

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

**AND**

**IN THE MATTER:** of Proposed Plan Change 94 (Washer Road Business Park) to the Western Bay of Plenty District Plan under Schedule 1 of the RMA.

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**STATEMENT OF EVIDENCE OF SUSAN IRA**

**Stormwater and Water Quality**

1 July 2022

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**INTRODUCTION**

**Qualifications and experience**

1. My full name is Susan Jean Tyson Ira.
2. I am the Founding Director of Koru Environmental Consultants Ltd. I have a Master of Science in Environmental and Geographical Science from the University of Cape Town in South Africa.
3. I have over 20 years' experience working in urban stormwater management, stormwater treatment, catchment management, water quality policy development, water quality consent review, life cycle costing of stormwater management, water sensitive urban design and green infrastructure.
4. I have specialist expertise in water quality treatment approaches, water sensitive design and green infrastructure. I came to New Zealand in 2003 and worked as a stormwater consent processing officer for the former Auckland Regional Council before becoming the manager of their stormwater consents and

compliance team. In 2007 I founded Koru Environmental Consultants Ltd. During this time, I have undertaken numerous stormwater and water quality technical consent and plan change reviews for Auckland Council, Bay of Plenty Regional Council, Greater Wellington Regional Council and Environment Canterbury. I have provided training on Auckland Council and Waka Kotahi's stormwater management guidelines nationally, and have also developed and provided national training for Water New Zealand on advanced stormwater management and water sensitive design. I am one of three New Zealand based trainers to have provided training to the stormwater community for the International Certification Programme for Green Infrastructure. Other recent projects I have been involved in include:

- 4.1 Technical Science Lead for water quality planning for the Lake Waikare and Whangamarino Wetland on behalf of Waikato Regional Council.
  - 4.2 One of four lead researchers on "Activating Water Sensitive Urban Design" in New Zealand jointly with NIWA, Manaaki Whenua Landcare Research and Batstone Associates for the National Science Challenge for Building Better Homes Towns and Cities.
  - 4.3 Development of a life cycle cost model for urban stormwater quality mitigation interventions for Auckland Council's Freshwater Management Tool.
  - 4.4 Undertaking a review of Auckland Council's contaminant load model, used for modelling contaminant loads from urban development and the efficacy of various treatment devices to reduce water quality effects on freshwater streams.
5. My evidence is given in support of the Bay of Plenty Regional Council submission and pertains to the stormwater treatment approach recommended to mitigate water quality effects from areas which would be rezoned as commercial as part of the proposed Washer Road Business Park PC94 structure plan change.
  6. My evidence should be considered together with the evidence of **Mr Nathan Te Pairi, Mr Mark Townsend, Mr Mark Ivamy and Mr Keith Hamill.**

7. I have read the Code of Conduct for Expert Witnesses (Code) in the Environment Court Practice Note (2014) and agree to comply with the Code. I confirm that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

### **Scope of evidence**

8. My evidence will deal with the following:
  - 8.1 Effects of commercial development on freshwater receiving environments.
  - 8.2 Efficacy of the proposed stormwater approach in PC94 to avoid remedy or mitigate water quality effects.
  - 8.3 Response to the Planner's Report.
  - 8.4 Response to the Applicant's evidence
  - 8.5 Recommendations and outcomes sought.
  - 8.6 Conclusions.

### **EFFECTS OF COMMERCIAL DEVELOPMENT ON FRESHWATER RECEIVING ENVIRONMENTS**

9. Urbanisation creates impervious surfaces which reduce infiltration of water into the ground, reduce evapotranspiration of water by plants into the atmosphere and increases the volume of run-off which is discharged to the receiving environment. In addition, impervious surfaces have contaminants (or pollutants) on them which become entrained in stormwater when it rains and, without treatment, these contaminants can be directly discharged to the receiving environment.
10. This leads to three key effects from stormwater management, namely: increased flooding, a decline in water quality, and effects on aquatic habitats both from an increase in the volume of water discharged and the poor water quality.

