

Delmore Fast Track Application

Appendix 8: A18 (Watercare) to Response to Comments Letter

From: Vineway Ltd
Date: 5 June 2026
Re: Response to Watercare Services Limited

1.1 Introduction

This memorandum responds to the memorandum prepared by Watercare Services Limited in relation to the above fast-track application. This memorandum has been prepared with input from several consultants. The consultant or consultants who have prepared each response are noted in each row.

The following attachments are included to this memo:

- **Attachment A:** Wastewater and Water Supply Transitioning Matrix
- **Attachment B:** Cost Comparison of LPS and Gravity

1.2 Response to Further Information Requests / Technical Comments

Information Request / Technical Comment from Watercare Services Limited under section 53 FTAA	Applicant Response under section 55 FTAA
Paragraphs 13-17: Watercare Services Limited does not provide water or wastewater connections to FUZ land. FUZ land must become 'live' urban zones for services to be provided.	<i>B&A:</i> The proposal provides for on-site water supply and wastewater servicing. If Watercare Services Limited's position does not change, Delmore will be serviced in this way. The proposal is therefore not reliant on Watercare Services Limited changing its position and providing a connection to the public water and wastewater networks. However, Vineway's proposed conditions of consent provide for the ability to service the site either through on-site infrastructure or by connection to the public network. This is to account for the changing factual context which may mean that Watercare Services Limited's position changes, or the zoning changes, and public connections become available in the short or medium term. That factual context includes a plan change process which may see the Delmore site live zoned (PC120); review of the Future Development Strategy; and/or review of Watercare Services Limited's connection policy. The reasons why this approach is both lawful and appropriate are addressed in the Ellis Gould Letter provided in

	Appendix 1: Attachment 1 (Infrastructure Legal Memorandum) to the Response to Comments letter. It is also noted for completeness that Watercare Services Limited has adopted an approach to the Delmore development that is contrary to this statement in respect of the neighbouring development Ara Hills which is FUZ. Watercare Services Limited has provided connections to the (approximately) 247 homes currently built at Ara Hills. It has also indicated it will provide connections for the remaining 253 currently consented homes, and the further 400 homes within Ara Hills which AV Jennings has sought through its plan change (PC 119 (Private)). This is despite those homes likely being developed after homes within the Delmore development (if approvals are granted) given the plan change is only at a preliminary stage.¹
Paragraphs 18-22: Watercare does not support out-of-sequence development that puts pressure on Watercare to reprioritise or reallocate funding in the current Watercare Asset Management Plan (AMP) away from live zoned areas and sequenced growth.	<i>B&A:</i> See comment above. The proposal provides for on-site water supply and wastewater servicing and if Watercare Services Limited's position does not change Delmore will be serviced in this way. If the Delmore development is serviced in this way, then the issues raised by Watercare Services Limited do not arise. However, for completeness it is noted that the applicant does not agree that servicing the Delmore site now would necessarily require Watercare Services Limited to reprioritise or reallocate funding because of the infrastructure upgrades already planned for the area. This is addressed in Appendix 1 to the Response to Comments letter (Overarching Legal Memorandum) <i>NZIER:</i> In addition to the comments above, it is noted that the issue of out-of-sequence development and re-prioritisation is, in terms of economics, one of costs and benefits. Watercare Services Limited seems to be approaching this application in a very simplistic way, assuming that because it would result in the Delmore site being developed ahead of the indicative 2050+ date in the FDS, it automatically has negative cost implications. This means that Watercare Services Limited is not considering the Delmore development in the way Auckland Council's economist considers is required, looking at both benefits and costs. In this case, any costs need to be

¹ See PC119 application Appendix T

	considered against the capacity available in the current and immediately planned infrastructure. The evidence we have seen shows that this provides capacity for all live zoned land and some or all FUZ land within the area. Therefore, costs are predominately associated with changing the order in which FUZ land is serviced. In contrast, the benefits of developing (and servicing) the Delmore site are additional houses being brought to market in the short term, continuing over the course of the development timeline, and the financial and infrastructure efficiency benefits from using the system capacity sooner, rather than having it sit idle for years or decades. By contrast, other live-zoned areas and other FUZ are less likely to produce benefits in the same time frame, because they are not as far along in the development process. On balance, Delmore represents more certain benefits than other land parcels.
Paragraphs 23-26, 34: If a permanent private water/wastewater system is adopted, this will affect Watercare's planning, and may result in a down-size and/or loss of efficiency and economic feasibility of planned networks for the area, ultimately increasing the price of servicing for others in the area.	<i>NZIER:</i> This comment supports the applicant's 'either/or' approach to water supply and wastewater servicing, providing for both providing for on-site and public network options. This is because the 'either/or' approach ensures the most efficient and effective servicing approach can be adopted at different stages of the Delmore development and Auckland gets needed housing now. We also note that this comment arguably supports connecting the Delmore development to the public network now, ahead of other FUZ land that is not currently subject to a development proposal. This is because this would ensure that actual public connection numbers align with planned public connection numbers and thus no down-sizing of the service area should occur.
Paragraphs 27-30: Watercare does not support tankering of any treated or untreated wastewater by Vineway to a Watercare facility and will not enter into a contract with Vineway for this.	<i>B&A:</i> Vineway does not need to enter into an agreement with Watercare Services Limited for receipt of any treated or untreated wastewater that needs to be taken from the Delmore site. In addition to Whangarei District Council, Vineway now has provisional agreement with several Auckland-based companies to take and dispose of the necessary quantities of treated or untreated wastewater for the Delmore stage 1 area. Correspondence confirming this is included is provided in Appendix 10 to the Response to Comments letter (Vineway Memorandum).
Paragraph 29: Watercare does not supporting trucking of treated or	<i>B&A:</i>

untreated wastewater for various effects-related reasons.	Watercare Services Limited has not presented any evidence that the small amount of trucking proposed as part of the Delmore development will have these effects. Rather, it has identified these as potential effects that can generally arise. In this case, the substantive application includes an assessment of effects² associated with trucking of treated and untreated wastewater, relating to traffic, air discharges, noise, and hazardous substances, all undertaken by technical specialists. As a result of these assessments, conditions³ have been proposed to address any identified adverse effects, or the risk of adverse effects arising. These include: • Preparation of a Wastewater Management Plan to be certified by Council, to manage and reduce the risks of hazardous substances, including any spills; • Installation of an acoustic fence adjacent to the dwelling at Lot 203 to ensure compliance from the wastewater filling station with the applicable noise standards under the Auckland Unitary Plan; • Dust management measures relating to the use of wastewater trucks along Russell Road; • Widening of Russell Road to accommodate wastewater trucks; • Preparation of an Off-site Wastewater Disposal Management Plan to be certified by Council, including identification of receiving facilities, contingency measures, and maximum daily volumes; • A condition that requires wastewater to be transported only to facilities identified in the Off-site Disposal Management Plan; • A condition that requires wastewater to be transported only by operators holding all required approvals and licences; • A condition that requires the consent holder to keep a record of all tanker loads removed from the site, with records to be submitted to Council every three months; • A condition that requires the consent holder to maintain contingency storage in the event that an approved receiving facility cannot accept the wastewater; • A condition that allows Council to review the trucking in accordance with section 128 of the RMA, and request updates to the Off-Site Wastewater Disposal Management Plan if significant effects arise;
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² Refer section 11.5.3 of the AEE, as well as corresponding technical assessments (Appendix 24: ITA, Appendix 39: Air Discharge Assessment, Appendix 38: Noise Assessment, and Appendix 40: Hazardous Substances Assessment).

