1.0 APPLICATION DESCRIPTION

Application and property details

Fast-Track project name:	Auckland Surf Park Community Stage 2
Fast-Track application number:	FTAA-2606-1246
Council reference number:	BUN60467823 (LUC

2.0 Technical Specialist Memo – Earthworks & Erosion and Sediment Control

To:	Brooke Dales, Consultant Planner & Warwick Pascoe, Principal Project Lead
From:	Patrick O'Riordan, GWE Consulting Ltd. Water and Wastewater Specialist.
Qualifications & Relevant Experience:	I hold the qualification(s) of: Beng (Hons) Mechanical and Manufacturing, BA. Mathematics and a PGDip in Clean Technology Management and have 16 years of experience in mechanical, process, water & wastewater engineering. I am a director and Technical Director at GWE Consulting Ltd., a role I have held since 2021. I am a full member of Engineering New Zealand and Water New Zealand. I am a Chartered Professional Engineer (CPEng.) My practice areas are Environmental engineering and Water engineering. I have prepared expert evidence and technical assessments for resource consent applications, plan changes, and fast-track applications and have appeared as an expert witness before consent authorities.
Preparation in Accordance with the Code of Conduct:	I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses and have complied with it in the preparation of this memorandum. I also agree to follow the Code when participating in any subsequent processes, such as expert conferencing directed by the Panel. I confirm that the opinions I have expressed are within my area of expertise and are my own, except where I have stated that I am relying on the work or evidence of others, which I have specified.

Signature:	
Date:	30 September 2026

3.0 Executive Summary

The Auckland Surf Park Community is a proposed mixed-use development covering approximately 54 ha between Dairy Flat Highway, Lascelles Drive and Postman Road in Dairy Flat. Stage 1 was consented in June 2024 under the COVID-19 Recovery (Fast-track Consenting) Act 2020. It included an artificial surf lagoon and associated leisure facilities, restaurants and market space, 70 visitor accommodation units, a solar farm, a data centre, roading and three-waters infrastructure.

The Stage 2 application would substantially expand and revise the consented development. It includes a hyperscale artificial intelligence data centre campus, three residential neighbourhoods comprising 364 dwellings, a village centre, live-work and other employment areas, further subdivision, internal roads, stream and landscaped areas, and dedicated water and wastewater treatment infrastructure. It also seeks variations to elements approved under Stage 1. Overall, the proposal is a staged residential, employment, visitor and recreation community centred on the surf park, rather than a stand-alone leisure facility.

The site is outside the current Watercare water and wastewater service area. The application therefore proposes private community systems intended to serve the entire development independently for an indefinite period, while retaining the ability to connect to public networks if they become available in the future. Water would be supplied from up to three deep groundwater bores, supplemented by the Stage 1 stream take and potentially rainwater, and treated through a central water treatment plant. Wastewater would be collected through a low-pressure sewer network and treated in a staged biological membrane plant, with treated flows discharged through a combination of land application, land contact and surface-water discharge.

4.0 Documents Reviewed

The following documents have been reviewed in preparing this memorandum:

- Assessment of Environmental Effects - Auckland Surf Park Community Stage 2
- Appendix 9 - Auckland Surf Park Community Masterplan - Part 2.
- Appendix 29 - Infrastructure Report.
- Appendix 30 - Water and Wastewater Servicing Report

- Appendix 38 - Geotechnical Factual Report.
- Appendix 39 - Geotechnical Interpretive Report.
- Appendix 48 - WWTP Design Report.
- Appendix 49 - WWTP Ecological Impact Assessment.
- Appendix 50 - WWTP Air Discharge Assessment.
- Appendix 51 - WWTP Environmental Management Plan.
- Appendix 52 - WWTP Emergency Response Plan.
- Appendix 53 - WWTP Odour Control Plan.
- Appendix 54 - WWTP Operations and Maintenance Plan.
- Appendix 60 Stage 1 section 127 Variation to Conditions
- Appendix 61 Stage 2 Land Use, Discharge and Water Take Conditions, Version 3 dated 5 June 2026
- Appendix 62 Stage 2 Staged Subdivision Conditions

5.0 Additional Reasons for Consent Not included in AEE / Incorrect Reasons for Consent

None identified

6.0 Specialist Assessment

6.1 Basis of Design

Design Standards and Guidance

The applicant has referred to the Watercare Code of Practice, Auckland Council guidance, TP58, GD06, the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, the National Policy Statement for Freshwater Management and general industry practice for communal wastewater treatment systems.

These documents provide an appropriate starting point, but the application does not present a single controlled basis-of-design document identifying:

- which standards apply to each component of the system;
- the adopted design criteria and their source;
- where project-specific criteria depart from published guidance;
- the design population and development yield for each stage;
- average, peak and critical wet-weather flows and loads;

- the required treatment and discharge performance; and
- the design margins, redundancy and contingency provisions.

