Te Maunga WWTP Sludge Dewatering – Pilot Trials to Full Scale

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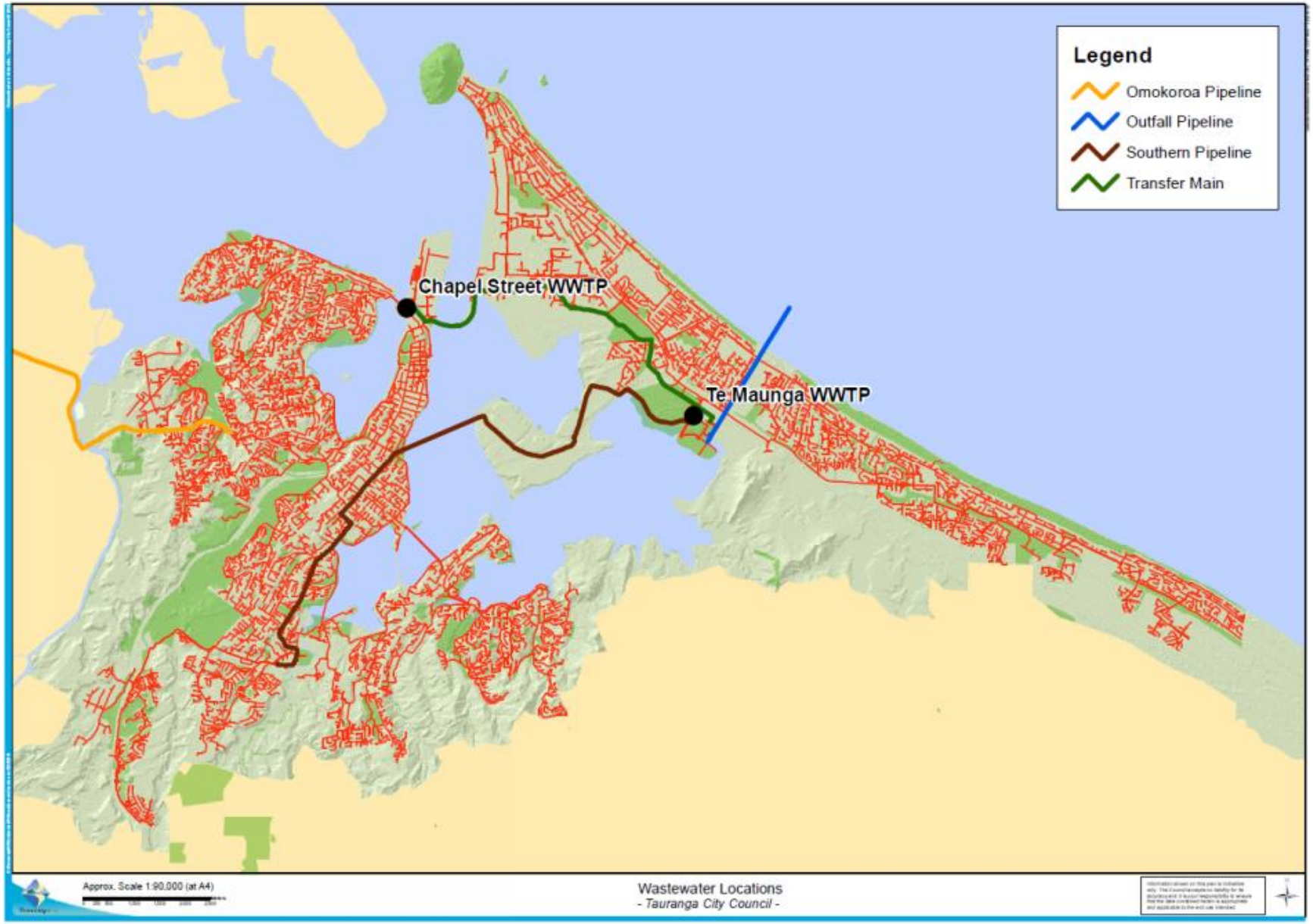
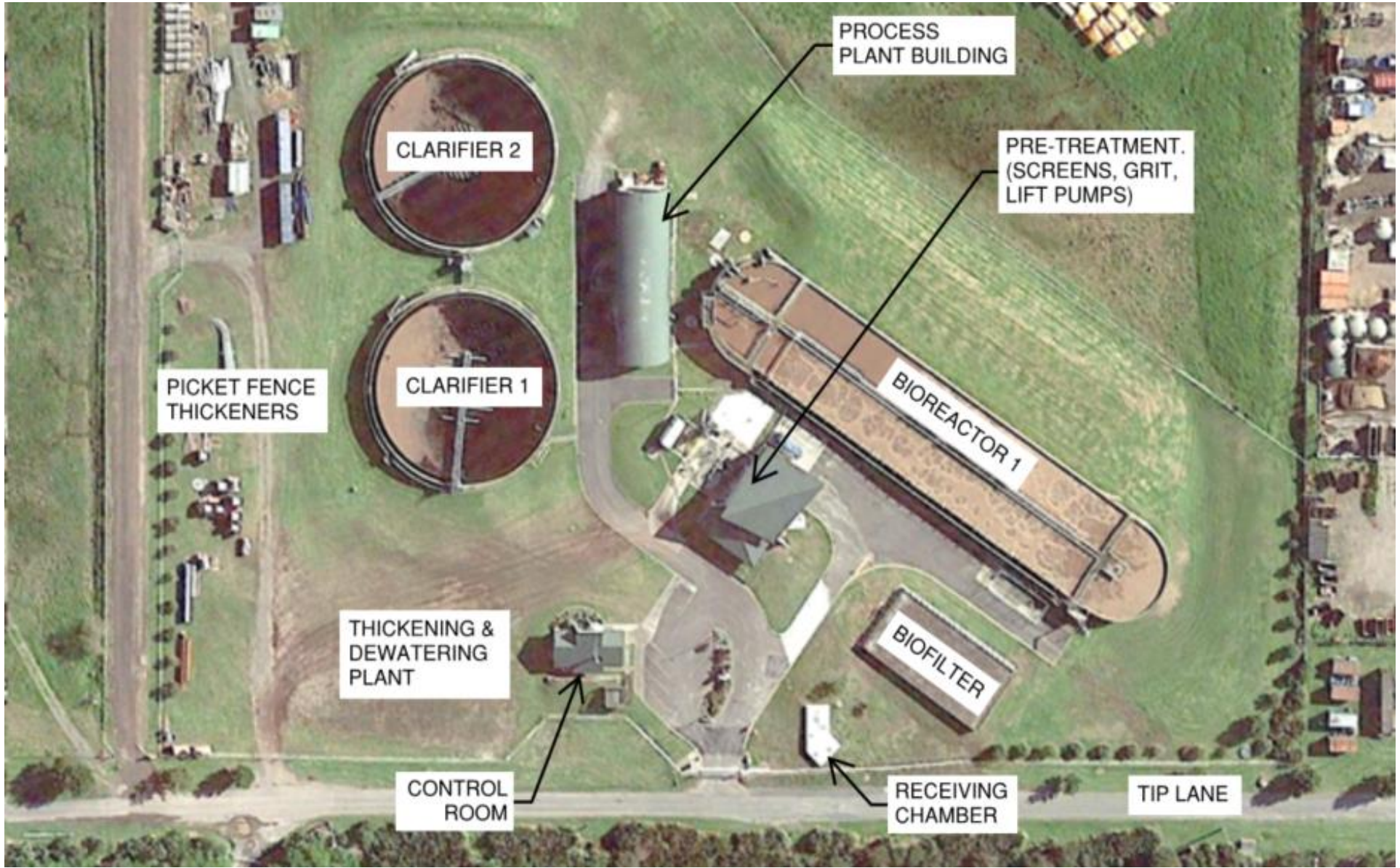
Outline

