

17 June 2026

Pamela Santos
Barker and Associated Ltd
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By email: [REDACTED]

Dear Pamela,

Technical Memorandum: Air Discharge Assessment – Proposed Beachlands South Waste Water Treatment Plant

Introduction & Purpose

This memorandum has been prepared for Barker and Associates Ltd in support of a substantive application lodged by Beachlands South Limited Partnership (BSLP) under the Fast-track Approvals Act (FTAA). The proposed development, referred to as 'Beachlands South', is listed in Schedule 2 of the FTAA as a project of significant regional or national benefits. The site is located at 110 Jack Lachlan Drive and 620, 712, 758, and 770 Whitford-Maraetai Road, Beachlands, legally described as Lot 2 DP 501271, Lot 100 DP 504488, and Lot 4 DP 54105 ('Site', 'Project').

As part of the Project, a Wastewater Treatment Plant (WWTP/ Beachlands South WWTP) is proposed, located approximately 1.5km south of the Beachlands Airshed (Figure 1). This memorandum provides a high-level review of the air and odour discharge requirements associated with the WWTP (based on the concept design), including the applicable regulatory framework, potential effects from the WWTP operation and outlines the proposed scope of the Assessment of Environmental Effects (AEE) to be undertaken.

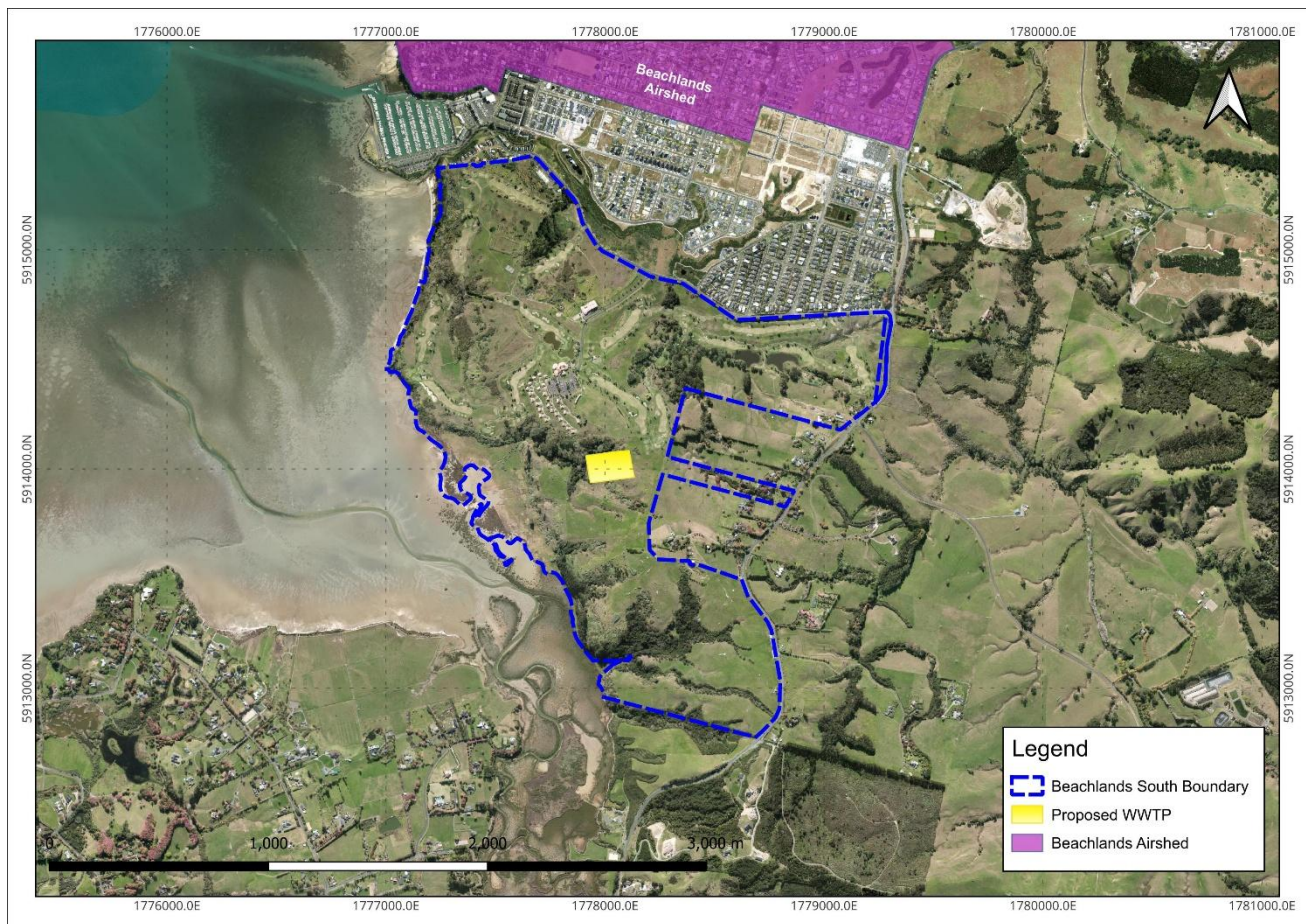


Figure 1 Location of Beachlands South WWTP

Project Description

The Beachlands South Project will provide for the development of live-zoned land into a comprehensively planned, public transport-focussed community comprising approximately 2,000 residential dwellings, a hotel and conference venue, community and commercial activities, an Ecological Protected Area Network, walking and cycling networks, and the potential for two schools, along with all associated infrastructure including wastewater servicing. A staged, centralised wastewater servicing strategy is proposed, whereby wastewater will be collected via a communal gravity sewer network and conveyed via pump stations to a centralised treatment plant.

The proposed design of WWTP system is based on Combined Works (CW) technology, developed by Raath and Associates¹. CW technology is an integrated biological wastewater treatment system that consolidates all major treatment functions within a single enclosed structure. The treatment plant is to be constructed in two stages:

¹ GWE Consulting Engineers (2026), Beachlands South Fast-Track Substantive Application, Wastewater Concept Design and AEE

