

# Performance of new stormwater system at Fonterra Tirau

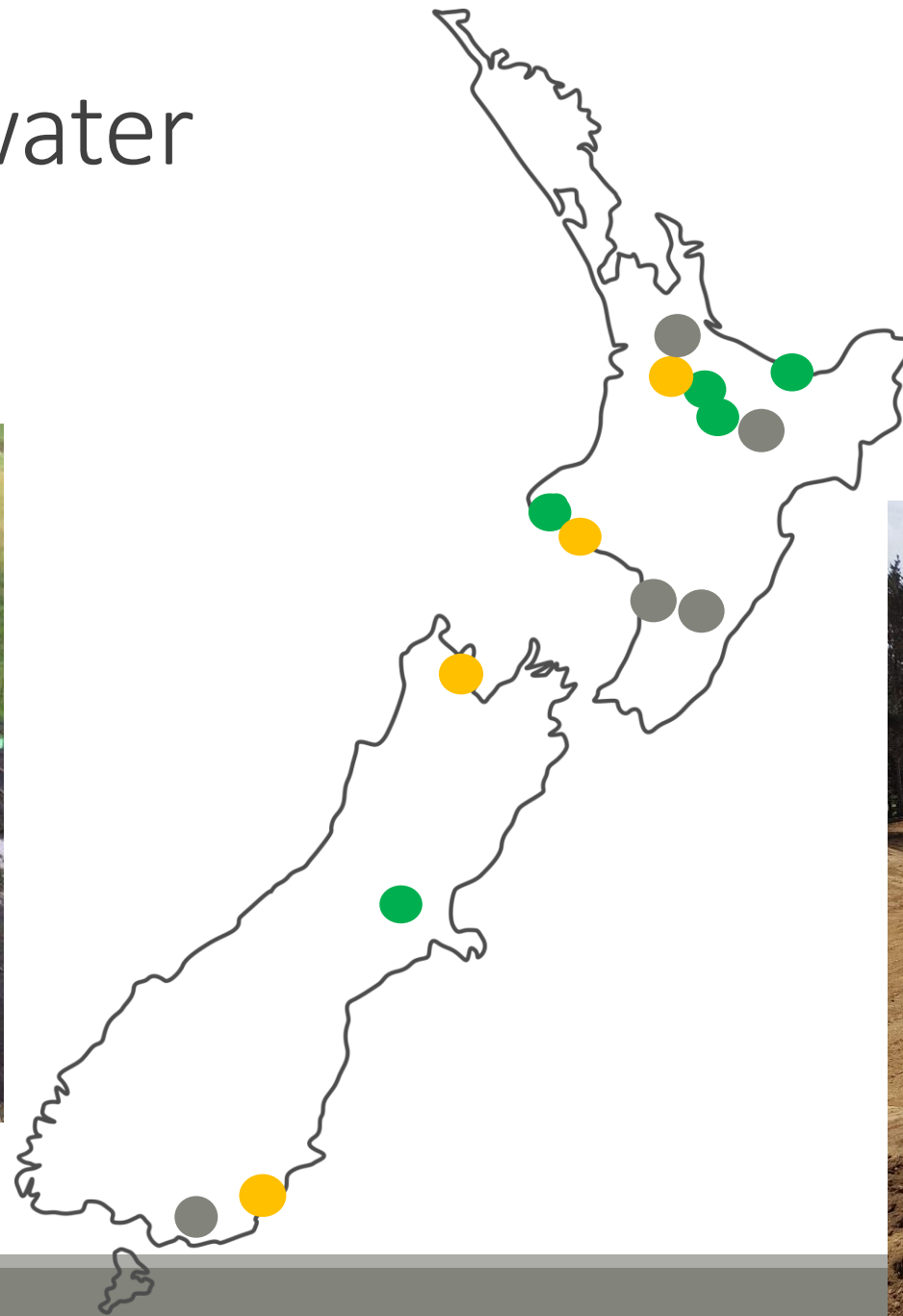
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# Fonterra NZ Stormwater Projects





# Stormwater Risk Management

An aerial photograph of a large industrial facility, likely a wastewater treatment plant, situated in a rural area with green fields and a small town in the background. The facility features several large white buildings with blue accents, numerous cylindrical tanks, and a large parking lot filled with cars. Eight white rectangular callout boxes with black text are overlaid on the image, each containing a numbered strategy for stormwater risk management. The background shows rolling hills under a blue sky with light clouds.

