

Sections 77J and 32AA - Port Hills Stormwater Qualifying Matter - additional evaluation (authored by Ike Kleynbos)

Introduction

The joint witness statement (JWS) of Planning experts dated 11 December 2023 affirms the planners' agreement with the position taken in my rebuttal evidence that the National Policy Statement for Freshwater Management (NPS-FM) can be considered as part of the IPI process, that the NPS-FM supports the identification of a QM, and that a QM response may be undertaken. However, there was disagreement as to where and how the QM approach should be applied.

Two alternatives to the approaches set out in Canterbury Regional Council's (CRC) evidence and in my rebuttal evidence were put forward: a certified permitted pathway applying over where loess soils are located; an impervious surface control aligning with the MDRS density standard for building coverage.

The JWS of Planning experts dated 24 April 2024 records the planners' agreement that both approaches, namely a certified permitted pathway and an impervious surface control, could be applied as a QM response as together they would manage both water quality and quantity effects of development on residential Port Hill areas. Certified permitted pathway controls were detailed and discussed within the JWS, however only the general approach of imperviousness was discussed, with a 50% imperviousness threshold discussed. This was due to the MDRS building coverage control and was a good alignment with the 45% imperviousness threshold used across Residential Hills zoned areas for stormwater design, as per Christchurch City Council's (Council) Waterways, Wetlands, and Drainage Guide (WWDG). However, in the presentation to the Panel Ms Buddle (CRC) acknowledged that any impervious surface control should seek alignment with the WWDG at a 45% imperviousness.

The WWDG is a detailed engineering document produced by Council used for the following purposes:

- setting conditions of resource consent;
- to determine the appropriateness of new stormwater connections under building consent;
- the design and construction of hydraulic systems (piped networks, waterways, culverts and bridges);
- the design of stormwater mitigation and disposal systems (basins, wetlands, rapid soakage systems); and
- guidance to consent applicants for hydraulic and hydrologic modelling.

My rebuttal evidence dated 16 October 2023 extensively considers the overarching Port Hills Stormwater QM. I conclude that the consideration of loess soils can be considered as a QM as this would give effect to the NPS-FM, meeting s77I(b) of the Act (para 42). As noted above, the applicability of the NPS-FM was affirmed by planning experts in the JWS dated 11 December 2023, and further in the JWS dated 24 April 2024 by specific reference to clause 3.5(4) of the NPS-FM.

My rebuttal evidence reiterates the conclusions reached in the WWDG regarding the sensitivity to development within loess soils (para 39).

Ms Newlands' (CRC) stormwater engineering evidence in-chief (dated [20 September 2023](#)) is also of particular relevance and details:

- Port Hills erosion characteristics (paras 23 to 26);
- flooding effects within the Ōpāwaho-Heathcote River (paras 42 to 46);
- requirements of the global stormwater consent ([CRC231955](#)) (paras 52 to 59);
- The Council's Residential Building Site Erosion Sediment Control Compliance Survey 2022/2023 results (paras 68 to 70);

Ms Newlands further details evidence in her summary statement, relevant aspects being:

- erosion effects on sloped sites: the erosion rate triples as the slope doubles (para 8); and
- current monitoring outcomes of the Ōpāwaho-Heathcote River (paras 11 to 14)

Mr Norton (for the Council) has stated his agreement with the position of CRC, noting the high risk of erosion from development on the Port Hills and difficulty in treating the effects of such erosion due to the presence of loess soils (Hearings Statement, 18 October 2023, para 8 and Hearings Statement, 2 November 2023, para 5).

Separate to the expert conferencing of Planners on this topic, the expert conferencing of Infrastructure Experts (which included both Ms Newlands and Mr Norton) took place on 5 October 2023. The agreed position from experts expressed in the JWS is that the Port Hills are overlain by loess soil which is fine grained, dispersive and highly erodible (page 5). It further highlights the particular risks infill development has on sedimentation, difficulty in stormwater management, and the further risks of erosion and scour from localised flooding, and the need to manage water quality effects during construction, and runoff effects post-construction.

