

GWE Proposed Condition	Apex Comment	Suggested Outcome
<p>Activity in Accordance with Plans</p> <p>1) The discharge activities shall be carried out in accordance with the plans and information submitted with the application (detailed below):</p> <ul style="list-style-type: none"> • “Design Report Karaka North Village Water and Wastewater Treatment” (Ref. 210203, V2, February 2022 by Apex Environmental). • “Karaka North Treated Wastewater Discharge Assessment” (Final, Ref. 64396 #BEE07, 19 January 2022, by Babbage). 		<p>Already in applicant’s proposed conditions refer conditions 9 and 265</p>
<p>Duration of Consent</p> <p>2) This consent shall expire on 31 March 2057.</p>		<p>Already in applicant’s proposed conditions refer condition 266</p>
<p>Discharge Volume</p> <p>3) The total volume of treated wastewater discharged to the irrigation field (or the disposal trench, or a combination of both) shall not exceed 850 m³/day, unless discharge has not taken place to the irrigation field the previous day.</p>	<p>The consent condition proposed by GWE is already covered satisfactorily within the application set by conditions 294 and 342.</p> <p>The adoption of GWE’s proposed condition here would be in contradiction with the operational philosophy of the wastewater treatment plant and lead to issues with the wastewater discharge system for two reasons:</p> <ul style="list-style-type: none"> - It does not consider the scenario where restricted irrigation occurs - It would contradict with operational philosophy to maximise beneficial re-use of treated wastewater by preferentially disposing of this via land irrigation <p>The irrigation field will be broken into 7 separate zones, each with individual soil moisture monitoring feeding back to the plant’s control system. When the soil moisture monitoring indicates that a zone is waterlogged, the irrigation system will automatically bypass that zone, removing it from the irrigation cycle. There will be periods where some zones are too waterlogged to receive irrigation whilst others are not. There will also be scenarios where some (or all zones) are available for irrigation but these will not be able to receive their full potential 20mm/d allowance. In these scenarios irrigation will occur, but not the full daily volume of treated wastewater produced.</p> <p>The overall design philosophy is to maximise the beneficial re-use of treated wastewater by sending it preferentially to the irrigation field. The system as designed will hold back treated wastewater in reserve (1ML reservoir) before diverting this to the infiltration trench when there is no longer storage capacity available. As a result, there will be periods where there is greater than 850m³/d available for discharge to the irrigation field while irrigation has occurred on the previous day.</p> <p>The condition proposed by GWE does not account for restricted irrigation and as a consequence the plant would need to be operated in such a way</p>	<p>Already in applicant’s proposed conditions refer conditions 294 and 342.</p>

	that would result in larger volumes of treated wastewater being diverted to the infiltration trench.																	
4) The annual daily average volume of treated wastewater discharged to the irrigation field (or the disposal trench, or a combination of both) shall not exceed 704 m ³ /d.		Applicant conditions should be updated to include this condition																
5) Prior to the exercise of this consent, the consent holder shall install a flow meter, at a location approved by the Council, to record the daily volume of wastewater discharged to the irrigation field and the rapid infiltration trench. A record of the volume of wastewater discharged daily to the land application area shall be kept by the consent holder at all times. The consent holder shall forward the record for the previous year to the Council upon request.	It is accepted that GWE's proposed condition 2 intends to combine the conditions 306 & 333 proposed by the applicant through use of more efficient wording. However, it is the applicant's belief that the wording does not clearly indicate that the monitoring of these two separate discharges must be achieved through the installation of dedicated instruments unique to each discharge pipeline.	Already in applicant's proposed conditions refer conditions 306 and 333																
<p>Discharge Quality</p> <p>6) The treated wastewater effluent from the wastewater treatment system prior to discharge to the land application area and/or the rapid infiltration trench shall comply with the following criteria:</p> <p><i>Table 1: Summary of discharge scenarios</i></p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>12-month median shall not exceed</th> </tr> </thead> <tbody> <tr> <td>Total Nitrogen [mg/L]</td> <td>5</td> </tr> <tr> <td>Ammoniacal Nitrogen</td> <td>2</td> </tr> <tr> <td>cBOD5 [mg/L]</td> <td>5</td> </tr> <tr> <td>Total Suspended Solids [mg/L]</td> <td>4</td> </tr> <tr> <td>Total Phosphorus [mg/L]</td> <td>2</td> </tr> <tr> <td>Escherichia-coli [cfu/100mL]</td> <td>2</td> </tr> <tr> <td>Enterococci [cfu/100mL]</td> <td>2</td> </tr> </tbody> </table>	Parameters	12-month median shall not exceed	Total Nitrogen [mg/L]	5	Ammoniacal Nitrogen	2	cBOD5 [mg/L]	5	Total Suspended Solids [mg/L]	4	Total Phosphorus [mg/L]	2	Escherichia-coli [cfu/100mL]	2	Enterococci [cfu/100mL]	2	<p>It is the applicant's belief that the proposed condition does not provide sufficient clarity as to the location where sampling must occur.</p> <p>For a discharge to the land application area, the sampling location must be immediately prior to the discharge to land. This would be any location post the recycled water reservoir.</p> <p>The applicant believes this wording should be retained to ensure the effect the reservoir has on treated water quality and hence discharges to the irrigation field are captured.</p> <p>Due to the effects of chlorine contact, settling and dilution, treated wastewater entering the reservoir will have a different profile than that leaving the reservoir when analysed for the parameters noted in Table 3.</p>	Applicant proposed conditions 315 and 331 cover this aspect however they need to be updated to include a median Enterococci [cfu/100mL] level of 2 cfu/100mL as suggested by GWE
Parameters	12-month median shall not exceed																	
Total Nitrogen [mg/L]	5																	
Ammoniacal Nitrogen	2																	
cBOD5 [mg/L]	5																	
Total Suspended Solids [mg/L]	4																	
Total Phosphorus [mg/L]	2																	
Escherichia-coli [cfu/100mL]	2																	
Enterococci [cfu/100mL]	2																	
7) The UV dose must be greater than 40mWs/cm ² 99% of the time.		Applicant conditions should be updated to include this condition																
8) The chlorine residual in the treated wastewater must be greater than 0.3 mg/L 99% of the time.	<p>It is the applicant's belief that Condition 8 proposed by GWE is in contradiction to their subsequent proposed Condition 25. Condition 25 specifically excludes chlorination of treated water being discharged to the irrigation trench.</p> <p>The applicant proposes the following wording amendment is adopted: <i>'Water discharged to the irrigation field shall be exposed to at least 0.3mg/L of free available chlorine for a minimum contact time of 30 seconds prior to discharge.'</i></p> <p>As stated by GWE, there is a requirement for a chlorine concentration but not a time. Without specifying a minimum contact time, the level of disinfection cannot be guaranteed.</p>	<p>Applicant conditions should be updated to include requirement for chlorination requirement as proposed below by APEX</p> <p><i>Water discharged to the irrigation field shall be exposed to at least 0.3mg/L of free available chlorine for a minimum contact time of 30 seconds prior to discharge</i></p>																

