

Project Address: FP326_3 Pigeon Mountain Road

Council Reference: BUN60419132

Request for Additional Information – Engineering (HW)

S92 Request (received via email 14 August 2025)		Applicant Response (86 Engineering _26 March 2026)																										
1	The OLFP assessment has not addressed the change in the exit points of the OLFPs, particularly for the OLFP at the northern boundary which is proposed to be subject to an increase in catchment area from approximately 0.233 hectares to 0.764 hectares. Please provide further assessment to demonstrate this will not result in the erosion of the downstream existing grassed embankment or increase the risk of flooding to public road users.	<p>The assessment of OLFPs has been updated to address changes in exit points and associated catchment areas. Although post-development peak flows for OLFPs differ e slightly from the pre-development scenario, the overall flow patterns remain close to pre-development conditions.</p> <p>Regarding the potential erosion from the increased northern runoff catchment, please refer to the comments on the northern runoff in the table below. The catchment for the entire site has been revised.</p> <p>The majority of flows generated within 3 Pigeon Mountain are now conveyed via channelled path between lots 11-42 with riprap proposed where concentrated flows occur to manage erosion, this OLFP is similar to pre-development scenario. Some of the catchments are now short sheet flow paths, limiting the flow velocity and erosive potential.</p> <p>A summary of pre- and post-development conditions with comments is provided in table below. The post development flow calculation is provided in Appendix F in SMP.</p> <table border="1"> <thead> <tr> <th></th> <th>Pre-development</th> <th>Post development</th> <th>Difference</th> <th>Comments/ Observations</th> </tr> </thead> <tbody> <tr> <td colspan="5">OLFP (via northern boundary)</td> </tr> <tr> <td></td> <td>Existing OLFP 1 + Existing OLFP 2</td> <td>Sheet flow from Catchment 4, 6, 7</td> <td></td> <td rowspan="3">In the post development scenario, the northern OLFP comprises flows from Catchments 4,6,7. The contributing catchment configuration has changed due to the proposed development and landform modifications, the overall flow direction (to north) remains comparable to pre-development conditions. The total peak flow at the north boundary reduces from 0.264m³/s (pre-development) to 0.228m³/s (post development). Furthermore, catchments 6 & 7 (originating from residential area) remain as short sheet flow with flow lengths less than 25m, which limits flow velocity and erosive potential to the downstream grassed embankment. These flows are dispersed and do not increase the risk of flooding to public road users. Runoff/sheet flow from Catchment 4 is conveyed northward via the access path between Lots 7 and 8. A downstream cross-section assessment confirms that the resulting flow remains as shallow sheet flow, with a maximum calculated water depth of</td> </tr> <tr> <td>Peak flow (m³/s)</td> <td>0.097 (OLFP1) + 0.167 (OLFP2) = 0.264</td> <td>= 0.135 (CA4) + 0.032 (CA6) + 0.061 (CA7) =0.228</td> <td>-0.036</td> </tr> <tr> <td>Catchment Area (ha)</td> <td>0.2198 (OLFP1) + 0.3959 (OLFP2) =0.6157</td> <td>= 0.329 (CA4) + 0.079 (CA6) + 0.149 (CA7) =0.557</td> <td>-0.0587</td> </tr> </tbody> </table>					Pre-development	Post development	Difference	Comments/ Observations	OLFP (via northern boundary)						Existing OLFP 1 + Existing OLFP 2	Sheet flow from Catchment 4, 6, 7		In the post development scenario, the northern OLFP comprises flows from Catchments 4,6,7. The contributing catchment configuration has changed due to the proposed development and landform modifications, the overall flow direction (to north) remains comparable to pre-development conditions. The total peak flow at the north boundary reduces from 0.264m ³ /s (pre-development) to 0.228m ³ /s (post development). Furthermore, catchments 6 & 7 (originating from residential area) remain as short sheet flow with flow lengths less than 25m, which limits flow velocity and erosive potential to the downstream grassed embankment. These flows are dispersed and do not increase the risk of flooding to public road users. Runoff/sheet flow from Catchment 4 is conveyed northward via the access path between Lots 7 and 8. A downstream cross-section assessment confirms that the resulting flow remains as shallow sheet flow, with a maximum calculated water depth of	Peak flow (m ³ /s)	0.097 (OLFP1) + 0.167 (OLFP2) = 0.264	= 0.135 (CA4) + 0.032 (CA6) + 0.061 (CA7) =0.228	-0.036	Catchment Area (ha)	0.2198 (OLFP1) + 0.3959 (OLFP2) =0.6157	= 0.329 (CA4) + 0.079 (CA6) + 0.149 (CA7) =0.557	-0.0587