³ Refer to sections 2.1.21 (private wastewater servicing), section 3.1.5 (transport), and section 8 (air discharge) of the conditions.

	• Preparation of an Odour Management Plan to be certified by Council, as well as monitoring and reporting obligations; and • Installation of odour control systems for the wastewater infrastructure, including a post-commissioning odour assessment to ensure odour is acceptable, and if not, remediation to be required. The above conditions have been reviewed by Auckland Council, who has confirmed that the conditions are acceptable. We understand from Auckland Council's review that there are no remaining concerns relating to wastewater trucking. For completeness, we note that Watercare Services Limited itself undertakes trucking of raw and treated wastewater. This further demonstrates that trucking of these products can be done in a safe and efficient manner, subject to appropriate management measures which have been proposed as part of this application.
Paragraphs 26 and 30: While the Applicant proposes to decommission the private WWTP and disposal area once connection to Watercare's network is available, this is not considered a reliable or supported outcome, due to the proposed design of the local network. All proposed options rely on a large-scale LPS system, which is not supported under the Water and Wastewater Code of Practice for Land Development and Subdivision (Code of Practice) for developments of this size.	<i>McKenzie & Co:</i> The on-site wastewater system has been designed to be able to be retained as a permanent solution for the Delmore site. This is commented on in more detail two rows below as part of responding to points raised by Watercare Services Limited at paragraph 27 of its comments. As a result, if Watercare Services Limited will not service the Delmore development because of the use of LPS, or for any reason, the development can be serviced by this on-site option on a permanent basis. However, we have nevertheless addressed the detail of the matters raised by Watercare Services Limited in order to demonstrate that should a connection to the public network become available, the Delmore development would be able to connect. First, regarding decommissioning generally, the on-site wastewater treatment plant and related infrastructure is physically able to be decommissioned at any stage of the development and replaced with a public connection. A matrix showing the high-level steps for doing this is provided in Attachment A to this table. Second, regarding the comments about the proposed LPS, the Code of Practice (COP) does provide for the use of LPS under (clause 5.3.12.3.1) where a low pressure system is the best practicable option (BPO) and a gravity system faces feasibility issues. It is accepted that the COP includes a note that LPS should generally be used for smaller developments, however this is expressly identified as not being a mandatory

	requirement (in the COP foreword) with BPO and feasibility being the guiding factors. We have considered the proposal against the criteria in the COP for feasibility and have concluded that the LPS is the best practicable option for this site. An overview of that assessment is provided in Attachment B. In summary: • LPS will deliver a lower lifecycle cost to Watercare than the conventional gravity alternative for this site. • Costs passed to homeowners under the proposed LPS arrangement are reasonable and are consistent with the ownership model that the COP itself defines for LPS systems, and that Watercare Services Limited has accepted at comparable developments across Auckland, including Riverhead (over approx. 1000 homes). • The proposed LPS provides reliable service with no single point of failure capable of causing total system failure across the development. The LPS design performs better against this criterion than the gravity-plus-pump-station alternative for this site. • The Watercare Subdivision Guidance Note (April 2021) identifies low pressure sewer systems as appropriate where a gravity system with a public pump station is not cost effective. There are site specific factors at the Delmore site which each make gravity more expensive than on a typical site. A conventional gravity/pump station design was prepared for Stage 1 and assessed using current, competitively tendered construction rates, confirming that it is not cost effective for this site. • The proposed LPS design mitigates potential environmental impact from spills, outages and pipe breaks, and better than the gravity-plus-pump-station alternative. The gravity-plus-pump-station alternative concentrates environmental risk at a single high-volume facility (wet well overflow, rising main rupture, power loss at the station), whereas the LPS distributes and contains it.
Paragraph 27: Watercare does not support interim private systems for servicing residential subdivisions, which create multiple freehold titles and therefore multiple asset owners. This fragments responsibility for operation, maintenance, renewals and eventual decommissioning. From Watercare's perspective, this creates long-term uncertainty and risk: interim private systems may be inconsistently maintained, are difficult or impossible to integrate into the public network	<i>Alexander Dorrington Lawyers:</i> Responsibility for operation, maintenance, renewals and eventual decommissioning is proposed to be centralised. Under the proposed structure there would be a single asset owner rather than multiple asset owners. The Utility Company referred to in the conditions will own the assets concerned and be responsible for these matters. Operation, maintenance and renewal is funded in the usual way by on-charge of costs by the Utility Company to the separate lot owners. The Residents Society (as shareholder and owner of the Utility Company) together with the consent holder will be responsible for assisting to fund eventual decommissioning. The Residents Society has the power to levy members. The proposed land ownership structure provides the developer a

and often become permanent by default.	commercial incentive to assist with funding the decommissioning if that is possible, as this will allow the lease (held by the Utility Company in respect of the land upon which the assets are sited) to be terminated, delivering freehold land back to the developer. In addition, the on-site infrastructure will be managed by well-established professional entities with both City Care and Veolia confirming they are willing and available to do this. Relevant correspondence is provided in Appendix 10 to the Response to Comments letter (Vineway Memorandum).
Paragraph 27: The proposed servicing must be treated as a permanent private solution and designed, consented, and operated on that basis, without reliance on a future connection to the public network.	<i>B&A:</i> The on-site water and waste-water servicing solutions have been designed so that they can provide servicing on a permanent basis if that is needed. Their technical comments on this are below. It also noted that the proposed on-site wastewater treatment system treats water to an exceptionally high standard (refer Appendix 29 to the AEE pages 29-31). <i>APEX:</i> The design and construction standards followed for the private water and wastewater treatment plants are consistent with those followed for permanent council owned assets. The core wastewater treatment technology proposed for Delmore (MABR/MBR) is the same as is currently being used by Watercare at Te Kauwhata and Meremere and is also now being installed as permanent solutions at Clark’s Beach, Ngaaruawaahia and Huntly. In order to facilitate decommissioning should a public connection become available, the wastewater treatment plant is constructed in above ground stainless steel tanks similar to those utilised by Watercare at Te Kauwhata and Clarks Beach. This does not limit the ability to act as a permanent solution, while ensuring that the treatment plant is easily relocatable and can continue to be used elsewhere should it no longer be required at Delmore. A photograph of this is depicted below. 

