BEFORE THE BAY OF PLENTY REGIONAL COUNCIL

UNDER	the Resource Management Act 1991
AND	
IN THE MATTER OF	resource consent applications by the Western Bay of Plenty District Council for the continued operation of, and discharge of treated wastewater from, the Te Puke Wastewater Treatment Plant

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STATEMENT OF EVIDENCE OF CORAL-LEE ERTEL
ON BEHALF OF WESTERN BAY OF PLENTY DISTRICT COUNCIL

Engineering

29 March 2019

Introduction

1. My name is Coral-Lee Ertel and I am the Asset and Capital Works manager at Western Bay of Plenty District Council (**WBOPDC**). I have held this position since August 2018. I have been employed by WBOPDC since March 2010.

2. I started at WBOPDC as a Graduate Engineer in 2010 and have worked in the three waters (drinking water, waste water and storm water) industry for 9 years. During my time at WBOPDC I have held the position of Asset Engineer - Drainage (2010 – 2015), Project and Design Engineer Team Leader (2015 - 2018) and Asset and Capital Manager (2018 to present).

3. I obtained a Bachelor's Degree in Civil and Environment Engineering with honours (University of Auckland, 2010). I am a Chartered Member of Engineering New Zealand.

4. Within my role as the Asset and Capital Works Manager at WBOPDC I am responsible for the Long Term Planning for wastewater, including the development of Asset Management Plans.

Code of Conduct for Expert Witnesses

5. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014. I have prepared my evidence in compliance with that Code in the same way as I would if giving evidence in the Environment Court. In particular, unless I state otherwise, this evidence is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express. I also acknowledge that as an expert expressing opinions my duty is to impartially assist the Court. In particular I am not an advocate for my employer.

Scope of evidence

6. I have been a member on the Te Puke Wastewater Treatment Plant (**Te Puke WWTP**) consent renewal project team since the project first started in 2015.

7. As a member of the project team I have been involved with all aspects of the consent renewal, including providing information to the technical experts relevant to the Te Puke WWTP performance and WBOPDC's planned upgrades. I have been involved with all consultation meetings including discussions with stakeholders and iwi.

8. My evidence will cover:

   (a) Background, including the history of the Te Puke WWTP, population projections, the application process and consultation.

   (b) Upgrades to the Te Puke WWTP.

   (c) Water metering / demand management.

   (d) Term of Consent.

9. I confirm that I have read and am familiar with the submissions, Officer's Report and proposed consent conditions. I have visited the sites multiple times. The last time I visited the site was 2 August 2018.

Executive summary

10. The Te Puke WWTP is a critical asset for the Te Puke community and WBOPDC has invested significant expenditure into the plant. Significant funding has been included in WBOPDC's 2018-2028 Long Term Plan (**LTP**) to continue to

upgrade the plant to cater for future growth. WBOPDC seeks a 35 year term to ensure optimum long term management of the plant and to provide certainty that it can cater for future growth in Te Puke.

Background

History of the Te Puke WWTP

11. Prior to the construction of the Te Puke WWTP, the Te Puke community relied on septic tanks for sewage disposal. In the late 1980s a collector network and Te Puke WWTP was constructed for most of the urban area. The Te Puke WWTP was increased and an extension of the collector network to industry at the northern end of the community was completed in 1998. Additional upgrading work to improve the performance and reliability of the Te Puke WWTP was completed in 2002.

12. WBOPDC was granted Resource Consent 02 4891 by the Bay of Plenty Regional Council (**BOPRC**) on 30 June 1998 for the discharge of treated wastewater from the Te Puke WWTP.

13. Currently, the Te Puke wastewater network is made up of 7 pump stations, 60km of reticulation, and the Te Puke WWTP. WBOPDC made a significant investment to establish, operate and upgrade the Te Puke WWTP. The reticulation has a replacement value of $30.3M and the Te Puke WWTP has a replacement value of $5.87m, based on WBOPDC's 2018 valuations. WBOPDC has spent $6.6m on upgrades since 1994 and a further $5.792 has been included in the LTP for ongoing upgrades.