The Watercare Code of Practice is a useful benchmark for collection networks, pump stations, storage, maintainability and asset resilience. However, compliance with Watercare requirements does not, by itself, demonstrate that the proposed private treatment and disposal system will perform adequately.

GD06 is the principal guidance relied upon for the land application assessment. TP58 is the active document under the AUP, however applying the standards in GD-06 is also acceptable.

Overall, I consider the standards referred to by the applicant to be broadly appropriate. The principal issue is that they have not been translated into one consistent and auditable design basis.

Wastewater Flow Generation

The wastewater schedule in Appendix 30 can be regrouped approximately as follows:

Source	**Average design flow (m^3/day)**
Residential neighbourhoods, apartments and work terraces	188.0
Visitor and villa accommodation	36.1
Retail, community and childcare activities	17.0
Restaurants, cafés and food and beverage activities	62.9
Surf park, lagoon and recreation-related activities	91.1
Data centre employee facilities	31.3
Vacant lot and potential light-industrial activities	31.1
Subtotal excluding water-treatment residuals	457.5
Water-treatment plant reject and residual flow	125.3
Total shown by the detailed calculation	**582.8**

Occupancy assumptions

Residential occupancy is not applied consistently across all typologies. The calculations use approximately two people per work terrace, 2.5 people per apartment and generally three people per dwelling elsewhere. The population assigned to the 178-lot north-eastern neighbourhood does not reconcile directly with a three-person occupancy assumption.

I consider this a slightly less than conservative assessment, however, note that it is acceptable.

Commercial loading assumptions

The calculations use a combination of floor-area, employee, seat, table-turnover and activity-specific loading rates. These assumptions are reasonable in principle but require confirmation against the final development schedule. Restaurant and hospitality flows are particularly sensitive to the assumed number of seats and daily sittings. Grease-trap requirements and the effect of fats, oils and cleaning chemicals should also be incorporated.

Management of this trade waste stream into the treatment plant has not been sighted, but a condition requiring a trade wastewater management plan may be able to address this.

Low Pressure Sewer

A peaking factor of 1.2 has been adopted on the basis that the development will use a low-pressure sewer system. A low-pressure network should reduce stormwater ingress compared with a conventional gravity network. A peaking factor has been applied for the inflow and infiltration, however the peal hydraulic operating peaking factor needs to be confirmed, and how this will be limited such that the WWTP is not hydraulically overloaded.

Data centre assumptions

The data centre flow is based on employee demand. The draft environmental management plan states that the cooling systems are refrigerant-based and do not generate process wastewater. That limitation should be carried into the design basis and conditions. Any future process-water use, cooling-water discharge, chemical cleaning waste or trade waste should require separate technical assessment and approval.

Wastewater Characterisation

The proposed wastewater stream will contain a mixture of domestic, visitor-accommodation, hospitality, recreational, commercial and staff wastewater. Wastewater strength is therefore likely to vary materially between development stages and between weekdays, weekends, holidays and surf park events.

Appendix 48 adopts design wastewater strengths informed by GD06 and monitoring data from the Clarks Beach wastewater system. The 95th-percentile Clarks Beach values include approximately:

- COD of 1,100 mg/L;

- filtered COD of 332 mg/L;
- BOD_5 of 420 mg/L;
- TKN of 94 mg/L;
- ammoniacal nitrogen of 65 mg/L; and
- total phosphorus of 13 mg/L.

These provide a reasonable preliminary basis for municipal wastewater. However, their direct application to the proposed mixed-use development has not been fully demonstrated. It is expected that the detailed design should provide design loads in kilograms per day for BOD, COD, suspended solids, nitrogen, phosphorus, fats, oils and grease for each development stage and for both normal and upper-percentile conditions.

The water-treatment residual stream requires separate characterisation. Bore-water testing identified elevated dissolved salts and source-water constituents, including boron, fluoride, sodium, chloride and total dissolved solids. Reported concentrations include boron of approximately 5.9–7.4 mg/L, fluoride of approximately 3.8 mg/L, sodium of up to approximately 280 mg/L and chloride of approximately 280 mg/L.

Depending on the selected water-treatment process, they may be concentrated in the water-treatment reject stream and subsequently reconcentrated in the wastewater reverse-osmosis retentate. Their effect on the biological process, treated-water quality, soils and groundwater has not been quantified.

Wastewater Treatment Plant Design

The proposed treatment process comprises a staged hybrid membrane aerated biofilm reactor and membrane bioreactor system, followed by ultraviolet disinfection and, at later stages, reverse-osmosis polishing. The proposed process is technically capable of producing high-quality effluent when it is appropriately designed, commissioned, operated and maintained.