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				67mm and a velocity of 0.864m/s. Based on these hydraulic characteristics, the flow is not expected to generate erosive forces capable of damaging the downstream grassed embankment.
OLFP (via eastern boundary)				
	Existing OLFP 3	OLFP C from Catchment 3 + Sheet flow from Catchment 5		Catchment 3 is directed to Pigeon Mountain Road via a channelled flow path, with riprap proposed to manage potential erosion. Catchment 5 remains as short sheet flow, with flow lengths less than 30 m. Flow rates from the sheet-flow catchments remain low, ensuring minimal erosive potential along the downstream grassed berm. With flows either dispersed as sheet flow or appropriately channelled, the proposed development is not expected to cause downstream erosion or materially increase flooding risk to public road users or adjacent properties.
Peak flow (m ³ /s)	0.229	= 0.21 (CA3) + 0.030 (CA5) = 0.24	0.011	
Catchment Area (ha)	0.5334ha	= 0.513 (CA3) + 0.073 (CA5) = 0.586	0.0526	
Sheet flow (via eastern boundary)				
		Sheet flow from Catchment 1,2		Sheet flow directed to Pigeon Mountain Road and not contributing to OLFP
Peak flow (m ³ /s)		= 0.068 (CA1) + 0.030 (CA2) = 0.098		
Catchment Area (ha)		= 0.167 (CA1) + 0.073 (CA2) = 0.24		
Overall, the revised OLFP design ensures that peak flows at the northern OLFP are managed, and hence minimise the erosion risk to the downstream grassed embankment.				
2	<p>The development is proposing an overall increase in imperviousness, which also exceeds AUP maximum standards for the zone. An assessment of potential effects on the 1% AEP flooding downstream of the site needs to be carried out and mitigation provided as necessary.</p> <p>The following SMP and matters are recommended to be considered and addressed by the Applicant:</p> <ul style="list-style-type: none"> Clarify how water quality treatment will be provided for private hardstand areas and common walkways and update SMP including BPO assessment as needed. Provide further justification to demonstrate the use of inert building materials is the BPO to manage water quality for roof areas and update SMP accordingly. Include definition of inert building materials into the SMP as per below recommendation: 	<p><u>Site imperviousness and flooding effects (1% AEP)</u></p> <p>The updated master plan confirms a total site imperviousness of 59.7%, which complies with the 60% maximum impervious area permitted for the Mixed Housing Urban Zone under the AUP.</p> <p><u>Water Quality</u></p> <ul style="list-style-type: none"> Private hardstand areas and common pedestrian accessways are limited in extent and serve individual dwellings only. These areas are subject to very low traffic volumes (typically 1-2 vehicles per dwelling) and therefore generate low contaminant loads when compared to commercial or high use hardstand areas. Water quality management for private hardstand and common walkway is achieved through source control through low traffic generation and minimisation of hardstand areas. Given the small contributing areas and low contaminant risk, this approach represents the Best Practicable Option (BPO) for managing stormwater quality from private hardstand areas and common walkways. The SMP has been updated accordingly. Refer to SMP Section 7. Water quality management for the roof is managed by the inert building materials, avoiding contaminant generating products, in accordance with HW recommendations. This significantly reduces dissolved metal contaminants at source. Additionally, the roof runoff is diverted to on lot stormwater detention tank, which reduce the volume and rate of discharge into public network, this provides additional sediment settlement and water quality 		

