



Upgrading of the Motueka WWTP Pond System by Tertiary Processes including Ultrafiltration Membrane

Humphrey Archer (Beca Ltd)

Steve Christensen (Beca Ltd)

Graeme Jenner (Beca Ltd)

Juliet Westbury (Tasman District Council)



Introduction

- Location
- Background
- Upgrading
- Performance
- Conclusions







Thorp Street

Background

- Average inflows are approximately 2,500m³ per day
- Peak flow 11,000m³ per day – elevated groundwater levels and rain
- Motueka WWTP commissioned 1980
- Several upgrades over time but soakage failed
- Construction of an additional sand soakage area began but was abandoned due to koiwi being discovered 2005
- Marine farming of mussels and scallops occurs within Aquaculture Management Areas of Tasman Bay approximately 4.5km offshore from the Motueka River mouth
- Discharge area was open to the public



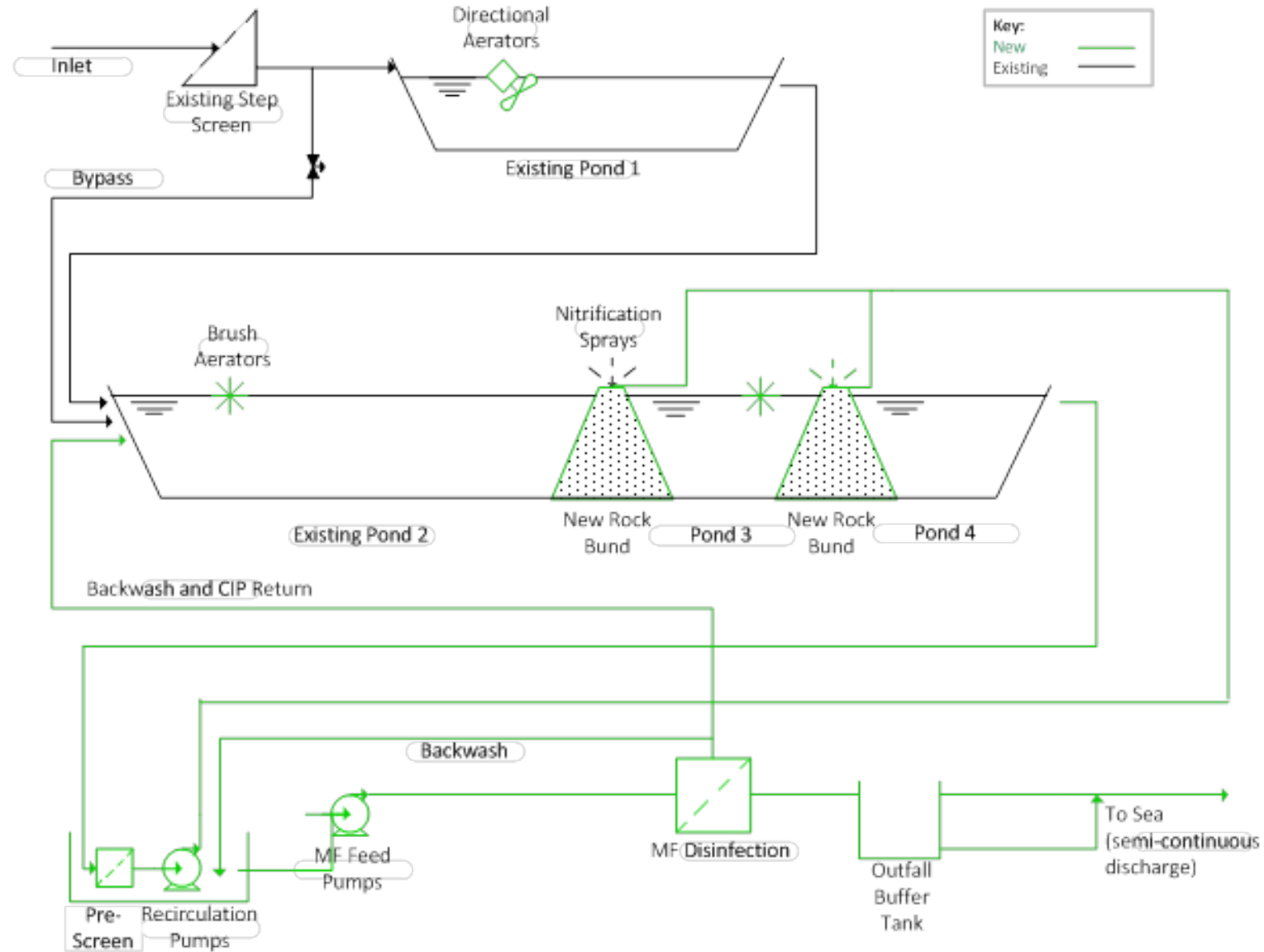


Upgrade

- Desludging the oxidation pond