Population Projections

14. The SmartGrowth Strategy is a collaborative strategy involving BOPRC, Tauranga City Council and WBOPDC to provide a unified vision, directive and

strategy for the Western Bay of Plenty sub-region. Te Puke township is one of four urban growth areas set out in the SmartGrowth Settlement Pattern. Population projections were prepared for SmartGrowth by the University of Waikato in 2014. In 2017 WBOPDC undertook an extensive review of the SmartGrowth population projections as part of its LTP process. The review recalibrated the population as it existed at the time based on the actual population and dwelling growth over that period. These trends, plus known and expected developments were used to then revisit the projections, particularly for the period of the LTP. The population figures were adopted by the WBOPDC Strategy and Policy Committee in June 2017. The revised figures show a steady increase in population until 2033, from which the population remains constant.

	2018	***2023***	***2028***	***2033***	***2038***	***2043***	**2048**	**2053**	**2058**	**2063**
Te Puke Population	8,324	8,484	8,900	9,056	9,056	9,056	9,056	9,056	9,056	9,056

15. As outlined in the Process Performance Review dated 19 May 2016 and prepared by Mr Zhuo Chen (the **Review**) (attached as Appendix H to the application), based on Smart Growth population projections by 2051 the projected Annual Average Flow (AAF) is expected to reach 2348m^3/day, with a peak wet weather flow at 5519m^3/day.

Rangiuru Business Park

16. The Rangiuru Business Park (**RBP**) includes 140km of industrial zoned land situated 8km from Te Puke. The park is currently un-developed.

17. RBP, once developed has two options for wastewater disposal: onsite treatment and disposal or piping to the Te Puke WWTP. If the flows were to be piped to the Te Puke WWTP, RBP would be required to comply with

WBOPDC's Tradewaste Bylaw, which regulates the discharge of trade waste to the WBOPDC wastewater network.

18. It is difficult to gauge the expected flows from RBP until the type of industry is known. However it is expected that any discharge would need to be pre-treated to ensure the plant could cater for the flows, or an upgrade at the treatment plant would need to be undertaken and funded by the development. The Schedule of Financial Contributions included in WBOPDC District Plan indicates $19M for upgrades to the Te Puke WWTP if RBP was to be developed. This value is reviewed with the Annual and Long Term Plans.

19. The current expected flow from RBP is 0.276 l/s/ha (ADWF) or 0.4971l/s/ha (MDF). For the full development of 140Ha this equates to 3,300m^3/day (ADWF). It is recognised this total flow volume sits outside the capacity of the consent applied for. However as these are only high level estimates and flow cannot accurately be determined it is difficult for WBOPDC to justify an increase in the maximum discharge volumes for this consent. Therefore the consent application is for the current discharge volume limits.

20. As set out in the evidence of Mr Robert Shaw, WBOPDC is carrying out an Alternative Disposal Options Assessment to identify alternative disposal options. An alternative option may be identified which could cater for all or part of the flows from the RBP, if those flows were to exceed the capacity under the consent. If no suitable alternative option is identified through the Alternative Disposal Options Assessment then an application to vary this consent could be made, at which point a full assessment of environmental effects could be undertaken for the known volume of discharge from the RBP.

Application process

21. WBOPDC began the consent renewal process in early 2015. A presentation was given to iwi on the 10 February 2015 at the Orchard Church in Te Puke.

The following iwi were invited to attend the meeting: Tapuika, Waitaha Ngati Whakaue ki Maketu, and Ngati Pikiao. This meeting was held prior to WBOPDC selecting a consultant to undertake the Assessment of Environmental Effects. At the meeting WBOPDC provided an overview of the Te Puke WWTP, the existing consents and WBOPDC's compliance history with the consent conditions as well as an overview of the consent renewal process.