- Stage 1: Construction of a 450 m³/day treatment module, with treated effluent discharged to land;
- Stage 2: Expansion to an ultimate capacity of 1,383m³/day through the installation of a second treatment module, with transition to marine discharge via a long sea outfall.

The treatment process comprises inlet screening (mechanical screen removing rags, plastics, and coarse solids) and grit removal (separating sand and heavier inorganic material, with some removal of fats, oils, and grease), followed by aeration and biological treatment within an enclosed reactor, where organic matter is oxidised and ammoniacal nitrogen is converted to nitrate through nitrification. Mixed liquor then passes into an integrated clarification zone, with settled biomass returned internally to the aeration zone. Partially clarified effluent flows through a fixed-film biofilter, enabling further nitrification and denitrification, followed by a dedicated denitrification reactor and a phosphorus removal stage. Excess sludge is directed to a stabilisation zone for further biological breakdown, with residual dewatered solids removed periodically by licensed contractors. Final clarification and UV disinfection complete the process prior to treated effluent discharge.

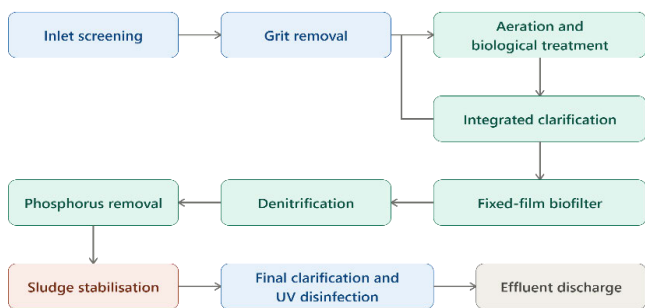


Figure 2 Wastewater treatment process

According to Raath and Associates, the system is fully automated and substantially enclosed, with only the building structure visible externally, as compared to conventional systems utilising open aeration basins, oxidation ponds or sludge drying beds, resulting in minimal odour generation².



Figure 3 WWTP building utilising CW technology (Source: Raath and Associates, Beachlands South Development, Integrated Wastewater Servicing Strategy and Discharge Assessment Report)

² Raath and Associates (April 2026), Beachlands South Development, Integrated Wastewater Servicing Strategy and Discharge Assessment Report

Regulatory framework and consent requirements

The following Table 1 studies the relevant regulatory and guidance applicable for the proposed WWTP, with regards to air and odour discharges. In summary, the proposed WWTP will require an air discharge permit, as the discharge of contaminants to air from a municipal wastewater treatment plant is classified as a Discretionary Activity under Rule A163 of the Auckland Unitary Plan. NESAQ does not impose additional restrictions, and the application will be evaluated by an FTAA project panel under Schedule 2 of the FTAA.

