

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for the
management of activities relating to the protection of the natural environment during the construction,
operational and decommissioning phases relating to the

THE PROPOSED ENLARGEMENT OF LANGRUG- BOONSTE NR1 DAM, ALSO KNOWN AS HELPMEKAAR DAM, CONSTRUCTION OF A NEW BUFFER DAM AND ASSOCIATED INFRASTRUCTURE, ON FARM RIETRIVIER 202, PORTION 5, CERES, WESTERN CAPE



SEPTEMBER 2026

Compiled by: ***EnviroAfrica cc***

INDEPENDENCE & CONDITIONS

EnviroAfrica is an independent consulting firm that has no interest in the proposed activity other than fair remuneration for services rendered. Remuneration for services is not linked to approval by decision-making authorities and EnviroAfrica has no interest in secondary or downstream development as a result of this project. There are no circumstances that compromise the objectivity of this EMP. The findings, results, observations and recommendations given here are based on the author's best scientific and professional knowledge and available information. EnviroAfrica reserves the right to modify aspects of this report, including the recommendations, if new information becomes available which may have a significant impact on the findings of this report.

RELEVANT QUALIFICATIONS & EXPERIENCE OF THE EAP

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Bianca specialises in:

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- Section 24G administrative processes
- Watercourse-related assessments and compliance
- EMPr compilation and environmental control
- Stakeholder and authority engagement

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1. INTRODUCTION

The main purpose of this Environmental Management Plan or Programme (EMP) is to prevent avoidable damage and/or minimise or mitigate unavoidable environmental damage associated with any construction and operational work where there is a risk of environmental damage and to enhance positive benefits of the project.

The EMP forms part of the contractual obligations to which all contractors/employees involved in construction or demolition work must be committed. It serves as a guideline and baseline information document for the construction and operational of the proposed project and aims to comply with Section 24N of the National Environmental Management Act (Act no 107 of 1998) also known as NEMA, as well as the Environmental Impact Assessment Regulations 2014 (as amended) and any additional specific information requested by any State Department, including the Western Cape Department of Environmental Affairs and Development Planning (WCDEADP) for specific projects.

This EMP:

- identifies project activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMP and provides their contact information;
- provides standard procedures to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- provides site and project-specific rules and actions required, including a site plan/s showing:
 - areas where construction, maintenance, or demolition work may be carried out;
 - areas where any material or waste may be stored;
 - allowed access routes, parking and turning areas for construction or construction-related vehicles;
- forms a written record of procedures, responsibilities, requirements and rules for Contractor/s, their staff and any other person who must comply with the EMP;
- provides a monitoring and auditing programme to track and record compliance and identify and respond to any potential or actual negative environmental impacts; and
- provides a monitoring programme to record any mitigation measures that are implemented;

The EMP is partly prescriptive (identifying specific people or organisations to undertake specific tasks, in order to ensure that impacts on the environment are minimised), but it is also an open-ended document in that information gained during the construction activities and/or monitoring of procedures on site could lead to changes in the EMP.

1.1 TERMS OF REFERENCE

EnviroAfrica cc was appointed by the Applicant, Sterkwater Boerdery (Pty) Ltd, to compile the Environmental Management Programme (EMPr) for the proposed enlargement of the existing Langrug-Boonste No. 1 Dam, also known as Helpmekaar Dam, the construction of a new Buffer Dam and associated infrastructure, including the connecting pipeline, on Portion 5 of Farm Rietrivier No. 202, near Ceres, within the Witzenberg Local Municipality, Western Cape.

In terms of the scope of the appointment and the applicable requirements of the Environmental Impact Assessment Regulations, 2014 (as amended), the EMPr must include the following:

- Details of the EAP (Refer to Page ii of this document)

- Purpose of the EMP (Refer Par. 1.2)
- Legal requirements (Refer Par. 4 & 6.1)
- Management of possible impacts (Refer Par. 5-7)
- Institutional arrangements (Refer Par. 7.1)
- EMP operational & implementation procedures (Refer Par 5-9)
- Conclusion (Refer Par. 6)
- Annexures (Refer to Appendices)

1.2 PURPOSE OF THE EMP

The purpose of this Environmental Management Plan or Programme (EMPr) is to give direction and guidance to all responsible parties, and binds all contractors, sub-contractors and other persons working on the site to adhere to the terms and conditions of the EMP during the construction and operational phase of the project. Any additional Site-Specific conditions decided and agreed upon during the “On Site Start-Up Meeting” shall be included and will become a part of the EMP.

The overall aim of the EMPr is to prevent avoidable damage and/or minimise or mitigate unavoidable environmental damage associated with the construction, and to a lesser degree, the operational phases of the proposed project.

The EMP forms part of the contractual obligations to which all contractors/employees involved in construction, maintenance, or demolition work must be committed. It serves as a guideline and baseline information document for the construction, operational and decommissioning phases of the proposed project and aims to comply with Section 24N of the National Environmental Management Act (Act no 107 of 1998) also known as NEMA, as well as the Environmental Impact Assessment (EIA) Regulations and any additional specific information requested by any State Department, including the Department of Environmental Affairs (DEA) for specific projects.

This EMPr:

- identifies project activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMP;
- provides standard procedures to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- provides site and project-specific rules and actions required, through the start-up report;
- forms a written record of procedures, responsibilities, requirements and rules for Contractor(s), their staff and any other person who must comply with the EMP;
- provides for monitoring of compliance and record keeping.

The EMPr is partly prescriptive (identifying specific people or organisations to undertake specific tasks, in order to ensure that impacts on the environment are minimised), but it is also an open-ended document in that information gained during the construction activities and/or monitoring of procedures on site could lead to changes in the EMP.

1.3 SCOPE

This EMPr addresses the construction and operational phases and all activities associated with this project. Compliance with the EMP shall be monitored by an independent Environmental Control Officer (ECO) who will visit the site on a regular basis during the construction phase (at least twice monthly).

The Client or the Construction Engineer or the Project Manager, on behalf of the Client, will be responsible for ensuring the implementation of the requirements of this EMP by all contractors and subcontractors.

2. DEFINITIONS AND ABBREVIATIONS:

2.1 DEFINITIONS

Applicant: the person or responsible person from an organisation who applied for the proposed activity described in the Environmental Authorisation.

Audit (Site Completion): environmental evaluation (audit) of compliance of the construction phase to the conditions of the EMP.

Bund: enclosure under / around a storage facility to contain spillage.

Batch plant: a concrete or plaster mixing facility and associated equipment and materials.

Construction: means the construction period of the project during which the actual works are carried out, deemed to include site establishment, site preparation, the works, maintenance period and decommissioning and is defined as from commencement of site establishment until site handover (practical completion).

Construction site: means the area influenced and affected by the construction activities or under the control of the Contractor, often referred to as “the Site”.

Construction Supervisor: The person responsible (appointed by the owner) to ensure that the construction is carried out to completion on time, within budget and that the Contractor fulfils his obligations in terms of the EMP.

Contaminated water: means water contaminated by the Contractor's activities, *e.g.* concrete water and runoff from plant/ personnel wash areas.

Contractor: the principal persons / company and all other subcontractors involved in the construction of the project.

Contractor's camp: means the designated and suitably demarcated areas on the Site within which all site offices and staff facilities are situated and within which equipment will be stored, for instance, borrow areas, batching plant, crusher plant, sand washing plant, workshop, offices, rest areas, ablution areas, etc., whichever is applicable.

Declaration of understanding: A Form that is signed by all contractors involved in the construction works, of their understanding and acceptance of the EMP and site-specific additions to the EMP.

Development site: boundary and extent of development works and infrastructure.

Environment: means the surroundings within which humans exist and that are made up of:

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part of the combination of the above two bullets and the interrelationships between them;
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being

Environmental Aspect: Any element of any construction activity, product or service that can interact with the environment.

Environmental Audit Report: report done by the ECO and submitted by the Applicant to the satisfaction of the Chief Directorate Environmental Affairs, within six months after construction has been completed and also after the site(s) have been rehabilitated.

Environmental Control Officer: The ECO must be independent and suitably qualified (a diploma or degree in environmental management with at least 5 or more years of environmental site management

experience) and must have a sound knowledge of the environment in which the activity will take place. The ECO should be registered as an Environmental Scientist (*in terms of section 20(3) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003)*).

Environmental Completion Statement: A report by the ECO to the relevant authorities stating completion of the project and compliance with the EMP and its conditions.

Environmental Impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from any construction activity, product or service.

Method statement: A statement by the Contractor, describing the scope of intended construction works step-by-step, in order for the ECO and Construction Supervisor to understand the Contractor's intentions and be able to comment on, so that they could assist with devising mitigating measures should it be necessary to avoid environmental impact.

No-Go Area(s): An area of such (environmental/aesthetic) importance that no person or activity is allowed within a designated boundary surrounding this area.

Owner: The owner, or dedicated person, responsible for the management of the property on which the proposed activity (in terms of the EA) will be performed.

Stop Works Order: An order which can be issued either by the ECO or Construction Supervisor to the Contractor (or any sub-contractor) if serious environmental damage is about to happen or is happening as a result of construction activities. On receiving such an order, the Contractor must immediately stop all activities (or planned activities) relevant to the specific issue until an environmentally friendly resolution has been approved by the ECO.

Site meetings: Periodic (weekly or monthly) meetings between the ECO, Construction Supervisor and Contractor to discuss construction activities that relate to the environment or any other environmental issues that might arise.

Works: The works to be executed in accordance with a contract.

On-site start-up meeting: a start-up meeting held on site, before any construction has begun, to discuss EMP and determine site-specific additions that will be included as the basis for the EMP.

Potentially hazardous substance: is a substance, which, in the reasonable opinion of the Engineer, can have a deleterious (detrimental) effect on the environment.

Precautionary principle: means the basic principle that when in doubt or having insufficient or unreliable information on which to base a decision, one to then undertake actions that will have minimum risk.

Reasonable: means, unless the context indicates otherwise, reasonable in the opinion of the Engineer/Project Leader after he has consulted with a person, not an employee of the client, suitably experienced in "environmental implementation plans" and "environmental management plans", both as defined in the Environmental Management Act (Act No 107, 1998).

Solid waste: means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

2.2 ABBREVIATIONS

CARA	Conservation of Agricultural Resources Act no. 43 of 1983
DEADP	Department of Environmental Affairs and Development Planning
EA	Environmental Authorisation (Record of Decision) issued by the relevant authority for the authorisation to commence construction under certain environmental compliances
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer - Must be a suitably qualified independent environmental consultant appointed to ensure compliance with the EMP
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan or Programme
ER	Engineer's representative or the Main contractor's representative
ESO	Environmental Site Officer - Must be a person with adequate environmental knowledge to understand and implement the EMP by conducting onsite inspections determined by the ECO and the client.
MSDS	Material Safety Data Sheet(s)
NEMA	National Environmental Management Act no. 107 of 1998.
NEM:AQA	National Environmental Management: Air Quality Act 39 of 2004.
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004.
NEM:PAA	National Environmental Management: Protected Areas Act 57 of 2003
NEM:WA	National Environmental Management: Waste Act 59 of 2008.
NFA	National Forest Act 84 of 1998.
NHRA	National Heritage Resources Act 25 of 1999.
NVFFA	National Veld and Forest Fire Act 101 of 1998.
NWA	National Water Act 36 of 1998
OSSM	On-site Start-up Meeting
SAHRA	South African Heritage Resources Agency

3. PROJECT LOCATION & DESCRIPTION

The proposed development entails the enlargement of the existing Langrug-Boonste No. 1 Dam, also known as Helpmekaar Dam, the construction of a new supplementary Buffer Dam and the installation of associated infrastructure, including a connecting pipeline, on Portion 5 of Farm Rietrivier No. 202, near Ceres, within the Witzenberg Local Municipality, Western Cape.

The Applicant, Sterkwater Boerdery (Pty) Ltd, proposes to increase the storage capacity of the existing Helpmekaar Dam from approximately 390 000 m³ to approximately 800 000 m³, representing an additional storage capacity of approximately 410 000 m³. The proposed development also includes a supplementary Buffer Dam with a storage capacity of approximately 27 000 m³ and an approximately 1.7 km underground pipeline connecting the two dams.

The development is intended to improve long-term irrigation-water security and drought resilience by increasing the storage of available winter runoff for use during the dry summer months. The additional storage will support the existing farming operation and the proposed conversion of approximately 45 ha of annual crops into permanent fruit orchards, subject to the applicable water use authorisation requirements.

The development area is situated within an established agricultural landscape characterised by cultivated lands, existing farm dams, agricultural infrastructure, farm roads and areas of natural vegetation. The existing Helpmekaar Dam is an instream dam situated within a tributary of the Leeu River. The proposed Buffer Dam will also be constructed within a watercourse, while the preferred connecting pipeline alignment predominantly follows existing farm roads, disturbed agricultural areas and farm infrastructure.

The proposed development has been assessed through the Environmental Impact Assessment process, supported by engineering investigations and specialist assessments addressing freshwater ecology, terrestrial biodiversity, hydrology, agricultural resources and heritage.

Description of Proposed Works

The proposed development will include the following infrastructure and associated activities:

- Enlargement of the existing Helpmekaar Dam through the raising and extension of the existing earth-fill dam embankment to increase its total storage capacity to approximately 800 000 m³;
- Construction-related excavation, earthworks and shaping of the existing dam basin and proposed inundation area, as required by the approved engineering design;
- Construction and modification of the dam wall, spillway, outlet works and associated erosion protection measures;
- Installation or modification of the necessary outlet structures, valves and associated dam infrastructure;
- Construction of a supplementary Buffer Dam with a storage capacity of approximately 27 000 m³ and an inundation area of approximately 2.1 ha;
- Construction of the Buffer Dam embankment, spillway, inlet and outlet structures and associated erosion protection measures;

- Installation of an approximately 1.7 km underground connecting pipeline between the enlarged Helpmekaar Dam and the proposed Buffer Dam, together with the necessary valves, fittings and associated water-transfer infrastructure;
- Excavation, pipe installation, backfilling, compaction and rehabilitation along the authorised pipeline alignment;
- Construction-related earthworks, temporary stockpiling and the establishment of temporary construction and laydown areas within approved locations;
- Use of suitable construction material obtained from within the approved development footprint and authorised borrow areas, where required and subject to engineering suitability and applicable environmental requirements;
- Use of existing farm roads and access routes for construction access, with limited upgrading where necessary and authorised;
- Implementation of the applicable freshwater, terrestrial biodiversity, agricultural and heritage mitigation measures during construction; and
- Rehabilitation and stabilisation of temporarily disturbed areas following completion of construction activities.

The preferred preliminary engineering design for the enlarged Helpmekaar Dam provides for a maximum dam wall height of approximately 13.8 m, a crest length of approximately 320 m and a water surface area of approximately 16.3 ha at full supply level.

The final construction specifications and infrastructure layout must remain consistent with the development assessed in the Environmental Impact Report, the approved Environmental Management Programme (EMPr), the Environmental Authorisation and the applicable water use authorisation requirements.

Water Source and Purpose

The proposed development is intended to store available winter runoff from the upper tributary catchment of the Leeu River for use during the dry summer irrigation period.

The enlarged Helpmekaar Dam will provide approximately 410 000 m³ of additional storage capacity, while the supplementary Buffer Dam will provide approximately 27 000 m³ of balancing storage to improve water-transfer efficiency, irrigation management and operational flexibility.

The Hydrological Assessment undertaken for the proposed development indicates that surplus water is available within the Leeu River catchment to support the proposed increase in storage. The modelling further indicates that the proposed development will have a limited effect on the downstream Wydekloof Dam and will not reduce the modelled irrigation supply abstracted from that dam.

The proposed additional water taking and storage remain subject to the applicable water use authorisation process. The Water Use Licence Application is being undertaken under reference WU38102. The Environmental Authorisation and this EMPr do not independently authorise additional water abstraction or storage.

The operation of the dams and associated infrastructure must comply with the applicable water use authorisation and its conditions once issued, including any requirements relating to authorised abstraction and storage volumes, downstream flows, monitoring and reporting.

Stored water will be used primarily to support the irrigation requirements of the existing farming operation and the proposed conversion of approximately 45 ha of annual crops into permanent fruit orchards.

Site Location and Coordinates

The proposed development is situated on Portion 5 of Farm Rietrivier No. 202, approximately 50 km north of Ceres, within the Koue Bokkeveld region of the Western Cape.

The property falls within the jurisdiction of the Witzenberg Local Municipality and the Cape Winelands District Municipality. The existing Helpmekaar Dam is located within an upper tributary of the Leeu River in quaternary catchment E21G.

The approximate coordinates of the principal development components are provided below:

Development component	Approximate coordinates
Existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam)	32°55'03.60" S; 19°14'12.90" E
Proposed Buffer Dam	32°55'39.10" S; 19°15'02.30" E
Connecting pipeline – start point	32°55'03.17" S; 19°14'16.41" E
Connecting pipeline – end point	32°55'37.87" S; 19°14'55.00" E

The georeferenced development layout, showing the proposed dam footprints, connecting pipeline alignment and associated infrastructure, is included in the Environmental Impact Report and its relevant appendices.

The construction and operation of the proposed development must remain within the authorised development footprint and comply with the Environmental Authorisation, approved EMPr, applicable water use authorisation requirements and relevant specialist recommendations.

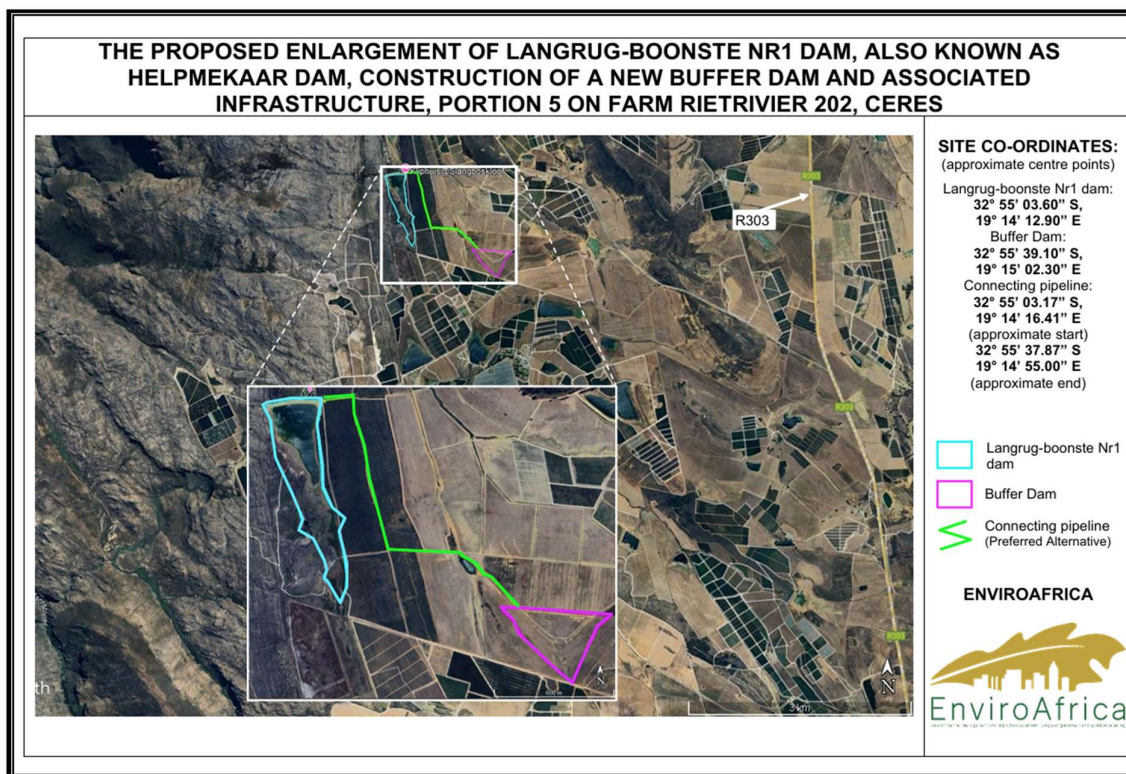


Figure 1: Proposed development site – Development footprint.

4. APPLICABLE LEGISLATION

Constitution of the Republic of South Africa (1996): of special relevance in terms of the environment is section 24

Conservation of Agricultural Resources Act 43 of 1983 (CARA): supports conservation of natural agricultural resources (soil, water, plant biodiversity) by maintaining the production potential of the land and combating/preventing erosion; for example, by controlling or eradicating declared weeds and invasive plants.

Hazardous Substances Act 15 of 1973: to control substances that may cause injury, ill-health, or death through their toxic, corrosive, irritant, strongly sensitising or flammable nature, or by the generation of pressure

National Environmental Management Act 107 of 1998 (as amended): replaces the Environmental Conservation Act (ECA) and establishes principles for decision-making on matters affecting the environment, and for matters connected therewith.

- **Environmental Impact Assessment Regulations:** identifying activities (listed activities) for which environmental authorisation must be obtained.

National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA): replaces the Atmospheric Pollution Prevention Act (No. 45 of 1965).

National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA): supports conservation of plant and animal biodiversity, including the soil and water upon which it depends.

- **Revised National List of Ecosystems that are Threatened and in Need of Protection, published under Government Notice No. 2747 of 18 November 2022.** Kouebokkeveld Alluvium Fynbos and Kouebokkeveld Shale Fynbos are classified as Critically Endangered ecosystems under this list.

National Environmental Management: Protected Areas Act 57 of 2003 (as amended Act 31 of 2004) (NEMPAA): To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

National Environmental Management: Waste Act 59 of 2008 (NEMWA): To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

- **List of Waste Management Activities that have or are likely to have a detrimental effect on the environment:** Identifies activities in respect of which a waste management license is required.

National Forests Act 84 of 1998 (as amended): supports sustainable forest management and the restructuring of the forestry sector.

- **List of protected tree species** (GN 716 of 7 September 2012)

National Heritage Resources Act 25 of 1999: supports an integrated and interactive system for the management of national heritage resources, including soil, water and animal and plant biodiversity.

National Veld and Forest Fire Act 101 of 1998 (NVFFA): protects soil, water and plant life through the prevention and combating of veld, forest, and mountain fires

National Water Act 36 of 1998 (NWA): promotes the protection, use, development, conservation, management, and control of water resources in a sustainable and equitable manner.

The **National Dust Control Regulations (GN R7335 of 31 March 2026)**, promulgated in terms of the National Environmental Management: Air Quality Act (Act 39 of 2004), are applicable to the proposed development and replace the previous National Dust Control Regulations (GN R827 of 2013).

5. SITE-SPECIFIC ENVIRONMENTAL CONCERNS

The purpose of this section of the Environmental Management Programme (EMPr) is to identify the site-specific environmental sensitivities and potential impacts associated with the proposed enlargement of the Helpmekaar Dam, construction of the supplementary Buffer Dam and installation of the connecting pipeline and associated infrastructure.

This section provides site-specific guidance for avoiding, minimising and managing environmental impacts during construction, operation and rehabilitation, taking into account the findings and recommendations of the specialist assessments undertaken for the proposed development.

5.1 VEGETATION ENCOUNTERED

The vegetation mapping obtained from CapeFarmMapper and the Western Cape Biodiversity Spatial Plan indicates that the proposed development area is associated with three vegetation types, namely Kouebokkeveld Alluvium Fynbos, Kouebokkeveld Shale Fynbos and Winterhoek Sandstone Fynbos.

Kouebokkeveld Alluvium Fynbos and Kouebokkeveld Shale Fynbos are classified as Critically Endangered ecosystems in terms of the Revised National List of Ecosystems that are Threatened and in Need of Protection (GN 2747 of 18 November 2022).

The Terrestrial Biodiversity Compliance Statement undertaken for the proposed Helpmekaar Dam development confirmed that the existing dam and its proposed enlargement footprint are associated with wetland and seepage vegetation, including areas of Kouebokkeveld Alluvium Fynbos. The specialist identified approximately 0.6–1 ha of Kouebokkeveld Alluvium Fynbos that may be affected by the proposed enlargement. Although the affected area is considered small and localised, the remaining indigenous vegetation within and adjacent to the development footprint must be protected from unnecessary disturbance.

The specialist further confirmed that the south-eastern portion of Langrug Ridge supports Kouebokkeveld Shale Fynbos in good ecological condition. This area is considered environmentally sensitive, and the specialist recommends that it be recognised as part of CBA 1.

The preferred connecting pipeline alignment traverses Langrug Ridge along an existing farm road/firebreak. The pipeline must be installed within the existing road or immediately adjacent to its edge, where necessary and feasible, to minimise disturbance to the surrounding indigenous vegetation. East of Langrug Ridge, the pipeline predominantly follows existing farm tracks and historically transformed agricultural land, where no significant remnants of natural vegetation were identified along the assessed alignment.

The proposed Buffer Dam is situated within an existing agricultural area that has been modified through historical cultivation. The terrestrial biodiversity specialist confirmed that the proposed Buffer Dam footprint does not support remaining natural veld of significance. Consequently, the construction of the Buffer Dam is not expected to result in significant additional loss of intact terrestrial vegetation.

The Terrestrial Biodiversity Compliance Statement verified the Plant Species Theme as having Medium sensitivity. Although no sensitive plant species were recorded during the specialist investigation, their occurrence within suitable habitat could not be entirely excluded due to the timing of the survey and the age and condition of the vegetation.

5.1.1 Critical Biodiversity Areas and Ecological Support Areas

Spatial data obtained from CapeFarmMapper and the Western Cape Biodiversity Spatial Plan indicates that portions of the proposed Helpmekaar Dam development area are mapped as Critical Biodiversity Area 1 (CBA1) and Ecological Support Areas (ESAs). These areas contribute to the conservation of biodiversity, the maintenance of ecological connectivity and the functioning of associated freshwater and terrestrial ecosystems.

The Terrestrial Biodiversity Compliance Statement confirmed that the proposed development area is associated with Kouebokkeveld Alluvium Fynbos, Kouebokkeveld Shale Fynbos and Winterhoek Sandstone Fynbos. Kouebokkeveld Alluvium Fynbos and Kouebokkeveld Shale Fynbos are classified as Critically Endangered ecosystems in terms of the Revised National List of Ecosystems that are Threatened and in Need of Protection (GN 2747 of 18 November 2022).

The existing Helpmekaar Dam and its proposed enlargement footprint are associated with wetland and seepage vegetation, including areas of Kouebokkeveld Alluvium Fynbos. The terrestrial biodiversity specialist identified approximately 0.6–1 ha of Kouebokkeveld Alluvium Fynbos that may be affected by the proposed enlargement. Although the affected area is considered small and localised, the remaining indigenous vegetation within and adjacent to the development footprint must be protected from unnecessary disturbance.

Ground-truthing further identified Kouebokkeveld Shale Fynbos in good ecological condition on the south-eastern portion of Langrug Ridge. The specialist recommends that this area be recognised as CBA1 due to its biodiversity importance and the ecological condition of the remaining indigenous vegetation.

The preferred connecting pipeline alignment traverses Langrug Ridge along an existing farm road/firebreak. The pipeline must be installed within the existing road or immediately adjacent to its edge, where necessary and feasible, to minimise disturbance to the surrounding Kouebokkeveld Shale Fynbos. East of Langrug Ridge, the pipeline predominantly follows existing farm tracks and historically transformed agricultural land, thereby limiting the potential disturbance of remaining natural vegetation.

The proposed supplementary Buffer Dam is situated within an existing agricultural area that has been modified through historical cultivation. The terrestrial biodiversity specialist confirmed that the Buffer Dam footprint does not support remaining natural veld of significance. Consequently, the proposed Buffer Dam is not expected to result in significant additional loss of intact terrestrial vegetation.

Although portions of the proposed development occur within historically transformed agricultural land, the mapped CBA1 and ESA classifications remain relevant to the protection of the surrounding ecological landscape. In particular, the remaining Kouebokkeveld Alluvium Fynbos associated with the Helpmekaar Dam and the good-condition Kouebokkeveld Shale Fynbos on Langrug Ridge require site-specific protection during construction and rehabilitation.

The Terrestrial Biodiversity Compliance Statement concluded that the overall terrestrial biodiversity impact of the proposed development is expected to be Medium to Medium-Low, subject to the implementation of the recommended mitigation measures.

Accordingly, the following management requirements must be implemented:

- Construction activities, temporary laydown areas, stockpiling and vehicle movement must remain within the approved development footprint and designated access routes.
- The extent of disturbance to Kouebokkeveld Alluvium Fynbos associated with the proposed Helpmekaar Dam enlargement must be minimised.

- The western boundary of the proposed inundation area must be clearly demarcated before construction to prevent unnecessary disturbance of adjacent indigenous vegetation.
- The connecting pipeline must follow the existing farm road/firebreak across Langrug Ridge, with disturbance to the surrounding Kouebokkeveld Shale Fynbos avoided or minimised.
- Where disturbance of natural vegetation cannot be avoided, suitable indigenous plant material and topsoil must be conserved and reused during rehabilitation in accordance with the terrestrial biodiversity specialist's recommendations.
- The supplementary Buffer Dam construction footprint must remain confined to the approved development area to prevent unnecessary disturbance of surrounding agricultural land and natural vegetation.
- Alien invasive plant species must be controlled within and around the development footprint, including the areas identified by the terrestrial biodiversity specialist.
- Temporarily disturbed areas must be stabilised and rehabilitated following completion of construction activities to prevent erosion, sedimentation, alien invasive plant establishment and further degradation of surrounding biodiversity features.

The implementation of these measures, together with the applicable specialist recommendations and the requirements of this EMPr, will assist in minimising impacts on the mapped CBAs, ESAs, threatened ecosystems and associated ecological processes within the development area.



Figure 3: Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) associated with the proposed Helpmekaar Dam development, showing the existing Helpmekaar Dam, proposed Buffer Dam and connecting pipeline alignment in relation to mapped terrestrial and riverine CBAs, aquatic ESAs, degraded biodiversity areas and the surrounding agricultural landscape on Portion 5 of Farm Rietrivier No. 202, Ceres, Western Cape.

A Terrestrial Biodiversity Statement was conducted (**Appendix 8D**), and findings are discussed in Section 10 of the EIR.

5.2 FRESHWATER FEATURES

The proposed enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam and installation of the connecting pipeline are located within the upper Leeu River catchment, quaternary catchment E21G, in the Koue Bokkeveld region of the Western Cape.

