

BEFORE THE INDEPENDENT HEARINGS PANEL

IN THE MATTER of the Resource Management Act 1991 ("**RMA**")

AND

IN THE MATTER Resource consent applications by Te Puna Industrial
Limited in relation to 297 Te Puna Station Road

**STATEMENT OF EVIDENCE OF DANIEL LEE CURTIS
ON BEHALF OF TE PUNA INDUSTRIAL LIMITED**

**STORMWATER
26 JUNE 2024**

1. EXECUTIVE SUMMARY

- 1.1 Overall, I consider that the proposed stormwater management for 297 Te Puna Station Road that has been designed by WSP:
- (a) generally meets the expectations of the Te Puna Business Park as detailed in the Western Bay of Plenty District Plan; and
 - (b) is appropriate for a proposed development of this nature and will ensure that any potential stormwater effects are appropriately avoided, remedied or mitigated.
- 1.2 The water quality management proposed includes a treatment train consisting of planted swales, treatment wetland/pond (with passive attenuation), and a separate substantial constructed vegetated wetland within an overland flowpath traversing 245 and 297 Te Puna Station Road.
- 1.3 The risk of contaminants to the receiving environment of the Wairoa River is considered minimal for the general land use associated with the Te Puna Business Park Structure Plan.
- 1.4 Attenuation of post-development discharges from the treatment wetland pond to 80% of pre-development site flows (in accordance with Bay of Plenty Regional Council RC Stormwater Management Guidelines 2012) has been proposed in the stormwater design. This is not needed for floodwater attenuation purposes, as detailed in the evidence and modelling by Dr Joynes which does not rely on the treatment pond for floodwater storage.¹
- 1.5 I therefore consider that the development of 297 Te Puna Station Road, together with the construction of the third culvert beneath Teihana Road can occur without adversely affecting offsite stormwater quality, subject to the proposed water quality and mitigation being implemented.

2. INTRODUCTION

- 2.1 My name is Daniel Lee Curtis. I am a Technical Director (Stormwater) at Harrison Grierson. I have been in this role since May 2023. Prior to this I was the Principal for Catchment Planning at Auckland Council, a role I had been in since March 2019.

¹ Statement of Evidence of Steven Joynes (dated 26 June 2024).

Qualifications and experience

- 2.2 I graduated from Cardiff University in 1999 with an Honours degree in Civil Engineering. Since graduating I have worked primarily as a consultant engineer and been involved extensively on water resource projects in New Zealand, United Kingdom, India and the Middle East.
- 2.3 As a consultant, I have been seconded to the Healthy Waters department of Auckland Council since 2013 in various roles, including the Special Housing Design Office, Engineering Technical Services. From 2019 to 2023 I was employed by the Healthy Waters Team as the Principal for Catchment Planning.
- 2.4 I am a certified Project Management Professional (PMP) through the Project Management Institute (Membership 4020212, Credential 1828274). I have held this certification since July 2015.

Code of conduct

- 2.5 I confirm that I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and I agree to comply with it while giving oral evidence before the Hearings Commissioners. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

3. SCOPE OF EVIDENCE

- 3.1 My evidence relates to the resource consent applications by Te Puna Industrial Limited ("**TPIL**") in relation to its site at 297 Te Puna Station Road ("**Site**"). The applications are to authorise the development of the Site for the establishment and operation of industrial activities, with associated earthworks and discharge to water, within the Site. The proposed development will give effect to the Te Puna Business Park Structure Plan ("**Structure Plan**") provisions that apply to the Site under the Western Bay of Plenty District Plan. ContainerCo will be the anchor tenant of the Site. ContainerCo intends to store, repair, and lease out/sell shipping containers.
- 3.2 Regional resource consents to enable the Project are required from Bay of Plenty Regional Council ("**BOPRC**") and land use consents are required

Western Bay of Plenty District Council ("**WBOPDC**") (together, the "**Application**"). The specific consent requirements are set out in the planning evidence of Mr Murphy.

- 3.3 I was engaged by TPIL in June 2023 to assess the previous stormwater management work undertaken by WSP Consultants including the WSP responses to the s92 requests issued by BBOPDC and BOPRC in relation to the Application. Since then, **I have** provided further technical input into the proposed stormwater management system, including following updated flood modelling undertaken by Golovin (described in the evidence of Dr Joynes) and the optimisation of developable land on the TPIL as a result of the flood modelling.
- 3.4 As part of this, I have reviewed the following documents which were included as appendices in the Assessment of Environmental Effects ("**AEE**") or have been submitted to provide further information on flooding and stormwater effects to both WBOPDC and BOPRC in 2024:
- (a) Structure Plan (SW Management) (Revision 2), Drawing No. 11 prepared by Momentum Planning and Design, dated 17 August 2023, which was attached at Appendix 3 of the AEE;
 - (b) Alternative SW Management (Revision 2), Drawing No. 12 prepared by Momentum Planning and Design, dated 17 August 2023, which was attached at Appendix 3 of the AEE;
 - (c) Updated WSP Site Plans which were attached at Appendix 3 of the AEE;
 - (d) Engineering Report by WSP dated 17 August 2023 ("**Engineering Report**"), which was attached at Appendix 5 of the AEE;
 - (e) Flooding memorandum by WSP to BOPRC dated 17 August 2023 which was attached at Appendix 5 of the AEE;
 - (f) Flooding memorandum by WSP to WBOPDC dated 17 August 2023 which was attached at Appendix 5 of the AEE;
 - (g) Golovin Flood Modelling Data dated 17 July 2023 which was attached at Appendix 5 of the AEE;

- (h) Proposed Earthworks in Relation to Flood Plain Drawing 017 Rev 02, Momentum 28 May 2024; and
- (i) Floodplain Assessment 297 Te Puna Station Road, RD6, Tauranga, Golovin, May 2024.

3.5 I have not attended Site and the assessment that has been carried out has been desk based using resources and information supplied by WSP and Momentum.

3.6 In this statement of evidence, I will:

- (a) detail the existing stormwater management for the Site;
- (b) explain the proposed stormwater management options for the Site with reference to the requirements of the Structure Plan;
- (c) respond to relevant submissions received on the Application and the Council's Section 42A Report; and
- (d) comment on the proposed conditions of consent relating to stormwater management.