22. WBOPDC then went out to tender to select a suitably qualified consultant to undertake the Assessment of Environmental Effects and prepare the consent renewal application. The contract was awarded to AECOM in March 2015. AECOM was selected as it is an established company that is involved in all aspects of Civil Engineering. It has extensive knowledge of Assessments of Environmental Effects and resource consent lodgement, and has experience in Western Bay of Plenty, Tauranga City, and throughout the Bay of Plenty region. AECOM has assisted WBOPDC on many occasions with wastewater schemes and consenting, including for Maketu, Omokoroa and securing a long term 35 year consent for the Waihi Beach community.

23. We considered that AECOM has the capability, resources and experience in resource consent applications to complete this contract.

24. WBOPDC recognises the importance of engagement with iwi and took a lead role in all consultation. A working group was established early and regular meetings were set up with all key stakeholders.

Consultation

25. WBOPDC undertook an extensive consultation programme throughout the consent renewal process. Presentations were given at the very beginning of the consent renewal project in order to raise awareness. We invited iwi representatives to form part of a working group and sought feedback

throughout the preparation of the consent application. As well as iwi engagement WBOPDC gave presentations to various stakeholders throughout the consent renewal process and sought feedback. Consultation with iwi is discussed more thoroughly in the evidence of Mr Christopher Nepia.

Upgrades

Upgrades undertaken

26. In 2011 and 2012, the inlet step screen and Ultra Violet (**UV**) disinfection unit were upgraded due to the age of the equipment and to ensure sufficient capacity for current and future flows. In 2013 the existing blowers were relocated to a separate building and in 2015 two blowers were replaced. This ensured appropriate aeration in the treatment process and access to the blowers for maintenance.

27. WBOPDC is currently underway with several upgrades at the Te Puke WWTP (due to be completed in the 2018/19 Financial Year), including:

(a) <u>Upgrade of brush clarifier – engineers estimate: $1.1M</u>

The purpose of the brush clarifier is to remove suspended solids from the final effluent, prior to UV treatment. However, due to its age and old technology it often does not reduce suspended solids to an optimum level. Currently the treatment plant is reaching an average total suspended solids of 18mg/l (over past 2 years).

WBOPDC are currently completing a project at the Te Puke WWTP to improve the tertiary treatment by installing a Veolia Hydrotech Disc Filter. This new filter is designed to reduce total suspended solids (**TSS**) in the effluent to 10 mg/L or less under normal operating conditions.

The existing brush clarifier will be kept operational to serve as a high flow bypass.

The current works will also prepare for installing future duplicate disc filters, which will allow the brush clarifier to eventually be decommissioned. Allowing for multiple disc filters will ensure that the tertiary treatment section of the Te Puke WWTP is capable of handling increasing flows from future growth.

(b) Renewal and upgrade of switchboard – engineers estimate: $440K

The existing switchboard is past its design life and has insufficient capacity to accommodate future upgrades at the Te Puke WWTP. If the switchboard does not have sufficient capacity, further upgrades to be undertaken at the plant to accommodate increased flows. The switchboard is currently being replaced and upgraded to ensure it can cater for future growth and consequential future upgrades at the Te Puke WWTP.

(c) Installation of recycled water system – engineers estimate: $80K

Currently WBOPDC uses potable water for washdown and plant maintenance. The installation of a recycled water system will enable WBOPDC to use treated effluent for washdown and will reduce overall flows at the treatment plant, and ensure efficient use of resources.

Planned upgrades

28. WBOPDC's LTP outlines proposed upgrades to the Te Puke WWTP to improve the performance of the plant and cater for future growth. This will result in a higher and more stable discharge quality.