1. Divert upstream catchments

2. Isolate high risk areas and divert to wastewater

3. Remove cross connections where possible

4. Source controls such as bunds, interceptors, and filters

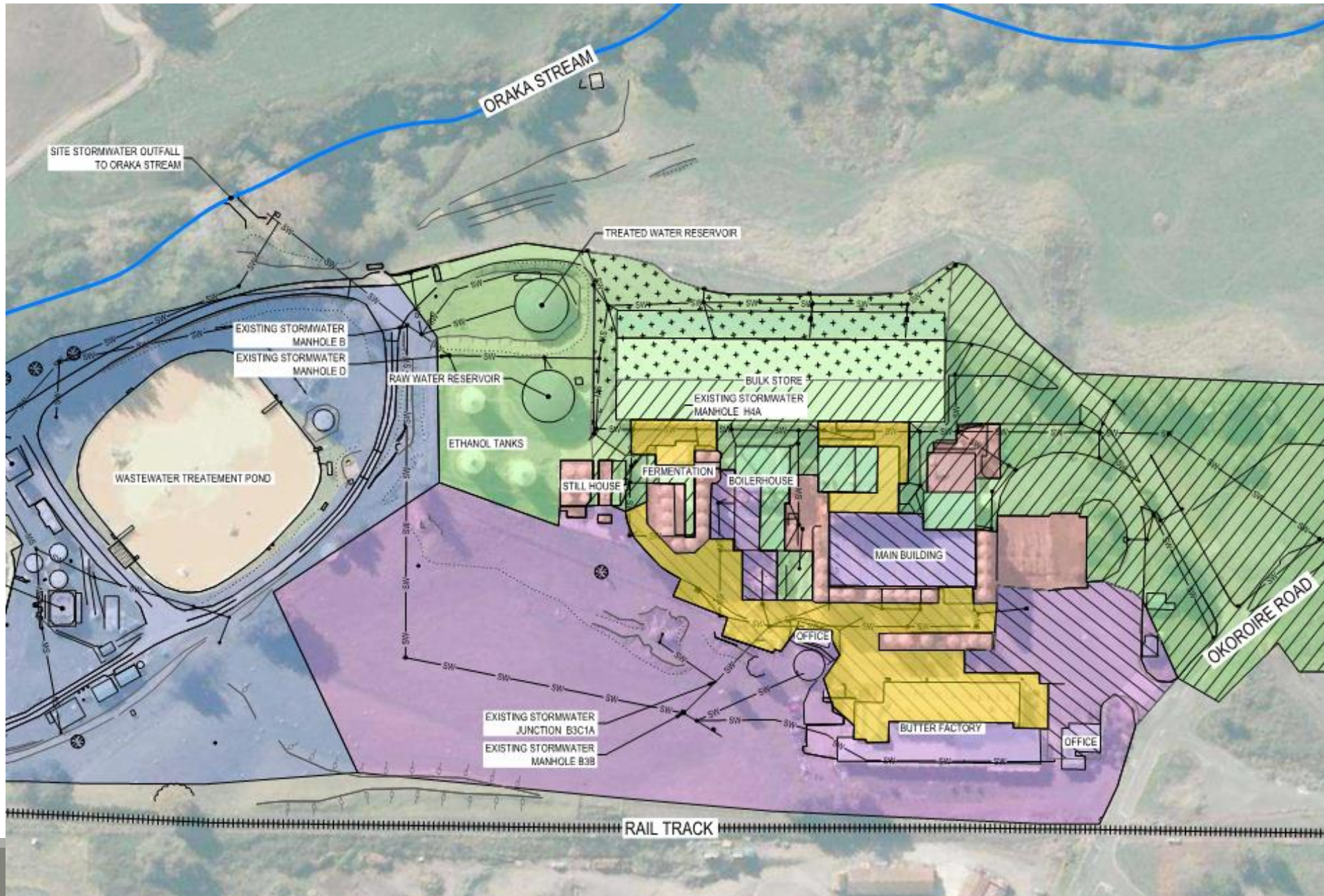
5. Combine outlets to allow centralised monitoring