- TCC Wastewater Network & Te Maunga WWTP
- Initial Equipment Selection
- Dewatering Pilot Plant Trials
- Process Design Implications
- Full Scale Construction & Commissioning
- Key Lessons Learnt

TCC Wastewater Network

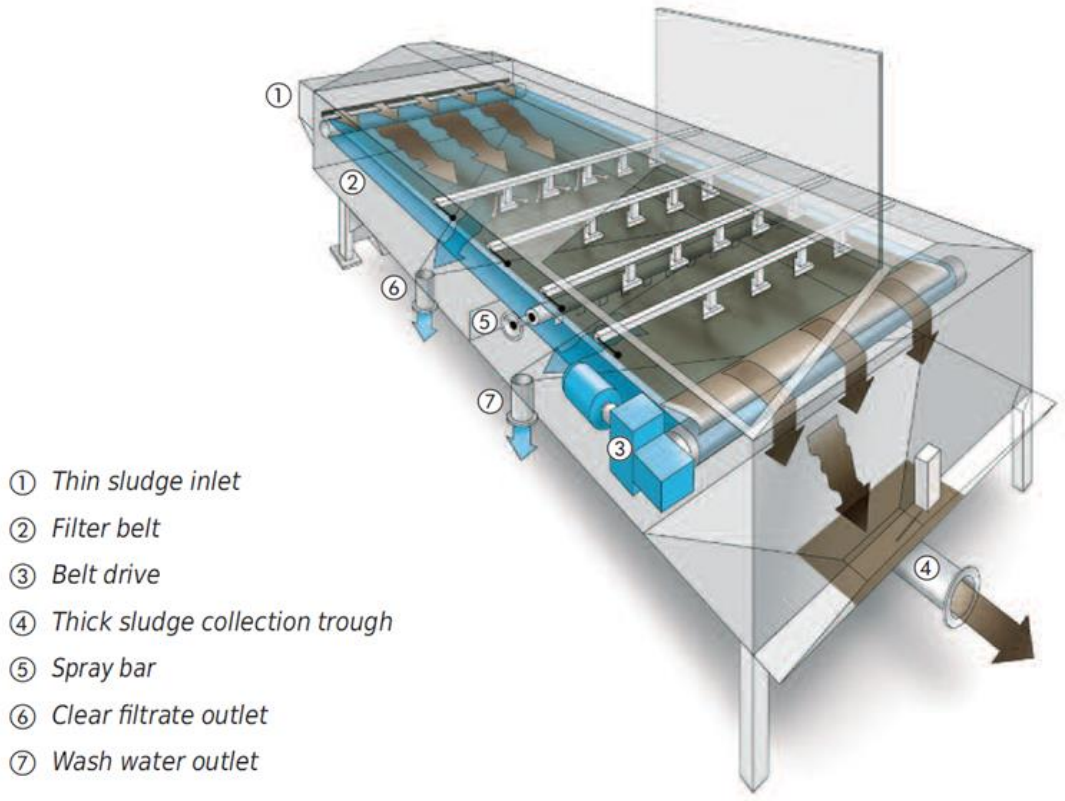


Te Maunga WWTP



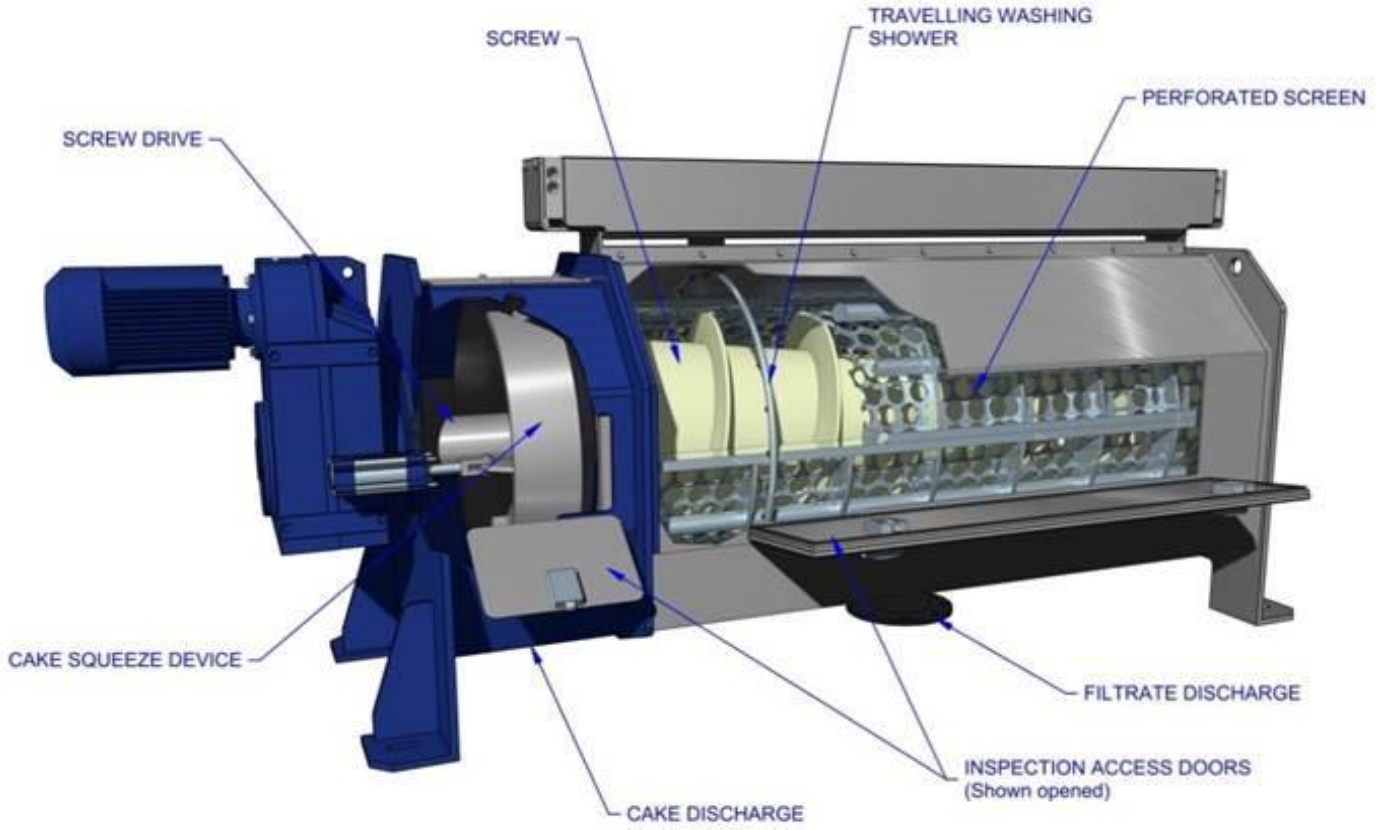
