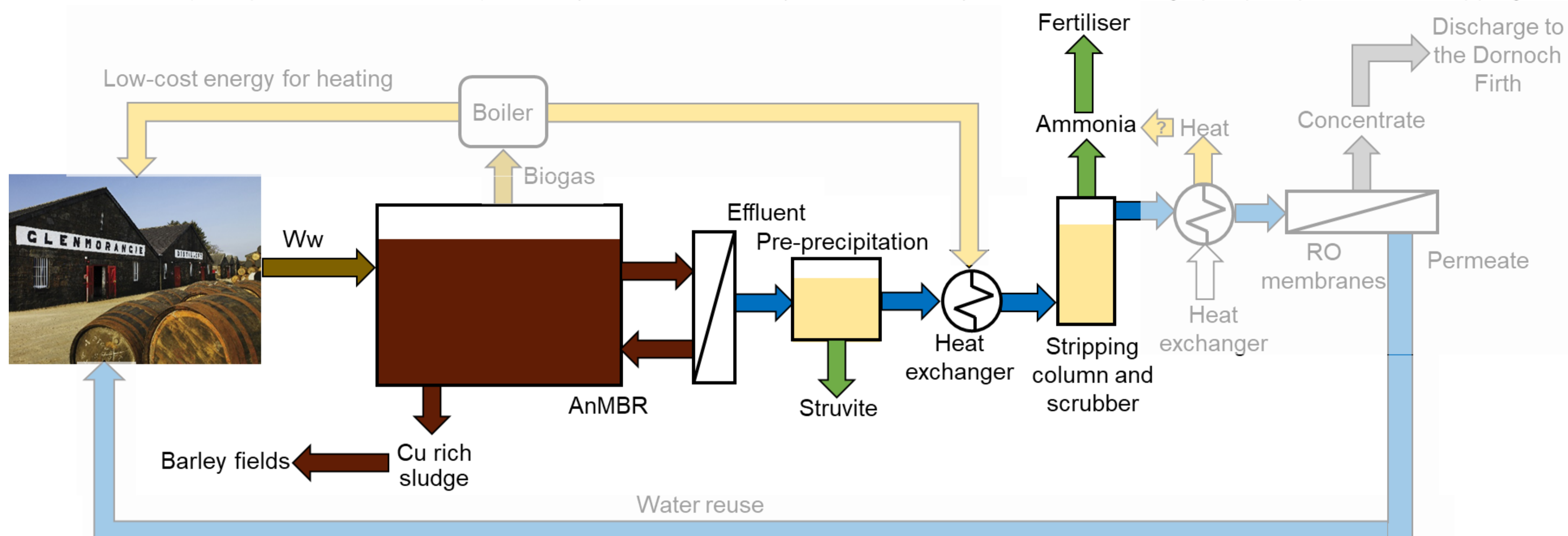


### CS7 – Nutrients recovery from distillery wastewater

#### Concept:

Nutrients (Phosphorus and Ammonia) recovery from anaerobically treated distillery wastewater through pre-precipitation and stripping