	<i>Watercare Clark's Beach MABR/MBR plant in above-ground relocatable stainless steel tanks.</i> Similarly, in order to safely and reliably provide potable water to a population of this size, the water treatment plant will be constructed to the same standard required for a permanent municipal solution. The relocatable nature of the drinking water treatment plant does not impact its ability to continue to operate as a permanent solution if required. <i>McKenzie & Co:</i> The water and wastewater networks have been designed to Watercare standards, and all materials will be in accordance with Watercare's approved materials list. The networks therefore meet the requirements for a vested servicing solution, not an interim standard. This means the private networks are fit for use as a permanent servicing solution in their own right. Should a public connection become available in the future, the reticulation has been designed to integrate with the public network without compromising the design integrity of the system. The capability to connect to the public network in the future does not reduce its ability to operate as a permanent solution now.
Paragraph 29-29: The applicant's assessment of available public wastewater capacity is not supported by Watercare. Planned upgrades to the Army Bay WWTP are intended to service forecast growth and committed developments in accordance with the AGS, and cannot be relied upon to accommodate out-of-sequence developments such as Delmore without adversely affecting the wider catchment, including existing live zones. Connections to Army Bay before the Stage 1 upgrade are limited and will service consented development.	<i>B&A:</i> The applicant's response to comments about adverse impacts due to the Delmore development being delivered before the indicative 2050+ development date in the FDS is provided in Appendix 1 to the Response to Comments letter (Overarching Legal Memorandum).
Paragraph 29: As well as upgrades to the Army Bay wastewater treatment	<i>B&A:</i>

plant there are other bulk wastewater pre-requisites that are required to enable wastewater servicing to the Upper Ōrewa FUA, including the Site: Orewa to Stanmore Wastewater Trunk Network Upgrade, currently anticipated to be completed by 2033. Stanmore Wastewater Pump Station (WWPS) and Rising Main (RM) Upgrade, currently anticipated to be completed by 2031.	The proposal provides for on-site water supply and wastewater servicing. If Watercare Services Limited's position does not change, Delmore will be serviced in this way. The proposal is therefore not reliant on Watercare Services Limited changing its position and providing a connection to the public water and wastewater networks. However, it is noted that Watercare Services Limited's comments refer to planned infrastructure and the dates align generally with the date for completing the Army Bay wastewater treatment plant Stage 1 upgrade. As a result, the applicant's response to comments about adverse impacts due to the Delmore development being delivered before the indicative 2050+ development date in the FDS provided in Appendix 1 to the Response to Comments letter (Overarching Legal Memorandum) are also relevant to responding to this comment. We also note that the applicant is willing to engage with Watercare Services Limited in relation to contributing to the cost of these upgrades, and the applicant has raised this with both Watercare Services Limited and the Auckland Urban Development Office.
Paragraph 35: The Applicants proposed private water system, including the location of proposed reservoirs, is incompatible with Watercare's network servicing plan for the area which may preclude future connection to the public network.	<i>B&A:</i> The proposal provides for on-site water supply and wastewater servicing. If Watercare Services Limited's position does not change, Delmore will be serviced in this way. The proposal is therefore not reliant on Watercare Services Limited changing its position and providing a connection to the public water and wastewater networks. However, McKenzie & Co have confirmed that connection to the public network is technically feasible, with the process summarised in the matrix in Attachment A. The 'private' reservoir would be removed, and the applicant would work with Watercare Services Limited to ensure reservoir capacity is made available adjacent to the proposed public reservoir to the northeast of the Delmore site. This is consistent with the meeting held with Watercare Services Limited. Connection from the Watercare reservoir to the site, can be made through one of the road connections in the future, as shown on drawing 3725-6507 (Appendix 6 (Civil Drawings) to the Response to Comments letter). Any works required to enable that connection would be undertaken by the applicant in the normal way.
Paragraph 36: Operational and water safety risks associated with connecting	<i>McKenzie & Co:</i>

a private serviced area to the public network at a future time. These risks, including significant water quality risks to connected customers, may mean the system needs to remain independent from the wider public network which may mean it becomes permanently private. Technical solutions to overcome these risks include super chlorination, flushing and water outage programme or complete duplication of the water supply network.	We agree with Watercare Services Limited that connecting private water and wastewater supply networks to the public system has safety risks. However, as Watercare Services Limited has observed, there are known and trusted methods for overcoming these risks which would be used at the Delmore development if a transition from private to public servicing was to occur. The specific methods used should be determined at the time, in order to select the method most appropriate for the number and location of connections being shifted, and to avoid precluding use of new methods that emerge. Best practice methods would generally include: • Super-chlorination of the private network prior to connection, to bring water quality to potable standard before any cross-connection. • Flushing and a managed water-outage programme during the connection works, to clear the private network and prevent backflow or contamination of the public supply. • Pressure and water-quality testing following connection, to confirm the joined network meets Watercare's acceptance criteria before customers are transferred. • Staged or sectional connection, connecting discrete parts of the network in sequence rather than all at once, to limit the population exposed to any single connection event. • Where risk cannot otherwise be managed, complete duplication of the affected section of the water supply network, so the private and public systems operate independently until connection can be made safely.
Paragraph 37: The Application does not set out whether the proposed private WTP, headworks and bores would be decommissioned prior to future connection to the public system. Watercare's preference, if the system is to connect to the wider public network in the future, is for the WTP, headworks and bores to be decommissioned prior to connection.	<i>McKenzie & Co:</i> It is not possible to decommission this infrastructure <i>prior</i> to connection to the public network because otherwise the Delmore development would be without servicing. Decommissioning must therefore occur after the change to the public network has been made. We have prepared a matrix showing generally what this would require in Attachment A to this response table. <i>B&A:</i> The proposed conditions provided in Appendix 2 to the Response to Comments Covering letter provide for decommissioning in accordance with this practical reality. See conditions 44, 70 and 71 of the land use consent.
Paragraph 39: The existing bulk water supply network is limited in this area and does not have sufficient capacity to support the anticipated growth in	<i>B&A:</i> The proposal provides for on-site water supply and wastewater servicing. If Watercare Services Limited's position does not change Delmore will be serviced in this way. The proposal is therefore not reliant on Watercare Services Limited

