



ON YOUR SIDE

Now you see it, now you don't: installation & startup of a below-grade containerized MBR

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Presentation Overview

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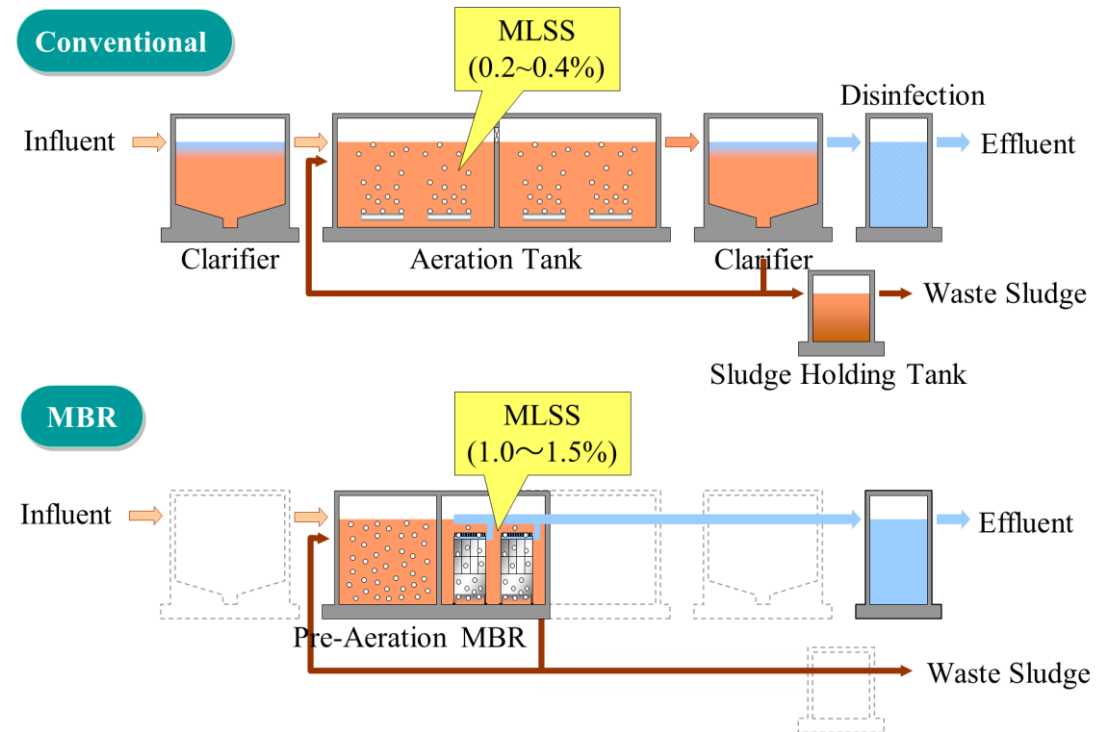
Kubota and Containerized MBRs

Kubota Water and Environment USA Corporation

- Subsidiary of the Tractor Company
- Based out of Bothell, WA
- Membrane Bio Reactor (MBR) business started in 1985
- Entered US market in 2001
- Entered the world of onsite wastewater with a containerized MBR in 2024

MBR Overview

- Activated sludge process
- Physical separation by flat sheet membranes (no settling needed)
- Reuse quality



Fall City Project Overview

- Fall City
- Small unincorporated town in Washington State
- Growth for Fall City Business District halted by outdated septic systems
- Cluster system for 63 Houses/Businesses
- 23,600 gpd

Component	Influent (mg/L)	Effluent (mg/L)
BOD5	386	< 5
TSS	479	< 5
Oil & Grease	105	< 5
TKN	85	-
TN	-	< 10



Fall City Project Overview



1 – Land Clearing

Tree and brush removal from site of MBR plant



2 – Excavation

Hole for 4 buried Kubota fiberglass reinforced plastic (FRP) tanks + 2 equalization tanks