3.7 As noted above, the flood modelling and the associated assessment of the potential flooding effects have been undertaken separately are set out in the evidence of Dr Steven Joynes.

4. EXISTING ENVIRONMENT AND STORMWATER MANAGEMENT AT THE SITE

4.1 The Site is approximately 12.16ha in area consisting of 9.5ha of pastureland and 2.66ha of the paper road on the southern boundary of the Site, the existing house, shed and associated hardstand area. Refer to Figure 1 for an aerial image of the existing Site area with the Te Puna Business Park Structure Plan overlay.

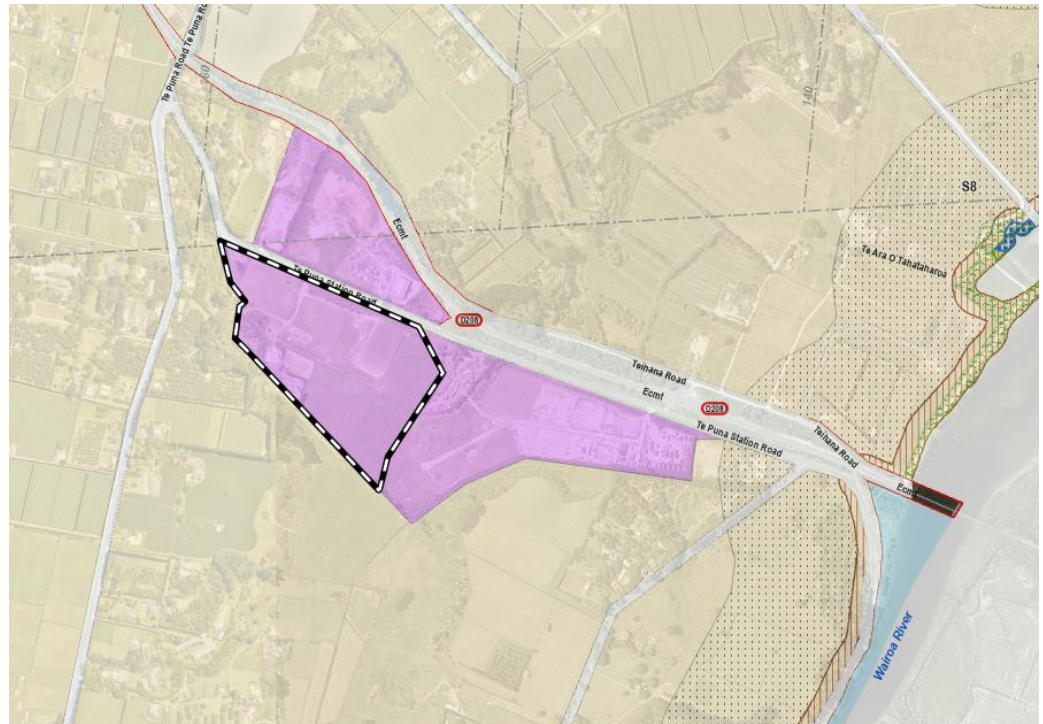


Figure 1: Existing land use on the Site (Source: WBOPDC Operative District Plan viewer)

- 4.2 The Site is bounded by Te Puna Station Road and the KiwiRail East Coast Main Trunk railway ("ECMT") to the north. To the immediate north and east of the Site is industrial zoned land which is subject to the Structure Plan (refer to Figure 1).
- 4.3 The land to the south of the Site is zoned rural under the WBOPDC Planning Maps rural zoned land and consists of various horticultural and lifestyle properties.

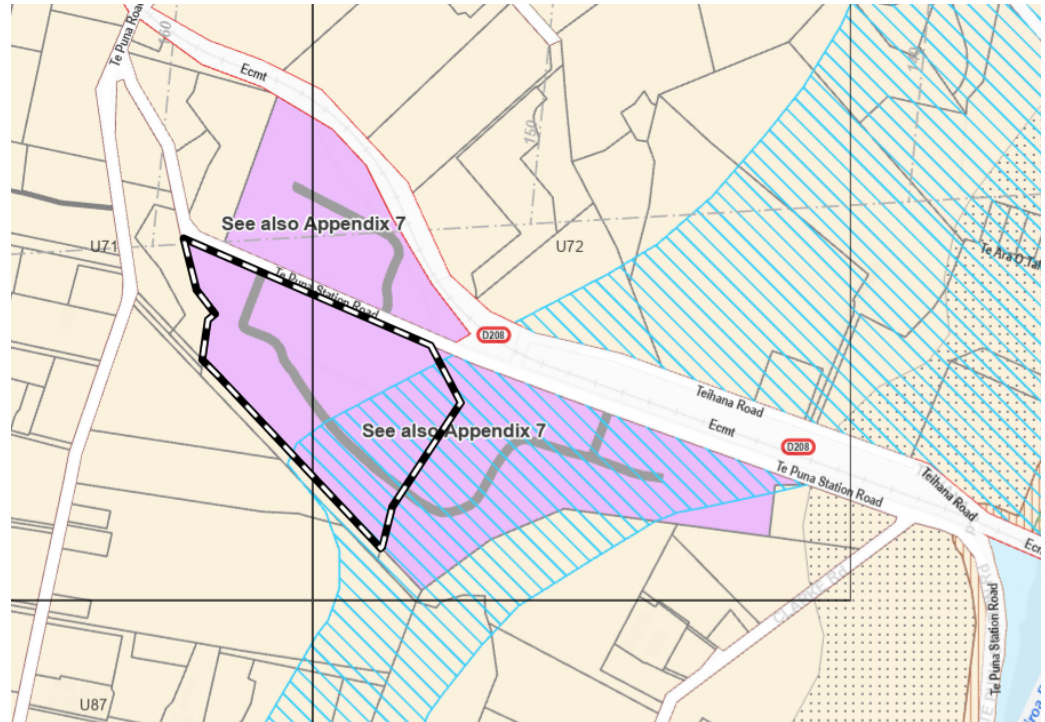


Figure 2: Extract from WBOPDC Te Puna Structure Plan (floodplain identified with blue hatch)