The MABR and MBR processes are established technologies. Combining biological nutrient removal with membrane solids separation should provide a compact and robust treatment system with low suspended solids and microbiological concentrations. Reverse osmosis can provide further removal of dissolved nutrients, salts and other contaminants from the permeate stream.

The stated nominal plant capacity is 700 m^3/day.

It is expected that the detailed design shall define the number and capacity of treatment trains, membrane area and design flux, process tank volumes, hydraulic retention time, solids retention time, oxygen demand, chemical dosing, ultraviolet performance, reverse-osmosis recovery, sludge production and emergency storage.

The treatment process is proposed to be staged. Initially, MABR-MBR permeate would be discharged to land. Reverse-osmosis treatment and surface-water discharge would be introduced when the land application system approaches its sustainable capacity or when irrigation land within the rapid-transit designation is no longer available.

This staging approach is feasible in principle, but the transition trigger must be objective and enforceable. It should be based on certified treatment and disposal capacity, connected population and measured flows, rather than waiting until soil-moisture monitoring indicates that the irrigation system is approaching failure. The conditions should prohibit additional connections or occupation beyond the certified capacity of the operating treatment and disposal systems.

Disposal Field Assessment

The proposed land application system has two principal functions:

1. irrigation of MABR-MBR permeate during the earlier stages of development; and
2. irrigation of reverse-osmosis retentate after the surface-water discharge system is commissioned.

Appendix 30 classifies the receiving soils as Category 6 and adopts a base design irrigation rate of 3 mm/day. It then adds 1 mm/day for winter evapotranspiration and calculates that approximately 5.02 ha is required to receive approximately 200.7 m^3/day.

Appendix 48 adopts a different approach. For the ultimate reverse-osmosis retentate discharge it identifies approximately 6.93 ha of available land, giving a base capacity of approximately 207.9 m^3/day at 3 mm/day. The predicted average retentate flow is 175.5 m^3/day and the predicted peak flow is 210.6 m^3/day.

The peak retentate flow therefore slightly exceeds the stated 3 mm/day field capacity before considering wet ground, maintenance, exclusion zones or partial loss of the irrigation area. The hydraulic margin is consequently very limited.

Appendix 48 proposes application rates of up to 10.8 mm/day when soil moisture and weather conditions are favourable. Real-time soil-moisture control is appropriate, but it does not by itself demonstrate that a rate of 10.8 mm/day is hydraulically or environmentally sustainable. Any rate above 3 mm/day should be supported by field-specific soil testing, infiltration assessment, groundwater monitoring and a calibrated soil-water balance.

A 1,200 m^3 irrigation buffer tank is proposed. Modelling indicates a maximum tank level of approximately 89% over the ten-year modelled period. However, the assessment should be rerun using:

- the final agreed wastewater and retentate flows;
- conservative wet-year conditions;
- seasonal groundwater levels;
- loss of the least favourable irrigation zones;

- maintenance and equipment outages;
- the final storage operating range;
- the final irrigation controls; and
- sensitivity testing for consecutive wet periods.

For the initial stage, Appendix 48 identifies approximately 13.47 ha of available irrigation area and an average sustainable capacity of approximately 380 m^3/day. Reverse-osmosis treatment is intended to be commissioned before the average discharge reaches this level. The conditions should establish a more conservative commissioning trigger that provides sufficient time for design, construction, performance testing and approval of the reverse-osmosis and surface-discharge systems.

The nutrient-loading assessment indicates that nitrogen, phosphorus and BOD loadings would be below the adopted agronomic limits. However, this assessment does not adequately address dissolved salts, boron, fluoride, sodium and chloride. A soil and groundwater mass balance is required for these constituents.

The final design should also identify:

- the exact field boundaries and usable areas;
- irrigation method and emitter layout;
- slopes, setbacks and exclusion zones;
- access and public-contact controls;
- soil-moisture monitoring locations;
- field rotation and resting requirements;
- storage and shutdown logic;
- management of runoff, ponding and equipment failure; and
- the replacement area available if part of the field becomes unusable.

Soil and Groundwater Conditions

The geotechnical investigation identifies variable Tauranga Group alluvium comprising predominantly low-permeability clay and silt, with local organic clay and peat. These conditions are consistent with the applicant's Category 6 classification and indicate a relatively limited capacity to accept sustained hydraulic loading.

Groundwater conditions are complex. The investigations identify:

- shallow perched groundwater, commonly within approximately 0–1 m of ground level;
- static groundwater within the alluvial deposits;
- local groundwater associated with peat and organic soils; and
- groundwater movement through fractured Mahurangi Limestone.