Sludge Thickening Options

- Centrifuge
- Gravity Tank
- Drum/Screw thickener
- Gravity Belt



Sludge Dewatering Options

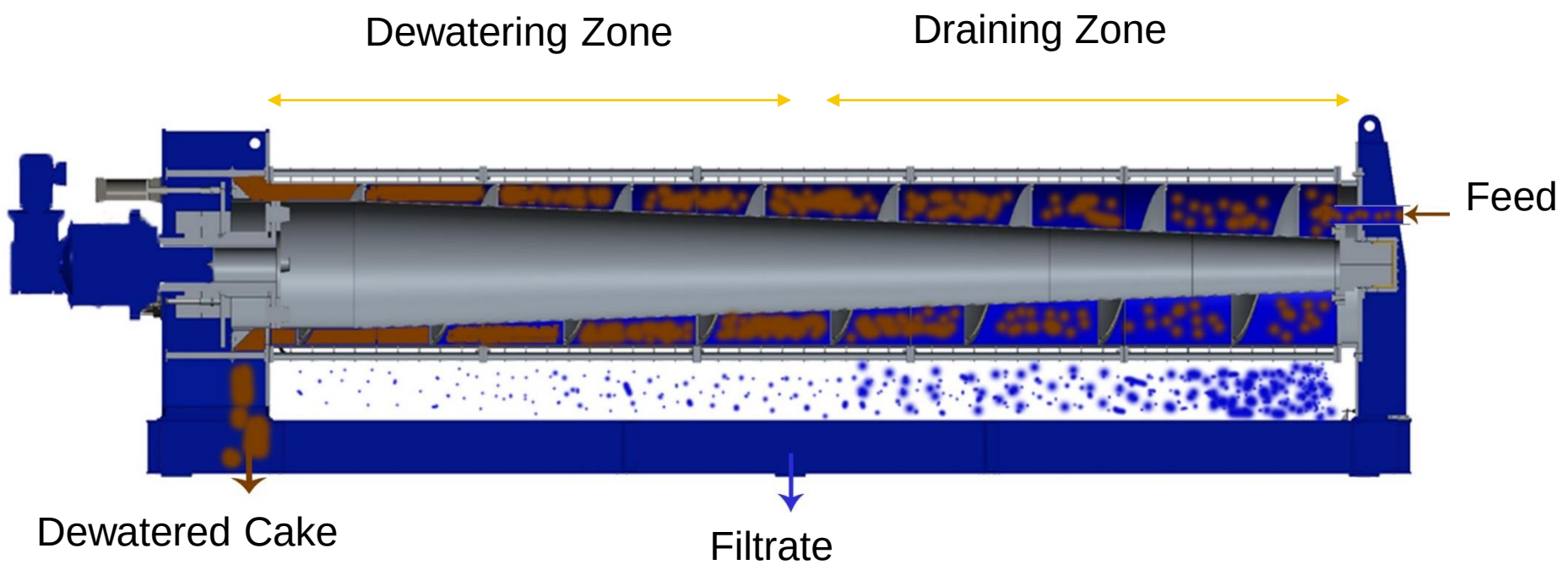
- Centrifuge
- Vacuum Drum Filter
- Plate Filter Press
- Piston press
- Rotary Press
- Belt Filter Press
- Screw Press