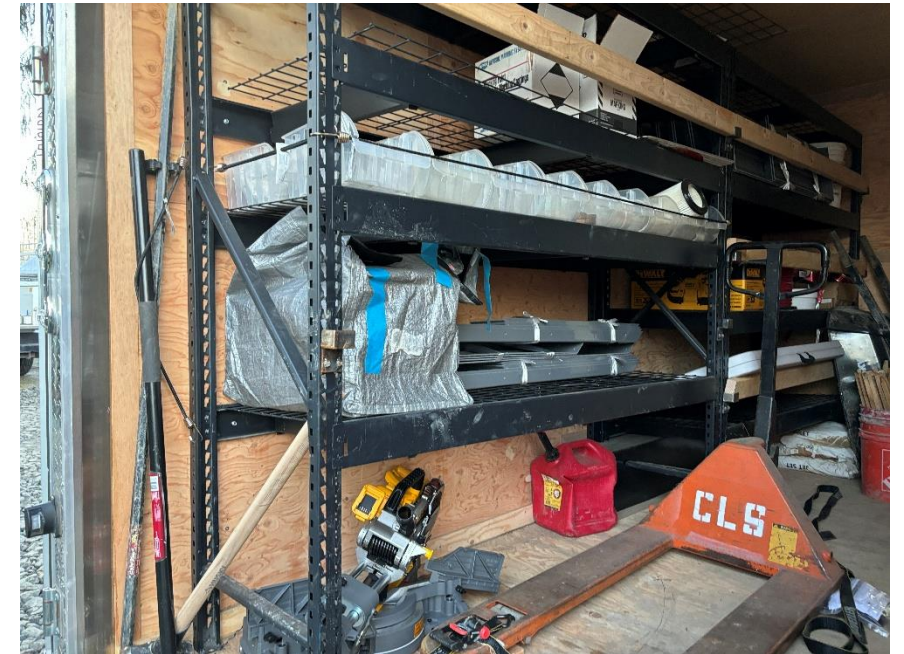
3 – Equipment Delivery

Delivery of 3 prebuilt equipment rooms



3 – Equipment Delivery

Left: Delivery of manholes, membranes, tank tie down straps, and other miscellaneous equipment



Right: Equipment stored in a work trailer. It is vital that the Membranes remain dry until clean water testing. Once they get wet, they must remain that way!