- 4.4 The Hakao Stream flows through the Site within the paper road boundary on the southeastern corner. The watercourse drains in a general south to north direction to just above the Site, before altering to a west to east direction to discharge to the intertidal Wairoa River immediately east of the intersection of Te Puna Station Road and Teihana Road approximately 1km to the east of the Site.
- 4.5 The Site has a relatively flat topography, with a general stepped rise from the low point on the eastern boundary to the natural high point on the western boundary. Within the southwest corner of the Site there is a low-rise hill. Beyond the western boundary the land gently slopes up towards Te Puna Road.
- 4.6 From the extract of the WBOPDC District Plan (refer to Figure 2 above) the eastern portion of the Site is indicated as being within the 2% Annual Exceedance Probability ("**AEP**") floodplain (commonly referred to as the 50-year Annual Recurrence Interval ("**ARI**"). This is marked by the pale blue hatch region on the image marked Figure 2. This floodplain surrounds the low-lying land either side of the Hakao Stream and extends to the coastal area in the vicinity of Lochhead Road. Above Te Puna Station Road the floodplain is relatively contained within the natural topography of the area. Immediately

downstream of Te Puna Station Road and the ECMTL, the floodplain expands across a much wider area, identifying land extending to the Wairoa River.

- 4.7 The WBOPDC District Plan also identifies in mapping resources that the Site is subject to inundation during the 1% AEP (equivalent to 100-year ARI) flooding of the Wairoa River (dark blue hatch in Figure 2), and to coastal inundation through storm-surge flooding risks within the Tauranga Harbour (brown dot hatch in Figure 2).

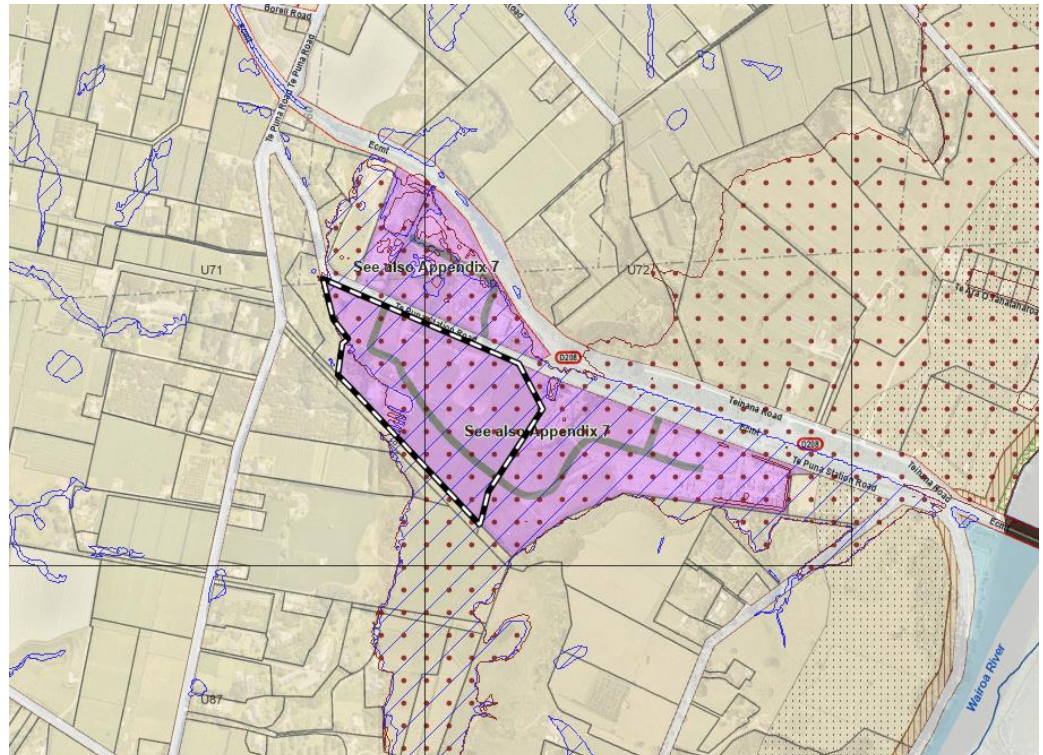


Figure 3: Extract from WBOPDC District Plan indicating Natural Hazard layer associated with Rural Areas and Small Settlement Floodable (dark blue hatched areas) and Tauranga Harbour Coastal Inundation area (brown dot hatch) (Site indicated by the black/white dashed outline)

- 4.8 These floodplains surround the low-lying land either side of the Hakao Stream and extends to the coastal area in the vicinity of Lochhead Road. Above Te Puna Station Road the floodplain is relatively contained within the natural topography of the area. Immediately downstream of Te Puna Station Road and the ECMTL, the floodplain expands across a much wider area, identifying land extending to the Wairoa River.
- 4.9 The Site is predominantly grassed area, with formed accessways extending into and through the Site from Te Puna Station Road to allow access to the

existing house and shed located on the west of the Site. An overview of the existing stormwater features on the Site and in the general vicinity is illustrated on Figure 4.



Figure 4: Existing drainage features on and in the location of the TPIL site (Source: Google Maps, 2024 imagery)

- 4.10 Stormwater runoff from the majority of the existing Site drains to Wairoa River via the flowpath through the adjacent 245 Te Puna Station Road ("TINEX Site") and through the culverts beneath Teihana Road. A small area of the southeastern portion of the Site discharges to the Wairoa River via the Hakao Stream.
- 4.11 Internally there is a drain constructed through the middle of the Site in a west to east orientation that directs runoff to the overland flowpath through the neighbouring TINEX Site. Runoff from upstream properties is intercepted by a drain along the Site's southern boundary and discharges to the Hakao Stream.
- 4.12 The roadside drain on the southern side of Te Puna Station Road also receives flows (piped and overland) from the 250 Te Puna Station Road ("**Overton Site**") where it is diverted around the Site to the flowpath through the TINEX Site.
- 4.13 There are no formal stormwater management devices located within the Site, apart from the drainage channels through the centre and along the southern boundary.