	Specifying a minimum concentration and minimum contact time, provides a higher level of certainty around the disinfection step.	
9) If a single sample of the effluent from the wastewater treatment system exceeds the limits set in Conditions 5 to 7 above, the consent holder shall investigate and provide an explanation to the Team Leader, Compliance Monitoring South of the potential causes and corrective actions of the exceedance within 15 working days of obtaining the monitoring results. A further sample shall be taken and analysed for the parameter that has been exceeded once action has been taken to address the failure. The results shall be forwarded to the Team Leader, Compliance Monitoring South within seven days of receipt of the result.	The GWE condition refers to a single sample of effluent, however the limits in the conditions it refers to relate to 12 month medians. By definition of 'median' half of the samples could be over the limit and the plant be compliant with the conditions. Accordingly the GWE condition needs to be amended to delete the words "If a single sample of effluent", or modified to "if three or more consecutive samples exceed the limits"... in order to require an investigation if a negative trend is occurring in the data.	Applicant condition 316 should be updated to reflect this GWE and APEX comments.
Discharge to Irrigation Field 10) The wastewater treatment plant shall be as per "Design Report Karaka North Village Water and Wastewater Treatment" (Ref. 210203, V2, February 2022 by Apex Environmental), comprising the key components of Membrane Bioreactor Plant, Ultraviolet (UV) disinfection, and chlorine disinfection.		Already in applicant's proposed conditions refer conditions 9 and 265
11) The irrigation fields shall be spread across 7.12 ha.	The applicant considers that condition 303 is more appropriate because the irrigation fields requires integration with the final/detailed landscape plans	Already in applicant's proposed conditions refer condition 303
12) If discharge to the disposal field has not taken place the previous day, up to 20 mm/d of treated wastewater can be applied to the disposal field.	The condition proposed by GWE does not account for periods where irrigation to the irrigation field is available but restricted in volume. (refer to explanation against condition 3 above). The adoption of this condition would contradict the overall operational philosophy of the wastewater discharge system to preferentially discharge treated wastewater to the irrigation field. The consequence of this could be that larger volumes of water would be discharged to the infiltration trench.	The controls on discharge volumes to the disposal field are in the applicant's proposed conditions 294, 295 and 296.
13) Should soil moisture monitoring, as specified by Condition 64e indicate that the soil of one or more of the individual zones within the irrigation field is at risk of becoming waterlogged before irrigation commences, these individual irrigation zones shall be isolated and treated wastewater shall be diverted to the other irrigation zones, or alternatively to the infiltration trenches. No treated wastewater irrigation shall commence into the isolated zones until the soil moisture content, as specified by Condition 64e indicates that the soil moisture levels are suitable for irrigation.		Already in applicant's proposed conditions refer condition 296
14) No treated water shall be applied to land within 40 m of any bore used for abstraction of water for human consumption		Already in applicant's proposed conditions refer condition 328
15) The discharge shall only be treated domestic and commercial wastewater as described in the consent application and as detailed within the Karaka North Village Water and Wastewater Treatment Design Report (Ref: 210203) by Apex Environmental.		Already in applicant's proposed conditions refer condition 297

