

A scenic landscape featuring a large blue lake nestled between green mountains. In the foreground, three people (two women and one child) stand on a grassy hill, looking out over the valley. The sky is clear and blue.

**For Earth, For Life**  
Kubota

**ON YOUR SIDE**

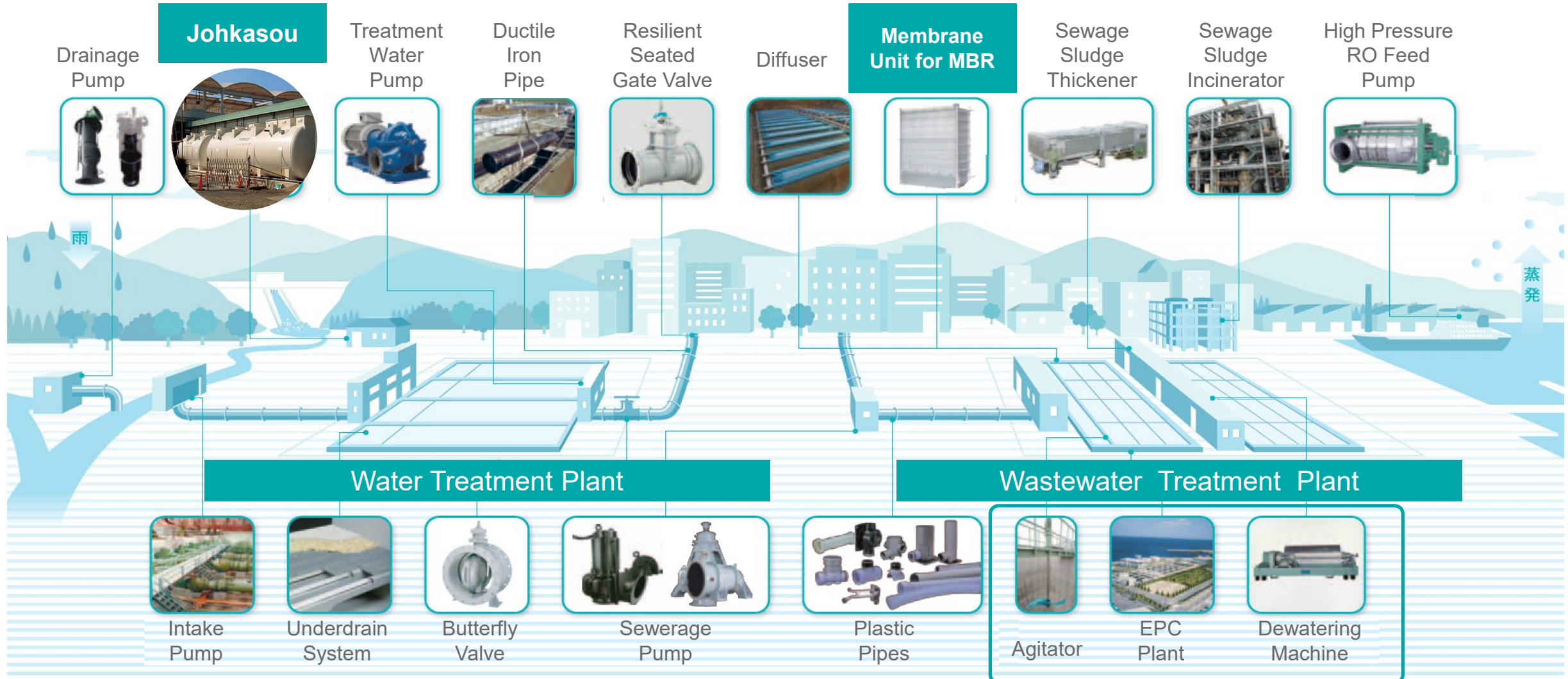
# **Organic Wastewater Treatment Technologies using MBR and Johkasou**

**Dr. Hisato Keith TAKEDA**  
**Kubota Kasui Philippines Corp.**

# Kubota's Water / Wastewater Related Products

For Earth, For Life  


- Wide range of Water and Wastewater related products. Equipment system and Pump, Pipe and Valve.
- Serving for Water Environment from water resource to water resource.





