ENVELOPE

MEMO

RFI RESPONSE 3

TO	Healthy Waters	**DATE**	21 November 2024
PROJECT NAME	Crestview Rise Proposed Plan Change	**ENVELOPE REF**	1915-01
ATTENTION	Carmel O'Sullivan	**FROM**	Alan Blyde
EMAIL ADDRESS	Carmel.osullivan@aucklandcouncil.govt.nz		

Dear Carmel,

Following our recent discussions and then receipt of an updated second RFI list received through Council's planner, Christopher Turbott, we hereby summarise our repose to your stormwater related requests and put this in table format.

Stormwater and flooding matters – Amber Tsang, Healthy Waters, Auckland Council

No.	Information Category	Further information request	Reasons for request	Applicant's response	Second request for info	Applicant's further response
SW1	Site feature – contour and overland flow path (OLFP)	Figures 1, 2 and 3 in Section 1.3 of the SMP present contour information. It is unclear from the explanation whether the contours are from SurveyWorx or from Auckland Council GeoMaps. They may not be consistent with the actual ground contours after recent earthworks. Likewise it is not clear whether the OLFP shown in other figures such as Figure 8 are the Auckland	Correct understanding and assessment of contours and OLFP are required to inform the most suitable methods of stormwater management for future development enabled by the proposed plan change and the potential effects of the plan change.	Section 1.3 has been updated to make it clear what Figure shows 'current' contours vs the figures which show the historical contours and flowpaths from Auckland Council Geomaps. This section now also includes some discussion around what re-shaping occurred on site and this is expanded on in Section 1.5. Appendix D has been added to the SMP which includes as-builts of all finished contours across the site.		

		Council GIS OLFP or the actual OLFP after recent earthworks. How does this information differ from the actual topography considering the bulk earthworks indicated on GeoMaps's aerials photo dated 2022 (refer to snapshot below)? What are the current OLFP alignments across the site considering the earthworks that have been undertaken within the plan change area? Please update the SMP content as necessary to show current contours and OLFP. 		The as-built plans are prepapred by Survey Worx. Our Overland Flowpath drawing, numbered 475 is attached within Appendix A. This clearly shows how flowpaths would be managed and directed across a potential future developed site. Section 1.8 of the SMP discusses the historic overland flowpaths which affected the site (noting these were minor). Section 6.2.8 of the SMP discusses future overland flowpath management.		
SW2	Site feature – gully and drainage feature	Please show on a map the feature described in Section 1.4 of the SMP as below: A shallow gully feature was mucked out within Lot 123 (28 Crestview Rise). Underfill drains were installed and was backfilled 2017.	This information is required to enable understanding of site features relevant to stormwater management and the effects of the plan change.	Section 1.4 of the SMP has been updated and now includes Figure 5 which shows the location of the underfill drains in what would have been the base of the shallow mucked out gully area.		
SW3	Site feature – existing stormwater network	Section 1.5 of the SMP referenced the Crang Civil design of the existing public stormwater network on Crestview Rise. The report states that: "The rural lots will capture rain from the roof and store this on site for re-use. Overflows from the tanks will discharge to the ground and flow overland." Thus, no additional flow allowance was catered for the subject site (zoned as rural). This excluded allowance for any stormwater runoff in the stormwater network from the rural lots, in the proposed plan change area.	This information is required to enable understanding of site features relevant to stormwater management and the effects of the plan change.	The existing drainage network was sized to cater for the lots as rural (from the subject site) and no additional allowance has been sized for. Section 1.5 of the SMP now clarifies that the overflows from rain tanks and overland flow from the rural lots (the site) has been allowed for within the existing piped network as the site makes up the existing natural upstream catchment. For that reason, flows from the site are attenuated for the 2/10/100 yr events. Peak flow rate control has been achieved to ensure that post development flows will be 80% of		