Shallow perched groundwater was commonly encountered near the base of the topsoil or above the low-permeability alluvial clay. Although some perched water may be of limited volume, its presence

is material to the irrigation assessment because it may reduce available soil storage and create lateral flow, ponding or rapid connectivity to drains and surface water.

The proposed conditions refer to maintaining approximately 0.9 m separation between the discharge and seasonal groundwater. The application does not contain sufficiently detailed seasonal groundwater mapping beneath the final irrigation areas to demonstrate that this separation can be maintained throughout the year.

A site-specific investigation should establish:

- seasonal high groundwater levels;
- the thickness and properties of the unsaturated soil profile;
- potential groundwater mounding;
- short circuit drainage pathways;
- areas susceptible to ponding or runoff; and
- the effect of earthworks and final site levels.

The proposed groundwater monitoring network is also too limited for the size and variability of the irrigation area. A monitoring network should be designed by a suitably qualified hydrogeologist and include representative upgradient and downgradient locations for each material groundwater pathway.

Baseline and operational monitoring should include water level, pH, electrical conductivity, total dissolved solids, sodium, chloride, boron, fluoride, nitrogen species, phosphorus and microbiological indicators. Soil monitoring should include pH, electrical conductivity, exchangeable sodium or sodium adsorption ratio, nutrients and relevant source-water constituents.

Receiving Environment Assessment

I am not a freshwater ecologist and have not independently assessed the ecological effects of the proposed discharge. I defer to Council's freshwater ecology specialist regarding the adequacy of the applicant's ecological assessment, its conclusions, any further information required and the appropriate ecological monitoring and consent conditions.

In summary, the applicant's assessment describes the unnamed tributary of the Rangitoopuni Stream as a small, modified and degraded watercourse. The September 2025 survey identified elevated sediment, microbiological contamination and phosphorus, with macroinvertebrate indices within NPS-FM attribute band D.

The reported seven-day mean annual low flow is approximately 0.91 L/s, compared with a median flow of 16.5 L/s. The assessment models a total treated discharge of 6.8 L/s during dry and average conditions, of which 5.8 L/s is assumed to enter the tributary through the land-contact system. Under the modelled low-flow scenario, the downstream flow would increase from approximately 0.91 L/s to approximately 6.7 L/s. From a water and wastewater engineering perspective, this

represents a material change to the hydraulic regime and requires the final discharge rate, frequency and control methodology to be clearly defined.

The applicant's modelling predicts that most assessed water-quality parameters would be maintained at, or improved relative to, the measured baseline. However, the following inconsistencies and assumptions require resolution as part of the integrated servicing design:

- the ecological model adopts an 85:15 surface-water-to-irrigation split, compared with the 70:30 split described in the engineering assessment;
- baseline water quality is based substantially on one September 2025 survey;
- irrigated flow is assumed to remain within the soil profile, with no runoff or subsurface drainage to the stream;
- the land-contact system has not been designed;
- discharge quality is represented by median values;
- concentrated salts associated with the source water and treatment residuals are not assessed; and

The final engineering design and conditions should be based on the same discharge regime assessed by the ecologist. I otherwise defer to Council's freshwater ecology specialist on the ecological effects, further information requirements and monitoring framework.

Wastewater Treatment – Conclusion

The proposed MABR-MBR treatment process, followed by UV disinfection and later reverse-osmosis(RO), is technically capable of producing a high-quality effluent. Subject to appropriate detailed design, commissioning and operation, the proposed private wastewater system could service the development.

However, the application does not yet provide one consistent and integrated design basis. The principal outstanding matters are treatment capacity, peak hydraulic loading from the low-pressure sewer, water-treatment residuals, land-application design, capacity and assessment of effects, shallow groundwater conditions, and the triggers for commissioning later treatment and discharge stages.

I therefore consider the wastewater servicing approach feasible in principle, but further information and amended conditions are required before it can be supported. These should ensure that adequate treatment and disposal capacity is commissioned before each stage is occupied and that the final discharge regime aligns with the ecological and hydrogeological assessments.

Water Supply

The primary source would be groundwater from the Rangitoopuni Waitemata aquifer. Two bores are proposed to operate as the principal sources, with a third bore described as providing standby capacity. The Stage 1 stream take would supplement groundwater during periods of high demand.

The reports refer to the future Orewa 3 bulk watermain and include provision for a future public-network connection. However, the timing and availability of that infrastructure are uncertain. The

proposed private system should therefore be designed and assessed as a permanent standalone supply. A future Watercare connection should not be relied upon to address deficiencies in source capacity, treatment, storage or operational resilience.

Similar to the wastewater management of the site, there is not one integrated water supply report detailing the entire water supply strategy.