#### Objectives:

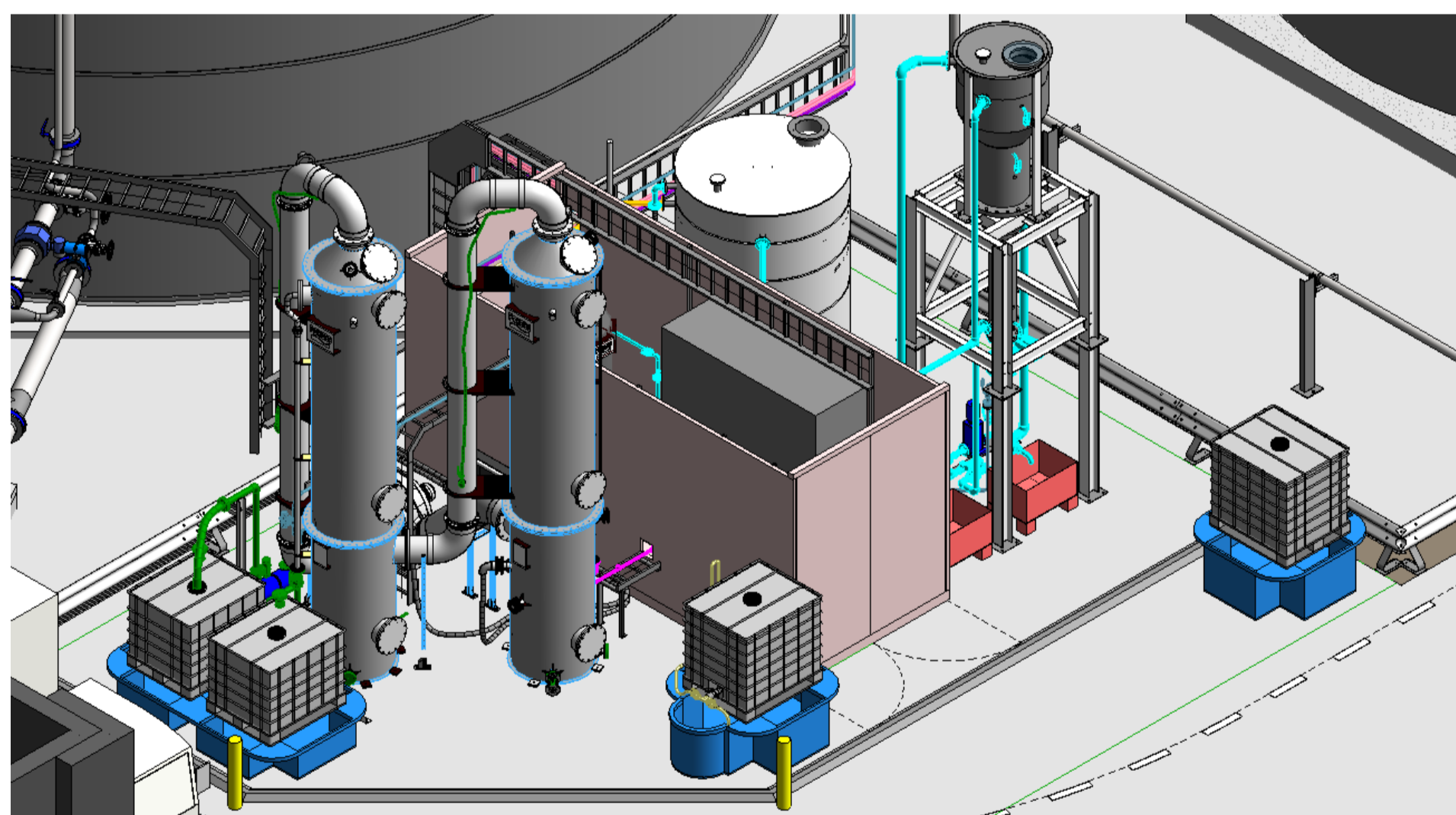
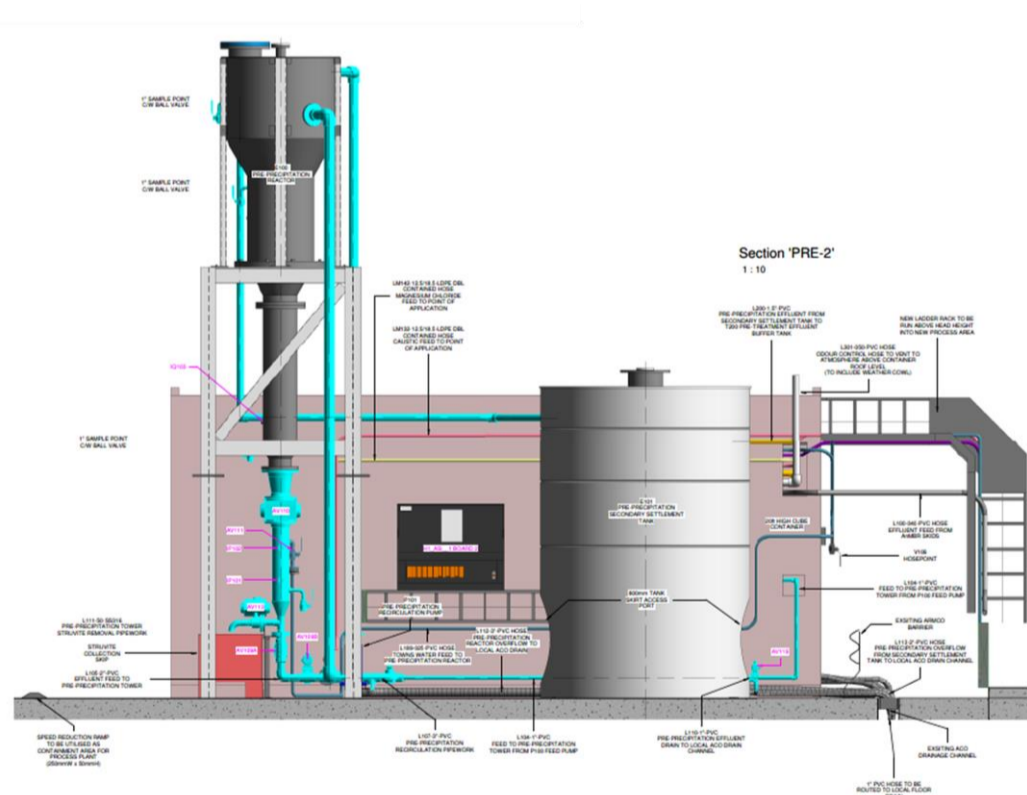
- Determine optimum operational conditions for struvite crystallization in anaerobically treated distillery wastewater (Mg dose, pH, crystals recovery)
- Determine optimum operational conditions for ammonia stripping and scrubbing for production of ammonium sulphate (pH, temperature, acid solution recycle ...)
- Evaluate trade-offs between products quantity and quality
- Achieve at least 80% recovery of both phosphorus and ammonia

