BEFORE HEARING COMMISSIONERS
IN THE WESTERN BAY OF PLENTY DISTRICT

UNDER THE	Resource Management Act 1991 ("**Act**")
IN THE MATTER OF	an application for resource consent to authorise four existing industrial activities within part of the Te Puna Business Park structure plan area, for a term of two years
BETWEEN	**TINEX GROUP LIMITED**
	Applicant
AND	**WESTERN BAY OF BAY OF PLENTY DISTRICT COUNCIL**
	Consent authority

STATEMENT OF EVIDENCE OF STEVEN JOYNES

Before a Hearing Panel: Rob van Voorthuysen (Chair),
James Whetu (Commissioner)

INTRODUCTION

Background, qualifications and experience

1. My full name is Steven Joynes.

2. I have over 35 years' experience in developing, utilising and managing water modelling projects.

3. I was awarded a PhD in Computational Hydraulics in 1988, and started Hydraulic Modelling Services Ltd in 1992. I established Golovin in 2008. This company is dedicated to best-practice methods in water modelling which includes the development of the *Modelling Policy Statement*, peer review structures and training programmes.

4.   I was the inaugural Chairman of the Modelling Special Interest Group within Water New Zealand for two years.

5.   At least 95% of my work is flood modelling to establish the impact of development in order for applicants to apply for a Resource or Building consent. I have completed over 550 projects in the past 15 years from individual houses, industrial plants and large subdivision. I have taught flood modelling software methodologies and processes to over 400 engineers in public courses and for in-house consultants.

6.   My background involvement for the applicant has largely been in respect of its first two resource consent applications, which relate to the overall Te Puna Business Park structure plan compliance and earthworks that have been undertaken on site. My focus has been to hydrologically model stormwater/flooding scenarios incorporating different works that might be advanced by the three different landowners within the Te Puna Business Park area. This has involved undertaking detailed modelling of various flooding scenarios and mitigations, attending expert witness conferencing (arising out of the abatement notice proceedings, but focused on issues beyond the existing activities to which the abatement notice relates), together with follow up conferencing and engagement with the applicant's planner and the other two business park owner's consultants.

Purpose and scope of evidence

7.   In respect of this current application to authorise the existing activities on site, the applicant has asked me to model any flooding impacts (particularly on the property at 177 Te Puna Station Road) of an 1800mmØ culvert that is proposed to replace the two existing culverts 450mmØ, as part of a vehicle accessway upgrade to the site. The reason that this has been proposed is because an 1800mmØ culvert "upgrade" is one part of the likely package of solutions that will be advanced to resolve wider stormwater management issues. It makes practical sense to undertake that upgrade now, if the entrance is to be upgraded, rather than to have to open up any recently completed works later as part of the wider solution.

8.   The flood model used has been developed over the past 2 years or so to include as much detail required to reflect the existing situation and consented activities. The flood model has been informally peer reviewed

by Council consultants with their requested improvements implemented. This included the use of a tidal boundary with climate change adjustment.

9. I have analysed existing land terrain and inserted the 1800mmØ culvert as required during both a 10-year and 100-year rainfall event. The 10-year storm is for the more frequent event and lower level and more likely to be noticed.

Expert witness code of conduct

10. I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's 2023 Practice Note. While this is not an Environment Court hearing, I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

FLOOD MODELLING

Hydrological Impact of 1800mmØ Culvert

11. The addendum below shows the water level hydrograph for 177 Te Puna Station Road. At this location the water levels change for the 10-year storm is **11mm** in an existing depth of 1.29m. The corresponding results for the 100-year storm is **1mm** and 1.9m. Note that these depths are for climate change rainfall and 1m sea level rise and may not have previously been experienced.

12. The increase in culvert flow for the 100-year storm is from about $0.8m^3/s$ to $1.6m^3/s$. However, this has minimal impact on downstream water levels because the flooding is widespread across multiple drainage channels.

13. It is estimated that the duration of flooding above the existing peak is 3.5 hours in the 10-year storm. For the 100-year storm it is 15 minutes.

14. For context and with no storm flows, 177 Te Puna Station Road will flood to about 1m deep due to sea level rise anyway. The proposed culvert provides a benefit because the inflow tide can move upstream easier and decrease tidal levels by 100mm. The present culverts will cause a restriction.

15.	In terms of the effect of this increase/decrease, I understand Mr Crossan will address this in his planning evidence.

CONCLUSION

16.	As described in this evidence I have modelled the impact of the proposed 1800mmØ culvert.

17.	As above and the worst-case, the impact at 177 Te Puna Station Road is 11mm higher water due to the proposed culvert in the 10-year storm.

18.	I am happy to assist the Panel further should it have any queries.

22 September 2023
Dr Steven Joynes

ADDENDUM

Water level change at the site, 10- and 100-year storm with twin 450mm pipes (existing) and 1800mm culvert (proposed)