



PROPOSED WATER ABSTRACTION AND SUPPLY INFRASTRUCTURE, HAIB APP- 006906

Environmental Management Plan

Prepared for: Namibia Water Corporation Ltd.

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Namibia Water Corporation Ltd

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Environmental Management Plan

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EXECUTIVE SUMMARY

NamWater seeks to apply for an Environmental Clearance Certificate (ECC) for the development of water abstraction and supply infrastructure and associated abstraction activities to support the Haib Copper Project (the Project). The Project is a porphyry copper exploration project located in the //Kharas Region of southern Namibia which is being developed by Haib Minerals (Pty) Ltd (Haib Minerals), a subsidiary of Koryx Copper (Koryx). Haib Minerals holds Exclusive Prospecting License (EPL) 3140, which allows for the exploration of base, rare and precious metals over an area of 36 571 hectares (ha).

The development of the proposed Haib Mine, by Haib Minerals, requires a sustainable water source to support its operational and processing activities. NamWater intends to provide this service through the abstraction of water from the Orange River to supply the proposed Haib Mine (off-channel water storage dam). The Project triggers listed activities under the Environmental Management Act (EMA), 2007, and requires an ECC from the Ministry of Environment, Forestry and Tourism (MEFT) through the Competent Authority (CA), the Ministry of Agriculture, Fisheries, Water and Land Reform (MAFWLR).

The water management component of the Project includes the development and operation of water abstraction and supply infrastructure required to support the proposed Haib Mines' annual water demand of 20 million cubic meters per annum (Mm³/a). This is inclusive of the development of water abstraction works along the northern bank of the Orange River, a water supply pipeline and associated infrastructure (roads, transmission lines, flow gauging station, etc.).

The proposed Haib Mine comprises an open pit mine, a 40 Million tonnes per annum (Mtpa) crushing, milling and flotation concentrator, as well as infrastructure necessary to support these operations (waste rock dumps, stockpiles, tailings storage facilities, off-channel storage dam, power infrastructure, pipelines, roads, offices, etc.). The mining schedule indicates a total material movement of approximately 87.5 Mtpa, providing approximately 24 years' supply of mineralised material. This equates to a total of 1.58 billion tonnes (Bt) of material to be mined. The processing of the mineralised material will extend to 33 years.

NamWater, as the custodian of bulk water supply in Namibia, will supply water to the proposed Haib Mine under an agreed volumetric tariff structure with Haib Minerals. Haib Minerals will design and construct the infrastructure (under NamWater's ECC) required for water supply on behalf of NamWater. The operation of infrastructure will be handed over to NamWater upon commissioning. A Memorandum of Understanding (MoU) between the two parties has been signed and an associated infrastructure development agreement is under development.

The Project is at an advanced conceptual stage, and pre-feasibility designs have been utilised to simulate and measure the potential impacts. For the Environmental Impact Assessment (EIA), a fixed project description was adopted and included in this report as of 29 June 2026. Should subsequent design refinements change listed activities, or introduce/increase material impacts, the project description will be updated, and an amendment will be lodged, including any necessary updates to the Environmental Management Plan (EMP), as applicable.

The site layout and associated activities have been designed around critical landform features such as topography, sensitive biodiversity areas, and heritage features. Further optimisations since the scoping phase have considered the efficiencies required for the optimisation of mining activities. The proposed water abstraction and supply activities are therefore at an advanced conceptual phase; however, the design is still a work in progress to move through pre-feasibility and detailed design phases. For the purposes of the EIA, a fixed project description as of 29 June 2026 was adopted and included in this report. Should subsequent design refinements change listed activities or introduce material impacts,

the project description will be updated, and an amendment will be lodged, including any necessary updates to the EMP, as applicable.

Haib Minerals appointed Knight Piésold Consulting (Pty) Ltd Namibia (KP) to support the development of environmental scoping and impact studies associated with the application for an ECC for the water abstraction and supply infrastructure on behalf of NamWater.

This EMP has identified management actions or measures for significant project impacts identified in the EIA, and assigns responsibilities, frequencies and timeframes for each. Monitoring and auditing requirements specify analytical parameters and frequencies for air, surface water, groundwater levels and quality, stormwater and erosion, biodiversity, heritage, and noise. As is typical with developments within watercourses, impacts will occur during the various development phases of the proposed Water Abstraction and Supply, requiring adequate mitigation and/or management. The negative impacts of the project are mitigable as best as practically possible through the mitigation / enhancement measures proposed and documented herein. The effective implementation of the proposed measures through the EMP would promote environmental sustainability via reduction of negative impacts and enhancement of positive impacts.

Water security management should ideally be a collaborative approach between government, affected water users, industries, and the public. Also, the assessment of cumulative effects due to multiple abstraction licenses under development falls outside the scope of this individual water user. However, NamWater is committed to mitigate any potential impacts (through effective implementation of the water abstraction strategy), so as to contribute to minimising the cumulative effects (on downstream users).

With approval of the ECC by MEFT and MAFWLR and adoption of this EMP, NamWater can proceed with activities in a manner that minimises environmental harm, protects people and biodiversity, and supports responsible socio-economic development.

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ABBREVIATIONS

CHMP	Cultural Heritage Management Plan
EAPAN	Environmental Assessment Professionals of Namibia
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
GDP	Gross Domestic Product
GN	General Notice
HIV	Human Immunodeficiency Virus
I&APs	Interested and Affected Parties
IWMP	Integrated Waste Management Plan
KP	Knight Piésold Consulting (Pty) Ltd
M	Million
MAFWLR	Ministry of Agriculture, Fisheries, Water and Land Reform
mamsl	Metres above mean sea level
MEFT	Ministry of Environment, Forestry and Tourism
MIME	Ministry of Industries, Mines and Energy
ML	Mining License
Mtpa	Million tonnes per annum
NamPower	Namibia Power Corporation
NamWater	Namibia Water Corporation
NHC	National Heritage Council of Namibia
OHTL	Overhead Transmission Line
ORASECOM	Orange-Senqu River Commission
PEA	Preliminary Economic Assessment
Project	Haib Copper Project
TSF	Tailings Storage Facility

1.0 INTRODUCTION

1.1 Project Overview

Namibia Water Corporation Ltd (NamWater) is Namibia's national bulk water utility, established to ensure a sustainable, safe, and reliable water supply for domestic, industrial, and commercial use across the country. NamWater is a recognised and licensed authority for the abstraction and distribution of bulk water in Namibia, ensuring that water use is sustainable, legally compliant, and environmentally responsible.

NamWater seeks to apply for an Environmental Clearance Certificate (ECC) for the development of water abstraction and supply infrastructure and associated abstraction activities to support the Haib Copper Project (the Project). The Project is a porphyry copper exploration project located in the //Kharas Region of southern Namibia which is being developed by Haib Minerals (Pty) Ltd (Haib Minerals), a subsidiary of Koryx Copper (Koryx). Haib Minerals holds Exclusive Prospecting License (EPL) 3140, which allows for the exploration of base, rare and precious metals over an area of 36 571 hectares (ha).

The development of the proposed Haib Mine, by Haib Minerals, requires a sustainable water source to support its operational and processing activities. NamWater intends to provide this service through the abstraction of water from the Orange River to supply the proposed Haib Mine (off-channel water storage dam). The Project triggers listed activities under the Environmental Management Act (EMA), 2007, and requires an ECC from the Ministry of Environment, Forestry and Tourism (MEFT).

Haib Minerals appointed Knight Piésold Consulting (Pty) Ltd Namibia (KP) to support the development of environmental scoping and impact studies associated with the application for an ECC for the proposed Haib Mine, as well as the application for an ECC for water abstraction and supply infrastructure on behalf of NamWater. The Project is at an advanced conceptual stage, and pre-feasibility designs have been utilised to simulate and measure the potential impacts. For the Environmental Impact Assessment (EIA), a fixed project description as of 29 June 2026 was adopted and included in this report. Should subsequent design refinements change listed activities, or introduce/increase material impacts, the project description will be updated, and an amendment will be lodged, including any necessary updates to the Environmental Management Plan (EMP), as applicable.

The water management component of the Project includes the development and operation of water abstraction and supply infrastructure required to support the proposed Haib Mines' annual water demand of 20 million cubic meters per annum (Mm³/a). This is inclusive of the development of water abstraction works along the northern bank of the Orange River, a water supply pipeline and associated infrastructure (roads, transmission lines, flow gauging station, etc.).

The proposed Haib Mine comprises an open pit mine, a 40 million tonnes per annum (Mtpa) crushing, milling and flotation concentrator, as well as infrastructure necessary to support these operations (waste rock dumps, stockpiles, tailings storage facilities, off-channel storage dam, power infrastructure, pipelines, roads, offices, etc.). The mining schedule indicates a total material movement of approximately 87.5 Mtpa, providing approximately 24 years' supply of mineralised material. This equates to a total of 1.58 billion tonnes (Bt) of material to be mined. The processing of the mineralised material will extend to 33 years.

The Project is currently in the Pre-Feasibility phase, whereby the feasibility of the Project is being defined through ongoing investigations and analyses. The broad schedule indicates that investigations and financing will continue into mid-2028.

1.2 Project Location

The water abstraction and supply infrastructure is strategically positioned along the Orange River and closely associated with the proposed Haib Mine development and operational infrastructure on EPL 3140 (Figure 1-1). The Orange River runs immediately to the south of the EPL, and a number of farms surround the EPL.

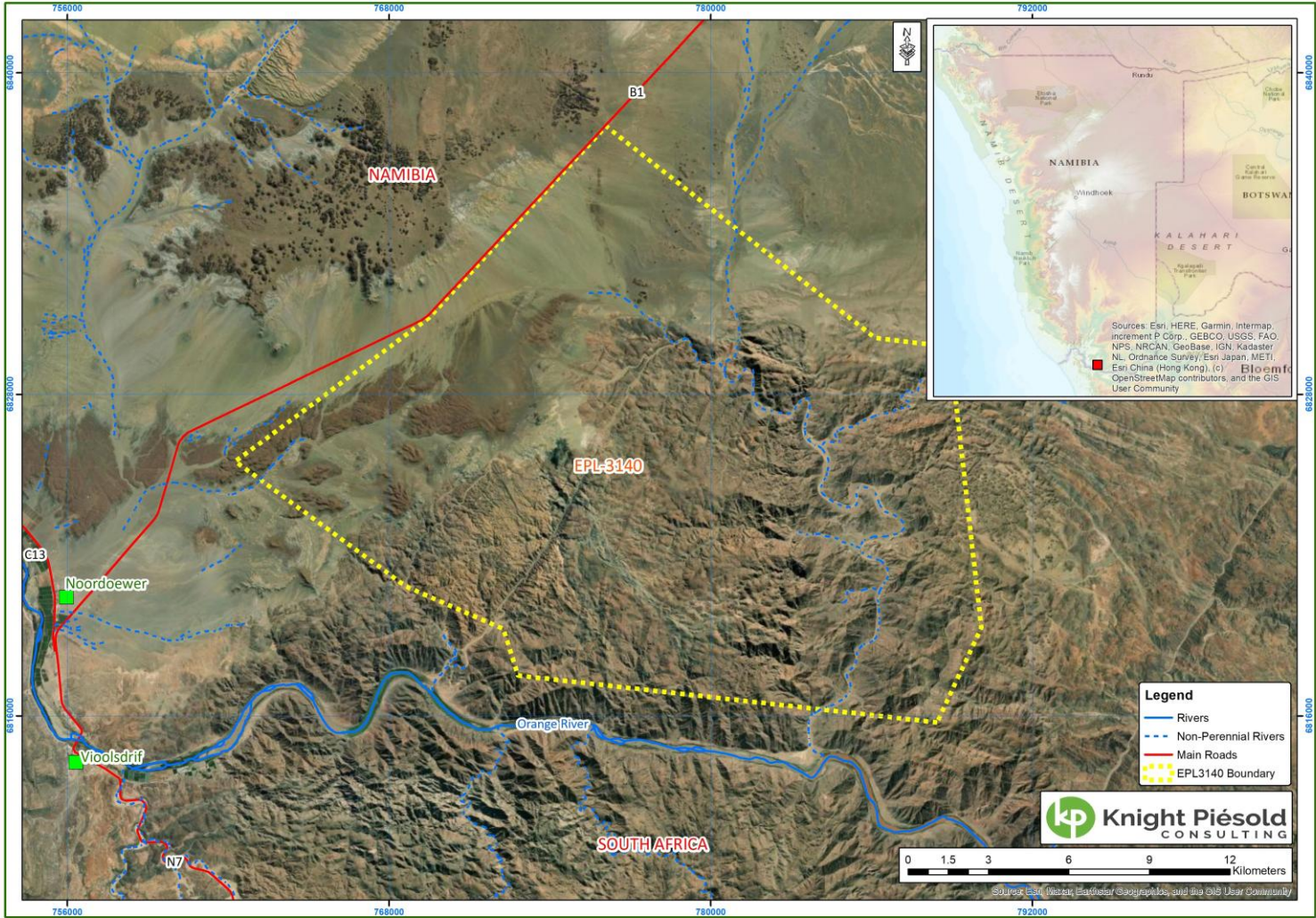


Figure 1-1: Location of EPL 3140 in southern Namibia

2.0 ROLES AND RESPONSIBILITIES

This EMP and subsequent ECC will constitute a formal and binding agreement between NamWater and the Government of Namibia once approved and issued by the Office of the Environmental Commissioner. NamWater is accountable for ensuring compliance with the EMP and for allocating adequate resources to meet all environmental management commitments. Effective implementation of the EMP relies on the clear assignment of roles and responsibilities for each management action. The key roles and associated responsibilities relevant to the EMP are outlined below.