Incompatibility with MDRS

Evidence presented throughout the hearing has demonstrated the high risks that the MDRS would present if enabled unencumbered across residential areas within the Port Hills. The MDRS would enable the ability for 'zero lot' development, where there is no site density control if a residential unit exists or is proposed (cl 8, Schedule 3A). Any development can occupy up to 50% of the site it occupies, with up to 3 residential units permitted for each site. The MDRS contains no limitations on imperviousness, though the RMA contemplates such controls through s80E(2) and has no limitation on other controls, subject to the MDRS and s771/O. An MDRS development scenario would then therefore likely lead to a large exposure of earthworks, overturning land and releasing loess soils, and the high potential for large areas of impervious surfaces, placing significant pressure on local infrastructure.

The existing District Plan framework for the Residential Hills limits development to 35% site coverage, with an RD pathway for site coverage of between 35-45% (RD12). Any breach of this is a Discretionary activity. Earthwork controls apply across this area, but provide an exception for any works relating to a building with resource consent (8.9.3.a.iv). While the Plan has not given effect to the NPS-FM, development across Residential Hill areas has been designed to meet an imperviousness of 45%, with Council's Stormwater Planning unit sizing networks accordingly. Most of the Residential Hills zone is occupied and therefore it is reasonable to anticipate that the predominate development scenario will be infill development dependent on existing networks. The Port Hills are a topographically and geographically constrained environment whereby adaption of an existing stormwater network to support (say) 60-70% imperviousness that may be generated from MDRS development is either not possible, highly challenging, or has significant financial or environmental costs. A Port Hills Stormwater qualifying matter response is therefore required under s771 of the Act.

Proposed QM provisions

Planning experts participating in the latest JWS on Port Hills Stormwater qualifying matter (dated 24 April 2024) expressed support for both a certified permitted pathway approach and an impervious surface control approach. These are addressed in-turn below.

Certified permitted pathway

- Creates a new Loess Soils Management Area overlay, representative of the Manaaki Whenua S-Map dataset for 'loess dominant soils' and applies rules accordingly.
- A new "suitably qualified soil professional" definition is added to Chapter 2, which states:

In relation to Chapter 8, means a person who:

- a. has been awarded a recognised science or engineering degree; and*
- b. has experience in engineering geology or soil science; and*
- c. is a registered Chartered Professional Engineer under the Chartered Professional Engineers Act 2002.*

- Introduces a new permitted standard for residential development Loess Soils Management Area overlay (8.9.2.1 P6) that requires an ESCP (erosion and sediment control plan) drafted by a suitably qualified expert to be submitted to Council prior to works commencing, and for the expert to be responsible for monitoring compliance with the associated water quality standard.
- A restricted discretionary activity (8.9.2.3 RD8) is introduced as an escalation to the certified permitted pathway.
- An associated matter of discretion is introduced for consideration under RD (8.9.4.11).
- Modifies the earthworks exemption (8.9.3.a.iv) for works with a building consent, whereby the exemption no longer applies if the RD rule for the certified permitted pathway breach is applied.
- Two new policies are introduced to direct the identification and management of loess soils (8.2.4.5) and to further permit development subject development being appropriately managed by a suitably qualified soil professional (8.2.4.6).

Importantly, the certified permitted pathway only applies for residential development that is at a density greater than the operative Plan. This is on the basis that the Plan anticipates effects at the operative density and are managed accordingly, whilst addressing any *Waikanae*-related concern. It means that the trigger for development in the overlay where the Residential Hills zone currently applies is at a density greater 650m² (i.e residential units in sites less than this), or 400m² for sites in the Lyttelton Township, across the Residential Banks Peninsula Zone.

The provisions included for this part of the QM response have been the subject of commentary in the JWS, with some minor modifications.