Water & Wastewater Engineering



Submerged Membrane Unit®  
(SMU)for MBR



Anaerobic MBR



Sludge Treatment Plant



Pumps



Johkasou

# Installation Records in ASEAN Regions

For Earth, For Life  
**Kubota**

Kubota has installed more than 2,000 units of Johkasou in ASEAN Regions

 Lao PDR



 Philippines



 Myanmar



 Vietnam



 Indonesia



# General Effluent Standards(GES)

(Excluded Marine Water Body)

Parameter	Unit	Water Body Classification (Excluded Marine Water Body)				Applicable DENR Administrative Order
		A	B	C	D	
pH	-	6.0 – 9.0	6.0 – 9.0	6.0 – 9.5	5.5 – 9.5	DAO2016-08
Color	TCU	100	100	150	300	DAO2016-08
Temp.	°C change	3	3	3	3	DAO2016-08
BOD	mg/L	20	30	50	120	DAO2016-08
<b>NH<sub>4</sub><sup>+</sup>-N</b>	<b>mg/L</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>9</b>	<b>DAO2021-19</b>
<b>NO<sub>3</sub><sup>-</sup>-N</b>	<b>mg/L</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>30</b>	<b>DAO2016-08</b>
TSS	mg/L	70	85	100	150	DAO2016-08
<b>PO<sub>4</sub><sup>3-</sup>-P</b>	<b>mg/L</b>	<b>1</b>	<b>1.5</b>	<b>4</b>	<b>10</b>	<b>DAO2021-19</b>
Cl <sup>-</sup>	mg/L	350	350	450	500	DAO2016-08
O&G	mg/L	5	5	5	15	DAO2016-08
MBAS	mg/L	2	3	15	30	DAO2016-08
Fecal Coliform	MPN/100ml	100	200	400	800	DAO2021-19

A: Public Water Supply Class II-Intended as source of water supply requiring conventional treatment (coagulation sedimentation, filtration and disinfection) to meet the latest PNSDW

B: Recreational Water Class I – Intended for primary contact recreation (bathing swimming, etc.)

C: 1. Fishery Water for the propagation and growth of fish and other aquatic resources

2. Recreational Water Class II – For boating, fishing, or similar activities

3. For agriculture, irrigation, and livestock watering

D: Navigable water

# Kubota Johkasou Lineup and Applicable Class in DAO For Earth, For Life



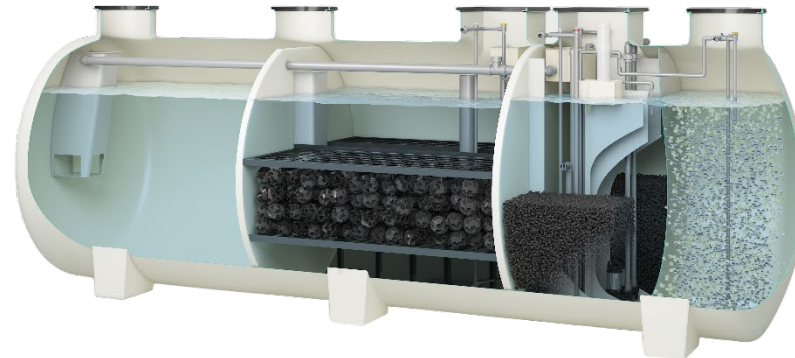
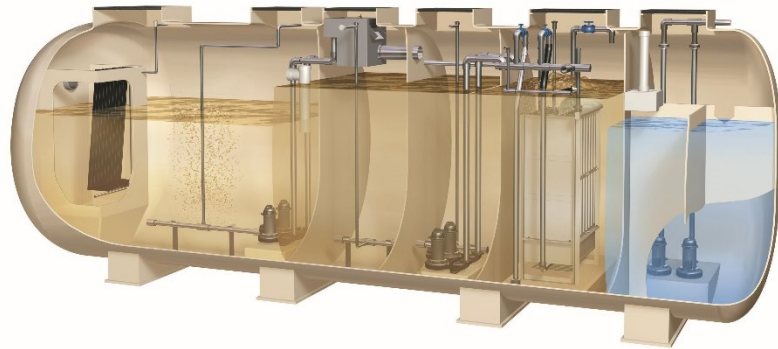
## Large Size (>10 m<sup>3</sup>/day)