5. PROPOSED STORMWATER MANAGEMENT

- 5.1 Flood modelling of the Hakao Stream catchment has been undertaken by Golovin and this is summarised in Dr Joynes' evidence. The modelling identified that 5.24 ha of floodplain on the Site could be filled to facilitate development, without negative impacts on upstream or downstream land, persons or properties. There would only be reductions in flooding effects occurring with the proposed floodwater relief features of the combined overland flowpath from 297 through 245 Te Puna Station Road, and the third 1600mm culvert under Teihana Road.
- 5.2 The WSP Engineering Report² set out the proposed stormwater management for runoff from the entire Site development. This included roadside swales either side of the proposed internal road to treat local runoff prior to discharging to two stormwater ponds as set out in the Structure Plan.
- 5.3 The swales constructed within the Site and along the northern road frontage were proposed to be constructed with a maximum longitudinal gradient of 2%. The northern swale is proposed to connect with the existing drain flowing south along the eastern boundary of the Site.
- 5.4 Both of the ponds have been designed to provide storage of the 10% AEP runoff and attenuation of the 1% AEP runoff to 80% of pre-development discharge rates. The main pond is proposed on the northeastern corner of the Site, adjacent to the existing drain along the boundary, the second pond was proposed on the southern boundary of the Site within the overland flowpath. Both ponds were proposed to have a base 0.5m below the existing ground level.
- 5.5 The main pond was designed to provide the storage and attenuation of 12.4ha of Site area and existing contributing catchment upstream of the Site, whilst the smaller pond was sized for 3.6ha of Site development.
- 5.6 In response to concerns raised by both BOPRC and WBOPDC through the s92 request for further information process the smaller pond on the southern boundary has been removed from the proposed stormwater management due to the location of the flowpath and floodplain associated with the Hakao Stream and the risks of resuspension of contaminants negatively impacting water quality.

² Te Puna Industrial Limited s92 Response Report, WSP, 17 August 2023 at [3].

- 5.7 In addition to the above Site stormwater management, the Application also includes the construction of a wetland between the Site and the TINEX Site as envisioned through the Te Puna Business Park Structure Plan that will discharge flows to the flowpath through the TINEX site.
- 5.8 The general stormwater layout is presented in the WSP Engineering Report (refer to Figure 5). Please note that this image was supplied early during the Application process and in this image the southern pond is still presented.

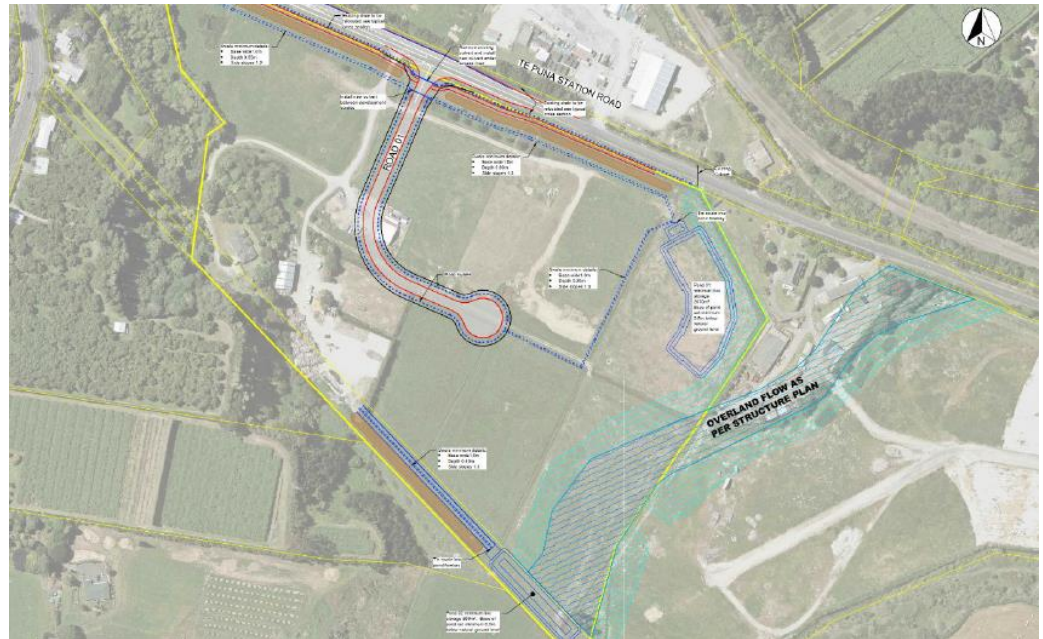


Figure 5: Stormwater layout plan (WSP Engineering Report)

Water Quality

- 5.9 WSP has proposed a treatment train as addressed above (ie a combination of a number of different tools to achieve overall stormwater management) to perform the water quality function for the proposed land use of the Application. The Application as now proposed is includes a treatment system that consists of:
- (a) swales constructed either side of the proposed internal road and to edges of proposed developable land (inclusive of culvert under internal road);
 - (b) constructed stormwater treatment pond (inclusive of forebay) located on the north-eastern corner of the Site; and

- (c) the above discharging through a throttled decanting outlet to the separate additional wetland on the eastern boundary of the Site and within the overland flowpath as enabled through the Structure Plan.
- 5.10 Ponds and a separate planted wetland are the listed stormwater management features at the eastern edge of the Site envisioned by the Te Puna Business Park Structure Plan.
- 5.11 WSP have designed the water quality to provide treatment of the first flush of the 1% AEP storm event.³
- 5.12 I consider that the proposed water quality management will provide an appropriate level of treatment to mitigate the effects of land use change.
- 5.13 The WSP Engineering report⁴ presents the anticipated Total Suspended Solids ("**TSS**") reduction provided by each of the management elements. The individual elements have varying efficiencies in TSS removal from 70% for the swales up to 90% for the wetland.
- 5.14 I consider that the treatment efficacies presented in the WSP Engineering report are values for individual elements, and not for devices constructed in series (ie swale to pond to wetland) as proposed for the Site. Overall, I consider that the efficacies presented in the WSP report will represent the lowest performance values to be achieved from the proposed stormwater management.
- 5.15 I consider that the proposed water quality management provides a good level of protection to the receiving environment and takes appropriate steps to reduce the risk of contaminants being released.

