

Need and Desirability

THE PROPOSED ENLARGEMENT OF LANGRUG-BOONSTE NR. 1 DAM, ALSO KNOWN AS HELPMEKAAR DAM, CONSTRUCTION OF A NEW BUFFER DAM AND ASSOCIATED INFRASTRUCTURE, ON PORTION 5 OF FARM RIETRIVIER NO. 202, CERES, WESTERN CAPE

1. Introduction

This Appendix has been prepared in accordance with the Western Cape Department of Environmental Affairs and Development Planning (WCDEA&DP) Guideline on Need and Desirability (March 2013) and the Department of Environmental Affairs Integrated Environmental Management Guideline Series (2017). It provides a structured assessment of the need and desirability of the proposed enlargement of the existing Langrug-Boonste Nr. 1 Dam (Helpmekaar Dam), the construction of a supplementary buffer dam, and the associated connecting pipeline on Portion 5 of Farm Rietrivier No. 202, near Ceres, within the Witzenberg Local Municipality, Western Cape.

The proposed development is intended to improve on-farm water storage capacity and operational flexibility by enlarging the existing Helpmekaar Dam, constructing a supplementary 27 000 m³ buffer dam, and installing an approximately 1.7 km long underground connecting pipeline with an indicative diameter of approximately 300–360 mm. The development will support the conversion of approximately 45 ha of annual crops into permanent fruit orchards, subject to the applicable water use authorisation requirements.

2. Need (Site-Specific and Contextual)

2.1 Site-Specific Need

Agricultural production within the Koue Bokkeveld is highly dependent on reliable irrigation water, particularly during the dry summer months when rainfall and streamflow are naturally limited. The region is subject to seasonal rainfall variability and recurring drought conditions, emphasising the importance of efficient agricultural water storage and management.

The existing Helpmekaar Dam currently has an approximate storage capacity of 390 000 m³. The proposed enlargement will increase the storage capacity to approximately 800 000 m³, representing a net increase of approximately 410 000 m³. The supplementary buffer dam will provide approximately 27 000 m³ of additional balancing storage and improve the operational management and distribution of irrigation water. The engineering documentation confirms that the application is based on an additional surface-water taking of 410 000 m³, with water to be abstracted during winter surplus periods and stored for irrigation during the dry summer season.

The proposed development is therefore required to:

- Increase on-farm water storage capacity by enlarging the existing Helpmekaar Dam and constructing a supplementary buffer dam;

- Improve the operational management and distribution of irrigation water through the connecting pipeline;
- Improve the efficient capture, storage and utilisation of available winter runoff, subject to the applicable water use authorisation requirements;
- Support the conversion of approximately 45 ha of annual crops into permanent fruit orchards;
- Improve agricultural productivity and long-term farming viability;
- Improve resilience to drought and climate variability; and
- Support sustainable agricultural water management within the farming operation.

The Hydrological Assessment undertaken for the proposed development confirms that surplus water is available within the upper Leeu River catchment to support the proposed increase in storage. The modelling indicates that increasing the combined capacity of the Langrug dams improves their ability to supply the existing irrigation requirement. Although the number of spill years and average annual spill volume from the Langrug dams are reduced, the assessment concludes that this has very little impact on the downstream Wydekloof Dam. The irrigation supply abstracted from the Wydekloof Dam remains unchanged under the modelled proposed-development scenario.

The proposed development does not in itself authorise the abstraction, taking or storage of water in terms of the National Water Act, 1998 (Act No. 36 of 1998). The applicable water uses include the taking and storage of water in terms of Sections 21(a) and (b), as well as activities associated with impeding or diverting the flow and altering the bed, banks, course or characteristics of a watercourse in terms of Sections 21(c) and (i). The Freshwater Assessment includes the required Risk Matrix assessment for the Section 21(c) and (i) water uses.

The water use authorisation process for the Helpmekaar taking and storage has been initiated with the Department of Water and Sanitation under reference WU38102, which was activated on 7 August 2024. The final authorised taking and storage volumes, ecological flow requirements and operational conditions will be determined through the applicable water use authorisation process.

2.2 Broader Public Need

The proposed development supports broader regional and provincial objectives relating to sustainable agriculture, water security and rural economic development.

The proposal contributes towards:

- Improving long-term agricultural sustainability within the Koue Bokkeveld;
- Supporting efficient water resource management through improved storage and management of winter runoff;
- Improving resilience to climate variability and prolonged drought periods;
- Supporting continued agricultural production and food security;
- Maintaining and potentially expanding employment opportunities within the agricultural sector; and

- Supporting the long-term competitiveness of the deciduous fruit industry within the Western Cape.

The proposal is consistent with the strategic importance of agriculture within both the Witzenberg Local Municipality and the Cape Winelands District Municipality, where agriculture remains an important economic sector.