<p>16) The land application area shall be designed in accordance with the figure in Appendix 1 of “Design Report Karaka North Village Water and Wastewater Treatment” (Ref. 210203, V2, February 2022 by Apex Environmental).</p>		<p>Already in applicant’s proposed conditions refer condition 298. Applicant wording refers to ‘in <u>general</u> accordance’</p>
<p>17) The land application area shall not be used:</p> <ul style="list-style-type: none"> a) For roading whether sealed or unsealed. b) As a hardstanding area. c) For erecting buildings or any non-effluent system structures. d) For activities that require intensively managed grass surfaces (e.g. grass tennis courts, bowling greens and golf tees and greens) 		<p>Already in applicant’s proposed conditions refer condition 299</p>
<p>18) The land application area shall be planted with grass, shrubs, trees or a fodder crop species and can be grazed by cattle or sheep or mowed.</p>		<p>Already in applicant’s proposed conditions refer condition 300</p>
<p>19) The total nitrogen loading in the land application area shall not exceed 220 kilograms of nitrogen per hectare per year. The calculated nitrogen loading shall be included as an item within the Condition 72 annual report.</p>		<p>Already in applicant’s proposed conditions refer condition 301</p>
<p>20) A buffer zone of a minimum of ten metres shall be maintained between the discharge of wastewater in the land application area and any surface water body, stormwater channel and/or pond.</p>		<p>Already in applicant’s proposed conditions refer condition 302</p>
<p>21) The consent holder shall submit the detailed design of the irrigation field to the council before installation. The detailed design shall include, at a minimum:</p> <ul style="list-style-type: none"> a) A final layout of the overall irrigation field and irrigation zones. b) A layout showing buffer distances from watercourses, buildings, bores and other features requiring buffer separation from the irrigation drip lines. c) A landscape plan, highlighting planting within the irrigation field including suitable grass species. d) Details of the sub-surface irrigation system design, including dripline depth, emitter type, emitter spacing and lateral spacing. 		<p>Already in applicant’s proposed conditions refer condition 303</p>
<p>22) The land application pasture area shall be planted with grass species that have roots that typically extend in excess of 300mm below the ground surface.</p>		<p>Already in applicant’s proposed conditions refer condition 304</p>
<p>23) Signage shall be placed at access ways to the irrigation field to alert visitors that irrigation of treated wastewater is taking place below the surface of the ground.</p>		<p>Applicant conditions should be updated to include this condition.</p>
<p>Discharge to Rapid Infiltration Trench</p> <p>24) The rapid infiltration shall be constructed as per Section 6.9.6 in the Karaka North “Design Report Karaka North Village Water and Wastewater Treatment” (Ref. 210203, V2, February</p>		<p>Applicant conditions should be updated to include this condition, with words ‘in general accordance’</p>

2022 by Apex Environmental).		added.
25) No chlorine dosing shall take place when discharge is to the rapid infiltration trench.	This condition contradicts GWE's condition 8 which states that there should be a concentration of 0.3mg/L in the treated wastewater for 99% of the time. The amendment to condition 8 proposed by Apex addresses this and this condition 25 should now be included.	Applicant conditions should be updated to include this condition.
26) The discharge trench shall be fenced off and signposted to discourage access to the area.		Applicant conditions should be updated to include this condition.
27) The agents of the Auckland Council shall be permitted to have access to the WWTP and discharge facilities at all reasonable times for the purpose of carrying out monitoring procedures, inspections, surveys, investigations, tests, measurements or take samples while adhering to the consent holder's health and safety policies.		Already in applicant's proposed conditions refer condition 269
Riparian Planting		
28) Riparian planting to be carried out in accordance with the Greenwood Associates Plans (REF 20035/3, dated 03/11/20 and any further detailed riparian planting plans accompanying the overall development submission).		Already provided for in applicant's proposed condition refer conditions 329
Performance Monitoring		
29) The consent holder shall give the Council no less than 10 working days' notice of the first exercise of this consent.		Already in applicant's proposed conditions refer condition 305
30) Prior to the exercise of this consent, the consent holder shall install a flow meter, at a location approved by the Council, to record the daily volume of wastewater discharged to the land application area and to the rapid infiltration trench.	It is accepted that GWE's proposed condition 2 intends to combine the conditions 306 & 333 proposed by the applicant through use of more efficient wording. However, it is the applicant's belief that the wording does not clearly indicate that the monitoring of these two separate discharges must be achieved through the installation of dedicated instruments unique to each discharge pipeline.	Already in applicant's proposed conditions refer conditions 306 and 333
31) A record of the volume of wastewater discharged daily to the land application area and rapid infiltration trench shall be kept by the consent holder at all times. The consent holder shall forward the record for the previous year to the Council upon request.		Already in applicant's proposed conditions refer conditions 306 and 333
32) Prior to the exercise of this consent, the consent holder shall establish adequate facility and access for wastewater quality sampling of the treated wastewater before the wastewater discharges to the land application area. This shall be at the minimum: a) A manual valve located within the treatment plant compound. b) Located post the last treatment step but prior to discharge to either the irrigation field or infiltration trench. c) Installed in a position accessible from ground level but no higher than 1.5 m.		Already in applicant's proposed conditions refer condition 307
33) Within one month of the first exercise of this consent, the consent holder shall supply the Council with a Producer Statement/Certificate of Compliance from a suitably qualified person,		Already in applicant's proposed conditions refer condition 308