Screw Press Assessment

Advantages	Disadvantages
Low operating speeds and noise	Capture rate can be poor
Low power consumption	Consider size of machines vs throughput (bigger than centrifuges, smaller than belt presses)
Reduced maintenance requirements	
Simple to Operate	
Fully enclosed – good for odour containment	
Pilot Plant Available	

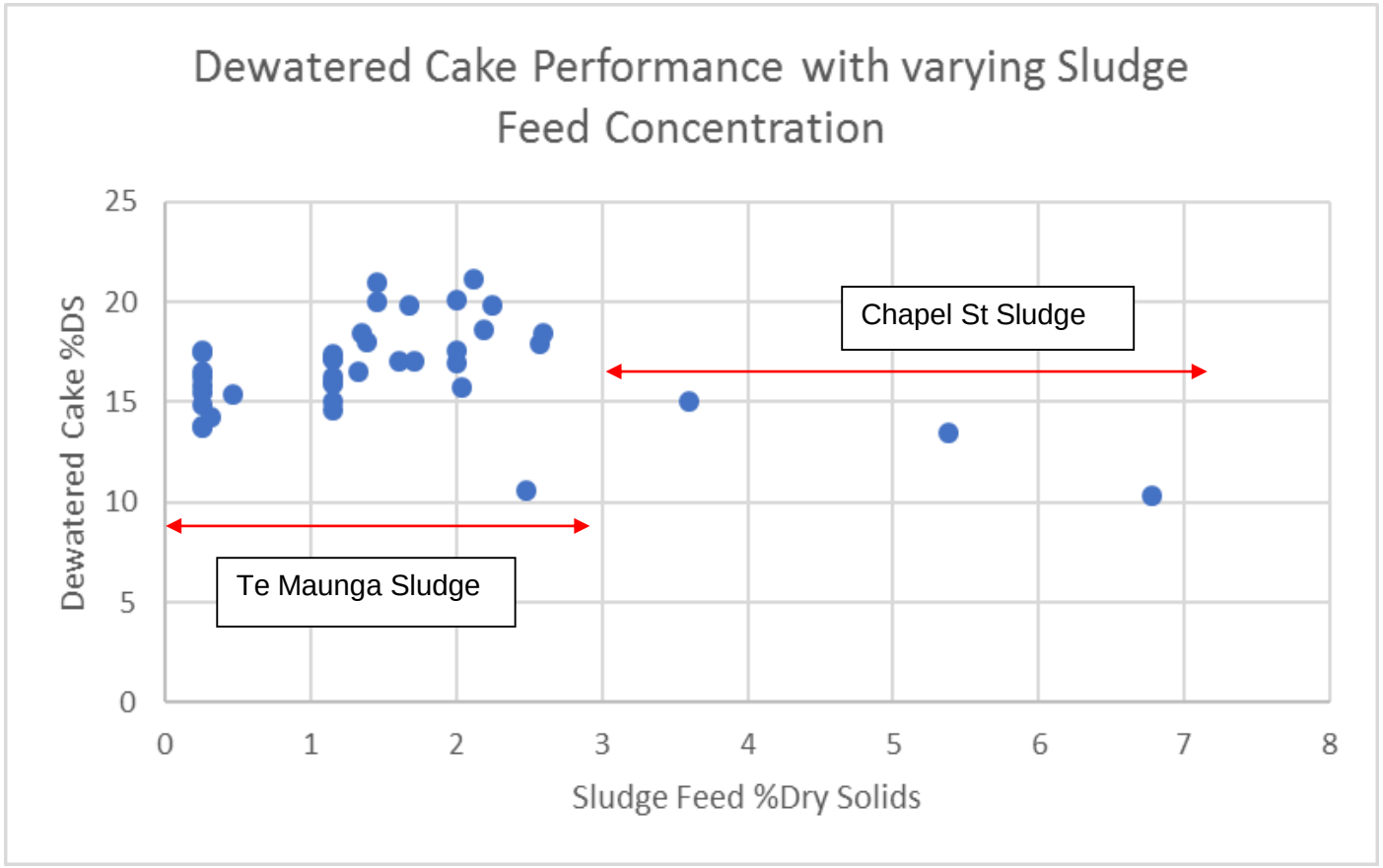
Screw Press Operating Principles



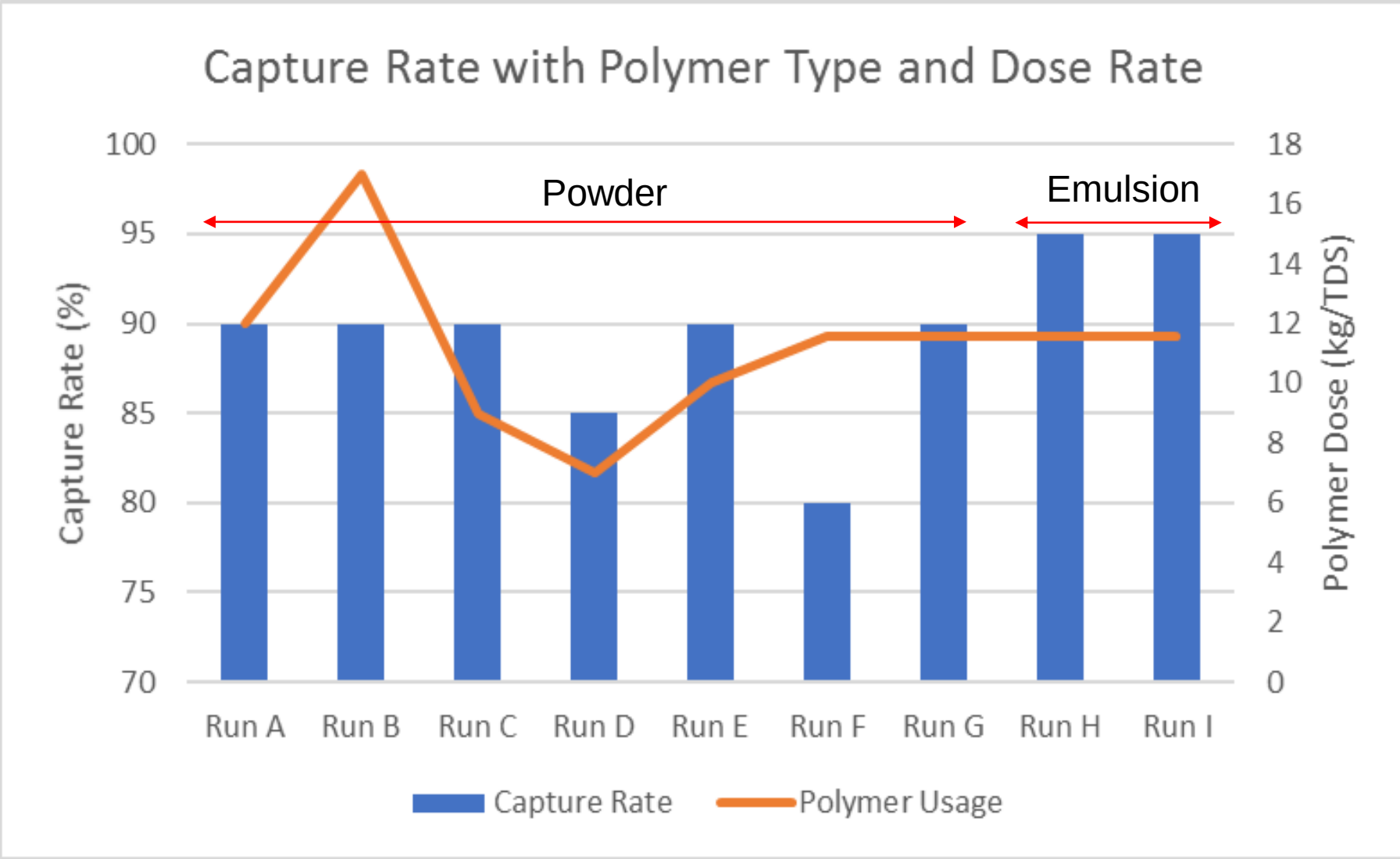
Pilot Plant Trials Set Up

- Sludge Feeds (dry solids)
  - .25 - .3 % from bioreactor
  - 1 - 2.5% gravity thickened
  - 3 - 7% GBT thickened