3. Desirability (Spatial, Environmental, Social and Economic)

3.1 Spatial Planning Alignment

The proposed development is consistent with applicable planning frameworks and existing land uses, including:

- Western Cape Provincial Spatial Development Framework (PSDF);
- Cape Winelands District Municipality Integrated Development Plan (IDP);
- Witzenberg Local Municipality Integrated Development Plan (IDP);
- Witzenberg Local Municipality Spatial Development Framework (SDF);
- Applicable agricultural and water resource planning policies; and
- Existing agricultural land use within the Koue Bokkeveld.

The proposed enlargement utilises an existing farm dam within an established agricultural landscape, thereby reducing the need for development of a completely new primary storage facility elsewhere. The supplementary buffer dam and connecting pipeline are similarly located within an existing farming environment and integrate with existing irrigation infrastructure.

The proposal is therefore considered compatible with the surrounding agricultural character of the area.

3.2 Environmental Desirability

The specialist assessments undertaken as part of the Environmental Impact Assessment process have confirmed the environmental sensitivities associated with the proposed development and have informed the assessment and refinement of the preferred development alternative.

The specialist studies indicate that:

- Portions of the proposed development occur within an established agricultural landscape that has been modified through historical cultivation and farming activities;
- The project involves the enlargement of an existing dam, reducing the need for the development of an entirely new primary storage facility elsewhere;
- The Terrestrial Biodiversity Compliance Statement confirmed that Kouebokkeveld Alluvium Fynbos and Kouebokkeveld Shale Fynbos occur within the broader development area. Ground-truthing identified Kouebokkeveld Shale Fynbos in good condition on the south-eastern portion of Langrug Ridge, which the specialist recommends should be included within CBA 1;

- The proposed enlargement of the Helpmekaar Dam will impact Kouebokkeveld Alluvium Fynbos; however, the specialist considers the affected area to be small and localised;
- The preferred connecting pipeline alignment predominantly follows existing disturbed agricultural areas and farm infrastructure. Where the pipeline traverses Langrug Ridge, use of the existing road/firebreak provides an opportunity to avoid or minimise disturbance to the good-condition Kouebokkeveld Shale Fynbos;
- The supplementary Buffer Dam is situated within an existing agricultural environment, thereby limiting unnecessary disturbance of natural terrestrial habitat;
- The Freshwater Assessment evaluated the enlargement of the Helpmekaar Dam, the balancing/Buffer Dam and the associated connecting pipeline and includes assessments of the Present Ecological State, Ecological Importance, Ecological Sensitivity, impact significance and the applicable DWS Risk Matrix. The assessment also identifies mitigation measures to address impacts on the aquatic environment;
- The Freshwater Assessment confirms that the proposed development requires consideration of Sections 21(a), (b), (c) and (i) of the National Water Act. The assessment of the Section 21(c) and (i) activities through the DWS Risk Matrix indicated that the applicable level of authorisation for these activities may be a General Authorisation. The final water use authorisation requirements remain subject to determination by the relevant water authority;
- The Hydrological Assessment confirms that surplus water is available within the Leeu River catchment to support the proposed increase in storage. The modelling indicates that the proposed enlargement will have very little impact on the downstream Wydekloof Dam and that the irrigation supply abstracted from the Wydekloof Dam will not be reduced under the modelled proposed-development scenario;
- The Agricultural Compliance Statement confirms that the proposed development occurs within the Op die Berg Protected Agricultural Area. The Helpmekaar Dam enlargement footprint occurs predominantly on soils of Low to Medium agricultural potential that have previously been disturbed by agricultural activities, while the Buffer Dam footprint overlaps land of higher agricultural potential. The verified agricultural sensitivity of the development area ranges from Low to High. Notwithstanding the loss of some potential agricultural land through inundation, the agricultural specialist concludes that the overall agricultural impact of the proposed development will be positive, as 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. The loss of agricultural land must nevertheless be minimised through adherence to the approved development footprint and implementation of the applicable soil conservation, erosion-control and rehabilitation measures;
- The Heritage Impact Assessment concludes that the proposed enlargement of the Helpmekaar Dam, construction of the Buffer Dam and connecting pipeline will not have a significant impact on local archaeological heritage resources. The visual impact is rated Low, and the assessment concludes that the development does not pose a significant threat to local archaeological and palaeontological heritage resources, subject to implementation of the recommended mitigation measures;

- No archaeological mitigation or monitoring is required prior to or during construction; however, work must cease if graves or unmarked human remains are encountered, and the Fossil Chance Find Procedure must be incorporated into the EMP; and
- The identified environmental impacts can be avoided, minimised or appropriately managed through implementation of the specialist recommendations and the mitigation and management measures contained in the Environmental Management Programme (EMP), together with the applicable Maintenance Management Plan (MMP) requirements and water use authorisation requirements and conditions.

The development footprint and infrastructure layout have been refined throughout the Scoping and Environmental Impact Assessment processes in response to engineering investigations, specialist findings, environmental sensitivities and comments received from authorities and Interested and Affected Parties.

