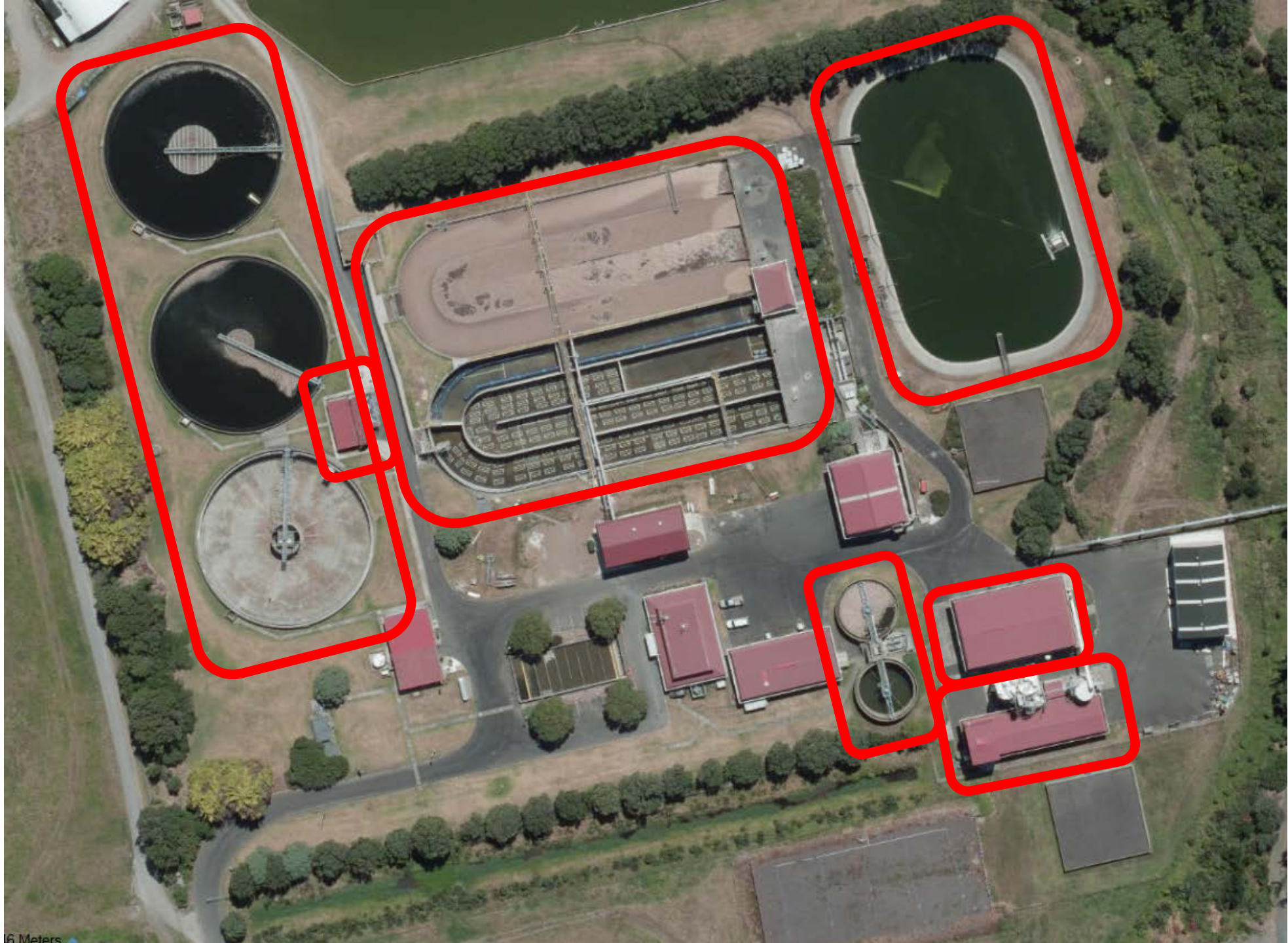




“Putting the Squeeze on Sludge”