## Middle Size (≤10.0 m<sup>3</sup>/day)

Type: **KM-SG-NP**

Type: **KTZ**

Type: **HCZ**



<b>Flow Rate</b>	about Max 500m <sup>3</sup> /day
<b>Process</b>	Membrane Bioreactor(MBR)
<b>Size</b>	2,500Φ X H2,800 mm

<b>Flow Rate</b>	about Max 500m <sup>3</sup> /day
<b>Process</b>	Moving Bed Biofilm Reactor(MBBR)
<b>Size</b>	2,500Φ X H2,800 mm

<b>Flow Rate</b>	Max 10m <sup>3</sup> /day
<b>Process</b>	Sedimentation-Separation Anaerobic Filter Moving Bed Process
<b>Size</b>	W2,000 X H2,180 mm

	Influent	Expected Effluent
<b>BOD</b>	200mg/L	20mg/L
<b>N</b>	100mg/L	2mg/L as NH <sub>4</sub> <sup>+</sup> -N 14mg/L as NO <sub>3</sub> <sup>-</sup> -N
<b>P</b>	5mg/L	1mg/L as PO <sub>4</sub> <sup>3-</sup> -P

	Influent	Expected Effluent
<b>BOD</b>	200mg/L	20mg/L
<b>N</b>	45mg/L	2mg/L as NH <sub>4</sub> <sup>+</sup> -N 14mg/L as NO <sub>3</sub> <sup>-</sup> -N
<b>P</b>	5mg/L	1mg/L as PO <sub>4</sub> <sup>3-</sup> -P

	Influent	Expected Effluent
<b>BOD</b>	200mg/L	20mg/L
<b>N</b>	45mg/L	2mg/L as NH <sub>4</sub> <sup>+</sup> -N 14mg/L as NO <sub>3</sub> <sup>-</sup> -N
<b>P</b>	5mg/L	1mg/L as PO <sub>4</sub> <sup>3-</sup> -P