11. Industrial and commercial developments generally require large areas of impervious surface (often >70%) and, depending on the nature of the activity, can be considered high contaminant generating surfaces. Key contaminants of concern from commercial areas include sediments, metals (such as zinc, copper and lead), hydrocarbons and temperature. Depending on the nature of a particular industry, industrial areas can also store hazardous substances. For this reason, Schedule 4 in the Regional Natural Resources Plan (RNRP) and Schedule 21.8 of the Western Bay of Plenty District Plan (WBOPDP) includes a list of high risk industries.
12. Sources of metals: The key source of zinc in urban areas is the use of roofing materials such as galvanised steel or zinc alloy type roofs<sup>1</sup>. Every time it rains, dissolved zinc will leach from these building materials and become entrained in the stormwater. Unpainted galvanised roofs can lead to total zinc loads of ~2.24g/m<sup>2</sup>/year versus an inert roofing material (such as colour steel or concrete tiles) which lead to total zinc loads of ~0.02g/m<sup>2</sup>/year<sup>2</sup>. Copper is widely used in the manufacture of alloys with zinc. Lead is less of a concern nowadays given that most paints are now lead free and lead is no longer contained within petrol. Other sources of zinc and copper are from vehicles (in tyres and brake pads) on roads and in parking areas<sup>1</sup>. Trafficked areas where vehicles are slowing down, turning, parking and speeding up represent high contaminant generating areas due to tyre and brake-pad wear and tear.
13. Increases in the volume and rate of stormwater runoff from large scale impervious surfaces has the ability to destabilise stream channels and cause accelerated stream channel erosion (and associated downstream sedimentation). Detaining water and releasing it slowly assists in reducing accelerated stream channel erosion downstream, but it will not reduce the volume of water which is discharged. Disconnecting the impervious surfaces from the receiving environment via green infrastructure approaches such as rain gardens or swales, together with providing for extended detention more readily mitigates stream channel erosion effects.

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<sup>1</sup> Ira S. 2021. Freshwater management tool: report 10. A total economic valuation approach to understanding costs and benefits of intervention scenarios – Part 2 Urban Source Control Costs. Prepared by Koru Environmental for Auckland Council.

<sup>2</sup> Auckland Regional Council. 2010. Development of the Contaminant Load Model. Auckland Regional Council Technical Report 2010/004

## **EFFICACY OF THE STRUCTURE PLAN'S PROPOSED APPROACH TO AVOID, REMEDY OR MITIGATE WATER QUALITY EFFECTS**

14. The applicant has submitted additional documentation, received from Richard Coles via email on 17/6/2022, incorporating a revised stormwater management approach based on the 27 May 2022 Boffa Miskell Ohineangaanga Stream ecological assessment and the Lysaght “sketch for plan change” drawing number 194210-100-SCH Rev C. The revised approach proposes the use of a treatment train approach to mitigate stormwater effects. A ‘treatment train’ approach is an approach to stormwater management which uses a series of source control and treatment solutions to avoid or mitigate stormwater effects. Their approach includes:
  - 14.1 Source control of building materials, i.e. using inert roof, cladding, gutters and external fittings to minimise dissolved metals.
  - 14.2 Requiring all high risk industrial activities to prepare site specific pollution plans and to include on-site treatment to minimise the risk of contaminants being discharged off the site.
  - 14.3 That the on-site treatment consist of a gross pollutant trap to provide pre-treatment by removing litter and sediments >5mm in size, which discharges to a mechanical filter system (such as the Stormfilter or Jellyfish) which will remove finer sediments and metals.
  - 14.4 Following treatment on-site, stormwater will be directed to a planted wetland to provide final treatment and to assist with the removal of nutrients such as nitrogen and phosphorus.
  - 14.5 Extended detention will be provided within the wetland to reduce the effect of accelerated stream channel erosion.
15. From a water quality treatment perspective, this ‘treatment train’ approach avoids contamination where possible, and uses constructed stormwater devices to provide treatment where necessary. It is important that these devices be designed in accordance with the Bay of Plenty Regional Council’s stormwater guideline document<sup>3</sup> to achieve best practice contaminant removal.
16. Given that the proposed landuse will be industrial, a very important part of this ‘treatment train’ approach will be the preparation of site specific pollution plans

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<sup>3</sup> Bay of Plenty Regional Council. 2012 (updated 2015). Stormwater Management Guidelines for the Bay of Plenty region. Guideline prepared by Earl Shaver, Aqua Terra International Ltd.

(SSPPs) to minimise the risk of contaminants being discharged from a particular site as a result of the activity or storage of materials which would occur on that site.