Water Quantity

- 5.16 Runoff generated from the Site will be collected by the internal roadside swale and conveyed to the turning head located in the central eastern area of the Site.⁵ From the turning head, runoff will be directed to the stormwater pond constructed in the northeastern corner of the Site and from there it will discharge to the proposed wetland before entering the flowpath through the TINEX Site.

³ WSP Te Puna Industrial Limited s92 Response Report (17 August 2023) at [3.2].

⁴ WSP Te Puna Industrial Limited s92 Response Report (17 August 2023) at [3.3]

⁵ WSP Te Puna Industrial Limited s92 Response Report (17 August 2023).

- 5.17 WSP has proposed that the Site will be earth worked to drain towards the internal roadside swales. To optimise the developable area, WSP have proposed that the roadside drain along the southern side of Te Puna Station Road will be realigned. This drain will collect runoff from the carriageway and convey it to the proposed wetland between the TPIL and TINEX Sites.
- 5.18 In their engineering report WSP sized the stormwater ponds to attenuate the runoff from the 1% AEP 20-minute storm event to 80% of pre-development discharge rates based on a climate change scenario as predicted by RCP⁶ 6.0.
- 5.19 In its September 2023 s92 response, the BOPRC identified that the stormwater management should be designed to account for the more conservative RCP 8.5 climate change scenario.
- 5.20 Harrison Grierson updated the WSP pond sizing using RCP 8.5 and the revised development area of the Site (as shown in Figure 6). This assessment indicated that there would not be a significant increase in the pond area and it will be refined during the detailed design process.

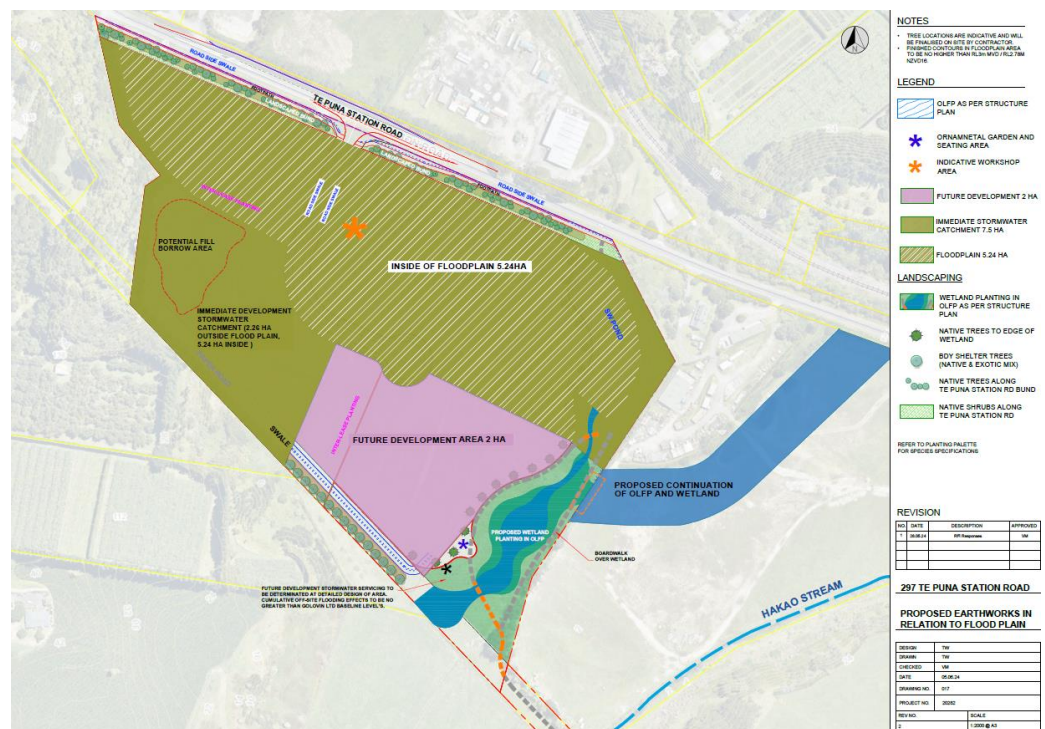


Figure 6: Proposed Earthworks required to enable development of Site frontage on Te Puna Station Road and existing high ground on the southern boundary of the Site.

⁶ RCP stands for Representative Concentration Pathway which are climate change scenarios to project future greenhouse gas concentrations and how this would impact global surface temperatures.

- 5.21 The WSP design of the internal road swales sized these for conveying the 10% AEP event; however, I consider that these will need to be designed to convey runoff from the 1% AEP event to ensure that buildings have protection and short circuiting of the system does not occur.
- 5.22 The evidence presented by Dr Joynes identifies that through modelling of the Hakao Stream catchment the stormwater management proposed by WSP would not result in negative impacts to other landowners in the catchment upstream or downstream of the TPIL development on the Site.

Stormwater management beyond the Site

- 5.23 Two stormwater management options have been presented for stormwater management downstream of the Site. These are presented in The Structure Plan (SW Management) (Revision 2), Drawing No.11 (Option 1) and Alternative Stormwater Management (Revision 2), Drawing No. 12 (Option 2). Both of which are included in Appendix 3 of the AEE.
- 5.24 Both of the options include:
- (a) localised improvement works associated with the roadside drain on the southern side of Te Puna Station Road within the Site and TINEX Site property boundaries to improve conveyance of runoff to the Teihana Road intersection;
 - (b) construction of a 45m wide flowpath from the Site to the roadside drain to be constructed within the TINEX property boundary;
 - (c) construction of stormwater treatment / attenuation pond and wetland on the eastern boundary of the Site; and
 - (d) construction of a third culvert beneath the Teihana Road intersection to improve drainage connectivity to the Wairoa River.
- 5.25 Option 1 retains the existing culvert beneath Te Puna Station Road to drain the Overton Site to the eastern drain around the Site.
- 5.26 Option 2 allows for stormwater discharge from the Overton Site to an upgraded roadside drain on the northern side of Te Puna Station Road to the Wairoa River through the culverts beneath the Teihana Road intersection.
- 5.27 I consider that Option 2 would provide a more appropriate stormwater solution

for up to the 10% AEP event as flows would connect direct to the Wairoa River. I do note that in events that exceed the capacity of the 10% AEP event, overland flows will develop and follow the contours as they do at present. In addition, I understand delivery agreements across multiple landowners are required to implement Option 2.