New buildings, and additions to buildings, must be constructed using cladding, roofing and spouting building materials that avoid the use of contaminant generating building products which have:

- a. exposed surface(s) or surface coating of metallic zinc of any alloy containing greater than 10% zinc; or
 - b. exposed surface(s) or surface coating of metallic copper or any alloy containing greater than 10% copper; or
 - c. exposed treated timber surface(s) or any roof material with a copper containing or zinc-containing algaecide.
- Flexibility is proposed to be allowed on the final selection of on-lot tanks. Please update the 10% AEP attenuation requirements in the SMP to include a specific target peak flow rate for each lot.
 - Proposed stormwater lines 2-2 to 2-3 and 1-2 to 1-1 are located within the side yard of private lots and in proximity to the proposed buildings. The proposed alignment may not meet the requirements of the SWCoP and there is a risk that it will not be approved at EPA in the current location. It is recommended to reconsider this alignment.

Note: Based on the property file information, the existing site is discharging stormwater to existing public manhole SAP ID 2000234285 in the north-western corner of the site. The development is now proposing to discharge all stormwater to existing public manhole SAP ID 2000323535, which is part of a different public branch line and is currently expected to receive minimal stormwater flow from the subject site. The condition of the stormwater network downstream of public manhole SAP ID 2000323535 is poor and deteriorating, particularly from the existing public manhole SAP ID 2000143859 to 2000860608. Discharging additional stormwater flow and volume into this network, as proposed by this development, increases the risk of potential failure of the affected pipes. The proposed discharge into this manhole is subject to further investigations by Healthy Waters and potentially the requirement to renew this section of network. Alternatively, connection to existing public manhole SAP ID 2000234285 may need to be maintained as per the current arrangement.

benefits, and prevent direct, uncontrolled discharge of roof runoff into public stormwater system. The combination of course control (inert materials) and detention (on lot stormwater tank) form a treatment train and is considered the BPO for roof runoff management for this development. The SMP (Refer to Section 7) has been updated to reflect this approach.

- The SMP has also been updated to include a definition of inert building materials.

Stormwater detention tank (on-lot)

The stormwater 10% AEP peak flow mitigation is now defined in the SMP with flexibility retained for the final selection of on-lot detention tanks to allow integration with individual dwelling designs at building consent stage. Each lot is required to limit its 10% AEP peak discharge to a specified target flow rate (average 1.54 l/s per lot). These target discharge rate have been included in the SMP and shall be demonstrated through detailed design building consent stage to ensure that the post development peak flows will be controlled and downstream effects is mitigated during a 10% AEP storm event via on-lot stormwater tank.

Details can be found on SMP Section 7.3 and SMP Appendix H.

Stormwater alignment

The stormwater network layout has been reviewed and revised, please refer to Engineering Plan FP326-400 for the revised stormwater alignment. Clearances have now been shown on the plan, with A minimum 1m horizontal clearance from the proposed stormwater pipes to other structures, in accordance with SW COP requirements.

Stormwater discharge point

The proposed stormwater network has been updated such that the majority of the development now discharges to the existing public manhole SAP ID2000234285, consistent with the historic discharge arrangement. Due to local level constraints, a small portion of the proposed site (lot 12-18, 34-41 and JOAL 4) will continue to discharge to the existing manhole (SAP ID 2000323535) on Pigeon Mountain Road. By maintaining the primary discharge to SAP ID2000234285 and limiting additional loading on the alternative downstream network, the proposal reduces the risk of adverse effects on the deteriorated public stormwater pipes identified by Council.

We have also proposed a 10% AEP peak flow rate mitigation considering the deteriorated condition of the downstream network as identified by Healthy Waters. Further details regarding the peak flow analysis and requirements refer to Appendix H in SMP.

Details of the proposed stormwater network and discharge points refer to FP326-400.