17. The BOPRC and Tauranga City Council developed “*Best Practice Guidelines for Pollution Prevention: Pollution Prevention Plan*”<sup>4</sup>, which is a step-by-step guideline for developing site specific pollution plans. It is a simple, easy to use guide which incorporates a checklist of all the items which industry owners need to think about when preparing SSPPs. I am not aware of any similar type of document within the WBOPDC, so the Regional Council’s document should be used as a template and guideline to ensure that any SSPPs prepared are effective at managing contaminant generating risks from their site.
18. Whilst the applicant has recommended a comprehensive stormwater quality management approach for the proposed industrial zoning, this approach needs to be fully integrated with their approach for mitigating the effects of increases in the quantity of stormwater resulting from the increase in impervious area. Water quantity effects, such as filling within floodplain areas, increased peak flows and the effect of the zoning on critical flooding infrastructure will be addressed through evidence from **Mr Townsend** and **Mr Ivamy**. **Mr Te Pairi** will also address this issue and recommend proposed conditions to adequately mitigate effects from stormwater discharges from the proposed plan change area.

## **RESPONSE TO THE PLANNER’S REPORT**

19. The Planner’s report requested that the applicant provide additional stormwater assessment and options for control on detention, impervious surfaces and water sensitive urban design. As stated in paragraph 14, this was received on via email from Richard Coles on 17/06/22. The proposed treatment approach will adequately avoid and mitigate water quality effects.
20. I disagree with assessment provided under Topic 5: Hazardous Substances in the Planner’s report. Whilst the current District Plan controls the use of land to manage any effect of the use, storage and transportation of hazardous substances on site, there are no specific provisions which require the storage of

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<sup>4</sup> Bay of Plenty Regional Council and Tauranga City Council. 2012. Best Practice Guidelines for Pollution Prevention: Pollution Prevention Plan.

hazardous substances outside of the 1% annual exceedance probability (AEP) flood event.

21. Additionally, whilst Chapter 21 identifies and places limits on high risk facilities (Schedule 21.8 of the WBOPDC and Schedule 4 of the BOPRC NRP), again there are no specific provisions which require these high risk activities to prepare SSPPs.
22. Good site management practices, spill response and careful storage are key to minimising ongoing and cumulative effects of potential contaminant discharges. As SSPPs are prepared and implemented, so the risk of contamination from activities on the industrial site will reduce. Risk management is based on assessing the risk or likelihood of losing significant values of receiving environments due to the impacts of urban stormwater. Ad hoc, poor site management practices, or sites where no formal site specific pollution protocol exists, increase the likelihood of toxic or high contaminant generating stormwater being discharged, on an ongoing basis, into the Ohineangaanga Stream. The applicant's ecologist has identified that the Ohineangaanga Stream has high values, and therefore they recommend the preparation of these SSPPs as part of their treatment approach. **Mr Hamill** has agreed with this assessment. As such, the requirement to prepare them should be included as a provision in the District Plan for the PC94 area.
23. Additionally, I support **Mr Te Pairi's** recommendation to include an additional provision requiring the preparation of a comprehensive stormwater management plan which addresses all aspects of stormwater management from the site in a comprehensive and integrated manner.
24. Effects from stormwater discharges are often only assessed as significant when considered cumulatively. Small contributions of contaminants or gradual increases in flow through development may not be noticeable on a day-to-day basis. However, over time and as development within a catchment increases, these small increases in flow or contaminants collectively combine to give a noticeable and significant effect<sup>5</sup>. The need to consider effects collectively necessitates a catchment or sub-catchment based approach. These types of approaches are usually considered at the structure planning stage and

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<sup>5</sup> Bay of Plenty Regional Council. 2005. Development of Comprehensive Stormwater Consent Applications and Catchment Management Plans. Guideline Number: 2005/02

implemented via provisions within a district plan. The resource consent process is prescriptively narrow and considering catchment-wide cumulative effects from stormwater discharges is challenging at best.

25. The current WBOPDC District Plan does not include sufficient controls to manage the effects of water quality discharges on the receiving environment. Whilst Policy 12.2.2 (5) requires subdivision and development to comply with minimum standards which result in improved environmental outcomes, no clarity is provided on what level of improvement may be needed for various types of land uses or receiving environments.
26. Section 3.5 of the NPSFM directs local authorities to adopt an integrated approach, as required by te mana o te wai, to manage the effects of land use on the receiving environment. Amongst other things, Section 3.5.1 (c) of the NPSFM requires that local authorities:

*“manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments;”*
27. As discussed by Mr Te Pairi, this provision has not received due consideration in the Planner’s report.
28. Integrating stormwater provisions within a Structure Plan provides certainty of outcome for the local authority, developers, Regional Council, iwi and the community. Additionally integrated management of land use and associated effects freshwater aquatic receiving systems is a requirement of the NPSFM. The potential to avoid eroding the outcomes sought during the structure plan process are substantially reduced when the necessary provisions to protect receiving environmental values are included within the amended District Plan provisions.