- Doubled the capacity of the aerators in the aeration basin and relined
- The installation of rock bunds in the oxidation pond to reduce short circuiting and create two new ponds prior to the outlet
- Pond 4 effluent sprayed on the rock bunds to increase biofilm resulting in increased nitrification treatment
- Aeration added to oxidation pond
- Installation of Ultrafiltration Membrane for disinfection treatment
- Install new submarine outlet in the river/estuary



Process Flow Diagram



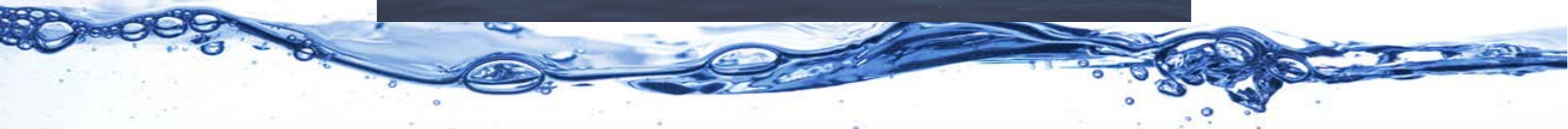
Pond Sludge Dewatering In Geotextile Bags On Site



New Aeration on Pond 1 (Fuchs)



Pond 1 Aeration With Covered Inlet Structure



Pond 2 Aeration Current Generation



New Aeration on Pond 2 (S&N brush Sindico)



Rock Nitrification Sprays (note 1m freeboard)



Pot Spreader Spray (non-clog, high flow)



Ultrafiltration Membrane (Masons/Memcor)



Ultrafiltration Membrane 2 (Masons/Memcor)