Table 2-1: Applicable Roles and Responsibilities

Roles	Responsibilities
Environmental Manager	Ensures the effective implementation, monitoring and compliance of the EMP throughout all project phases. Provides oversight and support to relevant departments in fulfilling EMP commitments, ensures adequate resources and integration of EMP requirements into contracts, and coordinates with the Environmentalist, Environmental Control Officer and Contractor. Ensures compliance with applicable legal and permit requirements, including ECC conditions and abstraction limits, and engages regulators such as MEFT and MAFWLR on significant environmental compliance matters.
Resident Engineer	Provides engineering, planning and maintenance support for infrastructure, machinery and equipment requirements. Reviews and enforces method statements and designs to incorporate environmental controls (bundling, erosion/sediment control, intake protection) and verifies as-built compliance.
Environmentalist	Overall responsibility for the implementation, monitoring and compliance of the EMP throughout all project phases. Provides environmental support to relevant departments, manages and coordinates the Contractor's Environmental Control Officer and Contractor, oversees compliance with legal and permit requirements (including ECC conditions and abstraction limits), environmental monitoring and reporting, and ensures timely implementation of corrective and preventive actions. Coordinates the resolution of environmental grievances and ensures that environmental commitments are effectively addressed. Conducts monthly inspections/audits, issues non-conformance reports with follow-up actions, and exercises stop-work authority for serious environmental risks.
Contractor's Environmental Control Officer (ECO)	A suitably qualified and experienced ECO shall be appointed by the Contractor before the commencement of construction to ensure that the mitigation and rehabilitation measures are implemented and to ensure compliance with the provisions of the EMP. Responsible for compliance with the requirements of the EMP during the construction phase, conducting daily inspections/audits as well as undertaking training of site personnel. The ECO is responsible for overseeing and monitoring compliance with and implementation of the EMP.
Operations Manager: Business Unit South (BUS)	Responsible for the operational activities undertaken for the project, including the successful implementation of the EMP, managing stakeholder expectations and tending to grievances lodged.

Roles	Responsibilities
Contractor	Responsible for financial management of the construction phase activities, management of contractor personnel and ensuring environmental and social awareness is undertaken by contractor personnel on site. Prepares and implements approved environmental method statements (spill prevention/response, waste handling, erosion control), keeps records and reports performance to the Environmentalist/Resident Engineer.
Haib Copper Project Developer (Haib Minerals (Pty) Ltd)	Responsible for the construction and decommissioning activities undertaken for the project, including successful implementation of the EMP in conjunction with NamWater during construction and decommissioning.
Head: Public Relations and Corporate Communications	Responsible for all internal and external communications for the Company, navigating public relations, ensuring a consistent and engaging message (e.g. preparing detailed media reports, press releases, facilitating workshops and marketing materials).

3.0 AUDITING AND REPORTING

3.1 Purpose of the EMP

The EMP details the actions required to effectively implement the mitigation measures identified in the EIA. These actions are required to minimise negative impacts and enhance positive impacts associated with the construction, operation and decommissioning of the water abstraction and supply facility along the Orange River to support the Haib Copper Project.

As the developer of the Haib Copper Project, Haib Minerals will design and construct the facility with oversight by NamWater to ensure the facility complies with NamWater's standards and requirements. Ownership and operation of the water abstraction and supply infrastructure will be transferred to NamWater after commissioning, who will maintain and operate the scheme under an agreed volumetric tariff structure.

Haib Minerals' responsibilities, as they pertain to the conditions within this EMP, will be defined through contractual and/or an appropriate development agreement with NamWater. NamWater, as the proponent of the proposed water abstraction and supply activities and the eventual holder of the ECC, will overall be responsible for implementation of the contents of this EMP.

The EMP sets out the commitments as required by Section 8(j) of the Environmental Management Act Regulations, as governed by the Government of the Republic of Namibia's Ministry of Environment, Forestry and Tourism. Those requirements include the following:

- (j)(aa) information on any proposed management, mitigation, protection, or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure;
- (bb) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and
- (cc) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants.

An EMP is a living document and will be updated by NamWater, Haib Minerals or their consultant(s) and amended as new information (e.g. environmental and social data from ongoing studies), policies, authority guidelines and technologies develop. The EMP will also be reviewed and updated, if required, based on the findings and recommendations of periodic internal and external audits and performance assessments. Should additional listed activities, as defined in the Environmental Impact Assessment Regulations 2012: Environmental Management Act, 2007 (Government Gazette No. 4878) be triggered, this EMP will be updated as a result of another EIA process as stipulated in the Regulations.

3.2 Auditing

To ensure effective implementation of management measures and compliance with the EMP and environmental and social legislative requirements, an auditing and reporting programme is proposed for the water abstraction and supply activities (Table 3-1). The purpose of auditing is to ensure continual improvement in environmental and social performance.

Table 3-1: Auditing requirements

Audit	Reporting Requirements	Action Plan	
		Responsibility	Frequency
Quarterly EMP Inspections Auditing compliance of the construction and operational phases to this EMP and any other legal requirements e.g. licenses, authorisations, Namibia Heritage Council (NHC) consent, etc.	Internal report to managers for discussion	Environmental	Quarterly during construction and operations
Management Review of EMP	Internal Report	Environmental Manager	Annually
Internal (Bi-annual) EMP Compliance Audit Auditing compliance to this EMP and any other relevant legal requirements e.g. licenses, authorisations, NHC consent etc.	Internally produced to be submitted to the MEFT	Environmental / Social Manager	Twice a year (Bi-annual)
External EMP Compliance Audit by the water user (Haib Mine)	Externally produced report to Environmental Authorities and distributed internally	Haib Mine- Environmental Manager	Twice a year (Bi-annual)
External EMP Compliance Audit	Externally produced report to Environmental Authorities and distributed internally	Environmental Manager to appoint an external / independent auditor	Every three years

3.3 Reporting

Reporting requirements are presented in Table 3-2.

Table 3-2: Reporting Requirements

Report	Description	Action Plan	
		Responsibility	Frequency
Environmental Monitoring Reports	Reporting on environmental monitoring requirements as per the Notification of Decision to the ECC	Environmental Manager	Bi-annually

Report	Description	Action Plan	
		Responsibility	Frequency
Water Abstraction Reporting	Reporting on water abstracted from the Orange River as per Water Abstraction License conditions to MAFWLR	Manager: Hydrology	Bi-annually
Stakeholder / Community Feedback Report	Periodic feedback to key stakeholders including following: • Compliance with the EMP • Abstraction volumes and rates • Results of monitoring programmes • Incident reports • Grievances • Allow for comment on non-confidential aspects of the Water Abstraction protocol (WAP) and any material changes to the WAP	Environmental Manager, Public Relations and Corporate Communications Office (PR&CCO), Haib Minerals (Water User)	Annually or more frequent aligned to Haib Mine SEP
	• Incident reports • Grievances		Episodic as incidents and grievances are raised, annually in performance reports
Training and Awareness	Maintenance of records for all training and awareness specifically relating to: • Environment • Heritage • EMP	ECO, Environmentalist	Ongoing / As it happens
	• Employee wellbeing	Contractor's Human Resources	
Incidence recording and adaptive management	The recording of incidents and non-compliances with the EMP and appropriate management to be included in bi-annual reporting including such as, not limited to: • Non-compliances with the EMP	ECO, Environmentalist, Haib Minerals	Ongoing / As it happens

Report	Description	Action Plan	
		Responsibility	Frequency
	- Plant / animal death / injury - Spills (water and contaminants) - New roads / infrastructure - Damage to sites of heritage importance		
Maintenance of records	Maintenance of records as per the EMP including, not limited to: - Rehabilitation photographic records - Safe disposal of waste - Volumes of water abstracted for use - Results of air and water monitoring programmes	NamWater's Environmental Services Division, Haib Minerals	Ongoing / as incidents occur or grievances are lodged
	- Agenda, minutes of meetings under the stakeholder engagement plan - Grievances lodged and feedback	Environmental Manager/Environmental, PR&CCO, Water User	
Finalisation and potential updates to the Water Abstraction Strategy (WAP)	The final WAP or any subsequent updates, must be submitted to MAWLR for concurrence and to MEFT for noting and, if suitable, formal referencing in the ECC conditions (or as an approved management instrument).	Hydrology Manager	Prior to operational abstraction and where required through operations and decommissioning

3.4 Permit / Approval / License requirements

The proposed activities will require a series of permits, approvals and licenses to ensure full compliance of proposed activities. Towards understanding the potential requirements, Table 3-3 includes a preliminary list of possible but likely requirements.

Table 3-3: Expected permit / approval / license requirements for the proposed water abstraction and supply activities to support for the proposed Haib Mine (LM Environmental Consulting)

Legislation	Regulatory Authority	Permit / Approval / License	Contact Details
Environmental Management Act No. 7 of 2007 and the Environmental Impact Assessment (EIA) Regulations of 2012	Ministry of Environment, Forestry and Tourism (MEFT)	Environmental Clearance Certificate for Water Abstraction and Supply from the Orange River.	Mr Timoteus Mufeti Environmental Commissioner Tel. 081-9528609 (Environmental Affairs Reception) E-mail: Timoteus.Mufeti@meft.gov.na
The Minerals (Prospecting & Mining) Act No. 33 of 1992, Section 93(1), Section 90(1)(e) and (2)(a)	Ministry of Mines and Energy (MME; now the Ministry of Industries, Mines and Energy (MIME))	Ancillary Works Permit	Mrs Isabella Kandjii-Chirchir Mining Commissioner Tel: 061-2848111 Email: isabella.chirchir@mme.gov.na
Water Resources Management Act No. 11 of 2013, Section 13, and the Water Resources Management Regulations 2023	Department of Water Affairs, Ministry of Agriculture, Fisheries, Water and Land reform (MAFWLR)	Water Abstraction License: 20 Mm ³ /for 33 years operational water from the Orange River	Mr Teofilus Nghitila Executive Director/Water and Marine Resources Accounting Officer Tel : 061-2087691 E-mail : ED-TNPA@mawlr.gov.na
		License for the removal of rocks, sand or gravel from a watercourse	
		License to remove riparian species, fill or excavate riparian zone or erect structural development within riparian zone	
National Heritage Act No. 27 of 2004, Sections 48–52 and 55	National Heritage Council of Namibia (NHC)	NHC Consent (Consent (Sections 53(7) and 55(8) of the National Heritage Act No. 27 of 2004))	Ms Erica Ndalikokule Acting Director Tel: 061-244375 E-mail : info@nhc-nam.org

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Legislation	Regulatory Authority	Permit / Approval / License	Contact Details
Nature Conservation Ordinance No. 4 of 1975, Section 73	MEFT	Land Clearance Permit (A permit is required prior to the picking, cutting/chopping/picking off, taking, gathering, uprooting, damaging or destroying, or transporting any protected plant)	Mr Johnson Ndokosho Director, Directorate of Forestry Tel: 081-9528544 (Permit Reception) E-mail: johnson.ndokosho@meft.gov.na
		Permit for the removal of a Protected Species	

4.0 ENVIRONMENTAL MANAGEMENT PLAN

4.1 Environmental Management Plan

The EMP summarises the mitigation and management actions required to manage impacts identified in the EIA for the proposed water abstraction and supply activities. The EMP guides the streamlining of the implementation and monitoring of management efforts. The applicant is to ensure full compliance not only with this EMP but also with all pertinent Namibian legislation, and as far as possible all best practice guidelines.