6. Detection and storage/divert of spills

7. Treatment of first flush volumes

8. Quantitative controls



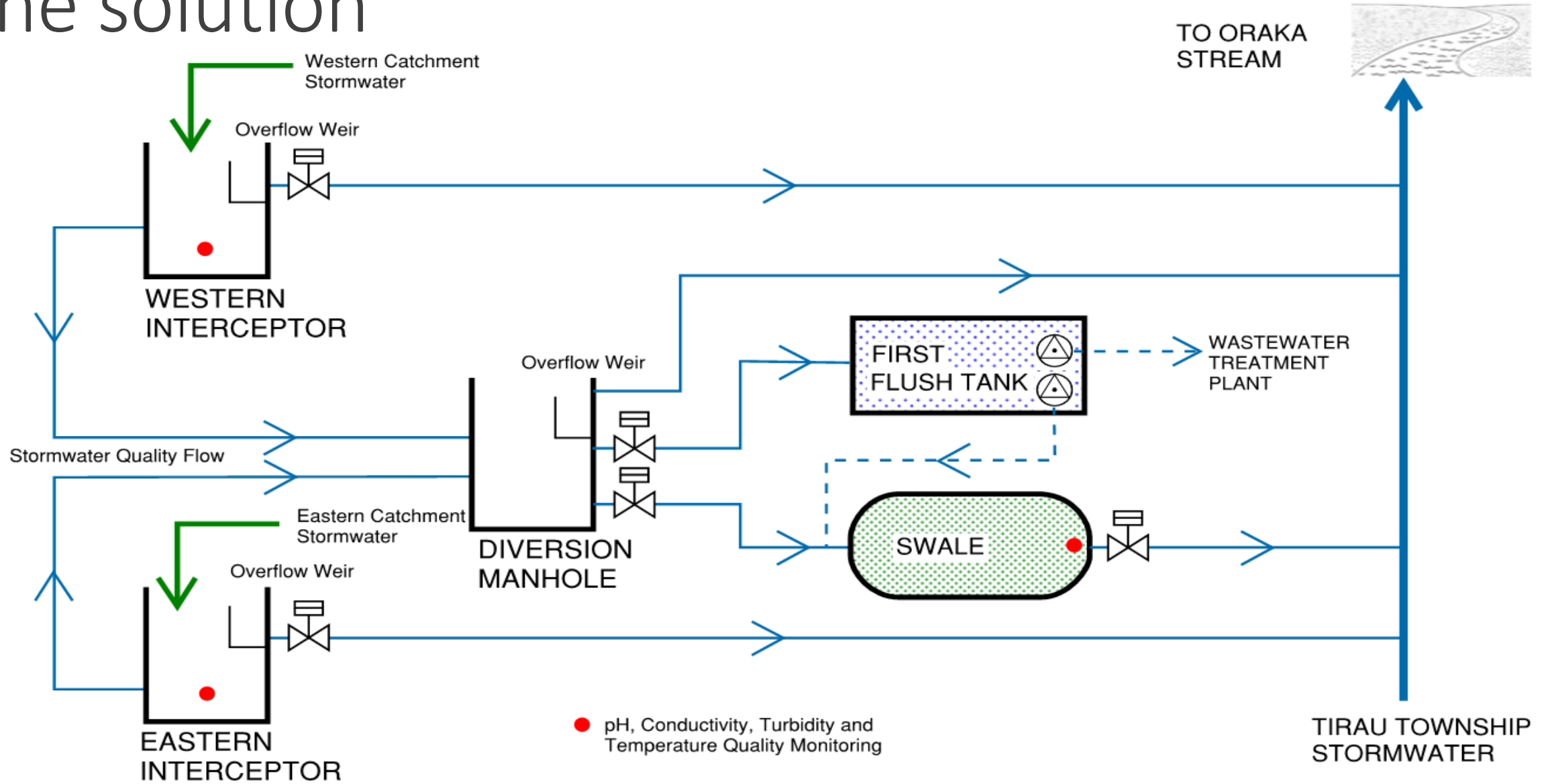