## **RESPONSE TO APPLICANT’S EVIDENCE**

29. I have read and considered the evidence submitted on behalf of the applicant by Mr Richard Coles and Mr Peter Moodie, with respect to water quality and integrated stormwater management.

30. The proposed extended detention and stormwater treatment approach discussed in Mr Moodie's evidence (paragraphs 31 to 34) is consistent with the approach I have discussed in my evidence.
31. For the reasons explained in paragraphs 20 to 28 of my evidence, I disagree with Mr Coles that sufficient provisions exist to manage the effects of water quality discharges on the receiving environment within the District Plan. There are no activity performance standards under rule 12.4.5 of the District Plan which recognise or provide for low impact design stormwater systems (paragraph 25 of Mr Coles' evidence). Whilst the rule does refer to Council's Development Code, the code is outdated (written in 2009), is inconsistent with best practice stormwater management and refers to sustainable "Low Impact Disposal". Low Impact Disposal does not equate to Low Impact Design or Water Sensitive Design (as described in the literature and the BOPRC stormwater design guideline) and should not be relied upon to adequately avoid or mitigate cumulative effects from stormwater discharges.

## **RECOMMENDATIONS AND OUTCOMES SOUGHT**

32. In order to meet the intent of the RMA to avoid, remedy or mitigate the effects of water quality and stormwater discharges on the receiving environment, the Structure Plan needs to consider an integrated treatment approach for stormwater management which is directed at avoiding or mitigating effects of contaminants through source control, at source treatment and structure plan wide treatment.
33. The applicant has proposed an integrated approach to avoiding, remedying or mitigating the effects contaminants entrained in stormwater to the receiving environment. However, the recommendations within the Planner's report do not consider setting the management framework for implementing this approach at the structure plan level. For the reasons set out in paragraph's 24 to 28 of my evidence, I disagree with this approach and recommend that:
  - 33.1 the structure plan include a provision requiring the use of inert roofing and building materials in order to avoid high loads of dissolved zinc or

copper being discharged from buildings. This would avoid the need for roof areas to be directed to an at source stormwater treatment device.

33.2 the structure plan include a provision requiring all high risk industrial activities, as defined in Schedule 21.8 of the District Plan, to prepare site specific pollution plans and require hazardous substances to be stored outside of the 1% AEP.

33.3 the structure plan include a provision requiring that cumulative effects on the downstream receiving environment are managed through the preparation of a stormwater management plan which addresses all aspects of stormwater management from the site in a comprehensive and integrated manner. This should be prepared prior to the developer obtaining any discharge permit or subdivision consent. The provision recommended by Mr Te Pairi requests details of the mitigation measures to be provided for the entire Washer Road structure plan area, including providing concept design and location information to manage water quality treatment in accordance with BOPRC Stormwater Management Guidelines (Guideline Document 2012/01, updated as at December 2015) for structure plan wide and at-source controls including approved proprietary devices, rain gardens or swales in areas zoned Industrial.

## **CONCLUSIONS**

34. A 'treatment train' approach to stormwater management, which uses a series of source control and treatment solutions to avoid or mitigate stormwater effects, has been proposed by the applicant to manage the effects of stormwater quality on the receiving freshwater streams.

35. Whilst I am supportive of the applicant's approach, I disagree with the reporting Planner's assessment of not needing to include additional provisions in the district plan.

36. There are no specific provisions with the District Plan which require hazardous substances to be stored outside of the 1% AEP and no specific provisions which require the preparation and implementation of SSPPs to manage ongoing

contaminant-generated effects from activities within the proposed Industrial zone.

37. The NPSFM requires local authorities to adopt an integrated approach to avoid, remedy or mitigate land use and development effects on freshwater ecosystems (s3.5.1) and to give effect to te mana o te wai (3.2.4b).
38. My evidence highlights that the current WBOPDC District Plan provisions do not adequately manage cumulative effects of stormwater discharges and therefore do not give effect to te mana o te wai and the NPSFM's requirement for integrated management.
39. I am supportive of the provisions recommended by Mr Te Pairi to avoid, remedy or mitigate cumulative effects of stormwater discharges on the Ohineangaanga Stream.

**Sue Ira**

1 July 2022