Prior to commencement of construction, the Contractor shall prepare and submit a Construction EMP and/or relevant construction specifications to NamWater for review and approval. These documents will guide the Contractor(s) in implementing the environmental requirements and controls applicable during the construction phase.

4.1.1 Pre-Construction and Construction Phase

Table 4-1: Pre-construction and Construction Phase EMP

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
Administrative				
Legal / Permitting	Legal non-compliance	Obtain the ECC before commencing any listed activities.	Environmental Manager	Pre-construction
		Incorporate all permit and license conditions into contractor specifications and site induction packs.		
		Obtain all required permits, approvals and licenses required for the proposed activities, including waste permits	Contractor/ Haib Minerals	
		Obtain necessary permits for the removal/ relocation/ destruction of nationally protected flora and fauna prior to undertaking clearance activities.		
		Obtain National Heritage Council consent where required for works near heritage resources. If required, obtain permits to relocate, disturb/destroy heritage features within the infrastructure footprint (i.e. the recorded burial cairns, surface scatter).		
Project establishment and training	Weak implementation and non-compliance	Conduct site induction for all personnel and contractors on the EMP, spill response, chance-finds, biodiversity and alien control, grievance and incident reporting.	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction and ongoing
		Provide refresher training quarterly and upon personnel or scope changes.		
		Keep signed attendance registers and training materials on file.		
Stakeholder Management	Lack of transparency	Develop and implement a Stakeholder Engagement Plan (SEP)	ECO (Overall Responsibility), Environmentalist & Project Manager (Supervision)	
Climate				

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
Climate Management	Generation of GHGs	Limit vegetation clearing to the essential construction footprint.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	Construction
		Maintain vehicles and equipment according to manufacturer schedules.		
		Prohibit unnecessary idling and enforce idling limits.		
		Use low-sulphur diesel where available.		
		Limit the use of generators		
Waste				
Waste Management	Contamination of soil, surface- and groundwater	Develop, implement and maintain a site-wide Integrated Waste Management Plan (IWMP) .	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction
		Train all staff and contractors in waste management, spill prevention, containment, remediation, and environmental responsibilities. provide specific training for waste operations.		
		Keep records of waste volumes, disposal certificates, hazardous chemical storage, and incidents.		ECO (Overall Responsibility), Environmentalist (Supervision)
		Provide suitable receptacles with lids for waste disposal at appropriate locations on site.		
		Dispose of hazardous waste (including hydrocarbon contaminated material/soil) and domestic at an appropriate waste disposal facility.		
		Prohibit the burning of waste material.		
Waste Collection		Establish sufficient designated waste collection points on site with adequate capacity for domestic and hazardous waste.	Construction	
Waste Storage / Separation – Domestic and Recyclable Waste		Separate domestic and recyclable waste at source and store in appropriate wheely/lugger bins or skips. Provide recyclable materials to qualified recycling companies.		
		Design waste storage areas/containers to meet specific requirements that prevent contamination of soil (impervious		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		floor, bunded areas, lids, sealed containers for hazardous waste).		
Hazardous Waste – Solid Waste		Develop procedures covering the storage, handling, transportation and disposal of hazardous and solid waste.		Pre-construction
		Store hazardous waste in designated containers (oil, batteries, cartridges, rags, fluorescent tubes).		
		Collect and accumulate other hazardous waste (e.g., car batteries, oil filters) until sufficient volumes are available for removal.		
Liquid Waste		Capture hydrocarbon and chemical-contaminated water/solids in pollution control structures, stored safely, treated or recycled by registered companies.		
		Appoint a reputable recycling company to collect waste oil.		
Machinery & Equipment Maintenance		Service equipment in equipped workshops and undertake regular servicing to minimise oil/fuel leaks.		
		Contain spills using spill kits, separate hydrocarbons from contaminated water; treat water before re-use.		
		Maintain existing bunds to contain 110% of the content of the largest tanks.		
		Maintain pumps and pipelines.		
		Contract service providers for large-scale or emergency spills and periodically test emergency response procedures.		
Material and Spoil				
Material Spoil	Material Spoil contributing to impact footprint	Situate spoil rock from construction activities within existing infrastructure footprints or on adjacent development sites and in line with associated EMP (i.e. on the Haib Mine site within designated licensed spoil sites)	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	Design and during construction

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
Material sources	Material sources / quarries contributing to impact footprint	Source material for concrete batching or construction from within existing infrastructure footprints or from adjacent licensed spoil; areas in line with associated EMP (i.e. on the Haib Mine site within designated licensed spoil sites). Limit the number of borrow pits as far as possible i.e. only excavate the areas actually needed for the volume of aggregate required (the less area disturbed, the easier and less expensive the rehabilitation of the area would be).		
		Limit the depths of the borrow pits to above the water table. Terminate any excavations if groundwater (or moist conditions) is encountered and refill the pit(s) to above the water level.		
		Prohibit the disposal/dumping of any liquid and/or solid waste in the borrow pits.		
		Undertake excavations in a safe manner and in compliance with the relevant safety regulations.		
Topography				
Topography and Drainage Management	Drainage alteration and erosion	Maintain natural drainage patterns where practicable through the use of diversions where required.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision	Construction
		Install temporary cut-off drains, silt fences and energy dissipaters before earthworks.		
Soil				
Site Clearance	Soil erosion	Develop a Soil and Erosion Management Plan	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	Pre-construction
		Clearly demarcate footprint areas required for clearance.		
		Where new tracks must be made off the main routes, select the routes to cause minimal damage to the environment.		
		Avoid uniform removal of all vegetation (clear felling) in areas viewed as erosion-prone, i.e., ephemeral rivers or steep slopes (hill areas).		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Rehabilitate temporary tracks immediately after use. Undertake routine inspection of established tracks to monitor for signs of erosion and undertake necessary maintenance.		
Hazardous Materials Management	Soil contamination	Store chemicals in line with Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS)		Construction
		Store fuel in line with SANS 10089		
		Store hydrocarbons on site in a demarcated area and on bunded impermeable surfaces with a capacity of 110 % of the largest storage volume kept within the bunded area.		
		Refuel only on impermeable surfaces or drip trays.		
		Regularly inspect and maintain vehicles and generators on bunded impermeable areas, to reduce the potential for hydrocarbon leaks.		
		Provide spill kits and train staff in their use.		
		Restrict the mixing of concrete and the cleaning of mixing equipment to lined or impermeable surfaces.		
		If a spillage occurs, clean it up immediately and dispose of contaminated soil at either an on-site bioremediation site or at an appropriate hazardous waste disposal site.		
		Implement proper pollution control measures to prevent accidental spillages, such as keeping hazardous materials in bunded areas to prevent spillages through runoff.		
Disturbance of soil	Loss of topsoil	Restrict topsoil clearance activities to only within the required footprints.		
		Clear only areas of topsoil if required for construction purposes and keep development footprint areas as small and compact as possible.		
		Strip and stockpile, together with any vegetation cover present, the usable soil (typically the top 150 millimetres (mm) of soil where available, or until hard rock is encountered where soil depths are <150 mm), making		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		provision for gathering soft sandy/silty material containing organic material. Avoid mixing topsoil and subsoil. Maintain topsoil stockpiles for use in rehabilitation efforts (if available). Place topsoil as the top layer after filling the pipeline trench with bedding material and subsoil. Store removed topsoil in areas where the topsoil will not mobilise during high rainfall events, or cover topsoil stockpiles to prevent erosion. Undertake topsoil stripping in the dry season to prevent mobilisation through runoff during the rainy season. Design and construct topsoil stockpiles with appropriate slopes and stormwater management to minimise the potential for erosion. Undertake routine inspections for signs of erosion and remedy erosion points where they arise.		
Surface Water				
Surface water – quality	Pollution and contamination of surface water and the surrounding environment	Schedule in-channel works for the dry season to reduce sediment mobilisation and contamination within the Orange River	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	Pre-construction
		Design all stormwater interventions to allow uncontaminated stormwater to bypass the construction areas.		
		Implement proper pollution control measures to prevent accidental spillages, such as keeping hazardous materials in bunded areas to prevent spillages through runoff.		
		Use drip trays for all refuelling and emergency maintenance near watercourses.		Construction
		Prohibit equipment washing and materials mixing within the Orange River, ephemeral Volstruis and Haib rivers and tributaries.		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Provide serviced ablutions and remove wastewater to approved facilities (as per the Labour Act, 2007). If chemical toilets are selected, the contents must be collected by an approved contractor and disposed of at an approved sewage site.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	
		Develop a surface water monitoring programme for water quality within the Orange River to be undertaken during the construction of the abstraction facility, inclusive of upstream, downstream and project site monitoring locations.		Pre-Construction and construction
Surface water – quantity	Reduction in surface water quantity	Obtain a Water Abstraction License from MAFWLR for construction phase water demand prior to abstraction for construction demand.		Pre-construction
		Finalise the Water Abstraction Protocol for use by NamWater in operational phase.	Hydrology Manager	Construction
		Install flow meters and effectively record abstraction volumes and rates. Calibrate all flow meters and retain proof thereof.	Hydrology Manager, Environmentalist & Resident Engineer	
		NamWater must be an active member of the local water users association (or similar).	Hydrology Manager, Operations Manager: Business Unit South (BUS)	Pre-Construction and construction
		Establish a water use forum to facilitate open dialogue between water users to share results of water abstraction related activities (inclusive but not limited to industries, farmers, the Haib Mine and NamWater).		Pre-construction
		Groundwater		
Groundwater Management		Train construction crews in groundwater protection and spill response.	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction and onboarding

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
	Contamination of groundwater resources	Develop and implement spill prevention measures and emergency response plans to address accidental spills of fuel, hazardous substances and waste.	Resident Engineer, Contractor	Pre-construction
		Undertake vehicle maintenance and refuelling on bunded or impenetrable areas and not on bare soil.		Construction
		Bund hazardous chemical / fuel storage to 110% of the largest container volume.		
Terrestrial Biodiversity				
Biodiversity – Terrestrial Fauna and Flora	Habitat loss, fauna injury and protected flora removal	Minimise the construction footprint and use directional clearing through the development and implementation of a Vegetation Clearance Protocol .	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction
		An ecologist must assist during the detailed design phase specifically to design alignment of the linear infrastructure (roads and powerlines), to avoid sensitive areas or flora. Design alignment of all pipelines, transmission line, laydown areas and roads to avoid sensitive areas or protected flora.	Environmental Manager, Resident Engineer	
		Apply for relevant permits for the removal/relocation of protected fauna and flora taxa.	ECO (Overall Responsibility), Environmentalist (Supervision)	
		Clearly demarcate and fence off the boundaries of the construction footprint areas, to limit migration across the area, prioritising any temporary laydown areas into low- and medium-sensitivity areas.		
		Implement a zero-tolerance policy on fishing, hunting, plant collection and firewood gathering.		Environmental Manager / Environmentalist
			All staff must undergo Environmental Awareness Training. Training shall include information on sensitive environmental receptors within the Project area, species identification, conservation status, habitat requirements, and management obligations.	ECO (Overall Responsibility), Environmentalist (Supervision)