The Leeu River catchment is characterised by seasonal rainfall and runoff, with higher flows generally occurring during the winter rainfall period and reduced flows during the dry summer months. The catchment supports agricultural irrigation and freshwater ecosystems and has been influenced by historical agricultural activities, existing farm dams and associated water resource development.

The existing Helpmekaar Dam is an instream dam situated within a tributary of the Leeu River. The proposed enlargement will increase its storage capacity from approximately 390 000 m³ to approximately 800 000 m³, representing an additional storage capacity of approximately 410 000 m³.

The supplementary Buffer Dam, with a proposed storage capacity of approximately 27 000 m³, will be constructed within a watercourse and connected to the enlarged Helpmekaar Dam by an approximately 1.7 km underground pipeline. The development is intended to improve the storage and management of available winter runoff for agricultural irrigation during the dry summer months.

Freshwater Ecological Assessment

The Freshwater Assessment undertaken by WATSAN Africa (October 2025) evaluated the freshwater features associated with the proposed enlargement of the Helpmekaar Dam and construction of the supplementary balancing/Buffer Dam.

The assessment considered the Present Ecological State (PES), Ecological Importance, Ecological Sensitivity, Ecological Importance and Sensitivity Category (EISC), anticipated impact significance, applicable Department of Water and Sanitation (DWS) Risk Matrix and resource-economic functions of the affected freshwater features.

The freshwater feature associated with the existing Helpmekaar Dam is mapped within a Critical Biodiversity Area (CBA) and Ecological Support Area (ESA) and is associated with a wetland and drainage system that has been modified by historical agricultural activities and the construction and operation of the existing dam.

The freshwater specialist concluded that the affected wetland has been substantially altered and degraded and that the proposed enlargement is not expected to result in a material additional threat to the current aquatic environment, subject to implementation of the recommended mitigation measures.

The proposed Buffer Dam will affect a separate wetland feature within an existing agricultural area. The freshwater specialist identified this feature as having limited ecological and resource-economic value and concluded that its inundation is not expected to result in a significant additional loss of freshwater ecosystem functioning.

Notwithstanding the existing modification of the affected freshwater features, construction activities must be managed to minimise unnecessary disturbance of the remaining aquatic habitat, wetland vegetation, watercourse beds and banks, and downstream freshwater environment.

Potential Freshwater Impacts

The proposed development may result in the following freshwater impacts:

- Permanent inundation of the freshwater features within the enlarged Helpmekaar Dam and proposed Buffer Dam footprints;
- Modification of the flow characteristics of the affected watercourses through additional water storage and associated dam infrastructure;
- Disturbance of watercourse beds, banks, wetland vegetation and associated aquatic habitat during construction;
- Temporary mobilisation of sediment and increased turbidity resulting from excavation, earthworks, embankment construction and pipeline installation;
- Erosion and scour associated with disturbed areas, dam spillways, outlet structures and downstream discharge areas;
- Potential contamination of surface water through construction-related fuels, oils, cement, concrete wash water, waste and other pollutants;
- Disturbance associated with the installation of the connecting pipeline where construction activities occur within or adjacent to freshwater features; and
- Potential downstream hydrological and cumulative impacts associated with increased water storage and changes in the timing and volume of flows.

The extent and significance of these impacts must be considered in conjunction with the findings of the Freshwater Assessment, Hydrological Assessment, applicable water use authorisation requirements and the mitigation measures contained in this EMPr.

Hydrological Assessment and Water Use Authorisation

The Hydrological Assessment undertaken for the proposed development investigated the availability of surplus water within the Leeu River catchment and the potential implications of the proposed increase in storage for downstream water resources and users, including the Wydekloof Dam.

The assessment indicates that surplus water is available to support the proposed enlargement of the Helpmekaar Dam. The hydrological modelling further indicates that the proposed development will have a limited effect on the downstream Wydekloof Dam and will not reduce the modelled irrigation supply abstracted from that dam.

The assessment also identifies a reduction in downstream spill volumes associated with the proposed additional storage. Consequently, the operation of the enlarged Helpmekaar Dam must take account of downstream water users, applicable ecological flow requirements and the conditions imposed through the water use authorisation process.

The proposed additional water taking and storage, together with activities affecting watercourses, remain subject to the applicable requirements of the National Water Act, 1998 (Act No. 36 of 1998).

The Water Use Licence Application for the proposed development is being undertaken under reference WU38102. The freshwater specialist's assessment of the watercourse-related activities through the DWS Risk Matrix indicated that a General Authorisation may be applicable to certain activities. However, the final water use authorisation requirements and conditions remain subject to determination by the relevant water authority.

The Environmental Authorisation and this EMPr do not independently authorise additional water abstraction, storage or other water uses requiring authorisation under the National Water Act.

Freshwater Mitigation and Management Measures

The following measures must be implemented during construction, rehabilitation and operation, as applicable:

- Construction activities within or adjacent to watercourses and wetlands must be confined to the approved development footprint and the minimum area necessary to undertake the authorised works.
- The boundaries of the approved dam footprints, connecting pipeline alignment, construction access routes and sensitive freshwater areas must be clearly demarcated before the commencement of activities involving physical disturbance.
- Earthworks within or adjacent to freshwater features must, as far as practicable, be undertaken during low-flow or dry conditions to minimise sediment mobilisation and disturbance of aquatic habitat.
- Appropriate erosion and sediment control measures must be implemented during excavation, embankment construction, pipeline installation and rehabilitation.
- Excavated material, spoil, construction materials and temporary stockpiles must be managed to prevent sediment-laden runoff or material from entering watercourses, wetlands or downstream freshwater features.
- Construction machinery must be maintained in good working condition, and appropriate measures must be implemented to prevent fuel, oil, hydraulic fluid, cement, concrete wash water and other pollutants from entering the freshwater environment.
- Refuelling, machinery servicing, hazardous substance storage and concrete washout must be undertaken in designated areas away from watercourses and wetlands, with appropriate containment and spill-response measures.
- The connecting pipeline must follow the approved alignment, with disturbance to watercourse beds, banks and associated freshwater vegetation avoided or minimised wherever practicable.
- Where pipeline installation or other authorised works disturb freshwater features, the affected areas must be appropriately backfilled, stabilised and rehabilitated following completion of construction.
- Spillways, outlet structures and downstream discharge areas must incorporate appropriate erosion protection measures in accordance with the approved engineering design.
- Construction activities must not result in unnecessary obstruction, diversion or concentration of flows outside the approved development footprint.

- Disturbed areas must be rehabilitated as soon as practicable following completion of construction to prevent erosion, sedimentation, alien invasive plant establishment and further degradation of freshwater habitats.
- The operation of the enlarged Helpmekaar Dam and supplementary Buffer Dam must comply with the applicable water use authorisation and its conditions once issued, including any requirements relating to authorised abstraction and storage volumes, downstream releases, ecological flows, measurement, monitoring and reporting.
- The dam walls, spillways, inlet and outlet structures, connecting pipeline and associated freshwater environment must be inspected and maintained in accordance with the approved EMPr, applicable dam-safety requirements and the Maintenance Management Plan (MMP).
- Any significant erosion, scour, sedimentation, pollution or other freshwater impact identified during construction or operation must be investigated and addressed through appropriate corrective and rehabilitation measures.

Conclusion

The Freshwater Assessment concluded that the proposed enlargement of the Helpmekaar Dam and construction of the supplementary Buffer Dam can be accommodated from a freshwater ecological perspective, subject to implementation of the recommended mitigation measures and the applicable water resource management requirements.

The Hydrological Assessment indicates that the proposed increase in storage can be supported by available surplus water within the Leeu River catchment, with limited modelled effects on downstream irrigation supply. These findings do not replace the requirement to obtain the applicable water use authorisation.

The freshwater management measures contained in this EMPr must therefore be implemented in conjunction with the specialist recommendations, approved engineering design, Environmental Authorisation, applicable water use authorisation requirements and the MMP for future maintenance of authorised infrastructure within watercourses.

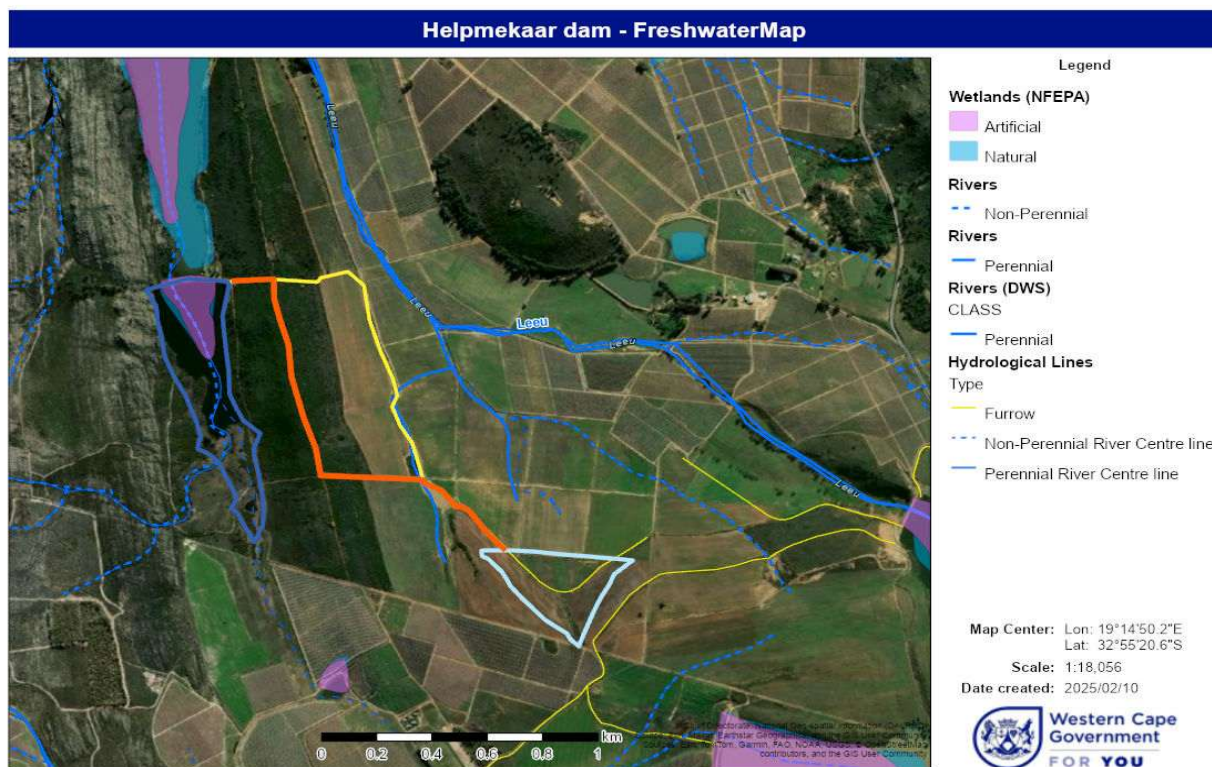


Figure 4: Freshwater Resources Map of the proposed Helpmekaar Dam development, showing the existing Helpmekaar Dam, proposed Buffer Dam and connecting pipeline alignment in relation to the mapped perennial and non-perennial watercourses, natural and artificial wetlands, and surrounding agricultural landscape on Portion 5 of Farm Rietrivier No. 202, Ceres, Western Cape.

A Freshwater Impact Assessment has been undertaken and is attached to the EIR (**Appendix 8C**).

5.3 AGRICULTURAL RESOURCES

The proposed enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam and installation of the connecting pipeline are located within an established agricultural landscape on Portion 5 of Farm Rietrivier No. 202, near Ceres, Western Cape.

The Agricultural Compliance Statement undertaken by Johann Lanz and David Lakey (November 2025) assessed the agricultural sensitivity of the proposed development footprint and the potential impacts of the development on agricultural resources and production.

The property falls within the Op die Berg Protected Agricultural Area and forms part of an established commercial farming operation. The proposed development is intended to improve irrigation-water storage and reliability, thereby supporting the conversion of approximately 45 ha of annual crops into permanent fruit orchards.

Agricultural Sensitivity and Potential Impacts

The Agricultural Compliance Statement verified that the proposed Helpmekaar Dam enlargement footprint occurs predominantly on soils of Low to Medium agricultural potential that have previously been disturbed by agricultural activities.

The proposed Buffer Dam footprint overlaps land of higher agricultural potential and was verified as having High agricultural sensitivity. The development will therefore result in the permanent loss of some potential agricultural land through inundation and the construction of associated infrastructure.

The connecting pipeline will predominantly follow existing farm roads, tracks and disturbed agricultural areas. Although the pipeline will result in temporary disturbance of agricultural soils during excavation and installation, the affected areas can be reinstated and rehabilitated following completion of construction.

Potential agricultural impacts associated with the proposed development include:

- Permanent loss of agricultural land within the enlarged Helpmekaar Dam and Buffer Dam footprints;
- Temporary disturbance of agricultural soils during pipeline installation, earthworks and construction activities;
- Loss or degradation of topsoil through inappropriate stripping, handling, storage or disposal;
- Soil compaction resulting from construction vehicles, machinery and temporary stockpiling;
- Increased erosion and sedimentation associated with exposed or disturbed soils;
- Disturbance of existing agricultural access routes, irrigation infrastructure and farming activities during construction; and
- Reduced agricultural productivity where temporarily disturbed areas are not adequately rehabilitated.

Notwithstanding the loss of some potential agricultural land, the Agricultural Compliance Statement concludes that the overall agricultural impact of the proposed development will be positive. The increased irrigation-water storage and reliability will improve the agricultural production potential of the farming enterprise and support the proposed conversion of approximately 45 ha of annual crops into permanent fruit orchards.

Agricultural Mitigation and Management Measures

The following measures must be implemented during construction and rehabilitation to minimise unnecessary disturbance and degradation of agricultural resources:

- All construction activities, access routes, temporary laydown areas, stockpiling and associated earthworks must remain within the approved development footprint and designated construction areas.
- Unnecessary disturbance of agricultural land outside the approved development footprint must be avoided.
- Existing farm roads and access routes must be used as far as practicable to minimise additional disturbance of cultivated land and agricultural soils.
- Topsoil must be stripped and stored separately from subsoil and other excavated material where temporary excavation or soil disturbance is required.

- Suitable topsoil must be conserved and reused during rehabilitation of temporarily disturbed areas.
- Topsoil stockpiles must be protected against erosion, contamination, excessive compaction and the establishment of alien invasive plant species.
- Construction vehicles, machinery and equipment must be restricted to designated access routes and work areas to prevent unnecessary soil compaction.
- Temporary stockpiles, construction materials and equipment must not obstruct existing agricultural infrastructure, drainage systems or farm access routes unless alternative arrangements have been made.
- Appropriate erosion and sediment control measures must be implemented during construction, particularly where soil disturbance occurs on slopes or adjacent to drainage features and watercourses.
- Disturbed areas must be backfilled, reprofiled and stabilised following completion of construction activities.
- Agricultural soils disturbed during pipeline installation must be reinstated as far as practicable to their original soil profile and condition to allow the continuation of agricultural activities.
- Construction waste, surplus materials, rubble and contaminated soil must be removed from agricultural areas and managed in accordance with the waste management requirements of this EMPr.
- Temporarily disturbed agricultural areas must be rehabilitated as soon as practicable following completion of construction to prevent erosion, soil degradation and unnecessary loss of agricultural potential.
- Rehabilitation measures must be monitored, and any areas exhibiting erosion, settlement, excessive compaction or unsuccessful rehabilitation must be subject to appropriate corrective action.

Conclusion

The Agricultural Compliance Statement concludes that the proposed development will have an overall positive agricultural impact, notwithstanding the permanent loss of some potential agricultural land within the dam footprints.

The proposed increase in irrigation-water storage will improve the agricultural production potential and water security of the farming enterprise, while the implementation of appropriate soil conservation, erosion-control and rehabilitation measures will minimise unnecessary impacts on surrounding agricultural resources.

The agricultural management measures contained in this EMPr must be implemented in conjunction with the approved development footprint, the Agricultural Compliance Statement, applicable specialist recommendations and the conditions of the Environmental Authorisation and relevant water use authorisation.

5.4 HERITAGE

In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), heritage resources may include archaeological, palaeontological, cultural, historical and landscape features of heritage significance. Due to the nature and scale of the proposed enlargement of the Helpmekaar Dam, construction of the

supplementary Buffer Dam and installation of the connecting pipeline, potential impacts on heritage resources were considered as part of the Environmental Impact Assessment process.

A Heritage Impact Assessment (HIA) was undertaken by ACRM, Jonathan Kaplan (January 2026), for the proposed development on Portion 5 of Farm Rietrivier No. 202, near Ceres, Western Cape. The assessment was undertaken in accordance with the applicable requirements of the NHRA and considered the archaeological, palaeontological and broader heritage implications of the proposed development.

The Heritage Western Cape (HWC) case reference for the proposed development is 25111407.

Archaeological Heritage

The archaeological assessment included the proposed enlargement footprint of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), the supplementary Buffer Dam footprint and the connecting pipeline alignment.

No archaeological resources were identified within the proposed Helpmekaar Dam enlargement footprint.

Two isolated Earlier Stone Age (ESA) flaked stone artefacts were recorded within the proposed Buffer Dam footprint. These artefacts occur within a historically transformed agricultural landscape and were assessed as having no conservation value. The specialist concluded that the recorded artefacts do not warrant archaeological mitigation prior to construction.

No archaeological resources were identified along the assessed connecting pipeline alignment.

The specialist concluded that the proposed development is not expected to result in significant impacts on archaeological heritage resources. No archaeological mitigation or archaeological monitoring is required prior to or during construction, subject to the implementation of the applicable chance-find procedures should previously unidentified heritage resources be encountered.

Palaeontological Heritage

The palaeontological assessment undertaken by Marion Bamford considered the geological formations underlying the proposed development area and their potential to contain fossil material.

The proposed development area is associated with Quaternary fluvial sediments and the underlying Voorstehoek Formation. The Quaternary fluvial sediments are considered to have low palaeontological sensitivity, while the Voorstehoek Formation may have very high palaeontological sensitivity.

Although the development area has been disturbed by historical and ongoing agricultural activities, the possibility of encountering previously unidentified fossil material during excavation and other subsurface construction activities cannot be entirely excluded.

The palaeontological assessment therefore recommends the implementation of a Fossil Chance Find Procedure during construction.

Should suspected fossil material be encountered, work in the affected area must cease, the find must be protected from further disturbance, and a suitably qualified palaeontologist must be consulted to assess the material and determine the appropriate action. Where necessary, representative fossil material must be recorded and collected in accordance with the applicable heritage requirements.

The Fossil Chance Find Procedure must be incorporated into this EMPr and communicated to the relevant construction personnel before the commencement of earthworks.

The palaeontological sensitivity of the area under consideration is presented in Figure 4. The two possible sites for development are in the potentially very highly sensitive Voorstehoek Formation (Ceres Subgroup, Bokkeveld Group) indicated in red in the SAHRIS map.

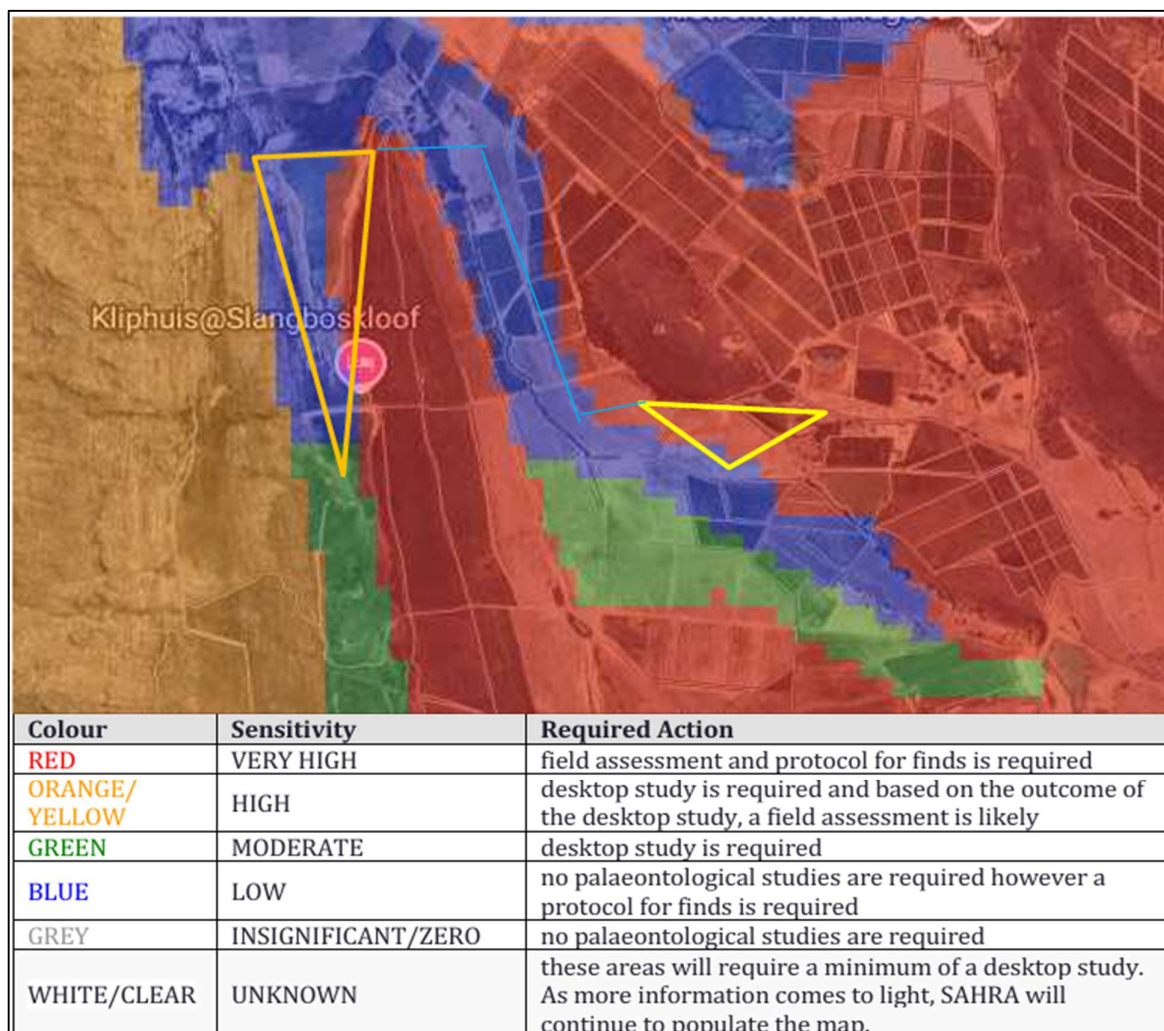


Figure 4: SAHRIS palaeosensitivity map for the site for the two proposed dam sites on Farm Rietfontein 202 shown within the orange (Dam 1) and yellow outlines (Dam 2).

Graves and Burial Grounds

No graves or formal burial grounds were identified within the assessed development footprints.

However, should graves, unmarked human remains or suspected burial sites be encountered during construction, all work in the immediate vicinity must cease immediately.

The affected area must be secured, and a suitably qualified archaeologist and the relevant heritage authority must be notified. No remains or associated material may be disturbed, altered or removed until the appropriate investigation has been undertaken and the necessary authorisation or instructions have been obtained.

Built Heritage and Cultural Landscape

The Heritage Impact Assessment did not identify any buildings or structures of built heritage significance within the proposed development footprint that would be adversely affected by the proposed works.

The broader landscape is characterised by established agricultural activities, existing farm dams, cultivated land, orchards, farm roads, irrigation infrastructure and associated farm buildings.

The proposed development involves the enlargement of an existing agricultural dam and the construction of supplementary water-storage and transfer infrastructure within this established farming landscape.

The Heritage Impact Assessment rated the visual impact of the proposed development as Low and concluded that the development is not expected to result in a significant adverse impact on the cultural landscape or the broader rural character of the area.

Heritage Mitigation and Management Measures

The following heritage management measures must be implemented during construction:

- Construction activities must remain within the approved development footprint and designated access routes to prevent unnecessary disturbance of surrounding areas.
- No archaeological mitigation or routine archaeological monitoring is required prior to or during construction, in accordance with the findings of the Heritage Impact Assessment.
- Should previously unidentified archaeological material be encountered, work in the immediate vicinity must cease, and the find must be reported to the ECO and a suitably qualified archaeologist for assessment.
- Should graves, unmarked human remains or suspected burial sites be discovered, work must cease immediately in the affected area, and the appropriate heritage procedures must be followed.
- The Fossil Chance Find Procedure must be incorporated into this EMP and implemented should suspected fossil material be encountered during excavation or other subsurface construction activities.
- Construction personnel must be informed of the procedures to be followed in the event of an archaeological, palaeontological or burial-related chance find.
- No suspected heritage material may be removed, damaged or otherwise disturbed without the necessary specialist assessment and applicable heritage authorisation.
- Any additional heritage-related requirements imposed by Heritage Western Cape must be implemented.

Conclusion

The Heritage Impact Assessment concluded that the proposed enlargement of the Helpmekaar Dam, construction of the supplementary Buffer Dam and installation of the connecting pipeline are not expected to result in significant adverse impacts on archaeological, palaeontological or other identified heritage resources.

No archaeological mitigation or routine archaeological monitoring is required. However, the implementation of the Fossil Chance Find Procedure and the prescribed procedures for any unexpected discovery of archaeological material, graves or human remains necessary.

The heritage management measures contained in this EMPr must be implemented in conjunction with the recommendations of the Heritage Impact Assessment and any applicable requirements of Heritage Western Cape.

6. RECOMMENDATIONS

The following site-specific recommendations are based on the findings of the specialist assessments undertaken for the proposed enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam and installation of the connecting pipeline and associated infrastructure on Portion 5 of Farm Rietrivier No. 202, near Ceres, Western Cape.

The recommendations incorporate the findings of the Freshwater Assessment, Terrestrial Biodiversity Compliance Statement, Agricultural Compliance Statement, Heritage Impact Assessment and Hydrological Assessment.

All construction, operational, rehabilitation and maintenance activities must comply with the Environmental Authorisation (EA), approved Environmental Management Programme (EMPr), applicable water use authorisation requirements and relevant specialist recommendations.

Where any inconsistency arises between this EMPr and the conditions of the EA or applicable water use authorisation, the statutory authorisation conditions shall take precedence. Any apparent conflict between specialist recommendations and the requirements of this EMPr must be referred to the Environmental Assessment Practitioner (EAP), Environmental Control Officer (ECO) and relevant specialist, where necessary, for clarification before the affected activity proceeds.

6.1 RECOMMENDATIONS ON IMPACT MINIMISATION

- All construction, operational and maintenance activities must be undertaken in accordance with this EMPr, the EA, applicable water use authorisation requirements and conditions, and the relevant specialist recommendations. The proposed additional water taking and storage remain subject to the water use authorisation process under reference WU38102.
- A suitably qualified ECO must be appointed prior to the commencement of construction activities to monitor environmental compliance, undertake regular site inspections and oversee the implementation of this EMPr, in accordance with the requirements of the EA.
- The approved development footprint, including the enlarged Helpmekaar Dam, supplementary Buffer Dam, connecting pipeline, associated infrastructure, construction access routes and temporary construction areas, must be clearly demarcated before construction commences. No unauthorised disturbance outside the approved footprint shall be permitted.
- Construction activities must be confined to the approved development footprint and designated access routes. Existing farm roads, tracks and previously disturbed areas must be used wherever practicable to minimise unnecessary disturbance of surrounding agricultural land, indigenous vegetation and freshwater features.
- Environmentally sensitive areas outside the approved development footprint must be identified and protected throughout construction. Particular attention must be given to Kouebokkeveld Alluvium Fynbos associated with the Helpmekaar Dam, the good-condition Kouebokkeveld Shale Fynbos on Langrug Ridge, mapped Critical Biodiversity Areas (CBAs), wetlands and associated watercourses.
- The western boundary of the proposed Helpmekaar Dam inundation area must be clearly demarcated before construction to minimise unnecessary disturbance of adjacent Kouebokkeveld Alluvium Fynbos.

- The connecting pipeline must follow the approved alignment, including the existing farm road/firebreak across Langrug Ridge. The pipeline must be installed within the existing road or immediately adjacent to its edge, where necessary and feasible, to minimise disturbance of the surrounding Kouebokkeveld Shale Fynbos.
- Where disturbance of indigenous vegetation cannot be avoided, suitable indigenous plant material and topsoil must be conserved and reused during rehabilitation in accordance with the Terrestrial Biodiversity Compliance Statement.
- Within the Kouebokkeveld Alluvium Fynbos area that will be inundated by the enlarged Helpmekaar Dam, the upper approximately 15–20 cm of suitable topsoil must be removed and redistributed over disturbed Kouebokkeveld Alluvium Fynbos outside the inundation area, in accordance with the terrestrial biodiversity specialist's recommendations.
- Topsoil removed from temporarily disturbed agricultural areas must be stripped and stored separately from subsoil and other excavated material. Suitable topsoil must be protected from erosion, contamination, excessive compaction and alien invasive plant establishment and reused during rehabilitation.
- Unnecessary disturbance of agricultural land outside the approved development footprint must be avoided. Construction access, temporary stockpiling and equipment storage must be managed to minimise soil compaction, erosion and interference with existing agricultural activities and infrastructure.
- Construction activities within or adjacent to watercourses and wetlands must be confined to the minimum area necessary to undertake the authorised works. Earthworks within freshwater features must, as far as practicable, be undertaken during low-flow or dry conditions to minimise sediment mobilisation and disturbance of aquatic habitat.
- Appropriate erosion, sediment and stormwater control measures must be implemented during construction and operation to prevent soil loss, sedimentation, scour and unnecessary downstream impacts on freshwater features.
- Excavated material, spoil, construction materials and temporary stockpiles must be managed to prevent sediment-laden runoff or other material from entering watercourses, wetlands or downstream freshwater features.
- Construction machinery must be maintained in good working condition. Refuelling, machinery servicing, hazardous substance storage and concrete washout must be undertaken in designated areas away from watercourses and wetlands, with appropriate containment and spill-response measures.
- The dam walls, spillways, inlet and outlet structures and downstream discharge areas must incorporate appropriate erosion protection measures in accordance with the approved engineering design and applicable freshwater specialist recommendations.
- The operation of the enlarged Helpmekaar Dam and supplementary Buffer Dam must comply with the applicable water use authorisation and its conditions once issued, including any requirements relating to authorised abstraction and storage volumes, downstream releases, ecological flows, measurement, monitoring and reporting.
- Disturbed areas must be rehabilitated progressively, where practicable, and following completion of construction. Rehabilitation must include appropriate backfilling, reinstatement of suitable topsoil, soil stabilisation, erosion control and the re-establishment of locally appropriate indigenous vegetation or agricultural land cover, as applicable.