Table 1 Regulatory framework and consent requirements for Beachlands South WWTP

Legal Requirement	Description / Relevant Rules	Applicability for this site
Resource Management Act 1991 Section 15 Discharge of Contaminants	Prohibits any person from discharging contaminants into air from an industrial or trade premise, unless expressly permitted by a national environmental standard, a regional plan rule, or a resource consent.	Applicable. The proposed treatment plant functions as an industrial and trade premise, with potential emissions to air (H ₂ S, NH ₃ and other wastewater odourous compounds) hence falling under this regulation. Operating the facility will require a dedicated air discharge permit.
Fast-track Approvals Act 2024 Schedule 2 – Listed projects with significant regional or national benefits	Provides a streamlined consenting pathway for listed projects of significant regional or national benefit. Imposes mandatory statutory criteria for the environmental assessment, requiring an evaluation of actual/potential effects on neighbourhood amenity, community social/cultural values, the nature of the discharge, and an explicit analysis of alternative discharge methods or alternative receiving environments.	Applicable. Beachlands South is a listed project under Schedule 2 of the FTAA, and the application will be evaluated by the FTAA project expert panel. To satisfy the statutory requirements of Clauses 6 and 7, the AEE scope shall evaluate the nature of the discharges to air, assess the sensitivity of the receiving environment, and detail all viable options for the treatment and disposal of potential emissions (including odours).

Legal Requirement	Description / Relevant Rules	Applicability for this site
Resource Management (National Environmental Standards for Air Quality) Regulations 2004 [NES-AQ]	Sets legally binding ambient limits for five air pollutants: PM₁₀, CO, NO₂, SO₂ and O₃. Applies to all resource consents: no consent can be granted on terms more lenient than these standards (Rule 28, more onerous requirement shall prevail). ● Regulation 17 PM₁₀ emissions from airshed ● Regulation 20 CO, NO_x and VOCs ● Regulation 21 SO₂	Applicable. ● Regulation 17 (PM₁₀) is not relevant to the project site as it is not located in a polluted Airshed and the operation of the WWTP is not likely to generate PM₁₀ emissions. ● Provision for standby power generation (emergency generator) is recommended in the plant design, to maintain essential treatment processes and pump station operation during power outages. The operation of the onsite emergency generator has the potential for carbon monoxide (CO) and oxides of nitrogen (NO_x) emissions. ● The discharges to air from the WWTP are expected to contain negligible concentrations of SO₂ and VOC's.
NES for Greenhouse Gas (GHG) Emissions from Industrial Process Heat 2023	Sets guidelines on greenhouse gas emissions originating from industrial processes. The objective is to reduce emissions of GHG in order to mitigate climate change and its current and future adverse effects on the environment and the wellbeing of people and communities.	With regards to the proposed WWTP the only potential GHG emissions from the combustion of fossil fuel will be from a diesel-fired back-up electricity generation device. Backup heat devices are specifically excluded from the regulations (Section 10(1)b) and therefore the Greenhouse NES does not need to be considered as part of this assessment.
Regional Plans and Policies		
Auckland Unitary Plan (AUP) E14 Air Quality <i>E14.3 Policies</i>	● Manage the discharge of contaminants to air, including by having regard to the Auckland Ambient Air Quality Targets, so that significant adverse effects on human health, including cumulative adverse effects, are avoided, and all other adverse effects are remedied or mitigated. ● In the coastal marine area and in urban and rural zones: ○ Avoid offensive or objectionable effects from dust and odour discharges and remedy or mitigate all other adverse effects of dust and odour discharges; or ○ Require adequate separation distance between use and development which discharges dust and odour to air and activities that are sensitive to adverse	Applicable. The proposed WWTP is located within both the "Residential – Mixed Housing Urban" and "Future Urban" zones. Under policy E14.3.6, wastewater treatment facilities are classified as "location-specific" activities. The WWTP operates on Combined Works technology within an enclosed unit, resulting in minimal odour emissions. The AEE will detail the air emissions and odour effects from the proposed WWTP, along with mitigation measures as necessary.