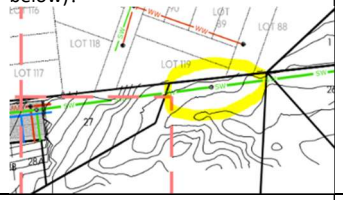
		How has the proposed stormwater management approach considered this limitation?		pre-development flow. This will in effect reduce future flow to the existing piped network, to less that what currently passes there.		
SW4	Site feature – existing easements	Easement Area ZB as shown on DP 536259 (for Right to Convey Gas) goes through the area where a raingarden and stormwater pond is proposed. Please demonstrate how the design, construction and on-going maintenance of these proposed stormwater devices will be managed without affecting other infrastructure and/or infringing relevant easement requirements.	This information is required to enable understanding of site features relevant to stormwater management.	The DP reference is incorrect. The easements quoted were temporary and have been removed. The updated CT reflects this.		
SW5	Stormwater management approach – consistency	Please confirm and/or clarify the following and update the SMP and other plans accordingly: • The executive summary proposes the use of inert building materials, but this is not discussed in Section 6.2. • Section 1.5 suggests that the public stormwater network on Crestview Rise has no capacity for the proposed plan change area, but Section 6.2.5 states that the existing 750mm diameter pipe has capacity for flows from the proposed greenfield development. • As stated in Section 3.1, Mana Whenua have requested that reuse tanks be incorporated into the design of the stormwater management, but this was not presented as an option in the executive summary. • Section 6.2.3 refers to a centralised raingarden is along Crestview Rise at the bottom of the catchment, but no raingarden is identified on the engineering plans submitted.	There are inconsistencies presented throughout the SMP and engineering plans which leads to uncertainty of what stormwater management approach is being proposed and what the effects of the plan change are.	• The executive summary proposes the use of inert building materials, but this is not discussed in Section 6.2. Added to 6.2 • Section 1.5 suggests that the public stormwater network on Crestview Rise has no capacity for the proposed plan change area, but Section 6.2.5 states that the existing 750mm diameter pipe has capacity for flows from the proposed greenfield development. The stormwater network was designed to accommodate flows from the existing pre-development rural lot catchment. In the post-development scenario, all flows will be attenuated to match the rural stormwater design discharge through on-lot reuse, detention, and a centralized pond. Additional details outlining this strategy have been included in the report • As stated in Section 3.1, Mana Whenua have requested that reuse tanks be incorporated into the design of the stormwater management, but this was not		

				presented as an option in the executive summary. This has been updated now. Water re-use tanks are indeed proposed. • Section 6.2.3 refers to a centralised raingarden is along Crestview Rise at the bottom of the catchment, but no raingarden is identified on the engineering plans submitted. This should now be clearly identified on the engineering plans submitted. These are attached in Appendix A.		
SW6	Water quality	Please confirm and clarify if all impervious areas are proposed to be treated to meet GD01/TP10 requirements as per the requirement of the NDC's water quality performance criteria.	This information is required to enable a full assessment of water quality effects. The executive summary of the SMP suggested that stormwater quality treatment will be applied to trafficable surfaces only. This does not meet the NDC's requirement. Section 6.2.2 suggested that only gross pollutants from high contaminant generating activities are required to be treated. This is incorrect. Stormwater discharging from high contaminant generating car parks and high use roads are subject to requirements under Chapter E9 of the Auckland Unitary Plan.	The NDC requires the treatment of all impervious surfaces including building roof catchment. It is proposed to use inert building materials to prevent the generation of contaminant-laden runoff from the proposed buildings. Additionally, while the treatment of the roof catchment is achieved in most catchments, as the treatment devices have been placed on-line; it is also proposed to provide full non-potable re-use in lieu of treatment as the Best Practical Option (BPO). This has been added to Section 6.2.2 of the SMP.	It is stated in Section 6.2.3 of the SMP that 200m2 of proposed Road 1 will discharge directly onto Crestview Rise. Please confirm the proposed treatment methods for this section of the proposed public road as per the requirement of the NDC's water quality performance criteria and the relevant policies under Chapter E1.3 of the Auckland Unitary Plan?	We have revised the drawings to include a raingarden at entrance of Road 1 to treat the catchment.
SW7	Water quality	Please confirm the proposed treatment methods for private residential roofs, private residential hardstand, and JOALs. Please also provide an assessment and justification of why the proposed treatment methods for different areas are considered the Best Practicable Option (BPO), and how they meet the requirements of the NDC and the relevant policies under Chapter E1.3 of the Auckland Unitary Plan.	The proposed treatment methods for the different impervious areas should be clearly identified and justified. It should be noted that roof runoff (composed of inert building materials) directed to re-use tanks and plumbed for internal re-use (such as toilet flushing) is acceptable as a BPO from a treatment perspective. Re-use for garden watering alone is not considered a BPO.	Treatment for new roads is provided through raingarden to treat 2% of contributing impervious catchments including the proposed JOAL, Road and driveways. Roof runoff will be directed to re-use tanks and plumbed for internal re-use. Section 6.2.2 has been updated to better describe proposed treatment methods.		
SW8	Water quality	It is stated in Section 6.2.2 of the SMP that treatment will be	This information is required to enable understanding of the	10mm/hr represents a first flush rainfall depth, not a flow rate. This		