- Rehabilitation of temporarily disturbed areas within or adjacent to natural vegetation must be undertaken in accordance with the Terrestrial Biodiversity Compliance Statement. The introduction of invasive alien plant species for rehabilitation purposes is prohibited.
- Alien invasive plant species must be controlled within and around the development footprint, including within 32 m of the dam and pipeline development areas, in accordance with the terrestrial biodiversity specialist's recommendations and the applicable alien and invasive species legislation.
- Rehabilitation success must be monitored following construction to assess soil stability, vegetation establishment, erosion control and alien invasive plant establishment. Corrective measures must be implemented where rehabilitation objectives have not been achieved.
- No routine archaeological mitigation or archaeological monitoring is required prior to or during construction, in accordance with the Heritage Impact Assessment. However, should previously unidentified archaeological material, graves or unmarked human remains be encountered, work in the immediate vicinity must cease and the applicable chance-find procedures must be followed.
- The Fossil Chance Find Procedure must be incorporated into this EMPr and implemented should suspected fossil material be encountered during excavation or other subsurface construction activities.
- Following construction, the enlarged Helpmekaar Dam, supplementary Buffer Dam, connecting pipeline and associated infrastructure must be inspected and maintained in accordance with the applicable dam-safety requirements, approved EMPr, EA, water use authorisation conditions and the Maintenance Management Plan (MMP).
- The MMP must guide future maintenance of authorised infrastructure within or adjacent to watercourses. It does not authorise new development, enlargement of the approved infrastructure, additional water taking or storage, or activities outside the scope of the relevant statutory authorisations.
- Environmental monitoring must continue during the operational phase in accordance with the requirements of the EA, applicable water use authorisation, approved EMPr and MMP. Monitoring must address, where relevant, erosion, scour, sedimentation, pollution, rehabilitation, alien invasive plant establishment and the condition of the dam walls, spillways, outlet works, connecting pipeline and downstream freshwater environment.
- Any environmental incident, non-compliance or pollution event must be reported promptly to the Applicant and ECO, where appointed. Appropriate containment, corrective and rehabilitation measures must be implemented, and the relevant authorities must be notified where required by legislation or the applicable authorisation conditions.

6.1.1.1 Botanical / Terrestrial Biodiversity (Terrestrial Biodiversity Compliance Statement, PB Consult, 2026))

The following recommendations are provided by the Botanical Assessment:

- The proposed development footprint must be clearly demarcated before construction. All construction activities, access routes, temporary stockpiling and laydown areas must be confined to the approved development footprint to prevent unnecessary disturbance of surrounding indigenous vegetation.
- Disturbance of Kouebokkeveld Alluvium Fynbos associated with the proposed enlargement of the Helpmekaar Dam must be minimised. The western boundary of the proposed inundation area must be

clearly demarcated before construction to prevent unnecessary disturbance of adjacent indigenous vegetation.

- The upper approximately 15–20 cm of topsoil within the Kouebokkeveld Alluvium Fynbos area that will be inundated must be removed and redistributed over disturbed Kouebokkeveld Alluvium Fynbos outside the proposed inundation area, in accordance with the specialist's recommendations. This measure is intended to conserve and redistribute the indigenous seed bank and assist vegetation recovery.
- The good-condition Kouebokkeveld Shale Fynbos on the south-eastern portion of Langrug Ridge must be protected from unnecessary disturbance. No construction-related activities, temporary laydown areas or stockpiling may occur within adjacent natural vegetation outside the approved development footprint.
- The connecting pipeline must follow the existing farm road/firebreak across Langrug Ridge. Where the road is narrow, the pipeline must be installed within the road or immediately adjacent to its edge to minimise disturbance of the surrounding Kouebokkeveld Shale Fynbos.
- East of Langrug Ridge, the connecting pipeline must follow the approved alignment along existing farm tracks and historically transformed agricultural areas to minimise unnecessary disturbance of remaining indigenous vegetation.
- Where disturbance of natural vegetation cannot be avoided during pipeline installation, larger indigenous shrubs must be removed before excavation, where practicable, and suitable indigenous plant material must be retained for redistribution during rehabilitation.
- Topsoil removed from areas supporting indigenous vegetation must be stripped and stored separately from subsoil and other excavated material. Suitable topsoil must be reinstated following completion of construction to promote the recovery of indigenous vegetation.
- The proposed Buffer Dam construction footprint must remain confined to the approved development area. Unnecessary disturbance of surrounding agricultural land and adjacent natural vegetation must be avoided.
- Temporarily disturbed areas must be stabilised and rehabilitated following completion of construction. Rehabilitation must promote the recovery of locally occurring indigenous vegetation in natural areas and prevent erosion, sedimentation and the establishment of alien invasive plant species.
- An alien invasive plant control programme must be implemented within and around the development footprint, including areas within 32 m of the enlarged Helpmekaar Dam, supplementary Buffer Dam and connecting pipeline, in accordance with the terrestrial biodiversity specialist's recommendations and applicable legislation.
- Follow-up monitoring and alien invasive plant control must be undertaken during construction, rehabilitation and operation to prevent the establishment and spread of alien invasive species within disturbed areas and surrounding natural vegetation.
- A suitably qualified Environmental Control Officer (ECO) must oversee the implementation of the applicable terrestrial biodiversity mitigation measures during construction, including the demarcation of sensitive areas, protection of indigenous vegetation, topsoil management, alien invasive plant control and rehabilitation of disturbed areas.

6.1.2 **Freshwater (Watsan Africa, Dr Dirk van Driel, 2025)**

The following freshwater mitigation and management measures apply to the proposed Toeka Instream Dam and associated agricultural development.

Site Preparation (Pre-Construction)

- Construction activities should preferably be undertaken during the dry summer months to minimise erosion, sediment mobilisation and disturbance to downstream freshwater systems.
- No unnecessary crossing or disturbance of drainage features, watercourses or excavated channels shall be permitted.
- Laydown areas, fuel storage, cement mixing areas, vehicle maintenance areas and material stockpiles must be located outside drainage features and at least 10 m from any excavated channels or drainage pathways.
- Topsoil must be stripped and stockpiled separately from subsoil and construction material. Topsoil stockpiles must be protected against erosion, compaction and contamination.
- Sediment control measures, including silt traps, berms, sediment fences and erosion barriers, must be installed downslope of disturbed areas where required and maintained throughout construction.
- Exposed soils, embankments and stockpiles must be protected using suitable erosion-control measures such as geotextiles, hessian sheeting or Geojute until permanent vegetation has been established.
- Vegetation clearing must be restricted to the minimum area required for construction and must not extend beyond the approved development footprint.
- Existing drainage lines and natural flow paths must be protected throughout construction and may not be unnecessarily obstructed or altered.
- Stormwater controls must be installed prior to the commencement of major earthworks to prevent sediment-laden runoff from entering drainage features and downstream watercourses.
- Baseline water quality and freshwater conditions should be recorded prior to construction, where applicable.

Construction Phase

- Completed embankments and disturbed areas must be covered with suitable topsoil and stabilised as soon as practicable following construction.
- Imported material and topsoil must be free of alien invasive vegetation propagules and contaminants.
- Spillway, outlet structures and associated drainage infrastructure must be constructed and protected to minimise erosion and downstream sedimentation.
- Concrete batching, mixing and washout activities must occur on impermeable lined surfaces outside sensitive drainage areas. Cement-contaminated water may not be discharged into the surrounding environment or any drainage feature.
- Hydrocarbon spills and leakages from construction vehicles and machinery must be prevented through appropriate maintenance and refuelling practices. Spill kits must be available at all active work areas and personnel must be trained in spill response procedures.
- All construction waste must be removed regularly and disposed of at appropriately authorised waste disposal facilities.
- Sediment control structures must be inspected regularly and maintained throughout construction.
- Water quality monitoring must be undertaken where construction activities have the potential to affect downstream freshwater resources.

- Regular inspections for erosion, sediment mobilisation and stormwater performance must be undertaken throughout construction.
- Particular attention must be given to inspections following significant rainfall events, with any erosion or sedimentation repaired immediately.
- Disturbed areas must be rehabilitated progressively throughout construction and not only upon completion of the project.

Operational Phase

- Operation of the proposed dam must comply with all applicable Water Use Licence conditions and approved operational management requirements.
- The dam wall, spillway, outlet works, pump station, abstraction pipeline, irrigation pipeline and associated infrastructure must be inspected regularly, particularly following significant rainfall events.
- Any erosion, instability or structural damage identified during inspections must be repaired without delay.
- Debris, sediment accumulation and vegetation blockages within spillway structures, outlet works and drainage channels must be removed regularly to maintain hydraulic performance.
- Ongoing monitoring of erosion and sedimentation associated with spillway discharge and downstream drainage features must be undertaken.
- Downstream drainage features must be inspected periodically to verify that no unacceptable erosion or sedimentation is occurring.
- Water quality should be monitored where operational activities have the potential to affect downstream freshwater resources.

Maintenance Phase

- Desilting activities must be carefully managed to prevent sediment mobilisation into downstream drainage systems.
- Temporary erosion and sediment control measures must be installed during maintenance activities where required.
- Vegetated embankments, berms and rehabilitated areas must be maintained to ensure long-term stability and erosion control.
- Any maintenance works within or adjacent to drainage features must be undertaken during suitable low-flow conditions, where practicable.
- Following maintenance activities, all disturbed areas must be rehabilitated as soon as reasonably practicable and monitored to confirm successful stabilisation and vegetation establishment.

6.1.3 Agricultural Resources (Johann Lanz and David Lakey, Agricultural Compliance Statement, November 2025)

The following agricultural mitigation and management measures are based on the findings of the Agricultural Compliance Statement undertaken for the proposed enlargement of the Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam and installation of the connecting pipeline and associated infrastructure.

The Agricultural Compliance Statement confirms that the Helpmekaar Dam enlargement footprint is predominantly associated with soils of Low to Medium agricultural potential, while the proposed Buffer Dam footprint overlaps land of higher agricultural potential. Although the development will result in the permanent loss of some potential agricultural land, the specialist concludes that the overall agricultural impact will be positive due to the improved irrigation-water storage and reliability.

The following measures must be implemented to minimise unnecessary disturbance and degradation of agricultural resources:

- The- All construction activities, temporary laydown areas, stockpiling, access routes and associated earthworks must be confined to the approved development footprint and designated construction areas.
- Unnecessary disturbance of agricultural land outside the approved development footprint must be avoided, particularly in areas of higher agricultural potential surrounding the proposed Buffer Dam.
- Existing farm roads, tracks and previously disturbed areas must be used for construction access wherever practicable to minimise additional disturbance of productive agricultural land.
- The construction footprint of the proposed Buffer Dam must be restricted to the approved development area to minimise the permanent loss of agricultural soils and surrounding productive land.
- The connecting pipeline must follow the approved alignment, predominantly along existing farm roads, tracks and disturbed agricultural areas, to minimise unnecessary disturbance of cultivated land and agricultural soils.
- Where temporary excavation or soil disturbance is required, suitable topsoil must be stripped and stored separately from subsoil and other excavated material.
- Topsoil stockpiles must be protected against erosion, contamination, excessive compaction and the establishment of alien invasive plant species.
- Suitable topsoil must be conserved and reused during rehabilitation of temporarily disturbed agricultural areas to retain the agricultural potential of the affected soils as far as practicable.
- Construction vehicles, machinery and equipment must be restricted to designated access routes and work areas to minimise unnecessary soil compaction and disturbance of surrounding agricultural land.
- Temporary stockpiles, construction materials and equipment must be positioned to avoid unnecessary interference with existing agricultural infrastructure, irrigation systems, drainage features and farm access routes.
- Appropriate erosion, sediment and stormwater control measures must be implemented during construction to prevent soil loss, degradation of agricultural land and sediment mobilisation into surrounding drainage features.
- Construction activities must be managed to minimise unnecessary disruption of existing farming operations and agricultural access.
- Following installation of the connecting pipeline, excavated areas must be appropriately backfilled, reprofiled and stabilised. Suitable topsoil must be reinstated to facilitate the continuation of agricultural activities where applicable.
- Temporarily disturbed agricultural areas must be rehabilitated as soon as practicable following completion of construction to prevent erosion, soil degradation and unnecessary loss of agricultural potential.

- Construction waste, surplus materials, rubble and contaminated soil must be removed from agricultural areas and managed in accordance with the waste management requirements of this EMPr.
- Rehabilitation of temporarily disturbed agricultural land must be monitored to identify erosion, settlement, excessive compaction or unsuccessful soil reinstatement. Appropriate corrective measures must be implemented where necessary.
- During the operational phase, maintenance activities associated with the enlarged Helpmekaar Dam, supplementary Buffer Dam, connecting pipeline and associated infrastructure must minimise unnecessary disturbance of surrounding agricultural land and soils.
- Any agricultural areas temporarily disturbed during operational maintenance must be reinstated and rehabilitated in accordance with the applicable requirements of this EMPr and the Maintenance Management Plan (MMP).

The implementation of these measures will minimise the loss and degradation of agricultural resources outside the approved development footprint while supporting the agricultural benefits associated with improved irrigation-water storage and reliability.

6.1.4 Heritage (ACRM, Jonathan Kaplan, January 2026)

The following heritage mitigation and management measures are based on the Heritage Impact Assessment undertaken for the proposed enlargement of the Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam and installation of the connecting pipeline and associated infrastructure.

The Heritage Impact Assessment concluded that the proposed development is not expected to result in significant impacts on archaeological or palaeontological heritage resources. No archaeological mitigation or routine archaeological monitoring is required prior to or during construction. However, the following measures must be implemented to manage any previously unidentified heritage resources encountered during construction:

- A Heritage Chance Find Procedure and Fossil Chance Find Procedure must be implemented during excavation, earthworks and construction activities.
- All construction personnel must be informed of the possibility of encountering archaeological material, fossils, graves, human remains or other heritage resources and must be made aware of the applicable reporting procedures.
- Should previously unidentified archaeological material, stone artefacts, historical structures or other suspected heritage resources be encountered during construction, work in the immediate vicinity of the discovery must cease, and the Environmental Control Officer (ECO) must be notified.
- The discovery area must be secured and protected from further disturbance until the find has been assessed by a suitably qualified archaeologist or relevant heritage specialist.
- Where required, Heritage Western Cape (HWC) must be notified, and any further investigation or mitigation must be undertaken in accordance with the relevant heritage authority's requirements.
- Should graves, unmarked human remains or suspected burial sites be encountered, all work in the immediate vicinity must cease immediately. The area must be secured, and a suitably qualified

archaeologist and the relevant authorities must be notified. No remains or associated material may be disturbed, altered or removed until the necessary investigation has been undertaken and the applicable authorisation or instructions have been obtained.

- Should suspected fossil material be exposed during excavation or other subsurface construction activities, work in the affected area must cease, and the find must be protected from further disturbance. A suitably qualified palaeontologist must be consulted to assess the material and determine whether recording, collection or other mitigation is required.
- Any recording, collection or removal of fossil material must be undertaken by an appropriately qualified specialist in accordance with the applicable heritage requirements and permits, where required.
- No archaeological material, fossils, artefacts or other heritage resources may be removed, collected, damaged or disturbed without the necessary specialist assessment and applicable heritage authorisation.
- Construction activities within an affected chance-find area may only recommence once the find has been appropriately assessed and any required mitigation, clearance or authorisation has been obtained.
- Any additional heritage mitigation or management measures required by Heritage Western Cape or the appointed heritage specialist following a chance find must be implemented before construction resumes in the affected area.
- The Fossil Chance Find Procedure must be incorporated into this EMP and made available to the ECO, Contractor and relevant construction personnel before the commencement of earthworks.

6.2 ENVIRONMENTAL AUTHORISATION

No site preparation, construction or listed activity associated with the proposed enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam, installation of the connecting pipeline or associated infrastructure may commence before the competent authority has issued a written Environmental Authorisation (EA) and all other applicable permits, licences and approvals required for the relevant activities have been obtained.

The proposed additional water taking and storage remain subject to the water use authorisation process under reference WU38102. This reference identifies an application in progress and does not constitute an issued Water Use Licence (WUL) or authorisation to undertake the proposed additional water uses.

The development must be undertaken in accordance with:

- The Environmental Authorisation and all associated conditions;
- The applicable water use authorisation, once issued, and all associated conditions;
- This Environmental Management Programme (EMP), as approved;
- The approved engineering designs, development layout and construction plans;
- The applicable specialist recommendations and mitigation measures; and
- All relevant national, provincial and local legislation.

All conditions contained in the EA, applicable water use authorisation and any other required approvals must be implemented and complied with throughout the planning, construction, operational and maintenance phases and, where applicable, the decommissioning phase of the project.

The approved development footprint, infrastructure configuration, storage capacities and operational arrangements may not be altered without first determining whether the proposed changes require an amendment to the EA, water use authorisation or any other applicable approval. Where an amendment or additional authorisation is required, the affected activities may only proceed once the relevant approval has been obtained.

The Maintenance Management Plan (MMP) applies to the future maintenance of authorised infrastructure and does not independently authorise construction, enlargement of the dams, additional water taking or storage, or activities outside the scope of the applicable statutory authorisations.

7. CONSTRUCTION PHASE EMP

7.1 STRUCTURE AND RESPONSIBILITY

Implementation of the EMP and environmental control and management of the construction phase will be achieved through the responsibility structure set out below. The role players include the Owner, the Construction Supervisor, the Environmental Control Officer (ECO) and the Contractor. All role players must familiarise themselves with the prescriptions of the EMP.

7.1.1 The client / applicant / owner

The client (or the designated responsible person appointed by him) is responsible for:

- appointing a suitably experienced ECO, the Construction Supervisor and the Contractor for the duration of the construction contract, and
- ensuring that the Construction Supervisor and Contractor fulfil their obligations in terms of this EMP.

7.1.2 The Construction Supervisor

The Construction Supervisor is responsible for ensuring that the construction is carried out to completion on time, within budget and that the Contractor fulfils his obligations in terms of the EMP. In addition, the Construction Supervisor and the ECO are expected to develop a close working relationship and to stay in contact with each other.

The responsibilities of the Construction Supervisor include:

- To issue site instructions to the Contractor.
- To serve as a conduit for all communication between the ECO and the Contractor. [The only exception is where the ECO or the Construction Supervisor needs to issue a “**STOP WORKS**” order on the contractor if serious environmental harm is about to happen or is happening as a result of construction activity. The “STOP WORKS” order must be confirmed by the other party as soon as reasonably possible.
- Discussing any problems that might lead to environmental damage with the ECO.
- When the ECO is not on site, the Construction Supervisor will be responsible for the implementation of the EMP.

7.1.3 The contractor

The Contractor shall be responsible for:

- ensure that all sub-contractors, employees, suppliers, agents, etc., are fully aware and adhere to the environmental conditions detailed in the EMP;
- liaise closely with the Construction Supervisor and the ECO;
- ensure that works on the site are conducted in an environmentally sensitive manner and in full accordance with the EMP;
- carry out instructions issued in the site instruction book;
- assist with solutions to environmental problems that may arise during the construction phase; and
- ensure that all “**No-Go**” areas are adequately fenced off.
- will report any deviation from the requirements of this EMP to the Principal Agent, and any pollution or environmental contaminant spill events.

- agrees to work stoppage and/or payment of penalties as required by this EMP and directed by the ECO/Construction Supervisor.
- agrees to bear full costs for any work stoppage resulting from contravention of the requirements of this EMP, and/or the costs of remedying environmental damage resulting from their or their sub-contractors or employees' contravention of the requirements of this EMP.

NB: All contractors must sign the "Declaration of Understanding" (Appendix 1 of this document) of this Environmental Management Plan before construction commences.

7.1.4 The Environmental Control Officer (ECO)

ECO will be responsible for overseeing the environmental aspects of the Construction phase and will work in close coordination with the Construction Supervisor.

7.1.4.1 ECO qualifications

The ECO must be independent and suitably qualified (a diploma or degree in environmental management and/or with at least 5 or more years of environmental site management experience) and must have a sound knowledge of the environment in which the activity will take place. The ECO should preferably be registered as an Environmental Scientist (in terms of section 20(3) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003)).

7.1.4.2 ECO duties

An ECO must be appointed for the duration of the construction phase (as required by the EA). The ECO:

- will be primarily responsible for ensuring the implementation of the EMP and will perform regular site inspections/audits with the specific aim to ensure environmental conformance by the Contractor;
- to visit the site on a regular basis while construction is in progress;
- will keep environmental records (including photographs) of the construction activities;
- must ensure that "No-Go" and "Open Space" areas are adequately protected and adhered to;
- must approve and be present during the demarcation of the necessary areas for storage of materials, ablutions, eating areas of contract workers, etc.;
- to conduct a start-up meeting before construction commences and will provide environmental training at the beginning of the project, and will provide environmental awareness training throughout the life of the project.
- must be informed of site and technical meetings to be able to comment and report on environmental issues;
- will call for, and approve, method statements for construction activities that might pose an environmental impact and must ensure that method statements are approved before commencement of the work;
- must implement immediate mitigating action in the case of critical environmental impacts
- must deal with public complaints/queries regarding environmental issues;
- will record his findings and all environmental non-conformances in an environmental completion report (which will be forwarded to the Client and the Construction Supervisor);
- will conduct a closing-down visit ASAP after completion of the Development;

7.1.4.3 ECO Authority

The ECO has the authority to stop works if there is a serious threat to or impact on the environment as a direct cause of construction. However, this authority is limited only to emergency situations where immediate consultation with the Construction Supervisor is not possible.

- The ECO is to inform the client/developer and site representative of the reasons for the stoppage as soon as possible. A relevant reason should be supplied as soon as possible after the stoppage of such works.
- Upon failure by the contractor or his employee to show adequate consideration to the environmental aspects of this contract, i.e. wilful destruction of the environment, the ECO may recommend to the client/developer or site representative to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied.
- No extension of time will be considered in the case of such suspensions, and all costs will be borne by the contractor

7.1.5 Health & Safety Officer:

A health & safety (H&S) officer for the project must be designated or appointed by the Contractor or Principal Agent, and his/her role is to support the successful implementation of the EMP through:

- Site evaluation on a regular basis.
- Identifying issues relating to day-to-day construction activities that can have a detrimental effect on the environment.
- Subcontractor audits to ensure compliance.
- Assist in the direct implementation of the EMP.
- Ensure that the requirements of the EMP are communicated and understood by personnel on site *via* induction sessions.
- Ensure that the contractors on site develop, implement and monitor the required H&S management functions.
- Evaluate the applicability and accuracy of the EMP and the method statements throughout the construction phase.
- Coordinate all statutory requirements, including permit authorisation and license requirements.
- Conduct or have conducted a hazard analysis and take the necessary corrective action.
- Where it is not possible to remove any remaining hazards to inform employees thereof, and what precautionary action is to be taken.
- Detail mitigation measures required to be taken, and the procedures for their implementation, to the project manager.
- Representing H&S issues at the production meetings.
- Coordinate H&S training of personnel.
- Coordinating spill response personnel.
- The H&S officer shall inspect the integrity of the hazardous waste containers/bins/skips on a weekly basis.

7.1.5.1 Health & Safety Officer qualifications

The Health and Safety Officer must be independent and suitably qualified, with a sound knowledge of the Occupational Health & Safety Act (Act no. 85 of 1993) and must have experience of the implementation of the act with regard to the construction and environmental environments in which the activity will take place.

7.2 COMMENCEMENT OF WORKS

The site project contractors must timeously receive a copy of the construction phase EMP (CEMP) and any other additional information that pertains to site conditions/amendments, or deviations from the original site plan.

- This EMP must be included to form part of the Contractor's site specification documentation.
- A copy of the EMP must be on site at all times and available for presentation to any authority requesting to see such document.

NO WORK ON SITE MAY TAKE PLACE UNTIL

- The Declaration of Understanding/Environmental Contract is signed between the relevant parties.
- One week's written notice given to the Department before commencement of any construction activity (As per EA).
- On-Site Start-Up Meeting has been held
- Site and No-Go areas have been identified and demarcated.
- Contractors are in possession of the EMP and other relevant documentation
- Contractors/Subcontractors have signed the Declaration of Understanding
- All mandatory site equipment is in place
- On-site Environmental Education & Awareness training session has taken place with all relevant construction personnel present.

NB: Work refers to: Camp Establishment, Earthmoving activities and any preliminary construction activities.

7.3 ISSUES OF CONCERN

All site-specific environmental issues and potential impacts identified during the Environmental Impact Assessment (EIA) process, in the Environmental Impact Report (EIR), specialist assessments, Environmental Authorisation (EA) and applicable water use authorisation must be discussed at the mandatory On-Site Start-Up Meeting before construction commences.

Particular attention must be given to the protection of freshwater features and sensitive indigenous vegetation, the management of agricultural soils, erosion and sediment control, heritage chance-find procedures, rehabilitation requirements and compliance with the approved development footprint.

The issues discussed, applicable mitigation measures, responsible parties and any actions required before construction must be recorded in the On-Site Start-Up Report and communicated to the Contractor, Environmental Control Officer (ECO) and relevant site personnel.

The On-Site Start-Up Meeting shall include, but not be limited to, the following:

- The approved development footprint of the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam), supplementary Buffer Dam, connecting pipeline and associated infrastructure, including designated no-go areas;
- Site demarcation, fencing and signage, including measures to protect neighbouring landowners, farm workers and the public during construction;
- Protection of environmentally sensitive areas, including wetlands, watercourses, mapped Critical Biodiversity Areas (CBAs), Kouebokkeveld Alluvium Fynbos and the indigenous vegetation on Langrug Ridge;

- Protection of agricultural land and soils outside the approved development footprint;
- Waste management, storage and disposal procedures;
- Mandatory environmental equipment, including spill kits, firefighting equipment, erosion-control materials and emergency response equipment;
- Establishment of the construction camp, laydown areas, material stockpile areas and designated construction access routes;
- Construction of the enlarged Helpmekaar Dam, supplementary Buffer Dam, connecting pipeline, spillways, inlet and outlet structures and associated infrastructure within the approved development footprint;
- Concrete batching, mixing and washout procedures;
- Topsoil stripping, separate stockpiling, reuse and rehabilitation requirements, including the specialist recommendations for Kouebokkeveld Alluvium Fynbos;
- Soil erosion, stormwater and sediment control measures, particularly during works within or adjacent to wetlands and watercourses;
- Storage, handling and use of fuels, oils, cement and other hazardous substances;
- Protection of freshwater resources and implementation of the applicable freshwater specialist mitigation measures;
- Heritage and Fossil Chance Find Procedures;
- Alien invasive plant management, protection of retained indigenous vegetation and rehabilitation of temporarily disturbed areas;
- Environmental monitoring, site inspection, incident reporting and non-compliance procedures;
- The responsibilities of the Applicant, Contractor, Environmental Control Officer (ECO) and other relevant personnel; and
- Compliance with all conditions of the Environmental Authorisation (EA), the applicable water use authorisation once issued, this EMP, the approved engineering designs and the relevant specialist recommendations.

7.4 SITE SPECIFIC ARRANGEMENTS & CONSTRUCTION PROCEDURES

It is imperative that all construction works be undertaken during the dry, summer months, as it is expected that surface runoff collected in the excavated channels will be minimal, and no diversion of flow would be necessary, which would prevent any indirect effects impacting the downstream Houdenbek River.

7.4.1 On-site start-up meeting

The mandatory **On-Site Start-Up Meeting** must be conducted prior to commencement of any site/camp establishment, earthworks and/or construction activities and will focus on site-specific conditions and requirements that may be applicable to the project and may require additional or special measures of control.

On-Site Start-Up Meeting points of discussion are:

- The Construction EMP & other relevant site documents
- Project to be discussed, and all uncertainties are cleared
- Method statement/s to be discussed
- Road and construction area to be demarcated
- Materials stockpile and lay down areas to be demarcated
- Method of stockpiling to be discussed

- Firefighting procedures
- Mandatory firefighting equipment & fire preventative measures
- Solid waste removal intentions
- Placement, type and service of toilets to be agreed on
- Placement and type of rubbish bins and removal of rubbish to be agreed on
- Labour camp to be demarcated and services agreed on
- Environmental Education and awareness training session to all contractors & onsite staff/labour.
- Location & establishment of concrete batching plant facility.

7.4.2 Start-up meeting participants

Minutes of the on-site Start-Up Meeting will be condensed to a report format and circulated to all attendees of the above-named meeting for their perusal and comments. The On-site Start-up Meeting report will form part of this EMP. If any discrepancies between the start-up report and the EMP arise, then the EMP will take precedence until clarification on the discrepancy is clarified. If any discrepancies between the EMP and the EA, then the EA will take precedence until the discrepancy is clarified.

Participants in the start-up meeting can include:

- Applicants Representative.
- Main Contractor's Representative.
- Resident Engineer
- Site foreman.
- Environmental Consultant.
- Environmental Control Officer.

NB: It is the responsibility of the main contractors to ensure that all sub-contractors that work on the site during and after the civil contract are informed of the environmental conditions pertaining to the site.

7.5 ENVIRONMENTAL AWARENESS TRAINING

7.5.1 Environmental awareness course

Environmental awareness training courses shall be run for all personnel on-site. The ECO will be responsible for the initial awareness course, which shall include all relevant management, the Construction Supervisor, the Contractor and all foremen. All attendees shall remain for the duration of the course.

The Contractor shall be responsible for ensuring that all his personnel and subcontractors (if applicable) are informed and made aware of the environmental constraints and shall also supply the ECO with a monthly report indicating the number of employees used by him. If refresher courses are deemed necessary, for instance, where personnel disregard the requirements of the EMP, the time lost and the cost of the course would be for the account of the Contractor.

7.5.2 Specific training

All contractors and workers shall be informed about any special habitat, biodiversity feature, vegetation and/or rare plant species that might be present on the specific construction site (if applicable).

7.6 METHOD STATEMENTS

Method Statements must be prepared by the Contractor for all environmentally sensitive activities identified by the Applicant, Environmental Control Officer (ECO), relevant specialists or competent authorities in connection with the proposed enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam, installation of the connecting pipeline and associated infrastructure.