#### Anaerobically treated distillery wastewater

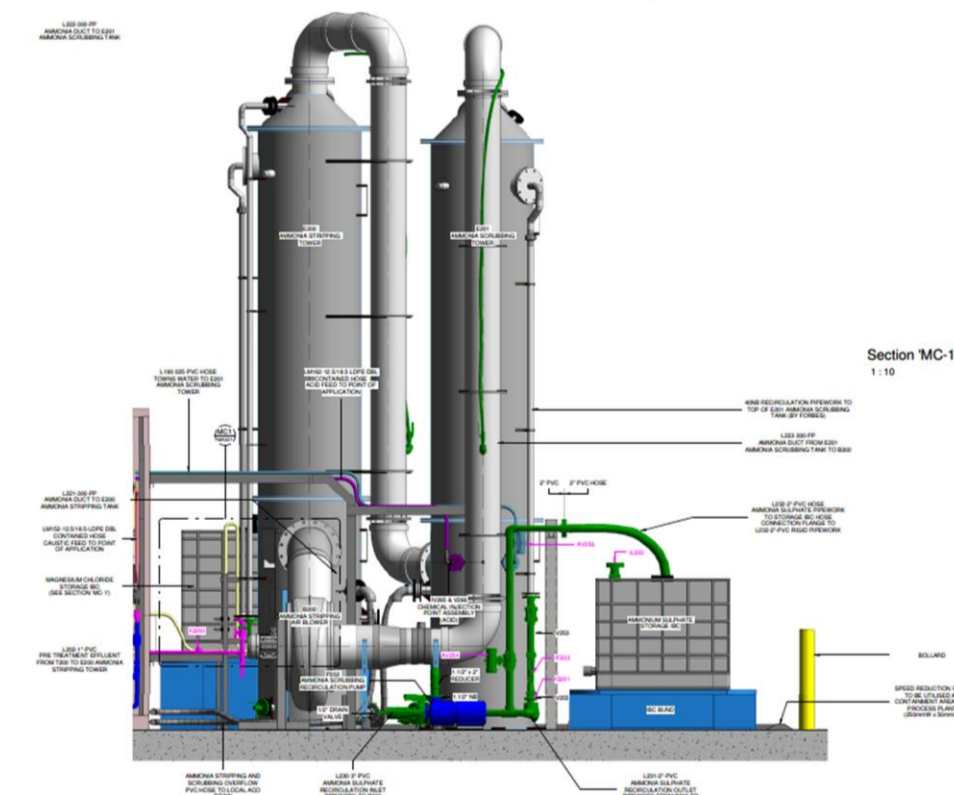
	Avg ± St.dev *	n		Avg ± St.dev *	n		Avg ± St.dev *	n
pH	7.16 ± 0.34	33	[TN]	824 ± 76	32	[Alk]t	3265 ± 791	33
Temp. (°C)	37.8 ± 2	619	[TAN]	801 ± 96	33	[SO <sub>4</sub> ]	532 ± 572	22
EC (mS/cm)	5.88 ± 0.63	33	[PO <sub>4</sub> -P]	210 ± 23	33	[Cl]	246 ± 30	22
[TSS]	85 ± 135	33	[Mg]	40 ± 30	33	[Na]	406 ± 103	33
[COD]t	554 ± 195	33	[Ca]	368 ± 121	33	[Cu]	0.99 ± 0.71	271

\*mg/L

Pre-precipitation system for struvite crystallization



Stripping and scrubbing columns for ammonia recovery



### Lessons learned from the design phase

→ The wastewater characteristics will have a significant impact on technology selection as well as the performance of the system and the quality of the products formed so it is critical to carry out a detailed characterization of the wastewater to select appropriate technologies

### What is crucial in terms of replication of the technology?

- Detailed characterization of the wastewater to be treated is critical for process selection
- Clear understanding of the product quality is essential to identify distribution routes
- Appropriate regulations are needed to enable the use of the recovered products

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