certifying that the wastewater treatment plant and land application areas have been constructed as required by this consent.																																
<p>34) The consent holder shall provide as-built plans and aerial photos of the treatment and land application system to the Council prior to the exercise of this consent, and if or when any substantive changes are made to the land application system. These shall include, but are not limited to, the following:</p> <p>a) Plans of the treatment system.</p> <p>b) Plans of the land application area clearly showing all the irrigation zones.</p> <p>Details of the area of each zone, the maximum volumes of wastewater that can be discharged to each zone (m3/day), the duration of discharge (hours) and daily frequency of each zone application</p>		Already in applicant's proposed conditions refer condition 309																														
<p>Treated Wastewater Monitoring</p> <p>35) The consent holder shall take 24-hour flow proportioned samples of the treated wastewater on a fortnightly basis from the treated wastewater compliance monitoring point, for the purposes of determining compliance with Conditions 5 and 6, and monitoring under Condition 53. All wastewater quality analyses shall be undertaken by an IANZ accredited or equivalent laboratory. All methods used shall be appropriate for the wastewater analyses undertaken.</p>		Already in applicant's proposed conditions refer condition 334. Note applicant condition this to be done monthly as this is the frequency required by the earlier conditions																														
<p>36) The consent holder shall ensure and be able to demonstrate that a UV dose of a minimum of 40 mWs/cm² is delivered by the UV disinfection facility 99% of the time (calculated on the basis of a 15-minute average) over each calendar month.</p>		Applicant conditions should be updated to include this condition																														
<p>37) The consent holder shall take 24-hour flow proportioned samples (taken in accordance with Condition 35) of the treated wastewater on a fortnightly basis from the treated wastewater compliance monitoring point and analyse for the parameters set out in Table 3.</p> <p><i>Table 2: Treated Wastewater Quality Monitoring</i></p> <table border="1" data-bbox="281 1333 1074 2001"> <thead> <tr> <th>Parameters</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Total Nitrogen</td> <td>(mg/L)</td> </tr> <tr> <td>Ammoniacal Nitrogen</td> <td>(mg/L)</td> </tr> <tr> <td>Nitrate Nitrogen</td> <td>(mg/L)</td> </tr> <tr> <td>Nitrite Nitrogen</td> <td>(mg/L)</td> </tr> <tr> <td>cBOD5</td> <td>(mg/L)</td> </tr> <tr> <td>Total Suspended Solids</td> <td>(mg/L)</td> </tr> <tr> <td>Dissolved Reactive Phosphorus</td> <td>(mg/L)</td> </tr> <tr> <td>Total Phosphorus</td> <td>(mg/L)</td> </tr> <tr> <td>Escherichia-coli</td> <td>(cfu/100mL)</td> </tr> <tr> <td>Enterococci</td> <td>(cfu/100mL)</td> </tr> <tr> <td>Temperature</td> <td>°C</td> </tr> <tr> <td>Electrical Conductivity</td> <td>mS/cm</td> </tr> <tr> <td>Total Residual Chlorine</td> <td>(mg/L)</td> </tr> <tr> <td>pH</td> <td>-</td> </tr> </tbody> </table>	Parameters	Unit	Total Nitrogen	(mg/L)	Ammoniacal Nitrogen	(mg/L)	Nitrate Nitrogen	(mg/L)	Nitrite Nitrogen	(mg/L)	cBOD5	(mg/L)	Total Suspended Solids	(mg/L)	Dissolved Reactive Phosphorus	(mg/L)	Total Phosphorus	(mg/L)	Escherichia-coli	(cfu/100mL)	Enterococci	(cfu/100mL)	Temperature	°C	Electrical Conductivity	mS/cm	Total Residual Chlorine	(mg/L)	pH	-	Additional monitoring of enterococci is acceptable. This is starting to be more common in some parts of the country.	<p>GWE have introduced Enterococci monitoring and the applicant considers that condition 335 should be updated to reflect this.</p> <p>As in 35 above applicant condition wording refers to monthly sampling consistent with the early consent condition wording.</p>
Parameters	Unit																															
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<p>Groundwater Monitoring</p> <p>38) The consent holder shall establish a control piezometer up-gradient of all land application areas at least six months prior to exercising this consent and begin groundwater monitoring in accordance with Condition 40 of this consent.</p>		<p>Already in applicant's proposed conditions refer condition 310</p>									
<p>39) The consent holder shall establish a down-gradient piezometer at least six months prior to exercising this consent. and begin groundwater sampling in accordance with Condition 40 of this consent.</p>		<p>Already in applicant's proposed conditions refer condition 311</p>									
<p>40) The piezometers shall be installed in accordance with the methods given in New Zealand Standard 4411:2001, "Environmental Standard for Drilling of Soil and Rock". The consent holder shall confirm the exact location of the piezometers with the Council prior to installation. A bore log shall be forwarded to the Council for each of the piezometers installed in accordance with Conditions 38 and 39 of this consent. Each log shall clearly indicate the depth of the bore and the depth to groundwater.</p>		<p>Already in applicant's proposed conditions refer condition 312</p>									
<p>41) The consent holder shall investigate and forward a written report to the Council within 15 working days of receiving notice of an exceedance if any of the following are met:</p> <p>a) The down-gradient monitoring bores have a nitrate- nitrogen concentration greater than 5 mg/L.</p> <p>b) The down-gradient monitoring bores have an Escherichia coli of 10 cfu/100 mLs or more.</p> <p>The report shall outline the likely reasons for the exceedance and methods to reduce the adverse effect.</p>		<p>Already in applicant's proposed conditions refer condition 313</p>									
<p>42) Following the commissioning of the treatment and land application system, the consent holder shall obtain representative samples for submission to the council and inclusion within the Condition 72 Annual Report of the effluent and test for the following parameters.</p> <p><i>Table 3: Effluent Testing Parameters</i></p> <table border="1" data-bbox="284 1398 1391 1682"> <thead> <tr> <th>Parameters</th> <th>Monitoring Frequency</th> </tr> </thead> <tbody> <tr> <td>Total Nitrogen Nitrate-Nitrogen</td> <td rowspan="7">Fortnightly</td> </tr> <tr> <td>Ammoniacal Nitrogen</td> </tr> <tr> <td>Carbonaceous 5-day Biochemical Oxygen demand (cBOD5)</td> </tr> <tr> <td>Total Suspended Solids Total Phosphorus Escherichia Coli</td> </tr> <tr> <td>Enterococci</td> </tr> <tr> <td>pH</td> </tr> </tbody> </table>	Parameters	Monitoring Frequency	Total Nitrogen Nitrate-Nitrogen	Fortnightly	Ammoniacal Nitrogen	Carbonaceous 5-day Biochemical Oxygen demand (cBOD5)	Total Suspended Solids Total Phosphorus Escherichia Coli	Enterococci	pH	<p>The addition of Enterococci as well as E.coli is acceptable</p>	<p>Already in applicant's proposed conditions refer conditions 314. Note monthly reporting proposed by the applicant, applicant is testing for more parameters but Enterococci should also be included in the condition</p>
Parameters	Monitoring Frequency										
Total Nitrogen Nitrate-Nitrogen	Fortnightly										
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Enterococci											
pH											
<p>43) If after, 12 months of sampling, it is found that all samples are less than the levels given in condition 41, the sampling frequency may be reduced to monthly with the approval of the Team Leader Compliance Monitoring South.</p>			<p>This condition would only be required if the initial monitoring frequency was more frequent. However, the applicant considers monthly is sufficient refer condition 314.</p>								
<p>Soil Monitoring and Assessment</p> <p>44) The Consent Holder shall engage a suitably qualified and competent individual to take composite soil sampling on an annual basis from seven representative locations (being one at</p>	<p>The 4 sample locations is a condition recommended via the Babbage</p>	<p>GWE condition is very similar to condition 323</p>									