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe	
		Enforce strict track discipline by using only existing tracks/access roads when travelling in the area and do not go off-road.	ECO (Overall Responsibility), Environmentalist (Supervision)		
		Avoid leaving open trenches overnight or install escape ramps and inspect daily.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)		
		Prohibit the use of herbicides and pesticides within the Project area.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)		
		Prohibit open fires within the Project area, unless a specific area has been set aside for the cooking of food. Cooking appliances (e.g. gas stoves) are to be properly maintained and ventilated.			
		Avoid restricting movement of faunal species through the appropriate design and placement of linear infrastructure (pipelines, fences, roads, etc.)			
		Remove and relocate all protected species with a good relocation/survival potential, e.g., <i>Aloe</i> spp., <i>Commiphora</i> spp., <i>Hoodia</i> spp., <i>Lithops</i> spp., <i>Tylecodon</i> spp., etc. and fauna under valid permits.			
		Undertake concurrent rehabilitation, where feasible, using indigenous vegetation.			
		Biodiversity - Avifauna	33 kV Overhead Transmission Line (OHTL) – Avifauna collisions, fauna injury		An ecologist must assist during the design phase specifically to design alignment of the linear infrastructure (powerlines), to avoid sensitive areas or flora. Design alignment of transmission lines to avoid sensitive areas or protected flora.
	Install Bird Flight Diverters along sensitive spans of the entire line.			ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	Construction
	Monitor OHTL mortalities to identify problem areas.				
Avoid routing on ridge crests where practicable.					
Backfill and secure pole holes at the end of each shift.					

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Select transmission pole configuration for 33kV to prevent bird mortalities and include suspended insulators (i.e., hanging insulators that drop the cables below the cross arms without ground wire); offset cross arms; conductors covered by LDPE (Low Density Polyethylene) insulating sleeves and anti-perching devices on cross arms. Select this technical configuration detail with NamPower (or contractor) input.		
Biodiversity – Alien Control	Proliferation of invasive alien species	Develop and implement an Alien and Invasive Species Management Plan	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction
		Limit land clearing activities at the facility site and infrastructure areas to prevent additional soil disturbances favouring invasive alien plant species.		
		Avoid the use of herbicides to remove invasive species, prioritising manual or mechanised removal methods.		
		Remove <i>Prosopis</i> spp. and other invaders by manual or semi-mechanised methods.		Construction
		Implement follow-up clearing after floods to prevent coppicing and thickening.		
		Conduct annual maintenance (alien plant removal) after rainy season.		
		Monitor the re-establishment and regrowth of invasive alien species and conduct follow-up procedures when necessary.		
Biodiversity – Aquatic Ecosystems	Riparian and aquatic habitat disturbance, loss of fauna	Incorporate preventative measures, such as access restriction cages, around offtake pumps to prevent kills of ichthyofauna or semi-aquatic species such as otters or waterfowl.	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction
		Establish a 50 m buffer from riparian edges for all non-essential activities.		
		Restrict in-channel works to the dry season, particularly within the ephemeral Haib riverbed, where feasible, to reduce potential for sediment mobilisation.		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Direct stormwater runoff from access roads and all construction areas to buffer zones before reaching rivers. If a spillage occurs, clean it up immediately and dispose of contaminated soil at either an on-site bioremediation site or at an appropriate hazardous waste disposal site. Provide drip trays for all construction vehicles, and spill kits must be made readily available to reduce the potential for hydrocarbon mobilisation into surface water courses. Restore streambed substrate and banks to pre-disturbance condition after works. Establish and undertake aquatic biomonitoring to monitor construction phase impact on the receiving environment. Develop a site closure and post construction rehabilitation plan		Construction
Air Quality				
Air Quality Management	Fugitive dust, PM _{2.5} and PM ₁₀ and emissions (NO ₂ and SO ₂) from construction activities and vehicle movement	Conduct quarterly elemental analysis of dust fallout to understand contamination of land and surface water bodies through dust fallout.	ECO (Overall Responsibility), Environmentalist (Supervision)	Construction
		Implement regular dust control or dust suppression measures for roads and work areas.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	
		Increase the frequency (where required) of water sprays and consider the addition of surfactants or chemical suppressants (e.g. lignosulfonates, calcium chloride, or polymer-based sealants) for areas or activities of concern along unpaved roads and exposed surfaces using water trucks with spray bars.		
		Reduce speed limits, truck weights and the number of vehicles using unpaved roads and surfaces as far as practicable. Vehicles travelling on unsealed roads must not exceed 60 km/h.		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Restrict idling times for vehicles and heavy machinery through efficient work planning to reduce fuel consumption and emissions.		
		Minimise surface areas of stockpiled material (i.e. avoid sharp edges) to reduce the surface area exposed to wind erosion.		
		Conduct workforce training at all levels (workers, foremen, managers and contractors) on air emissions awareness. This may be included in site induction courses and must focus on promoting understanding of why operational controls are in place and must be adhered to.	ECO (Overall Responsibility), Environmentalist (Supervision)	
		Maintain appropriate operational controls (e.g. adherence to repair and maintenance requirements for all equipment, including vehicles).	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	
		Initiate progressive rehabilitation (e.g. revegetation with appropriate species or coarse material covers) to stabilise disturbed areas and reduce dust entrainment. Inactive surfaces must be rendered non-dust forming.		
		Utilise windbreaks, contouring and material covers or enclosures for exposed soils and stockpiles of erodible material. Install porous windbreaks or fencing around the facility or at a minimum alongside areas of high erosion potential.		
		Adhere to the minimum practical drop heights when offloading materials.		
		Develop and maintain a grievance register for air quality related complaints.	ECO (Overall Responsibility), Environmentalist & Project Manager (Supervision)	
Noise				
Noise	Increase in ambient noise	Maintain equipment and fit mufflers or silencers where practicable.		Construction

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
	levels affecting sensitive receptors	Provide hearing protection and monitor occupational exposure.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	
		Implement acoustic mitigation measures at noise sources exceeding 85 dBA.		
		Schedule noise intensive maintenance during daytime hours.		
		Develop and maintain a grievance register for noise-related complaints.	ECO (Overall Responsibility), Environmentalist & Project Manager (Supervision)	
Land Use and Land Capability				
Given the change in land use from grazing to construction, no mitigations are foreseen.				
Blasting				
No blasting planned- if this changes it must be managed through the relevant authority				
Visual				
Visual aesthetics management	Generation of negative visual views affecting sense of place	Restrict vegetation clearing to the minimum area required and undertake progressive rehabilitation at the earliest opportunity.	ECO (Overall Responsibility), Environmentalist (Supervision)	Construction
		Maintain a clean and orderly construction site through regular removal of rubble and waste materials.		
		Design surface infrastructure to remain within approved footprint sizes and heights.	ECO (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	
		Implement a grievance mechanism for communities to report grievances related to visual disturbances	ECO (Overall Responsibility), Environmentalist & Project Manager (Supervision)	
		Use natural-coloured paints that are representative of the ambient area to reduce the visual impact of built infrastructure.	ECO (Overall Responsibility), Environmentalist Supervision	
Archaeology and Cultural Environment				
Heritage Resource Management	Damage to / loss of heritage sites	Develop a Cultural Heritage Management Plan (CHMP)	ECO (Overall Responsibility), Environmentalist (Supervision)	Pre-construction
		Contractor must be made aware of all heritage sites. Locations are not included in this EMP due to sensitivity.		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Demarcate all heritage sites as “No-go” zones and associated buffer zones on site maps and physically demarcate with visible flagging and fencing in line with the NHC Consent.	Contractor (Overall Responsibility), Environmentalist & Resident Engineer (Supervision)	
		Create and maintain a buffer zone around all burial sites and suspected burial sites.	ECO (Overall Responsibility), Environmentalist (Supervision)	
		Create and maintain a buffer zone around the stone circle, storage cairns, blinds and stone hut features.		
		Conduct a pre-construction walkover with an archaeologist confirming the suspected grave sites and burial cairns, and refine no-go zones where necessary.		
		Obtain the necessary permits from the NHC, if necessary, to destroy, remove or relocate sensitive heritage finds		
		Implement the Chance-Find Procedure for all ground-breaking activities. Train all contractors and employees in the Chance Find Procedure for chance find or unrecorded discoveries.		
		Supervise earthworks in sensitive areas and report finds to the NHC.	ECO (Overall Responsibility), Environmentalist (Supervision)	
	Socio-Economic			
Social and Economic Performance	Employment opportunities	Develop and implement a Personnel Procurement and Retention Plan towards developing local procurement and retention policies.	Contractor, Environmentalist and Project Manager (Supervision)	Pre-construction
		Prioritise local employment for construction activities.		
		Establish a formal and organised recruitment process.		
		Prioritise Namibian labourers.		
		Recruiting must be conducted through a central office and no on-site hiring should be allowed.		
	Inform job seekers that they are hired for a contract period only.			
	Economic benefit to	Source goods and services locally (e.g. contractors, accommodation, equipment, construction materials and		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe	
	national (GDP) and local economies	perishable goods) during construction, wherever practicable.			
		Prioritise the use of local sub-contractors, wherever practicable.			
	Social pathologies	Develop and implement an employee and contractor code of conduct , inclusive of behaviour, substance abuse, harassment and transactional sexual relationships, and provide training thereof.	ECO (Overall Responsibility), Environmentalist (Supervision) and Hydrologist (water user forums)		Construction
		Develop, implement and maintain a community-level grievance mechanism and act on reported grievances.			
	Water abstraction and conflict with agriculture	Participate in Orange River water user forums and implement feedback.			
		Develop and maintain grievance mechanism for downstream users to raise grievances related to abstraction.			
		Maintain open communications with stakeholders and river users downstream of the abstraction works			
		Establish an accessible data platform allowing downstream users to access flow rate monitoring data.			
		Install flow rate monitors downstream of the abstraction point, to monitor changes in flow as a result of abstraction.			
	Emergency Responses	Prepare and publicly disclose emergency response plans for spills, dam failures, fires or hazardous incidents.			
Health and Safety Management	Increase in HIV infection and STI's	Implement HIV/AIDS and STI awareness programmes for all employees and subcontractors.	ECO (Overall Responsibility), Environmentalist (Supervision)	Construction	
		Provide free condoms at appropriate and accessible locations.			
		Facilitate access to voluntary and confidential HIV testing, counselling and STI treatment services.			
		Include HIV/AIDS and STI prevention in worker induction and toolbox talks.			

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
		Awareness activities must promote confidentiality and non-discrimination.		
		Record and report awareness activities and interventions without disclosing employees' confidential health information.		
	Employee injuries	Provide appropriate personal protective equipment (PPE) to all employees, as required for the tasks and associated risks.	Contractor (Overall Responsibility), Environmental & Resident Engineer (Supervision)	
		Train all employees in the competent and correct use of PPE.		
		Adequately stocked first-aid kits must be available and readily accessible at the project offices and all active construction sites.		
		Establish and maintain an emergency rescue and evacuation system for the prompt evacuation and medical treatment of seriously injured persons.		
		Establish and communicate to all employees, emergency response arrangements that guide emergency procedures for accidents and other incidents to all employees		
		Clearly demarcate and access control dangerous and restricted areas.		
		Promote safe driving practices and strict adherence to applicable safety rules		
		Install and maintain fire extinguishers at all refuelling sites. Train staff to utilise such equipment.		
		No person shall dispose of any burning or smouldering material in any area where it may cause or contribute to the ignition or spread of a fire.		
		Construction workers shall be clearly identifiable by wearing construction uniforms displaying the logo of the construction company.		