A Method Statement establishes how a particular activity will be undertaken while meeting the applicable environmental requirements. It must be treated as a live document and may be amended, with the agreement of the Contractor, Applicant and ECO, where site conditions or construction requirements change. Any amendment must remain within the scope of the approved development and applicable statutory authorisations.

All approved Method Statements must form part of the implementation documentation for this Environmental Management Programme (EMPr) and must comply with the Environmental Authorisation (EA), applicable water use authorisation and its conditions once issued, relevant specialist recommendations and environmental legislation. Copies of approved Method Statements must be kept on site and made available to the competent authorities upon request.

Each Method Statement must describe the proposed activity, construction methodology, environmental protection measures and mitigation actions in sufficient detail for the Applicant and ECO to determine whether the proposed works comply with this EMPr, the approved engineering designs and the applicable authorisation conditions.

The Contractor must submit each required Method Statement to the Applicant and ECO sufficiently in advance of the proposed activity to allow for review and any necessary revisions. No work associated with an activity requiring a Method Statement may commence until the Method Statement has been reviewed and approved by the Applicant and ECO.

Each Method Statement shall include, where applicable:

- A description of the proposed activity and the sequence of construction works;
- The location, extent, timing and anticipated duration of the activity;
- The plant, machinery, materials and equipment to be used;
- Transportation of equipment and materials to and from the site;
- Internal movement of vehicles and construction equipment, including designated access routes;
- The location of temporary construction areas, laydown areas, site offices and material stockpiles;
- Storage, handling and management of construction materials;
- Concrete batching, mixing and washout procedures;
- Fuel storage, refuelling procedures and hazardous substance management;
- Spill prevention, containment and emergency response procedures;
- Stormwater, erosion and sediment control measures;
- Measures to protect watercourses, wetlands, drainage features and other environmentally sensitive areas;
- Measures to protect retained indigenous vegetation and agricultural land outside the approved development footprint;
- Vegetation clearing, topsoil stripping, separate stockpiling, reuse and rehabilitation procedures;
- Measures to minimise disturbance during construction of the dam walls, spillways, inlet and outlet structures and connecting pipeline;
- Applicable environmental mitigation measures and specialist recommendations;

- Arrangements for environmental inspections, monitoring and corrective actions;
- Measures to ensure compliance with this EMP, the EA, applicable water use authorisation and other relevant approvals; and
- Any additional information requested by the Applicant, ECO or competent authority.

The Contractor must comply with all approved Method Statements throughout the relevant works. Any proposed amendment must be submitted to the Applicant and ECO for review and approval before implementation. Where a proposed change falls outside the approved development footprint, engineering design or scope of an applicable authorisation, the necessary statutory approval must be obtained before the affected work proceeds.

NB: No work associated with an activity requiring a Method Statement may commence until the relevant Method Statement has been approved by the Applicant and ECO.

Method Statements must be prepared for the following activities, where applicable, and for any additional environmentally sensitive activity identified during construction:

Method Statements shall include, but not be limited to, the following activities:

- Site demarcation, including approved construction boundaries, sensitive areas and designated no-go areas;
- Establishment of the construction camp, site offices and laydown areas;
- Construction access routes, internal vehicle movement and haul routes;
- Transportation of oversized equipment and construction materials;
- Stormwater management;
- Erosion and sediment control;
- Vegetation clearing and protection of retained indigenous vegetation;
- Topsoil stripping, separate stockpiling, conservation and reuse, including the specialist requirements for Kouebokkeveld Alluvium Fynbos;
- Temporary material and spoil stockpiling;
- Protection of agricultural soils and rehabilitation of temporarily disturbed agricultural land;
- Fuel storage and refuelling;
- Hazardous substance storage, handling and spill response;
- Waste management, storage and disposal;
- Concrete batching, mixing and washout;
- Construction vehicle servicing and maintenance;
- Heavy earthworks, excavation and management of excavated material;
- Enlargement of the existing Helpmekaar Dam, including construction of the dam wall, spillway, inlet and outlet structures and associated works;
- Construction of the supplementary Buffer Dam, including its dam wall, spillway, inlet and outlet structures and associated works;
- Installation of the approximately 1.7 km connecting pipeline along the approved alignment, including measures to protect indigenous vegetation on Langrug Ridge;

- Construction activities within or adjacent to wetlands, watercourses and drainage features;
- Temporary flow management and protection of downstream freshwater resources during construction, where required by the approved engineering design and applicable authorisations;
- Dust suppression and noise management;
- Rehabilitation, soil stabilisation and revegetation of disturbed areas;
- Implementation of the Heritage Chance Find Procedure and Fossil Chance Find Procedure; and
- Any additional activity identified by the Applicant, ECO, relevant specialist or competent authority as requiring a Method Statement.

7.6.1 Additional method statements

Any additional method statements (with regard to a specific aspect of construction) that may be required must be **submitted** and approved before commencement of the specific works and must be available at the site offices.

7.7 NON-COMPLIANCE

Applicant (on recommendation by the ECO) reserves the right at all times for the duration of this agreement to impose restrictions and associate penalties on the contractor with respect to the specific nature, timing and extent of construction activities on environmentally sensitive sites.

7.7.1 Corrective action instruction

The ECO may issue an onsite corrective action instruction to the site agent, or, by means of an entry into the Site Instruction Register, for remedial work to be carried out to rectify any non-compliance that has been carried out within a reasonable and agreeable time frame to carry out and complete the remedial work.

7.7.2 Written warning

In instances of non-compliance with the EMP by the contractor (or any of their employees) or sub-contractor/s (or any of their employees) that move on or off the site, the onsite ECO must issue a written warning indicating the non-conformance to the contractor.

If repeated instructions by the ECO to the site agent to respond to the corrective action instruction have not been carried out, the ECO can issue a Written Warning notation instructing the site agent to timeously carry out the corrective measures as per the original non-compliance.

7.7.3 Penalty fines

In the event of the site agent's negligence to respond and correct the noted non-compliance, the ECO may, in collaboration with the relevant parties, recommend that a Penalty Fine be imposed on the contractor.

- The applicant, in consultation with the ECO, must determine the amount of the penalty applicable in accordance with the Penalties for Non-Compliance Schedule of Tariffs.

- Such penalty amount must be in writing and presented to the contractor within seven (7) days of the written warning.
- Applicant may recover penalties by deducting the fine from the offending contractor.
- The contractor will be responsible for all costs incurred where emergency procedures are implemented to deal with accidents impacting the environment, as well as the rehabilitation of such damage in conjunction with the ECO and site engineer.
- In serious cases, at the discretion of the Applicant and the Environmental Consultant/ECO, multiple offences can be added together.

7.7.4 Stop works

The ECO (after consultation with Environmental Consultant/Applicant/Engineer) may also stop the works or part thereof until the situation is resolved; no extension of time is claimable by the contractor.

These penalties do not preclude any prosecution under any law or regulation.

7.8 CHANGES TO EMP

Although care has been taken to address all known relevant environmental issues for the construction phase, it may become necessary to add or amend certain procedures or instructions to improve the efficiency of the Environmental Management Plan (EMP).

- Only those additions or amendments to this EMP that will either improve environmental protection or can be proved not to have any negative effect on the immediate and surrounding environment will be considered.
- Changes or deviations have to be motivated in writing by means of a Method Statement, and the same procedures for a standard Method Statement have to be followed.
- Any additions or amendments must be submitted by the ECO to DEADP (if so requested) after the ECO has consulted with the Environmental Consultant and Applicant.
- No deviation from the contents of the EMP will be allowed without following the above procedures.

7.9 RECORD KEEPING

All records relating to the implementation of this Environmental Management Plan must be kept together, be readily retrievable and available for scrutiny by any relevant authority. Records include the following:

- Declarations of understanding;
- ECO Checklist, audits and/or diary;
- Method statements
- Photographs (must be taken before, during and immediately after construction as a visual reference);
- The Environmental completion statement.

These records must be available for scrutiny by any relevant authorities.

7.10 STANDARD MANAGEMENT PROCEDURES

7.10.1 Access & haul routes

The Contractor shall control all access to and from the construction site by vehicles, plant and equipment, including those of subcontractors and suppliers. All construction traffic must remain within the approved access routes and development footprint associated with the enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam, installation of the connecting pipeline and associated infrastructure.

Vehicle movement must be managed to minimise disturbance to surrounding agricultural operations, indigenous vegetation, wetlands, watercourses and other environmentally sensitive areas.

The following requirements shall apply:

- Where heavy-duty vehicles, construction plant or specialised equipment are required, the type of vehicle or equipment and proposed access routes must be detailed in an approved Method Statement.
- Existing farm roads and established access tracks must be used wherever practicable. No new access roads or tracks may be created unless they fall within the approved development footprint and have been approved by the Applicant and Environmental Control Officer (ECO), with any additional statutory approval obtained where required.
- Where temporary access routes are required for construction of the enlarged Helpmekaar Dam, supplementary Buffer Dam, connecting pipeline or associated infrastructure, a Method Statement must be prepared and approved before the routes are established.
- The existing farm road/firebreak across Langrug Ridge must be used for access associated with pipeline installation wherever practicable. Construction vehicles must not enter the surrounding indigenous Kouebokkeveld Shale Fynbos outside the approved working area.
- Any approved temporary access routes must be designed and managed to minimise erosion, avoid unnecessary disturbance of wetlands and watercourses, and prevent uncontrolled concentration of stormwater runoff.
- Construction vehicles and plant must remain within demarcated access routes, working areas and the approved development footprint at all times.
- Access across watercourses, wetlands or drainage features must be limited to approved crossing points. Unnecessary crossing or disturbance of these features is prohibited.
- Construction access and vehicle movement must avoid unnecessary disturbance or compaction of agricultural soils, particularly around the proposed Buffer Dam and along the connecting pipeline alignment.
- All reasonable measures must be implemented to minimise disruption to neighbouring landowners, farm workers, agricultural activities and other road users. Construction deliveries should, where practicable, avoid periods of peak farm traffic.
- On gravel or earth roads within the site, construction vehicles must not exceed a speed limit of 25 km/h.
- Vehicles travelling on public roads must comply with all applicable national, provincial and municipal traffic legislation.
- Dust generated by construction traffic must be controlled through appropriate dust suppression measures where required. Dust suppression must be managed to avoid excessive water use, erosion and sediment-laden runoff into freshwater features.
- Temporary access routes and areas disturbed by construction traffic must be rehabilitated following completion of the works. Rehabilitation must include appropriate soil reinstatement, stabilisation and erosion control, to the satisfaction of the ECO.

Where required by the landowner, the following additional requirements shall apply:

- All contractors, subcontractors and personnel must wear appropriate identification and carry valid identification documentation.
- Deliveries and the movement of heavy equipment must, where practicable, take place during normal working hours unless otherwise approved by the Construction Supervisor.
- No personnel may reside permanently on site unless specifically authorised in terms of the construction contract.
- Access routes must be clearly demarcated using temporary fencing, danger tape or similar approved demarcation measures.
- The Contractor must document the condition of existing access roads before construction commences.
- Any damage to existing farm roads or public access roads resulting from construction activities must be repaired by the Contractor, at no cost to the landowner or relevant road authority, and the roads must be restored to at least their pre-construction condition.

7.10.2 Appropriate use of machinery

The Contractor must select and operate machinery appropriate to each construction activity while minimising environmental disturbance, soil compaction, erosion and the risk of pollution. Particular care must be taken when machinery is used within or adjacent to the Helpmekeer Dam, proposed Buffer Dam, connecting pipeline alignment, wetlands, watercourses and areas of retained indigenous vegetation.

The following requirements shall apply:

- Machinery, vehicles and construction equipment may only operate within the demarcated construction areas, approved access routes and development footprint. No machinery may enter designated no-go areas or disturb indigenous vegetation outside the approved working area.
- Machinery must be selected and operated to minimise unnecessary disturbance of agricultural soils, wetland areas, watercourse beds and banks, and sensitive vegetation along the connecting pipeline alignment across Langrug Ridge.
- All vehicles, plant and equipment must be routinely inspected for fuel, oil and hydraulic-fluid leaks, maintained in good working order and serviced regularly. Leaking equipment must be repaired immediately or removed from the site.
- Drip trays must be used when servicing equipment and must be provided beneath stationary plant, parked machinery and equipment where there is a risk of fuel or oil leakage. Drip trays must be inspected regularly and emptied as necessary to prevent accumulated rainwater or contaminants from overflowing.
- Drip trays and secondary containment measures must have sufficient capacity to contain potential leaks or spills. Where containment is provided for a fuel or oil container, it must have a minimum capacity of 120% of the volume of the container, unless a different capacity is required by applicable legislation or an authorisation condition.
- Servicing, repairs and maintenance of construction vehicles, plant and machinery must take place in a designated service and maintenance area, preferably at an established off-site workshop. Servicing and maintenance may not take place within watercourses, wetlands or other environmentally sensitive areas.
- Where emergency maintenance outside the designated service area is unavoidable, the Contractor must obtain approval from the Engineer and Environmental Control Officer (ECO), where practicable, and implement suitable ground protection, drip trays and spill-containment measures before work commences.

- An appropriate, service-certified dry-powder fire extinguisher of at least 2.5 kg, or a higher capacity where required by the applicable fire-safety assessment, must be available on construction vehicles and mobile plant operating on site.
- Suitable spill-response equipment must be readily available wherever machinery is operating. Any fuel, oil or hydraulic-fluid spill must be contained and cleaned up promptly, and contaminated material must be collected and disposed of appropriately.
- Machinery must not be washed, refuelled or serviced within or immediately adjacent to watercourses, wetlands or drainage features. Contaminated wash water, fuels, oils and lubricants may not be discharged onto the ground or into freshwater features.
- Construction machinery must be removed from temporarily disturbed areas as soon as the relevant works are complete to allow for soil reinstatement, stabilisation and rehabilitation.

7.10.3 “No-Go” areas

Areas identified as environmentally sensitive in the Environmental Authorisation (EA), this Environmental Management Programme (EMPr), specialist assessments or during the On-Site Start-Up Meeting must be designated as “No-Go” areas where they fall outside the approved development footprint.

For the Helpmekaar Dam development, particular attention must be given to the protection of wetlands, watercourses, retained indigenous vegetation, mapped Critical Biodiversity Areas (CBAs), Kouebokkeveld Alluvium Fynbos adjacent to the proposed dam enlargement and the good-condition Kouebokkeveld Shale Fynbos on Langrug Ridge.

The following requirements shall apply:

- All designated No-Go areas must be clearly indicated on the approved site plan and demarcated on site before construction commences.
- All natural areas outside the approved development footprint and designated construction access routes must be treated as No-Go areas. Agricultural areas outside the approved footprint must also be protected from unauthorised construction-related disturbance.
- The Contractor must submit a Method Statement to the Environmental Control Officer (ECO) detailing the proposed demarcation and protection measures for No-Go areas. Temporary fencing, danger tape, signage or other suitable measures must be used, as appropriate to the sensitivity of each area.
- The western boundary of the approved Helpmekaar Dam inundation area must be clearly demarcated to prevent unnecessary disturbance of adjacent Kouebokkeveld Alluvium Fynbos.
- Along the connecting pipeline alignment across Langrug Ridge, the approved working area must be clearly demarcated to prevent construction personnel, machinery and materials from entering the surrounding indigenous Kouebokkeveld Shale Fynbos.
- No-Go areas are out of bounds to the Contractor, construction personnel, subcontractors, suppliers and other persons involved in the project. Entry may only be permitted with the prior written approval of the ECO where it is consistent with the EA, approved development footprint and other applicable authorisations.
- No person, vehicle, machinery, equipment, construction material, spoil or waste may enter or be placed within a designated No-Go area without the required approval.
- No vegetation clearing, excavation, stockpiling, vehicle parking, refuelling, servicing or establishment of temporary construction facilities may take place within No-Go areas.
- The Contractor must ensure that No-Go demarcation remains visible and effective throughout construction. Damaged or displaced fencing, tape or signage must be repaired or replaced promptly.

- All contractors, subcontractors and site personnel must be informed of the location and environmental significance of No-Go areas during environmental induction and must be made aware of the consequences of non-compliance.
- Any unauthorised entry into or disturbance of a No-Go area must be reported to the ECO. The affected activity must cease, and appropriate corrective and rehabilitation measures must be implemented.

7.10.4 Restriction of working areas

The approved layout plans will be used to establish the site demarcation, with fencing and warning signage installed to prevent unauthorised access, particularly by residents and children, during construction.) All relevant parties responsible for the day-to-day activities on the site will be present and made aware of the implications of the site demarcation. They include the:

- Environmental Consultant: EnviroAfrica
- Principal Agent
- Main Contractor: Project Site Manager
- Sub-contractor: Project contractor
- ECO: Environmental Control Officer

The approved construction areas, access routes and designated No-Go areas must be demarcated before any site establishment or construction activity commences, including the delivery or movement of construction materials, machinery and equipment onto the site.

Demarcation must clearly distinguish the approved working areas from surrounding agricultural land, wetlands, watercourses and environmentally sensitive indigenous vegetation associated with the Helpmekeer Dam enlargement, supplementary Buffer Dam and connecting pipeline.

The following requirements shall apply:

- The approved development footprint, construction access routes, temporary laydown areas, material stockpile areas and designated No-Go areas must be clearly demarcated before construction commences.
- Demarcation may consist of appropriately spaced dropper poles with a single strand of orange baler twine at approximately 1 m above ground level, or another suitable fencing or demarcation method agreed upon during the On-Site Start-Up Meeting.
- The type and positioning of demarcation must be appropriate to the site conditions and sensitivity of the area being protected. More visible or robust temporary fencing must be used where necessary to prevent accidental entry into sensitive areas.
- The location and method of demarcation must be agreed upon during the On-Site Start-Up Meeting and approved on site by the Environmental Control Officer (ECO).
- Particular attention must be given to demarcating the western boundary of the approved Helpmekeer Dam inundation area to prevent unnecessary disturbance of adjacent Kouebokkeveld Alluvium Fynbos.
- Along the connecting pipeline alignment across Langrug Ridge, the approved working area must be clearly demarcated to prevent construction personnel, vehicles, machinery and materials from entering the surrounding indigenous Kouebokkeveld Shale Fynbos.
- The approved construction boundaries around the supplementary Buffer Dam must be clearly demarcated to minimise unnecessary disturbance of adjacent agricultural land and freshwater features.

- All work areas and access routes must remain clearly identifiable throughout construction. Construction personnel, vehicles, machinery, equipment and materials must remain within the approved and demarcated areas.
- Where individual sensitive features or areas are at risk of disturbance, additional temporary fencing or protective barriers must be installed as directed by the ECO.
- The Contractor must maintain all demarcation, fencing, signage and protective barriers in good condition for the duration of construction, or for as long as required by the ECO.
- Demarcation may not be moved, relocated, altered or removed without the prior approval of the ECO. Any proposed change to a construction boundary must also remain within the approved development footprint and comply with the applicable authorisation conditions.
- Any temporary fencing or demarcation removed to undertake an approved construction activity must be reinstated by the Contractor as soon as practicable.
- Damaged, displaced or ineffective demarcation must be repaired or replaced promptly to prevent unauthorised access or disturbance.
- All contractors, subcontractors and site personnel must be informed of the purpose and location of the demarcated construction boundaries and No-Go areas during environmental induction.
- Upon completion of construction, the Contractor must remove all temporary demarcation, fencing, signage and barriers that do not form part of the approved permanent works, unless otherwise instructed by the Applicant or ECO.

7.10.5 Protection of natural veld

The proposed Helpmekaar Dam development includes areas of historically transformed agricultural land as well as environmentally sensitive indigenous vegetation. The enlargement of the existing Helpmekaar Dam will affect an area of Kouebokkeveld Alluvium Fynbos, while good-condition Kouebokkeveld Shale Fynbos occurs along Langrug Ridge in the vicinity of the proposed connecting pipeline. These vegetation types are classified as Critically Endangered and must be protected from unnecessary disturbance.

The proposed Buffer Dam footprint is situated within historically transformed agricultural land. However, construction activities must remain within the approved development footprint to prevent unnecessary disturbance of surrounding agricultural land, indigenous vegetation and freshwater features.

The following requirements shall apply:

- All environmentally sensitive areas retained indigenous vegetation, wetlands, watercourses and designated No-Go areas identified during the Environmental Impact Assessment process must be clearly demarcated before construction commences and protected throughout the construction period.
- Construction activities must be confined to the approved development footprint, designated working areas and access routes. No unnecessary vegetation clearing, grubbing, excavation, stockpiling or disturbance outside these areas is permitted.
- Vegetation clearing must be limited to the minimum area necessary for the enlargement of the existing Helpmekaar Dam, construction of the supplementary Buffer Dam, installation of the connecting pipeline and associated infrastructure.

- Indigenous vegetation outside the approved development footprint may not be removed, damaged or disturbed. Existing ecological linkages and natural vegetation adjoining the development footprint must be protected.
- The western boundary of the approved Helpmekaar Dam inundation area must be clearly demarcated to prevent unnecessary disturbance of adjacent Kouebokkeveld Alluvium Fynbos.
- The upper approximately 15–20 cm of suitable topsoil within the Kouebokkeveld Alluvium Fynbos area to be inundated must be conserved and redistributed over disturbed Kouebokkeveld Alluvium Fynbos outside the inundation area, in accordance with the terrestrial biodiversity specialist's recommendations.
- The connecting pipeline must follow the approved alignment along the existing farm road/firebreak across Langrug Ridge. Where necessary, installation must be confined to the road or immediately adjacent to its edge to minimise disturbance of the surrounding Kouebokkeveld Shale Fynbos.
- Where disturbance of indigenous vegetation cannot be avoided during pipeline installation, suitable indigenous plant material and topsoil must be retained separately and reused during rehabilitation, where practicable.
- No construction camp, laydown area, material stockpile, spoil stockpile or machinery parking area may be established within retained indigenous vegetation outside the approved development footprint.
- Disturbed areas must be stabilised and rehabilitated progressively, where practicable, and following completion of construction. Rehabilitation within natural areas must promote the recovery of locally occurring indigenous vegetation appropriate to the affected vegetation type.
- No invasive alien plant species may be introduced or used for rehabilitation. Imported topsoil or rehabilitation material must, as far as practicable, be free of alien invasive plant propagules.
- Alien invasive plant control must be undertaken within and around the development footprint, including areas within 32 m of the enlarged Helpmekaar Dam, supplementary Buffer Dam and connecting pipeline, in accordance with the terrestrial biodiversity specialist's recommendations and applicable legislation.
- Follow-up inspections and alien invasive plant clearing must be undertaken during construction, rehabilitation and operation, where necessary, to prevent the establishment and spread of alien invasive species.
- Trapping, poisoning, hunting or intentional disturbance of wildlife by construction personnel is prohibited. Domestic animals may not be brought into the construction area by construction personnel.
- Where herbicides or other chemicals are proposed for alien invasive plant control, the Contractor must submit a Method Statement to the Applicant and Environmental Control Officer (ECO) for approval before their use. Chemical application must be managed to prevent contamination of wetlands, watercourses, stored water and surrounding vegetation.
- The Contractor may not damage, paint, mark or otherwise deface natural features, including rock outcrops, mature indigenous trees and other retained environmental features, unless such disturbance forms part of the approved works.
- Any accidental disturbance of indigenous vegetation or other sensitive features outside the approved development footprint must be reported promptly to the ECO. The affected activity must cease, and appropriate corrective and rehabilitation measures must be implemented.
- All incidents involving damage to retained indigenous vegetation or wildlife must be reported to the ECO, who must determine the necessary corrective actions and any additional specialist input required.

7.10.6 Protection of flora

Please also refer to the Terrestrial Biodiversity Compliance Statement (PB Consult, 2026) and the specialist recommendations contained in Section 4.1.1.1 of this EMPr.

The proposed enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam) will affect an area of Kouebokkeveld Alluvium Fynbos. Good-condition Kouebokkeveld Shale Fynbos also occurs along Langrug Ridge, in the vicinity of the proposed connecting pipeline. Both vegetation types are classified as Critically Endangered and must be protected from unnecessary disturbance. Although the proposed supplementary Buffer Dam is situated within historically transformed agricultural land, construction activities must remain within its approved footprint.

The following measures shall apply throughout the construction phase:

- All indigenous vegetation identified for protection must be clearly demarcated and designated as a No-Go area before construction commences.
- Construction activities must be confined to the approved development footprint, designated working areas and access routes. No unnecessary clearing, excavation, compaction or disturbance of vegetation outside these areas is permitted.
- The western boundary of the approved Helpmekaar Dam inundation area must be clearly demarcated to prevent unnecessary disturbance of adjacent Kouebokkeveld Alluvium Fynbos.
- The upper approximately 15–20 cm of suitable topsoil within the Kouebokkeveld Alluvium Fynbos area to be inundated must be conserved and redistributed over disturbed Kouebokkeveld Alluvium Fynbos outside the inundation area, in accordance with the terrestrial biodiversity specialist's recommendations.
- The connecting pipeline must follow the approved alignment along the existing farm road/firebreak across Langrug Ridge. Where necessary, installation must be confined to the road or immediately adjacent to its edge to minimise disturbance of the surrounding Kouebokkeveld Shale Fynbos.
- Existing indigenous vegetation outside the approved development footprint must be protected from vehicle movement, soil compaction, excavation, stockpiling and the placement of construction materials or equipment.
- Where mature indigenous shrubs or trees occur adjacent to construction activities, appropriate protective measures must be implemented to prevent damage to stems, branches and root systems. Excavation and vehicle movement beneath their canopies must be avoided where practicable.
- Where disturbance of indigenous vegetation cannot be avoided during pipeline installation, suitable indigenous plant material must be retained for reuse during rehabilitation, where practicable.
- Topsoil removed from areas supporting indigenous vegetation must be stripped and stored separately from subsoil and other excavated material. Suitable topsoil must be protected from erosion and contamination and reused during rehabilitation.
- Rehabilitation of temporarily disturbed natural areas must promote the recovery of locally occurring indigenous vegetation appropriate to the affected vegetation type. Invasive alien plant species may not be introduced or used for rehabilitation.
- Rehabilitation must commence progressively during construction, where practicable, and temporarily disturbed areas must be stabilised and rehabilitated as soon as practicable following completion of the relevant works.
- Rehabilitated areas must be monitored for soil stability, vegetation recovery and alien invasive plant establishment. Additional rehabilitation or corrective measures must be implemented where required.

- Alien invasive plant control must be undertaken within and around the development footprint, including areas within 32 m of the enlarged Helpmekaar Dam, supplementary Buffer Dam and connecting pipeline, in accordance with the terrestrial biodiversity specialist's recommendations and applicable legislation.
- Follow-up inspections and alien invasive plant clearing must be undertaken during construction, rehabilitation and operation, as necessary, to prevent the establishment and spread of invasive species.
- The use of herbicides or other chemical control measures must be undertaken in accordance with an approved Method Statement and applicable legislation. Chemical application must be managed to prevent contamination of wetlands, watercourses, stored water and retained indigenous vegetation.
- Any accidental damage to indigenous vegetation outside the approved development footprint must be reported promptly to the Environmental Control Officer (ECO). The affected activity must cease, and appropriate corrective and rehabilitation measures must be implemented to the satisfaction of the ECO.

7.10.7 Protection of fauna and Avifauna

The proposed Helpmekaar Dam development includes historically transformed agricultural land, freshwater habitats and areas of indigenous vegetation that may provide habitat for fauna and avifauna. Construction activities associated with the enlargement of the existing Helpmekaar Dam, construction of the supplementary Buffer Dam and installation of the connecting pipeline must be managed to minimise unnecessary disturbance, injury or mortality of wildlife.

The following requirements shall apply:

- Trapping, - Trapping, poisoning, hunting, intentional killing or unnecessary disturbance of wildlife by construction personnel is strictly prohibited. Construction personnel may not bring domestic pets into the construction area.
- Before vegetation clearing or earthworks commence, the relevant work area must be inspected for the presence of wildlife, particularly slow-moving animals, reptiles and amphibians.
- Where wildlife is encountered within an area scheduled for clearing or excavation, work in the immediate vicinity must be temporarily suspended to allow the animal to move away safely. Where relocation is necessary, it must be undertaken by a suitably competent person and in accordance with applicable legal requirements.
- Injured, trapped or distressed wildlife encountered during construction must be reported promptly to the Environmental Control Officer (ECO), who must arrange appropriate assistance from a suitably qualified person or wildlife rehabilitation facility, where required.
- Construction activities must remain within the approved development footprint, designated working areas and access routes to minimise disturbance of surrounding habitats.
- Retained indigenous vegetation, wetlands, watercourses and designated No-Go areas must remain clearly demarcated and protected throughout construction.
- Construction personnel may not collect, capture, remove or deliberately disturb wild animals, birds, eggs, nests or other wildlife without the necessary authorisation.
- Active bird nests encountered within or immediately adjacent to a proposed work area must not be unnecessarily disturbed. Where construction may affect an active nest, the ECO must determine whether the activity can be adjusted or temporarily delayed and seek specialist advice where necessary.

- Construction vehicles must comply with the prescribed on-site speed limit of 25 km/h on gravel and earth roads to reduce the risk of collisions with wildlife.
- Open excavations must, where practicable, be inspected daily and before backfilling for trapped animals. Suitable escape measures must be provided where excavations are left open, and any trapped fauna must be safely removed before work continues.
- Excavations and trenches associated with installation of the connecting pipeline must be backfilled as soon as practicable following completion of the relevant works to minimise the risk of animals becoming trapped.
- Food waste must be stored in closed containers and removed regularly to avoid attracting wildlife to construction areas.
- Night-time construction and artificial lighting must be limited to what is necessary for safe working conditions. Where lighting is required, it must be directed towards the active work area and away from surrounding natural habitats as far as practicable.
- Excessive noise and unnecessary vehicle movement near retained natural vegetation and freshwater habitats must be avoided, particularly outside normal construction hours.
- Any incident involving injury or mortality of protected fauna or avifauna must be reported promptly to the ECO and recorded in the site environmental register. The ECO must determine the appropriate corrective measures and any additional reporting required.
- Where the handling or relocation of protected wildlife requires a permit or other authorisation, the relevant approval must be obtained before the activity is undertaken.

7.10.8 Clearing of vegetation, stripping & conservation of topsoil

Vegetation clearing and topsoil handling must be undertaken in a manner that minimises unnecessary disturbance of indigenous vegetation and agricultural soils, conserves suitable topsoil and the indigenous seed bank, and promotes successful rehabilitation following construction.