- 5.28 Notwithstanding my preference for Option 2, in my opinion, Option 1 provides an appropriate stormwater solution which will appropriately manage potential off-site stormwater effects that have been confirmed through Dr Joynes modelling. Importantly, Option 1 can be delivered by TPIL without other third-party agreements, meaning there is certainty it can be delivered.
- 5.29 The modelling that has been completed by Mr Joynes confirms that either option will be able to deliver the conveyance of stormwater from the catchment to the Wairoa River without negative impacts to landowners in the wider catchment.

6. RESPONSE TO ISSUES RAISED IN SUBMISSIONS

- 6.1 I have reviewed relevant submissions on the Application that raise matters relating to stormwater.
- 6.2 I note that the submissions filed by 50 of the submitters on this Application are identical in form and substance.⁷ I acknowledge that these submissions were made by individual submitters, however for ease of reference and given the likeness of these submissions, I will refer to these submitters as "Submitter Group 1", rather than by referring to their individual submitter number.
- 6.3 In general, the submitters have raised the following issues:
- (a) Concerns over the stormwater management of the site and wider area, and that the activity will commence prior to stormwater being addressed on the Site;⁸
 - (b) Concerns over proximity of the Hakao Stream to the Site;⁹

⁷ Submitters #3, #4, #6, #8, #9, #10, #11, #12, #14, #15, #16, #17, #19, #20, #21, #22, #23, #24, #27, #28, #29, #31, #32, #33, #37, #40, #41, #42, #45, #47, #48, #51, #52, #57, #58, #61, #62, #63, #64, #66, #71, #72, #100, #105, #111, #112, #127, #187, #194 and #195.

⁸ Submitters #26, #30, #49, #54, #59, #69, #85, #95, #141, #146, #147, #148, #155, #156, #158, #159, #160, #161, #162, #167, #173, #175, #190, #250, #251, #254, #264, #268 and Submitter Group 1.

⁹ Submitters #56, #82 and #88.

- (c) Concerns that the wetland provisions from the Structure Plan are not being implemented and general concerns that the settlement ponds proposed will not be adequate;¹⁰
 - (d) Concerns over pollution and chemicals leaking into waterways;¹¹
 - (e) Concerns that the Site is in a low-lying area and in a floodplain, and general concerns over the flooding of the area;¹² and
 - (f) Concerns over the rising of the Site platform leading to discharges of stormwater from the Site on to Te Puna Station Road, and onto neighbouring properties.¹³
- 6.4 The submissions summarised in 6.3(e) and (f) above that raise issues in relation to potential flooding effects are addressed in the evidence of Dr Steven Joynes at [6]. I respond below to the submissions summarised in 6(a) to (d) above.

Water quality and effects on the Hakao Stream and Wairau River

- 6.5 As previously stated in [5] of my evidence I have set out the proposed method of stormwater treatment for the Site.
- 6.6 I consider the approach of using a number of interconnected stormwater management devices (swales to vegetated pond to wetland to vegetated flowpath) proposed in the Application will provide appropriate water quality management to minimise risks of contaminants being released the Hakao Stream and Wairoa River.
- 6.7 As set out in the WSP engineering report¹⁴ adequate site management protocols will be employed to minimise the risk of contaminants being released from specific site activities through isolation (bundled storage areas), restricted areas and appropriate treatment devices. I consider that this will provide an

¹⁰ Submitters #60, #87, #88, #89, #93 and #96.

¹¹ Submitters #1, #49, #55, #81, #91, #92, #110, #114, #117, #120, #141, #146, #147, #150, #151, #153, #156, #158, #161, #166, #170, #172, #173, #176, #180, #183, #184, #186, #200, #201, #202, #215, #242, #248, #253, #259, #263, #264, #265, #268, #269, #272 and Submitter Group 1.

¹² Submitters #7, #13, #43, #49, #55, #73, #75, #76, #81, #87, #89, #91, #104, #110, #118, #123, #124, #136, #138, #139, #143, #150, #160, #161, #162, #167, #170, #171, #172, #120, #173, #189, #196, #214, #221, #249, #259, #264, #268 and Submitter Group 1.

¹³ Submitters #73, #113, #115, #116 and #126.

¹⁴ WSP Te Puna Industrial Limited s92 Response Report (17 August 2023) at [4.3], 4.5,4.6] and [4.7]

acceptable level of protection through at-source management prior to discharging into the site wide stormwater management.

- 6.8 As noted in several submissions, the construction of stormwater management devices should be completed prior to any development of the Site. This will minimise the risk of contaminants being released from the Site.

Flood management

- 6.9 As outlined in Section 5.24, the development of the Site will also include upgrading the culvert capacity to the Wairoa River beneath Teihana Road. This will improve the existing ability of Te Puna Station Road and the Structure Plan Area to discharge greater flows and potentially reduce the frequency, extent and duration of flooding that is currently experienced.
- 6.10 Hydraulic modelling undertaken by Dr Joynes has indicated that for the 10%, 2% and 1% AEP design events in the Hakao Stream catchment that the proposed works (including partial filling of the Site) will not result in negative impacts downstream and predicts an overall reduction in flood levels.

7. RESPONSE TO MATTERS RAISED IN THE SECTION 42A REPORTS

- 7.1 I have reviewed the Council's section 42A Report and recommendation dated 17 June 2024. Matters relating to stormwater effects are addressed in both the BOPRC and WBOPDC section 42A Reports. There have been two peer review reports considering Stormwater as well. These are the Bronwyn Rhynd's Stormwater Management and Flooding Modelling Review done on behalf of the BOPRC ("**BOPRC Review**") and the Review of flood / stormwater effects for undertaken by Mark Pennington Water Resources Engineer at Tonkin and Taylor for the WBOPDC ("**WBOPDC Review**"). I have read both of these reviews and the respective s42A reports and address points raised in these below.
- 7.2 The following issues were raised in the BOPRC and WBOPDC s42A Reports:
- (a) lack of modelling of the future development area of the Site and unknown stormwater consequences;¹⁵

¹⁵ BOPRC s42A Report (dated 17 June 2024) at [7.55]. WBOPDC s42A Report (dated 17 June 2024) at [221].