Legal Requirement	Description / Relevant Rules	Applicability for this site
	effects of dust and odour discharges, or both of the above. • In the future Urban Zone: ○ Recognise that rural air quality is generally a result of dust and odours, and other emissions generated by rural production activities ○ Avoid, remedy or mitigate adverse effects of dust and odour discharges ○ Provide for minor and localised elevation of odour levels where the air discharge is from (ii) the operation of infrastructure or location specific industry ○ Require adequate separation between use and development which discharge dust and odour and activities that are sensitive to these adverse effects	
AUP Table E14.4.1 Rule A163 – Treatment of municipal wastewater (municipal wastewater treatment plants)	Categorises the discharge of contaminants into air from municipal wastewater treatment plants as a Discretionary Activity across all air quality areas.	Applicable. Table E14.4.1 (Rule A163) of the AUP states that treatment of municipal wastewater (municipal wastewater treatment plants) is a Discretionary Activity in all air quality areas. As the proposed WWTP is designed to accept and treat municipal wastewater from a new subdivision, it falls under Rule A163, and the associated air discharges, including odour, get Discretionary Activity status. An AEE must be prepared and submitted as part of the substantive resource consent application, discussing the air discharges from the WWTP. The AEE shall demonstrate that, through application of the Best Practicable Option (BPO), the plant can be designed and operated to avoid offensive or objectionable odour effects beyond the site boundary.

Legal Requirement	Description / Relevant Rules	Applicability for this site
AUP Table E14.4.1 Rule A48 – Emergency generators used for the purpose of generating electricity for premises during mains power unavailability (includes operation for the purpose of generator testing and maintenance)	Categorises the use of emergency generators as a Permitted activity across all air quality areas.	The site’s proposed plan to include an emergency generator (if applied) will meet the intent of Rule 48 and as such is a Permitted activity.

Potential Air and Odour Effects

The primary discharge to air from the wastewater treatment process will be odour. WWTP odours have the potential to be generated from the decomposition of organic material (e.g. carbohydrates, fats and proteins) present in the wastewater, with high levels of odour potentially generated when wastewater or sludge becomes oxygen depleted and anaerobic (septic) conditions develop, resulting in the generation of highly odorous compounds such as hydrogen sulphide (H_2S). While health effects from individual compounds can occur at elevated concentrations (for example H_2S), based on Air Matters' experience with WWTPs and review of the combined works technology adopted at this site, concentrations of such compounds are expected to be low and unlikely to result in direct health effects. Consequently, the scope of an AEE should be limited to the effects of nuisance odour from the proposed WWTP.

Table 2 summarises the potential odour-generating processes within the WWTP and the proposed design measures to manage them^{1,3}.

Table 2 Odour generating potential and proposed controls for the Beachlands South WWTP

Process ¹	Odour Potential	Proposed Controls
Inlet Screening <i>Raw wastewater screened to remove rags, plastics and coarse solids. Screenings managed via off-site disposal</i>	Potential source of odour due to the fresh state of the waste/sewage (H_2S , reduced sulphur compounds, ammonia) and accumulation of screenings	- Enclosure to be provided at the inlet, with a provision for extraction of air from enclosed odour-generating zones - Treatment of extracted air through an odour control system prior to discharge
Grit Removal <i>Sand and heavier inorganic material separated</i>	Potential odour from accumulated grit, sand, and fats, oils and grease	- Enclosed within the same odour-generating zone as inlet screening - Extraction and treatment of air prior to discharge
Aeration and Biological Treatment <i>Wastewater flows into aeration zone; organic matter is oxidised</i>	Oxygen is supplied at this zone to promote biological activity. Aerobic process is not inherently odorous provided aerobic conditions are maintained; odour potential increases if anaerobic conditions develop	- Enclosed CW reactor - Oxygen supplied through fine-bubble diffusion, hence provides controlled, efficient oxygen supply to maintain aerobic conditions
Integrated Clarification <i>Solids are separated from treated effluent; sludge is returned internally to aeration zone</i>	Low odour potential, as the settled biomass is returned internally and treatment occurs within the enclosed CW reactor (aeration zone)	Contained within the enclosed CW unit

