

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of a Notice of Requirement submitted by Palmerston North City Council for the extension of Abby Road to Johnstone Drive.

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**REPORT TO COMMISSIONERS**  
**SECTION 42A REPORT OF DAVID CHRISTOPHER ARSENEAU – STORMWATER**  
**MANAGEMENT FOR THE PROPOSED EXTENSION OF ABBY ROAD**

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Dated: 11 December 2020

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## OUTLINE OF REPORT

- [1] A brief synopsis of the major sections of this report is listed below:
- a. Qualifications and Experience – substantiating my qualifications to author this report to commissioners.
  - b. Proposed Activity – an overview of the Activity in question.
  - c. Scope of Report – summarising the scope and extent of this review.
  - d. Information Reviewed – documenting the information used in completing this review.
  - e. Site and Surrounding Area – documenting the existing conditions along and adjacent to the proposed alignment of the Abby Road extension, particularly as it pertains to stormwater management.
  - f. Assessment of Stormwater Effects – summary of the stormwater details included in the Notice of Requirement and my professional assessment of the anticipated stormwater impacts from the proposed road extension on adjacent areas.
  - g. Conclusion and Recommendations – a summary of my assessment and recommendations for the Committee.

## QUALIFICATIONS AND EXPERIENCE

- [2] My full name is David Christopher Arseneau. I am a senior water engineer with GHD, currently located in Palmerston North.
- [3] I have a degree in Civil Engineering with a specialisation in Water Resources from the University of Waterloo (Canada), obtained in 2008, and a Masters of Engineering in Public Policy degree from McMaster University (Canada), obtained in 2011.
- [4] I am a licensed Professional Engineer (P.Eng.) in the Canadian province of Ontario (since 2011).
- [5] I have been a practicing water resources engineer since 2008 and transferred to New Zealand in August 2019. I have experience in the analysis, design and construction of a variety of water resources infrastructure in Canada, including stormwater management systems/facilities, drainage improvements, flood risk assessments and river engineering works. Since arriving in New Zealand I have been primarily engaged

in the review and development of stormwater management plans for residential developments in the Palmerston North and Horowhenua areas.

- [6] I have read and agree to comply with the Code of Conduct for expert witnesses issued as part of the Environment Court Practice Notes. The matters addressed in this statement of evidence are within my expertise and I am not aware of any material facts that have either been omitted or might alter or detract from the opinions expressed in this statement.

#### **PROPOSED ACTIVITY**

- [7] Palmerston North City Council (PNCC), the Applicant and Requiring Authority, has submitted a Notice of Requirement (NOR) to PNCC, the Consenting Authority, for the extension of Abby Road from its current northern terminus to intersect with Johnstone Drive, located in the Aokautere subdivision of Palmerston North. The road extension would consist of approximately 180 m of two-lane roadway crossing several parcels of land owned by Aokautere Land Holdings Limited (ALHL) and encompassing a portion of the “Abby Road Gully” (the gully).

#### **SCOPE OF REPORT**

- [8] The scope of this report is to review the proposed activity in the context of the Notice of Requirement and applicable policies, standards and regulations. The objective of the review is to provide an unbiased technical assessment of stormwater conditions at the proposed road extension site to assist the Hearing Committee in addressing the effects of the Notice of Requirement application, and recommend potential conditions to require of the application.

#### **INFORMATION REVIEWED**

- [9] The information reviewed for this assessment included the following:
- a. The Applicant’s Notice of Requirement application for the Abby Road extension, dated 10 September 2020
  - b. Submissions received by PNCC regarding the NOR, specifically:
    - i. Submission #1 from Bo Yu of 19 Woodgate Court

- ii.Submission #2 from Powerco Limited
- iii.Submission #3 from ALHL
- iv.Submission #4 from Lynne Bishop of 11 Woodgate Court
- c. The Aokautere Stormwater Management Strategy (April 2020), prepared by myself for PNCC as part of the ongoing Aokautere Structure Plan initiative
- d. Available GIS data from PNCC, including 2018 LiDAR elevation information, parcel boundaries and storm main/sump locations and elevations
- e. PNCC Engineering Standards for Land Development
- f. PNCC District Plan
- g. Horizons Regional Council One Plan
- h. Resource Management Act 1991