- (b) Concerns regarding runoff from the upstream catchments;¹⁶
- (c) lack of information about stormwater and groundwater interaction;¹⁷ and
- (d) question as to the depths of roadside drains.¹⁸

7.3 I have outlined responses to these below.

Conveyance of runoff from the upstream catchment (BOPRC)

7.4 The WSP stormwater design allowed for flows from the upstream catchment area on the southern boundary of the Site to be conveyed through the site to the stormwater pond.

7.5 In updating the pond design to account for RCP 8.5, Harrison Grierson considered only flows from the developable area of the Site.

7.6 I consider that there are options available to manage the upstream flows received by the Site (approximately 3 hectares of rural land). These could include:

- (a) The diversion of the flows through the existing channel constructed on the southern boundary of the Site to discharge to the overland flowpath through the neighbouring TINEX Site.
- (b) The acceptance of upstream flows into the Site and management of these through interlease planting areas between leased sites to channel flows to the TPIL internal road drainage and discharge to the stormwater pond on the northeastern corner of the Site.
- (c) Acceptance of the upstream flows into the Site and management of these through interlease areas between leased sites to the channel flows direct to the flowpath through to the TINEX site.

7.7 I consider that Option A above is the preferred option for managing these flows would be through the diversion of the upstream runoff utilising the extension of the existing drain on the southern boundary and to the Hakao Stream. This would remove the hydraulic load on the TPIL stormwater infrastructure. Refer to Figure 7.

¹⁶ WBOPDC s42A Report (dated 17 June 2024) at [184].

¹⁷ CKL Technical Review (dated 17 June 2024) at [4.2].

¹⁸ CKL Technical Review (dated 17 June 2024) at [4.3].

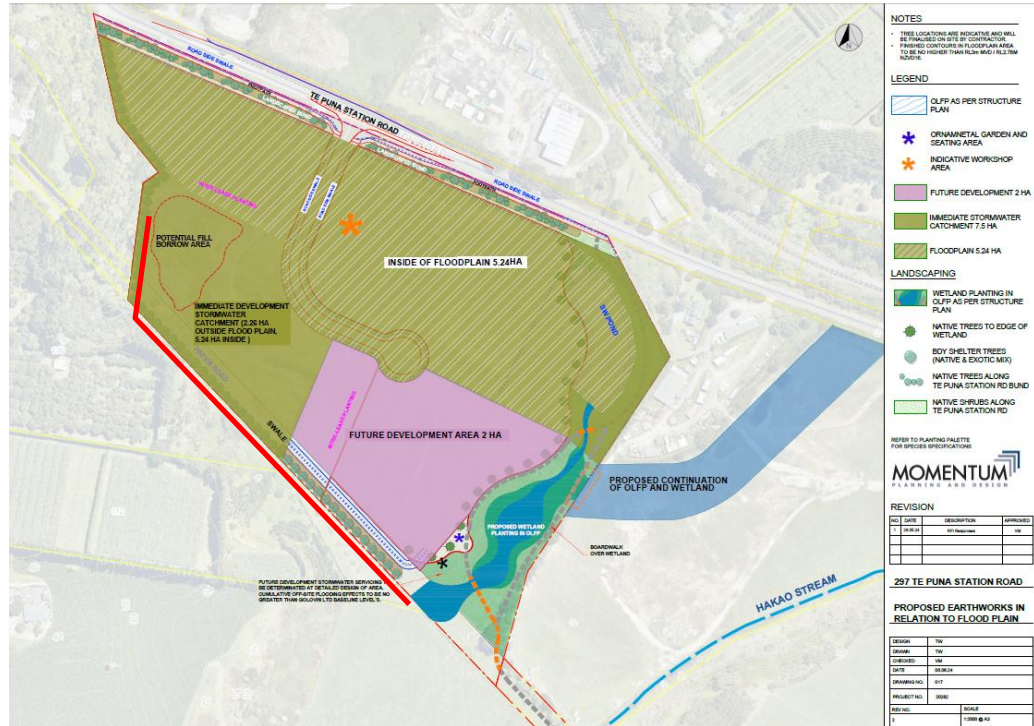


Figure 7: Option A – Extension of the existing swale drain on the southern boundary to intercept upstream flows and divert them to the Flowpath through the TINEX Site

Full Buildout Solution for whole Site Options (BOPRC and WBOOPDC)

7.8 The current developable area shown on the Proposed Earthworks in Relation to Flood Plain Dwg 17 (Figure 8) indicates 2 ha of low-lying land on the Site that has been currently excluded from the Harrison Grierson updated pond sizing. This area has been removed from the current development area because it is not needed urgently and fine finessing of landform is required to ensure off-site flooding baseline levels are not exceeded.