The Contractor must implement the applicable recommendations of the Terrestrial Biodiversity Compliance Statement (PB Consult, 2026) and Agricultural Compliance Statement (Johann Lanz and David Lakey, November 2025). Particular attention must be given to the Kouebokkeveld Alluvium Fynbos affected by the proposed Helpmekaar Dam enlargement, the Kouebokkeveld Shale Fynbos along Langrug Ridge and the agricultural soils affected by construction of the supplementary Buffer Dam and connecting pipeline.

Vegetation Clearing

- Vegetation clearing must be limited to the minimum area necessary for the enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam, installation of the connecting pipeline and associated infrastructure.
- All clearing must remain within the approved development footprint and designated working areas. No unnecessary clearing or disturbance of vegetation outside these areas is permitted.
- Before clearing commences, the Contractor must submit a Method Statement describing the proposed clearing sequence, equipment, demarcation, topsoil conservation and rehabilitation measures to the Applicant and Environmental Control Officer (ECO) for approval.

- Indigenous vegetation outside the approved development footprint must be protected throughout construction. The western boundary of the approved Helpmekaar Dam inundation area and the pipeline working area across Langrug Ridge must be clearly demarcated before clearing commences.
- Along Langrug Ridge, vegetation clearing for pipeline installation must be confined to the approved alignment within the existing farm road/firebreak or immediately adjacent to its edge, where necessary, to minimise disturbance of the surrounding Kouebokkeveld Shale Fynbos.
- Where disturbance of indigenous vegetation cannot be avoided during pipeline installation, suitable indigenous plant material must be retained for reuse during rehabilitation, where practicable.
- Cleared indigenous vegetation may be retained for use as brush packing, mulch or slope stabilisation during rehabilitation, subject to the ECO's approval. Material containing alien invasive plant propagules must not be used for this purpose.
- Burning of cleared vegetation on site is prohibited.
- Cleared vegetation may not be buried or incorporated into backfill material unless the proposed method has been assessed and approved by the ECO.
- Where appropriate, retained indigenous brush material may be distributed over rehabilitated natural areas to assist soil stabilisation and vegetation recovery.
- Rehabilitation of temporarily disturbed natural areas must promote the recovery of locally occurring indigenous vegetation appropriate to the affected vegetation type. Invasive alien plant species may not be introduced or used for rehabilitation.

Topsoil Removal and Stockpiling

- Before earthworks commence, suitable topsoil must be stripped from areas that will be temporarily disturbed, including approved construction camps, laydown areas, stockpile areas, temporary access routes and the connecting pipeline trench.
- Within the Kouebokkeveld Alluvium Fynbos area to be inundated by the enlarged Helpmekaar Dam, the upper approximately 15–20 cm of suitable topsoil must be conserved and redistributed over disturbed Kouebokkeveld Alluvium Fynbos outside the inundation area, in accordance with the terrestrial biodiversity specialist's recommendations.
- Topsoil stripping depths in other areas must be determined according to the soil profile, intended rehabilitation use and approved Method Statement. A uniform stripping depth must not be applied where it would result in unnecessary removal of subsoil or loss of the indigenous seed-bearing layer.
- Topsoil and subsoil must be stripped, handled and stockpiled separately. Topsoil from natural vegetation areas must also be kept separate from agricultural topsoil to prevent inappropriate mixing during rehabilitation.
- Where different soil types occur, topsoil must be stockpiled separately and reinstated within the areas from which it originated, where practicable, except where the terrestrial biodiversity specialist has specifically recommended redistribution of topsoil from the proposed inundation area.
- Topsoil stockpiles must be located within approved stockpiling areas, outside watercourses, wetlands, drainage features and designated No-Go areas. Stockpiles must be positioned and managed to prevent sediment-laden runoff from entering freshwater features.
- Topsoil stockpiles must not exceed 2 m in height and must be stabilised or protected where necessary to minimise erosion, dust generation, excessive compaction and loss of soil.

- Topsoil must be protected against contamination by fuels, oils, cement, waste and other construction materials, and must not be mixed with spoil or unsuitable excavated material.
- Construction vehicles and machinery may not travel over or park on topsoil stockpiles.
- Topsoil stockpile areas must be clearly demarcated and managed throughout construction to prevent accidental disturbance, contamination or disposal of conserved material.
- These requirements must also apply to any approved temporary material extraction or borrow areas associated with the development, where applicable.

Reinstatement of Topsoil and Rehabilitation

- Temporarily disturbed areas must be rehabilitated progressively during construction, wherever practicable, and as soon as practicable following completion of the relevant works.
- In areas requiring soil reinstatement, suitable subsoil must be replaced first, followed by the conserved topsoil. Soil layers must not be unnecessarily mixed during backfilling.
- Reinstated soil must be reprofiled to levels compatible with the surrounding ground surface and the approved engineering design, while maintaining appropriate surface drainage.
- Compacted subsoil in temporarily disturbed areas must be loosened before topsoil is replaced, where appropriate, to promote infiltration and root penetration without damaging underlying infrastructure.
- Following installation of the connecting pipeline, the trench and associated temporary working areas must be appropriately backfilled, stabilised and rehabilitated. Agricultural areas must be reinstated to allow the continuation of farming activities where applicable.
- Rehabilitation of temporarily disturbed natural areas must promote the recovery of locally occurring indigenous vegetation representative of the affected vegetation type. Rehabilitation of agricultural areas must focus on suitable soil reinstatement, stability and recovery of agricultural use.
- Invasive alien or inappropriate non-local plant species may not be introduced during rehabilitation.
- Fertilisers and chemical soil enhancers must not be applied to rehabilitated natural vegetation areas unless specifically recommended by a suitably qualified specialist.
- Rehabilitated areas must be monitored for vegetation establishment, erosion, soil settlement, compaction and alien invasive plant establishment. Additional rehabilitation and corrective measures must be implemented where the required outcomes have not been achieved.
- Follow-up inspections and alien invasive plant clearing must be undertaken in disturbed and rehabilitated areas, as necessary, in accordance with the terrestrial biodiversity specialist's recommendations and the alien invasive plant management requirements of this EMPr.

7.10.9 Erosion & sedimentation control

The Contractor must implement appropriate preventative and corrective measures to minimise erosion, sediment mobilisation and stormwater impacts associated with the enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam, installation of the connecting pipeline and associated infrastructure.

Particular attention must be given to earthworks within and adjacent to wetlands and watercourses, the stability of dam embankments and spillways, the connecting pipeline alignment across Langrug Ridge, and the protection of surrounding agricultural soils and indigenous vegetation.

Erosion and sediment control measures must be implemented before earthworks commence, maintained throughout construction and monitored until disturbed areas have been successfully stabilised and rehabilitated.

The following requirements shall apply:

- Construction - Construction activities within or adjacent to wetlands and watercourses must, where practicable, be scheduled during low-flow or dry conditions to minimise erosion, sediment mobilisation and disturbance of downstream freshwater features.
- Appropriate erosion and sediment control measures must be installed before vegetation clearing and major earthworks commence and maintained throughout the construction period.
- Existing vegetation must be retained wherever practicable to reduce erosion and maintain slope stability. Vegetation clearing must remain within the approved development footprint and designated working areas.
- Wetlands, watercourses, retained indigenous vegetation and designated No-Go areas outside the approved development footprint must be clearly demarcated and protected from unnecessary disturbance.
- Temporary stormwater measures must be designed to manage runoff from upslope areas without causing erosion, flooding or the uncontrolled diversion of water into adjacent freshwater features or agricultural land.
- Sediment control measures, including silt fences, sediment traps, berms, check dams or other suitable structures, must be installed downslope of disturbed areas where required to prevent sediment from entering wetlands, watercourses and downstream drainage features.
- Stormwater management measures must prevent the uncontrolled concentration of runoff, ponding, scour and sediment-laden discharge from construction areas.
- Exposed dam embankments, stockpiles, pipeline trenches and disturbed slopes must be stabilised as soon as practicable using suitable engineering or erosion-control measures, such as geotextiles, erosion-control matting, brush packing or mulch, where appropriate.
- Construction vehicles and machinery must remain within approved access routes and working areas to minimise unnecessary soil disturbance, compaction and erosion.
- Topsoil must be stripped, conserved, stockpiled and reused in accordance with Section 4.5.8 of this EMPr. Topsoil from natural vegetation areas must be managed separately from agricultural topsoil, as applicable.
- Topsoil, spoil and construction-material stockpiles must be located within approved stockpiling areas, outside wetlands, watercourses, drainage features and designated No-Go areas. Stockpiles must be protected against erosion by wind and water.
- Fuels, oils, cement, chemicals and other hazardous substances must be stored and handled in appropriately contained areas to prevent contamination of soil, stored water and downstream freshwater resources.
- Polluted water, cement-contaminated water, sediment-laden runoff and other construction-related contaminants may not be discharged into wetlands, watercourses or downstream drainage features.
- Earthworks associated with the enlarged Helpmekaar Dam and supplementary Buffer Dam must be managed to prevent unnecessary sediment mobilisation into freshwater features outside the approved construction area.

- Spillways, inlet and outlet structures, embankments and associated discharge areas must be constructed in accordance with the approved engineering design and must incorporate appropriate erosion and scour protection measures.
- Pipeline trenches must be backfilled, reprofiled and stabilised as soon as practicable following installation. Where the pipeline crosses or approaches a drainage feature, appropriate measures must be implemented to prevent erosion, settlement and alteration of drainage patterns.

Inspection and Monitoring

- Erosion - The Contractor must inspect erosion and sediment control measures regularly, with oversight by the Environmental Control Officer (ECO).
- Additional inspections must be undertaken following significant rainfall or high-flow events to identify erosion, sediment mobilisation, scour, slope instability or failure of erosion-control measures.
- Any erosion, instability, sediment accumulation or failure of erosion-control measures identified during inspections must be addressed promptly through appropriate corrective, engineering or rehabilitation measures.
- Dam embankments, spillways, inlet and outlet structures, pipeline working areas and downstream discharge areas must be inspected during construction to confirm that erosion and sedimentation are being effectively controlled.
- Temporarily disturbed areas must be rehabilitated progressively, wherever practicable, with permanent stabilisation implemented as soon as the relevant construction activities have been completed.
- Where erosion or sedimentation affects a wetland or watercourse, the ECO must assess the incident and determine whether freshwater specialist input or notification of the relevant authority is required.

Operational Phase

- Long-term erosion risks associated with the enlarged Helpmekaar Dam, supplementary Buffer Dam, connecting pipeline, spillways, inlet and outlet structures and associated drainage infrastructure must be monitored throughout the operational phase.
- Dam embankments, spillways, outlet works and downstream discharge areas must be inspected regularly and following significant rainfall, high-flow or overflow events, where applicable.
- The connecting pipeline alignment must be inspected for evidence of soil settlement, erosion or instability, particularly where temporary construction areas have been rehabilitated and where the alignment crosses sloping terrain or drainage features.
- Any erosion, scour, sediment accumulation, instability or structural damage identified during operational inspections must be addressed promptly through appropriate maintenance, rehabilitation or engineering measures.
- Maintenance activities involving soil disturbance within or adjacent to wetlands and watercourses must be undertaken in accordance with the approved Maintenance Management Plan (MMP) and applicable statutory authorisations.
- Ongoing erosion and sediment management must comply with this EMPr, the Environmental Authorisation (EA), the applicable water use authorisation and its conditions once issued, and relevant specialist and engineering requirements.

Where applicable, all erosion and sediment control measures must also comply with the approved Stormwater Management Plan, Method Statements and engineering specifications prepared for the project. Any proposed amendment to an approved Method Statement must be submitted to the Applicant and ECO for approval before implementation.

7.10.10 Alien invasive management plan

In accordance with the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the applicable Alien and Invasive Species Regulations, listed alien invasive plant species occurring within and around the approved development footprint must be managed and controlled during construction, rehabilitation and operation.

Alien invasive plant control must address the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam), supplementary Buffer Dam, connecting pipeline and associated disturbed areas. Particular attention must be given to wetlands, watercourses, temporarily disturbed soils and retained indigenous vegetation, where disturbance may create opportunities for alien invasive plant establishment.

The following requirements shall apply:

- Alien invasive plant species occurring within the approved development footprint and associated disturbed areas must be identified and controlled using methods appropriate to the species, site conditions and applicable legal requirements.
- In accordance with the Terrestrial Biodiversity Compliance Statement, alien invasive plant control must be undertaken within and around the development footprint, including areas within 32 m of the enlarged Helpmekaar Dam, supplementary Buffer Dam and connecting pipeline.
- Particular attention must be given to wetlands, watercourses, drainage features, pipeline working areas, rehabilitation sites and retained indigenous vegetation adjoining the construction footprint.
- Alien invasive plant removal must be undertaken using methods that minimise unnecessary disturbance of indigenous vegetation, agricultural soils and freshwater features.
- Where an alien invasive plant species is capable of regenerating from cut stems, roots, seeds or other plant material, appropriate treatment and disposal methods must be implemented to prevent regrowth or further spread.
- Cleared alien invasive vegetation and propagative material may not be dumped, buried or stockpiled within wetlands, watercourses, drainage features, retained indigenous vegetation or designated No-Go areas.
- Burning of cleared alien invasive vegetation on site is prohibited unless specifically authorised by the relevant authority and permitted under applicable fire-safety requirements.
- Where herbicides or other chemical control methods are necessary, the Contractor must submit a Method Statement to the Applicant and Environmental Control Officer (ECO) for approval before application. Only appropriate products may be used, in accordance with their registered instructions and applicable legislation.
- Herbicide application must be managed to prevent contamination of stored water, wetlands, watercourses, agricultural land and retained indigenous vegetation. Chemical control must not be undertaken where spray drift or runoff could cause unacceptable environmental damage.

- Imported topsoil, fill material, mulch and rehabilitation material must, as far as practicable, be free of alien invasive plant seeds, roots and other propagative material.
- Temporarily disturbed areas must be stabilised and rehabilitated as soon as practicable following completion of the relevant construction activities to reduce opportunities for alien invasive plant establishment.
- Rehabilitation of natural areas must promote the recovery of locally occurring indigenous vegetation appropriate to the affected vegetation type. Alien invasive plant species may not be introduced or used for rehabilitation.
- The Contractor and ECO must inspect disturbed and rehabilitated areas for alien invasive plant establishment during construction. Identified infestations must be addressed promptly using appropriate control measures.
- Follow-up monitoring and clearing must continue during rehabilitation and operation, as necessary, to prevent regrowth and the establishment or spread of new infestations. The frequency of inspections must be appropriate to the species present, seasonal growth conditions and the effectiveness of previous control measures.
- The Applicant must ensure that alien invasive plant control continues after construction in accordance with applicable landowner obligations, specialist recommendations and the operational requirements of this EMPr.
- Records of inspections, species identified, control measures implemented, follow-up treatment and rehabilitation outcomes must be maintained and made available for environmental auditing where required.

Where applicable, alien invasive plant management must also comply with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), and other relevant requirements governing agricultural land management.

The classification of listed alien invasive species and the applicable control obligations must be determined in accordance with the legislation and species lists in force at the time of implementation.

7.10.11 Protection of archaeological & paleontological remains

The Heritage Impact Assessment (ACRM, Jonathan Kaplan, January 2026) did not identify archaeological resources requiring mitigation within the proposed Helpmekaar Dam enlargement footprint or along the connecting pipeline alignment. Two isolated Earlier Stone Age stone artefacts recorded within the historically transformed Buffer Dam footprint were assessed as having no conservation value.

The palaeontological assessment identified low sensitivity associated with Quaternary fluvial sediments, while the underlying Voorstehoek Formation may have very high palaeontological sensitivity. Although routine archaeological monitoring and pre-construction archaeological mitigation are not required, previously unidentified heritage resources may be exposed during excavation and earthworks. A Heritage Chance Find Procedure and Fossil Chance Find Procedure must therefore be implemented throughout construction.

The following requirements shall apply:

- All construction personnel must be informed during environmental induction of the possibility of encountering archaeological material, fossils, graves, human remains or other heritage resources during vegetation clearing, excavation and earthworks.
- If suspected archaeological material, stone artefacts, pottery, historical structures, fossils, fossilised wood, bones, shells or other heritage resources are uncovered, all work in the immediate vicinity of the discovery must cease immediately.
- The discovery area must be clearly demarcated, secured and protected from further disturbance. Construction personnel may not collect, move, clean, damage or otherwise interfere with the material.
- The Environmental Control Officer (ECO) must be notified promptly. The ECO must arrange for assessment by a suitably qualified archaeologist or palaeontologist, as appropriate, and notify Heritage Western Cape (HWC) where required.
- If suspected human remains or an unmarked grave are discovered, work in the immediate vicinity must cease immediately and the area must be secured. The South African Police Service (SAPS) must be notified where the circumstances require investigation of potentially recent human remains. HWC and a suitably qualified heritage specialist must also be consulted to determine the applicable heritage procedures.
- Suspected human remains; graves and associated material may not be disturbed, excavated, removed or reburied without the necessary investigation and statutory approvals.
- No archaeological material, fossils or other protected heritage resources may be excavated, collected, removed, damaged or otherwise disturbed without the authorisation required under the National Heritage Resources Act, 1999 (Act No. 25 of 1999).
- Where suspected fossil material is encountered, the Fossil Chance Find Procedure must be followed. A suitably qualified palaeontologist must assess the find and determine whether recording, sampling, collection or other mitigation is necessary.
- Construction may continue outside the demarcated discovery area where it can do so without affecting the find. Work within the affected area may only recommence once the relevant specialist has completed the necessary assessment and any required mitigation, clearance or statutory authorisation has been obtained.
- Any mitigation or management measures required by HWC or the appointed heritage specialist following a chance find must be implemented before construction resumes in the affected area.
- All heritage-related chance finds, notifications, specialist assessments, instructions and corrective actions must be recorded in the site environmental register and included in the ECO's compliance reports.

Heritage Western Cape contact details:

Protea Assurance Building, Green Market Square, Cape Town 8000.

Private Bag X9067, Cape Town 8001.

Tel: 086-142 142. Fax: 021-483 9842.

Email: hwc.hwc@westerncape.gov.za

7.10.12 Storage of construction material & stockpiling

Construction materials, equipment and stockpiles must be stored only within approved and clearly demarcated areas identified before construction commences. Storage and stockpiling associated with the enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam and installation of the connecting pipeline must be managed to prevent unnecessary disturbance of indigenous vegetation, agricultural soils, wetlands and watercourses.

Storage areas must be located outside retained indigenous vegetation, freshwater features and designated No-Go areas. Particular care must be taken to prevent sediment, cement-contaminated water, fuels and other pollutants from entering the existing dam, the proposed Buffer Dam footprint or downstream watercourses.

Before construction commences, the Contractor must submit a Method Statement to the Applicant and Environmental Control Officer (ECO) describing:

- The types and anticipated quantities of construction materials to be stored on site.
- The proposed locations of construction camps, laydown areas, stockpile areas and temporary storage facilities.
- Whether fuels, oils, chemicals, hazardous substances or oil-containing equipment will be stored on site, and the proposed containment arrangements.
- The proposed methods of transporting and handling construction materials within the approved development footprint.
- Measures to prevent erosion, sediment mobilisation, stormwater contamination, dust generation and pollution.
- Proposed spill prevention, containment, clean-up and emergency response procedures.
- The proposed handling, separation, storage and reuse of topsoil, subsoil and excavated material.

The following requirements shall apply:

- All construction materials and equipment must be stored within approved, clearly demarcated storage and laydown areas.
- Temporary laydown or storage areas outside the initially designated construction camp must be approved by the Applicant and ECO before use. Such areas must remain within the approved development footprint or other areas lawfully authorised for construction activities.
- Storage areas must be located outside wetlands, watercourses, drainage features, retained indigenous vegetation and designated No-Go areas.
- Materials may not be stored in areas identified for rehabilitation unless temporary use of the area has been approved by the ECO and appropriate soil conservation and reinstatement measures have been specified.
- Stockpiles and storage areas must be positioned so that they do not obstruct natural drainage, concentrate stormwater runoff or increase erosion and sedimentation risks.
- Cement, lime and other materials capable of contaminating soil or water must be stored in suitable covered or contained areas and protected from rainfall and stormwater runoff.
- Concrete batching, mixing and equipment washout may take place only within approved areas equipped to contain cement-contaminated water and prevent its discharge into soil, wetlands, watercourses or the dam.
- Imported fill, gravel, sand, aggregate and topsoil must be obtained from lawful sources and must, as far as practicable, be free of contaminants and alien invasive plant seeds, roots and other propagative material.

- Topsoil, subsoil, spoil and construction materials must be stockpiled separately, as appropriate. Topsoil must be conserved and managed in accordance with Section 4.5.8 of this EMPr.
- Topsoil stockpiles must not exceed 2 m in height. The height and configuration of other material stockpiles must be determined with regard to material stability, erosion risk and the Engineer's requirements.
- Stockpiles must be stabilised, covered or otherwise protected where necessary to prevent wind erosion, water erosion, dust generation and sediment mobilisation.
- Construction vehicles and machinery may not travel over or park on conserved topsoil stockpiles.
- Materials and equipment may not be stored along farm access roads where they obstruct safe passage, within drainage features or outside approved storage areas.
- Excavated material intended for reuse in dam embankment construction or backfilling must be stored and handled in accordance with the approved engineering design and Method Statement. Material may be obtained only from approved excavation or borrow areas, where applicable.
- No additional borrow area, material extraction area or disposal area may be established without confirmation that the proposed activity is covered by the applicable approvals and statutory requirements.
- Fuels, oils, chemicals and other hazardous substances must be stored in appropriately contained areas, with suitable spill-response equipment available. Refuelling and maintenance activities must comply with the pollution prevention requirements of this EMPr.
- Temporary stockpiling and laydown areas not required for permanent infrastructure must be cleared of construction materials, reprofiled where necessary and rehabilitated as soon as practicable following completion of their use.
- All contractors, subcontractors and delivery personnel must be informed of the approved access routes, storage areas and No-Go areas before entering the construction site.
- The Contractor must inspect storage and stockpiling areas regularly. The ECO must verify compliance during environmental inspections, and any identified erosion, contamination, unauthorised storage or other non-compliance must be rectified promptly.
- All storage and stockpiling activities must comply with the approved Method Statements, this EMPr, the Environmental Authorisation and applicable water use authorisation once issued, and relevant specialist and engineering requirements.

7.10.13 Oil storage and management

An important potential environmental impact is oil spills from any oil-filled equipment and machinery that may occur during transportation or storage of decommissioned and new construction material/ equipment. The following conditions shall apply:

- Vehicles must be checked for oil leaks prior to going on site
- Care should be taken to prevent any potential oil spillage during upgrading activities.
- Sufficient measures should be put in place to ensure that any potential oil spills are mitigated.
- An oil spill kit should be available on site at all times during the construction activities;
- Oil containment facilities should be provided for any oil-filled equipment onsite;
- All oil spills must be reported to the ECO within 24 hours, indicating the containment and rehabilitation measures implemented

Oil spill kits are available from:

- Drizit (021) 531 5335
- Enretech (021) 683 1858
- Pinelands Environmental Technology (021) 531 3749

7.10.14 Storing of petroleum products

Although no petroleum products will be stored on site, it is important to know that petroleum fuels contain harmful substances known to cause health problems and can easily have adverse effects on water quality and the environment. Petroleum spills can move rapidly into the soil and quickly contaminate drinking water. In order to prevent pollution, it is important to use proper methods when handling, using, and storing diesel fuel, gasoline, kerosene, or other petroleum products.

The South African National Standards pertaining to the installation of a storage tank include:

- Sans 310, which requires that an aboveground storage tank be of sufficient structural strength, based on sound engineering practices, to withstand normal operations and use;
- Sans 1668, for fibre-reinforced plastic tanks for the underground storage of petroleum products;
- Sans 10089-1, which deals with the storage and distribution of petroleum products in aboveground bulk installations; and
- Sans 1535, for glass- reinforced polyester-coated steel tanks, for the underground storage of hydrocarbons and oxygenated solvents, which are intended to be buried horizontally.

Above-ground fuel storage tanks (not recommended, but if required)

Any fuel storage proposals must be cleared by the ECO before any storage or stockpiling takes place. If the contractor proposes to install above-ground fuel storage tanks for use during the construction phase of the project, the following basic requirements must be adhered to:

- A Method Statement, explaining the method of storage and mitigation measures to prevent spillages, must be submitted to the ECO and accepted prior to the installation of such a fuel storage facility (please note that storage of any dangerous goods/fuel of 30 cubic meters or more requires environmental authorisation).
- The fuel tank must be placed within a completely sealed concrete bund (containment structure) which must be able to contain at least 120% of the total capacity of the fuel tank.
- The bunded area should be built to be at least a third wider (on all sides) than the base of the fuel tank in order to maximise its capability to contain spillages and leakages.
- The fuel distributor must also be located within a bunded area to better prevent accidental spillages during refuelling.
- In addition, drip trays are to be used during refuelling.
- All vehicles, equipment, fuel and petroleum services and containers must be maintained in good condition that prevents leakage and possible contamination of soil or water supplies.
- Fuel storage areas must comply with general fire safety requirements.
- Fuel storage areas must be at least 100m from any watercourses.

Storing smaller quantities of fuel or oil

Any fuel storage proposals must be cleared by the ECO before any storage or stockpiling takes place. If the contractor proposes to use only small fuel storage facilities (< 200 litres), the following basic requirements must be adhered to:

- Fuels and oils must be safely located out of harm's way from the elements, and safety and fire prevention must be strictly adhered to.
- All fuel oil containers must be placed within suitable drip trays to prevent accidental spillage of oils and fuels.
- A suitable leak-proof container for the storage of oiled equipment (filters, drip tray contents and oil changes, etc.) must be established.
- All spills are to be recorded in the ECO diary.

7.10.15 Storing of hazardous substances

Although no potentially hazardous substances will be stored on site, it is important to understand how potentially hazardous substances are to be stored on site. The Contractor must submit a Method Statement detailing the substances and/or materials to be used, together with the storage, handling and disposal procedures of the materials to the ECO.

- Hazardous materials must be stored under lock and key in designated areas with properly displayed and visible warning signs.
- No works related to the submitted Method Statement may commence until the Method Statement has been studied and approved in writing.
- An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use, and storage must be implemented. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or stormwater systems.
- Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmentally sensitive areas from construction impacts, including the direct or indirect spillage of pollutants, must be implemented.
- **Paints:** - No paint products may be disposed of on Site, and brush/roller wash facilities must be established to the satisfaction of the Engineer and the ECO. Oil-based paints and chemical additives, and cleaners such as thinners and turpentine must be strictly controlled. A Method Statement detailing the paint management procedures is required.
- **Hazardous building materials:** -Hazardous building materials (e.g. asbestos, fibre claddings, refrigerants, coolants, sub-station cooling oils, etc.) must be identified and dealt with in accordance with the relevant safety and health legislation. All such material must be separated on-site and disposed of at appropriate licensed disposal sites. The Contractor must supply the ECO with a certificate of disposal.

7.10.16 Use of cement or concrete

All concrete will be imported from a local supplier and will not be mixed on site. Concrete will be transported on wheelbarrows to the weir site through alien vegetation and disturbed land.

The Contractor is advised that cement and concrete are highly hazardous to the natural environment because of the high pH levels of the material and the chemicals contained therein. Wash-out water with high pH is the number one environmental issue for the ready-mix concrete industry. The alkalinity levels of wash water can be as high as pH 12, which is toxic to fish and other aquatic life.

The Site Supervisor or Contractor must indicate the need for and the proposed location of concrete batching plants, which includes the location of cement stores, sand and aggregate stockpile areas. No cement will be mixed on-site for this project. A Method Statement indicating the layout, type of concrete batching preparation (dry or wet mix). The site agent must indicate on the Method Statement the proposed total volume of concrete that is needed for the completion of the entire project.

Concrete/cement mixing:

- Concrete and cement may only be mixed on existing hard surfaced areas, or on edged mortar boards or a suitable container. Concrete may not be mixed or stored directly on the ground under any circumstances.
- The visible remains of the batch and concrete, either solid or from washings, must be physically removed immediately and disposed of as hazardous waste.
- Washing of equipment shall be done in a container to prevent any runoff of contaminated washing water.
- Extreme care must be taken to limit the amount of water contaminated by washing equipment. Water from concrete washing can be reused in concrete mixes or must be stored in drums, then removed from the site and disposed of at a licensed municipal dump site.

Concrete batching plants

The following procedures must be implemented to control wastewater run-off from concrete batching plant locations:

- The location of concrete batching areas must be approved by the ECO (if possible/appropriate, the use of ready-mix concrete is preferred).
- Concrete batching facilities must have suitable bunding methods in place to ensure minimal wastewater run-off occurs during batching operations.
- Contaminated water may not enter a natural or man-made (e.g. trench / sloop or dam) water system. Preventative measures include establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.
- Dry mixing batching areas to be carefully placed in consultation with the ECO.
- Cement bags are to be stored securely out of harm's way from the elements (wind and rain). Bags have to be covered and placed on plastic sheeting. Used cement bags must be disposed of on a regular basis via the solid waste management system and must not be used for any other purpose.
- Sand and stone used for cement or concrete batching must be stored on plastic layers (or on ECO-approved disturbed areas) in order to prevent contamination of the natural environment.
- Cleaning of equipment and flushing of mixers must not result in pollution of the surrounding environment. All wastewater resulting from batching of concrete must be disposed of *via* the contaminated water management procedure.
- Excess or spilt concrete must be confined within the works area, and all visible remains of excess concrete must be physically removed and disposed of on completion of cement work. Washing the remains into the ground is not acceptable. All excess aggregate must also be removed.
- Wash-down areas must be confined to within the concrete batching areas only.

7.10.17 Blasting/drilling

In the event that blasting or rock drilling is required, the following must be implemented:

- A Method statement must be provided for each case separately **prior** to commencement of blasting works.
- The contractor must take all necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly rock.

- The contractor must ensure that no pollution results from drilling operations, either as a result of oil and fuel drips or from drilling fluid. The contractor must take all reasonable measures to limit dust generation as a result of drilling operations.
- The ECO must be given 72-hour notice before blasting events.

7.10.18 Fire fighting

Appropriate fire prevention measures shall be implemented throughout the construction period to minimise the risk of veld fires and accidental fires associated with construction activities.