the existing live zoned areas in addition to the Delmore Project. The following bulk water supply pre-requisites are identified as being required to enable servicing of the Upper Ōrewa FUA, including the Site: • The Orewa 3 Watermain scheme (transmission watermain, reservoir and pump station) which is currently anticipated to be completed by 2038 and is dependent on the completion of the North Harbour 2 (NH2) watermain; • The NH2 watermain, currently anticipated to be completed in 2034+.	changing its position and providing a connection to the public water and wastewater networks. However, this comment ultimately relates to Watercare Services Limited's current view that the application is 'out of sequence' and so should not be serviced by the public infrastructure for which it is responsible. The applicant's response to comments on this matter are provided in Appendix 1 to the Response to Comments letter (Overarching Legal Memorandum) and Attachment 1 (Infrastructure Legal Memorandum) to that document explains why conditions providing for connection to the public network are lawful and appropriate in this context. We also note that the applicant is willing to engage with Watercare Services Limited in relation to contributing to the cost of these upgrades, and the applicant has raised this with Watercare Services Limited and the Auckland Development Office.
Paragraph 43: The Application does not consider how the proposed private WTP and WWTP will be decommissioned in the future and connected to the public system. More information, including appropriate conditions, is required to confirm that any water supply and/ or wastewater systems will be designed and constructed in accordance with Watercare's Code of Practice, and addressing the monitoring and reporting, decommissioning, and potential future connection to the public system.	B&A: The proposed conditions have been amended to ensure that the different water supply and water servicing options are clear, and to more precisely specify when and how decommissioning would occur. Many of the proposed conditions are those that Watercare Services Limited has recommended and that have been accepted by the applicant. The suite of relevant conditions is in Appendix 2 to the Response to Comments Covering letter at: • Condition 70 and 71 of the land use consent require a Decommissioning Plan to be prepared and submitted to Council for certification. • Condition 44 of the land use consent requires that Engineering Plan Approval will be required when a connection is to be made to the public network. McKenzie & Co has confirmed that transition from private to public servicing is technical feasible and has prepared a matrix demonstrating what it would involve at a high level. This is provided in Attachment A to this response.

1.3 Response to Recommended / Amended Conditions

Condition Request from Council	Applicant Response
New condition to add: <u>All new water supply and wastewater infrastructure that is proposed to connect to the</u>	This new condition is accepted but has been split into two separate conditions (see Condition 43 and 44 of the land use consent).

<u>public network, or be vested to the water utility provider either now or in the future must be designed and constructed in accordance with the current Water and Wastewater Code of Practice for Land Development and Subdivision (Code of Practice). Where the private water supply or wastewater network is proposed to be connected to, or vested in, the public network at any time in the future, the consent holder will be required to obtain Engineering Plan Approval at that time.</u>	
New condition to add: <u>The consent holder must design and construct all private water supply and wastewater infrastructure to ensure that, if a connection to the public water supply or wastewater network is established in the future, the connection and associated infrastructure will not adversely affect the capacity, integrity, operation, or safety of the public network.</u> <u>Advice Notes:</u> <u>(a) As at the date of this consent, no agreement has been reached with the water/wastewater network utility provider regarding the acceptance for vesting of any water or wastewater infrastructure associated with the subdivision and development. Any infrastructure proposed to vest is subject to the current Watercare Water and Wastewater Code of Practice for Land Development and Subdivision (Code of Practice), standards, operational requirements, and acceptance of the relevant network utility provider.</u>	This condition is not accepted. The conditions require Engineering Plan Approval if a connection to the public system is required in the future at which point it would be assessed whether the infrastructure is acceptable for vesting.
New condition to add: <u>For the avoidance of doubt, nothing in this consent requires the network utility provider(s) to accept vesting of any infrastructure or to approve any connections to the public water and/or wastewater network under the Water Supply and Wastewater Network Bylaw 2015 now or in the future.</u>	This condition is not accepted. The applicant understands that a connection to the public network is subject to the <i>Water Supply and Wastewater Network Bylaw 2015</i>. This is a separate process, and as such, a specific condition is not needed.
Amendment to existing condition: <i>The consent holder must prepare a Wastewater Management Plan (WMP). The WMP must be submitted to Council for certification at least 20</i>	This amendment to the condition is accepted and has been updated within the condition set. Refer to Condition 47 of the land use consent.

working days prior to the commissioning of the wastewater system. The purpose of the WMP is to manage and reduce risks to the natural environment and to people from hazardous substances stored for wastewater purposes. The WMP must be in general accordance with the draft WMP approved under Condition 1. It must include, but not be limited to:

(a) Identification of the specific activities conducted on the site;

(b) Identification of potential contaminants associated with these activities, including a Hazardous Substance Inventory and associated Material Safety Data Sheets;

(c) Methods used to contain identified contaminants and prevent them contacting stormwater runoff as far as practicable, and methods to manage environmental risks from site activities;

(d) A Spill Response Plan (which includes the provision that all spills over 20 litres, or any spill or environmentally hazardous substances that has entered the stormwater system, a waterbody or has contacted unsealed ground, must be reported immediately to the Auckland Council's 24- Hour Pollution Hotline (09-377-3107)). If untreated wastewater is to be taken off-site, the Spill Response Plan must include management measures to disinfect small spills or drops that may occur during filling (such as the use of sodium hypochlorite spray);

(e) Accurate site drainage plan(s) showing the location of all site catchpits, containment systems, treatment devices and the discharge point(s) of the site stormwater system;

(f) An appropriate auditing programme to ensure site performance with all components of the WMP;

(g) Methods for providing and recording staff training;

(h) Details of processes governing review and updating of the WMP; and

(i) An Operation and Maintenance Plan for the WWTP.

Amendment to existing condition: In the event that an eventual connection is able to be made to the public wastewater network, disposal of untreated wastewater by way of off-site tankering can be undertaken. At least 20 working days prior to any off-site tankering of untreated wastewater occurring, the consent holder must submit a Wastewater Tankering Management Plan to Council. At a minimum, the Wastewater Tankering Management Plan shall include the following: (a) The number of dwellings that the tankering will service; (b) The expected duration that the dwellings will be serviced by off-site tankering; (c) The number and volume of on-site tanks required to accommodate the necessary wastewater volumes; (d) A maintenance plan for the on-site tanks and any other associated on-site plant; (e) An odour management plan; and (f) A traffic management plan for tanker movements associated with removing untreated wastewater from site. The traffic management plan must also include measures to minimise dust from the increase of trucks on Russell Road. <u>(g) Written confirmation that the off-site disposal of the untreated wastewater will be accepted by a facility with sufficient capacity to accept the anticipated volumes.</u> <u>Advice note: At the time of granting this resource consent, Watercare Services Limited has confirmed that none of its facilities will accept any tankered wastewater from the development.</u>	This addition is accepted in principle; however this existing condition had been replaced as a result of consultation with Auckland Council (wastewater team). A new condition was proposed by Auckland Council and included within the updated condition set which appears to address this item raised by Watercare. See Condition 55 of the land use consent. <u>No wastewater shall be tankered from the site except to a lawfully authorised receiving facility that is identified in the certified management plan and has confirmed capacity and acceptance criteria. The consent holder shall maintain current written confirmation of acceptance from each receiving facility.</u>
Amendment to existing condition: The consent holder must construct <u>and commission</u> the on-site water treatment infrastructure in general accordance with the “Delmore Water and Wastewater Treatment Plant Design Report” prepared by Apex and approved under Condition 1.	This condition is accepted and has been updated within the condition set. See condition 63 of the land use consent.
New condition to add:	This condition is partially accepted. The timeframe for when the Decommissioning Plan needs to be