<p>each irrigation sector). After a period of two years, subject to Auckland Council approval, soil monitoring frequency may be reduced to once every three years if results indicate soil composition has not been impacted by irrigation discharge.</p>	<p>report.</p>	
<p>45) The soil samples shall be taken at a depth of 300mm to 400mm and shall be analysed for the following parameters:</p> <ul style="list-style-type: none"> a) pH b) Exchangeable potassium c) Exchangeable calcium d) Exchangeable sodium e) Exchangeable magnesium f) Exchangeable sodium percentage g) Cation exchange capacity h) Sulphate-S i) Phosphate retention (anion storage capacity) j) Olsen phosphorus k) Total nitrogen 		<p>Already in applicant's proposed conditions refer condition 324</p>
<p>46) All sample analyses shall be undertaken by an IANZ accredited or equivalent laboratory. All methods shall be appropriate for the sample analyses undertaken.</p>		<p>Already in applicant's proposed conditions refer condition 325</p>
<p>47) A "Land Disposal Field Assessment Report" shall be prepared every three years from the date of commencement of consent by a soil scientist, agronomist, or other suitably qualified person. The report shall include:</p> <ul style="list-style-type: none"> • Vegetation Survey: An assessment of the types of vegetation present, presence of weeds, percent soil cover, and vegetation health. • Soil quality: An assessment of the soil chemical and physical properties and any trend or changes in soil properties that may be indicative of salt damage. • Recommendations: Any recommendation for changes in irrigation management, gypsum applications, and type of forage to be grown. • A schedule for implementation of the recommendations 		<p>Applicant conditions updated to include this condition</p>
<p>48) Recommendations from the land disposal field assessment shall be implemented in accordance with the schedule provided or an alternative schedule as approved by the Team Leader, Compliance Monitoring South.</p>		<p>Applicant conditions should be updated to include this condition</p>