3 – Equipment Delivery

Delivery of 4 Kubota FRP tanks



4 – Concrete Base

Construction of concrete base for Kubota tanks



MBR tanks must be level in order for scour air to properly clean the membranes

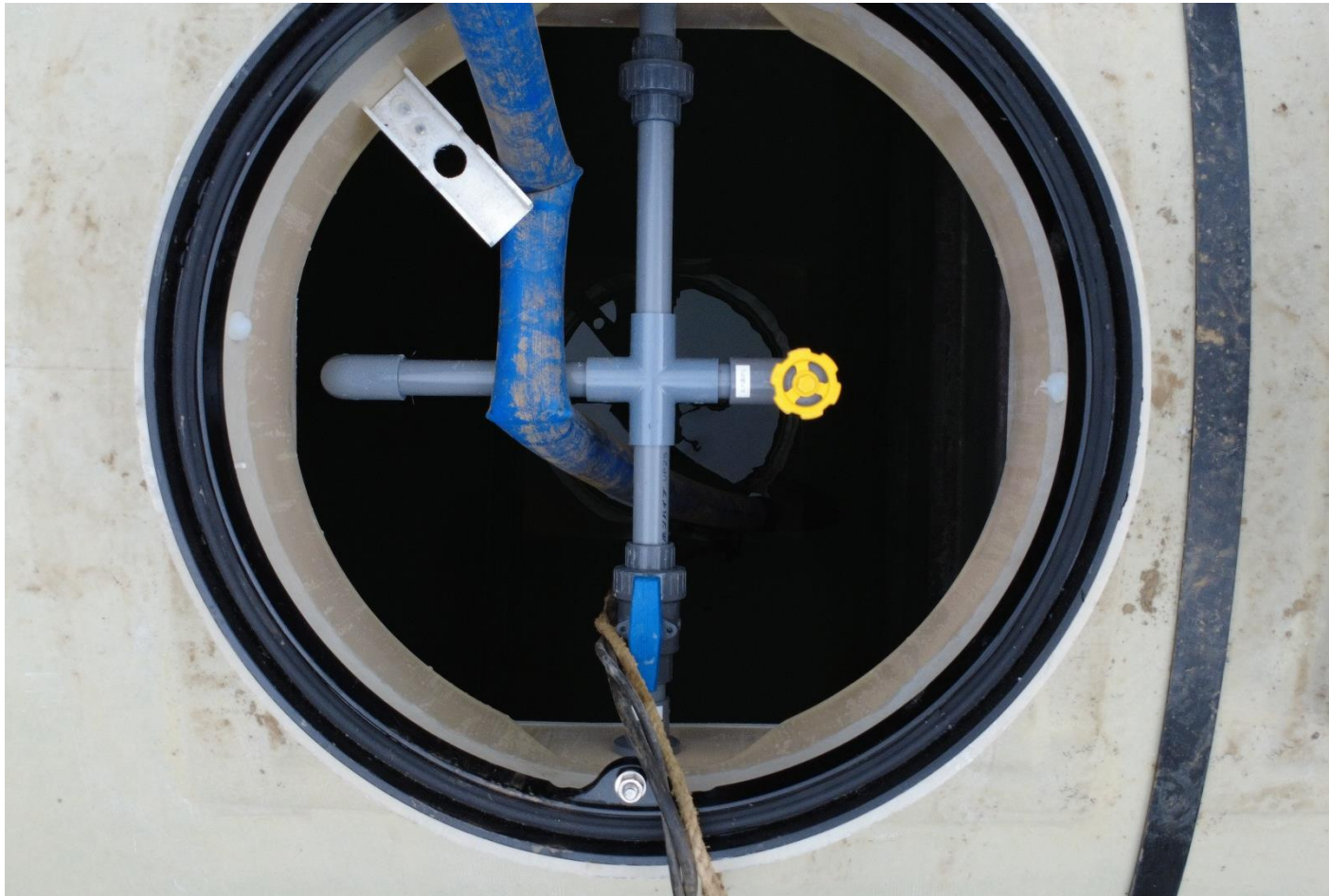
5 – Tank Placement

Tanks are aligned with anchor points on the concrete base so all tie down straps contact the tank's reinforced sections



6 – Water Leakage Test

All tanks evaluated by Kubota and Washington State for water tightness



7 – Onsite Piping



8 – Equipment Rooms



Three prebuilt equipment rooms containing blowers, permeate pumps, chemical dosing systems, and control panel

8 – Equipment Rooms

Permeate Pumps



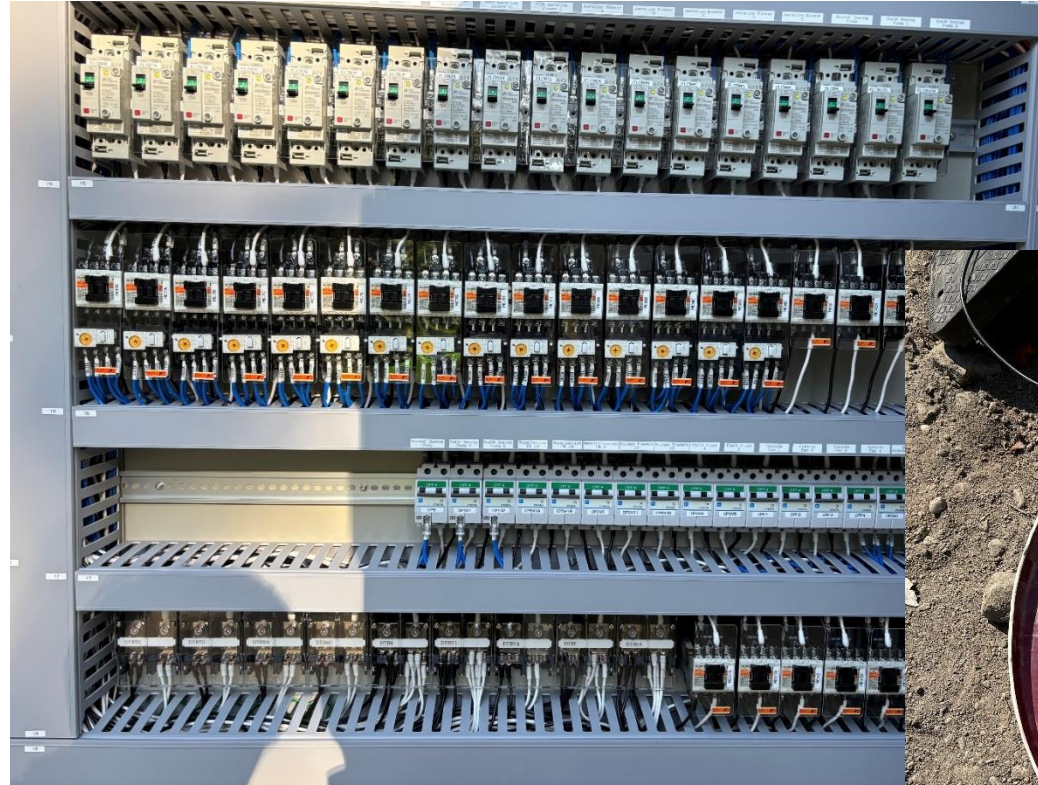
Blowers



9 – Dry Checks & Clean Water Testing

Dry Checks:

- Motor rotation
- Solenoid valves
- Float switches



Clean Water Testing:

- Control system
- Membrane installation
- Permeate pumps
- Aeration pattern in water



10 – Seeding & Startup

Seed sludge requirements for a containerized MBR system:

- MLSS of 10,000 mg/L or higher
- From a wastewater plant that removes nitrogen
- Wastewater must already be partially treated



For Earth, For Life
Kubota



ON YOUR SIDE

Thank you

Kubota

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Thank you to CLS Septics
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