The following requirements shall apply:

- Adequate firefighting equipment shall be available on site at all times and maintained in good working order. As a minimum, each active work area shall be equipped with at least one 4.5 kg ABC (all-purpose) fire extinguisher and three fire beaters, or equivalent equipment appropriate to the identified fire risk.
- All site personnel shall receive appropriate induction and training regarding fire prevention procedures, the use of firefighting equipment and emergency response procedures.
- The Contractor shall prepare and implement an Emergency Fire Response Plan prior to the commencement of construction activities.
- Emergency contact numbers for the local Fire and Rescue Service, Emergency Medical Services, South African Police Service, landowner and other relevant emergency services shall be displayed prominently at the site office and construction camp.
- Welding, gas cutting, grinding and other hot works shall only be undertaken within approved working areas and appropriate firefighting equipment shall be immediately available during such activities.
- During periods of high fire danger or strong winds, hot works shall be suspended where there is an unacceptable risk of veld fire.
- No open fires shall be permitted on site unless specifically authorised by the Applicant and appropriate fire prevention measures are in place.
- Flammable materials, fuels and combustible waste shall be stored and managed in accordance with the hazardous substances requirements of this EMPr.
- Smoking shall only be permitted within designated smoking areas provided with suitable fire-safe cigarette disposal containers.
- In the event of any fire, the Contractor shall immediately notify the relevant emergency services, the landowner and the Environmental Control Officer (ECO), and shall implement the approved Emergency Fire Response Plan.
- The Contractor shall be responsible for all costs associated with the extinguishing of any fire caused by construction activities and for the rehabilitation of any areas damaged as a result of such fire.

7.10.19 Emergency Procedures

It is the responsibility of the contractor to assess the potential risks to the environment as a result of the project. As such, the contractor must have the necessary standard emergency operating procedures in place to deal with any potential emergency, such as oil spills or fire.

- All staff should be made aware of the necessary basic emergency procedures in the event of an emergency, including injuries to staff. The appropriate equipment and identified personnel to deal with such basic emergencies should be available on site.
- **Fire:** The Contractor must advise the relevant authority of a fire as soon as one starts and must not wait until he can no longer control it. The Contractor must ensure that their employees are aware of the procedure to be followed in the event of a fire.
- **Hazardous Material Spills:** The Contractor must ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which must include notifying the Engineer, the ECO and the relevant authorities. Treatment and remediation of the spill areas must be undertaken to the reasonable satisfaction of the ECO and Local Authority.

7.10.20 Solid waste management

Waste includes all domestic waste, construction waste, hazardous waste, recyclable materials and any other waste generated during the construction, operation and maintenance of the proposed development. The Contractor shall establish and implement an effective waste management system, incorporating waste avoidance, reuse and recycling wherever practicable.

The following requirements shall apply:

- No littering, dumping, burning or burying of waste, construction debris, vegetation or refuse shall be permitted on site.
- Waste generation shall be minimised as far as reasonably practicable through appropriate planning, material management, reuse and recycling.
- Separate waste receptacles shall be provided for general waste, recyclable materials and hazardous waste where applicable.
- The Contractor shall provide sufficient weatherproof, animal-proof waste bins fitted with lids throughout the construction site. Waste containers shall be emptied regularly and shall not be allowed to overflow.
- Temporary waste storage areas shall be located within approved, demarcated areas outside drainage lines, environmentally sensitive areas and designated No-Go Areas.
- All general waste shall be removed from site regularly and disposed of at a suitably licensed waste disposal facility.
- All hazardous waste shall be stored separately in appropriately labelled containers and disposed of at a licensed hazardous waste disposal facility by an appropriately authorised waste contractor.
- Waste manifests, disposal certificates and any other disposal records shall be maintained on site and made available to the Environmental Control Officer (ECO) and competent authorities upon request.
- Construction camps, laydown areas, stockpile areas and work areas shall be inspected and cleaned daily to prevent litter accumulation.
- Waste shall be removed from the construction site at least weekly, or more frequently where necessary to maintain a clean and orderly site.
- Hydrocarbon-contaminated materials, used spill absorbents, empty chemical containers and other hazardous waste shall be managed in accordance with the applicable hazardous waste requirements contained in this EMPr.
- No waste or construction material may be disposed of within drainage lines, watercourses or environmentally sensitive areas.

- Waste generated during maintenance activities shall be managed and disposed of in the same manner as construction waste.
- All waste shall be managed in accordance with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), and all other applicable legislation.

7.10.21 Toilets & Ablution Facilities

The Contractor must provide suitable sanitary arrangements at designated points of the construction site for all site employees. A minimum of one toilet must be provided per 15 persons at each working area (station) or as stipulated in the Management plan.

- Toilets must be at least 50m away from any watercourse and be screened from the surrounding residences.
- The toilet must be within easy reach (max 300m) of the working area and be in good working condition and cleaned on a daily basis. Toilet paper must be provided. The toilets must be emptied on a weekly basis or when full, or when instructed by the ECO on site.
- Disposal arrangements must be made in advance and cleared with the ECO before construction starts. Sanitation provision and servicing must be to the satisfaction of the ECO.
- Toilets must be secured and anchored to prevent tipping by wind.
- The Contractor must ensure that toilets are emptied prior to any builders' holidays, and/or weekends.
- Toilets must be of a neat construction and must be provided with doors and locks and must be secured to prevent them from blowing over.
- NB: No burying of any waste material on or near the construction site, nor anywhere on the surrounding property, is permitted.
- Eating areas that are allocated for workers must be established in an environmentally acceptable manner and in line with all OH & Safety Act regulations. All on-site and on-route workers' temporary eating areas must have acceptable toilet and refuse management systems in place, and these areas must have suitable refuse receptacles available for the containment and disposal of general litter and refuse.

7.10.22 Discharge of construction water

Potential pollutants of any kind and in any form must be kept, stored, and used in such a manner that any escape can be contained and the water table not endangered. This particularly applies to water emanating from runoff from fuel depots/workshops/truck washing areas.

- The contractor, being responsible for the construction and effective containment and maintenance of settlement ponds, must ensure that the surrounding environment is not adversely affected as a result of construction activities.
- Wash down areas must be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. Contaminated water includes water that is carrying excess sediment due to construction activities.
- Contaminated water storage facilities must not be allowed to overflow and appropriate protection from rain and flooding must be implemented.
- Contaminated water that is removed from the site must be disposed of at a facility approved by the ECO and Local Authority.
- No contaminated water that does not meet the water quality standards and criteria under the National Water Act may be released into a natural system, whether it is to surface or groundwater.
- All cement effluent from mixer washings and run-off from batching areas and other work areas must be contained in suitable sedimentation ponds.

- Sedimentation ponds must be allowed to dry out on a regular basis to allow for solid material to be removed.
- This material must be disposed of in a suitable manner, depending on the nature of the material, and at the discretion of the ECO.

7.10.23 Treating (flushing/testing) of pipelines (if required)

Where pressure testing, flushing or commissioning of the proposed ± 1.7 km connecting pipeline between the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam) and the supplementary Buffer Dam is required, these activities must be undertaken in a manner that prevents erosion, sedimentation and pollution of surrounding agricultural land, indigenous vegetation, wetlands and watercourses.

The following requirements shall apply:

- Pipeline testing, flushing and commissioning must be undertaken in accordance with the approved engineering specifications, this EMPr and the conditions of any applicable water use authorisation once issued.
- Before testing or flushing commences, the Contractor must identify the proposed water source, anticipated water volumes, discharge location and measures required to prevent erosion and pollution. These arrangements must be submitted to the Applicant and Environmental Control Officer (ECO) for approval.
- Water used for testing and flushing must be obtained from a lawful source. Testing and commissioning activities may not result in unauthorised abstraction, diversion or discharge of water.
- The direct discharge of sediment-laden water, chemicals, disinfectants, hydrocarbons or other contaminants into wetlands, watercourses, drainage features or designated No-Go areas is prohibited.
- Where discharge of clean testing or flushing water is permitted, it must be released in a controlled manner onto a suitable, stable area where it will not cause erosion, flooding, soil instability or damage to agricultural land or indigenous vegetation. Energy-dissipation and sediment-control measures must be provided where necessary.
- Water containing sediments, chemicals, disinfectants, hydrocarbons or other contaminants must be contained and appropriately managed. It may not be discharged to the environment unless the proposed discharge is lawful and the water meets all applicable quality and authorisation requirements.
- Where contaminated water cannot lawfully and safely be treated or managed on site, it must be removed by an appropriately authorised service provider and disposed of at a facility authorised to accept it.
- Pipeline testing and flushing must be monitored by the Contractor to ensure that leaks, uncontrolled discharges, erosion, sediment mobilisation and pollution are identified and addressed promptly.
- Any leakage or failure identified during pressure testing must be repaired before the pipeline is commissioned. Water released during repairs or retesting must be managed in accordance with the requirements above.
- Following testing and commissioning, temporary discharge points and any disturbed areas must be stabilised and rehabilitated as soon as practicable.
- Any accidental spill, uncontrolled discharge or pollution incident must be reported promptly to the ECO. The Contractor must immediately implement appropriate containment and remedial measures, and any additional statutory reporting requirements must be addressed where applicable.

7.10.24 Eating facilities

The Contractor must designate eating areas for the approval of the ECO, which must be clearly demarcated. No eating of meals must take place outside these designated areas without the approval of the Contractor/ESO.

- The feeding or leaving of food for animals is strictly prohibited.
- Sufficient waste bins must be present in this area and emptied regularly.
- The contractor must supply cooking facilities that are suitable for the environment and are not liable to cause the outbreak of fires.
- No overnight camping/stay on site allowed. If overnighing is necessary for security purposes, then it must be cleared with the ECO on site.
- No washing in dams or streams is allowed.

7.10.25 Dust Control

The Contractor must take all reasonable measures to minimise dust generated during the enlargement of the existing Helpmekaar Dam (Langrug-Boonste No. 1 Dam), construction of the supplementary Buffer Dam, installation of the connecting pipeline and associated construction activities.

Dust-generating activities must be managed in accordance with the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), and the National Dust Control Regulations (GN R827 of 1 November 2013), where applicable. Dust control measures must be implemented from the commencement of construction until exposed and temporarily disturbed areas have been adequately stabilised or rehabilitated.

The following dust control measures must be implemented:

- Exposed surfaces, approved access roads, construction areas and stockpiles must be dampened with water where excessive dust generation occurs. Water used for dust suppression must be obtained from a lawful source and applied in a manner that does not cause erosion, ponding or sediment-laden runoff into wetlands or watercourses.
- Construction vehicles travelling on gravel and earth roads must comply with the prescribed on-site speed limit of 25 km/h to minimise dust generation.
- Vehicle movement must be restricted to approved access routes and working areas. Unnecessary vehicle movement over exposed agricultural soils or retained natural vegetation is prohibited.
- Soil stockpiles, exposed dam embankments and other disturbed surfaces must be stabilised, covered or otherwise protected where practicable to minimise wind erosion.
- Excavated material must be handled and stockpiled in a manner that minimises dust generation, particularly during dry and windy conditions.
- Dust-generating activities must be reduced or temporarily suspended during periods of high wind where dust cannot be effectively controlled.
- Open burning of cleared vegetation, construction waste or other materials on site is prohibited.
- Vehicles transporting sand, soil, aggregate or other fine materials must be covered where necessary to prevent material loss and dust generation.
- Dust suppression must be managed to avoid excessive water use, soil saturation, damage to agricultural land and runoff into surrounding freshwater features.
- Construction equipment and vehicles must be maintained in good working order to minimise unnecessary exhaust emissions.

- A complaints register must be maintained on site to record dust-related complaints received from surrounding landowners or Interested and Affected Parties, together with the investigation undertaken and corrective measures implemented.
- The Contractor must monitor dust conditions during daily site activities. The Environmental Control Officer (ECO) must assess the effectiveness of dust control measures during routine environmental inspections.

Where excessive dust generation persists or substantiated complaints are received, the Contractor must implement additional mitigation measures. Dustfall monitoring must be undertaken where required by the relevant authority or where necessary to assess compliance with applicable dust control requirements.

7.10.26 Noise Management

Objective

To prevent, minimise and manage noise impacts associated with construction activities in order to protect surrounding landowners, farm workers and other sensitive receptors, and to ensure compliance with applicable legislation and municipal requirements.

Impact

Construction-related noise generated by construction vehicles, earthmoving equipment, heavy machinery, pumping equipment and general construction activities.

Management Outcomes

- Minimise noise disturbance to surrounding landowners, neighbouring farming operations and other sensitive receptors.
- Ensure compliance with applicable municipal by-laws and environmental legislation.
- Prevent unnecessary noise associated with construction activities.

Management Actions

The following noise management measures shall be implemented throughout the construction phase:

- Construction activities shall, where practicable, be limited to normal working hours unless otherwise approved by the Applicant or required for safety reasons.
- All construction vehicles, machinery and equipment shall be maintained in good working order and fitted with appropriate silencers or noise suppression devices where applicable.
- Unnecessary idling of construction vehicles and machinery shall be avoided.
- High-noise activities, including excavation, blasting (if required), rock breaking, heavy earthworks and cutting operations, shall be undertaken during normal daytime working hours wherever practicable.
- No amplified music, hooting, shouting or other unnecessary noise-generating activities shall be permitted on site.
- Construction vehicles shall comply with approved access routes and on-site speed limits to minimise noise generation.

- Where unusually noisy activities are anticipated that may affect neighbouring landowners or other sensitive receptors, reasonable prior notification shall be provided where practicable.
- A complaints register shall be maintained on site and all noise-related complaints shall be investigated, recorded and addressed promptly.
- The Environmental Control Officer (ECO) shall monitor compliance with the noise management requirements during routine site inspections and recommend corrective actions where required.
- Should excessive noise levels be identified, appropriate corrective measures shall be implemented immediately to reduce the impact on surrounding receptors.

Responsible Party

Owner / Contractor

Monitoring Method

Visual inspection and ECO compliance monitoring

Monitoring Frequency

Weekly and as required during construction

7.10.27 Restoration and rehabilitation

The Contractor shall ensure that all temporary construction infrastructure, equipment, materials and facilities established for the construction of the proposed development are removed upon completion of construction. All disturbed areas not required for the operational phase shall be rehabilitated to a stable condition that is compatible with the surrounding environment and to the satisfaction of the Environmental Control Officer (ECO).

Rehabilitation shall be undertaken progressively during construction, wherever practicable and completed immediately following the completion of construction activities.

The following requirements shall apply:

- Construction camps, site offices, laydown areas, temporary storage areas, labour facilities and temporary fencing shall be removed upon completion of construction.
- All surplus construction materials, rubble, waste and debris shall be removed from the site and disposed of at appropriately authorised facilities.
- All temporary access routes and disturbed construction areas not required for the operational phase shall be rehabilitated to at least their pre-construction condition.
- Disturbed areas shall be reinstated to blend with the surrounding natural landform and agricultural landscape.
- Topsoil shall be replaced in the same sequence in which it was removed, with subsoil placed first and topsoil replaced as the final layer.
- Topsoil from different soil types shall, where practicable, be returned to the areas from which it originated.
- Compacted areas shall be ripped prior to topsoil replacement to promote infiltration and root establishment.

- Rehabilitation shall utilise locally occurring indigenous fynbos species representative of the surrounding vegetation. No alien invasive or non-local plant species shall be used.
- Where practicable, brush-cut indigenous vegetation shall be spread over disturbed areas to promote natural seed dispersal, improve soil protection and facilitate natural vegetation recovery, in accordance with the recommendations of the Botanical Assessment.
- The mature stand of alien invasive Poplar (*Populus × canescens*) removed during construction shall be subject to follow-up control to prevent regrowth or re-establishment.
- Fertilisers, pesticides and other chemical soil enhancers shall not be used unless specifically recommended by a suitably qualified specialist and approved by the ECO.
- Erosion control measures shall remain in place until disturbed areas have stabilised and vegetation has become successfully established.
- Rehabilitation success shall be monitored following completion of construction, with corrective rehabilitation undertaken where vegetation establishment, erosion control or slope stability objectives have not been achieved.
- Annual inspections for alien invasive vegetation shall be undertaken within rehabilitated areas for a minimum period of two years, with follow-up clearing implemented where required.
- Any additional disturbed areas identified during construction shall be rehabilitated to the satisfaction of the ECO.

Where approved borrow areas or material extraction areas are utilised, the following additional requirements shall apply:

- No waste, rubble or hazardous materials may be disposed of within borrow areas.
- Suitable clean excavated material from the approved development footprint may be used for backfilling where required.
- Where borrow areas are not completely backfilled, side slopes shall be reprofiled to stable gradients that blend with the surrounding landform. Vertical faces shall not be left exposed.
- Appropriate drainage, erosion protection and rehabilitation measures shall be implemented and monitored until the borrow area has stabilised.

7.10.28 Land Management

Construction activities shall be undertaken in a manner that minimises disturbance to agricultural operations, existing farm infrastructure, access roads and the surrounding environment.

The following requirements shall apply:

- Construction vehicles and plant shall use only approved access routes and shall remain within the approved development footprint.
- Drivers accessing the construction site shall be made aware of potential hazards associated with narrow farm roads, sharp bends, livestock, wildlife, farm workers, pedestrians and adverse weather conditions.
- Vehicle movements shall be minimised during periods of heavy rainfall where there is a risk of damaging farm roads or causing excessive soil disturbance.
- Existing farm roads shall be maintained in a safe and serviceable condition throughout the construction period.

- Any damage to farm roads, fences, gates or other farm infrastructure resulting from construction activities shall be repaired by the Contractor to the satisfaction of the landowner.
- Existing fences and gates shall not be damaged or removed unless authorised by the landowner.
- Access gates shall be kept closed at all times when not in use to prevent the movement of livestock or wildlife and to restrict unauthorised access to the construction site.
- Appropriate access control measures shall be implemented to prevent unauthorised entry onto the construction site.
- Soil erosion shall be prevented along access roads, temporary haul routes, construction areas and disturbed surfaces through the implementation of appropriate erosion and stormwater control measures.
- Construction activities shall be planned to minimise unnecessary disturbance to existing agricultural activities and surrounding cultivated lands.
- Any disturbed agricultural land outside the permanent development footprint shall be reinstated and rehabilitated upon completion of construction.
- The Environmental Control Officer (ECO) shall inspect access roads and disturbed areas regularly to ensure that erosion, drainage and land management measures remain effective throughout construction.

7.10.29 Socio-Cultural Issues

Construction activities shall be undertaken in a manner that minimises disturbance to neighbouring landowners, surrounding farming operations, farm workers and other lawful users of the surrounding area.

The following requirements shall apply:

- Adjacent landowners, neighbouring farmers, farm workers and members of the public shall be treated with courtesy and respect at all times.
- Construction personnel shall conduct themselves in a professional manner and shall not engage in behaviour that may cause conflict or unnecessary disturbance to neighbouring properties.
- Existing farming operations shall, as far as reasonably practicable, continue without unnecessary interruption during construction.
- Access to neighbouring properties and existing farm infrastructure shall not be obstructed unless prior arrangements have been made with the affected landowner.
- Construction activities shall, where practicable, be limited to normal working hours.
- Should construction activities be required outside normal working hours, these shall only take place where authorised in terms of the Environmental Authorisation, approved by the Applicant and undertaken in accordance with any applicable municipal by-laws or other statutory requirements.
- Noise, dust and traffic associated with construction shall be managed in accordance with the relevant provisions of this Environmental Management Programme (EMPr).
- Any complaints received from neighbouring landowners or members of the public shall be recorded in the site complaints register and investigated promptly by the Contractor and Environmental Control Officer (ECO). Appropriate corrective action shall be implemented where required.

7.11 EMERGENCY PREPAREDNESS & RESPONSE

The following potential emergency situations have been identified and include the procedure for responding to, and for preventing and mitigating the environmental impacts that may be associated with them (also refer to Penalties and Fines).

7.11.1 Accidental fires

Fire safety in the Fynbos Area is a very real risk and must be stringently controlled. No fires will be permitted on site for any reason. If required, a designated smoking area will be provided, and clearly demarcated and signposted, with a facility for safe containment and disposal of cigarette butts.

The following measures must be implemented:

- Adequate firefighting equipment must be available on site and in good working order (including at least one type of ABC (all purpose) 4.5 kg fire extinguisher and 3 fire beaters per working area). The persons on site must be trained in the use of such equipment.
- The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office.
- The contractors must establish an emergency procedure (with contact numbers) to the satisfaction of ECO (whenever work is done in any fire-prone areas).

7.11.2 Hydrocarbon spills

Since the project is relatively small, no fuel storage or distribution facilities will be established. As a result, the significance of any spill is much reduced. The following must be observed:

- Vehicles will arrive on site already fuelled for the project.
- If additional fuel is needed, it will be brought in as needed (minimal volumes) and refuelling will be done using a pump and not a funnel (to minimise the risk of spills).
- Spill trays shall be used during refuelling.
- In the case of accidental spillages or leakage, the contractor will be responsible for immediate containment and corrective action (e.g. stopping the leakage), and will inform the Construction Supervisor and ECO.
- The ECO will recommend the best possible environmental solution.
- The Contractor will be liable for any costs incurred.

7.11.3 Concrete/cement spillages

The Contractor/supplier will be liable for the safe and correct deliverance of substantial loads of concrete or cement.

- Should a spill occur, the Contractor/supplier will be liable for all costs of the rehabilitation needed.

8. OPERATIONAL EMP (OEMP)

The operational phase of the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam) and supplementary Buffer Dam will focus on ensuring that the dams, the approximately 1.7 km connecting pipeline and associated infrastructure are operated and maintained in an environmentally responsible manner.

The Applicant, Sterkwater Boerdery (Pty) Ltd, shall remain responsible for the environmental performance of the development and must ensure that operational activities comply with the Environmental Authorisation (EA), the applicable water use authorisation once issued, this Environmental Management Programme (EMPr), the approved Maintenance Management Plan (MMP), relevant specialist recommendations and applicable environmental legislation.

The dams must be operated for their intended purpose of storing water for agricultural irrigation. Water storage, transfers and releases must remain within the limits and conditions of the applicable water use authorisation. The Applicant must ensure that any pollution, environmental degradation, infrastructure failure or non-compliance is addressed promptly through appropriate corrective action.

During the operational phase, the Applicant or delegated responsible person must implement the following management measures:

- Access - Access management and control to prevent unauthorised entry, damage to infrastructure and unnecessary disturbance of surrounding agricultural land and natural habitats.
- Operation, inspection and maintenance of the enlarged Helpmekaar Dam, supplementary Buffer Dam, dam walls, spillways, inlet and outlet structures, connecting pipeline and associated infrastructure.
- Management of water storage, transfers and releases in accordance with the applicable water use authorisation and its conditions once issued.
- Monitoring and implementation of any environmental flow, downstream water resource or other water management requirements specified in the applicable water use authorisation.
- Monitoring of dam performance, seepage, erosion, sediment accumulation, embankment condition and structural stability, with engineering inspections undertaken where required.
- Inspection of the connecting pipeline for leaks, erosion, soil settlement and damage, with repairs undertaken promptly.
- Stormwater, erosion and sediment management, particularly at dam embankments, spillways, discharge points and rehabilitated sections of the pipeline alignment.
- Water quality protection and pollution prevention, including the appropriate storage and handling of fuels, oils, chemicals and other potentially polluting substances used during operational or maintenance activities.
- Waste management and the lawful removal and disposal of waste generated during operation and maintenance.
- Fire prevention and emergency preparedness, including the maintenance of appropriate access for emergency response.
- Dust suppression during maintenance activities where required, using methods that do not cause erosion or polluted runoff.
- Ongoing monitoring and control of alien invasive vegetation within and around the dam footprints, connecting pipeline and associated disturbed areas, in accordance with the specialist recommendations and this EMPr.
- Protection of retained indigenous vegetation, wetlands, watercourses, fauna and avifauna from unnecessary disturbance during operational and maintenance activities.

- Monitoring and maintenance of rehabilitated areas, including the implementation of additional erosion control, soil reinstatement or vegetation rehabilitation where necessary.
- Inspection and maintenance of approved access roads and associated drainage infrastructure to prevent erosion and unnecessary expansion of disturbed areas.
- Implementation of appropriate emergency response procedures for spillages, uncontrolled discharges, pipeline failures, structural damage and other environmental incidents.
- Recording of operational inspections, maintenance activities, environmental incidents, complaints and corrective actions, where applicable.

Routine inspections and maintenance must be undertaken throughout the operational life of the development to ensure that the dams and associated infrastructure remain safe and environmentally compliant. Maintenance activities must be undertaken in accordance with the approved MMP and applicable statutory authorisations. The MMP does not authorise new construction, enlargement of infrastructure or activities outside the scope of the approvals issued for the development.

8.1 TRAFFIC ACCESS ROUTES & HAUL ROADS

The Applicant or delegated Operator must control the movement of all vehicles, machinery and maintenance equipment associated with the operation and maintenance of the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam), supplementary Buffer Dam, connecting pipeline and associated infrastructure. All vehicles, including those of contractors and suppliers, must remain on designated access routes and be operated in a manner that minimises disturbance to surrounding agricultural activities, natural habitats and other lawful road users.

The following requirements shall apply:

- Only approved farm access roads and designated maintenance routes may be used. Vehicles and machinery may not create new tracks or shortcuts through agricultural land, retained indigenous vegetation, wetlands or designated No-Go areas.
- Vehicles travelling on gravel or earth roads within the site must not exceed a speed of 25 km/h.
- Vehicles using public roads must comply with applicable municipal and provincial traffic regulations, including posted speed limits and vehicle-loading requirements.
- Vehicle movements associated with routine inspections and maintenance must be planned to minimise disruption to neighbouring farming operations, farm workers, adjacent landowners and other lawful road users.
- Where practicable, the movement of heavy vehicles and the delivery of large equipment must be scheduled to avoid periods of high traffic activity and unnecessary interference with agricultural operations.
- Maintenance vehicles and equipment must remain within existing approved access routes and designated working areas. Any temporary access required for maintenance must comply with the approved Maintenance Management Plan (MMP) and applicable statutory authorisations.
- Access roads must be inspected and maintained as necessary to prevent erosion, excessive dust generation, deterioration of drainage structures and sediment-laden runoff into wetlands or watercourses.
- Any damage to access roads, drainage structures, fences or agricultural infrastructure resulting from operational or maintenance activities must be repaired promptly.

- All contractors, suppliers and maintenance personnel must be informed of the approved access routes, speed limits and environmentally sensitive areas before commencing work on site.

8.2 WATER MANAGEMENT

All water uses associated with the operation of the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam), the supplementary Buffer Dam and the connecting pipeline must comply with the applicable water use authorisation and any requirements imposed by the Department of Water and Sanitation (DWS). The Applicant, Sterkwater Boerdery (Pty) Ltd, must ensure that water storage, transfers, releases and irrigation-related activities remain within the scope and conditions of the authorisations issued for the development.

Water conservation, pollution prevention and the protection of downstream freshwater resources must form part of the routine operation and maintenance of the development.

The following requirements shall apply:

- The enlarged Helpmekaar Dam, supplementary Buffer Dam and connecting pipeline must be operated in accordance with the applicable water use authorisation once issued, including any conditions relating to storage capacity, water use volumes, monitoring, releases and reporting.
- Water may be stored, transferred and used only to the extent permitted by the applicable authorisations and other lawful water use entitlements. The proposed development and its hydrological assessment do not, on their own, confer water use rights.
- Water conservation and demand management measures must be implemented throughout the operational phase. These must include efficient irrigation practices, routine leak detection and repair, appropriate maintenance of water conveyance infrastructure and the avoidance of unnecessary water losses.
- The connecting pipeline, inlet and outlet structures, valves and associated infrastructure must be inspected regularly for leaks, malfunction or uncontrolled discharge. Defects must be repaired promptly.
- Operational staff and maintenance contractors must receive appropriate environmental awareness instruction covering water conservation, pollution prevention and the protection of wetlands and watercourses.
- A water monitoring programme must be implemented in accordance with the applicable water use authorisation. Water storage, transfers, releases and use volumes must be measured and recorded where required by the authorisation.
- Water monitoring records must be retained and made available to DWS or other relevant authorities upon request, in accordance with applicable reporting requirements.
- Any environmental flow, downstream release or other water resource protection requirements specified in the applicable water use authorisation must be implemented and monitored. The Applicant must not substitute assumptions from the hydrological assessment for the final authorisation conditions.
- Stormwater runoff and erosion associated with the dam walls, spillways, inlet and outlet structures, connecting pipeline and surrounding disturbed areas must be managed to minimise sedimentation and downstream impacts.

- Fuels, oils, chemicals, waste and other potentially polluting substances used during operation or maintenance must be stored and handled so that they cannot contaminate stored water, wetlands, watercourses or surrounding soils.
- Water from equipment washing, maintenance activities or other potentially contaminated sources may not be discharged into either dam, a wetland or a watercourse.
- The operation and maintenance of the dams must take account of changing rainfall patterns, intense rainfall and flood events, prolonged drought, erosion risks and associated dam safety considerations.
- Dam embankments, spillways, inlet and outlet structures, erosion protection measures and downstream discharge areas must be inspected and maintained regularly, with additional inspections following significant rainfall, high-flow or overflow events where appropriate.
- Any evidence of excessive seepage, erosion, scour, sediment accumulation, structural instability or uncontrolled water loss must be investigated promptly. Appropriate engineering, environmental or operational corrective measures must be implemented.
- Maintenance activities within or adjacent to wetlands and watercourses must comply with the approved Maintenance Management Plan (MMP), this EMP and the applicable statutory authorisations. The MMP does not authorise new water uses or infrastructure enlargement.
- Water-related incidents, non-compliance and corrective actions must be recorded. Any incident requiring notification under the applicable authorisation or legislation must be reported to the relevant authority within the prescribed timeframe.

The Applicant must ensure that the operational water management programme is reviewed and, where necessary, updated to incorporate the final conditions of the water use authorisation associated with application reference WU38102, once issued.

8.3 EROSION & SEDIMENT CONTROL

The Applicant or delegated Operator must implement appropriate erosion prevention, sediment control and rehabilitation measures throughout the operational phase of the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam), supplementary Buffer Dam, connecting pipeline and associated infrastructure.

Particular attention must be given to the stability of dam embankments, spillways, inlet and outlet structures, downstream discharge areas, access roads and rehabilitated sections of the connecting pipeline alignment. These measures must minimise soil loss, protect agricultural soils and indigenous vegetation, and prevent unnecessary sedimentation of wetlands and watercourses.