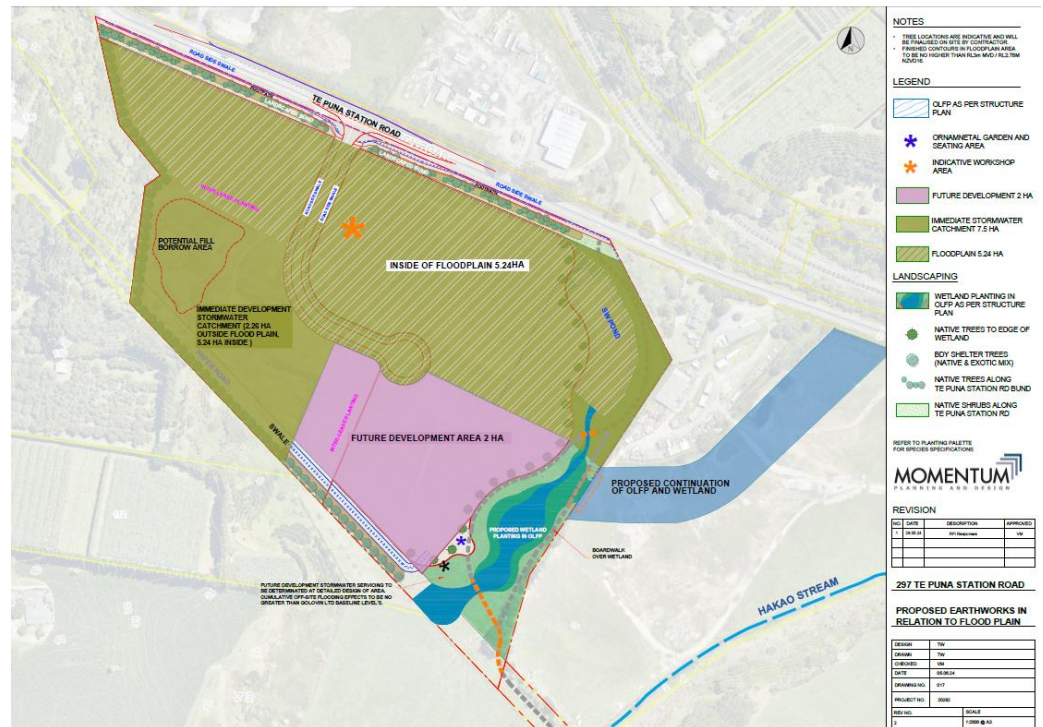


Figure 8: Proposed Earthworks required to enable development of site frontage on Te Puna Station Road and existing high ground on the southern boundary.

- 7.9 It is considered that in the future this area of land will be developed, subject to demonstration that flood effects downstream are not exacerbated from what is experienced currently.
- 7.10 There are a number of options to manage stormwater from this area that will provide an alignment with the current treatment train approach to minimise the risk of contaminants and provide protection to the receiving environment. Such options could be:
 - (a) On-site management of runoff from individual leaseholders to achieve the treatment and volume management being achieved for the remaining Site area in this application.
 - (b) Construction of a small communal wetland with sediment forebay incorporated into the ornamental garden indicated on the Dwg 17. This would then decant into the wetland and flowpath through the TINEX Site.

- (c) Diversion of flows into the stormwater pond proposed in this application. This would require either enlargement of the pond when the 2 ha of Site develops or overdesign the stormwater pond now.

7.11 Either option is feasible to provide the appropriate stormwater management to protect the receiving environment.

Groundwater Interaction

7.12 The Site is relatively low-lying and as a consequence the presence of groundwater may impact the stormwater components proposed in the WSP design.

7.13 WSP have proposed that Pond 01 (the main pond on the eastern end of the Site development) will be planted and function as a wetland. As such it is required to have a permeable base to maintain appropriate conditions for proposed vegetation.

7.14 WSP has designed the base of Pond 01 to be 500mm below existing ground level. The presence of seasonal groundwater will not impact the function of the pond as attenuation storage will be provided above this level.

Potential depth of roadside drains

7.15 At an average fall of 1% grade the roadside drain to be constructed on the northern boundary of the Site could theoretically end up being very deep at the location of the wetland (approximately 5m). This has raised concerns of constructability.

7.16 It is my opinion that there are options to be considered to limit the depth of the drain. This could take the form of a parallel pipe network to collect runoff from the drain and delivering this to the existing channel on the eastern boundary of the Site. This would be subject to detailed design.

8. COMMENTS ON PROPOSED CONDITIONS

8.1 To mitigate identified potential adverse stormwater-related effects of the proposal, the following conditions of consent are expressly offered, over and above and to ensure compliance and appropriate delivery of the submitted

design for the Site:

- (a) filling of up to 5.24 ha is permitted only after completion of the following on-site stormwater management and treatment features are implemented including:
 - (i) permanent treatment ponds;
 - (ii) adjoining wetlands including within the structure-plan overland flowpath;
 - (iii) internal stormwater swales to roadside and edges of interior of business park conveying water to treatment ponds;
 - (iv) replacement roadside drain constructed inside northern boundary; and
 - (v) two culverts connecting internal swale network, and replacement roadside drain, underneath new road.

- (b) prior to development and commencement of industrial use from the remainder of the Site approved to be developed beyond the 6.05ha covered by condition 23 above, one of the following suite of off-site measures shall be constructed and functioning:
 - (i) Overland flowpath over 245 Te Puna Station Road, and a third 1600mm-diameter culvert under Teihana Road, in general accordance with Drawing No. 011 prepared by Momentum Planning and Design.
 - (ii) The same measures as a) above, with additional de-commissioning of a cross-road culvert at the north-eastern boundary, and widening of the roadside drain on the northern side of Te Puna Station Road, in general accordance with Drawing No. 012 prepared by Momentum Planning and Design.

- (c) The finished level of industrial land created by filling at the Site shall not exceed 3.0m RL (Moturiki datum).

(d) The repair workshop shall be serviced by a proprietary water-runoff treatment device in accordance with the WSP Engineering Report (sections 3.3, 4.7) prior to the operation of industrial operations utilising the workshop.

8.2 I consider that the conditions proposed are fair and reasonable to enable the development to proceed.

S42A Report on Conditions

8.3 Both councils have proposed conditions relating to stormwater. These are standard and appropriate.

9. CONCLUSION

9.1 I consider that the stormwater management proposed by WSP in the development of the Site meets the expectations of the Structure Plan set out in the WBOPDC District Plan.

9.2 I consider that the proposed treatment train approach presented by WSP will provide adequate protection to the receiving environment from the risk of contaminants being released for the operational site.

9.3 Should specific leases granted after the development of the Site include high risk industries, then additional on-site mitigation should be investigated to further mitigate contaminant risks.

9.4 The WSP decision to attenuate 1% AEP 20-minute flows to 80% of pre-development levels was made at a time when flood modelling had not been completed in the catchment.

9.5 Flood modelling of the Hakao Stream completed by Dr Joynes has indicated that filling of the floodplain on the Site can occur without negative impacts on the floodplain elsewhere in the catchment.

9.6 I consider that regardless of whether attenuation is required for the Site, the proposed stormwater pond area will be required to provide treatment of runoff from the Site. More detailed hydrologic and hydraulic modelling will be required at the detailed design stage to confirm the attenuation requirements.

Daniel Lee Curtis

26 June 2024