<u>Decommissioning of On-Site Wastewater Servicing and On-Site Water Treatment</u> <u>Where, at any time in the future, a connection to the public water supply and/or wastewater network is proposed, and the network utility operator has confirmed in writing that there is sufficient capacity in the network to enable connection, and that it is willing to accept the connection in principle, the consent holder must:</u> <u>(a) within 20 working days of receiving that written confirmation, submit a draft Decommissioning Plan to the Council and/ the water and/or wastewater utility provider for approval; and</u> <u>(b) obtain certification of the Decommissioning Plan prior to any connection to the public network occurring; and</u> <u>(c) implement the Decommissioning Plan as certified.</u>	submitted has been amended as per below. Once confirmation is received from Watercare that a connection can be made to the public system, there are processes that the utility company and/or Resident's Society need to go through which may take longer than days. Therefore, the timing should be linked to 20 days before the connection is made. Refer to Conditions 70 of the land use consent. <u>Where, at any time in the future, written confirmation has been received from the network utility operator that a connection to the public water supply and/or public wastewater network can be made,</u> a connection to the public water supply and/or wastewater network is proposed, and the network utility operator has confirmed in writing that there is sufficient capacity in the network to enable connection, and that it is willing to accept the connection in principle, the consent holder must: (a) within 20 working days of receiving that written confirmation, <u>At least 20 working days prior to connecting to the public network,</u> submit a draft Decommissioning Plan to the Council and/ the water and/or wastewater utility provider for approval; and (b) Obtain certification of the Decommissioning Plan prior to any connection to the public network occurring; and (c) Implement the Decommissioning Plan as certified.
New condition to add: <u>The Decommissioning Plan must include:</u> <u>(a) The design and steps for disconnection of the WWTP and WTP from the local water supply and wastewater reticulation network.</u> <u>(b) The design and steps for the connection of the local wastewater reticulation network to the public network.</u>	This condition is partially accepted, with amendments included below. Refer also to Conditions 71 of the land use consent. <u>The Decommissioning Plan must include:</u> <u>(a) The design and steps for disconnection of the WWTP and WTP from the local water supply and wastewater reticulation network.</u>

<u>(c) The decommissioning, making safe and removal of all infrastructure comprising associated with the WWTP and WTP.</u> <u>(d) the proper and complete remediation of the site, (including the treatment and removal of any contamination caused arising from the operation of by the WWTP and WTP) (the “site” for the purposes of this condition shall include the land where the WWTP / WTP is located and any other land affected by operation of the Property and any other part of the Land affected by the WWTP and WTP.</u> <u>(e) A programme and timetable for all decommissioning and connection works.</u> <u>(f) Written approval from the water utility provider that there is sufficient capacity in the network that the development can be connected.</u> <u>Advice notes:</u> <u>As at the date of this consent, no agreement has been reached with the water/wastewater network utility provider regarding the acceptance for vesting of any water or wastewater infrastructure associated with the subdivision and development. Any infrastructure proposed to vest is subject to the current Watercare Water and Wastewater Code of Practice for Land Development and Subdivision (Code of Practice), standards, operational requirements, and acceptance of the relevant network utility provider.</u> <u>For the avoidance of doubt, nothing in this consent requires the network utility provider to accept vesting of any infrastructure or to approve any connections to the public water and/or wastewater network under the Water Supply and Wastewater Network Bylaw 2015 now or in the future.</u>	(b) The design and steps for the connection of the local <u>water supply and</u> wastewater reticulation network to the public network. (c) The decommissioning, making safe and removal of all infrastructure comprising associated with the WWTP and WTP. (d) the proper and complete Any required remediation of the site, (including the treatment and removal of any contamination caused arising from the operation of by the WWTP and WTP) (the “site” for the purposes of this condition shall include the land where the WWTP / WTP is located and any other land affected by operation of the Property and any other part of the Land affected by the WWTP and WTP. (e) A programme and timetable for all decommissioning and connection works, <u>including notification to residents.</u> (f) Written approval from the water utility provider that there is sufficient capacity in the network that the development can be connected. <u>Advice notes:</u> <u>As at the date of this consent, no agreement has been reached with the water/wastewater network utility provider regarding the acceptance for vesting of any water or wastewater infrastructure associated with the subdivision and development. Any infrastructure proposed to vest is subject to the current Watercare Water and Wastewater Code of Practice for Land Development and Subdivision (Code of Practice), standards, operational requirements, and acceptance of the relevant network utility provider.</u> <u>For the avoidance of doubt, nothing in this consent requires the network utility provider to accept vesting of any infrastructure or to approve any connections to the public water and/or wastewater network under the Water Supply and Wastewater Network Bylaw 2015 now or in the future.</u>
Amendment to existing condition / table for Resident’s Society: ... The WWTP shall be operated, maintained and when required, renewed <u>and the wastewater</u>	Amendments have been made to all conditions relating to the Resident’s Society. In particular, a new consent condition is proposed which requires a utility company to be established (refer to

<u>discharge reconseented by the Residential Society.</u> All costs shall be borne by the Residential Society. <u>This shall be incorporated into the Constitution...</u> The Residential Society must monitor the wastewater irrigation lines in accordance with the consent conditions. <u>This shall be incorporated into the Constitution.</u>	Condition 31 of the subdivision consent). The utility company will operate and maintain the private water and wastewater infrastructure and will hold ultimate responsibility for re-consenting the wastewater discharge and groundwater take (if required).
Amendment to existing condition: The consent holder shall provide written evidence to Council that the Residential Society <u>Constitution</u> includes the following items: (a) The ownership and management responsibilities of the Residential Society, including the operation, maintenance, repair, and renewal, <u>and reconseenting</u> of the Common Infrastructure and associated water takes and wastewater discharges within the development; (b) Mechanisms for the raising of funds from members to adequately finance the operation, maintenance, repair, and renewal, and reconseenting of the Common Infrastructure; and (c) Decision making and dispute resolution requirements; <u>(d) The obligation on the Residential Society to comply with all resource consents;</u> <u>(e) Mechanisms for the raising of funds from members to adequately finance the future decommissioning of any on-site wastewater servicing, wastewater treatment plant, or on site water take and treatment;</u> <u>(f) Mechanisms for the raising of funds from members to adequately finance the infrastructure works required to enable future connections to the public water supply and wastewater networks; and</u> <u>(g) Mechanisms for the raising of funds from members to adequately finance the payment of future Infrastructure Growth Charges that may be payable to the public water and/or wastewater utility provider.</u> <u>Advice Note: Condition 115(e) (f) and (g) are only applicable if connections to the public water and</u>	As per above, changes have been made to the Resident’s Society conditions (refer to Condition 34 of the subdivision consent). The applicant has considered the request from Watercare and has adopted the changes relating to the mechanisms relating to the raising of funds, as well as the obligation of the Resident’s Society to comply with all resource consents. The responsibility for re-consenting of the wastewater and groundwater take will sit with the utility company (condition included above).