## **SITE AND SURROUNDING AREA**

- [10] Abby Road is a residential road in the Aokautere subdivision of Palmerston North off Pacific Drive, currently terminating in a dead-end just south of the Abby Road Gully. The gully separates the end of Abby Road from Johnstone Drive.
- [11] The area between the end of Abby Road and Johnstone Drive is currently undeveloped and is situated on two lots owned by ALHL: Lot 2 DP 484515 and Lot 1102 DP 519561.
- [12] Based on the available LiDAR elevation data, overland stormwater flow along Abby Road is split into north and south flow directions approximately at Woodgate Court. Runoff from Abby Road north of Woodgate Court flows to the current terminus of Abby Road and would be expected to continue north into the gully if the road extension is constructed. Similarly, runoff from the portion of Abby Road leading to the proposed intersection of Abby Road with Johnstone Drive would flow west towards the gully.
- [13] The gully extends south (upstream) from the proposed Abby Road extension location for approximately 200 metres, terminating at the rear property lines of residences along Woodgate Court. Stormwater from the rear gardens of these properties and others along Abby Road and Johnstone Drive drains into the gully and flows north into the Manga O Tane Reserve, crosses under Aokautere Drive into the Pari Reserve, and ultimately discharges into the Manawatū River across from the Manawatū Golf Course. The proposed road crossing will intersect this drainage path through the gully.

- [14] Abby Road is situated in the Aokautere subdivision, which is currently the subject of a new Structure Plan to be implemented by PNCC. Although the Structure Plan has not yet been notified or approved, the stormwater management strategy for the Aokautere area detailed in the Structure Plan is considered relevant, as it is in compliance with PNCC's Engineering Standards for Land Development. The stormwater management strategy includes stormwater controls to manage flood risk, erosion risk, and water quality risk.

#### **ASSESSMENT OF STORMWATER EFFECTS**

- [15] The Applicant's Notice of Requirement notes the following general details regarding stormwater (paraphrased where appropriate):
- a. Notes the requirement for a culvert to be installed in the gully to allow stormwater to be conveyed from the upstream portions of the gully.
  - b. Notes that the small stream within the gully originates from a small stormwater pipe at the upstream end of the gully which appears to discharge water from residential areas along Woodgate Court and Johnstone Drive.
  - c. Assumes that best practice stormwater management and ESC (erosion and sediment controls) would be implemented during construction to avoid short term impacts.
  - d. Indicates that Rangitāne o Manawatū have expressed interest in the stormwater management of the gully.
  - e. Indicates that stormwater contamination from the adjacent urban areas is likely present in the stream flow.
  - f. Identifies the risk that the proposed works could increase stormwater runoff into the gully, particularly in the context of the Manga O Tane Reserve.
  - g. Suggests that native plantings on the proposed road embankments could mitigate stormwater quality and treatment concerns.
- [16] The Applicant's Notice of Requirement appropriately acknowledges the stormwater-related risks associated with the proposed activity, including increased runoff to the gully and increased stormwater contamination. However, mitigation of stormwater risks and adverse effects is not well described.

- [17] Several sensitive areas are located downstream of the proposed road extension site, including the Manga o Tane Reserve which is a focus of local restoration and native revegetation efforts. Increased stormwater volume and contamination could adversely impact these areas if not mitigated. As well, increased runoff can result in increased erosion throughout the downstream gully system, creating potential slope stability hazards and impacting aquatic habitat.
- [18] Placement of the road through the gully will impact the flow of stormwater from upstream areas, which is acknowledged in the NOR. Mitigation is recommended with the installation of a culvert under the road. However, considering the local topography and relatively small upstream catchment area, there is not a high risk of flood impacts to upstream areas associated with the proposed road. Rather, there is a significant opportunity to use the portion of gully south/upstream of the proposed road as a stormwater detention and treatment area prior to discharge into the sensitive downstream areas. This would also serve to treat stormwater discharge from the existing residential areas. This approach would be consistent with the stormwater management strategy for the Aokautere Structure Plan.
- [19] The stormwater management strategy for the Aokautere Structure Plan requires that development areas control stormwater such that downstream areas are protected from increased risk of flooding, erosion, and water quality impacts. These measures should be applied pre-emptively to the proposed extension of Abby Road, which is located in the Aokautere Structure Plan area.

#### **STATUTORY PROVISIONS – PNCC DISTRICT PLAN AND ENGINEERING STANDARDS**

- [20] The proposed subdivision was evaluated against the PNCC District Plan and PNCC Engineering Standards for Land Development (ESLD) in the context of objectives and policies that relate to stormwater or stormwater effects.
- [21] The District Plan includes several objectives and policies to ensure that development occurs in a thoughtful and effective manner, including the following:
- a. Policy 2.3 – To ensure safe, convenient and efficient movement of people, vehicles and goods in a high quality environment with minimum adverse effects by providing that: ...the road network stormwater control system shall protect the road, road users and adjoining land from the adverse effects

of water and minimise any adverse effects on the environment...[the structure of a road] be protected from the adverse effects of surface and ground water...[and] the road network stormwater control system shall...adequately convey water to an approved discharge point.