Water & Wastewater Engineering



Submerged Membrane Unit<sup>®</sup>  
(SMU)for MBR



Anaerobic MBR



Sludge Treatment Plant



Pumps

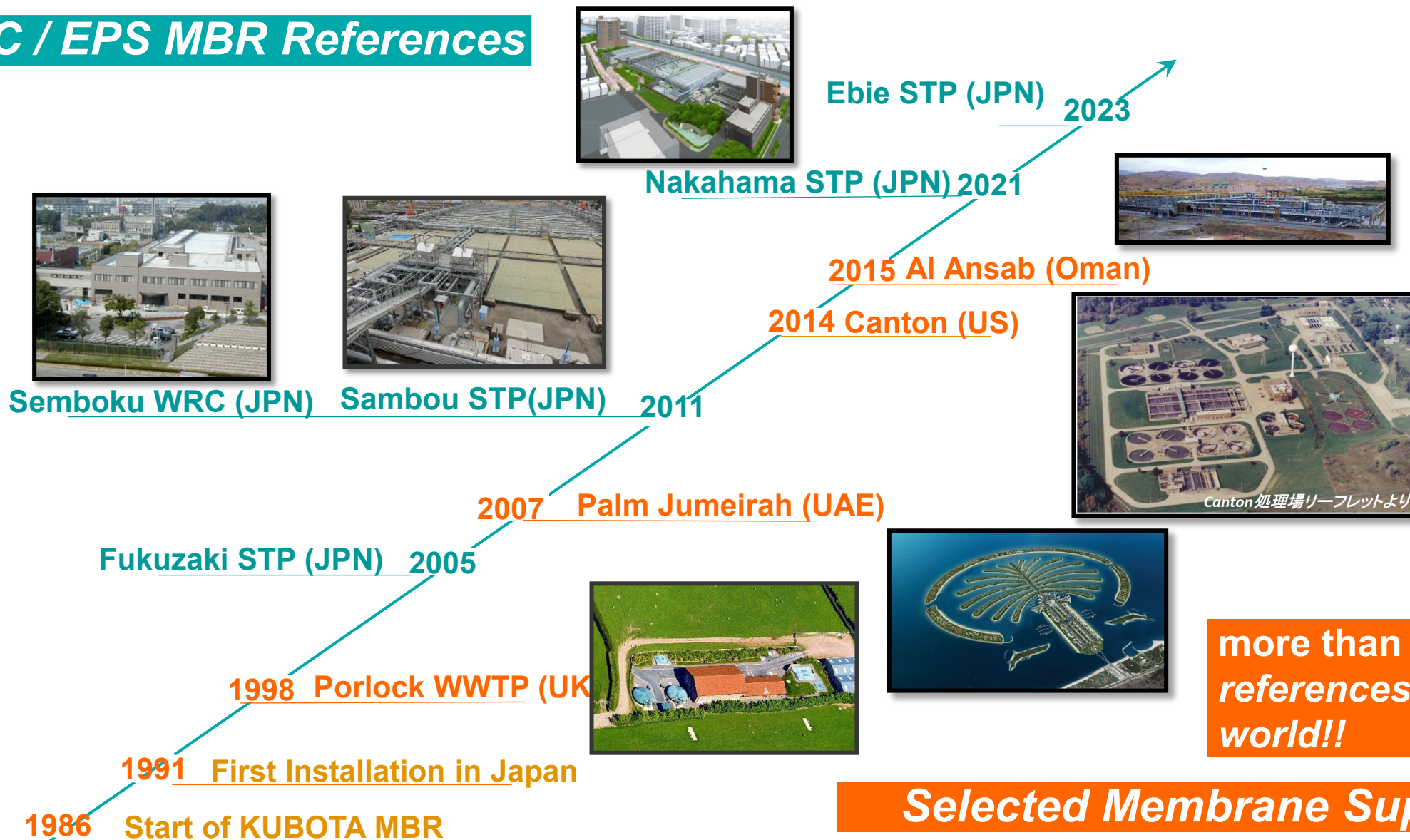


Submerged Membrane Unit<sup>®</sup>  
(SMU)for MBR

# History of Kubota MBR Business

For Earth, For Life  
Kubota

## EPC / EPS MBR References



KUBOTA is NOT ONLY Membrane supplier BUT ALSO MBR System Provider

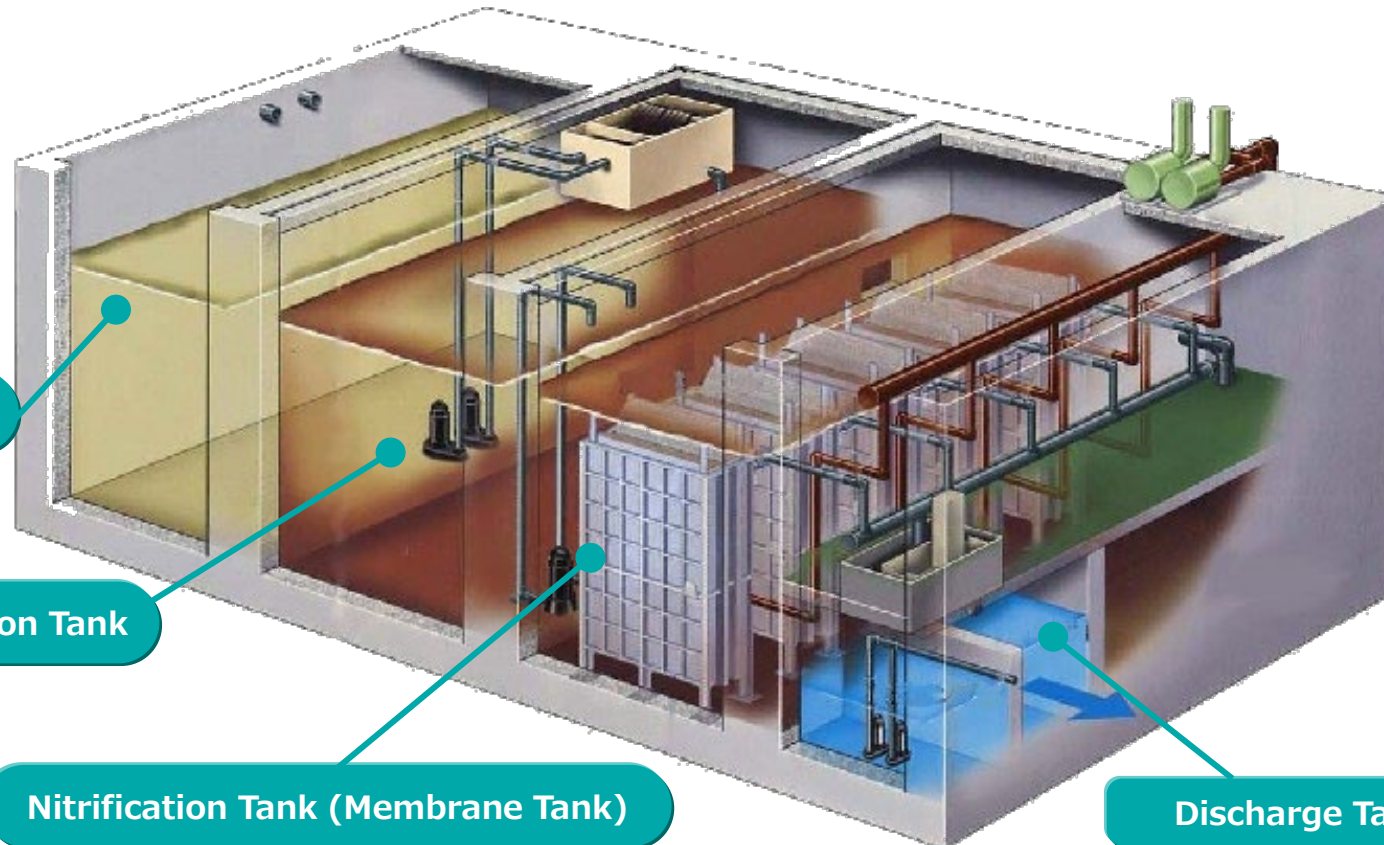


# KUBOTA Submerged Membrane Unit<sup>®</sup> (SMU)

For Earth, For Life  
Kubota

Kubota MBR System is an advanced technology, a combination of Conventional Activated Sludge process and Kubota Submerged Membrane Unit.