Water Demand and Design Basis

The reported water demands are not consistent. Average demand ranges from approximately 602/604 m^3/day in the servicing and treatment reports to 701.5 m^3/day in the groundwater assessment. Peak-day demand ranges from approximately 1,047–1,062 m^3/day to 1,303 m^3/day, while peak-hour demand is reported as both 21.5 L/s and 27 L/s. The annual groundwater allocation of 256,230 m^3 equates to approximately 702 m^3/day, and the stated 1,000 m^3/day treatment capacity is below several of the reported peak-day demands.

The calculations also rely on a 20% reduction for water-efficient fittings, while rainwater harvesting is optional and should not be treated as a firm demand reduction. Demand assumptions should be confirmed for all activities, particularly surf-lagoon filling and top-up, hospitality, irrigation, industrial uses and any data-centre cooling, humidification, cleaning or commissioning requirements.

The applicant should provide one controlled, stage-by-stage demand schedule and integrated water balance reconciling raw-water abstraction, treatment recovery, storage, consumer demand, network losses, treatment residuals and wastewater generation. Until this is provided, it cannot be confirmed that the proposed abstraction, treatment, storage and wastewater systems have been consistently sized.

Water Treatment

The proposed treatment process is based principally on two Bore 1 grab samples collected in September 2025, one shortly after bore construction and flushing. The results identified elevated boron of approximately 5.9–7.4 mg/L and fluoride of approximately 3.8 mg/L, together with elevated sodium, chloride, conductivity and total dissolved solids. Representative testing is required for each bore, including seasonal variability and the supplementary surface-water source.

Reverse osmosis or selective ion exchange, followed by ultraviolet disinfection and/or chlorination, is proposed. Both options may be suitable, but the final process has not been selected or demonstrated. The design should confirm contaminant removal, microbial treatment barriers, recovery, treated-water stabilisation, residual disinfection, monitoring and shutdown controls. It should also address management of reverse-osmosis retentate or ion-exchange regeneration waste, as applicable.

The assumed 90% treatment recovery and residual flow of 125.3 m^3/day should be reconciled with the final water demand and incorporated into the wastewater treatment and discharge assessments. The nominal 1,000 m^3/day treatment capacity is also below the reported peak-day demand of approximately 1,047–1,303 m^3/day. If storage is intended to balance this shortfall, an

operating balance should demonstrate treatment production, tank drawdown and recovery under normal and contingency conditions.

Water Storage

The reported storage volume is inconsistent, with different sections referring to 2,000 m^3, 2,500 m^3 and 3,200 m^3. A single design volume should be confirmed and supported by calculations demonstrating at least 48 hours of security of supply.

The assessment should be based on usable rather than nominal storage and account for operational balancing, firefighting reserve, dead storage, minimum operating levels and treatment-plant downtime. It should also demonstrate adequate potable and firefighting supply with one tank, bore, pump, treatment unit or power supply unavailable.

The proposed two-tank arrangement is appropriate in principle because it allows a tank to be isolated for maintenance. However, the final design should also address tank turnover, stratification, disinfectant-residual decay and network water age, particularly during early development stages when demand is lower.

Firefighting Supply, Reticulation and Hydraulic Assessment

This is outside of my scope of expertise, and I defer to the Development Engineer on these aspects.

Water Supply - Conclusion

The proposed private water-supply system is feasible in principle. Bore 1 testing provides useful preliminary evidence of groundwater availability, and suitable treatment technologies are likely to be available for the identified raw-water contaminants.

The supply must be registered with Taumata Arowai and operated in accordance with the Water Services Act. Occupation of each stage should not occur until adequate source, treatment, storage and operational capacity has been commissioned and certified, without reliance on untested bores or future public infrastructure.

Governance

While the conditions propose a dedicated Utility Company to own, operate and maintain the private water, wastewater and stormwater infrastructure, framework for governance has not been finalised. In particular how the Utility Company would be arranged with the residents society, the renewal arrangements, and how insolvency of such a company would be managed should be defined.

7.0 Section 67 Information Gap

I recommend that the following information be requested under section 67 of the Fast-track Approvals Act 2024. Detailed design may remain subject to post-consent certification, but the information provided must demonstrate a feasible design and clearly define the effects envelope.

1. **Integrated servicing design basis**

Provide a controlled, stage-by-stage design basis covering development yield, occupancy, water demand, wastewater flows and contaminant loads. This should reconcile the differing average and peak figures across the application documents and identify all design assumptions, peaking factors, treatment capacities and staging allowances.