<p>49) On an annual basis, an independent, suitably qualified and experienced soil scientist shall be engaged to assess the soil conditions and collect samples for soil hydraulic conductivity (Ksat and K40) from four representative locations within the irrigation fields. The location of the sampling sites shall be recorded on an accurate, scaled map of the wastewater irrigation fields. The findings of the assessment along with any recommended remedial actions, shall be forwarded to Auckland Council.</p>	<p>This is a condition that has entered via Babbage. GWE have separated them into 2 separate conditions one for the testing, the other for revising the frequency.</p>	<p>Already in applicant's proposed conditions refer condition 326 which is as per Babbage and includes GWE proposed condition 50</p>
<p>50) After a period of two years, subject to approval by the Team Leader Compliance Monitoring South, the soil monitoring frequency may be reduced to once every three years if results indicate soil conditions have not been impacted by irrigation discharge.</p>		<p>Already in applicant's proposed conditions refer condition 326 which is as per Babbage and includes GWE proposed condition 49</p>
<p>Monitoring of Whangamarie Stream</p> <p>51) The consent holder shall undertake water quality monitoring at the general locations specified below:</p> <ul style="list-style-type: none"> a) Whangamarie Stream upstream of the land application area at Glassons Bridge. b) Whangamarie Stream downstream of the land application area and discharge from land contact trench. 		<p>Already in applicant's proposed conditions refer condition 336</p>
<p>52) The sample sites shall be confirmed with the Council at least three months prior to the exercise of this consent.</p>		<p>Already in applicant's proposed conditions refer condition 337</p>
<p>53) For a period of at least 12 months prior to commencement of wastewater discharge, KNVL shall take surface water quality samples on a quarterly basis at two locations within the unnamed stream present on Site (Source and LwrStr) and the Whangamaire Stream estuary (UppEs and LowEs). The purpose of this sampling is to establish a baseline of stream quality prior to the commencement of the development discharges.</p>		<p>Already in applicant's proposed conditions refer condition 338</p>



54) Following the first discharge from the wastewater treatment plant, the consent holder shall obtain surface water quality samples on a quarterly basis during February, May, August, and November at the same locations within the unnamed stream and the Whangamaire Stream Estuary. At least two of the water quality samples shall be taken when discharge is taking place to the disposal trench.

This condition has been captured within condition 339 of the application set. Condition 339 has been proposed as a consent condition by Babbage Consultants and has been taken from the proposed consent conditions in their report

Already in applicant's proposed conditions refer condition 339

55) After a period of 3 years, subject to approval by the Team Leader Compliance Monitoring south, the in-stream monitoring frequency may be reduced to an annual basis, provided that results indicate no significant change in surface water quality has resulted from the discharge.

Already in applicant's proposed conditions refer condition 339

Note applicant condition refers to 2 years rather than 3

56) All surface water quality samples shall be tested for the following parameters:

Table 4: Surface Water Parameters

Parameter
pH
Total Suspended Solids
Total Ammoniacal Nitrogen
Nitrate-Nitrogen
Nitrite-Nitrogen
Total Nitrogen
Dissolved Reactive Phosphorous
Total Phosphorous
Escherichia Coli

GWE have introduced Enterocci monitoring and the applicant is happy if this is added to condition 341.

<table border="1"> <tr> <td data-bbox="281 96 774 138">Enterococci</td> </tr> <tr> <td data-bbox="281 138 774 180">Soluble cOBDS</td> </tr> </table>	Enterococci	Soluble cOBDS			
Enterococci					
Soluble cOBDS					
57) All sample analyses shall be undertaken by an IANZ accredited or equivalent laboratory. All methods shall be appropriate for the sample analyses undertaken.			Already in applicant's proposed conditions refer condition 341		
Monitoring of Ecology 58) For a period of at least 12 months prior to commencement of the discharge from the treatment plant, KNVL shall undertake a surface water ecology survey each season at two locations within the unnamed stream present on Site (Source and LwrStr) and the Whangamaire Stream estuary (UppEs and LowEs). The purpose of this sampling is to establish a baseline of stream ecology prior to the commencement of the development discharges.			Already in applicant's proposed conditions refer condition 347		
59) Following the commencement of the discharge, KNVL shall conduct ecology surveys on a yearly basis, during summer, at two locations within the unnamed stream present on Site (Source and LwrStr) and the Whangamaire Stream estuary (UppEs and LowEs). After a period of 2 years, subject to approval by the Team Leader Compliance Monitoring South, the in-stream monitoring frequency may be reduced to once every three years if results indicate the ecological community has been unaffected by the discharge.		Condition 348 within the application set covers the equivalent requirement as those proposed by GWE. Condition 348 within the applicant's set has been taken from the Babbage Assessment of Environmental Effects supporting the applicant's submission.	Already in applicant's proposed conditions refer condition 348		
60) All surface water ecology surveys shall, as a minimum, meet the following requirements: <ul style="list-style-type: none"> a) Provide an assessment of fish and macroinvertebrate communities, physical habitat quality, macrophytes and periphyton. b) Shall be undertaken by person(s) suitably qualified in freshwater ecology. c) Shall not be undertaken within two weeks of a flood event. d) Shall report on any significant trends observed over time. 			Already in applicant's proposed conditions refer condition 349		
Microbial Health Risk Assessment 61) If after three years of discharge commencing it is found that more than 13% of the total discharge volume has taken place to the rapid infiltration trench, the consent holder shall undertake a Quantitative Microbial Health Risk Assessment (QMhRA) of the discharge to the tributary of the Whangamaire Stream and the Whangamaire Stream, to assess whether additional disinfection is needed at the wastewater treatment plant. 62) The consent holder shall utilize data obtained from the three years of treated wastewater monitoring and water quality monitoring required under conditions 35 to 37 and 51 to 54. 63) The consent holder shall implement additional disinfection at the wastewater treatment plant if the QMhRA finds that it is necessary.			Applicant conditions should be updated to include these conditions		
Irrigation Management Plan 64) At least three months prior to the discharge of wastewater, the consent holder shall provide to Auckland Council an 'Irrigation Management Plan' (IMP). The IMP shall be prepared by a suitably qualified and experienced person(s). This IMP shall include at a minimum:			Already in applicant's proposed conditions refer condition 327		

