

RISK ASSESSMENT MATRIX for Section 21 (c) and (i) Water Use activities (Version 2.1.1)

POTENTIALLY AFFECTED WATERCOURSE/S			FIELD-VERIFIED ASSESSMENT RESULTS				
Watercourse number	Watercourse name	Watercourse type	PES	EI	ES	EIS	Wetland Importance
(1)	Two first-order non-perennial watercourses (small ephemeral preferential water flow paths/drainage lines confluence)	River / Natural channel	A/B	Low	Low	Low	Not assessed

DETAILED PROJECT SPECIFICATIONS:

Include detailed project description, including all proposed control measures to prevent/minimise impacts on watercourses

The project applicant, Arbor Acres (Pty) Ltd, proposes to formally construct 4 separate blocks of poultry laying farms and 2 separate blocks of poultry rearing farms on their farm property located approximately 12 km east of the town of Boshof, Free State Province. Each separate block will be fenced off and will contain 5 broiler houses each. The broiler houses will be heated by means of diesel combustion from small storage tanks at each block. According to the information received from the EAP, the proposed development will tie into the existing municipal electrical infrastructure but will abstract water from on-site borehole/s. A proposed septic tank sewage system will be installed for disposal and management of sewage from the on-site office building.

According to the available desktop water catchment and drainage data of the latest South African National Biodiversity Assessment of 2018 (Van Deventer et al., 2019) and National Wetland Map 6 (SANBI, 2024), there are no significant natural perennial watercourses, -wetlands or -salt pans of which the regulated areas fall within the proposed development footprints. Merely a single non-perennial watercourse flows past Rearing House 6 within 100 m to the west (Van Deventer et al., 2019 & SANBI, 2024).

'Ground truthing' conducted during the site assessment, however determined that two first-order non-perennial watercourses (small ephemeral preferential water flow paths/drainage lines) rather join each other/confluence and flow past Rearing House 6 within 100 m to the west.

Recommended Mitigation Measures

- Implement adequate alien invasive species management and prevention measures during the construction- and subsequent operational phases of the proposed development. An Alien Invasive Species Management Plan must be compiled by a suitably qualified and experienced SACNASP registered ecologist, if deemed necessary by the competent authority.
- It is recommended that all individuals of any identified legally declared alien invasive species must be actively eradicated from the study area and specifically surrounding the artificial flow channel, in accordance with the requirements of the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. Removed materials must also be adequately and lawfully disposed of, in order to prevent potential further spreading/dispersal.
- It is recommended that a large impermeable surface area be constructed for the temporary stockpiling, containment and management of the poultry manure generated by the 6 blocks, before it gets removed and used for composting on agricultural croplands. This area must prevent significant leaching into- and eutrophication of the soil and groundwater resources/aquifers by any organic minerals.
- Implement adequate stormwater and erosion management measures during the construction- and subsequent operational phases of the proposed development. This must be done to sufficiently manage stormwater runoff and clean/dirty water separation, in order to prevent any significant surface water contamination of the local and broader surrounding landscape as well as prevent any significant soil erosion from occurring within and around the proposed development footprints and to attempt to maintain the ecological connectivity, -functionality and -integrity of the local watershed and broader sub-quaternary surface water catchment and drainage area.
- It is recommended that the development design layouts for the proposed infrastructure bases must be adequately elevated to above the surface water runoff levels which can be received from the surrounding upslope areas, during seasonal rainfall events and must include adequate stormwater management measures. This must be done in order to ensure that sufficient volumes and quality of surface water runoff from the established infrastructure footprints, continue to be channelled through the local catchment during seasonal rainfall events.
- It is further recommended that sufficient stormwater cut-off berms/trenches be constructed around the upslope boundaries of the proposed 6 blocks and stockpiling area. These cut-off berms/trenches must assist with- and manage clean/dirty water separation by diverting and channelling clean surface water runoff from the surrounding natural landscape around the proposed 6 blocks during seasonal rainfall events, for continued flow. The cut-off berms/trenches are to be adequately lined internally, if deemed necessary by the engineer to prevent channel erosion. The cut-off berms/trenches are to be adequately maintained and regularly cleaned out, as and when necessary.
- Water flow-breaks and dispersal infrastructure should be installed at the water release-points of the of the design layouts. This infrastructure must be able to adequately reduce the water flow velocity and disperse the water over a larger surface area, prior to entering into the surrounding landscape. This is necessary to prevent any potential localised erosion, which could occur at the water release-points due to high water volume concentration and flow velocity build-up. The water flow-breaks and dispersal infrastructure are to be adequately maintained and regularly cleaned out, as and when necessary.
- The detailed design layouts including the slope- and measurement/capacity parameters of the stormwater cut-off berms/trenches, water flow-breaks and dispersal infrastructure must be calculated and determined by a suitably qualified and experienced engineer, in order to achieve this objective.
- It is recommended that the construction of the proposed infrastructure be conducted and completed during the winter season as far as practicably possible/feasible. This will considerably reduce the possibility of the construction areas receiving significant rainfall, which would prevent the risk/likelihood of any soil erosion occurring.