Adoption of Screw Press Technology at New Plymouth WWTP

David Taylor & Chris French (in association with David Grace & Alun James)



- 1. Reduce whole of life cost**
- 2. Minimum of 20% DS to allow landfilling when TDF shut down**

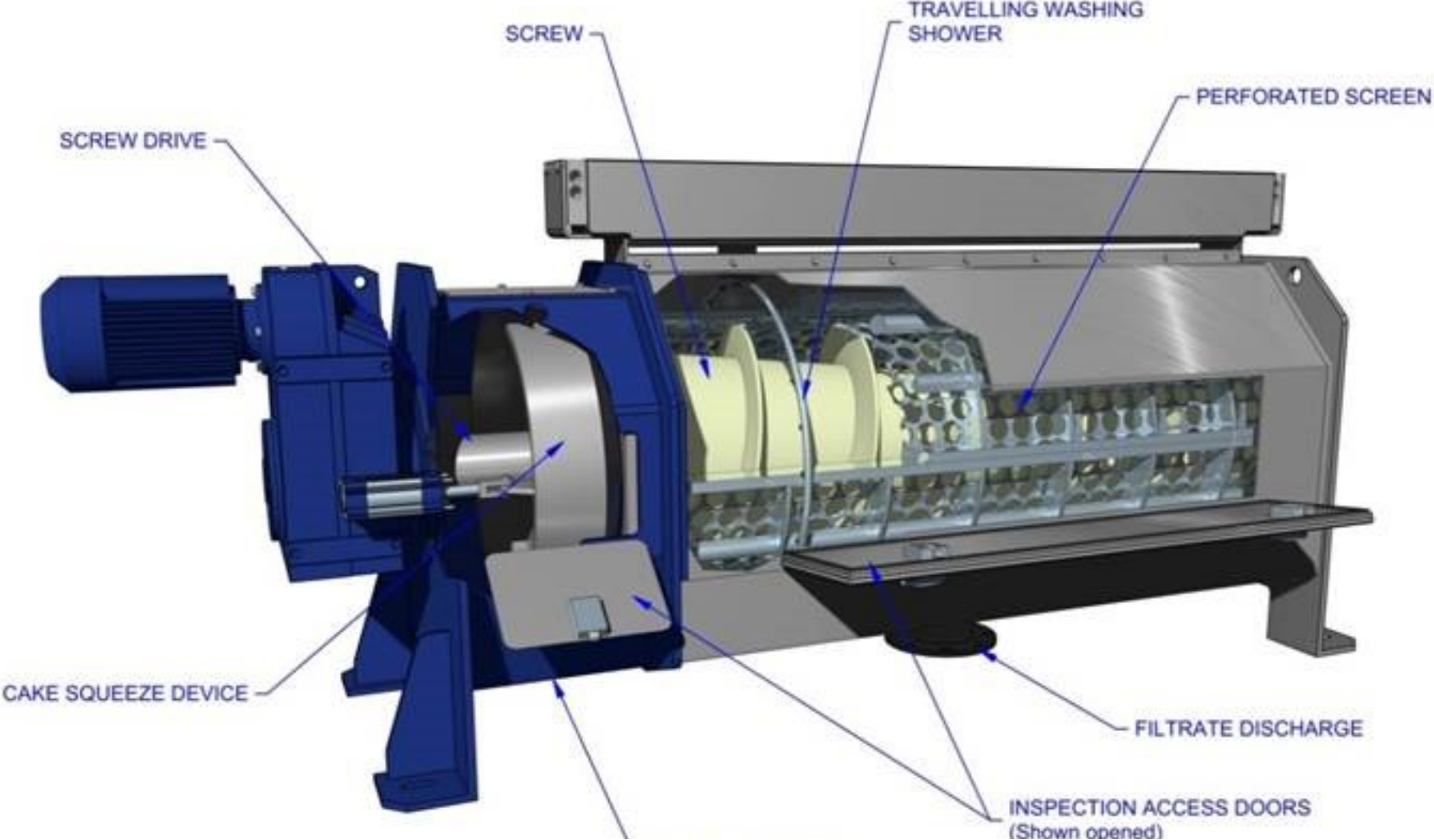