# The problem

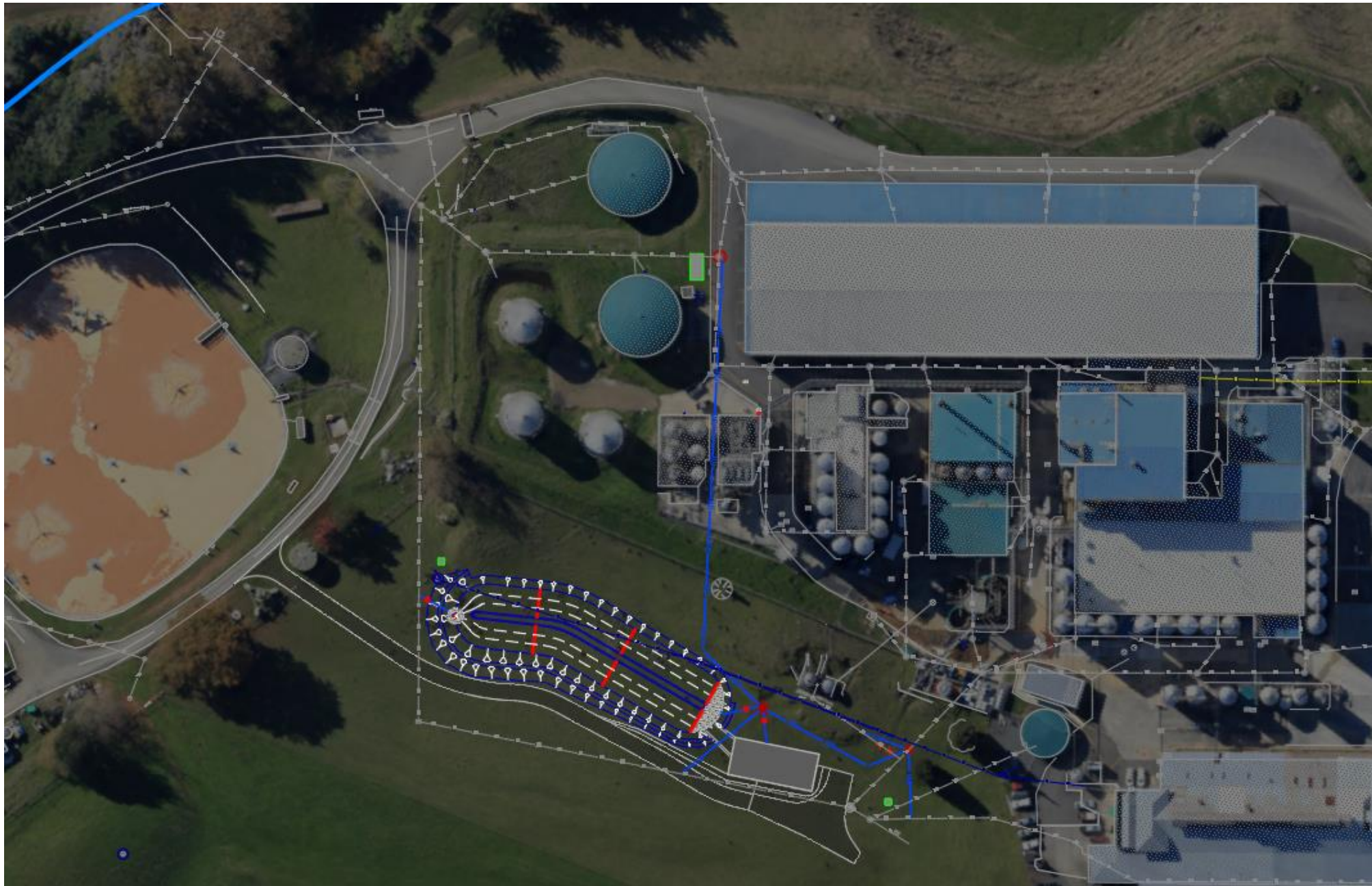
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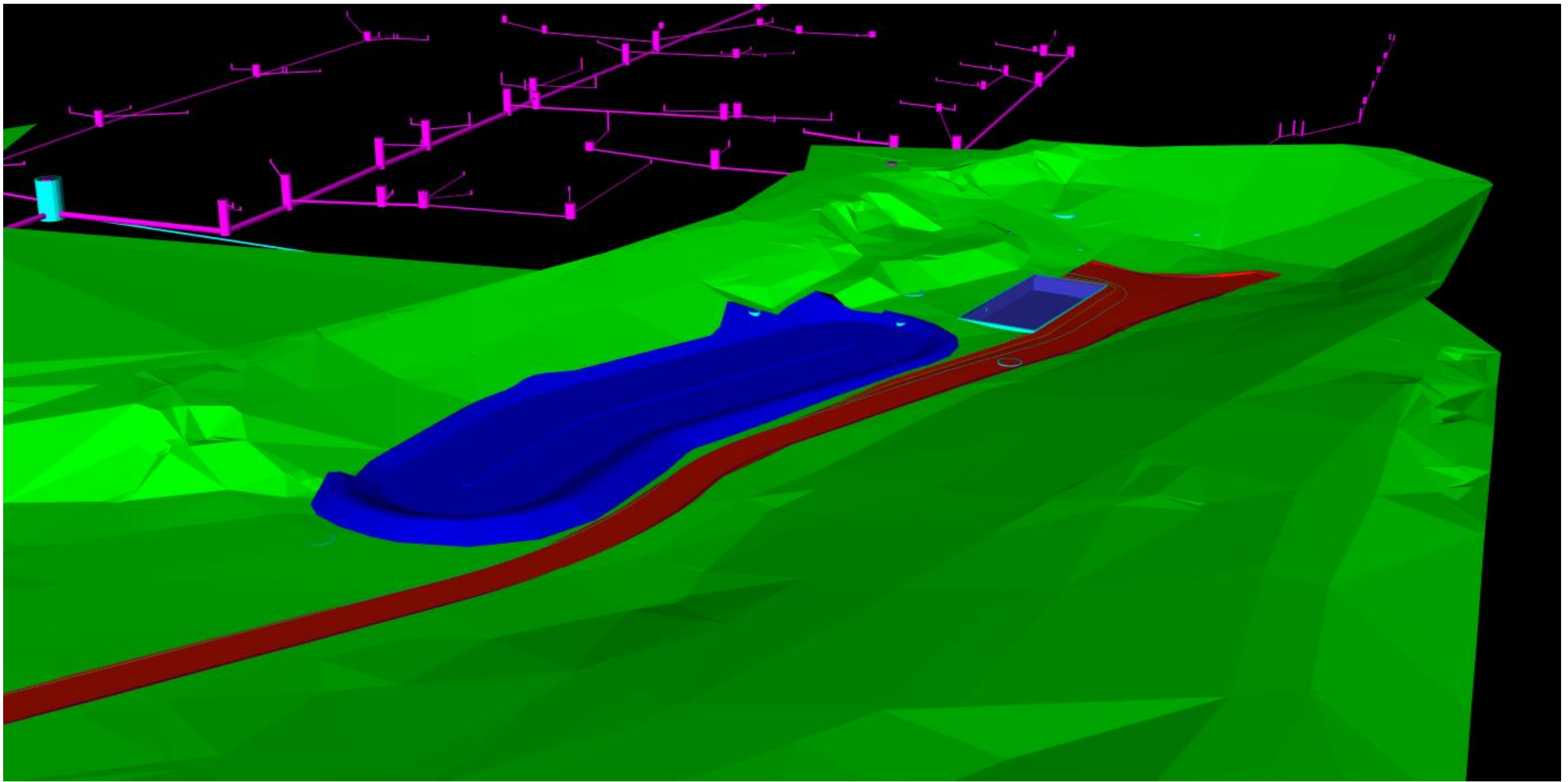
- Stormwater non compliances
  - Existing, aging stormwater system
  - Limited discharge control
  - Limited monitoring
  - Tirau township stormwater
- Resource consent renewal
  - New limits operational 1 August 2017