Aspect	Project phase potential impacts	Management action	Responsibility	Timeframe
	Public Injuries	Site access control must be implemented through establishing clear rules and regulations		
		Where the public could be exposed to danger by any of the construction works or site activities, provide flagmen, barriers, and/ or warning signs in English		
		All unattended open excavations shall be adequately demarcated.		
		Adequate protective measures must be implemented to prevent unauthorised access to the working area.		
		No firearms are permitted on site		
	Traffic related incidents	Road junctions must have effective line of sight		
		Optimise transportation of materials to minimise number of required trips, while not permitting overloading.		
		Enforce speed limits on and off site roads.		
		Implement traffic control measures where necessary.		

4.1.2 Operation Phase

The measures below must be undertaken throughout the operational phase.

Table 4-2: Operational Phase EMP

Aspect	Operational phase potential impacts	Management action	Responsibility
Administrative			
Legal / Permitting	Non-compliance with licences	Keep all relevant permits, certifications and licenses valid and up to date.	NamWater
Stakeholder Management	Lack of transparency	Implement the Stakeholder Engagement Plan (SEP)	Operations Manager: Business Unit South (BUS)

Aspect	Operational phase potential impacts	Management action	Responsibility
Climate			
Climate Management	Greenhouse gas (GHG) emissions and climate change	Maintain and service mechanical equipment to reduce combustion emissions and particulate matter generation.	Operations Manager: Business Unit South,
		Use low sulphur diesel.	
Waste			
Waste Management	Waste Generation	Maintain the site wide IWMP	Environmental Manager, Operations Manager: Business Unit South
		Maintain training of all staff and contractors in waste management, spill prevention, containment, remediation, and environmental responsibilities;	
		Keep records of waste volumes, disposal certificates	
		Maintain designated waste collection points on site with adequate capacity for domestic or other waste	
		Provide suitable receptacles with lids for waste disposal at appropriate locations on site.	
		Dispose of hazardous waste (including hydrocarbon contaminated material/soil) and domestic at an appropriate waste disposal facility	
		Prohibit the burning of waste material.	
		Segregate and recycle waste to reduce disposal emissions.	
Topography			
Impacts will be established during the construction phase; therefore no mitigations are foreseen for the operational phase			
Soil			
Soil Management	Soil erosion	Implement a Soil and Erosion Management Plan	Environmental Manager
		Conduct erosion maintenance after each rainy season.	
Hazardous Materials Management	Soil contamination	Store chemicals in line with MSDS or SDS	Environmental Manager
		Store fuel in line with SANS 10089	
		Provide spill kits and train personnel in their use.	
		Avoid mixing topsoil and subsoil.	
		Store and handle hydrocarbons and chemicals safely to prevent soil contamination.	Environmental Manager, Operations Manager: Business Unit South
		Undertake maintenance of vehicles or mechanical equipment on an impervious layer to prevent soil contamination.	
		Clean up all spills immediately; keep records and dispose of contaminated soil at the on-site bioremediation site or at an appropriate hazardous waste disposal site.	

Aspect	Operational phase potential impacts	Management action	Responsibility
Surface Water			
Surface Water – quality	Pollution/contamination of surface water and the surrounding environment	Maintain and implement the surface water monitoring plan .	Environmental Manager
		Monitor stormwater channels for erosion	
		Store hydrocarbons in bunded, impermeable areas with traps and oil-water separators; maintain tanks, pipes, and pumps; provide spill kits and train staff in their use; remediate spills within 24 hours.	
		Prohibit any sewage discharge to the environment.	
		Provide spill kits and train personnel in their use.	
Surface Water – quantity	Reduction in surface water quantity	Monitor and implement the Water Abstraction Protocol and operating procedure	Environmental Manager, Hydrology Manager
		No abstraction may occur outside of periods of “surplus” flow.	
		Monitor flows in the Orange River at Blouputs and at dedicated points within the Noordoewer/ Vioolsdrift area.	
		Record any/all incidences of “over-abstraction”	Hydrology Manager, Operations Manager: Business Unit South (BUS)
		Effectively record abstraction volumes and rates. Calibrate all flow meters and retain proof thereof.	Hydrologist, Operations Manager: Business Unit South (BUS)
		Participate in Orange River water user forums and implement feedback on results of flow monitoring.	
		Maintain membership of the local water users association (or similar).	
		Maintain and manage the complaints register; investigate and close out all water-related complaints.	
		Maintain the establishment of the water use forum to facilitate open dialogue between water users to share results of water abstraction related activities (inclusive but not limited to industries, farmers, the Haib Mine and NamWater).	
Biodiversity			
Terrestrial and Aquatic Biodiversity and Habitat Management	Habitat loss, injuries or fatalities of terrestrial biodiversity	Implement and maintain the Alien and Invasive Species Management Plan	Environmental Manager
		Conduct Environmental Awareness Training for staff and contractors on local species, conservation status, biology, habitat and management requirements.	

Aspect	Operational phase potential impacts	Management action	Responsibility
		Enforce zero-tolerance rules for poaching and illegal resource collection.	
		Maintain equipment used to prevent bird collisions with powerlines (spiral markers, flappers, LED devices).	
		Prohibit herbicide/pesticide use on site.	
		Record any observed animal fatalities on site and maintain complete database of all fatalities.	
		Monitor offtake equipment and restrictive caging/meshes for damage and replace where necessary to prevent ichthyofauna or semi-aquatic species from access to offtakes.	
		Implement site closure and post construction rehabilitation plan	
Air Quality			
Air quality	Dust from operational/maintenance activities and vehicle movement	Enforce speed limits on all site roads.	Environmental Manager
		Maintain vehicles and equipment according to manufacturer schedules.	Operations Manager: Business Unit South (BUS)
		Maintain and manage the complaints register; investigate and close out all air-related complaints.	
Noise			
Noise	Increase in ambient noise levels affecting sensitive receptors	Implement acoustic mitigation measures at noise sources exceeding 85 dBA.	Environmental Manager, Operations Manager: Business Unit South (BUS)
		Schedule noise intensive maintenance during daytime hours.	
		Maintain and manage the complaints register; investigate and close out all noise-related complaints.	
Land Use and Land Capability			
No mitigations required.			
Visual			
Visual Aesthetics Management	Alterations to visual landscape	Maintain operational areas to a high standard of cleanliness	Operations Manager: Business Unit South (BUS)
		Maintain a clean and orderly operational site through regular removal of rubble and waste materials.	
		Direct lights downwards and away from habitats to reduce light pollution.	
		Conduct concurrent rehabilitation and revegetation during operations to reduce the visual impact and dust.	
		Manage and protect vegetation that does not require removal.	
Archaeology and Cultural Environment			

Aspect	Operational phase potential impacts	Management action	Responsibility
Heritage Resources Management	Damage to / loss of heritage sites	Maintain the Cultural Heritage Management Plan (CHMP) .	Environmental Manager, Operations Manager: Business Unit South (BUS)
		Maintain buffer zones, “no-go” zones, fencing infrastructure and all demarcations around all identified features.	
	Chance finds during maintenance	Maintain the Chance-Find Procedure and report any new finds to NHC.	
Socio-Economic			
Social Performance	Social pathologies	Maintain a community level grievance mechanism and act on reported grievances.	Operations Manager: Business Unit South (BUS)
	Local employment	Implement the Personnel Procurement and Retention Plan	Manager: Human Resources
		Prioritise the employment of local personnel in line with the local employment and retention policies.	Operations Manager: Business Unit South (BUS)
	Education, training and skills development	Facilitate further capacity development of personnel.	
	Water abstraction influencing downstream users	Participate in Orange River water user forums and implement feedback.	
		Maintain grievance mechanism for downstream users to raise grievances related to abstraction.	
		Maintain open communications with stakeholders and river users downstream of the abstraction works	
		Maintain the accessible data platform allowing downstream users to access flow rate monitoring data.	
	Emergency Responses	Maintain and publicly disclose emergency response plans for breaches, spills, fires or hazardous incidents.	Hydrology Manager
Health and Safety Management	Increase in HIV infection and STI's	Maintain HIV/AIDS and STI awareness programmes for all employees and subcontractors.	Environmental Manager, Operations Manager: Business Unit South (BUS)
		Provide free condoms at appropriate and accessible locations.	
		Facilitate access to voluntary and confidential HIV testing, counselling and STI treatment services.	
		Include HIV/AIDS and STI prevention in worker induction and toolbox talks.	
		Awareness activities must promote confidentiality and non-discrimination.	

Aspect	Operational phase potential impacts	Management action	Responsibility
	Employee and public injuries	Record and report awareness activities and interventions without disclosing employees' confidential health information.	
		Provide appropriate personal protective equipment (PPE) to all employees, as required for the tasks and associated risks.	
		Train all employees in the competent and correct use of PPE.	
		Adequately stocked first-aid kits must be available and readily accessible at the project offices and all active construction sites.	
		Maintain the emergency rescue and evacuation system for the prompt evacuation and medical treatment of seriously injured persons.	
		Maintain and communicate to all employees, emergency response arrangements that guide emergency procedures for accidents and other incidents to all employees	
		Site access control must be implemented through establishing clear rules and regulations	
		Enforce speed limits on and off site roads.	

4.1.3 Rehabilitation, Decommissioning and Closure

As decommissioning is currently unclear, this phase has been included in the impact assessment and mitigation measures for the currently identified impacts are included below. An updated EIA and EMP will be developed once further decisions on the decommissioning of infrastructure have been concluded.

Table 4-3: Rehabilitation, Decommissioning and Closure Phase EMP

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
Administrative				
Closure Plan	Legal compliance	Prepare a Closure Plan and Rehabilitation Action Plan covering assets, final land use, design options, rehabilitation, monitoring and costs.	Environmental Manager, Operations Manager: Business Unit South (BUS)	Prior to closure (i.e. Ongoing throughout planning, construction and operations)
		Establish strict procedures for draining, dismantling and cleaning all equipment,		

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
		using impermeable work areas equipped with retention facilities.		
		Secure financial provision and obtain necessary permits and approvals.		
		Consult stakeholders on closure schedule, risks and post-use options.		
		Notify MEFT, MAFWLR, ORASECOM, other relevant stakeholders and landowners of closure timelines.		
		Update or surrender licences according to requirements.		
		Maintain the grievance mechanism through closure.	Environmental Manager, Operations Manager: Business Unit South (BUS)	
	Infrastructure Opportunities	Investigate opportunities for retaining infrastructure in place of decommissioning.	Environmental Manager, Operations Manager: Business Unit South (BUS)	
		Assess the opportunity to retain subterranean infrastructure (pipelines)for beneficial post-mining use.		
Stakeholder Management	Lack of transparency	Implement the Stakeholder Engagement Plan (SEP)		Decommissioning
Climate				
Climate Management	Generation of GHGs	Revegetate footprint areas with local vegetation.	Environmental Manager, Resident Engineer, Contractor	Rehabilitation and decommissioning
		Undertake erosion and rehabilitation monitoring.		
		Maintain vehicles and equipment according to manufacturer schedules.		
		Prohibit unnecessary idling and enforce idling limits.		
		Use low-sulphur diesel where available.		
Waste				

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
Waste Management	Waste Generation	Maintain the site wide IWMP	Environmental Manager	Decommissioning
		Maintain training of all staff and contractors in waste management, spill prevention, containment, remediation, and environmental responsibilities;		
		Keep records of waste volumes, disposal certificates		
		Maintain designated waste collection points on site with adequate capacity for domestic or other waste		
		Provide suitable receptacles with lids for waste disposal at appropriate locations on site.		
		Dispose of hazardous waste (including hydrocarbon contaminated material/soil) and domestic waste at an appropriate waste disposal facility		
		Prohibit the burning of waste material.		
		Segregate and recycle waste to reduce disposal emissions.		
Topography				
Topography and Drainage Management	Drainage alteration and erosion	Reinstate natural drainage patterns where practicable in line with the Closure Plan and Rehabilitation Action Plan.	Environmental Manager	Rehabilitation and decommissioning
Soil				
Soil Management	Soil rehabilitation	Rip compacted areas and apply a 150-millimetre (mm) layer of topsoil recovered from topsoil stockpiles for rehabilitation and revegetation of the disturbed footprint area.	Environmental Manager, Resident Engineer	Rehabilitation and decommissioning
	Soil contamination	Store chemicals in line with Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS)		
		Store fuel in line with SANS 10089		