		provided for the Water Quality Flow of 10mm/hr. Please clarify this. Does it mean the runoff from 10mm/hr or the proposed treatment devices will achieve a flow rate of 10mm/hr?	proposed stormwater management methods and effects.	aligns with common practice for first flush treatment and corresponds to the design storm for water quality treatment, aligning with GD01/TP10 guidelines. This approach ensures that rainwater reuse tanks are topped up, and all runoff from impervious, trafficable areas is directed to the proposed raingarden for treatment and treatment devices are designed at a minimum for this rainfall depth.		
SW9	Water quality	Engineering plan Drawing No. 400 appears to show stormwater runoff from Lots 2 to 8B will discharge to the existing public stormwater network on Crestview Rise without treatment. Please confirm the proposed treatment methods for impervious areas within Lots 2 to 8B as shown on Engineering Plan (drawing ref: 400)?	This information is required to enable understanding of the proposed stormwater management methods and effects.	Various sections of the SMP have been updated to discuss how treatment will be provided for lots 1-10 and 22. Roofs will be constructed with inert building materials (zinc and copper will be prohibited). Driveway areas which cannot fall to the proposed reticulated network in Road 1 (which passes through the centralised rain garden) will have localised on-lot treatment devices or will be constructed with permeable paving.		
SW10	Stormwater discharge point and effects	Two discharge options are discussed in Section 6.2.5 of the SMP: 1) discharge to the existing public network or 2) discharge to the stream via a new outlet. It is unclear which of these discharge options is to be applied and what the effects would be. Both options will have impacts on the receiving environment. Drawing 401 is not sufficient to clarify this. Although it shows a potential connection to the public network, we don't know if this is feasible or the preferred option. Also, what is shown on Drawing 401 may not be consistent with the discussion in the SMP. Please: • confirm the discharge point and the receiving environment,	Assessment and understanding the discharge point and the condition of the ultimate receiving environment is required to inform the most suitable methods of stormwater management, including discharge options.	The proposal is to discharge to the existing public pipe network and this is reflected on the plans attached in Appendix A of the SMP(sheets 400-402). Section 6.2.5 of the SMP has been updated. The catchment is allowed for in the parent subdivision. We are mitigating the increased adverse effects through attenuation/ treatment. The updated SMP and attached calculations confirm other queries.		

		• provide an evaluation explaining why this is the preferred option, • provide an evaluation demonstrating that the existing network has enough capacity for the increased volume, • provide an evaluation of the condition of the existing downstream environment, • provide an evaluation of the effects of the discharge on stream flow on erosion, • explain how any adverse effects will be avoided or mitigated. • update the SMP documents and engineering plans accordingly.				
SW11	Hydrological mitigation	Please confirm the retention and detention performance that is being proposed?	This information is required to enable a full assessment of stormwater runoff effects.	Retention - Water re-use for non-potable water use such as laundry, toilet flushing and for landscaping will be provided within on-lot rainwater tanks. Detention - The roof areas will be detained within the on-lot rainwater tanks. The vehicles accessways discharge to the centralised stormwater pond. SMP has been updated to better clarify,	Please confirm if the vehicles accessways for hydrological mitigation will discharge to the rain garden, instead of the stormwater pond and that the rain garden is big enough for the detention volume?	All runoff from accessways pass through the raingardens prior to discharge to the pond. If conveyance is not feasible, permeable paving will be utilised.
SW12	SMAF	Please provide an evaluation demonstrating if SMAF (as per the requirements outlined in Chapter E10 of the Auckland Unitary Plan) is the BPO, accounting for the existing condition of the receiving stream (un-named) and its vulnerability to erosion: • Has a geomorphic assessment of the current state of stream been completed (including within the zone of influence – this may include streams downstream of the plan change area)? • Has an investigation of pre and post development flow/shear stress been undertaken to show potential future erosion risks resulting from land use change	The Stormwater Management Area Flow (SMAF) overlay was not applied to sites that are future urban and rural zoned under the Auckland Unitary Plan. This was on the basis that structure planning and plan change processes are the most appropriate time at which the best method of hydrology mitigation would be determined and applied. Therefore this needs to be addressed now to understand the effects of the plan change.	SMP has been updated to better clarify. Best methods of hydrological mitigation will be applied.	Please provide photos of the existing outfall. Please be advised that contribution to the upgrade of the outfall is expected at the development stage.	An updated plan of the outfall has been prepared which includes photos.