2. **Integrated water and wastewater balance**

Provide an integrated balance covering raw-water abstraction, treatment recovery, potable-water production, storage, demand, network losses, water-treatment residuals, wastewater generation, treatment recycles, MBR permeate, RO permeate and retentate, land application and surface-water discharge. Average, peak-day and critical operating conditions should be included.

3. **Wastewater collection and treatment capacity**

Confirm the instantaneous hydraulic peaking factor for the low-pressure sewer and demonstrate how pump operation will be controlled to prevent overloading of the wastewater treatment plant. Demonstrate that the 700 m^3/day plant has adequate firm hydraulic and process capacity for wastewater, water-treatment residuals and internal recycle streams at each stage, including relevant equipment-outage conditions.

4. **Treatment and discharge staging**

Provide objective and enforceable triggers for commissioning each treatment and discharge stage. These should be based on connected development, measured flows and certified treatment and disposal capacity, and should allow sufficient time for construction, commissioning and performance testing before existing capacity is exceeded.

5. **Land-application system**

Provide a final land-application concept identifying the available areas, design application rates, storage, irrigation controls, setbacks and replacement area. Any proposed rate above 3 mm/day should be supported by site-specific soil testing and a calibrated soil-water balance. The assessment

should also address seasonal groundwater levels, consecutive wet periods, equipment outages and loss of part of the disposal area. Currently, a consent limit of 10.8mm/day and a BOD loading of 600kg/ha/day has been adopted. I consider both of these to be too high, and no justification has been provided for these consent conditions within the documentation.

6. **Treatment residuals and contaminant mass balance**

Provide a contaminant mass balance for boron, fluoride, sodium, chloride and total dissolved solids through the water and wastewater systems, including their final discharge to land, surface water or off-site disposal. What volume of slugged shall be removed from site and provide confirmation of the receival facility to be used?

7. **Surface-water discharge regime**

Confirm the final discharge rates, frequencies and routing, including the proportions directed to the land-contact system and irrigation.

8. **Water source, treatment and storage**

Confirm the reliable yield and representative water quality of each proposed bore and the supplementary surface-water source. Identify the selected treatment process and demonstrate boron and fluoride removal, microbial barriers, treatment recovery and residual management. Reconcile the 1,000 m^3/day treatment capacity with the reported peak demand and reconcile the proposed storage volumes of 2,000 m^3, 2,500 m^3 and 3,200 m^3, including usable storage and the claimed 48-hour security of supply.

9. **Governance and operation**

Provide a governance plan identifying the proposed Utility Company, asset and consent ownership, drinking-water supplier, treatment operator, relationship with the Residents Society, funding and renewal arrangements, and provisions for default, insolvency or transfer. The plan should also explain how adequate source, treatment, storage and disposal capacity will be certified before occupation of each stage.

8.0 Recommendation

The proposed private water and wastewater servicing systems are technically feasible in principle, and the proposed treatment technologies are capable of achieving the required potable-water and treated-effluent quality, noting that the cotgncentrations proposed for treated wastewater effluent

are very difficult to meet, even allowing for RO. I do not consider that the servicing approach should be opposed in principle.

However, the application documents do not yet provide a sufficiently consistent and integrated basis to confirm source security, treatment and disposal capacity, discharge effects or long-term operational resilience. I therefore recommend that the information identified in Section 7.0 be requested under section 67 of the Fast-track Approvals Act 2024. These matters are fundamental to defining the authorised activity and should not be deferred entirely to post-consent detailed design.

Subject to satisfactory responses to the section 67 requests, confirmation from the relevant ecological, hydrogeological and development-engineering specialists, and an appropriately amended condition set, the proposal could be supported. The conditions should secure stage-specific capacity, commissioning and occupation controls, maximum flows and loads, treatment and discharge performance, monitoring and shutdown requirements, trade-waste controls, and long-term governance and operation of the private infrastructure.

9.0 Proposed Conditions

Table 1 – Applicants Proposed Consent Conditions.

301	General accordance	The wastewater treatment process at the WWT Precinct and physical discharge facilities must be designed, operated and maintained in general accordance with the plans and information referenced in Condition (1).	**No technical objection**	Complete references and add certified detailed-design requirements.
302	Duration	Discharge permit [insert DIS ref] will expire 35 years from the commencement date unless it has lapsed, been surrendered or been cancelled at an	**No technical objection**	