- The proposed 6 blocks must be designed to exclusively operate as closed unit systems and the footprints must function in complete ecological isolation from the surrounding surface and subsurface environment, as far as practicably possible/feasible.
 - A closed inward-draining system design must be adopted for the proposed 6 blocks, as far as practicably possible/feasible.
 - By implementing the relevant Department of Water and Sanitation (DWS) Wetland/Watercourse buffer calculation tools, a minimum Water Quality- and Biodiversity Buffer distance of approximately 25 m from the ephemeral preferential water flow paths/drainage lines confluence, was determined. In accordance with the precautionary principle of the National Environmental Management Act (Act 107 of 1998), it is however highly recommended that the buffer zone be increased by a further 15 m due to the potentially significant additional ecological impacts associated with the subsequent operational phase of the established development. It is therefore recommended that a minimum Water Quality- and Biodiversity Buffer distance of approximately 40 m be implemented around the ephemeral preferential water flow paths/drainage lines confluence. No current or future development or transformation or any movement/operations of machinery/equipment may take place within the buffered zone.
 - If building materials, hydrocarbons or other chemicals are to be stored on site during the construction- or subsequent operational phases, the storage areas must be situated as far away as practicably possible/feasible from the ephemeral preferential water flow paths/drainage lines confluence and minimum outside the buffer zone.
 - Building material, hydrocarbon and other chemical storage areas must be adequately bundled in order to be able to contain a minimum of 150 % of the capacity of storage tanks/units.
 - Adequate hydrocarbon and other chemical storage, handling, usage and spillage clean-up procedures must be developed, and all relevant employees must be sufficiently trained on- and apply these procedures during the construction- or subsequent operational phases.
 - Spill kits must be readily available at the construction- and subsequent operational site. All relevant employees must be adequately trained on the correct procedure and use of the spill kits.
 - Adequate dirty water collection and containment sumps/drains or other measures must be constructed as part of the proposed 6 blocks designs. These sumps/drains or other measures must assist with- and manage clean/dirty water separation by preventing contaminated water runoff from leaving the proposed 6 blocks and entering the surrounding natural landscape.
 - It is recommended that environmentally friendly/biodegradable chemical products be utilised as far as practicably possible/feasible in all the cleaning and sanitising/disinfecting processes associated with the operational phase of the proposed 6 blocks.
 - Suitable and lawful management and disposal of hydrocarbons other chemicals and all waste products generated by the proposed 6 blocks must be ensured by the applicant.
 - Process-water, wastewater and other chemical/artificial waste/by-products must be adequately stored/contained and disposed of in a lawful and environmentally acceptable/responsible manner.
 - No process-water or any form of contaminated wastewater or any other chemical/artificial waste/by-products resulting from any operational activities, are allowed to be unlawfully discharged directly or indirectly into the surrounding natural landscape. If any form of process-water, wastewater or any other chemical/artificial waste/by-products need to be discharged into the surrounding natural landscape, this must be done lawfully in accordance with all relevant legislative requirements. The products to be discharged must continuously meet legal discharge quality and quantity standards.
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- Chemical and biological analyses of products to be discharged must be continually conducted on a weekly basis, in order to ensure that the quality and quantity standards of all discharges are legally compliant and environmentally acceptable/responsible.
 - All byproducts and waste emanating from the operational processes must be collected and removed from the facility in an adequately controlled and regulated manner. Various byproducts and waste will be repurposed for secondary products and/or adequately disposed of at a registered landfill or other suitable disposal site.