		activities on natural stream receiving environments? • Please provide a pre and post development flows analysis in terms of excess shear stress. • Please provide details of the condition of the existing outlet and stream at outlet. • Please also provide information on the design of the proposed remediation works on the existing wingwall outlet (as stated in Section 6.2.5).		The existing wingwall is currently damaged/ affected by scour. This is a council asset and is vested public drainage. As such it is Council's responsibility to maintain and repair the infrastructure. If at the time of future EPA applications there is some upgrade or repair required to the wingwall, this will be evaluated with Council as part of that EPA application process.		
SW13	SMAF	Please provide an assessment to confirm if the use of SMAF will be sufficient to mitigate stormwater runoff effects on the receiving stream environment caused by the change of land use (e.g. erosion and instream habitat changes etc).	This information is required to enable a full assessment of stormwater runoff effects.	Water re-use for non-potable water use such as laundry, toilet flushing and for landscaping will be provided within on-lot rainwater tanks. Flow attenuation is proposed to ensure peak flow post development will be less then pre-development peak flows.		
SW14	Stormwater device – rain garden	Please provide calculations to support sizing of the rain garden described and proposed in Section 6.2.3 of the SMP. Please confirm if the rain garden will be sized to include runoff from private driveways?	This information is required to enable assessment of the feasibility and suitability of the proposed stormwater devices. And hence to confirm if adverse effects associated with stormwater discharge will practically be able to be mitigated.	Treatment for new roads is provided through raingarden to treat 2% of contributing impervious catchments including the proposed JOAL, Road and driveways. Section 6.2.3 is updated within the SMP.	As per GD01, the rain garden will need to size for 5% of the contributing impervious catchment area to meet the SMAF requirements. Please provide information/ calculations demonstrating 5% as per GD01.	To be updated and provided.
SW15	Stormwater device – tank	Please confirm the areas that will drain into the 5m3 water tank proposed on each allotment (as stated in Section 6.2.3 of the SMP and shown on the engineering plans)? Please provide calculations to support the proposed tank volume and explain what this volume will consist of i.e. how much retention, detention and/or attenuation?	This information is required to enable assessment of the feasibility and suitability of the proposed stormwater devices?	Roof areas of dwellings will discharge into the 5m³ on-lot tanks. A roof area of 90m² has been used to inform our tank sizes. Driveways are excluded and have been factored into the accessway stormwater catchment calculations. • 3m³ Detention Volume to be released via orifice at pre-development flows • 1.5m³ Retention Volume to be used for non-potable re-use in dwellings • 0.5m³ Approx of dead storage at the bottom of the tanks (150mm depth)	Tanks alone will not be accepted by Healthy Waters to provide for 1% attenuation from roofs as roof guttering is only sized for about a 10 yr event. Alternative roof guttering sizing cannot be enforced by a building consent. Please consider and provide alternative or additional mitigation for 1%. This needs to be demonstrated to mitigate downstream flood risk.	Accepted. No detention is currently assumed, but will be used for retention.