Impervious surface control

- Introduces a new maximum imperviousness of 45% across residential hill areas (not Lyttelton Township), which is spatially applied to Suburban Hill Density Precinct and/or the Residential Hills Precinct (standard 14.5.3.2.16):
 - Provisions align with the operative definition of “Impervious surfaces” with the rule further adding to this and applying further exclusions.
 - Within the standard, a breach of the 45% imperviousness is permitted where water is discharged to stormwater facility of coastal waters, subject to network capacity to convey the stormwater. This must be confirmed by Council in writing at least six months prior to works commencing. This follows a similar approach operative to the Wastewater Capacity Certification process (rule 8.4.1.3 and 8.6.8.b).
- Modifies permitted building coverage within the Residential Hills Precinct to 45% to align with the imperviousness control (standard 14.5.3.2.9.g). The Suburban Hill Density Precinct already sets a standard of building coverage of 35% under the same associated standard.
- Creates a restricted discretionary rule for beaches of the standard (14.5.3.1.4 RD22).
- An associated matter of discretion is introduced (14.15.45).
- Modifies Policy 14.5.7 (operative as 14.4.5) – Character of residential development on the Port Hills – to add an additional sub-clause focused on development that responds to the topographical and geographical constraints of the Port Hills.
- Modifies Table 14.2.1.1a, Medium Density Residential Zone description, to better reflect the wider purpose of the two hill-focused precincts that the QM is spatially tied to.

Distinct to the certified permitted pathway, these rules are located under the area-specific rules of the Medium Density Residential Zone sub-chapter. This is for the following reasons:

- stormwater management is not considered generally within Chapter 9;

- rules have a relationship to site density that the zone would otherwise permit; and
- the application of the rule does not include the Lyttelton Township, whereas the Loess Soils Management Area does.

The reason for the latter is primarily because no evidence has been provided as the assumed imperviousness of Lyttelton Township; the WWDC only considers residential zones from the northern face of the Port Hills. By all accounts the physical environment is very different, being much more established, denser, and with a direct discharge into coastal waters.

Relationship with LPTAA and alternatives

Overall, there is seen to be an integrated approach to the response through the Low Public Transport Accessibility Area (LPTAA) QM since a lesser site coverage and general building occupancy is directed through associated precincts over Residential Hill areas. These are all features that assist in the intended outcomes of the Port Hills Stormwater QM response and, in concert with proposed provisions, would provide greater means to provide for other impervious access requirements due to the 10% difference between precinct and impervious controls (the Suburban Hill Density Precinct permits a 35% building coverage, whilst imperviousness is set at 45%).

Both the provisions coexisting would likely provide the most practical rule framework for residential occupancy on the Residential Hills. However, if the Panel does not support the LPTAA approach, it remains important for a reactionary approach.

If the Suburban Hill Density Precinct is removed and MRZ remains, the Residential Hill Precinct should apply over all areas currently zoned as Residential Hills where MRZ is proposed. This is because:

- The Residential Hills Precinct would apply a minimum 650m² vacant allotment site requirement – reflective of the challenging terrain, thereby ensuring that residential development thereafter is able to be achieved.
- Rules associated with imperviousness are still tied to this precinct.

It is not considered necessary for changes to be made in relation to the Loess Soils Management Area, as these would remain fit-for-purpose regardless of what density is enabled.

As an alternative to the above, my rebuttal evidence (16 October 2023) outlines that the retention of Residential Hills Zone as a response to the QM could be considered an appropriate means to respond to the QM. This would be the simplest means to achieve the outcomes that the QM intends as it retains the operative approach to development density. It is considered, however, that the proposals included here better achieve the prerequisites of s77I of “to the extent necessary”, being a more targeted approach.

s77 evaluation of the qualifying matter

The first test is whether it is a qualifying matter under s77I. The evidence before the Panel is that the Port Hills Stormwater qualifying matter approach is justifiable under s77I(b) as a response to the requirement of the NPS-FM, clause 3.5(4).

The branch of the QM that introduces the Loess Soil Management Area and associated controls via a Certified Permitted Pathway introduces additional consenting requirements or evaluative material to ensure activities remain permitted. However, there is no direct influence upon the MDRS or Policy 3 of the NPS-UD, therefore in terms of the threshold set under s77I to be “less enabling” of the MDRS or Policy 3, it could be argued that the permitted pathway element is not a qualifying matter and may instead be considered as a s80E related matter. For the benefit of the Panel a full consideration under s77J is provided below in consideration of the fact that the standard would require additional evaluation/documentation to remain a permitted activity. Impervious surface controls do seek to modify the building coverage controls that the MDRS density standards introduce and there is no dispute that this must be justified as a qualifying matter.