<u>wastewater systems are confirmed by the water and/or wastewater utility provider.</u>	
Amendment to existing condition: The consent holder must, <u>at no cost to the wastewater utility provider</u> make provision for a design and construct connections to the wastewater connection to be made to the public wastewater reticulation network to serve all residential lots in accordance with the requirements of the wastewater utility service provider. Certification from the utility provider that works have been satisfactorily undertaken must be provided when applying for a certificate under section 224(c).	This condition is accepted and has been updated within the condition set. Refer to Condition 35 of the subdivision consent.
Amendment to existing condition: The consent holder must, <u>at no cost to the water utility provider design and construct connections to the</u> make provision for a design and construct connections to the water connection to be made to the public water reticulation network to serve all residential lots in accordance with the requirements of the water supply utility service provider. Certification from the utility provider that works have been satisfactorily undertaken must be provided when applying for a certificate under section 224(c). <u>Advice Notes (condition 119 & 120)</u> • <u>Acceptable forms of Evidence from the Utility Providers include a Certificate of Acceptance.</u> • <u>Plans approved under resource consent do not constitute an Engineering Plan Approval and must not be relied upon for the purposes of constructing public reticulation works in the absence of that approval.</u> • <u>Any person wishing to connect to the public water and/or wastewater network must also obtain approval to such connection under the Water Supply and Wastewater Network Bylaw 2015 (Bylaw). Under the Bylaw an application to connect to a network may be refused in specified circumstances, including where there is insufficient capacity in the network to accommodate the connection. Any alterations to the public wastewater reticulation network require Engineering Plan Approval. Additional</u>	This condition is accepted and has been updated within the condition set. Refer to Condition 36 of the subdivision consent. The advice note is not considered necessary.

<u>approval is required from Watercare as part of the Engineering Plan Approval process.</u> • <u>Public connections are to be constructed in accordance with the Water and Wastewater Code of Practice for Land Development and Subdivision.</u>	
New condition to add: <u>The consent holder must make provision for private water supply and wastewater connections to service all residential lots. Certification that works have been satisfactorily undertaken must be provided when applying for a certificate under section 224(c).</u> <u>Advice notes:</u> • <u>Where private water supply and wastewater infrastructure is constructed to service the development, and a future connection to the public water supply or wastewater network may be sought, the consent holder is advised that such infrastructure should be designed, constructed, and operated, in accordance with the Water and Wastewater Code of Practice for Land Development and Subdivision, to facilitate any potential future connection.</u> • <u>For the avoidance of doubt, nothing in this consent requires the network utility operator to accept any infrastructure for vesting or to approve any connection to the public network.</u>	This condition has been partially accepted, with the proposed changes included below. Refer also to the updated condition set at Section 3.1.13 – Infrastructure Servicing. The advice note is not considered necessary. <u>If a connection to the public reticulation network is not is not provided in accordance with Condition 12 (general conditions), the consent holder must design and construct connections to the make provision for private water supply and wastewater connections reticulation network to service all residential lots within the relevant stage or sub-stage. Certification that works have been satisfactorily undertaken must be provided when applying for a certificate <u>for the relevant stage</u> under section 224(c).</u>
Amendment to existing condition: Prior to the occupation <u>construction</u> of any dwellings with in Stage 2 <u>any stage</u> of the development, the consent holder must provide evidence <u>to the Council</u> that suitable provision has been made for the <u>treatment and</u> disposal of wastewater <u>and treatment and supply of potable water.</u> <u>Advice note: Condition 122 and 123 is not applicable if a connection can be made to the public wastewater system.</u>	This condition change is not accepted. The wording of the condition is proposed in accordance with section 84A of the FTAA, to ensure infrastructure will be provided. It is specifically limited to Stage 2 wastewater, as the substantive application does not include wastewater disposal for Stage 2 of the development. Notwithstanding, there are additional conditions that ensure suitable provision has been made for both wastewater and potable water supply. Refer to all conditions referenced above.
Amendment to existing condition: The WWTP shall be designed and constructed in general accordance with the “Delmore Wastewater Treatment Plant Design Report” prepared by Apex and approved under Condition 1 <u>and must be designed in accordance with the</u>	This condition change is not accepted. The WWTP will be privately owned and operated and does not need to be designed in accordance with Watercare’s standards. Should a connection be made to the public network in the future, the WWTP would be decommissioned.

<u>Water and Wastewater Code of Practice for Land Development and Subdivision.</u>	
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Attachment A: Wastewater and Water Supply Transitioning Matrix