				This information will be included within Section 6.3.1 of the SMP		
SW16	Stormwater asset	Please provide information on how access for the on-going maintenance of the proposed public network within the plan change area will be provided for, particularly regarding the section of network that will be located within rural zoning (refer to snapshot below)? 	This information is required to enable assessment of the feasibility and suitability of the proposed stormwater asset to be vested with Healthy Waters.	No different to any of the other drainage in the area. Access will be provided by the Road with a heavy-duty vehicle crossing provided and 3m wide access way suitable for maintenance vehicles.		
SW17	Stormwater attenuation	According to Section 6.2.5 of the SMP, a communal stormwater pond is proposed to attenuate stormwater flows for the 1% AEP storm events and will discharge stormwater at pre-development flows. Please provide information of how the stormwater pond will be designed to achieve this? Calculation to support sizing of the pond is also requested. Please also demonstrate how stormwater flows will be conveyed to the pond (including flows from Lots 2 to 8B as shown on Engineering Plan (drawing ref: 400))? Will all upstream connections be sized to accommodate the 1% AEP storm events? Supporting calculations are requested to demonstrate feasibility.	Greenfield development enabled by this plan change proposal will increase imperviousness and therefore increase the flow rate and volume of stormwater runoff from the site. This information is required to enable assessment of whether it is feasible to attenuate stormwater flows from the plan change area for the 1% AEP storm events. And hence to confirm if adverse effects associated with stormwater discharge will practically be able to be mitigated.	Further information has been provided in the SMP and supporting calculations.	Healthy Waters is concerned about the potential blockage of the inlet to the proposed pipe network which leads to the stormwater pond. Please assess any actual and potential flood effects on downstream properties in the event of blockage and provide that information. Given that relying on tanks for 1% attenuation is not an acceptable option and the concerns regarding inlet blockage, please consider provision of additional attenuation ponds and respond providing information on that.	Entry into the piped system will be via Superpits/ Megapits. A secondary OLFP will direct 100yr flows to the ponds. Directing flows from the road will be done via raised pedestrian crossings, superelevation or similar design features.
SW18	Stormwater attenuation	It is stated in Section 6.2.6 of the SMP that the stormwater tanks on each dwelling will be sized to attenuate and reduce stormwater flows so that there is no increase in flow rate in a 1% AEP storm event. All downpipes and upstream	Further information is required to confirm feasibility of this proposed arrangement as the mitigation of effects is reliant on this. Healthy Waters' Catchment Manager has requested confirmation of the feasibility and	We have designed on-lot tanks to accommodate a 90m² roof area. A feasibility assessment will require details on proposed gutter types, roof pitch angles, pitch arrangement, and downpipe locations, none of which are	Tanks alone are not adequate for hydrological mitigation. Please respond as per the question for SW15.	Accepted.

		connections of the tank will also to be sized to accommodate the 1% AEP storm events. Please provide a feasibility assessment of the potential arrangement as described in Section 6.2.6 of the SMP, considering allotment sizes, setbacks and separations required between tanks, buildings, property boundaries and retaining walls etc. Supporting calculations are requested.	demonstration of the ability that the downpipes and upstream connections to tanks can accommodate the 1% AEP storm events.	typically detailed during the Plan Change Process. The proposed elements are standard, even for smaller medium-density developments.		
SW19	Stormwater attenuation	Please confirm if attenuation is proposed for the 50% and 10% AEP storm events and how?	This information is required to enable a full assessment of stormwater runoff effects.	Confirmed attenuation is proposed for the 50% and 10% AEP events through a manhole with tiered orifices within the stormwater pond. This will be finalised in the detail design process and can be explained in more detail in the updated SMP.		
SW20	Network capacity	Please provide an impact assessment downstream of the site on network performance of discharging the increased volumes of stormwater runoff from the greenfield development enabled by the plan change proposed over a prolonged duration. Please confirm how any adverse effects will be avoided and/or mitigated.	The development of a rural area for urban land use will increase imperviousness and therefore increase the flow rate and volume of stormwater runoff from the area. Attenuation of flows will partially mitigate the effects of this land use change by limiting the peak flow. However, it does not address the increased volumes of runoff that will be generated. It should be noted that historically, where a Catchment Management Plan was not present the approach was to attenuate to 80% of pre-development for new development. This may be applicable for the plan change proposal. Where there are downstream flooding issues, peak discharges for the post development 100 year 1% AEP storm event may need to be managed to ensure that downstream flood levels are not increased. Depending on the catchment, the number of	A water reuse system is proposed for each dwelling, featuring larger-than-usual tanks (5m^3). Extended storage within the pond and raingardens will be adopted during the detail design phase. This approach will help decrease discharge volume. Since the site lacks suitable infiltration options, this method is the most practical solution to mitigate both volume and extended flows. Attenuation will be to 80% of pre-development flow.	While attenuation to 80% of pre-development is considered acceptable, the concerns regarding inlet blockage is outstanding and the utilisation of tanks alone for 1% attenuation from roofs is not considered acceptable. Please respond as per the questions for SW15 and S17.	Accepted..