Loess Soil Management Area

s77J – incompatibility (sub-section (3)(a)):

The area is already influenced by the LPTAA QM response; however, this still provides for greater development opportunities over operative controls when specific conditions are met. This area contains highly erodible soils with great potential for sedimentation of local waterways. Any increase in development has a greater influence on land being overturned.

s77J – development capacity (sub-section (3)(b)):

The proposed Loess Soil Management Area (LSMA) intersects with just over 9,600 residential parcels: about 8,300 are currently (partially or wholly) Residential Hill zoned and 1,300 are currently (partially or wholly) Residential Banks Peninsula zoned.

For Residential Hill sites, the average parcels size is about 1,400m² and a median of 850m². There is an imperfect relationship between the proposed LSMA and parcel areas, with the total area of parcels being 28.4% greater than the total area of LSMA over the Residential Hills area. Therefore, for the purposes of modelling development capacity loss, it is assumed that the LSMA would cover 71.6% of Residential Hill sites.

Under a full MDRS scenario, the development on the hills is assumed at one unit per 100m² of the parent site after 30% of the site area has been removed for access and retaining of hill sites (see para 2.3.21 of Section 32 report on Qualifying Matters – Part 1).

Applying the above, LSMA overlap would be 610m² of an 850m² median site size. Removing 30% leaves approximately 430m² to be developed – being 4 residential units. Assuming that every parcel has an existing dwelling, the net calculation should be based on 3 units per site. Multiplying this by the approximately 8,300 parcels results in net development capacity 24,900 units. However, the above figure does not represent a total loss, but rather acts to evaluate the impact of consenting requirements for ESCP measures that the LSMA requires. In theory, there is no development capacity loss with this QM.

The reality of its influence is likely to be quite different due to the commercial feasibility of hill development due to high cost to manage and engineer hillside development, whilst also considering the influence of the LPTAA. My rebuttal evidence (16 October 2023, paras 52 to 54) states that if the LPTAA did not apply over residential hills, the estimated commercially feasible yield would be just over 6,000 residential units and an additional 1,600 within areas not covered by the LPTAA.

For Residential Banks Peninsula sites, the average parcel size is about 840m² and a median of 560m². Applying the same methodology as Residential Hills would mean there is assumed to be an 82.5% alignment between LSMA and Residential Banks Peninsula zones (RBP). The LSMA would therefore cover approximately 460m² of a 560m² median site. Removing 30% leaves approximately 325m² to be developed – being 3 residential units, or 2 net units, assuming one existing unit per parcel. Multiplying this by the 1,300 parcels results in 2,600 development capacity units influenced by the LSMA. As above, this is an absolute maximum figure as the commercial reality of development is likely to reduce this figure significantly (commercial feasible yields typically represent in the order of 10% of plan-enabled yield (e.g. development capacity)).

s77J – broader costs (sub-section (3)(c)):

The broader costs of the proposed LSMA approach are likely felt in the additional costs on development to employ a chartered engineer, or alternatively the commissioning of relevant expertise to complete the resource consenting requirements. This would also likely further delay the delivery of housing overall, with the potential to increase borrowing costs over a longer development window. Ultimately, there is potential for an increase in housing, albeit that the under an MDRS scenario there would be more opportunity for smaller scale housing, which would lower the barrier to entry for housing overall.

s77J – MDRS modification & DP application (sub-section (4)(a)):

The LSMA would not seek to alter any of the MDRS density standards or activity standards. Instead, there would be an additional permitted activity standard to introduce the certified permitted pathway. A new overlay would be introduced to denote the location of loess soil areas relative to operative Residential Hills and Residential Banks Peninsula zones. Rules associated with the LSMA would be contained under the area-specific controls for MRZ.

s77J – spatial relationship to QM extent (sub-section (4)(b)):

The LSMA is located over where loess soils have been mapped through the Manaaki Whenua Landcare Research S-Map programme, as supplied by Environment Canterbury (CRC). Proposed provisions therefore seek to directly align with where adverse effects may be anticipated.