		earlier date, pursuant to section 123 of the RMA.		
303	Discharge volume	The annual daily average volume of treated wastewater discharged to either the land contact device, the irrigation field or a combination of both locations must not exceed 585m3/day (as a 12-month rolling mean).	**Amend**	Add a maximum 24hr limit to reflect potential for infiltration, and requirement to rectify any infiltration.
304	Flow records	A record of the volume of wastewater discharged daily to the both the land contact device and the irrigation field must be kept by the Consent Holder at all times. The Consent Holder must make this data available for the Council at their request	**Amend**	Continuous separate metering, telemetry and five-year retention.
305	RO permeate quality	As measured directly after the Reverse Osmosis treatment step, the treated wastewater permeate discharged to the land contact device must comply with the following standards as a 12-month median: (a) Total Nitrogen (kg/day) - 0.410kg/d (b) Ammoniacal Nitrogen (kg/d) - 0.045kg/d (c) cBOD5 (kg/day) - 0.410kg/d (d) Total Suspended Solids (kg/day) - 1.638kg/d (e) Total Phosphorous (kg/day) - 0.008kg/d	**Amend**	Add concentration and acute limits, correct references, address salinity and prohibit unauthorised RO reject. Noting that even for RO, this permeate is extremely tight. Can these concentrations be reliably met? What is the discharge quality of the RO retentate?

		(f) Escherichia-coli (CFU/100mL) - 4 CFU/100mL		
306	Exceedance response	Should four consecutive samples return results above the median limits for any of the parameters detailed above, the Consent Holder must notify the Council within 5 working days of the latest result. The Consent Holder must then conduct an investigation into the cause, supported by a report to be supplied to the Council. The report must outline the actions being undertaken to address and remedy the cause of the trigger level exceedance and detail whether further monitoring is required.	**Amend**	Immediate escalation for acute or pathogen failures.
307	Irrigation loadings	As measured directly prior to the discharge to the irrigation field, the discharge must comply with the following standards: (a) Total Nitrogen (kg/hectare/year) - 220 (b) Total Phosphorous (kg/hectare/year) - 80 (c) cBOD5 (kg/hectare/day) - 600	**Do not accept as drafted**	BOD5 Limit is too high in practice, more appropriate at 150kg/ha/day/. Not enough information on the disposal field design or investigation provided.
308	Sampling	The Consent Holder must take 24-hour flow proportioned samples taken in general accordance with Condition (304) (monitoring treated wastewater discharge	**Agree with correction**	Correct cross-reference and define each compliance point.

		flows and volume) of the treated wastewater on a fortnightly basis from the treated wastewater compliance monitoring point and analyse for the parameters set out below. (a) Total Nitrogen (b) Ammoniacal Nitrogen (c) Nitrate Nitrogen (d) Nitrite Nitrogen (e) cBOD5 (f) Total Suspended Solids (g) Dissolved Reactive Phosphorus (h) Total Phosphorus (i) Escherichia-coli (j) Enterococci (k) Temperature (l) Electrical Conductivity		
309	Laboratory	IANZ-accredited or equivalent analysis.	**Agree**	Retain.
310	UV dose	40 mWs/cm2 for 85% of discharge time monthly.	**Agree in principle**	Add continuous record, alarms and corrective response.
311	Reduced sampling	Council may reduce sampling during low-flow early stages.	**Amend**	No reduction during commissioning or first 12 months.
312	Sampling facilities	Accessible post-treatment sampling before each pathway.	**Agree**	Retain and provide separate final-stream points.

313	Environmental plan	Certified WWT Plant Environmental Management Plan.	**Agree**	Retain.
314	Irrigation design	The Consent Holder must submit the detailed design of the irrigation field to the Council prior to installation. The detailed design must include, at a minimum:	**Replace**	Use expanded detailed irrigation design in Additional Draft Conditions.
315	Upgradient piezometer	Install six months before discharge.	**Agree**	Link to defined baseline programme.
316	Downgradient piezometer	Install six months before discharge.	**Agree**	Confirm representative location.
317	Piezometer standard	Install to NZS 4411:2001 and provide logs.	**Agree**	Retain.
318	Baseline surveys	Baseline water and ecology surveys.	**Agree**	Retain; correct drafting.
319	Operation gateway	Conditions 320 to 327 before operation.	**Amend**	Add design, commissioning, storage and residuals conditions.
320	Notice	10 working days notice of commencement.	**Agree**	Retain.
321	Flow meters	Meter daily discharge to both pathways.	**Amend**	Separate totalisers, telemetry, alarms, calibration and backup.

322	Hazardous substances	Supply required compliance certificates.	**Agree**	Retain.
323	OMM	Certified operating manual before discharge.	**Agree, with some additions for specificity**	Add design loads, process limits, alarms, redundancy, storage, residuals, irrigation controls and operator competency.
324	ERP	Certified emergency response plan.	**Agree with correction**	Correct EMP to ERP in 2nd sentence; add overflow, cessation, storage and notification procedures.
325	Weather station	Continuous meteorological monitoring.	**Agree**	Retain.
326	Odour plan	Certified odour management plan.	**Agree**	Retain.
327	Adaptive loading	Council may adjust mass loads on request.	**Delete or qualify**	Material changes require s127/new consent; certification must not enlarge scope. I assume this has been included to facility the change to a WEPS regime – can this be accommodated under the RMA? A change to the discharge limits changes the effects or potential effects of the discharge.
328	Council access	Reasonable access for monitoring.	**Agree**	Retain.
329	Working order	Maintain plant and disposal system.	**Agree**	Retain.