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
		Store and handle hydrocarbons and chemicals safely to prevent soil contamination.		
		Avoid mixing topsoil and subsoil.		
Surface Water				
Watercourse rehabilitation	Rehabilitation and restoration	Preserve and maintain the vegetated buffer zones along all watercourses.	Environmental Manager, Resident Engineer	Rehabilitation and decommissioning
		Reshape the land to eliminate steep slopes and create stable terrain that is suitable for natural drainage without erosion.		
Hazardous Materials Management	Pollution/contamination of surface water and the surrounding environment	Maintain the surface water monitoring plan .	Environmental Manager	Decommissioning
		Monitor stormwater channels for erosion.	Environmental Manager, Resident Engineer	
		Use drip trays for all refuelling and decommissioning near watercourses.		
		Prohibit equipment washing within the Orange River and tributaries.		
		If a spillage occurs, clean it up immediately and dispose of contaminated soil at an appropriate hazardous waste disposal site.		
		Maintain serviced ablutions.		
		Prohibit any sewage discharge to the environment.		
		Provide spill kits and train personnel in their use.		
		Implement monitoring to determine decommissioning impacts on the receiving Orange River.		
Biodiversity				
Biodiversity – Terrestrial and Aquatic	Habitat loss, injuries or fatalities of terrestrial biodiversity	Monitor the establishment of indigenous vegetation on rehabilitated areas.	Environmental Manager	Rehabilitation, decommissioning

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
		Monitor the proliferation of alien invasive vegetation and implement a control programme for these species.		
		Prohibit the destruction or death of any flora and fauna, report any deaths as incident reports.		
		Maintain access control, track discipline and implement anti-poaching measures.		
		Respond to major spillages and wildlife injury incidents as required.		
	Habitat restoration	Implement the Closure Plan and Rehabilitation Action Plan and undertake rehabilitation using local flora, undertake progressive monitoring of rehabilitation efforts.		
Air Quality				
Air Quality Management	Dust from decommissioning activities and vehicle movement	Manage wind erosion through the successful rehabilitation of exposed surfaces to reduce or prevent dust generation.	Environmental Manager	Rehabilitation and decommissioning
		Restrict demolition activities requiring blasting to typical daytime hours only.		
		Enforce speed limits on all site roads.		
		Maintain vehicles and equipment according to manufacturer schedules.	Operations Manager: Business Unit South (BUS)	
		Maintain and manage the complaints register; investigate and close out all air-related complaints.		
Noise				
Noise		Restrict demolition activities requiring blasting to typical daytime hours only.	Environmental Manager	Rehabilitation and decommissioning

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
	Increase in ambient noise levels affecting sensitive receptors	Maintain all vehicles and machinery used during rehabilitation and decommissioning activities.		
		Maintain and manage the complaints register; investigate and close out all noise-related complaints.	Operations Manager: Business Unit South (BUS)	
Land Use and Land Capability				
Land Use	Obtaining final land use	Undertake rehabilitation activities in line with desired final land use as determined by the Closure Plan and Rehabilitation Action Plan.	Environmental Manager	Rehabilitation and decommissioning
Visual				
Visual aesthetics management	Visual aesthetics restoration	Undertake rehabilitation activities in line with desired final land use as determined by the Closure Plan and Rehabilitation Action Plan.	Environmental Manager	Rehabilitation and decommissioning
Archaeology and Cultural Environment				
Heritage Resource Management	Maintenance and preservation of heritage resources	Maintain the CHMP	Environmental Manager, Resident Engineer	Decommissioning
		Maintain all protective infrastructure and demarcations for all identified archaeological sites.		
	Damage to / loss of heritage resources	Maintain the Chance-Find Procedure for all demolition activities.		
		Arrange archaeologist call-out for subsurface works as needed.		
		Report any finds to the NHC and follow directives.		
Socio-Economic				
Closure and decommissioning	Loss of employment	Assess opportunities to mobilise personnel to other NamWater facilities.	Operations Manager: Business Unit South (BUS)	Decommissioning
	Revenue to NamWater	Assess opportunities to incorporate the abstraction facilities into other NamWater		

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Environmental Management Plan

Aspect	Decommissioning phase potential impacts	Management action	Responsibility	Timeframe
		operations, (i.e. the proposed Noordoewer / Vioolsdrift Dam).		
	Cessation of water abstraction improving accessible water quantities for downstream users	Participate in Orange River water user forums, inform the relevant stakeholders of the cessation of abstraction and implement feedback.	Environmental Manager, Operations Manager: Business Unit South (BUS)	

4.2 Procedures, Plans, Protocols and Mechanisms

4.2.1 Management Plans and Protocols

NamWater will need to implement the following plans and protocols for the successful impact management of the Project.

- **Biodiversity Management Plan (including Alien and Invasive Species Management):** To avoid, mitigate habitat loss and species harm, manage permits/relocations, protect sensitive habitats and riparian buffers, and prevent the spread of invasives such as *Prosopis sp*
- **Closure Plan and Rehabilitation Action Plan:** Translate rehabilitation objectives into site-specific tasks with timelines and measurable acceptance criteria to achieve timely restoration of safe, stable, vegetated landforms; and plan and implement decommissioning and closure activities, including safe dismantling and removal of infrastructure, rehabilitation and restoration of impacted sites license/permit updates or surrender, and post-closure monitoring, maintenance, and stakeholder engagement, to minimise residual environmental and social risks. Objectives include:
 - Reduction or elimination of the need for a long-term management program to control and minimise the long-term environmental and social impacts
 - Clean-up, treatment or restoration of contaminated areas (e.g. soils contaminated by oil or fuel spills, concrete spills, etc.). Excavation of contaminated material and disposal thereof in an acceptable manner.
 - All potential hazards are properly closed and left in a safe and condition.
- **Construction EMP and Construction Specifications:** To ensure contractors meet legal and EMP obligations through pre-qualification, binding environmental and social requirements, induction and supervision, routine audits, and corrective actions/penalties for non-compliance.
- **Cultural Heritage Chance Finds Procedure:** To identify and record any additional findings throughout the life of the project. The chance finds procedure is presented within Section 4.2.9
- **Cultural Heritage Management Plan (CHMP) (including Chance Find and No-Go Procedures):** To obtain requisite NHC permits, demarcate and enforce buffers and “no-go” areas, implement the Chance Find Procedure, supervise works near heritage resources, and monitor/report site integrity in compliance with the National Heritage Act (27 of 2004), the Burial Place Ordinance (27 of 1966) and the Environmental Management Act (7 of 2007). This includes obtaining relevant permits and approvals from the National Heritage Council of Namibia.
- **Employee and contractor code of conduct:** Define the set of rules that informs employees and contractors how to behave safely and respectfully so they do not harm local communities or resources. The code of conduct must directly address risks of the workforce on social, health, and environmental impacts or damage.
- **Grievance Redress Mechanism:** To capture, investigate and resolve community and worker complaints promptly, providing early warning of impacts and demonstrating accountability. The Grievance Mechanism is provided within Section 4.2.7.
- **Personnel Procurement and Retention Plan:** To identify the employment requirements for personnel, as well as establish policies to promote local employment, retention and skills development, as well as personnel remobilisation plans.
- **Surface Water Management and Monitoring Plan:** To separate clean and dirty water, maintain stormwater controls to protect the Orange River, monitor quality/flows at defined points, and implement trigger based corrective actions. The management of surface water in

the project area and the supply of water for processing are integral components of the planned infrastructure. Categories of water that are typically encountered will align to these categories:

- Non-contact water (NC): Run-off from undisturbed catchments;
- Clean water (CW): Water from restored / rehabilitated areas;
- Contact clean water (CC): Run-off from disturbed catchment areas with some sediment pick-up, sources including inert waste, and restored areas;
- Contact dirty water (CD): Run-off from operational areas with potential for contamination; sources include hydrocarbon or other waste.
- **Spill Prevention and Emergency Response Plan:** To prevent, contain and remediate fuel/chemical spills that could contaminate soil, surface water and groundwater, especially near watercourses. A conceptual plan is provided within Section 4.2.6.
- **Integrated Waste Management Plan (IWMP):** Avoid generating waste as far as practicable; where avoidance is not possible, segregate all waste streams (including sewage and hazardous wastes) and prioritise minimisation, re-use and recovery (including recycling and composting). Where these are not feasible, ensure legal, environmentally sound disposal to prevent pollution and nuisance. Separate waste at source in colour-coded, labelled containers and transfer to a dedicated on-site waste management area for sorting and temporary storage before removal to appropriate facilities. Store waste to prevent discharge using impervious floors, weather protection, no stormwater ingress, and bunding of liquids to 110% of the largest container, with spill kits and fire prevention in place.
 - Construction phase: deploy mobile segregation stations at work fronts and remove segregated wastes routinely.
 - Operational phase: manage hazardous streams, including fuels, oils, chemicals and reagents, paints and solvents, acids and alkalis, detergents and resins, brine, batteries, lamps, e-waste, tyres, scrap, clinical waste, and sewage solids and sludge, with compatibility segregation and closed, labelled containers. Use only licensed transporters and permitted receiving facilities and keep manifests and disposal or recycling certificates. Prohibit open burning and burial. Provide training for employees and contractors, conduct routine inspections and audits, track and report monthly generation, recycling and disposal volumes, and integrate with spill response and surface and groundwater protection plans.
- **Water Abstraction Protocol:** The Protocol must ensure abstraction only within licensed surplus-flow windows, protect downstream users and environmental flows, and maintain compliance through metering and reporting. The contents of this Protocol must be guided by any water resource and water demand studies conducted outlining favourable conditions that trigger abstraction. The Water Abstraction Framework is proposed under Section 4.2.5 which must be finalised to include operational details and key roles and responsibilities within NamWater prior to any abstraction commencing from the Orange River. A stand-alone Water Abstraction Protocol (WAP) must be developed, with its own purpose, scope, roles/responsibilities, decision rules, monitoring and reporting requirements, version control, and change management procedure
- **Vegetation Clearance Protocol:** To limit clearing to the demarcated footprint, phase works to avoid sensitive seasons, conduct pre-clear surveys and rescue/relocation of protected flora and fauna, maintain riparian/buffer no-go zones to reduce habitat loss and erosion potential while meeting permit conditions.

4.2.2 Training and Awareness Programme

Conduct site induction and awareness training for all contractors and employees. The induction training should be inclusive of the following:

- Relevant Namibian Legislation.
- The contents of the EIA and EMP.
- Conditions to the ECC and the contents of the Notification of Decision.
- The importance of cultural heritage, their sensitivity, avoidance of no-go zones, the Chance Find Procedure and the management procedures herein.
- Spill management and protocols/procedures.
- Wildlife conservation and species of conservation importance with established protocols.
- Risks of erosion and procedure for reporting incidences.
- Alien species management requirements and reporting of colonisation/proliferation.
- The impacts of contamination of groundwater and surface water resources and mitigation measures to prevent contamination.
- The impacts of over abstraction from the Orange River.
- Occupational (and community) health and safety.

4.2.3 Incident Reporting

An incident reporting programme must be implemented that records all non-compliances with the EMP as well as other relevant incidents that may be of material value. The following aspects are key to include in the incidence reporting mechanism under this EMP:

- Non-compliances with the contents of the EMP or any of the management plans / protocols in section 4.2.1.
- Spills (hydrocarbons, hazardous chemicals, etc), remediation measures and outcome.
- Fauna: Loss, injury, death, relocation.
- Flora: Relocation, damage, destruction.
- Water: Spillages, leakages or over-abstraction events.