			tributaries and the location of the project in a catchment, timing of flow discharges may be an issue. If so, a catchment wide study may be necessary to ensure that downstream flood risks are not increased. If there is no catchment-wide study, work done by the former Manukau City Council and overseas has indicated that limiting the peak discharge of the 100 year storm to not exceed 80% of the predevelopment 100 year storm will reduce downstream flood increase concerns. The 80% peak discharge rate reduces potential for coincidence of elevated flow downstream by extended release of the flows. The council will consider this approach as an alternative to a catchment wide study.			
SW21	Network capacity	Section 1.5 suggests that the public stormwater network on Crestview Rise has no capacity for the proposed plan change area, but Section 6.2.5 states that the existing 750mm diameter pipe has capacity for flows from the proposed greenfield development. This appears contradictory. To clarify this please provide the following: What is the design flow for the 10% AEP event within the existing network and how much capacity remains? Please provide the results of an investigation into the capacity of the existing public stormwater network, to the point of discharge downstream of Opaheke Road bridge, including details of any mitigation proposed should available capacity not be sufficient to service the proposed greenfield development.	This is information assists in understanding the effects on the capacity of the downstream network.	*"The report states that "The rural lots will capture rain from the roof and store this on site for re-use. Overflows from the tanks will discharge to the ground and flow overland." Thus, no additional flow allowance was catered for the subject site (zoned as rural)."* The existing 750mm diameter pipe currently conveys pre-development peak flows. The discharge from the development will not exceed existing flow levels, ensuring the pipe's capacity is maintained. The development will attenuate 1% AEP events through on-lot retention tanks and a centralized stormwater pond. Post-development discharge from any outlet will not exceed the existing 1% AEP event levels. This aligns with the recommendations in the SWP and previous design reports.	While attenuation to 80% of pre-development is considered acceptable, the concerns regarding inlet blockage is outstanding and the utilisation of tanks alone for 1% attenuation from roofs is not considered acceptable. Please respond as per the questions for SW15 and S17.	Accepted.

SW22	Flooding	There is no identification of what downstream flooding effects this greenfield development will have on the receiving environment and how the 1% AEP storm event will be discharging. Please provide an assessment on how the proposed land use change will affect overland flow paths and flood plains downstream of the plan change area, considering both existing rainfall and climate change rainfall.	Floodplains presented in Auckland Council GeoMaps do not include impacts of the proposed greenfield development. This information is therefore required to enable a full assessment of flooding effects of the proposed land use. It should be noted that downstream floor flooding has previously occurred.	The development is not located in any existing flood hazard zones. Being elevated, the site is not expected to experience flood hazards. We are aware of downstream flooding issues and are therefore managing post-development flows within the development to ensure no adverse downstream effects. The development will not impact overland flow paths or floodplains downstream, as it does not obstruct either. All stormwater will be managed within the development to prevent any downstream effects. A detailed design of the pond and outlet structure, including final post-development flows, will be addressed in the detailed design phase. Attenuation will be to 80% of pre-development flow.	For sizing of the stormwater pond, please confirm if the sizing is based on an HMS model and please provide the model for review.	We have used Info Drainage (an Autodesk software) and we can provide the outputs.
SW23	Flooding	The SMP proposes attenuation of the 1% AEP storm event. Attenuation may extend the duration of downstream flooding. Has coincidence of flows been considered and how will adverse effects be avoided and/or mitigated?	This information is required to enable a full assessment of downstream flooding effects.	A water reuse system is proposed for each dwelling, featuring larger-than-usual tanks (5m^3). Extended storage within the pond and raingardens will be adopted during the detail design phase. This approach will help decrease discharge volume. Since the site lacks suitable infiltration options, this method is the most practical solution to mitigate both volume and peak flows. Additionally, we are over attenuating the 1% AEP event. Attenuation will be to 80% of pre-development flow.	The concerns regarding inlet blockage is outstanding and the utilisation of tanks alone for 1% attenuation from roofs is not considered acceptable. Please respond as per the questions for SW15 and S17.	Accepted..
SW24	Flooding	Please provide a flood impact assessment of the proposed greenfield development on: • Crestview Rise. • Kotahitanga Street. • Adjacent properties, particularly Lots 112, 113, 117, 118 and 119	This information is required to enable a full assessment of flooding effects.	No existing flood hazards are present on Crestview Rise, Kotahitanga Street, or the adjacent properties. The development will manage 1% AEP rainfall events, maintaining pre-development flow rates. Stormwater discharge will be contained within the development,	Please refer to comments above in relation to flood effects assessment on downstream properties in the event of inlet blockage. Please respond as per question SW17.	Suitable OLFP's are available to direct flows into the 2 SW ponds.