Impervious surface controls

s77J – incompatibility (sub-section (3)(a)):

It is intended for the impervious QM approach to apply to all current operative Residential Hill areas. This is due to the over 80% alignment that the zone has with loess soils and their high degree of erodibility and consequential sedimentation of waterways. Developing at greater densities is likely to lead to much higher degrees of imperviousness, which on hill sites would easily create overflow paths and erode loess soil areas, carrying this sedimentation to the Ōpāwaho Heathcote River at the foothills or ocean discharge areas. The potential for this is captured in Council's WWDC, which estimates that current Residential Medium Density (RMD) zoned areas result in an 80% impervious cover ([Table 21-6](#), page 9, Chapter 21)

s77J – development capacity (sub-section (3)(b)):

The impervious surface control would be applied to all the operative Residential Hills zone where MRZ has been proposed. The operative zone currently intersects with approximately 9,300 parcels that are either wholly or partially influenced by the zone. This is exemplified by difference between the total area of intersecting sites and total area of the Residential Hills zone, which has an average alignment of about 83% with parcels.

Intersecting sites have an average size of just less than 1,300m² and a median of about 840m².

Provisions under Chapter 7 (Transport) set standards for site access, as per Appendix 7.5.7. Specific provisions have been recommended for accessways to service rear lots considering emergency service access requirements, which is a particular concern on Port Hill sites (see #842 Fire and Emergency submission regarding Appendix 7.5.7, h.iii, and #751 Council submission on this matter). While the notified proposal was for 7.5m access width to address this, the final proposal is for a 4m access to rear sites.

As above, it is anticipated that most of the development in Residential Hill areas will be infill development and therefore access allocation has been assumed for development capacity loss calculations. After applying the assumed 30% access allocation for hill sites, 50% building coverage would provide for about 300m² of building coverage. If it is assumed that the 20% of a median site would contain access that is impervious (~170m²), then the total imperviousness over median sites applying MDRS is assumed at 470m² – or 70% impervious cover. This assumption broadly aligns with the conclusions reached in the WWDC for flat RMD sites ([Table 21-6](#), page 9, Chapter 21).

A 45% imperviousness over median sites would provide for about 380m² of site cover. Applying the same 20% access imperviousness assumptions above, would leave about 210m² for building coverage (roofed) and other paths or patios.

MDRS density standards provide for a variety of building forms to be constructed, up to three storeys. A three-storey townhouse typology can be constructed on lots of 80m², with 40m² building footprint. Theoretically, such a building typology would be unaffected by the proposed 45% imperviousness control when constructing the permitted three units per site – occupying 120m² of the 210m² that

would theoretically be available. This would leave more space for site manoeuvring, retaining, paths, or patios.

However, lower density units seeking to utilise MDRS may be directly affected and would theoretically be limited to a building footprint of 210m² or about 70m² footprint for a three-unit development. Such a footprint is considered typical for a two-storey townhouse typology.

s77J – broader costs (sub-section (3)(c)):

Broader costs are addressed above. In addition, a further cost may simply be the innovation required to configure building location to reduce the proportion of the site dedicated to access. This may mean that units are located closer to the road access, however topography may constrain options to achieve this. Alternatively, pervious paving or other finishes for the site access may need to be considered to provide for a greater allowance of building footprint.

s77J – MDRS modification & DP application (sub-section (4)(a)):

A 45% imperviousness area is more restrictive than a 50% building coverage permitted through the MDRS. The Act anticipates that there may be additional controls to manage imperviousness (s80E(2)(f)), however the proposal would be 5% lesser than what is enabled through MDRS, resulting in this being a qualifying matter under s77I.

The impervious surface control would limit building coverage to 45% in addition to adding a built form standard of 45% for imperviousness. This would simply be considered alongside other built form standards and have a corresponding RD breach and associated matters of discretion. The spatial application would align with proposed Precincts which collectively capture the operative Residential Hill area; therefore, no additional overlay would be required.

It is noted that most of the area influenced is also captured by the LPTAA response, which permits a 35% site coverage.

s77J – spatial relationship to QM extent (sub-section (4)(b)):

As above, this QM would directly relate to where operative Residential Hill zones are located. This approach aligns with how the stormwater network has been engineered across hilled sites.

s77 conclusion

The above demonstrates that both branches of the Port Hills Stormwater QM meet the requirements under s77I and s77J of the Act. It is noted that the LSMA could also be considered as a s80E(2) related matter.