4.2.4 Monitoring Programme

Monitoring requirements for successful implementation of this EMP and for obtaining legal compliance is presented within Table 4-4. The monitoring described below is appropriately aligned to requirements of the water abstraction and supply activities throughout construction, operational, decommissioning and closure phases. Table 4-4, as well as the EMP tables (Table 4-1, Table 4-2 and Table 4-3) must be updated as the relevant licenses / permits / certificates are issued to incorporate any specific conditions mentioned.

Table 4-4: Monitoring Requirements

Aspect / Type	Monitoring Parameter	Monitoring Method / Description	Frequency
Pollutants	General Pollutants	Maintain an Environmental Pollutant Register inclusive of airborne emissions, water pollutants and waste/residues.	Quarterly
Stormwater and Soil Erosion	Erosion of rehabilitated slopes	Visual inspections for formation of gullies, soil loss, and removal of vegetation.	Monthly during concurrent rehabilitation and decommissioning phase
Rehabilitation	Vegetation establishment	Visual and photographic assessment of planted or natural vegetation on rehabilitated construction and operational areas.	Quarterly
	Vegetation cover	Assessment of vegetative cover on rehabilitated areas (across project phases).	Annual inspection during seasonal period of peak biomass
Employee Health and Safety	Risk of HIV and STI	Verify that an awareness and education programme on the risks of HIV/AIDS and recommended preventative measures have been conducted	Monthly
	Injuries	Conduct checks to verify that required procedures are followed and that appropriate PPE is always worn during construction.	Weekly
Biodiversity – Terrestrial	Alien invasive plant species	Inspection for the presence and spread of alien invasive plant species within the Project footprint.	Annual inspection during seasonal period of peak biomass

Aspect / Type	Monitoring Parameter	Monitoring Method / Description	Frequency		
	Wildlife mortality	Recording of any wildlife mortality incidents.	Monthly, or as incidents occur		
Biodiversity – Aquatic Ecosystems	Community Assemblages – Aquatic Biomonitoring	Monitor aquatic biodiversity for alterations in community assemblages.	Bi-annually		
Heritage Resources	Heritage site demarcation	Conduct visual inspections to maintain no-go areas, and demarcations remain visible.	Monthly		
Surface water	Surface water monitoring network	Monitor surface water quality at points along the Orange River.	Monthly		
	Surface water quality parameters	Sampling and analysis against the pre-development baseline and the Namibian Drinking Water Quality Guidelines (Ministry of Agriculture, Water and Land Reform, 2023), including the below parameters.	Monthly		
		Parameter		Ideal Drinking Water Quality	Acceptable Drinking Water Quality
		pH		6 – 8.5	6 – 9
		EC (mS/m)		80	300
		Turbidity (NTU)		0.5	2
		TDS (mg/l)		1 000	2 000
		Total Hardness (mg/l)		400	1 000
		Cl- (mg/l)		100	300
	F- (mg/l)	0.7	1.5		

Aspect / Type	Monitoring Parameter	Monitoring Method / Description			Frequency
		SO ₄ ²⁻ (mg/l)	100	300	
		NO ₃ ⁻ (mg/l)	6	11	
		NO ₂ ⁻ (mg/l)	0.1	0.15	
		NH ₃ (mg/l)	0.3	0.5	
		PO ₄ ³⁻ (mg/l)	25	100	
		Na (mg/l)	100	300	
		K (mg/l)	25	100	
		Mg (mg/l)	30	70	
		Ca (mg/l)	80	150	
		Surface water quantity	Monitor flows, depth at abstraction and abstraction volumes from the Orange River. Monitor flow rates at Blouputs station through official data sources. Monitor flow rates downstream of the abstraction point.		
Environmental Management Plan (EMP)	Refer to Section 3.				
Stakeholder Engagement	Monitor all stakeholder engagement events inclusive of attendance, minutes and presentations provided.			As per SEP	

4.2.5 Water Abstraction Framework

The proposed Haib Bulk Water Supply Scheme is to abstract 20 Mm³/a of water from the Orange River during periods of surplus flow at abstraction rates up to a maximum of 2 m³/s. Surplus flow is defined as flow in the Orange River in excess of the minimum flow requirements set for the Blouputs Flow Gauge (D8H014), where the minimum flows are comprised of all downstream user demands, environmental flow requirements at the estuary and losses from the river between Blouputs and the estuary.

Water will be abstracted via an intake works located on the north bank of a bend in the river just upstream of the Haib River confluence and will be pumped into an ~20 Mm³/a off-channel storage dam via a pipeline and two booster pump stations. This scheme will be constructed by Haib Minerals and handed over to NamWater for ownership and operation. From the dam, the mine will draw water and pump this to their processing plant.

The water level in the dam will be measured by a level sensor (likely sonar) and this data will be sent to NamWater's controls and those of the mine. In the latter case, sufficient water will allow the mine to pump to their processing plant.

If the dam is below Full Supply Level, the controls of NamWater's scheme will check whether pumping can be activated to fill the dam ("Request Pumping"). The next step in the control process will be to check the water level at the Blouputs Gauge (daily water levels are available via DWS SA's website) is above the minimum value for the month in question. If the river level is below the minimum level, pumping is not possible if not already active, and if active, the pumps must be switched off.

If the river level is above the minimum value for the month in question, the pumps can be scheduled to start-up allowing for the transit time of flow between Blouputs and Haib (a few days, exact value still to be confirmed). NamWater's scheme controls will then check to see what the flow in the Orange River is at the Noordoewer / Vioolsdrift Bridge Gauging Station (D8H003) and set the operating flow of the pumps, which is scaled according to a set formula below a flow of 12 m³/s, and at the maximum value of 2 m³/s for any flow above 12 m³/s.

At the scheduled time and at the pre-determined rate, the pumps will start, activating abstraction from the Orange River, with the two booster pumps starting operation as flow reaches them, according to preset pump controls set according to water levels in the balancing reservoirs at each of the booster pump stations. This will transfer water into the off-channel storage dam.

NamWater's scheme controls will continuously monitor the water level in the dam, and "run" the control "loop" continuously, stopping the pumps either when the dam is full or when the river flow at Blouputs drops below the minimum value for the month in question. The above proposed operating protocol is shown schematically in Figure 4-1.

The minimum flow values for Blouputs are assessed annually under the Annual Operating Analysis for the Orange River by consultants appointed by DWS South Africa, and these are adjusted if needed, for example to account for increased user demands downstream or revised environmental water requirements. Haib Minerals will investigate whether it will be possible to set equivalent monthly minimum values for Noordoewer / Vioolsdrift as part of this process, and are investigating the possibility of gauging flow in the vicinity of Noordoewer / Vioolsdrift, which is closer to Haib Mine, to avoid the effect of the transit time between Blouputs and Noordoewer / Noordoewer / Vioolsdrift. These investigations are ongoing.

HAIB ORANGE RIVER ABSTRACTION SCHEME: Proposed Operating Protocol

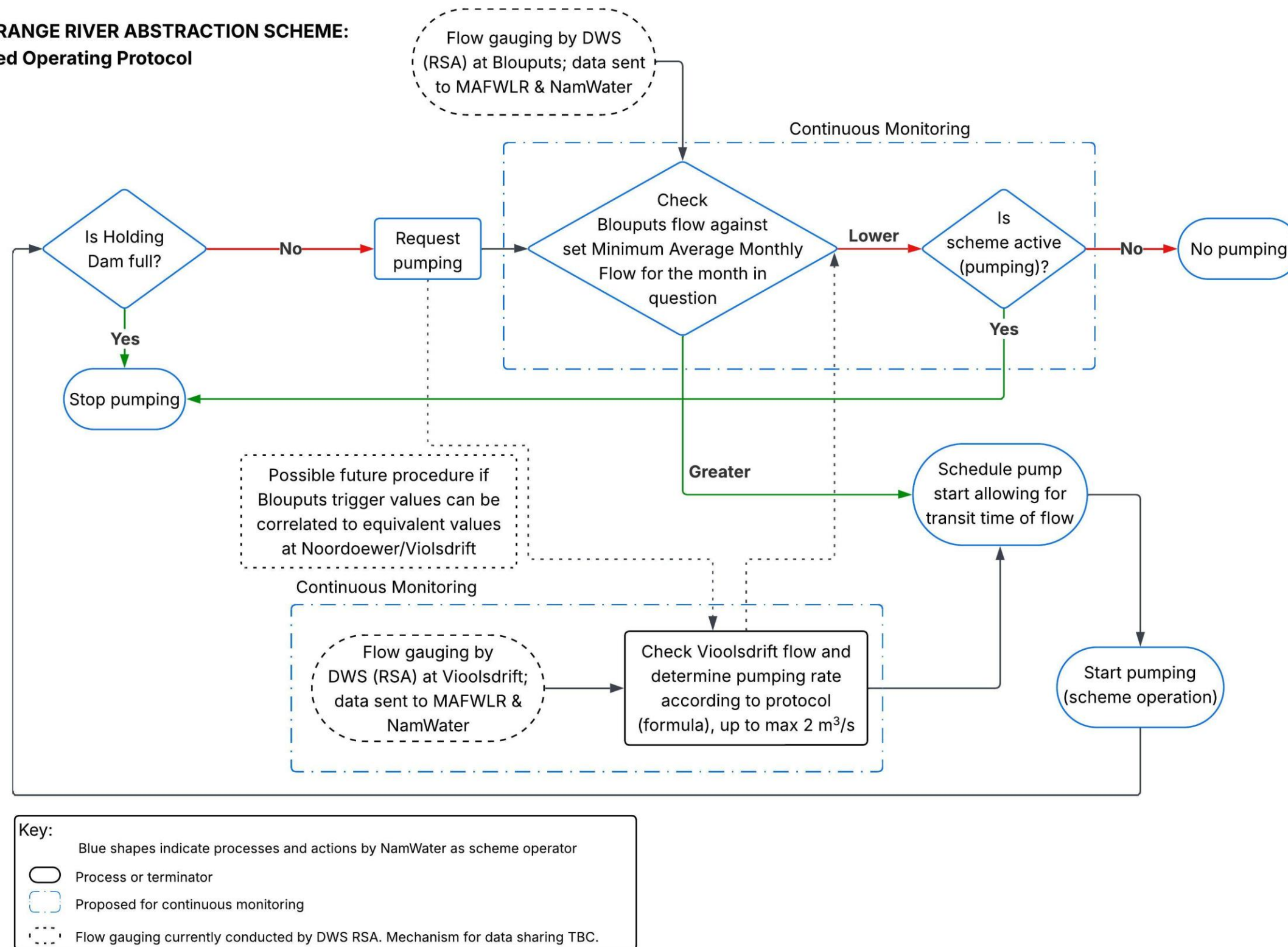


Figure 4-1: Haib-Orange River Water Abstraction Framework: Proposed operating procedure

4.2.6 Spill Prevention and Emergency Response Plan

A preliminary / conceptual spill prevention and emergency response plan is provided below. NamWater will need to update the below with any additional site-specific information required for site personnel and contractors.

4.2.6.1 Scope

The procedure covers the actions to be taken immediately upon discovery of a hydrocarbon spill, from first response and protection of the Orange River intake, through to containment, recovery, notification and waste management.

4.2.6.2 Compliance

The procedure is intended to ensure compliance with applicable Namibian legislation and permit conditions, including the Environmental Management Act (No. 7 of 2007) and water protection requirements as administered by MEFT and MAWLR. Significant spills and any discharge to the Orange River must be reported without delay to the competent authorities. Only approved absorbents are to be used; detergents or dispersants are not permitted.

4.2.6.3 Responsibility

- Construction Foreman (Contractor): To secure the site, cease nearby works, isolate ignition sources, and advise management timeously.
- Construction Superintendent (Contractor): To determine a safe working boundary, decide on temporary abstraction shutdown, and request inspection/support.
- Environmental Control Officer / Environmentalist (NamWater): To inspect, classify spill, direct containment and recovery, coordinate notifications, and arrange waste disposal and remediation.