29. The Review sets out a number of recommended upgrades to the Te Puke WWTP. Where possible these have been included in WBOPDC's LTP, as set out in the table below:

Process Unit	Proposed Upgrade (as per Review)	Long Term Plan
Inlet Works	Provide full redundancy for the 3mm screen	$578,000 has been included in 2024/2025 for an inlet screen upgrade. This will provide both screen redundancy and some allowance for growth.
	Additional Grit Removal Unit	$513,000 in 2019/2020 has been included for additional grit removal. The inlet grit removal system will reduce wear and tear on equipment, reducing maintenance and renewal costs and reduces the costs of grit removal from the aeration tank.
	Automatic control of Sutro weirs to allow easy adjustment of the flow split between the two secondary reactors.	A design was completed in 2018 to improve the inlet flow splitting. The engineers estimate for this work is $150,000. This work has not been included in WBOPDC LTP at this stage however it is anticipated this will be undertaken at the same time the inlet screen is upgraded in 2024/25.
Secondary Reactors	• It is recommended that the air diffusion system is upgraded to a fine bubble diffusor system to increase the oxygen transfer rate. • It is recommended that the dissolved oxygen level within the aeration tank is maintained at 2 mg/L, if possible. • It is recommended that the MLSS level be increased to a minimum 3000 mg/L. • It is recommended that the sludge retention time within the aeration tank is increased to up to 9 days to allow adequate nitrification. • It has been recommended previously that the empty space in the previous blower room (underneath the current aeration tanks) is used to increase the size of the aeration tanks. The actual sizing of the upgraded aeration tanks cannot be determined at this stage	Funding is included to undertake a design and whole of life assessment on fine bubble diffusion in the 2018/19 Financial Year. These recommendations have been noted and will be reviewed in line with an overall plant upgrade review once the final discharge consent conditions are determined. WBOPDC has included a total of $1,610,000 in 2021/2022 and $1,378,000 in 2027/2028 for general plant upgrades. Actual upgrades to the plant are yet to be determined

	without a detailed process model. Nevertheless, construction of a third aeration tank around Clarifier 3 is likely to be needed in the near future. • Detailed analysis is required to determine the size of the anoxic zone and amount of mixed liquor recycled for the purpose of denitrification.	
Clarifiers	• Continuous monitoring of the sludge SVI is recommended to ensure that the clarifiers are not overloaded. • Flow splitting among the three clarifiers may require attention to ensure that the flow is split correctly according to the operating volume of each clarifier.	No additional upgrades are included in the LTP.
Sludge Dewatering	• It is recommended that the capacity of the sludge holding tanks is increased to provide flexibility on centrifuge operation. • AECOM recommends the installation of a second centrifuge to provide full redundancy of the centrifuge. • AECOM recommends the addition of a pre-thickening or other solid consolidation step prior to the centrifuge. This may involve installing a gravity thickener or other similar unit to produce a sludge dry solid content of up to 4% before centrifuge and returning the supernatant to the inlet works. • AECOM recommends the usage of sludge cake collection bins, which can be covered, stored on site, and emptied periodically by trucks when full.	$550,000 is included in the LTP for the 2022/2023 Financial Year. The sludge thickener will produce a drier sludge content. This will reduce the overall operating costs at the WWTP and the volume of solids taken offsite. A second centrifuge has not been included in the Long Term Plan at this stage as it is not considered critical for the ongoing operation and maintenance of the plant. However a second centrifuge has been recognised as potentially required in the 30 year plan.
Tertiary brush filter	• It is recommended that a study investigating the TSS removal performance of the brush filter under various flow scenarios is undertaken. • If the study shows that clarifier effluent meets the consent requirements on TSS and design specifications for the UV disinfection, the brush filter may be decommissioned or bypassed.	As previously mentioned WBOPDC is currently upgrading the tertiary brush filter to a micro screen. The total cost of this upgrade is $1.1M.