WASTEWATER - TRANSITION FROM PRIVATE TO PUBLIC - SCENARIO MATRIX

Option Scenario	Immediate Connection to Public Network	Interim Onsite Solution, Subsequent Transition to Public Network						Permanent Onsite Solution
	1. Start of Stage 1	2. Part-way through Stage 1		3. End of Stage 1 / Start of Stage 2	4. Part-way through Stage 2		5. End of Stage 2 (~2050)	6. No changeover
Scenario description		Tank and Truck	WWTP					
	Connection at outset. No on-site systems built. Full development on public network from day one.	Connection mid-Stage 1. Includes the holding/trucking raw sewage if no WWTP/on-site WWTP built.	Connection mid-Stage 1. No WWTP/on-site WWTP built.	Connection between stages. Stage 1 fully serviced by onsite, will transition to public network Stage 2 starts on public network	Connection mid-Stage 2. Stage 1 and part of Stage 2 fully serviced by onsite, will transition to public network	Connection at end of Stage 2. Full build-out completed on on-site systems. Transition from Private to Public is final decommissioning event	Full build-out completed on on-site systems.	
On-site WW infrastructure built and operating at transition	None. No WWTP	Partial. WWTP built (holding/trucking only). LPS network partly laid.	Partial. WWTP built LPS network partly laid.	Full Stage 1 infrastructure WWTP operating at Stage 1 capacity. LPS network complete for Stage 1.	Stage 1 + part Stage 2 LPS network. Full development infrastructure. WWTP upgraded for Stage 2.	Full development infrastructure. WWTP at full design capacity. Full LPS network complete.	Full development infrastructure. WWTP at full design capacity. Full LPS network complete.	
Physical works required to transition	None. Build public-network LPS & connection infrastructure as part of normal subdivision works. Standard Winyaw-funded WC connection.	Decommission Tanks. Reconfigure LPS to discharge to public network connection point.	Full WWTP decommissioning (treatment plant, ponds disposal field). Reticulation reconfiguration at point of public connection.	Full WWTP decommissioning (treatment plant, ponds disposal field). Reticulation reconfiguration at point of public connection.	Full WWTP decommissioning (treatment plant, ponds disposal field). Reticulation reconfiguration at point of public connection.	Full WWTP decommissioning (treatment plant, ponds disposal field). Reticulation reconfiguration at point of public connection.	N/A	
Continuity of service for residents during changeover	Residents connect direct to public from occupation.	Stage 1: Planned 4-24hr outage with notice; tankering backup available.	Stage 1: Planned 4-24hr outage with notice; tankering backup available.	Stage 1: Planned 4-24hr outage with notice; tankering backup available. Stage 2: N/A	Stage 1 & 2: Planned 4-24hr outage with notice; tankering backup available.	Stage 1 & 2: Planned 4-24hr outage with notice; tankering backup available.	N/A	
Asset disposition (transfer to WC / decommission / remain	Public reticulation transferred to WC at vesting. No on-site assets to dispose of.	WWTP decommissioned. LPS network: transfer to WC	WWTP decommissioned. LPS network: transfer to WC	WWTP decommissioned. LPS network: transfer to WC	WWTP decommissioned. LPS network: transfer to WC	WWTP decommissioned. LPS network: transfer to WC	Retain in private	

WATER SUPPLY - TRANSITION FROM PRIVATE TO PUBLIC - SCENARIO MATRIX

Option	Immediate Connection to Public Network		Interim Onsite Solution, Subsequent Transition to Public Network			Permanent Onsite Solution
Scenario	1. Start of Stage 1 (post 2038+)	2. Part-way through Stage 1	3. End of Stage 1 / Start of Stage 2	4. Part-way through Stage 2	5. End of Stage 2 (~2050)	6. No changeover
Scenario description	Connection at outset. No on-site systems built. Full development on public network from day one.	Connection mid-Stage 1. On-site WWTP/WTP partially built. Includes the holding/trucking raw sewage question if no WWTP built.	Connection between stages. Stage 1 fully serviced by on-site systems. Stage 2 starts on public network.	Connection mid-Stage 2. Stage 1 on-site for life. Stage 2 split: part on-site, part public.	Connection at end of Stage 2. Full build-out completed on on-site systems. Transition is final decommissioning event.	As per Scenario 5 but retained in private ownership.
On-site water infrastructure built and operating at transition	None. No bores, no WTP, no reservoirs.	Partial. Bores, WTP, Reservoirs built. Reticulation partly laid.	Partial. Bores, WTP, Reservoirs built, dismantled after public connection Stage 1 network complete.	Partial. Bores, WTP, Reservoirs built. Reticulation fully laid in stage 1, partly laid in stage 2	Bores, WTP, Reservoirs built Stage 1 & 2 network complete.	Bores, WTP, Reservoirs built Stage 1 & 2 network complete.
Physical works required to transition	No decommissioning. Build Watercare reservoir (if required), public-network connection as part of subdivision works. Standard WC connection.	Full WTP/bore/reservoir decommissioning. Ensure connection to Watercare reservoir. Connection to public pipe, then Decommission. (no as per per para 37). Reticulation may need flushing/super-chlorination/duplication (per para 36).	Full WTP/bore/reservoir decommissioning. Ensure connection to Watercare reservoir. Connection to public pipe, then Decommission. (no as per per para 37). Reticulation may need flushing/super-chlorination/duplication (per para 36).	Full WTP/bore/reservoir decommissioning. Ensure connection to Watercare reservoir. Connection to public pipe, then Decommission. (no as per per para 37). Reticulation may need flushing/super-chlorination/duplication (per para 36).	Full WTP/bore/reservoir decommissioning. Ensure connection to Watercare reservoir. Connection to public pipe, then Decommission. (no as per per para 37). Reticulation may need flushing/super-chlorination/duplication (per para 36).	N/A
Continuity of service for residents during changeover	N/A - residents connect direct to public from occupation.	Manageable with planned 4hr outage and notice to residents (per para 36 response). Temporary water tanker supply possible for extended outages.	Manageable with planned 4hr outage and notice to residents (per para 36 response). Temporary water tanker supply possible for extended outages.	Manageable with planned 4hr outage and notice to residents (per para 36 response). Temporary water tanker supply possible for extended outages.	Manageable with planned 4hr outage and notice to residents (per para 36 response). Temporary water tanker supply possible for extended outages.	N/A
Asset disposition (transfer to WC / decommission / remain private)	Public reticulation vests to WC. No on-site assets.	WTP/bores decommissioned (WC preference per para 37). Reservoirs: decommission private, construct new public reservoir next to Ara Hills Reservoir Reticulation: vest if WC-CoP compliant, else duplicate network may be required.	WTP/bores decommissioned (WC preference per para 37). Reservoirs: decommission private, construct new public reservoir next to Ara Hills Reservoir Reticulation: vest if WC-CoP compliant, else duplicate network may be required.	WTP/bores decommissioned (WC preference per para 37). Reservoirs: decommission private, construct new public reservoir next to Ara Hills Reservoir Reticulation: vest if WC-CoP compliant, else duplicate network may be required.	WTP/bores decommissioned (WC preference per para 37). Reservoirs: decommission private, construct new public reservoir next to Ara Hills Reservoir Reticulation: vest if WC-CoP compliant, else duplicate network may be required.	Retain in private ownership

Attachment B: McKenzie & Co Assessment of LPS system connection to public network utilising criteria in the COP

For the reasons below, LPS is the best practicable option for this site.

Feasibility is determined by reference to 6 criteria in clause 5.3.12.3.1. These are:

- (a) equivalent or lower lifecycle cost to Watercare;
- (b) costs passed to homeowners are reasonable;
- (c) reliable service - no single component failure causing total system failure;
- (d) site-specific problems it overcomes;
- (e) environmental impact mitigation for spills, outages, pipe breaks;
- (f) discharge point integrated with existing wastewater network.