330	Signage	Discourage unauthorised access.	**Agree**	Retain.
331	Noise	Operational noise limits.	**Other specialist scope**	Retain subject to acoustic review.
332	Truck access	Restricted service-truck hours.	**No wastewater objection**	Retain subject to transport/noise review.
333	Land-contact maintenance	Qualified monitoring and maintenance.	**Agree**	Retain.
334	Quarterly maintenance	Three-monthly disposal-system inspections.	**Agree**	Retain.
335	SCADA flows	Continuous flow monitoring; retain two years.	**Amend**	Retain at least five years; pathway-specific data, alarms and calibration.
336	Operator	Qualified party responsible for daily operation.	**Agree**	Retain.
337	24/7 response	Operator available for odour contingencies.	**Expand**	Cover all discharge, public-health and environmental contingencies.
338	EMP implementation	Operate to certified EMP.	**Agree**	Retain.
339	EMP review	Review after 12 months.	**Amend**	Also review after significant change.

340	EMP onsite	Keep accessible onsite.	**Agree**	Retain.
341	Hazardous inventory	Keep inventory, SDS and spill plan current.	**Agree**	Retain.
342	Spill kits	Maintain suitable spill kits.	**Agree**	Retain.
343	OMM review	Review every three years and after changes.	**Agree**	Retain.
344	Air pollutants	No harmful hazardous air pollutant beyond boundary.	**Agree in principle**	Correct incomplete wording; air-quality review.
345	Visible emissions	No offensive or objectionable visible emissions.	**Agree in principle**	Retain subject to air-quality review.
346	Air incident notice	Notify Council of significant air discharge.	**Agree**	Correct reference and formatting.
347	Odour control	Enclose and ventilate specified sources.	**Agree**	Retain.
348	Aeration DO	DO not below 0.1 ppm for over 12 hours.	**Review required**	Please clarify this.
349	Process monitoring	Continuous influent, DO, ORP and fan monitoring; two-year records.	**Amend**	Five-year retention; include membranes, RO, UV and storage.

350	Power outage	Alarm, auto-generator and four-hour UPS.	**Agree**	Confirm capacity covers all critical processes.
351	Annual report	Prepare annually; submit only if requested.	**Amend**	Make submission mandatory and expand listed content.
352	Air non-compliance	Notify significant air discharge.	**Agree**	Add equivalent wastewater-incident notification.
353	Odour complaints	Maintain detailed complaint log.	**Agree with correction**	Correct drafting and replace Condition XX.
354	Irrigation rate	Maximum 10.4 mm/day.	**Do not accept without verification**	Demonstrate site-specific suitability and explain difference from Stage 1 2 mm/day.
355	Wet soils	Isolate wet zones and divert to others.	**Amend**	Only divert where spare compliant capacity exists; otherwise stop and store.
356	Drinking-water setback	40 m from drinking-water bores/surface sources.	**Agree but incomplete**	Add setbacks from waterways, drains, groundwater, boundaries, structures and services.
357	Land-use restrictions	No roads, hardstand or intensive turf.	**Agree**	Protect reserve areas from compaction and development.
358	Groundwater trend	Monitor nitrate-N and E. coli.	**Amend**	Specify frequency, both bores, levels, baseline and triggers.
359	Groundwater suite	Test listed wastewater indicators.	**Amend**	Specify programme and add conductivity/sodium where relevant.

360	Reduced groundwater monitoring	May reduce after five years with no statistical difference.	**Clarify**	Define biannual and require trend assessment.
361	Soil monitoring	Annual samples at seven sectors; possible reduction.	**Amend**	Add baseline and action levels for salinity, sodium and phosphorus.
362	Qualified monitoring	Water/ecology work by qualified specialist.	**Defer to Ecologist**	.
363	Locations	Upstream controls and downstream impact site.	**Defer to Ecologist**	
364	Surface water	Quarterly baseline and operational monitoring.	**Defer to Ecologist**	Complete truncated criterion before any frequency reduction.
365	Ecology	Baseline then annual summer surveys.	**Defer to Ecologist**	
366	Deterioration	Investigate, report and remedy attributable effects.	**Defer to Ecologist**	Require interim measures where effects continue.
367	Environmental report	Annual monitoring report and attribution assessment.	**Agree with correction**	Correct minor drafting.