³ Raath and Associates (Juen 2026), Air quality and Odour Management Memorandum

Process ¹	Odour Potential	Proposed Controls
Fixed-Film Biofilter Treatment <i>Biofilter containing structured media; biofilms attached to media provide aerobic zones and anoxic microenvironments (happening within the same CW unit)</i>	Low odour potential under normal aerobic/anoxic operation; potential for odour if biofilm conditions become anaerobic	- Enclosed within the CW unit - Structured media supports stable aerobic and anoxic micro-environments
Denitrification <i>Anoxic denitrification reactor downstream of biofilter/aeration zone</i>	Anoxic process is not inherently odorous, provided anaerobic (septic) conditions are avoided	- Enclosed within the CW unit - Controlled anoxic conditions
Phosphorous Removal <i>Combination of biological uptake and adsorption within the reactor media</i>	Low odour potential	Contained within the enclosed CW unit
Sludge stabilisation <i>Biological breakdown of sludge under low-oxygen conditions</i>	Potential for odour from biological breakdown under low-oxygen conditions, particularly if anaerobic conditions develop	- Extended sludge age and endogenous respiration reduce sludge volume and odour generation potential - Enclosed unit, and controlled ventilation (extraction of air)
Final polishing and UV Disinfection	Low odour potential	- Contained within the enclosed CW unit - UV disinfection does not generate odorous by-products
Sludge storage and removal, screenings disposal	Potential odours during tank venting, sludge transfer, and vehicle loading	- Controlled ventilation of sludge storage areas; - Extraction and treatment of air prior to discharge

Note: The treatment facility is reported to be designed to incorporate appropriate ventilation and odour management measures during detailed design.

Odour treatment may include ozone treatment, activated carbon filtration, or equivalent odour control techniques, to be confirmed at detailed design stage and selected to represent the BPO appropriate to the scale and nature of the facility.

The CW system is reported to be designed as a contained biological process, maintaining predominantly aerobic conditions throughout treatment and thereby limiting the generation of foul odours under normal operating conditions. Overall, odour effects are expected to be minor and localised, and manageable through standard operational controls. The enclosed configuration of the CW system significantly reduces odour generation compared to open treatment systems, such as those incorporating open aeration basins, oxidation ponds, or sludge drying beds.

Initial anticipated Effects and Proposed Assessment Approach

Based on Air Matters' experience with a range of large municipal and community-scale WWTPs throughout New Zealand, offsite odour effects are typically acceptable under normal operations.

The Beachlands South WWTP is proposed with enclosed elevated odour generating activities (inlet works, enclosed sludge handling), with capture and treatment of odorous air through an additional odour control (Table 2). On this basis, and based on Air Matters experience with WWTPs having similar mitigations, provided the proposed mitigations are implemented, Air Matters considers that odour effects from the Beachlands South WWTP could be appropriately managed, with a low likelihood of offensive or objectionable effects beyond the site boundary.

To confirm the actual level of effects, an assessment of potential odour from the WWTP would need to be undertaken, following the methodology outlined below. The assessment will follow a qualitative FIDOL (Frequency, Intensity, Duration, Offensiveness, and Location) approach in accordance with the MFE Good Practice Guide for Assessing and Managing Odour (2016), a screening level assessment of separation distances to sensitive receptors in accordance with the Victoria EPA 2024 guidelines(widely accepted in New Zealand), and where possible supported by a review of odour surveys conducted at comparable community-scale WWTPs, consented and/or operating for other subdivisions in the Auckland Region.

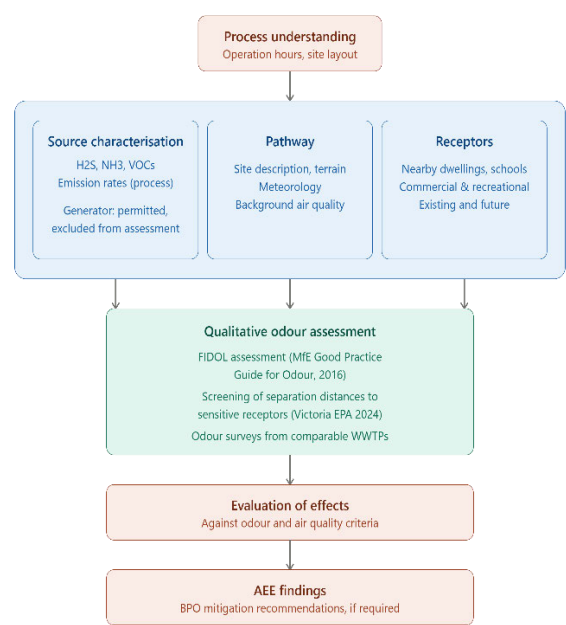


Figure 4 AEE Approach and Methodology

The AEE will set out the anticipated air quality and odour effects of the WWTP, and, where required, recommend BPO mitigation measures to ensure these effects are appropriately managed.

Kind Regards,

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