The water and waste report we prepared to support the substantive application as lodged (AEE, Appendix 27) addressed criteria (d) and (f) in section 6.3. Criteria (a)-(e) are addressed below:

Criterion (a): The LPS solution delivers a lower lifecycle cost to Watercare than the conventional gravity alternative for this site. The Delmore catchment topography requires deep gravity excavation and a Watercare-owned pump station to reach the receiving network, which carries materially higher capital, renewal and operational cost obligations for Watercare over the asset life than a low-pressure reticulation in the road reserve. Under the proposed Riverhead-equivalent ownership model, Watercare's asset base is limited to the small-diameter pressure main in the road reserve. The individual on-property pump units are owned, operated, maintained and renewed by each lot owner at their own cost, removing the principal lifecycle cost drivers (pump station mechanical and electrical renewal, wet well maintenance, odour control, SCADA and power) from Watercare entirely. On this basis criterion (a) is met.

Criterion (b): Costs passed to homeowners under the proposed LPS arrangement are reasonable and are consistent with the ownership model that the COP itself defines for LPS systems, and that Watercare Services Limited has accepted at Riverhead. Homeowners will pay standard Watercare wastewater charges on the publicly vested reticulation in the road reserve in the same way as a gravity-served household. The incremental cost specific to LPS is ownership and operation of the individual on-property pump unit, comprising the pump capital cost (included in the lot purchase), routine maintenance, and electricity to run the pump. These costs are modest on a per-dwelling annual basis, are disclosed to purchasers at point of sale, and are commensurate with the costs accepted by homeowners at comparable LPS developments across Auckland, including Riverhead. Criterion (b) is met.

Criterion (c): The proposed LPS provides reliable service with no single point of failure capable of causing total system failure across the development. The design is inherently distributed: each lot has its own dedicated pump unit with on-property emergency storage and individual alarm. Failure of an individual pump affects only the lot it serves and is recoverable by replacement or repair of that single unit, without service interruption to any other dwelling. There is no central pump station whose failure would take the whole development offline, which is the failure mode the criterion is directed at and which a conventional gravity-plus-pump-station alternative would introduce. The pressure main in the road reserve is a passive small-diameter pipe with no single mechanical component whose failure would isolate the network, and the design provides the strategic isolation zoning, flow and pressure monitoring, and air valve and flushing

access required by clause 5.3.12.3.2 of the Code of Practice, which together support rapid containment and recovery from any localised event. Criterion (c) is met, and the LPS design performs better against this criterion than the gravity-plus-pump-station alternative for this site.

Criterion (d): The Watercare Subdivision Guidance Note (April 2021) describes low pressure sewer systems as suited for use "where a gravity system with a public pump station is not cost effective." That cost-effectiveness test, rather than the indicative 50-dwelling figure with which it is associated, is the operative consideration. The relevant question for Delmore is whether a conventional gravity/pump station solution is cost effective for this site. For Stage 1, where a gravity design was done, and current competitively tendered construction rates are applied, it is not cost effective.

The gravity baseline is the complete gravity wastewater design, priced from the wastewater reticulation and the pump station and rising main, established competitively at current market construction rates. The LPS reticulation is priced on a like-for-like basis (same trench approach, same pipe material family, same fittings approach), with privately owned grinder pump units excluded from the Watercare-ownership scope. An estimate of costs for both gravity and LPS is outlined below:

- **Upfront capital:** gravity wastewater \$5,993,528 (\$12,834 per lot) against LPS reticulation \$1,677,888 (\$3,593 per lot), a capital saving of \$4,315,640, or 72%.
- **Whole-of-life (50-year, NPV):** gravity \$8,082,896 against LPS \$2,296,804, a saving of \$5,786,092, or 71.6%. On a per-lot basis this is \$17,308 against \$4,918.

Because these figures derive from a completed Stage 1 design and current tendered construction rates, the per-lot results provide a defensible basis for extrapolation to the balance of the development, which shares the same topography, geology, and servicing constraints.

The savings are itemised against specific gravity infrastructure that LPS removes:

- Central wastewater pump station and rising main: approximately \$2,596,485, removed entirely.
- Pipe bridges (2 no.): approximately \$515,000, removed entirely
- Deep and large-diameter drop manholes (approximately 92 no.): approximately \$644,000, eliminated by the sealed pressure network.
- Deep gravity trenching (0 to 6 m depth against approximately 0.9 m for LPS): the reduced excavation, bedding, and hardfill is reflected across the reticulation rates.

These outcomes are the direct consequence of the following site-specific factors, each of which makes gravity more expensive at Delmore than on a typical site:

Topography. The site comprises undulating terrain across the lots planned for Stages 1 and 2. A conventional gravity reticulation following natural ground would require deep cuts to enable minimum self-cleansing grades, significant number of drop manholes, pipe bridges across low streams, or intermediate pump stations to lift between sub-catchments, each adding capital cost, and construction risk. The LPS uses small-diameter pressure mains that follow natural ground contours at shallow depth, independent of grade, consistent with clause 5.3.4.3 of the Code of Practice.

Stream crossings. The site contains watercourses that any reticulation must cross. A gravity main would require deep directional drilling or above-ground pipe bridges, with the structural, seismic, and access constraints set out in clause 5.3.6.3A; the gravity design carries a \$515,000 allowance for two such crossings. The LPS avoids streams altogether.

Infiltration and inflow risk. The geology and groundwater conditions at Delmore present an infiltration risk to a deep gravity reticulation over its 100-year design life, against the zero-infiltration commissioning standard at clause 5.2.1(h) and the low-infiltration requirement at 5.2.1(i). Pressure systems are sealed and operate without joints subject to groundwater ingress, eliminating the infiltration mechanism that

drives long-term operating and treatment cost in gravity systems, and removing the gravity network's manhole population and its associated inspection and CCTV burden.

Taken together, a gravity-and-pump-station solution is not cost effective for Delmore, which is the precise circumstance in which the Watercare guidance contemplates LPS. The full value engineering and selections, with the assessment of assumptions and alternatives, will be confirmed in the comprehensive design report at engineering plan approval; the Stage 1 comparison summarised here provides the evidential foundation. Criterion (d) is met.

Criterion (e): Environmental impact from spills, outages and pipe breaks is well mitigated under the proposed LPS design. Spill volumes are inherently constrained: each on-property pump operates on a small storage tank with limited stored volume, so any single-unit failure produces a containable event at a single property rather than a network-wide discharge. Power outages are managed through the on-property emergency storage and alarm system required by the Code of Practice, which provides buffer capacity for normal household discharge during typical outage durations. Pipe breaks on the pressure main are detectable through the pressure monitoring points required by clause 5.3.12.3.2(m) and are limited in consequence: the small-diameter pressure pipe carries far lower instantaneous volumes than a gravity main, and discharge ceases once the affected isolation zone is closed using the section valves required at intervals not exceeding 500m. By comparison, the gravity-plus-pump-station alternative concentrates environmental risk at a single high-volume facility (wet well overflow, rising main rupture, power loss at the station), whereas the LPS distributes and contains it. Criterion (e) is met.

We note that the Riverhead development which we have referred to above is over approx. 1000 homes in West Auckland provides a current example of an LPS system connected to the public network.