Pilot Plant Trials Results



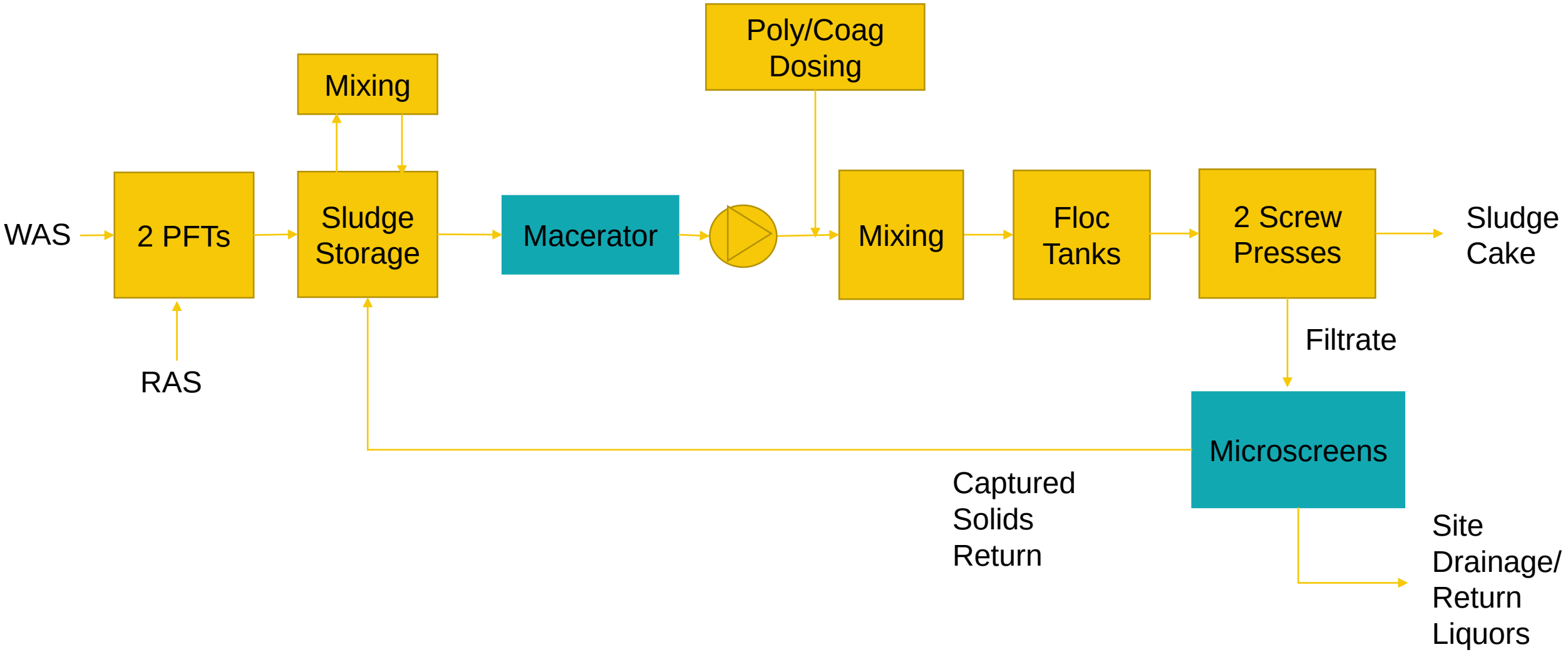
Chemical Conditioning



Process Design Considerations

- Sludge age and VSS:TSS Ratio
- Change of thickening to gravity tank (picket fence) thickeners
- Cutting type macerators ahead of feed pumps
- Coagulant dosing
- Static and dynamic mixers
- Micro-screens on filtrate lines