The following erosion and sediment control measures shall apply:

- Erosion - Dam embankments, spillways, inlet and outlet structures, downstream discharge areas and associated drainage infrastructure must be inspected regularly for erosion, scour, sediment accumulation, seepage and signs of instability.
- Additional inspections must be undertaken following significant rainfall, high-flow or overflow events, where appropriate.

- Existing vegetation must be retained wherever practicable to maintain soil stability. Routine maintenance activities must be confined to approved access routes and designated working areas to prevent unnecessary disturbance of agricultural land and natural habitats.
- Retained indigenous vegetation, wetlands, watercourses and designated No-Go areas must be protected from unnecessary disturbance during inspection, maintenance and repair activities.
- Stormwater must be managed to prevent concentrated runoff, uncontrolled discharge, erosion and sediment transport from access roads, embankments and other disturbed areas.
- Sediment control measures, such as berms, silt traps, erosion barriers or other suitable structures, must be installed and maintained where necessary to prevent sediment from entering wetlands, watercourses and downstream drainage features.
- Erosion protection measures on dam embankments, spillways, discharge points and other vulnerable areas must be maintained in accordance with the approved engineering design and applicable dam safety requirements.
- The connecting pipeline alignment must be inspected for soil settlement, erosion, exposed pipe sections and instability, particularly along sloping sections of Langrug Ridge and within previously rehabilitated working areas.
- Any erosion, scour, instability or sediment accumulation identified during inspections must be addressed promptly using appropriate engineering, erosion-control or rehabilitation measures. Such measures may include revegetation, erosion-control matting, geotextiles, stone pitching, reno mattresses or other suitable protection structures, where required.
- Spillways, inlet and outlet structures and associated drainage channels must be maintained to ensure that their hydraulic function is not impaired by debris, sediment accumulation or inappropriate vegetation growth. Vegetation removal must be limited to what is necessary for safe and effective operation.
- Sediment removed during maintenance must be handled and disposed of in a manner that prevents its return to wetlands, watercourses or downstream drainage features.
- Maintenance activities involving excavation, vegetation clearing or soil disturbance within or adjacent to wetlands and watercourses must comply with the approved Maintenance Management Plan (MMP) and applicable statutory authorisations. The MMP does not authorise enlargement of the dams or construction of new infrastructure.
- Operational inspections must consider the potential effects of intense rainfall, flood events, prolonged drought and changing runoff patterns on erosion, embankment stability, spillway performance and downstream discharge areas.
- Where repeated erosion, excessive sediment accumulation or instability is identified, the Applicant must obtain appropriate engineering or specialist advice and implement the necessary corrective measures.
- Inspection findings, maintenance activities, erosion incidents and corrective actions must be recorded and retained for environmental compliance purposes.

Areas disturbed by authorised maintenance or repair activities must be stabilised and rehabilitated as soon as practicable. Rehabilitation success, vegetation establishment and soil stability must be monitored, with additional corrective measures implemented where required.

8.4 WATER QUALITY MONITORING

The Applicant or delegated Operator must implement measures to protect water quality during the operation and maintenance of the enlarged Helpmekaar Dam (Langrug-Boonste No. 1 Dam), supplementary Buffer Dam, connecting pipeline and associated infrastructure. Operational activities must be managed to prevent contamination of stored water, surrounding soils, wetlands and downstream watercourses.

Any discharge of wastewater or water containing waste must comply with the National Water Act, 1998 (Act No. 36 of 1998), and any applicable statutory authorisation. This EMPr does not authorise the discharge of wastewater or contaminated water.

The following requirements shall apply:

- Water quality monitoring must be undertaken at the locations, frequencies and for the parameters specified in the Environmental Authorisation or applicable water use authorisation once issued, where required.
- Where monitoring is required, the Applicant must establish a programme identifying the sampling locations, monitoring parameters, sampling frequency, responsible person, recordkeeping requirements and procedures for responding to adverse results.
- Water quality monitoring results must be retained and submitted to the relevant authority where required by an applicable authorisation.
- Equipment and instruments must be cleaned using methods that minimise water use and prevent the release of detergents, oils, chemicals or other contaminants into either dam, surrounding soils, wetlands or watercourses.
- Water used to wash equipment or undertake maintenance must be contained and managed appropriately where it may contain chemicals, hydrocarbons, sediment or other pollutants.
- Contaminated wash water or wastewater may not be discharged onto land, into either dam, or into a wetland, drainage feature or watercourse unless the discharge is lawful and complies with all applicable authorisation and water quality requirements.
- Where wastewater is generated and cannot be lawfully treated or discharged on site, it must be collected and removed by an appropriately authorised service provider for disposal at a facility authorised to accept it.
- If wastewater treatment or discharge is proposed during operation, the Applicant must determine the applicable statutory requirements and obtain any necessary authorisation before commencing that activity. Where required by an authorisation, wastewater volumes and quality must be monitored and recorded.
- Appropriate erosion, stormwater and sediment control measures must be maintained to prevent sediment-laden runoff from maintenance areas, access roads, exposed soils and disturbed areas from entering freshwater features.
- Fuels, oils, chemicals and other potentially polluting substances used during operation or maintenance must be stored and handled in a manner that prevents leaks, spills and contamination of water resources.
- Any suspected water pollution incident must be investigated promptly. The source of pollution must be contained, appropriate corrective measures must be implemented, and the Environmental Control Officer (ECO) or designated responsible person must be informed.

- Pollution incidents, monitoring results and corrective actions must be recorded. The relevant authority must be notified where required by applicable legislation or an authorisation condition.

The Applicant must review the water quality monitoring and reporting requirements of this OEMP when the water use authorisation associated with application reference WU38102 is issued and incorporate any additional conditions into the operational monitoring programme.

8.5 WASTE & POLLUTION MANAGEMENT

An integrated waste management approach based on waste minimisation (e.g. reduction, recycling, re-use and disposal) must be encouraged. Poor waste management can lead to adverse environmental impacts (e.g. odours, pollution and visual impact) as well as health risks. Sound waste management is thus non-negotiable.

- No on-site burying or dumping of any waste materials, vegetation, litter or refuse may be allowed.
- Domestic waste must be stored in approved containers (e.g. bins with removable lids).
- All solid waste will be disposed of at a landfill licensed in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

8.5.1 Recycling

Whenever possible, a suitable recycling arrangement must be negotiated with a local recycling agent to ensure the re-use of recyclable material. Recycling should aim at sorting as much of the following materials as practical:

- Paper and cardboard
- Aluminium
- Copper
- Metals (other than aluminium and copper)
- Glass
- Organic waste
- Batteries
- Electronic equipment

8.5.2 Pollution management

All possible pollution sources must be identified and all reasonable steps taken to prevent pollution or accidental spillages.

- Ensure that all concentrated potential sources of pollution are protected (bunded) in order to minimise the risk of accidental spillage or pollution. Any storage tanks should be bunded in such a way to contain at least 120% of the storage tank's capacity.
- Spill kits shall be maintained on site and replenished after use.
- All pollution incidents shall be recorded and reported to the ECO.

8.6 FIRE MANAGEMENT

Refer to the emergency preparedness and response paragraph 8.9.

8.7 MINIMISE DUST AND AIR EMISSIONS

Refer to the erosion and sedimentation control paragraph 8.3.

8.8 MANAGEMENT OF NATURAL AREAS

The objective regarding the management of natural areas is to identify critical or conservation-worthy features and to manage such areas and gardens in such a manner as to promote biodiversity and ecological processes.

- Natural areas must be managed as close to natural as possible (no interference wherever possible).
- All listed invasive alien vegetation must be removed in accordance with the National Environmental Management: Biodiversity Act (NEMBA) Alien and Invasive Species Regulations.
- Annual inspections for alien invasive vegetation shall be undertaken.
- Follow-up control of Poplar (*Populus × canescens*) regrowth shall be undertaken.

8.9 EMERGENCY PREPAREDNESS AND RESPONSE

The following potential emergency situations have been identified and include the procedure for responding to, and for preventing and mitigating the environmental impacts that may be associated with them.

8.9.1 Accidental fires

Fire safety in the Fynbos Area is a very real risk and must be stringently controlled. No fires will be permitted on site for any reason. If required, a designated smoking area will be provided, and clearly demarcated and signposted, with a facility for safe containment and disposal of cigarette butts.

The following measures must be implemented:

- Adequate firefighting equipment must be available on site and in good working order (including at least one type ABC (all purpose) 4.5 kg fire extinguisher and 3 fire beaters per working area). The personnel on site must be trained in the use of such equipment.
- The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office.
- The contractors must establish an emergency procedure (with contact numbers) to the satisfaction of ECO.

8.9.2 Hydrocarbon spills

Since the project is relatively small in proportion, no fuel storage or distribution facilities will be established. As a result, the significance of any spill is much reduced. The following must be observed:

- Vehicles will arrive on site already fuelled for the project. If additional fuel is needed, it will be brought in as needed (minimal volumes), and refuelling will be done using a pump and not a funnel (to minimise the risk of spills). Spill trays shall be used during refuelling.
- In the case of accidental spillages or leakage, the client will be responsible for immediate containment and corrective action (e.g. stopping the leakage) and will be liable for any costs incurred.
- Spill kits shall be available wherever refuelling or maintenance activities occur.
- Contaminated soil shall be removed and disposed of at an appropriately authorised facility.
- The ECO shall be notified immediately following any significant spill.

8.10 MAINTENANCE

Control measures applicable to this activity would be as per Construction and Operation above. Additionally, the following is applicable:

- During desilting, silt associated with the dam should immediately be removed in order to prevent sedimentation of the downstream excavated channel. Additionally, during desilting, a temporary silt trap would be installed at the spillway and in the excavated channel. This would be emptied on a regular basis and not allowed to reduce the capacity of the dam.
- The dam wall, spillway, outlet works, pump station and pipeline infrastructure shall be inspected regularly.
- Desilting shall be undertaken in accordance with the Freshwater Ecological Assessment recommendations.
- Erosion associated with spillway discharge shall be repaired immediately.
- Rehabilitation of disturbed maintenance areas shall be completed as soon as practicable following maintenance activities.

9. ENVIRONMENTAL AUDIT PROGRAMME

A Final Construction Phase Audit Report is to be undertaken 6 months post construction. This must be undertaken by a qualified Independent Environmental Auditor and is to be submitted to the Competent Authority.

Operational environmental audits shall be undertaken where required by the Environmental Authorisation or at the request of the competent authority.

In terms of the 2014 EIA Regulations, Audit Reports must be submitted to the registered Interested & Affected Parties within 7 days of submission to the competent authority.

10. IMPACT MANAGEMENT OUTCOMES

Impact Management Outcomes

Planning, Design and Pre-Construction					
Impact	Management Outcomes	Management Actions	Responsible Person/Party	Implementation Monitoring Method	Monitoring Frequency
Demarcation of work areas	Prevent disturbance outside the approved development footprint and minimise impacts on sensitive environmental features.	- Clearly demarcate the approved construction footprint, access routes, laydown areas, stockpile areas and temporary work areas prior to construction. - Demarcation shall be maintained throughout construction. - No disturbance outside the approved development footprint shall be permitted.	Owner / Contractor	ECO inspection / Method Statement	Once-off prior to construction and monitored throughout construction
Demarcation of No-Go Areas	Protect sensitive environmental features and indigenous vegetation outside the approved development footprint.	- All No-Go Areas shall be clearly demarcated prior to construction. - Natural vegetation, drainage features and environmentally sensitive areas outside the approved footprint shall be designated as No-Go Areas unless specifically authorised. - No personnel, vehicles or equipment shall enter No-Go Areas without approval.	Owner / Contractor	ECO inspection / Method Statement	Once-off prior to construction and monitored throughout construction
Site camp establishment and access roads	Prevent unnecessary impacts on freshwater resources, natural vegetation and surrounding agricultural land.	- Site camp, laydown areas, stockpile areas and access routes shall be located within approved areas shown on the site plan. - Unnecessary crossing of drainage features shall be prohibited.	Owner / Contractor	ECO inspection / Method Statement	Once-off and ongoing

		- Laydown areas, refuelling areas and material stockpiles shall be located at least 10 m from drainage features. - Cleared vegetation shall be stockpiled in approved areas at least 10 m from drainage features and shall not be disposed of within drainage lines. - Vegetation shall not be burned on site. Indigenous vegetation may be retained for brush packing and rehabilitation, where approved by the ECO. - Existing farm access roads shall be used wherever practicable.			
Fuel Storage	Prevent contamination of soil, groundwater and surface water resources.	- Fuel storage areas shall be located outside environmentally sensitive areas and at least 100 m from watercourses where practicable. - Fuel storage tanks shall be located within impermeable bunds capable of containing at least 110% of the largest container or 25% of the total stored volume, whichever is greater. - Drip trays shall be used during refuelling and maintenance. - Spill kits shall be available at all fuel storage and refuelling areas. - Hydrocarbon-contaminated material shall be removed and disposed of at an authorised facility.	Owner Contractor	/ ECO inspection / Method Statement	Weekly and after refuelling activities
Mandatory Site Equipment	Ensure that appropriate environmental protection equipment is available throughout construction.	- Firefighting equipment shall be available and maintained in good working order. - Spill kits and drip trays shall be available wherever fuels or hazardous substances are stored or handled. - Adequate chemical toilets shall be provided at least 50 m from drainage features and serviced regularly. - Adequate weatherproof waste bins shall be provided throughout the site. - Emergency contact numbers shall be displayed at the site office.	Owner Contractor	/ ECO inspection	Weekly

Waste Management	Prevent pollution and minimise waste generation.	• No littering, dumping or burning of waste shall be permitted. • Waste shall be separated where practicable for reuse and recycling. • General waste shall be removed regularly and disposed of at a licensed waste disposal facility. • Hazardous waste shall be disposed of at an authorised hazardous waste facility. • Waste manifests and disposal certificates shall be retained for auditing purposes. • Temporary waste storage areas shall be located outside drainage features and environmentally sensitive areas.	Owner / Contractor	ECO inspection / Waste disposal records	Weekly
Fire Management	Prevent veld fires and ensure rapid response to any fire incidents.	• Adequate firefighting equipment shall be available at all active work areas. • Construction personnel shall receive fire awareness training. • An Emergency Fire Response Plan shall be implemented. • Emergency contact numbers shall be displayed at the site office. • No open fires shall be permitted on site. • Hot works shall only be undertaken in approved areas with appropriate fire protection measures in place.	Owner / Contractor	ECO inspection	Weekly and throughout construction

Construction					
Impact	Management Outcomes	Management Actions	Responsible Person/Party	Implementation Monitoring Method	Monitoring Frequency
Topsoil Removal	Protect, conserve and reuse topsoil to facilitate successful rehabilitation.	- Topsoil shall be stripped to a depth of approximately 300 mm, or deeper where directed by the Engineer in consultation with the ECO. - Topsoil and subsoil shall be stockpiled separately. - Topsoil from areas containing indigenous vegetation shall be retained for rehabilitation. - The completed dam wall, particularly the crest and downstream embankment, shall be covered with retained topsoil as soon as practicable following construction. - Imported topsoil, where required, shall be free of alien invasive plant propagules and contaminants. - Topsoil stockpiles shall be protected against erosion, compaction and contamination.	Owner / Contractor	ECO Inspection	Weekly during earthworks
Stockpile Management	Prevent erosion, sedimentation and contamination associated with stockpiles.	- Separate stockpiles shall be provided for topsoil, subsoil, spoil material and construction materials. - Stockpile areas shall be clearly demarcated before construction. - Stockpiles shall be located outside drainage features and environmentally sensitive areas. - Stockpiles shall not exceed 2 m in height and shall be stabilised where required. - Stockpiles shall be protected against wind and water erosion.	Owner / Contractor	ECO Inspection	Weekly
Erosion and Sediment Management	Prevent erosion, sediment mobilisation	Erosion and sediment control measures shall be installed prior to earthworks and maintained throughout construction.	Owner / Contractor	ECO Inspection	Weekly and after significant rainfall

	and downstream impacts.	- Existing vegetation shall be retained wherever practicable. - Silt traps, berms, erosion barriers or similar measures shall be installed where required. - Stormwater runoff shall be managed to prevent erosion and sedimentation of drainage features. - Disturbed areas shall be stabilised as soon as practicable. - Erosion control measures shall be inspected after significant rainfall events and repaired where necessary.			
Concrete and Cement Works	Prevent contamination of soil and water resources from concrete works.	- Concrete batching and mixing shall occur only within approved areas on impermeable surfaces or suitable mixing trays. - Cement wash water shall be collected and contained. - Equipment shall be cleaned only within designated washout areas. - Concrete waste shall be removed from the site and disposed of at an authorised facility. - No cement-contaminated water shall enter drainage lines or watercourses. - Spill kits shall be available where concrete works are undertaken.	Owner / Contractor	ECO Inspection	Throughout the concrete works
Dust Control	Minimise dust generation and nuisance impacts.	- Dust suppression measures shall be implemented where required, including water spraying or other approved dust suppression methods. - Vehicle speeds shall be controlled on access roads. - Construction activities shall be modified during periods of strong winds where excessive dust generation may occur - Stockpiles shall be stabilised or covered where necessary. - Dust complaints shall be investigated and appropriate corrective measures implemented.	Owner / Contractor	ECO Inspection	Daily where required

General Construction Requirements	Ensure environmentally responsible construction of the dam and associated infrastructure.	• The dam wall shall be constructed in accordance with the approved engineering design and Preliminary Design Report. • Exposed dam wall slopes shall be stabilised during construction using appropriate erosion-control measures such as geotextiles, hessian or Geojute until vegetation has established. • The dam wall shall be rehabilitated using locally occurring indigenous vegetation following completion of construction. • Brush packing may be utilised where recommended by the Botanical Assessment to promote natural vegetation recovery. • Spillway and outlet works shall be constructed in accordance with the approved engineering design and protected against erosion. • The spillway shall discharge into the approved downstream drainage system as reflected in the engineering design. • The pump station and associated pipeline infrastructure shall be installed within the approved development footprint and rehabilitated following construction. • Rehabilitation shall be undertaken progressively throughout construction wherever practicable.	Owner / Contractor	ECO Inspection	Continuous throughout construction
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Rehabilitation

Impact	Management Outcomes	Management Actions	Responsible Person/Party	Monitoring Method	Monitoring Frequency
Rehabilitation of the Construction Site	Reinstate all areas disturbed during construction to a stable condition compatible with the surrounding environment and agricultural landscape, while preventing erosion, alien invasive plant establishment and long-term environmental degradation.	- All temporary construction infrastructure, site offices, laydown areas, stockpile areas, temporary fencing, labour facilities, equipment and surplus construction materials shall be removed upon completion of construction. - All disturbed areas not required for the operational phase shall be rehabilitated as soon as practicable following completion of construction. - Earthworks shall restore disturbed areas to stable landforms that blend with the surrounding landscape. - Topsoil shall be replaced in the correct sequence, with subsoil first and topsoil reinstated as the final layer using the original stockpiled material wherever practicable. - Compacted areas shall be ripped prior to topsoil replacement to promote infiltration and vegetation establishment. - Rehabilitation shall utilise locally occurring indigenous vegetation representative of the surrounding fynbos communities. - Brush packing and other approved rehabilitation techniques may be implemented where recommended by the Botanical Assessment to promote natural vegetation recovery and reduce erosion. - The removed stand of alien invasive Poplar (<i>Populus × canescens</i>) shall be subject to follow-up control to prevent regrowth. - Erosion control measures shall remain in place until vegetation has successfully established and disturbed areas have stabilised.	Owner / Contractor	ECO Inspection / Rehabilitation Monitoring	Progressive throughout construction, at completion of construction, and annually for a minimum of two years following rehabilitation

		• Annual inspections for alien invasive vegetation shall be undertaken for a minimum period of two years following rehabilitation, with follow-up clearing undertaken where required. • Rehabilitation success shall be monitored, and any unsuccessful areas shall be rehabilitated until the required rehabilitation objectives have been achieved. • Any approved borrow areas or temporary material extraction areas shall be reprofiled, stabilised and rehabilitated following completion of construction. • Final rehabilitation shall be completed to the satisfaction of the Environmental Control Officer (ECO).			
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Operation					
Impact	Management Outcomes	Management Actions	Responsible Person/Party	Monitoring Method	Monitoring Frequency
Water Management	Ensure sustainable operation of the dam while protecting downstream water resources and complying with the Water Use Licence.	- Operate the dam in accordance with Water Use Licence (WUL No. 01/E21D/AB/9699). - Supplementary abstraction from the Houdenbeks River shall only occur when river flows exceed the prescribed Environmental Water Requirement (EWR) thresholds. - Monitor abstraction volumes and water use in accordance with the Water Use Licence. - Inspect pipelines, valves, pump station and outlet structures regularly and repair leaks immediately. - Implement water conservation and efficient irrigation practices wherever practicable. - Operate the dam in accordance with the recommendations of the Hydrological and Environmental Water Requirements Study.	Owner	Operational records, visual inspections and WUL monitoring	Continuous
Erosion and Sediment Management	Prevent erosion, maintain dam safety and protect downstream freshwater resources.	- Inspect the dam wall, spillway, outlet works and downstream drainage channels regularly, particularly following significant rainfall events. - Repair erosion immediately using appropriate engineering and rehabilitation measures. - Maintain permanent vegetation cover on rehabilitated embankments. - Keep spillways and drainage channels free of debris and excessive sediment accumulation. - Install additional erosion protection where required following specialist advice. - Monitor long-term erosion, sedimentation and dam stability throughout the operational life of the dam.	Owner	Visual inspections and maintenance records	Monthly and after significant rainfall events

Waste and Pollution Management	Prevent pollution of soil, groundwater and surface water resources.	- No dumping, burning or burying of waste shall be permitted. - Waste shall be separated for reuse and recycling where practicable. - General waste shall be disposed of at a licensed waste disposal facility in accordance with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). - No waste, including organic waste, shall be disposed of within drainage lines or environmentally sensitive areas. - Spill kits shall be available where fuels or hazardous substances are stored or handled. - Any pollution incidents shall be investigated and corrective action implemented immediately.	Owner	Visual inspections	Weekly
Emergency Preparedness – Fire	Minimise the risk of veld fires and ensure an effective emergency response.	- Appropriate firefighting equipment shall be maintained in good working order. - An Emergency Fire Response Plan shall be implemented. - Emergency contact numbers shall be displayed at the site office. - Firefighting equipment shall be inspected regularly. - No unauthorised open fires shall be permitted on site.	Owner	Visual inspections	Monthly and during periods of high fire danger
Management of Natural Areas	Protect indigenous vegetation and maintain ecological integrity of the surrounding environment.	- Natural vegetation shall be managed with minimal disturbance. - Annual inspections for alien invasive vegetation shall be undertaken. - Follow-up control of alien invasive species, including Poplar (<i>Populus × canescens</i>), shall be undertaken where required. - Rehabilitation areas shall be monitored until vegetation has successfully established. - Alien invasive plant management shall be undertaken in accordance with the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of	Owner	Visual inspections and maintenance records	Annually

		2004) and the Alien and Invasive Species Regulations.			
Maintenance	Maintain the long-term integrity, safety and environmental performance of the dam and associated infrastructure.	- Inspect and maintain the dam wall, spillway, outlet works, pump station and pipeline infrastructure regularly. - Desilting activities shall be undertaken in accordance with the Freshwater Ecological Assessment recommendations. - Temporary silt traps shall be installed where required during maintenance activities. - Disturbed areas shall be rehabilitated immediately following maintenance works. - Maintenance activities shall comply with the Environmental Management Programme (EMPr), Water Use Licence and specialist recommendations.	Owner	Visual inspections and maintenance records	As required and after significant maintenance activities

APPENDIX 1: DECLARATION OF UNDERSTANDING

DECLARATION OF UNDERSTANDING

**THE PROPOSED ENLARGEMENT OF LANGRUG-BOONSTE NR1 DAM,
ALSO KNOWN AS HELPMEKAAR DAM, CONSTRUCTION OF A NEW
BUFFER DAM AND ASSOCIATED INFRASTRUCTURE, ON FARM
RIETRIVIER 202, PORTION 5, CERES, WESTERN CAPE**

I _____

Representing: _____

Declare that the conditions of the EMP were brought to my attention and that I have read and understood the contents of this Environmental Management Plan and that a copy of this EMP has been made available to me.

Site: _____

Date: _____

I also declare that I understand my responsibility in terms of enforcing and implementing the Environmental Specifications as set out in this Environmental Management Plan.

I also undertake to inform all persons under my supervision of these specifications and the contents of the Environmental Management Plan.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

APPENDIX 2: START-UP REPORT

To be included after the start-up meeting.

APPENDIX 3: ENVIRONMENTAL EDUCATION

ENVIRONMENTAL TRAINING FOR CONSTRUCTION.

The why, what and how...

BUT WHY...

... should we care about the environment?

The environment provides us with everything we need to survive – food, water, fuel, air, etc. Human activity uses resources and has an impact on those resources. Managing our resource use and ensuring that our impact is minimised will ensure that these resources are not depleted.

The Constitution says that all people in South Africa have the right to a healthy environment. If you damage the environment, you are taking away that basic right of others, as well as future generations – your children and grandchildren!

...environmental management if there is already conservation?

Historically, development and environmental conservation have been in conflict, because conservation was understood as the protection of resources, and development as the use, or exploitation of resources. The two competed for the same resources, but both are needed! Enter: *SUSTAINABLE DEVELOPMENT*.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable development thus aims to improve the quality of human life while living within our ecological means = the wise use of resources!

...environmental management of construction?

South Africa's effort to attain sustainable development is based on the concept of Integrated Environmental Management (IEM). The purpose of IEM is to resolve or lessen any negative environmental impacts and to enhance positive aspects of development.

IEM is designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning, implementation and management of all developments.

It is intended to guide, rather than impede, the development process by providing a method of gathering, analysing and utilising information about the environmental impacts of development. IEM and other principles of Environmental Management are set out in the National Environmental Management Act (No. 107 of 1998) & National Environmental Management Amendment Act (No. 62 of 2008)

BUT WHAT...

...exactly is the 'environment'? What if we're not working near rivers or fynbos or leopard toad habitat?

The environment is not only the 'conservation-worthy' such as rare plants and endangered animals. The environment is everything around you!

It is made up of living things (e.g. people, plants & animals) and non-living things (e.g. soil, water, buildings & cars). People and man-made things are also important parts of the environment.

Protection of the environment means that all living and non-living things are protected. During construction, Environmental Management Programmes (EMPs) are implemented not only to protect fynbos or leopard toads but also to protect people (both on site and off), property (houses, cars, etc.), as well as natural resources such as water, air and soil.

...do Environmental Management Programmes (EMPs) do? What does this mean for my contract?

EMPs are tools to facilitate environmental management during the construction phase of development projects and thereby avoid *unnecessary* impacts to the environment.

In the past, the functionality and efficiency of EMPs were hampered by resistance from contractors and engineers, the difficulties of costing for compliance and the lack of legal enforceability.

Now Environmental Management Programmes (EMPs) are stipulated in the Environmental Authorisations (ROD) as a condition of the approval to go ahead with the development, in other words, it is legally binding.

When you sign a contract do work on a project with an EMP, you are legally bound to comply with that EMP!

Methods of implementing EMPs are becoming more and more stringent and issues of enforceability are being addressed. Those individuals and companies that are familiar with compliance with EMPs will be at a competitive advantage!

...do EMPs consist of?

EMPs usually contain an environmental policy statement, organisational structure detailing the responsibilities and authorities involved in the project, procedures for communication and record-keeping and environmental specifications.

EMPs are adapted to the scale and sensitivity of the construction project. They can be thick documents detailing specifications for every eventuality specifically adapted to the project, or they can be short and brief documents setting out standard environmental procedures and controls. Sometimes EMPs include extensive penalty and incentive schemes.

A WORD ON METHOD STATEMENTS:

A method statement can be requested or proposed when an activity is either not included in the EMP at all, if the EMP specifications for an activity are not deemed adequate, if an activity is required that is not allowed by the EMP, etc. In other words, when the EMP does not give enough information to manage the environmental impact of a specific activity.

A method statement is defined as a written submission by the Contractor setting out the plant, materials, labour and method proposed to carry out an activity. Method statements must provide enough detail that the environmental impact of the activity can be assessed. Method statements must therefore be submitted well in advance of the activity (usually at least 5 days but sometimes more).

Method statements are therefore an extension of the EMP, are also legally binding and are intended to ensure that the environmental implications of an activity outside of the EMP can be addressed.

Method statements usually require the approval by the engineer, the ECO/ESO/DEO, etc. before the activity can take place. If such an activity takes place without approval and result in environmental damage, the contractor is responsible for the cost of rehabilitation/clean-up/etc.

...is an ECO, ESO, DEO, etc.?

EMPs usually require the appointment of an ECO, ESO, DEO, etc. to oversee the implementation of and compliance with the EMP on behalf of the engineer or the contractor(s). Ultimate responsibility for compliance with the EMP lies with the contractor(s) and the engineer.

ESO = Environmental Site Officer – usually on site permanently or often. Can be independent consultant or from contractor/engineer.

ECO = Environmental Control Officer – usually visits site on a regular basis and audits compliance with the EMP. Usually independent consultant.

DEO = Designated Environmental Officer – usually on site permanently, usually member of contractor or engineer site staff.

Organisational structures and responsibilities differ from project to project and depend on environmental sensitivity of the project, scale of the project, etc. Increasingly nowadays, each party is required to appoint their own person responsible for environmental management on site, e.g. the engineer would have an ESO/ECO and the main contractor(s) would have an ESO/DEO etc.

It is therefore important to familiarise yourself with that part of the EMP that deals with organisation and responsibilities for each contract that you are involved in.

BUT HOW...

...do EMPs promote sustainable development?

They don't!

It is the people on site that protect the environment. The EMP, like any other plan or policy, is not worth anything if there isn't a commitment from those working on the project to compliance with the EMP.

...can I ensure my work comply with the EMP?

Environmental specifications in different EMPs can vary from vague to very detailed.

- Firstly, it is obviously important to know what those specifications are, vague or not, so **READ THE DOCUMENT!** Ignorance does not absolve you from your responsibility. A copy of the EMP must be kept at the site office at all times.
- It also helps to understand **WHY** those specifications are there – some things are obvious but others may not be. Some EMPs may have specifications that are not relevant. Don't be afraid to question the EMP; it can only increase its efficiency!
- Know where the sensitive areas on site are – watercourses, wetland areas, residential areas, etc. – and be extra vigilant when working in these areas.