<ul style="list-style-type: none"> a) An overview description of the irrigation system. b) A description of the irrigation system functionality. c) Details of the irrigation system design, including: <ul style="list-style-type: none"> i) Depth of the irrigation laterals. ii) Materials of construction. iii) Design flowrates and pressures. iv) Types of emitters. d) Details of the acceptable plant species within the irrigation field. e) A methodology for monitoring soil moisture levels to assess suitability for irrigation at any one time. f) A map of the irrigation field highlighting the following: <ul style="list-style-type: none"> i) The individual irrigation zones. ii) The area of each irrigation zone. iii) The location of key equipment and monitoring points. g) Maximum allowable application rates, as dictated by this consent. h) Maximum allowable nutrient loading to each zone, as dictated by this consent. i) An emergency response plan detailing responses to emergency scenarios. 		
<p>65) The following minimum buffer distances shall be maintained at all times for the irrigation of the Karaka North development wastewater irrigation:</p> <ul style="list-style-type: none"> a) At least 5 m from all external property boundaries. b) All least 20 m from all watercourses. c) At least 50 m from any water take or groundwater bore. 		<p>Already in applicant's proposed conditions refer condition 328</p>
<p>Irrigation Field Construction Management Plan</p> <p>66) Prior to earthworking on the irrigation field area, the consent holder shall prepare an "Irrigation Field Construction Management Plan". The plan shall include, as a minimum, the following:</p> <ul style="list-style-type: none"> • Confirmation of which areas will be cut, and which areas will be filled. • A description of how the underlying soil will be made ready after heavy machinery movements across the area. 		<p>Applicant conditions to be updated to include this condition</p>

<ul style="list-style-type: none"> • Confirmation of depth of topsoil across the disposal field. • Confirmation of irrigation line separation, including plans showing the line, valves, and other associated irrigation equipment. 		
<p>67) A series of soakage tests (minimum of one per disposal area zone) shall be conducted across the areas following preparation of the underlying soils to confirm that the permeability of the soils is consistent with those proposed within “Design Report Karaka North Village Water and Wastewater Treatment” (Ref. 210203, V2, February 2022 by Apex Environmental).</p> <p><i>Advice note: Heavy machinery movements on the area may result in compaction of the underlying soils which can affect the drainage characteristics. The construction management plan should specifically address how this effect will be mitigated.</i></p>		<p>Applicant conditions to be updated to include this condition but reference should be to the Riley Geotech Report which details the soakage rates.</p>
<p>Operations and Management Plan</p> <p>68) Within six months of the commencement of the discharge of treated wastewater, the consent holder shall prepare an Operations and Management Plan (OMP). The objective of the OMP is to provide a framework for the operation and management of the WWTP and discharge facilities to ensure compliance with the conditions of consent. The OMP shall be submitted to the Council for certification that it is consistent with the requirements of this condition and Condition 0. The OMP shall be reviewed and updated every three years by the consent holder and as required as a result of any significant changes in WWTP and discharge.</p> <p>As a minimum, the OMP shall include:</p> <ol style="list-style-type: none"> An outline of the minimum contractual responsibilities of the operations provider, with appropriate people to contact in the event of system malfunction Provision of manufacturer’s specification for the key components of the MBR and UV disinfection systems, including manufacturers performance standards in terms of trans membrane pressure of the MBR units, total suspended solids, and UV transmissivity (UVT) of the treated wastewater A full description of the entire treatment and land application system, including a site map showing the location of the treatment system and the land application area and sampling sites. A description and schedule of the routine inspection, monitoring and maintenance procedures to be undertaken to ensure operation of the WWTP and discharge facilities, complies with this consent. A description of the sampling location/s and methodology for sampling the treated wastewater discharge. A description of the practices and procedures associated with the monitoring and reporting conditions of this consent including (as a minimum): (i) locations and type of monitoring equipment, (ii) maintenance and calibration of monitoring equipment, (iii) schedule and log of monitoring requirements, and (iv) field collection methodologies, 	<p>GWE’s wording is acceptable, APEX is more generic in places, they have made it more specific. – Standard O&M manual covers all these items already either condition will be fine</p>	<p>Applicant happy with wording of their proposed condition 345 and 346 but equally would accept the GWE proposed condition</p>