4.2.6.4 Procedure

Upon identification of a hydrocarbon spill, personnel need to undertake the following actions:

- If operating machinery or equipment stop work; stop fuel transfer and hit emergency stop where provided.
- Identify the area with flag tape; keep untrained persons out; eliminate ignition sources.
- Protect water first: cover nearby drains; place oil-only absorbent socks/booms to divert flow away from channels and the riverbank/intake.
- Contain at source using absorbent socks/soil; upright/plug leaking containers; place small leaking containers in an overpack.
- Determine GPS position if possible and report product, estimated volume and location to the foreman.
- Actions by foreman:
 - Cease any works in the immediate vicinity; suspend abstraction if there is potential risk to the intake.
 - Confirm deployment of spill kit(s) and request additional resources if required.
 - Report findings, site location and actions taken to the superintendent.
- Actions by superintendent:

- Visit the site and determine whether work can proceed without risk to water resources; determine and mark an exclusion boundary.
- Direct additional containment/recovery on land and, if on-water sheen is present, instruct deployment of oil-only river booms in a U or V configuration upstream of the intake and downstream of the release; anchor to banks; recover free product with pads; do not use detergents or high-pressure water.
- Request inspection and support from the Environmental Control Officer / Environmental Manager; initiate notifications as per contacts below.
- Actions by Environmental Control Officer / Environmentalist:
 - Inspect site, confirm spill tier and addition to incident register/GIS; verify that drains and the intake are protected; advise on shutdown and restart criteria (no visible sheen at intake).
 - Advise and liaise with MEFT Regional Office and MAWLR Department of Water Affairs for Tier 2 – 3 spills or any entry to water; liaise with Police/Fire if required.
 - Arrange recovery, packaging and labelling of contaminated media for collection by a licensed hazardous waste contractor; oversee remediation of any impacted soil.
 - Close out incident with root-cause corrective actions and restocking of spill kits.

4.2.6.5 Emergency Contacts

The list below provides contact details for emergency contacts; however this list must be further updated based on appointments by NamWater.

- General emergency (Namibia, mobile): 112
- Ambulance (if subscribed): E-Med Rescue 24 Namibia – 081 924
- Namibian Police – Noordoewer Police Station – 063 297 132
- Fire/Rescue – Karasburg Town Council Emergency Contact – 063 271 100
- Nearest health facilities:
 - Noordoewer Clinic – 063 297 109
 - Karasburg District Hospital – 063 270 167
- Environmental reporting:
 - MEFT Regional Office (Keetmanshoop) – 063 221 077
 - MAFWLR Department of Water Affairs – 061 208 7604
- Licensed hazardous waste/spill response contractor (24/7, pre-contracted): To be included once NamWater has appointed a contractor.

4.2.7 Grievance Redress Mechanism

A preliminary/conceptual grievance procedure for the Project is compiled below based on desktop-level information. This Procedure should be expanded/updated prior to the start of construction.

4.2.7.1 Introduction

The impacts (both positive and negative) of the proposed water abstraction and supply activities can potentially affect the lives of surrounding communities, thus giving rise to grievances. These potential grievances may relate to any aspect of the project. They might be felt and expressed by a variety of parties including individuals, groups, communities, entities, or other parties affected or likely to be affected by the social or environmental impacts of the project.

With this in mind, and in following international best practices trends, the Proponent (in this case NamWater) is required to establish suitable mechanisms, resources, personnel and budget to manage Project-related grievances, via a Grievance Management Procedure.

4.2.7.2 Notification

Directly and indirectly affected parties / communities will be notified of the Grievance Management Procedure. Notification of the Grievance Management Procedure will take place at all information-sharing meetings.

4.2.7.3 Key Elements

The key elements of a robust Grievance Management Procedure include the following:

- An agreed and disclosed grievance submission and response procedure
- Clear rules, performance criteria and lines of accountability
- A hierarchy of response and resolution
- Fair, objective and consistent application of the Grievance Management Procedure
- A mechanism that ensures that women, vulnerable groups or minorities are considered, and privacy is ensured.

4.2.7.4 Grievance Management Officer

The responsibility for implementing the Grievance Management Procedure, during construction, will be delegated to an Community Liaison Officer (CLO) appointed by the contractor, hereafter referred to as the Grievance Management Officer. During operational phase this task is delegated to the Business unit Manager, hereafter referred to as the Grievance Management Officer. The Grievance Management Officer must have the necessary skills, training, and disposition that lend themselves to community liaison work; and will be expected to receive, record, track, and resolve grievances.

The CLO shall be based at the Contractor's office for the duration of the construction phase and shall serve as the primary point of contact for receiving, recording and facilitating the resolution of community grievances. The CLO shall be available throughout the construction period to engage with affected communities and stakeholders and shall implement the project's Grievance Redress Mechanism (GRM) in coordination with NamWater.

4.2.7.5 Organisation

The grievance management structure and procedure might be organised as follows:

- It is recommended that the Grievance Management Office adopts a monthly turnover rate for complaints in which receipt of the complaint/suggestion will be acknowledged within 15 days and issues will be resolved within 30 days.
- Verbal submissions may be made to the Settlement Office in Noordoewer first, but the grievance must then be directed to the Grievance Management Officer, who will record the grievance on a Grievance Report Form that includes the following information:
 - Case number
 - Date the complaint was reported
 - Complainant's name and contact details
 - Nature of the complaint
 - Department designated to investigate and resolve complaint(s)
 - Follow-up action / corrective action

- The final outcome
 - Any information on the case closure, including the date
- A register of grievances is to be maintained by the Grievance Management Officer
- Where possible, grievances during the Operation Phase will be addressed directly by NamWater. Where a grievance requires broader consultation or independent intervention, it may be referred to an appropriate third party. The third party should be neutral, credible, and mutually acceptable to both NamWater and the affected party(ies). Such third parties may include the Office of the Ombudsman, legal advisors, legal non-governmental organisations (NGOs), or relevant university personnel
- As a last resort, aggrieved parties have a right to take legal action.

4.2.7.6 Records

The record of grievances will be held electronically and in hard copy at the site office. This will be available for scrutiny by Interested and Affected Parties (I&APs) (within limits of protecting the privacy of complainants). The record will reflect the following:

- Date and nature of grievance (or comment).
- Source of the grievance (name and contact details).
- Date and nature of acknowledgement of receipt.
- Department designated to investigate and resolve the grievance.
- Details of actions taken to resolve the grievance.
- Status box to indicate whether the grievance has been resolved or not. Resolved and unresolved grievance records will be filed appropriately.
- Minutes of all follow-up meetings with affected parties.

4.2.7.7 Monitoring and reporting

NamWater will monitor grievances routinely as part of the broader management of the Project. Good record keeping of complaints raised throughout the life of the Project must be maintained and managed.

4.2.8 Stakeholder Engagement Plan

A Stakeholder Engagement Plan (SEP) must be developed which sets out how NamWater will inform, consult and involve I&APs throughout the Project life cycle, in compliance with Namibian law and aligned to good international industry practice. Stakeholder engagement regarding abstraction of water from the Orange River under this EMP is the responsibility of NamWater although the SEP may combine and tie-in with the Haib Minerals' SEP.

4.2.8.1 Key Elements

The SEP must address key social elements such as:

- Inclusive, accessible engagement (local languages; gender- and vulnerability-sensitive).
- Regular, accurate disclosure of plans, risks, monitoring results and incidents.
- Two-way communication with feedback tracked to closure.
- Clear interface with the Grievance Mechanism for complaints and disputes.
- Respect for local customs and leadership.
- Data privacy and consent for personal information.

4.2.8.2 Notification

The SEP must incorporate notification measures, such as but not limited to:

- Disclose the SEP, focal contact points and engagement schedule at information-sharing meetings and via local channels (notice boards, radio, WhatsApp/SMS).
- Notify stakeholders of the Company's participation in Orange River water user forums and other coordinated sessions.
- From construction start, display notice boards at Traditional Authority and Settlement Offices (Noordoewer) with engagement dates and grievance channels.
- Public meetings, small-group briefings, one-on-ones with directly affected parties, participation in water user forums, site open days, printed factsheets/posters, local-language radio, WhatsApp/SMS groups.

4.2.8.3 Records

Records of engagements must be maintained, including:

- Maintain a stakeholder register (contacts, preferred channels/languages), engagement log, meeting minutes and an action/commitment tracker.
- Store records electronically at the Project office; make non confidential summaries available to I&APs.

4.2.8.4 Monitoring and Recording

The monitoring and reporting of engagements must include:

- Number of engagements and attendance (disaggregated), percentage of commitments closed on time, timeliness of incident notifications, participation in water user forums, grievance acknowledgement/resolution rates.
- Summarise engagement outcomes and the minimum feedback items listed above in quarterly (construction) and bi-annual (operations) stakeholder updates and in annual public environmental and social performance summaries.
- Review and update the SEP annually and after material changes (e.g., major incident, licence changes), incorporating lessons from grievances, audits and stakeholder feedback.

4.2.9 Archaeological Chance Find Procedure

A conceptual chance find procedure for cultural heritage resources is provided below, which will be tailored and incorporated into the site-specific CHMP.

4.2.9.1 Scope

The "chance finds" procedure covers the actions to be taken immediately upon the discovery of a heritage site or item (such as stone tools, human remains, historical wartime artefacts, etc.), to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

4.2.9.2 Compliance

The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): *"a person who discovers any archaeological objectmust as soon as practicable report the discovery to the Council"*. The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

4.2.9.3 Responsibility

- Operator: To exercise due caution if archaeological remains are found
- Foreman: To secure site and advise management timeously
- Superintendent: To determine safe working boundary and request inspection
- Environmental Manager: To appoint archaeologist to investigate the site
- Archaeologist: To inspect, identify, advise management, and recover remains.

4.2.9.4 Procedure

- Actions by a person identifying archaeological or heritage material:
 - If operating machinery or equipment, stop work
 - Identify the site with flag tape
 - Determine GPS position if possible
 - Report findings to foreman.
- Actions by foreman:
 - Report findings, site location and actions taken to the superintendent
 - Cease any works in the immediate vicinity.
- Actions by superintendent:
 - Visit the site and determine whether work can proceed without damage to the findings
 - Determine and mark the exclusion boundary
 - Site location and details to be added to the Project GIS for field confirmation by the archaeologist.
- Actions by the archaeologist:
 - Inspect site and confirm addition to Project GIS
 - Advise NHC and request written permission to remove findings from the work area
 - Recovery, packaging and labelling of findings for transfer to the National Museum.
- In the event of discovering human remains:
 - Actions as above
 - Field inspection by an archaeologist to confirm that remains are human
 - Advise and liaise with NHC and the Namibian Police
 - Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

Monitoring and reporting should include the following:

- Monitor compliance with this EMP and record any chance finds or incidents related to heritage features through incident reporting.
- Report findings and compliance updates to the NHC of Namibia every six months.

5.0 CONCLUSION

This Environmental Management Plan was developed for NamWater as part of the application for ECC for the proposed water abstraction and supply activities to support the Haib Copper Project in Southern Namibia.

Successful implementation depends on sustained leadership commitment, adequate resourcing, competency-based training, and disciplined execution through combined efforts with Haib Minerals. Routine monitoring, audits, and transparent reporting will verify performance and trigger timely corrective actions where required. Ongoing engagement with regulators, neighbouring land users and communities, and the maintenance of an accessible grievance mechanism, will support accountability and continuous improvement.

Water security management should ideally be a collaborative approach between government, affected water users, industries, and the public. Also, the assessment of cumulative effects due to multiple abstraction licenses under development falls outside the scope of this individual water user. However, NamWater is committed to mitigate any potential impacts (through effective implementation of the water abstraction strategy), so as to contribute to minimising the cumulative effects (on downstream users).

With approval of the ECC by MEFT and MAFWLR and adoption of this EMP, NamWater can proceed with activities in a manner that minimises environmental harm, protects people and biodiversity, and supports responsible socio-economic development.

6.0 CERTIFICATION

This report was prepared and reviewed by the undersigned.



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