- b. Policy 2.5 – To avoid, remedy or mitigate the adverse effects of land development by ensuring as far as possible that the carrying out of land clearance, earthworks and other construction activity does not result in: ... damage to property from stormwater runoff.
- c. Policy 2.9 – To safeguard people, property and the environment from the adverse effects of surface water by ensuring that: The layout and functioning of the stormwater drainage system: ...adequately services its catchment...ensures that stormwater disposal from the subdivision would not increase the risk of inundation in urban areas.

[22] The full design details of the stormwater management system are not included in the NOR; the Applicant should provide confirmation as needed that the ESLD objectives for stormwater (described in section 6.1.4 of the ESLD) are satisfied. In particular, stormwater measures that achieve the following objectives should be considered by the Applicant:

- a. Reduces stormwater peak flow rates to pre-development levels.
- b. Avoids adverse environmental and community effects.
- c. Identifies and incorporates downstream improvements required as a result of the proposed works.
- d. Ensures stormwater management devices are fit for purpose, taking into account local characteristics.

[23] In the context of the Assessment of Stormwater Effects described previously in this report, and considering the objectives and policies from the District Plan and ESLD (listed above, at a minimum), it is my opinion that any NOR approval should include explicit requirements or conditions for the effective management of stormwater to protect downstream areas.



## REVIEW OF SUBMISSIONS

- [24] The four submissions received by PNCC regarding the NOR were reviewed for any relevant implications to stormwater-related aspects of the application.
- [25] Submission #1 was received from Bo Yu, resident at 19 Woodgate Court located at the upstream end of Abby Road gully. The submitter's opposition to the NOR is related primarily to the road changing the nature of the gully, as well as leading to further filling of the gully (i.e., a slippery slope). There are no specific concerns related to stormwater, although it is noted that impacts to the visual nature of the gully could be mitigated through native plantings around and upstream of the proposed road; this would also provide stormwater and erosion control benefit.
- [26] Submission #2 was received from Powerco Limited and seeks only to ensure that its underground gas assets located at the end of Abby Road are protected during any future construction work. No stormwater related concerns are raised, and therefore no comment is made on the submission in this report.
- [27] Submission #3 was received from ALHL and does not include any specific concerns related to stormwater or similar impacts associated with the proposed road connection. Therefore no comment is made on the submission in this report.
- [28] Submission #4 was received from Lynne Bishop, resident at 11 Woodgate Court adjacent to the upstream end of the gully. The submitter is opposed to the application due to anticipated adverse effects to landscape and visual effects, the nature of the gully topography, and fear of further filling of the upstream end of the gully after the road is constructed. Although there are no specific concerns with stormwater or drainage, the submitter's proposal to have the gully vested to Council and revegetated with native plantings would have significant benefit to stormwater quality, erosion and sedimentation mitigation, and protection of the downstream Manga o Tane Reserve.

## CONCLUSION AND RECOMMENDATIONS

- [29] The stormwater review described herein indicates that the proposed extension of Abby Road could create stormwater adverse effects to downstream areas. These risks

are broadly and appropriately acknowledged in the NOR. However, the mitigation of these risks is not well described, creating the possibility that the road extension is implemented without appropriate stormwater management controls.

- [30] There is a significant opportunity to use a portion of the Abby Road gully upstream of the proposed road alignment for the detention and treatment of stormwater runoff from both the new road and upstream residential areas.
- [31] The submissions received during the NOR notification process do not include any specific concerns related to stormwater, natural hazards or environmental impacts. Submissions #1 and #4 include concerns related to the nature of the gully, some of which could be mitigated through natural plantings which would also have stormwater benefits.
- [32] Based on this review, it is my recommendation that any approval of the NOR includes conditions for stormwater management, namely:
- a. That the extension of Abby Road complies with the requirements of the Engineering Standards for Land Development and the Aokautere Structure Plan stormwater management strategy. This includes the following minimum requirements, or as otherwise described in the approved Structure Plan:
    - i. Mitigation of the 100-year ARI post-development flows to pre-development levels.
    - ii. Mitigation of erosive potential due to post-development stormwater flows in downstream areas.
    - iii. Treatment of stormwater runoff up to the 90% percentile rainfall event (15 mm depth) in an appropriate stormwater treatment facility (i.e., roadside rain gardens and/or a stormwater wetland).
  - b. That the Abby Road extension design submission include a stormwater management report prepared by an experienced and qualified stormwater professional that provides comprehensive details of the engineering calculations of pre- and post-development stormwater runoff flows from all hardstand areas associated with the road extension, and the appropriate

sizing, placement and configuration of stormwater quantity and quality controls.

- c. In the event that the Aokautere Structure Plan is not approved or is delayed, the Abby Road extension should regardless be held to the above listed stormwater management requirements.
- d. That the applicant work to protect and revegetate the upstream portion of the gully to provide stormwater management, erosion control, and landscape amenity benefits.

Dated: 11 December 2020



**David Christopher Arseneau**