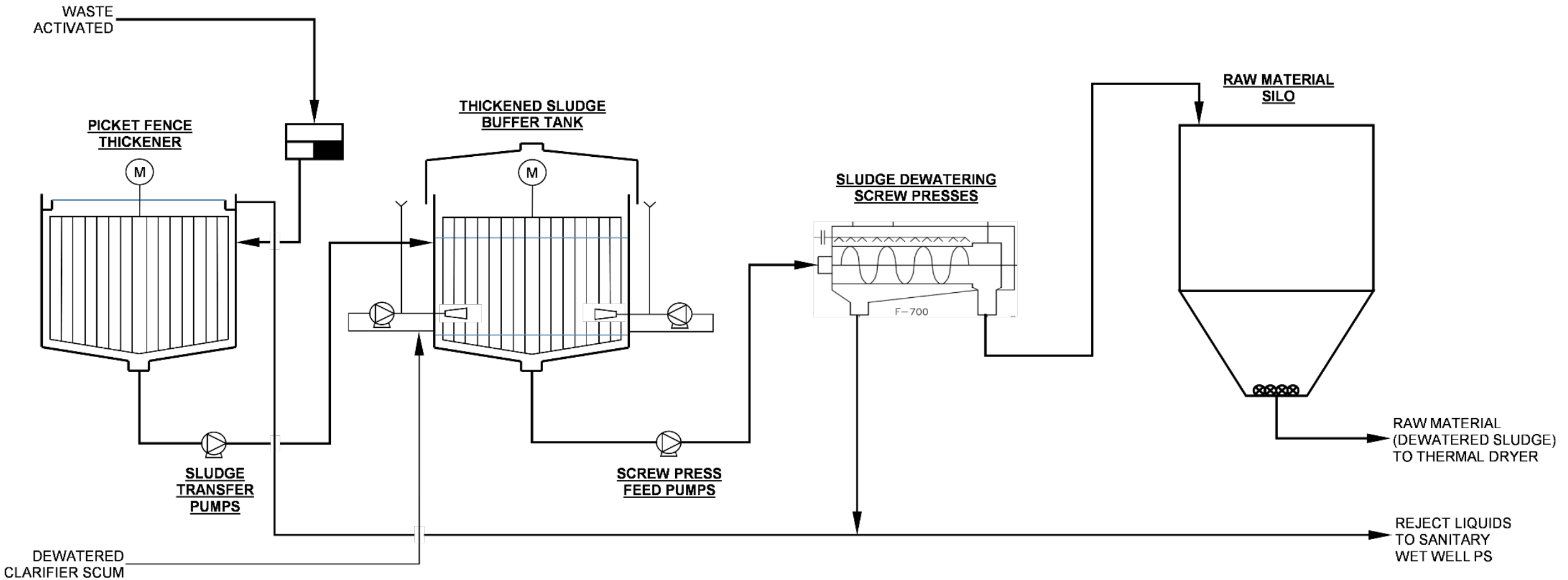
Technology Selection

Technology	Belt Press	Screw Press	Centrifuge	Rotary Press
Dry Solids %	14	22	19	17
Capital Cost	-	\$2M	\$1.7M	\$1.9M
Operating Cost (incl TDF gas)	\$790,000	\$470,000	\$620,000	\$680,000
NPV (25 yrs)	\$9.5M	\$7.7M	\$8.8M	\$10M
H&S Ranking	4	1	3	2