Section 32AA Further Evaluation

A further evaluation in accordance with s32AA of the Act has been provided in the following table:

Benefits	Appropriateness in achieving the objectives / higher order document directions
<p>Environmental:</p> <ul style="list-style-type: none"> • Reduces the risks of sedimentation of waterways as a result of otherwise increased development in Port Hill areas. • Water quality is less likely to deteriorate further. • Improved management of dust and other nuisance effects of earthworks through the (conditional) removal of earthworks 	<p>Efficiency:</p> <p>This is considered to be the most efficient means to address:</p> <p>MDRS Objective 1; MDRS Policy 2; NPS-FM Objective, Policy 1, Policy 2, Canterbury Regional Policy Statement Objectives 5.2.1, 6.2.1, 6.2.3, Policies 5.3.3, 6.3.2, Mahaanui Iwi Management Plan: WM2.4, WM6.8,</p>

<p>exemption.</p> <ul style="list-style-type: none"> • Further addresses requirements under Council’s global discharge consent. • Proposed restrictions would force residential developments to reduce their building footprint, thereby reducing the overall environmental impact of housing development. 	<p>WM6.15, WM6.16, Policy P6.1, Policy P6.4, Policy P11.1, Policy P11.9, District Plan Strategic Objectives: Objective 3.3.3, Objective 3.3.10, Objective 3.3.17.</p>
<p>Economic:</p> <ul style="list-style-type: none"> • Lessened flood risk and associated erosion of hillsides that would otherwise cause land damage and remedial works. • Potential mitigation against any further increase in local Council rates and/or private insurance due to the management of erosion caused by overflow paths from stormwater network breaches. • Reduces financial burden on hill residents through the further upgrade of full stormwater network, which has limited opportunities for upgrade given topography, land conditions, and ownership. 	<p>Effectiveness:</p> <p>The certified pathway can only be achieved by a chartered engineer, increasing the effectiveness. Any breach is dealt with via a resource consent process with matters targeted to actual or potential effects associated with the breach.</p> <p>Restricting impervious surfaces will have a direct effect on how stormwater traverses hilled areas and the quantity of water runoff. This in turn reduces the degree of hillside erosion.</p> <p>There is potential for conflict/duplication with LWRP requirements and confusion about s30/31 responsibilities.</p>
<p>Social:</p> <ul style="list-style-type: none"> • Improved management of flooding supports people’s sense of security – both for residents within residential hill areas and for residents within areas prone to flooding along the Ōpāwaho-Heathcote River. • Management of development itself, rather than the associated hilled infrastructure, is likely to reduce remedial works that may otherwise frustrate the local community, with larger works having the potential to alter people’s sense of place. 	
<p>Cultural:</p> <ul style="list-style-type: none"> • Management of land which reduces sedimentation of waterways supports the values placed on ngā wai, as per the Mahaanui Iwi Management Plan and the District Plan. • The proposed framework allows for limited notification where the certified permitted pathway is breached. The QM is designed to work alongside the Ngā Tūranga Tūpuna overlay present on the Port Hills. 	
<p>Costs</p>	
<p>Environmental:</p> <ul style="list-style-type: none"> • There are seen to be little to no 	

environmental costs.

Economic:

- For both branches of the QM, there is anticipated to be additional consenting costs, with the potential to delay the delivery of housing.
- There is potential for less housing infill across Port Hill and Lyttelton Township areas, subject to their interaction with other QMs.
- Under a 'full MDRS' scenario, permitted development would require resource consent due to the 45% building coverage modification. This reduces layout and design options given the accessibility and retaining requirements of hill sites, which is exacerbated when seen alongside accessway requirements under Chapter 7.

Social:

- There is potential for less housing infill across Port Hill and Lyttelton Township areas, subject to their interaction with other QMs.
- The QM approach would further restrict the development of residential housing, acting as a barrier further access to the housing market (recognising that ample housing opportunities are provided for elsewhere).

Cultural:

There are seen to be little to no cultural costs.

Risk of acting/not acting:

- There is a risk that these proposals are replaced with the forthcoming plan change on earthworks (PC17).
- The risk of not acting is that there is a period where MDRS development is able to progress causes sediment mobilisation of loess soils, reducing water quality throughout the Ōpāwaho Heathcote River catchment.
- Not acting would mean there are no means to control stormwater at greater densities within a sensitive environment.

Recommendation:

The Loess Soil Management Area certified permitted pathway approach and impervious surface controls are a recommended instrument to apply the Port Hills Stormwater qualifying matter as it is considered to give effect to the purpose of the Act.