	• If further TSS removal is required due to more stringent consent conditions, it is recommended to install an automated tertiary filter.	
UV disinfection	• If required in the future, an additional UV lamp module can be installed in the existing channel.	No upgrades have been included in the LTP for the UV as it was recently upgraded in 2012.
Wetland	• It may be appropriate to reconfigure the wetland to a traditional horizontal flow wetland, which may induce a more even distribution of the treated effluent in the wetland. However a feasibility study will need to be completed to determine whether an additional wetland polishing step is required and if this can be achieved by the wetland. • In the short term, it may be appropriate that the treated effluent be discharged directly after the UV disinfection via a reconstructed bank-side perforated diffuser pipe and a rock passage located along the river bank. This rock passage can be built along the existing gabion basket wall which appears to have a minimal visual impact on the surrounding area.	WBOPDC have recommended the decommissioning of the wetlands and the installation of a rock filter. Therefore $220,000 has been included in the LTP for the 2022/2023 financial year to undertake this work.

30. As set out in the above table, WBOPDC has included $1.861M in the LTP to undertake operational improvements to the plant, which will be undertaken over the next six years and will include:

(a) Grit removal (2019/20);

(b) Wetland decommissioning and rock filter construction (2022/23);

(c) Sludge Thickener (2022/23); and

(d) Inlet Screen (2024/25).

31. However WBOPDC has also included $2.988M in the LTP to undertake undetermined Te Puke WWTP upgrades, which may include some of the Review recommendations that were not adopted in the LTP. If the new consent is granted, a full review of the Te Puke WWTP will be undertaken to determine what upgrades are required to meet the new consent conditions.

32. The first upgrade ($1.61M) will be undertaken in the first five years to enable the plant to cope with more stringent nutrient limits. The second upgrade ($1.378M) will be undertaken in 2027/28 to cater for future growth. If the funding of $1.378M is required sooner than 2027/28 as currently outlined in the LTP this funding can be brought forward through the Annual Plan process.

33. In addition to the upgrades proposed in the Review WBOPDC has included the following projects in the LTP to improve the overall plant performance and resilience.

    (a) Installation of a fixed generator: $120,000 in 2018/2019. WBOPDC will install a generator at the Te Puke WWTP to ensure the plant can operate during power failures. It is likely that this project will not be completed until 2020 due to delays with the installation of the switchboard.

    (b) Effluent monitoring equipment: $121,000 in 2022/2023. Continuous influent and effluent monitoring equipment will enable better plant control by the Operates.

    (c) For general plant renewals works $811,000 has been included over the LTP 10 year period.

34. WBOPDC has also included $72,000 in its LTP over the next two years to investigate and reduce inflow and infiltration into the wastewater system.

35. In addition to the above upgrades, $19M has been included in the Schedule of Financial Contributions for upgrades at the Te Puke WWTP should the RBP discharge wastewater to the plant.

Water metering/ Demand Management

36. WBOPDC is undertaking several initiatives to reduce wastewater through its Water Conservation Strategy, water metering, infiltration investigations and public education.

37. WBOPDC's Water Conservation Strategy includes measures to help provide a better security of supply and plan for future growth demands. These benefits have a wider regional impact on social, cultural, economic and environmental outcomes. As part of WBOPDC's Water Conservation Strategy WBOPDC has included district wide water metering. Water metering is the single most significant conservation initiative identified due to its far reaching effect and the range of conservation measures it can address.

38. Water metering for the Eastern Catchment (including Te Puke) was completed in 2016. The introduction of water metering has demonstrated a reduction in of 20% of overall water consumption since it was implemented in 2016. There has not been a corresponding reduction in wastewater flows, however wastewater flows have not increased since its implementation despite steady growth at Te Puke.

Term of Consent

39. WBOPDC seeks a consent term of 35 years.

40. As set out in my evidence, WBOPDC has made significant investment in the Te Puke WWTP and continues to make significant investment through upgrades and renewals planned in its LTP. The current replacement value of

the treatment plant is $5.87M. WBOPDC is currently undertaking a $1.2M upgrade on the plant to improve its overall performance and has $5.792M planned for future upgrades and renewals over the next 10 years. WBOPDC is responsible for the prudent financial management of ratepayer funds and needs assurance that this investment is secure hence a 35 year term is sought.