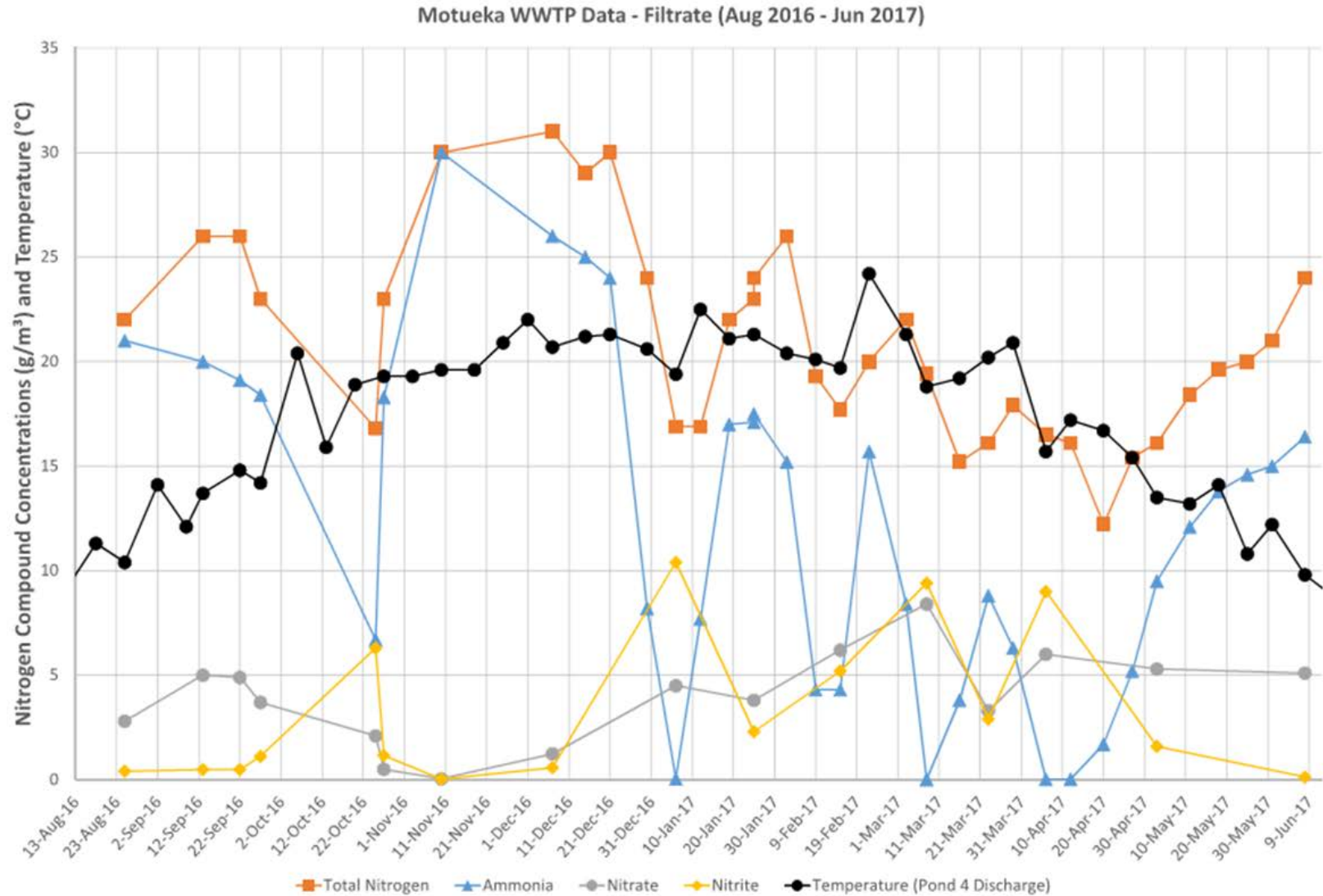


Performance – Final Effluent

	TSS (g/m ³)	CBOD ₅ (g/m ³)	TN (g/m ³)	Ammonia-N (g/m ³)	E.Coli (CFU/100ml)	FC (CFU/100ml)
Filtrate Annual Rolling Median Compliance Requirements	3.0	5.0	12.0	9.0	5	5
Progress Results (Averaged from Aug-16 to Jun-17)	4.6	2.6	21.0	12.3	<1	<1



Effluent Quality Trend Plot



Key Features Consenting Phase

- Tasman District Council had investigated application to land in the vicinity but was not a viable option
- Present WWTP location is at risk from coastal erosion
- Likely that WWTP will be moved inland in 20 to 40 years time
- Consents were processed for UF upgrade without a Hearing and there were no appeals



Key Features Implementation

- Multiple contracts to fully utilise local contractors
- UF plant supplied by a Design Build Contract – Downer, Masons, Harrison Grierson
- Beca was Client Advisor and prepared AEE, Contract Documents and provided Construction Monitoring



Key Outcomes

- When discharge to land was found to be not viable, the stakeholders agreed with the upgrading package of: improved pond aeration, Ultrafiltration Membrane disinfection, and nitrogen reduction using rock trickling filters
- Initial results are promising and greater rock spray usage should achieve more consistent N removal
- UF membrane achieves > 3 log removal of virus
- UF backwash recycles nitrifying biomass to rock trickling filters
- Implemented within the \$8 million capital budget



Acknowledgements

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