Mostly environmental management of construction activities and compliance with EMPs require only common sense and with good housekeeping the battle is half won!

The enclosed environmental hand-out sets out the standard environmental specifications

DO'S AND DON'TS (1)

**Workers & equipment must stay inside the site boundaries at all times.
Nobody may enter areas marked as No-go areas.**

Why? Construction activities, equipment and people cause damage and disturbance to the area surrounding the site. As small an area as possible will be affected if all workers and equipment stay within the site boundaries. This is especially important if there are people who live around the site or natural areas around the site which should not be disturbed.



**Do not swim in or drink from streams.
Do not throw oil, petrol, diesel, concrete or rubbish in streams.
Do not work in the stream without direct instruction.
Do not damage the banks or plants of streams.**

Why? River water may be polluted which could make you sick.
Oil, petrol, diesel, concrete or rubbish will kill plants and animals living in the water. They may also make people who may drink the water downstream sick. Rubbish in the stream also makes it look ugly.
People and machinery working in the stream will damage it and kill plants and animals living in the stream. It may also cause erosion, which is expensive to repair.
The plants on the edge of the stream bind the soil together and prevent soil from getting washed away. Soil washed into a stream may affect people using the water downstream (e.g. for irrigation).



**Protect animals on the site.
Ask your supervisor to remove animals found on site.**

Why? Animals are an important part of the environment. All animals have a purpose, even snakes which catch mice and rats. Other important animals are owls, chameleons and frogs.



**Do not damage or cut down any trees or plants without permission.
Do not pick flowers.**

Why? Some plants are rare and may take a long time to grow back, if at all. Plants in the "no go" areas should not be damaged.
Some plants will die if their flowers are picked. Rare plants may be lost.



**Put cigarette butts in a rubbish bin.
Do not smoke near gas, paints or petrol.
Do not light any fires without permission.
Know the positions of firefighting equipment.
Report all fires.
Do not burn rubbish/ vegetation without permission.**

Why? Leaving a burning cigarette butt on the ground may lead to runaway fires which are dangerous to construction workers, people living around the site, equipment, houses, plants and animals.
Smoking near flammable material is dangerous and may cause an explosion.
Lighting a fire without permission may cause a runaway fire (see above).
Reacting quickly to fires that break out will prevent them from spreading and causing damage.

DO'S AND DON'TS (2)



Work with petrol, oil & diesel only in designated areas.
Report any petrol, oil & diesel leaks or spills.
Use a drip tray under vehicles & machinery.
Empty drip trays after rain & throw away were instructed.

Why? Designated areas should have measures to protect against petrol, oil & diesel spills. Oil, petrol and diesel can drip onto the soil and soak into it. Plants will not grow and animals will not live in dirty soil. It also looks ugly to people living around the area.

Drip trays will prevent oil, petrol or diesel from soaking into the soil and killing plants and animals.

If drip trays are not emptied they may overflow and pollute the surrounding soil. If oil, petrol or diesel is put into a stream, plants and animals living in the stream will be killed. They may also make people who may drink the water downstream sick. Ask your supervisor where drip tray water may be disposed of on site.



Try to avoid producing dust – wet dry ground and stockpiles.

Why? Dust can be irritating to people and can reduce production on site. It can cause problems such as eye irritations and coughs. It also reduces visibility on and around the site, which can be dangerous to drivers and pedestrians, and can cause damage to the surrounding environment.

Soil should not be made too wet because that will cause safety problems and soil may be washed away.



Do not make loud noises around the site, especially near schools and homes.
Report or repair noisy vehicles.

Why? Loud noises are irritating to workers and people living around the site. Loud noise can also be harmful to people (especially children) and affect their hearing.

By keeping vehicles in good condition, loud noise can be prevented.



Use the toilets provided.
Report full or leaking toilets.

Why? Sewage attracts flies and other irritating pests. If the site is near a river or stream, sewage makes the water smell and people who swim in it or use it to wash their clothes will get sick. It also causes plants to grow too much which blocks the river, which may cause flooding of houses and property.

Regular emptying of toilets is hygienic and will also prevent overflows.



Make sure that you eat where there is a rubbish bin nearby.
Never eat near a river or stream.
Put packaging & leftover food into rubbish bins.

Why? Eating areas generate a lot of rubbish and litter (e.g. bottles and packets) which will pollute the site and surrounding areas. Therefore, eating must be done near bins which are placed in the eating.

Rubbish in a stream looks ugly and can be harmful to people's health. It may also kill the plants and animals living in the stream. Rubbish and food left lying around will attract pests (such as rats) which are

dangerous to people and cause a health hazard. Also, rubbish left lying around is ugly and unpleasant to look at.



Do not litter—put all rubbish (especially cement bags) into the bins provided.
Ask your supervisor for a bin if there is none. Bins must be provided.
Report full bins to your supervisor.
The responsible person should empty bins regularly.

Why? Litter is ugly. It is also dangerous and unhealthy to adults, children and animals walking around the area.
Not putting the lid back on the bin will cause rubbish to be blown away.
Regularly emptying bins will prevent litter and rubbish flying around the site.



Always keep to the speed limit.
Drivers - check & report leaks.
Ensure loads are secure & do not spill.

Why? Speeding is dangerous to people who live in the area, especially children. Speed kills!
Faulty vehicles are dangerous to the driver, pedestrians and other motorists. Leaks can also pollute the ground and water and smoke from vehicles can cause health problems.
This is a potential danger to other motorists. Also, do not overload vehicles.



Know all the emergency phone numbers.

Why? Prompt reaction to an accident, fire or spill will reduce the risk of serious damage to the environment and to workers.



If rules are broken:
- Spot fines
- Removal from site.
- Construction may be stopped.

Why? Failure to adhere to the EMP may result in spot fines being issued to the company. It is then the Site Agent's responsibility to collect these fines from guilty individuals and he may even deduct fines off your wages.

The fines are meant to act as an incentive for workers to take the EMP seriously.

A person may be removed from site if they continually disregard the specifications in the EMP.

If the EMP is not adhered to, the local Environmental Authority may stop construction.



Report any breaks, floods, fires, leaks and injuries to your supervisor.
Ask questions!

Thank you for your attention.

APPENDIX 4: BASIC RULES OF CONDUCT

BASIC RULES OF CONDUCT

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: **ALL new site personnel must** attend an environmental awareness presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ESO.

DO:

- Use the toilet facilities provided – report dirty or full facilities
- Clear your work areas of litter and building rubbish at the end of each day – use the waste bins provided and ensure that litter will not blow away.
- Report all fuel or oil spills immediately & stop the spill from continuing.
- Dispose of cigarettes and matches carefully. (Littering is an offence.)
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Prevent contamination or pollution of streams and water channels.
- Ensure a working fire extinguisher is immediately at hand if any “hot work” is undertaken, e.g. welding, grinding, gas cutting, etc.
- Report any injury to an animal.
- Drive on designated routes only.
- Prevent excessive dust and noise.

Do not:

- Remove or damage vegetation without direct instruction.
- Make any fires.
- Injure, trap, feed or harm any animals – this includes birds, frogs, snakes, lizards, etc.
- Enter any fenced-off or marked area.
- Allow cement or cement bags to blow around.
- Speed or drive recklessly
- Allow waste, litter, oils or foreign materials into the stream
- Swim in the dam.
- Litter or leave food lying around

Notes:

If any animals such as tortoises, chameleons or snakes be encountered then do not harm them. The ECO or Site Supervisor must be contacted to remove these safely. The harming of any animal will result in disciplinary action.

Construction and heavy machine operators must be particularly sensitive to staying within access routes and prevention of unnecessary damage. Dust and noise is also of particular concern. Ensure that vehicles and machinery do not leak fuel or oils. Refuelling or maintenance must be done within the maintenance camp area only.

Alien plant clearing and control work teams must be closely supervised.

BASIESE GEDRAGSKODES

Die volgende lys verteenwoordig die moets en moenies vir omgewingsbewustheid wat alle deelnemers aan hierdie projek in ag moet neem tydens die uitvoer van hul take. Hierdie lys is nie volledig nie en dien slegs as 'n vinnige verwysing.

Nota: **alle nuwe terreinpersoneel moet** 'n aanbieding ten opsigte van omgewingsbewustheid bywoon. Indien u nog nie so 'n aanbieding bygewoon het nie, lig asseblief u voorman of bestuurder in of kontak die omgewings terreinbeampte.

Moets:

- Gebruik die beskikbare toilet-geriewe – rapporteer vuil of vol geriewe.
- Maak u werkplek skoon van rommel of bourommel aan die einde van elke dag – gebruik beskikbare vullisdromme en verseker dat rommel nie rondwaai nie.
- Rapporteer alle brandstof- en olie stortings onmiddellik – stop verdere storting.
- Wees versigtig met die wegdoen van sigarette en vuurhoutjies. (rommelstrooi is 'n oortreding.)
- Beperk werkaktiwiteite en die stoor van toerusting tot die onmiddellike werkarea.
- Gebruik veiligheidstoerusting en voldoen aan alle veiligheids-maatreëls.
- Voorkom besoedeling van strome en waterbane
- Verseker dat 'n brandblusser in werkende toestand byderhand is wanneer “warm” werk verrig word bv. Sweis, wegslyp, gasny, ens.
- Rapporteer beseerde diere.
- Ry slegs op aangewese roetes.
- Voorkom oormatige stof en geraas.

Moenie:

- Plantegroei verwyder of beskadig sonder direkte instruksie nie.
- Enige vure maak nie.
- Enige diere dood, beseer, vang of voer nie, insluitende voëls, paddas, slange, akkedisse, ens.
- Enige omheinde of afgesperde areas binnetree nie.
- Sement of sementsakke laat rondwaai nie.
- Vinnig of roekeloos bestuur nie.
- Enige rommel, afval, olie of enige vreemde materiaal in strome laat beland nie.
- In die dam swem nie.
- Rommelstrooi of kos laat rondlê nie.

Notas:

Indien enige diere soos skilpaaie, verkleurmannetjies of slange teëgekom word, moet hulle nie beseer of dood nie. Kontak die otb of ri om hulle veilig te verwyder. Die besering van diere sal lei tot dissiplinêre optrede.

Operateurs van konstruksie- en swaar masjiene moet veral versigtig wees om binne toegangsroetes te bly en om enige onnodige skade te voorkom. Verseker dat voertuie en masjiene nie olie of brandstof lek nie. Brandstofaanvulling en voertuigonderhoud mag slegs binne die onderhoudsarea gedoen word.

Streng toesig moet gehou word oor indringerplantbeheerspanne.

EZIPPHAMBILI EKUNYANZELEKILEYO UKUBA ZENZIWE

Zonke ezi zinto zilandelayo zizinto ekufuneka zenziwe nekufuneka zingenziwanga.

Wonke umntu ofikayo kufuneka afundiswe ngemigaqo kupala. Needa yazisa iforman yakho ikuba awukhange uye kufundiswa.

Izinto emazenziwe

- Sebenzisa izindlu zangasese, yazisa xa kukho umonakalo.
- Zama ukucoca apho ubusebenza khona.
- Sebenzisa imigqomo yenkukuma ungayeki iphaphtieke.
- Yazisa xa ubona ioil echithskalayo okanye ipetrol.
- Cima lozoli cigarette xa ugqibibile ukutshaya
- Zonke izixhobo usebenza zibuyisele apho zihlaka khona xa ucgibile apho zihlala khona xa ugqibile ukuzisebenzisa.
- Zisebenzise izikhuselixa uzinkiwe.
- Sukugalela izinto emlanjeni.
- Masibekho isicima mlilo xausebenza ngomlilo.
- Yazisa msinyane xa ubone isilwanyana ezonzakeleyo.
- Xauqhuba isithuthi hamba endleleni qha ungafathulinje.
- Naphina zamaungenzi thuli okanye ingxolo xa usebenza.

Emazingenziwa

- Sukususa nesiphina isityalo ungakhange uxelelwe
- Sukwenza mlilo nokuba sekubanda
- Amagqara ukubulala izilwanyana nokuzifida akuvumelekanga
- Sukungena xa kuvaliwe ngaphandle kwe mvume
- Ingxowa zesamente mazincedwe zingahlwa nje
- Sukuqhuba ngesantya esiphakamileyo
- Sukugalele nayiphi into phaya emlanjeni
- Sukuqhuba edameni q oqosha yonk inkukuma

APPENDIX 5: PENALTIES FOR NON-COMPLIANCE

PENALTIES FOR NON-COMPLIANCE

The contractors / sub-contractors must contact the ECO at any stage if unsure about any matter, or if a pollution incident occurs, or if vegetation or animals are damaged.

ECO = Environmental Control Officer ESO= Environmental Site Officer

PHASE	Penalty for Non-compliance	
	Bottom range	Top Range*
PRE-CONSTRUCTION PHASE		
The construction area is to be marked off before construction starts.		5000
The demarcated area must be maintained throughout the construction phase	500	1000
The site area for the stockpiling of building material must be demarcated	500	5000
The site area for storing waste material must be demarcated	500	5000
Fencing off the construction site with mesh fencing of 1.8m, where necessary or other suitable material as agreed on by ECO	500	1000
Sitting of access road/s to be approved by ECO & demarcated with stakes before any construction starts (if applicable)		5000
Temporary route used for construction must be determined on site with ECO (if applicable)	1000	5000
Telecommunications & AC power routes must be determined with the ECO (if applicable)	1000	5000
Sensitive features that may be harmed must be clearly marked or demarcated.	500	2000
Vegetation that may not be removed must be clearly marked or demarcated.	500	5000
The contractor must make the Construction team and all subcontractors aware of all environmental aspects that could lead to the imposition of penalties	100	5000
Contractor to sign the Declaration of Understanding (DOU) before construction starts		5000
Contractor to ensure that all subcontractors are informed and sign the DOU	1000	5000
Method statements must be provided on request by the ECO. No work may commence until the Method Statement is accepted by the ECO and Engineer	1000	5000
CONSTRUCTION PHASE		
Information		
A copy of the EMP & Record of Decision with all the conditions of approval, and the relevant Method Statements must be at site at all times.	200	5000
Construction crew behaviour		

Construction crews may not overnight on site.	200	5000
No amplified music allowed on site	100	200
The construction crew must stay within the demarcated construction area. (Applicable in sensitive sites)	50	500
Eating meals is only allowed in a demarcated area	50	500
No pets permitted on site		100
Driving, Parking & Storing of machinery and vehicles are only allowed inside demarcated areas and existing roads	1000	5000
Machinery may only be used on the road and may not disturb the vegetation on the sides of the road except if cleared by ECO. Machinery used must be carefully considered to limit environmental damage	500	5000
No vegetation other than that agreed on may be damaged - i.e. no access to areas outside the construction area.	500	2000
No individual may cause unnecessary damage to flora and fauna on, around or near the site	20	2000
No littering allowed (incl. cigarette butts)	50	500
Excavations		
No topsoil may be removed or altered outside the demarcated area and/or which was not specified.		2000
Commercial sources of sand, rock and gravel to be cleared with ECO	200	5000
All surplus material to be taken off-site and be disposed of at the approved site	500	5000
Toilets		
Sufficient ablution facilities must be provided		3000
Toilets to be secured to prevent them from falling or blowing over.	100	1000
They must be serviced regularly (according to the manufacturer's instructions) and kept clean.	100	1000
Everybody on site must make use of the ablution facilities	50	1000
Fire Prevention		
All mandatory firefighting equipment (as specified at start-up) must be on site at all times	500	4000
Firefighting equipment is to be in good working order and serviced.	500	2000
No fires, including cooking fires, allowed on site	1000	5000
Cement		

Concrete may only be mixed within the boundaries of the demarcated area and/or where was agreed on by the ECO.	500	5000
All excess cement & concrete mixes to be contained on construction site prior to disposal off site	200	5000
Any cement / concrete spillage to be cleaned up immediately.	500	5000
Ready-mix delivery trucks must not carry out the wash down of their trucks on or around the site unless arranged with ECO.	1000	3000
Dust pollution control		
Ensure that loose building material is covered to prevent dust pollution	100	1000
Water run-off		
Contamination of water bodies, rivers, dams or wetlands must be prevented at all cost	500	5000
Rainwater from construction & building site/s must be channelled, contained & allowed to dry out, so as not to transport any pollutants into the surrounding area. Temporary trenches, straw stabilising, brush cutting can be used	500	5000
Waste control		
Sufficient refuse bins must be placed on site	500	2000
Refuse bins must be cleaned on a regular basis	100	1000
General litter / building refuse must be cleaned up on a regular basis from the site	500	3000
Cement-contaminated water; paint; oil; cement slurries etc. must be stored in watertight containers or as agreed with ECO	500	5000
Store all refuse & waste material in wind & animal proof containers	100	1000
Waste must be disposed of at an official waste deposit site on a regular basis.	500	5000
The absence of or inadequate drip trays or bunding facilities	500	5000
Failure to address oil/fuel leaks from on-site machinery	200	5000
Herbicides		
No herbicides or pesticides whatsoever may be used.	200	2000
Construction road		
Road must be upgraded to prevent degradation and erosion of the road and surrounds.	500	5000
Power and Telecommunications supply		
Demarcate power supply route	500	5000

No vehicles to drive through vegetation unless authorised by ECO	500	5000
Storage of equipment may only take place at an area demarcated by the ECO.	500	5000
Working must be done in phases to prevent trampling of vegetation	N/A	
Use of generators and fuel powered equipment		
A watertight cover must be place under the power generator equipment to prevent accidental spillage of fuel & oil seeping into the soil.	500	5000
Drip tray must be able to take 120% of fuel on site	500	5000
All waste material generated from the use of this equipment must be contained and removed from the site	500	5000
Mobile fuel powered equipment must be well maintained and must not have any fuel or oil leaks.	200	5000
Soil Stabilisation		
Ensure that soil material for filling and stabilisation comes from a source that does not contain seeds alien to the area. The source must be cleared with the ECO.	100	2000
Rehabilitation		
Remove rocks and stones and stock pile in area recommended by ECO	500	5000
Remove all plants that can be used for rehabilitation and store on- or off-site in appropriate manner as agreed with ECO	200	5000
Removal of all old concrete and alien materials from site	500	5000
Site must be cleared of all waste and building material	500	5000

*(Large scale / repeated offence)

APPENDIX 6: INFO ON METHOD STATEMENTS

INFORMATION ON METHOD STATEMENT

Method Statements are to be completed by the person undertaking the work (i.e. the Contractor). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed.

The Method Statement can only be implemented once approved by the ECO

The Contractor (and, where relevant, any sub-contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The ECO will use the Method Statement to audit compliance by the Contractor with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the ECO denoting that the changed methodology or works are necessary for the successful completion of the works and are environmentally acceptable. The Contractor will also be required to sign the amended Method Statement, thereby committing him/herself to the amended Method Statement.

This Method Statement **MUST** contain sufficient information and detail to enable the ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works.

THE TIME TAKEN TO PROVIDE A THOROUGH, DETAILED METHOD STATEMENT IS TIME WELL SPENT. INSUFFICIENT DETAIL WILL RESULT IN DELAYS TO THE WORKS WHILE THE METHOD STATEMENT IS REWRITTEN TO THE ER'S AND ESO'S SATISFACTION.

The page overleaf provides a *pro forma* method statement sheet, which needs to be completed for each activity requiring a method statement in terms of the EMP.

APPENDIX 7: EXAMPLE OF METHOD STATEMENT

PRO-FORMA METHOD STATEMENT

CONTRACT:..... **DATE:**.....

PROPOSED ACTIVITY (give title of method statement and reference number):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:

End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL CONSULTANT AND/OR ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(Signed) (Print name)

(Signed) (Print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ESO will audit my compliance with the contents of this Method Statement

(Signed) (Print name)

Dated: _____

3) THE APPLICANT

The works described in this Method Statement are approved.

(Signed) (Print name) (Designation)

Dated: _____

APPENDIX 8: CONTRACTOR ENVIRONMENTAL CHECKLIST

CONTRACTOR/S REPRESENTATIVE: ENVIRONMENTAL WEEKLY CHECKLIST

SITE: _____

PHASE OF WORK AND % OF COMPLETION: _____

ENVIRONMENTAL ASPECT	YES/ NO (✓ or X)	COMMENTS
How many workers are on site		
All new personnel on site are aware of the contents of the EMP and have been through the environmental awareness course.		
Contractor's camp is neat and tidy and the labourers' facilities are of an acceptable standard.		
Sufficient and appropriate firefighting equipment is visible and readily available.		
Waste control and removal system is being maintained.		
Refuse bins in place and maintained		
Toilets are in place and clean		
Demarcation and other fences are being maintained.		
What machinery are on site		
Drip trays are being utilised where there is a risk of incidental spillage		
Bunds/ drip trays are being emptied on a regular basis (especially after rain).		
No leakages (oil & fuel) are visible from construction vehicles		
No go areas, remaining natural features and trees have not been damaged.		
Dust control measures (if necessary) are in place and are effectively controlling dust.		
Noise Control measures (if necessary) is in place and is working effectively.		
Erosion control measures (if necessary) are in place and are effective in controlling erosion. (Access road, site areas etc.)		
Stockpiles are located within the boundary of the site, do not exceed 2 m in height and are protected from erosion.		

Completed by:..... Sign:..... Date:.....

To be submitted at the end of each week to the Environmental Site Officer (ESO)

Received by:

Environmental Site Officer: :..... Sign:

Date:.....

APPENDIX 9: ECO/ESO REPORT/CHECKLIST

ECO CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT

Project Name: _____

Report no _____

Main Contractor: _____

Date _____

ECO: _____

EnviroAfrica Ref. no. _____

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING: 1 = EXTREMELY POOR 2 = POOR 3 = AVERAGE 4 = GOOD 5 = EXCELLENT		
1. DEMARCATION Boundaries of “no go” areas, construction sites, offices, temporary storage areas, as well as labourers’ facilities must be demarcated (EMP and ECO requirements) and maintained for the length of the construction period.		
2. NO-GO AREAS Identified “No-Go Areas”, must be demarcated for protection from construction damage (including secondary impact). • All areas outside of the demarcated construction site(s) and access road(s) to be regarded as NO-GO areas, including remaining natural veld identified trees. • Special attention to identified areas with significant vegetation.		
3. SEARCH & RESCUE All flora identified for search & rescue must be removed before any construction takes place and reused in a pre-approved way.		
4. VEGETATION & TOPSOIL REMOVAL Before any construction or earthworks, topsoil must be stripped (>150mm) and stockpiled for rehabilitation/ landscaping. Stockpiles: • must be protected (erosion) and stored separately. • may not be moved further than 50m or mixed with any other soil. • must be convex and should not exceed 2m in height. In addition: • Cleared areas must be stabilised. • Burning or burying of cleared vegetation is prohibited (may be used for mulch or slope stabilisation on site).		
5. CONSTRUCTION CAMP & SITE OFFICES Must be demarcated, organised and free of day-to-day litter (good housekeeping standards).		

ENVIRONMENTAL ASPECT		RATING	FINDINGS & RECOMMENDATIONS			
RATING:		1 = EXTREMELY POOR	2 = POOR	3 = AVERAGE	4 = GOOD	5 = EXCELLENT
6.	LABOURER'S FACILITIES Facilities must be of acceptable standards suitably demarcated, well maintained, neat and tidy and with adequate ablution facilities.					
7.	ENTRANCE AND HAUL ROADS Only approved entrance and haul roads may be used. No new roads or parking areas may be developed without written approval from the ECO.					
8.	MANDATORY SITE EQUIPMENT Mandatory site equipment must be in place, well maintained and in accordance with EMP and ECO requirements. • Sufficient refuse bins, well placed and cleaned regularly. • Sufficient fire extinguishers, readily available, maintained and functional. • Drip trays must be used at all fuel and oil storage and refuelling sites. • Toilets and sanitation facilities must be kept clean neat and hygienic.					
9.	FUEL STORAGE Fuel storage areas must be situated within the demarcated construction camp site (or an area approved by the ECO). • Larger containers must be bunded (containment of accidental spillages). • Drip trays must be used during refuelling or under stationary refuelling vehicles. • Fuel and oil storage and refuelling sites must be maintained.					
10.	STOCKPILING & TEMPORARY STORAGE May only be placed on pre-approved sites, demarcated, stabilised or organised and neat.					
11.	WASTE CONTROL The contractor is expected to control all construction-related waste material and general litter on actual construction sites and its immediate surroundings. • Waste management must be in accordance with the EMP, of acceptable standards, with regular removal of general waste, hazardous waste, as well as construction waste (e.g. concrete waste and spoil).					
12.	CEMENT MIXING & BATCHING AREAS Mixing areas must be approved by the ECO, suitably demarcated and may not result in pollution. • Polluted cement water may only be released into sedimentation ponds.					

ENVIRONMENTAL ASPECT		RATING	FINDINGS & RECOMMENDATIONS		
RATING:	1 = EXTREMELY POOR 2 = POOR	3 = AVERAGE	4 = GOOD	5 = EXCELLENT	
	Sedimentation ponds must be maintained and cleaned regularly (and reinstated after use).				
13.	CONSTRUCTION VEHICLE MAINTENANCE Construction vehicles must be in good working order and well-maintained to prevent oil and fuel leakages and to reduce noise levels.				
14.	HEAVY EARTHMOVING EQUIPMENT Construction vehicles and equipment may only operate <u>within</u> the demarcated site boundaries (and approved access roads), especially heavy earthmoving vehicles.				
15.	DUST CONTROL Adequate control measures must be in place to prevent dust nuisance or pollution (entrance-, haul roads and exposed surfaces). Areas of concern must be watered regularly during construction AND periods of strong winds, BUT must take water saving into account.				
16.	EROSION CONTROL Erosion resulting from works must be controlled. - Temporary and permanent drainage areas must be maintained. - Erosion damage and damage in drainage courses must be reinstated.				
17.	NOISE CONTROL Effective noise control measures must be in place and acceptable working hours must be kept (deviations must be approved by the ECO).				
18.	ARCHAEOLOGICAL & HERITAGE FINDS Should any archaeological or heritage remains be exposed during excavations or any activity on site, these must be immediately reported to the site agent/engineer, the ECO HWC or SAHRA.				
19.	METHOD STATEMENTS Method statements must be submitted and approved before commencement of the works. Possibly Required: - Demarcation & No-Go Areas (Map) - Clearing of vegetation & topsoil conservation - Stockpiling & temporary storage - Construction camp & site offices - Labourer's facilities				

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING: 1 = EXTREMELY POOR 2 = POOR	3 = AVERAGE	4 = GOOD 5 = EXCELLENT
6. Mandatory site equipment 7. Fuel storage 8. Entrance & haul roads 9. Waste management 10. Cement/Concrete mixing 11. Dust control 12. Erosion control 13. Noise control 14. Rehabilitation Additional Method Statements		
20. ENVIRONMENTAL CONDUCT Environmental conduct of construction personnel must be acceptable (e.g. no burning or burying of refuse; no littering and no cement bags or other construction waste material lying around).		
21. ENVIRONMENTAL CHECKLIST The contractor must ensure that the weekly environmental checklist is completed at the end of each week, and it must be available at the site offices.		
22. REHABILITATION On completion of the project or phase, all areas impacted by the construction activities must be reinstated and/or rehabilitated to the satisfaction of the ECO, with emphasis on the following: • Site offices must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. • Labourer's facilities must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. • All construction site areas must be rehabilitated or reinstated to the satisfaction of the ECO. • All temporary fencing and demarcation must be removed and the areas reinstated to the satisfaction of the ECO. • Temporary storage areas must be rehabilitated or reinstated to the satisfaction of the ECO. • All remaining construction material must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. • Any additional disturbed areas must be rehabilitated or reinstated to the satisfaction of the ECO.		

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING: 1 = EXTREMELY POOR 2 = POOR 3 = AVERAGE 4 = GOOD 5 = EXCELLENT		
23. SPOT FINES & PENALTIES Spot fines and penalties must be recorded and documented by the ECO (in accordance with the EMP).		
24. FIXED POINT PHOTOS Photographs must be taken by the ECO, Site Engineer and or Site Manager, prior to, during and immediately after construction as visual reference. These photographs must be stored with other records relating to the EMP.		

ECO COMMENTS

[illegible]

End of report

ECO Signature

APPENDIX 10: Environmental incident report format
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ENVIRONMENTAL INCIDENT REPORT

No. _____

PROJECT NAME			
PROJECT LOCATION			
SITE AGENT			
DATE OF INCIDENT		TIME	
BRIEF DESCRIPTION AND CAUSE OF INCIDENT:			
WHAT IMMEDIATE ACTIONS / CONTROL MEASURES WERE TAKEN:			
WHAT CORRECTIVE ACTIONS WERE TAKEN TO ENSURE NO REPEATS OF THE INCIDENT:			
ECO/ESO RESPONSE TO INCIDENT AND RECOMMENDATIONS:			
IS THIS INCIDENT A:	☐ FIRST OFFENCE	☐ SECOND OFFENCE	☐ THIRD OFFENCE
SIGNATURE OF SITE AGENT:	_____	DATE	_____
SIGNATURE OF ECO/ESO	_____	DATE	_____
REMEMBER TO BE FACTUAL WHEN DESCRIBING THE INCIDENT			

APPENDIX 11: Environmental complaints register

COMPLAINTS REGISTER FORM

(To be completed by Site Agent/Supervisor)

[illegible]

APPENDIX 12: Method Statement Register

METHOD STATEMENT REGISTER		SITE AGENT:			PROJECT NAME:		
		CONTRACTOR:			PROJECT LOCATION:		
No.	METHOD STATEMENT ACTIVITY REFERENCE	DATE CREATED	DATE RECEIVED	CREATED BY	ACCEPTED / REJECTED	DATE APPROVED	APPROVED BY
1	Demarcation						
2	Clearing of vegetation and topsoil removal						
3	Stockpiling						
4	Temporary storage facilities						
5	Construction camp and site offices						
6	Fuel storage						
7	Labourer's facilities						
8	Entrance and haul roads						
9	Mandatory site equipment						
10	Waste management/control						
11	Cement mixing and batching areas						
12	Construction vehicle maintenance						
13	Dust control						
14	Erosion control						
15	Noise control						
16	Archaeological and heritage finds						
17	Rehabilitation						
18	Additional MS (Waste Licence requirements)						

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APPENDIX 13: Maps & Drawings

APPENDIX 14: Specialist studies

APPENDIX 15: Proof of compliance