41. Resource consent processes are costly to ratepayers. To date, this consent renewal has costed $363,000 since the project started in 2015. A consent renewal is a long process and creates a great deal of uncertainty around the long-term operation and upgrades at the Te Puke WWTP. Repetitive resource consent processes through short-term consents are not only costly to the WBOPDC but restrict the ability to adequately plan for the long term. WBOPDC is required to develop asset management plans with a 30 year horizon for its infrastructure strategy.

42. WBOPDC manages and operates five wastewater treatment plants within the District. WBOPDC has committed to looking at alternative discharge options for both the Katikati and Te Puke WWTP. The Katikati WWTP has been granted a 20 year term (expires 2038). It is expected that an alternative will be implemented prior to the end of the 20 year term. This will be a significant expenditure for the Western Bay of Plenty ratepayers. Any implementation of alternatives for the Te Puke WWTP should therefore be staged appropriately with the Katikati WWTP and adequate time should be allowed for WBOPDC to fund the alternative.

43. WBOPDC has some of the highest wastewater rates in the country. The current Uniform Annual Charge for wastewater in the Western Bay District is $907.43. Therefore it is important that the WBOPDC carefully manages wastewater infrastructure investment across the District. The implementation of two alternative discharge options within the same time frame in the District will heavily impact the wastewater UAC.

44. The proposed consent conditions have sought to maintain the maximum discharge volume, while improving the quality of treated effluent.

45. It is my opinion that a 35 year term will allow WBOPDC to adequately plan for the long term management of Te Puke's wastewater. It will provide certainty around the Te Puke WWTP's ability to deliver on future growth without the need to undertake costly consent renewal processes.

Submissions

46. A number of submissions were made highlighting the significance of the Wairai Stream to Maori and that the discharge of treated wastewater into water is culturally offensive. WBOPDC recognises that the discharge is offensive to Maori and is undertaking a number of actions to address this. These include:

(a) Recognition and inclusion of tangata whenua in ongoing consent conditions, which is discussed in Mr Richard Harkness' evidence;

(b) Continued improvement and upgrades to the discharge quality, which is discussed in the evidence of Mr Zhuo Chen;

(c) Installation of the rock chamber, which is discussed in Mr Kelvin Hill's and Mr Richard Harkness' evidence; and

(d) Alternative Disposal Options Assessment, which is discussed in Mr Robert Shaw's evidence.

47. A number of submissions claimed that there was a lack of involvement with iwi in the consent renewal process. Mr Christopher Nepia's evidence sets out

the extensive engagement program WBOPDC undertook to involve iwi in the consent renewal process.

48. One submitter has recommended a 20 year term for consent. However Council seeks a 35 term to ensure certainty for continued operation of the Te Puke WWTP. WBOPDC is looking at alternative disposal options for the treatment plant as set out in Mr Robert Shaw's evidence. Any alternative will require significant expenditure by WBOPDC. With the need to implement an alternative disposal option for Katikati WWTP within the 20 year time frame, implementing one for Te Puke within the same time frame will be a large burden for the WBOPDC's ratepayers. Therefore the two options should be appropriately staged. In addition, if an alternative is implemented, some discharge may be required to the Waiari Stream in times of wet weather/ high flow (depending on the selected alternative). Further information on this is included in Mr Robert Shaw's evidence.

49. The consent capacity can cater for future population growth. Some spare capacity is included in the consent to allow for future flows from RPB.

Officer's Report

50. I confirm that I have read the Officer's Report and have no comments to make.

Conditions

51. The draft recommended conditions are attached to Mr Richard Harkness's evidence. The proposed conditions do not include any upgrade requirements. I agree with this approach because it is important that WBOPDC can respond to changing technology rather than being tied to what may become outdated upgrade requirements.

Conclusion

52. The Te Puke WWTP is currently operating well and providing a high quality level of treatment. The plant has capacity to deal with the projected flows for the next 35 years and with the planned upgrades can continue to provide a high level of treatment.

Name: Coral-Lee Ertel

Date: 29 March 2019