		as shown on the Engineering Plan (drawing ref: 400)		ensuring no discharge to adjacent properties. If any existing runoff issues are currently occurring due to slope runoff, the development of the site would improve these issues. Attenuation will be to 80% of pre-development flow.		
SW25	SMP implementation	Please provide information on how the proposed stormwater management methods outlined in the SMP are intended to be implemented. Please confirm and clarify at what stage of the development the proposed communal device and other public network/devices are intended to be constructed. If staging of development is proposed, please provide information on how the SMP will be implemented corresponding to each stage of development.	This information is required to enable assessment of whether adverse effects associated with stormwater discharge will practically be able to be mitigated. It is considered appropriate to address SMP implementation as part of the plan change proposal to ensure stormwater effects are being assessed at a catchment wide level, considering cumulative effects.	The communal devices and other public network systems will be constructed during the civil construction contract along with the other proposed infrastructure. The centralized treatment and attenuation devices will be operational before any dwellings are constructed, regardless of the staging approach. Updated Section 6.2.9		
SW26	Scope of the SMP	Please confirm the scope of and clearly identify the area to be covered by the SMP.	Part of the plan change area will remain rurally zoned. It should be noted that the NDC cannot authorises stormwater diversions and discharge in rural zoned areas. Therefore, any approved SMP will not cover stormwater diversions and discharge in the plan charge area that is rurally zoned. This should be made clear in the SMP.	Noted.		
SW27	SMP approval	Please provide an amended SMP which includes the further information and assessment as requested above and the remaining points below: • Section 5.3 of the SMP states that there will be approximately 7181m3 of cut and 865m3 of fill for the entire site. Please confirm how the surplus fill and an existing stockpile area adjacent to Kotahitanga Street referred to in the section is to be managed.	The SMP acts in the plan change process as an assessment of stormwater effects at a catchment wide level, considering cumulative effects and forms part of the NDC authorisation process. An approved SMP is required for the authorisation of stormwater diversion/discharge under the NDC. It also sets out how the effects of the land uses proposed in the plan change are to be avoided or mitigated.	Any surplus will be removed from the site. Updated in Section 5.3 Retention storage will be provided within the raingarden and in the dead storage area of the pond. Due to the lack of soakage options on-site, retention for the accessway is limited. Creating storage as described is the most practical solution. Additionally, lots will be equipped with water reuse systems to manage rainwater retention. These updates are reflected in Section 6.2.3 of the SMP		

		• Section 6.2.3 suggests that the proposed raingarden and stormwater pond will provide additional retention volume. However, considering that these devices will likely be lined it should be detention volume. • Section 6.5 appears to be incomplete (i.e. containing one risk only). This should be updated to reflect a more comprehensive risk assessment associated with the proposed land use change and shifting of the RUB. This could include but is not limited to risks associated with outdated or inaccurate floodplain/OLFP info on Geomaps, climate change risk, blockages, overloading of network capacity and some of the matters raised above.		Section 6.5 has been updated to address additional risks.