How a Screw Press Works

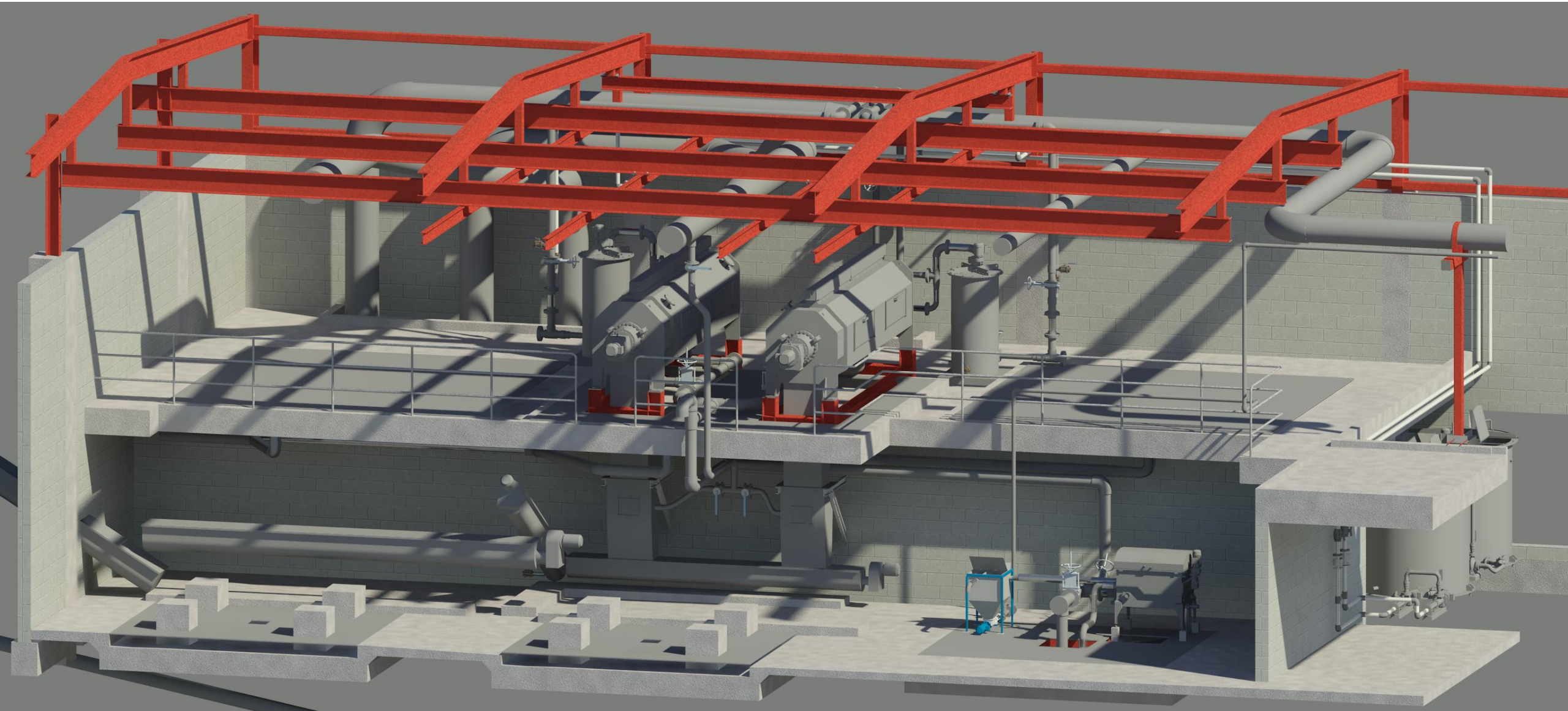


The Sludge Dewatering Process





Plant Layout



SAFE WORKING LOAD 0.5 TONNE

IEA PRESS
MADE IN AUSTRIA

So What Really Happened?