3.3 Socio-Economic Desirability

The proposed development is expected to provide several socio-economic benefits, including:

- Improving long-term agricultural water security;
- Supporting the establishment and management of approximately 45 ha of permanent fruit orchards;
- Supporting continued agricultural production and long-term farm viability;
- Creating employment opportunities during construction;
- Supporting longer-term employment associated with orchard establishment, maintenance and production;
- Contributing to the regional agricultural economy; and
- Improving the resilience of the farming operation to drought and climate variability.

The proposed conversion of approximately 45 ha of annual cash crops into permanent fruit orchards is also identified in the engineering motivation as contributing to the long-term economic viability and sustainability of the farming operation and creating additional permanent employment within the agricultural industry.

The proposal therefore supports both sustainable agricultural production and broader rural economic development within the Koue Bokkeveld.

4. Best Practicable Environmental Option

Based on the engineering investigations, specialist assessments and findings of the Scoping and Environmental Impact Assessment processes, the preferred development represents the best practicable environmental option identified because it:

- Expands an existing water storage facility rather than constructing an entirely new primary dam;

- Improves water storage and operational efficiency within an existing agricultural landscape;
- Integrates with existing irrigation infrastructure;
- Includes a supplementary buffer dam to improve operational flexibility and irrigation management;
- Utilises a preferred connecting pipeline alignment that predominantly follows existing disturbed agricultural areas and farm infrastructure;
- Allows impacts on the good-condition Kouebokkeveld Shale Fynbos associated with Langrug Ridge to be avoided or minimised through use of the existing road/firebreak;
- Limits the impact on Kouebokkeveld Alluvium Fynbos associated with the dam enlargement to a relatively small and localised area;
- Is supported by the Freshwater Assessment, subject to implementation of the prescribed aquatic mitigation and water-use authorisation requirements;
- Is supported by hydrological modelling confirming the availability of surplus water and indicating very limited effects on the downstream Wydekloof Dam and no reduction in irrigation supply abstracted from that dam;
- Does not result in significant archaeological or palaeontological impacts, subject to implementation of the recommended chance-find procedures;
- Supports sustainable agricultural production and the proposed conversion of approximately 45 ha of annual crops into permanent fruit orchards; and
- Allows identified environmental impacts to be avoided, minimised and appropriately managed through implementation of the specialist recommendations, EMPr and applicable water use authorisation conditions.

The engineering alternatives assessment considered two primary dam-storage alternatives. Site 1, comprising the enlargement of the existing Langrug-Boonste Nr. 1 Dam (Helpmekaar Dam), was identified as the preferred alternative over the construction of a new primary dam at Site 2. The engineering assessment found Site 1 to be substantially more efficient from a storage-to-earthworks and economic perspective and also considered the potential loss of existing productive orchards or fields in selecting the preferred alternative.

Alternative pipeline alignments were considered during the assessment process. The preferred alignment has been selected based on engineering, agricultural and environmental considerations and has been refined to utilise disturbed agricultural land, existing farm infrastructure and existing road/firebreak corridors as far as practicable, thereby reducing unnecessary disturbance to sensitive natural vegetation.

5. Conclusion

The proposed enlargement of the Helpmekaar Dam, construction of the supplementary buffer dam and installation of the associated connecting pipeline are considered both needed and desirable within the context of the Koue Bokkeveld agricultural region.

The proposal:

- Addresses the need for improved agricultural water storage and operational flexibility;
- Supports long-term agricultural sustainability and water security;
- Improves resilience to climate variability and drought conditions;
- Utilises and expands existing agricultural water storage infrastructure within an established agricultural landscape;
- Supports the proposed conversion of approximately 45 ha of annual crops into permanent fruit orchards;
- Has been refined in response to engineering investigations and the findings of the specialist assessments;
- Avoids or minimises impacts on sensitive biodiversity features where practicable, including the good-condition Kouebokkeveld Shale Fynbos associated with Langrug Ridge;
- Limits the impact on Kouebokkeveld Alluvium Fynbos to a relatively small and localised area;
- Is supported by the Freshwater Assessment, subject to implementation of the recommended aquatic mitigation measures and applicable water use authorisation requirements;
- Is supported by hydrological modelling confirming the availability of surplus water and indicating very limited effects on the downstream Wydekloof Dam and no reduction in the irrigation supply abstracted from the dam;
- Does not pose a significant threat to local archaeological or palaeontological heritage resources, subject to implementation of the recommended chance-find procedures; and
- Provides agricultural and socio-economic benefits while allowing identified environmental impacts to be avoided, minimised and appropriately managed.

The proposed development is therefore considered consistent with the principles of sustainable development contained in the National Environmental Management Act, 1998 (Act No. 107 of 1998), and is considered acceptable from an environmental perspective, subject to the implementation of the specialist recommendations and mitigation measures contained in the Environmental Management Programme (EMPr), the applicable Maintenance Management Plan requirements, and the applicable water use authorisation requirements and conditions.