# The solution











# First Flush Tank

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- High strength (soluble) collection & management
- Centralised spill management
- 10mm first flush
  - 350m<sup>3</sup> total; 305m<sup>3</sup> live and 45m<sup>3</sup> dead storage
- Pumping
  - Wastewater treatment plant
  - Manual pumping to swale





# Swale Treatment

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- Suspended solids treatment
- Two 65m long, 7m wide wetland swales
- Planted in native oioi
- Bunded for calamity spill containment
- Liner provided underneath







CyberLink  
by PowerDirector

# Previous Performance

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- pH, temperature and conductivity monitoring and weekly BOD grab sample
- Five non-compliances over last year
- Averages compliant with consent limits
- No isolation possible if non-complaint flows detected – High risk

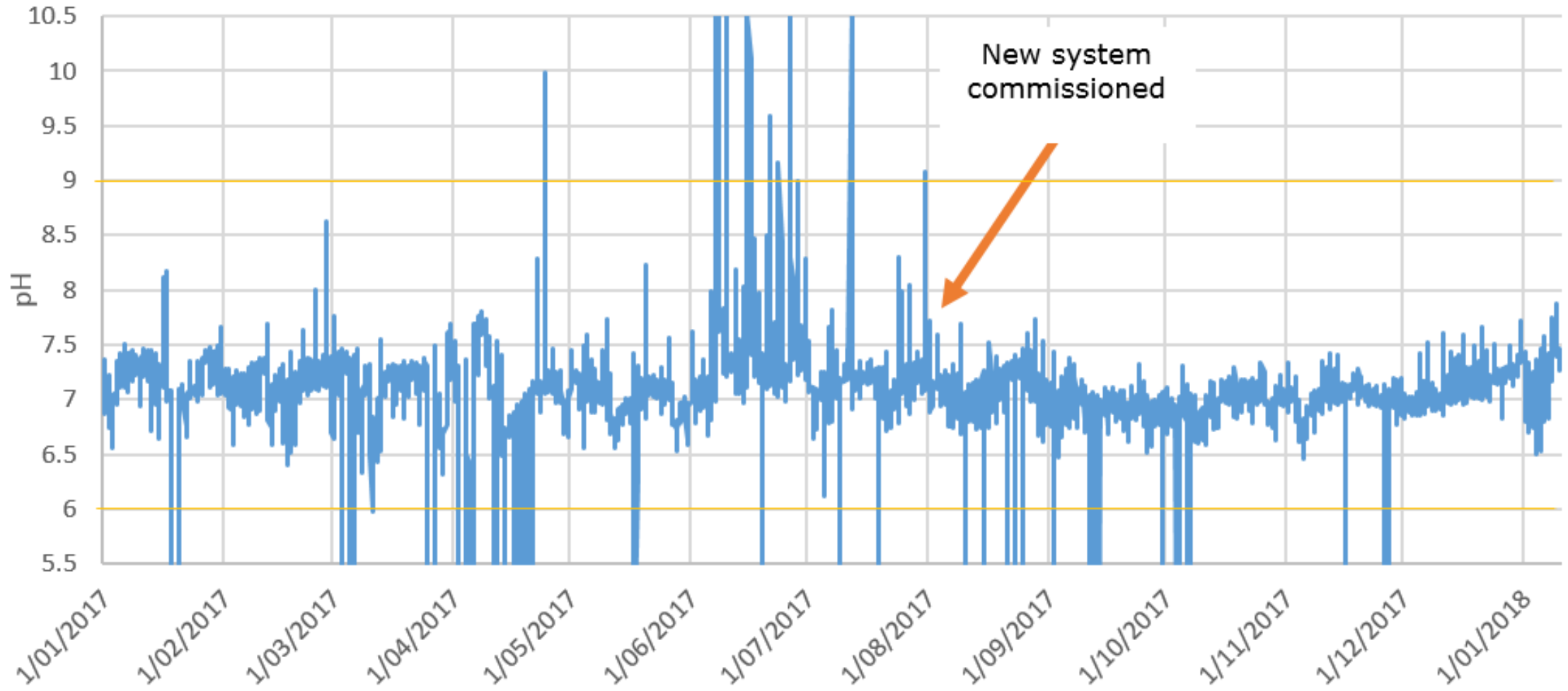


# Current Performance

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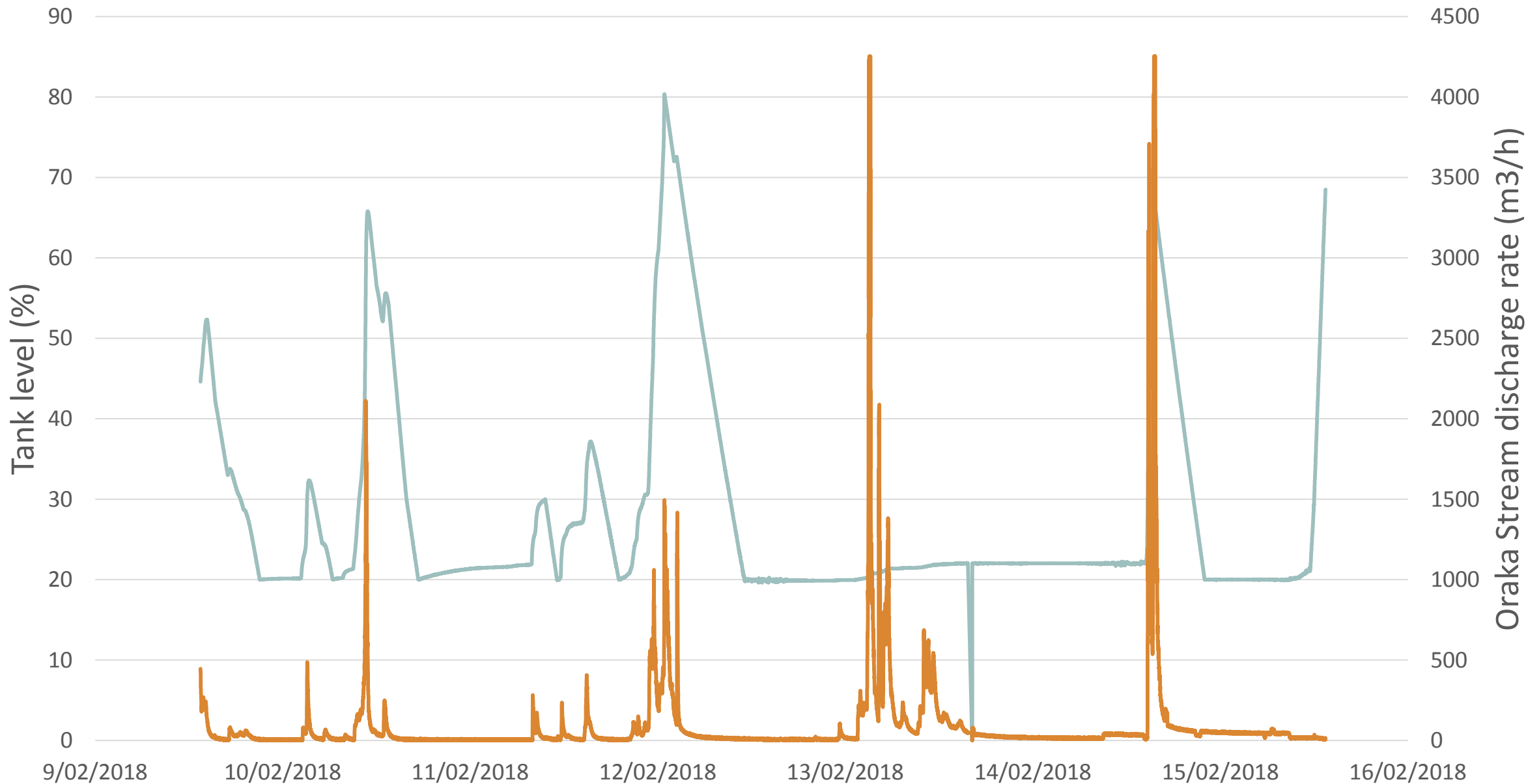
- pH, temperature, conductivity and turbidity monitoring and weekly BOD grab sample
- No non-compliances
- Turbidity and suspended solids improvement from swale
- First flush tank reducing TP, TN and COD

