimeter fencing and gates; signage; controlled access; incident response; community liaison where needed.	Fence integrity; incident trend stable or decreasing.	SM, OM	Weekly	Security logs; maintenance records
Emergency readiness	Safety	Delayed response	Maintain emergency equipment; update contacts; drills; first aid coverage.	Drill completion; equipment inspections current.	OM, SM	Quarterly	Drill reports; inspection logs

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Compliance audits	Governance	EMP drift	Annual internal audit; ECO audit if required; CAPA system maintained.	Audit findings closed within deadlines.	OM, JCM PM	Annual	Audit report; CAPA register
Grievances	Social	Unresolved community issues	Maintain grievance channels; timely response; document close-out.	Close-out within set time (e.g., 14 days routine).	OM, JCM PM	Continuous; monthly review	Grievance register; correspondence

C. DECOMMISSIONING & CLOSURE PHASE

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Decommissioning planning	Compliance	Poor closure; legacy impacts	Prepare decommissioning plan and method statements; confirm waste pathways (panels, metals, cables, oils, e-waste); regulatory notifications; stakeholder communication.	Approved plan in place (Y/N). Waste pathways contracted (Y/N).	JCM PM, OM, ECO	Once pre-start	Approved plan; contracts; notifications
Dismantling & removal	Waste/OSH	Injury; debris	Safe work procedures; exclusion zones; PPE; controlled lifting; housekeeping and debris control.	No serious incidents; housekeeping ≥90%.	Decom Contractor, HSE	Daily	HSE logs; checklists
Hazardous materials removal	Spills	Oil/e-waste mishandling	Drain oils into sealed containers; bunding; licensed transport; certified recyclers; chain-of-custody.	100% manifests; no spills.	Decom Contractor, SEO	Daily	Manifests; recycler certificates; spill log

Activity	Aspect	Impact / Risk	Detailed Mitigation / Management Measures (Expanded)	Monitoring Indicators / Acceptance Criteria	Responsibility	Frequency	Evidence / Records
Bulk waste management	Waste	Illegal dumping	Segregate waste streams; weighbridge slips; disposal certificates; recycling rates tracked.	Disposal evidence complete; recycling % reported.	Decom Contractor, SEO	Weekly reporting	Waste register; slips; certificates
Civil reinstatement	Soils/erosion	Unstable landforms	Remove pads/roads if required; recontour to stable landform; restore drainage; erosion controls.	Drainage stable; erosion absent or controlled.	Decom Contractor, ECO	Weekly; post-rain	Inspection forms; photos
Rehabilitation & closure audit	Closure performance	Long-term land degradation	Rip compaction; topsoil re-spread; reseed (if applicable); monitor for erosion/invasives; final closure audit and punch list close-out.	Closure audit pass; punch list closed.	ECO, JCM PM	Final	Closure report; completion certificates

Conclusion

The Environmental Management Plan (EMP) for the Naruchas 20 MW Solar Photovoltaic Power Plant (JCM Power) on Farm Naruchas at the interface with the Rehoboth Townlands in the Hardap Region provides a comprehensive, implementable, and auditable framework to manage environmental and social risks throughout the project lifecycle. The EMP consolidates the mitigation commitments from the environmental assessment process into clear operational controls, assigns responsibilities for implementation and oversight, and establishes monitoring and corrective action mechanisms that enable continuous compliance with applicable Namibian legal requirements and authorisation conditions. The primary impact pathways for the project—footprint disturbance, erosion and stormwater-related effects, dust and noise nuisance, pollution from hazardous substances and waste streams, and community and worker health and safety risks—are addressed through the mitigation hierarchy, with avoidance and minimisation achieved primarily through disciplined footprint control, early installation of stormwater and erosion measures, stringent hazardous materials and waste management practices, and enforceable workforce conduct and safety systems.

Provided that the EMP is implemented as intended—supported by approved method statements, competent supervision, independent auditing, and complete recordkeeping—the residual environmental and social risks associated with the Naruchas 20 MW project are expected to remain low to moderate and manageable. Importantly, the EMP's emphasis on progressive rehabilitation, drainage integrity, pollution prevention, and structured corrective actions ensures that disturbance can be stabilised and reinstated progressively during construction and fully during demobilisation and closure, thereby reducing long-term legacy impacts. The EMP therefore establishes a suitable basis for achieving compliant, safe, and environmentally responsible project implementation and operation in the Hardap Region, while maintaining appropriate interface management with Rehoboth-area stakeholders and road users.

Recommendations

To ensure the EMP functions effectively as a live management tool and meets regulatory and stakeholder expectations, the following recommendations are made for implementation:

1. Confirm site-specific design inputs early and lock footprint discipline. Finalise and circulate the approved layout and micro-siting boundaries (including the ~50 ha footprint, access routes, laydown areas, and drainage buffers) prior to mobilisation, and ensure demarcation and no-go zones are installed before any clearing or earthworks commence.

2. Appoint competent environmental personnel with clear authority. Ensure the Environmental Control Officer (ECO) and contractor Site Environmental Officer (SEO) are appointed before mobilisation, with explicit authority to enforce controls, issue non-conformances, and recommend stop-work where serious risk is present.

3. Treat method statements as mandatory "permit-to-work" controls. Require the EPC contractor to submit and obtain approval for all required method statements prior to commencing relevant activities, and integrate these into daily planning, toolbox talks, and supervision. Changes in methods or layout must be controlled through a documented Management of Change (MoC) process.

4. Prioritise stormwater and erosion controls as critical early works. Install and maintain stormwater diversion, cross-drainage, and erosion stabilisation measures early in the construction programme, and enforce post-rainfall inspections with rapid repair timelines to prevent gully initiation and sediment movement.

5. Implement a strict pollution prevention standard for fuels, oils, and waste. Enforce bunding requirements, designated refuelling, drip trays, spill kits, and spill response training. Maintain complete waste chain-of-custody evidence (manifests, disposal certificates, weighbridge slips) for both general and hazardous waste streams, with zero tolerance for burning or burying waste.

6. Strengthen traffic and community safety measures near Rehoboth interfaces. Implement a detailed Traffic Management Plan, enforce speed limits, use signage and escorts where required, and maintain a clear, accessible grievance mechanism with defined response times and documented close-out.

7. Embed workforce welfare and conduct requirements into contractor management. Apply labour and working condition controls, including adequate sanitation, fair working terms, a worker grievance mechanism, and a Code of Conduct addressing respectful behaviour, prohibition of hunting/resource collection, and compliance with site rules. Where relevant, include targeted awareness measures on harassment prevention and community interaction.

8. Use Annexure MM-01 as the compliance backbone and report against it. Implement the Mitigation & Monitoring Table (Annexure MM-01) as the primary monitoring instrument, ensuring inspections, audits, and monthly compliance reporting are explicitly aligned to its indicators, responsibilities, and evidence requirements. Maintain a controlled environmental file on site to support audit readiness.

9. Implement progressive rehabilitation and define closure performance criteria early. Require rehabilitation to occur progressively (not only at end-of-works), verify reinstatement quality through photo logs and ECO sign-off, and prepare a decommissioning/closure approach in advance to ensure compliant handling of PV panels, e-waste, and electrical components.

10. Maintain a structured CAPA system and continuous improvement loop. Track all incidents, near misses, and non-conformances through a corrective and preventive action (CAPA) register with defined close-out deadlines, root-cause analysis for significant events, and targeted retraining or procedural updates where trends indicate recurring issues.