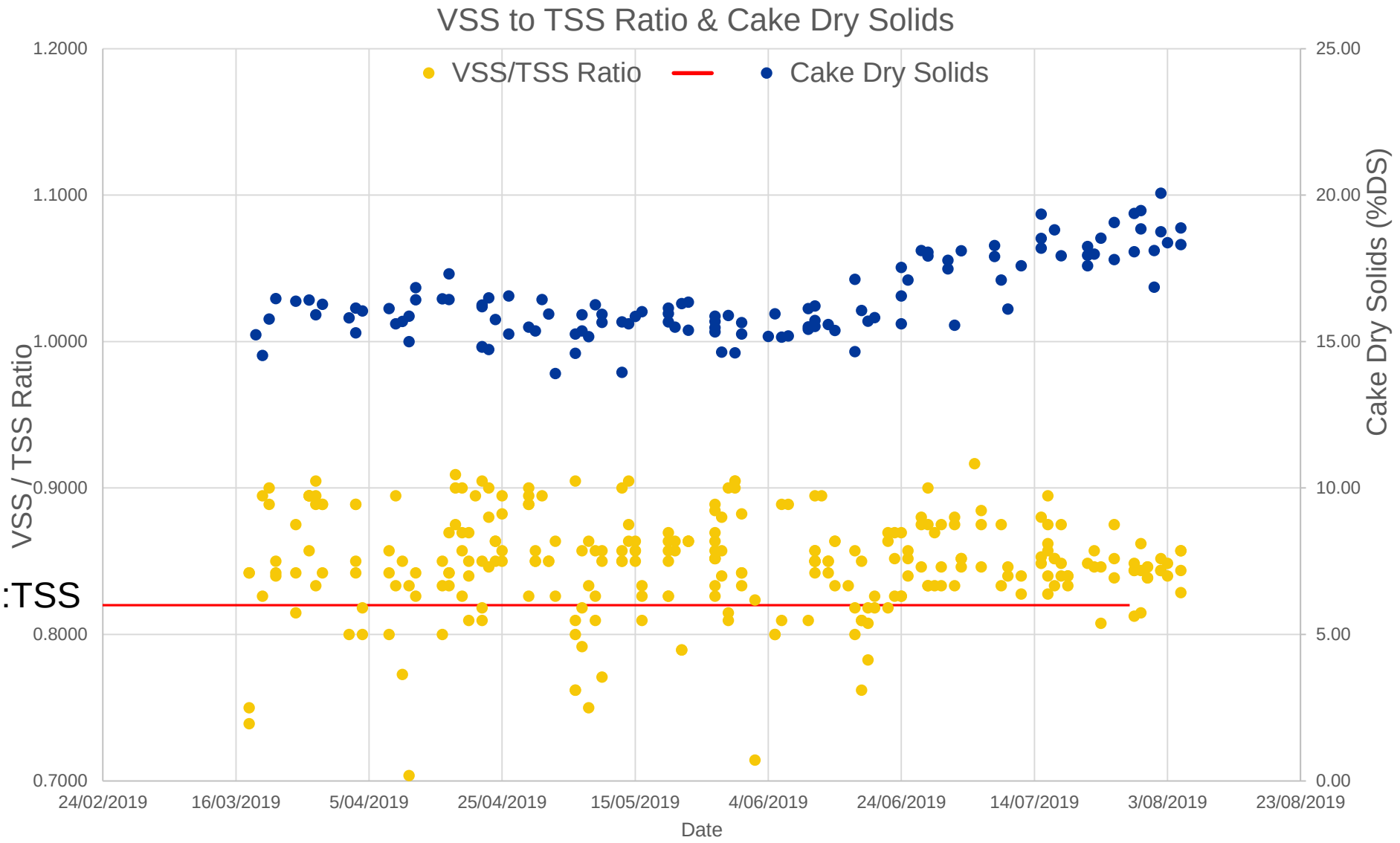
System Components



Plant Construction

Dewatered Sludge Cake Load Out

Full Scale Plant Results



Pilot trial VSS:TSS

Final Performance Testing

- Screw press performance testing guarantees were based on a maximum sludge feed VSS:TSS ratio of 82%
- Final testing not yet undertaken due to current plant overloading with drop in sludge age to 8 days
- Confidence pilot plant results will be replicated

Key Lessons Learnt

- Influence of sludge feed rate, % solids and age/VSS:TSS ratio on screw press performance
- Importance of sludge conditioning - maceration, polymer selection and good mixing
- The **criticality** of pilot plant dewatering trials, on WAS only in particular


Questions?
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Thank You to Peter Gohns, TCC