# Stormwater Final Discharge pH

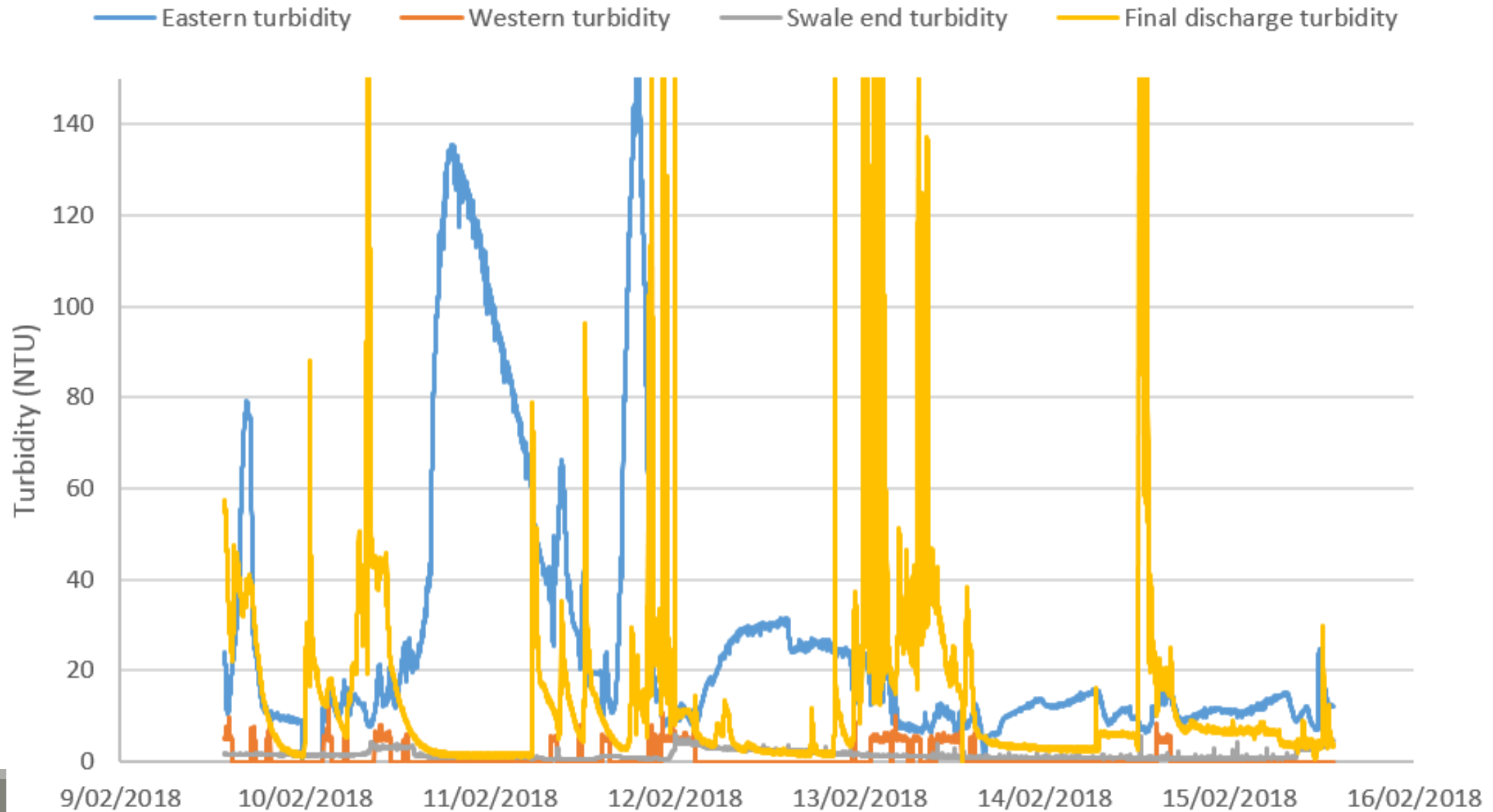




— First Flush Tank Level — Final discharge flow



# Swale Treatment



# Swale Treatment

Contaminant	Swale inlet	Swale outlet
Total suspended solids ( $\text{gm}^{-3}$ )	12	< 3
Total nitrogen ( $\text{gm}^{-3}$ )	0.42	1.12
Total phosphorus ( $\text{gm}^{-3}$ )	0.08	0.086
COD ( $\text{g O}_2 \text{m}^{-3}$ )	12	12





# Complications

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- Cooling Water in system
- Weed growth in swale
- Volumes to wastewater treatment plant
- Town stormwater risk

# Conclusion

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- No non-complaint discharges
- Swale reducing suspended solids and turbidity
- First flush tank leading to reduction in TP, TN and COD
- Process flows within system
- First flush criteria should be reviewed regularly

# Acknowledgements

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