<p>protocols, data recording procedures and standards, and record keeping.</p> <p>g) A schedule of the critical aspects of the WWTP and the detailed response and contingency plans to remedy any possible variations from normal plant operation that could potentially affect discharge quality.</p> <p>h) Details of contingency plans and procedures to address a critical power or equipment failure at the WWTP.</p> <p>i) Procedures for recording routine maintenance and all major repairs that are undertaken.</p> <p>j) The consent holders' chain of command, responsibility and notification protocols.</p> <p>k) A description of odour mitigation measures at the site.</p> <p>l) The means of receiving and dealing with any complaints.</p> <p>m) Procedures for continuous reviewing and improving of the manual.</p>		
<p>Odour Management</p> <p>69) There shall be no odour emission verified by Council resulting from the treatment and disposal system that is offensive or objectionable to such an extent that it has an adverse effect on the environment beyond the boundary of the property on which the consent is exercised.</p>	<p>The applicant has engaged Tonkin and Taylor to review the APEX design and provide recommended conditions for odour management. These are provided in the draft conditions 270-293. The applicant suggests that these detailed conditions better address the potential effects of odour better than those recommended by GWE.</p> <p>The conditions detailed in 270-293 cover important aspects such as where mechanical ventilation and odour control must be applied, the means in which odour control must be applied and the minimum operational requirements of said odour control system.</p>	<p>The applicant considers that their draft conditions at 270-293 which have been proposed by Tonkin & Taylor better address the potential effects of odour than those recommended by GWE.</p>
<p>70) An Auckland Council Enforcement Officer shall be notified as soon as practicable in the event of any significant discharge to air which results, or has the potential to result, in a breach of condition 69. The information shall include details of the nature of the discharge, an explanation of the cause, and remedial action being undertaken.</p>		<p>Please refer to comment 69 above</p>
<p>71) An Odour Management Plan (OMP) shall be submitted to the Team Leader Compliance Monitoring South for approval prior to the commissioning of the wastewater treatment plant. The OMP shall detail the maintenance and inspection procedures for the odour control system, as well as the procedures for the receipt, recording, and handling of odour complaints.</p>		<p>Please refer to comment 69 above</p>
<p>Reporting</p> <p>72) The consent holder shall forward an annual report in writing to the Council by 30 June each year. The annual report shall cover the preceding 12-month period (from 1 April the preceding year until 31 March of the current year) and shall report on compliance with this consent. As a minimum, the report shall include:</p>		<p>Applicant condition 317 should be updated to include 72(m) which has been recommended by GWE</p>

<ul style="list-style-type: none"> a) A summary of the year’s monitoring results, in context of the previous years’ results. b) A summary of the volumes of treated wastewater discharged to land, including. c) A summary of the quality of treated wastewater discharged to land. d) A summary of the volumes of treated wastewater discharged to the infiltration trench. e) A summary of the volumes of treated wastewater discharged to the infiltration trench. f) A summary of the soil moisture monitoring data and irrigation zone availability. g) The calculated nitrogen loading to the irrigation field. h) A summary of all analytical results from the monitoring bores or piezometers and an interpretation of the groundwater quality results, particularly with regard to the discharge of treated wastewater. i) Comments on compliance with this consent, and actions taken where there has been noncompliance. j) A summary of any complaints received, the validity of each complaint and the corrective action taken. k) A summary of any significant malfunctions or breakdowns and the corrective action taken. l) Any other issues considered relevant by the consent holder. m) Any other reports conducted in the previous year, including the land disposal field assessment report required under condition 47. 		
<p>73) At all times the consent holder shall ensure that the Council has a copy of the up- to-date Operations and Management Manual.</p>		<p>Already in applicant’s proposed conditions refer condition 318</p>
<p>74) A maintenance service contract, which provides for the operation and servicing of the treatment and land application systems shall be entered into with an appropriately qualified contractor prior to the exercising of this consent. The contract shall include a requirement to ensure that the treatment and land application system is operated and managed in accordance with the Operations and Management Manual prepared in accordance with Condition 68 of this consent</p>		<p>Already in applicant’s proposed conditions refer condition 319</p>
<p>General</p> <p>75) All analysis carried out in connection with this consent shall be performed by a laboratory that meets ISO 17025 standards, or otherwise as specifically approved by the Council.</p>		<p>Already in applicant’s proposed conditions refer condition 320</p>
<p>76) No ponding or surface run-off of effluent shall occur on the irrigation field as a result of the exercise of this consent.</p>		<p>Already in applicant’s proposed conditions refer condition 321</p>
<p>77) No sludge or grease is permitted to be discharged to land or water.</p>		<p>Already in applicant’s proposed conditions refer conditions 322</p>

Review

- 78) The conditions of this consent may be reviewed by Team Leader Southern Monitoring, Auckland Council pursuant to section 128 of the Resource Management Act 1991 (RMA), by giving notice pursuant to section 129, on the fifth anniversary of the commencement of these consents and subsequently at intervals of not less than five years thereafter in order to:
- a) To deal with any significant adverse effects on the environment arising from the exercise of the consent, which was not foreseen at the time the application was considered and which is appropriate to deal with at the time of review.
 - b) To consider the adequacy of conditions that prevent nuisance and adverse effects beyond the boundary of the site particularly if regular or frequent complaints have been received and validated by a Council enforcement officer.
 - c) To consider developments in technology and management practices that would enable practical reductions in the discharge of contaminants.
 - d) To alter the monitoring requirements, including requiring further monitoring, or increasing or reducing the frequency of monitoring.

Applicant has a review condition at condition 293. Application would be happy to adopt the wording proposed by GWE instead.