- 1. Sludge Characterisation**
- 2. Process Redundancy & Performance**
- 3. Understand your Biosolids End Use**
- 4. Procurement – Intent vs Reality**
- 5. The Importance of Polymer Mixing**



1. Sludge Characterisation

- **The value of a comprehensive sludge characterisation programme cannot be underestimated**
- **They represent a very small part of the total project cost**
- **It impacts:**
 - Process design development
 - Plant procurement
 - Preparedness for commissioning and handover
- **Large distribution required over time**
- **VSS:TSS ratio particularly critical**

3. Where's Your Sludge Going?

- **Work backwards from your biosolids end use**
- **At NPWWTP this means:**
 - The dryness of the feed sludge to the TDF impacts product characteristics from it
 - Dried biosolids characteristics are very important to NPDC
- **Investigating and understanding these constraints may have influenced/enhanced the design process**



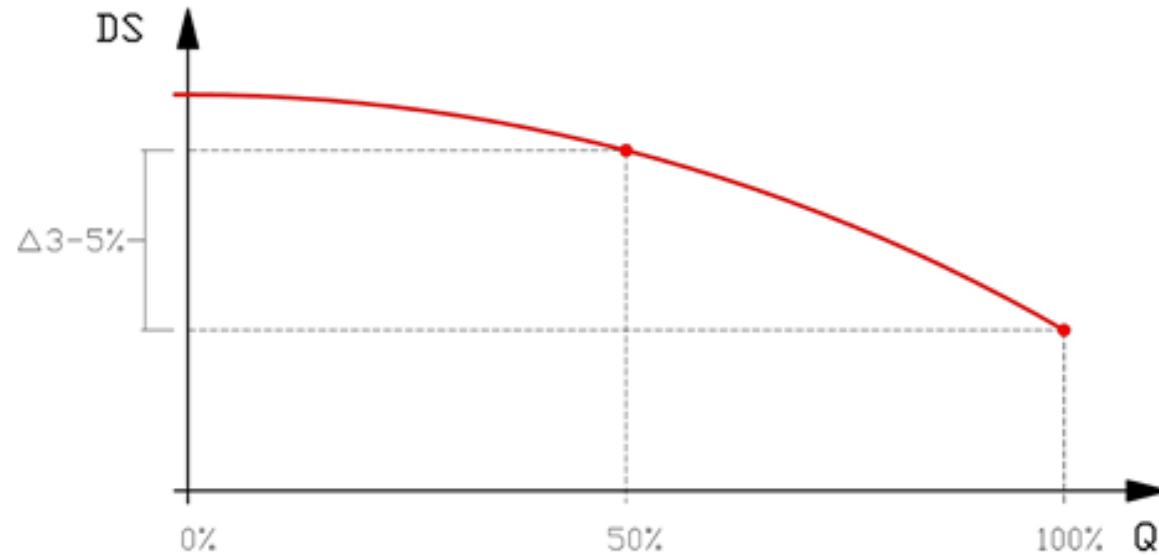
Natural Organic Fertiliser



3. Procurement – Intent vs. Reality

- **Significant effort was put into developing performance guarantees based on “performance envelopes”**
 - Sludge dewaterability at varying hydraulic throughput
 - Solids capture ratio at varying hydraulic throughput
 - Polymer consumption at varying hydraulic throughput
- **Changes were required to approach based on response from tenderers**
- **Earlier/stronger engagement with suppliers?**

4. Process Redundancy & Performance



Operating Condition	Design Basis	NPDC's approach
Normal Operations	What are the desired operating conditions most of the time	To achieve the lowest whole of life cost
One machine out	What is the minimum acceptable flow and dry solid output with one machine out of service	20% DS at 2040 Peak Flows



5. The Importance of Polymer Mixing

- **Polymer mixing is critical to dewatering performance**
- **There could be significant gains (at relatively low cost) by optimising polymer mixing systems**



Thank You