 - A Water Use License Application (WULA)/General Authorisation (GA) must be submitted to the Department of Water and Sanitation for the proposed abstraction from the on-site borehole/s as well as the proposed development within 100 m of the ephemeral preferential water flow paths/drainage lines confluence associated with the study area, as required in accordance with the National Water Act (Act 36 of 1998).
 - Pump testing must be conducted of the on-site borehole/s, in order to determine whether the borehole/s will be able to provide sustainable yield that can adequately and sustainably supply the required volumes of water necessary for the established development.
 - Only the allotted water quantities as per the approved Water Use License are to be abstracted.
 - Flow meters are to be installed in order to enable monitoring and management of water abstraction.
 - Water abstraction figures must be submitted to the Department of Water and Sanitation (DWS) on a regular basis in order to ensure compliance with the allotted water quantities as per the approved Water Use License.
 - Water saving initiatives must be implemented for the established development.
 - Environmentally responsible water-use practices and activities must be adopted for the construction- and subsequent operational phases of the proposed development.
 - Provide training interventions for the relevant employees on correct environmentally responsible water use practices and activities.
 - Implement suitable dust suppression and management measures during the construction- and subsequent operational phases of the proposed development.
 - Construction areas and -roads to be sufficiently wetted down during the construction phase of the proposed development, if/when necessary, in order to suppress/prevent significant fugitive dust generation, emissions and fallout.
 - Adequate operational procedures for machinery and equipment must be developed to strictly govern and restrict movement of machinery, in order to avoid unnecessary fugitive dust generation, emissions and fallout and ensure environmentally responsible operational practices and activities.
 - It is recommended that no bright light from any spotlights or perimeter lights or loud/excessive noise should be emitted into the surrounding landscape, during the nighttime. As little light emissions as practicably/reasonably possible from the established development, should occur during nighttime as this could lure aquatic bird- and other nocturnal avifaunal species individuals towards the permitter fences and potentially result in collisions and mortality.
 - Lighting and illumination infrastructure technology and layout designs must be done in an environmentally friendly and responsible manner.
 - The minimum amount of lighting and illumination infrastructure which is practicably/feasibly possible for the established development to function at, must be utilised during nighttime owed by the applicant to locate and remediate the source of leakage, as soon as practicably possible/feasible.
 - Lighting and illumination infrastructure must as far as practicably possible be directed at low shining angles towards the ground and towards the inner portions of the established development, in order to reduce the amount of bright light being emitted into the surrounding natural landscape.
 - Lower shining intensity environmentally friendly lighting products must be utilised in order to reduce the brightness of light being emitted into the surrounding natural landscape.
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- An adequate sewage management system must be installed for the proposed development.
 - Adequate leakage detection and prevention systems/measures must be installed into the sewage management system in order to detect any potential leakages and subsequent contamination of soil and groundwater resources.
 - If any leakages or overflows of the sewage management system occur, the competent authority must immediately be notified and the necessary steps must be followed by the applicant to locate and remediate the source of contamination, as soon as practicably possible/feasible.
 - The integrity of the sewage management system must be inspected on a regular basis and adequately maintained over time, in order to ensure its continued functionality and prevent any leakages or failures.