- Small Tank, NO Clarifier = Space Saving
- Membrane Separation = Cleaner Permeate
- Simple Configuration = Easy Upgrade, O&M



## Advantages

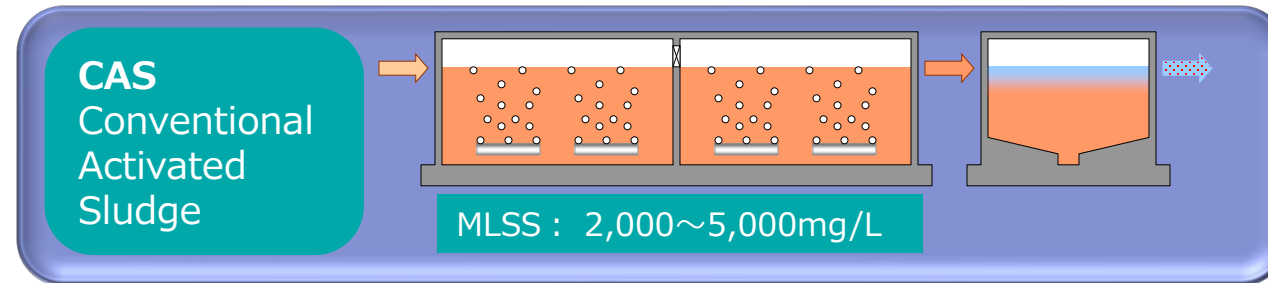
1. Small footprint
  - ◆CAPEX & Space saving
  - ◆Effective use of land
2. High effluent quality
  - ◆Complies with strict regulations
3. Easy retrofit / upgrade
  - ◆Increase of WWTP capacity
4. Easy O&M
  - ◆CAPEX&OPEX saving due to simplified system
5. Direct feed to RO
  - ◆CAPEX&OPEX saving by eliminating tertiary process

WWTP: Waste Water Treatment Plant  
O&M: Operation and Maintenance

# Advantages of Kubota MBR System

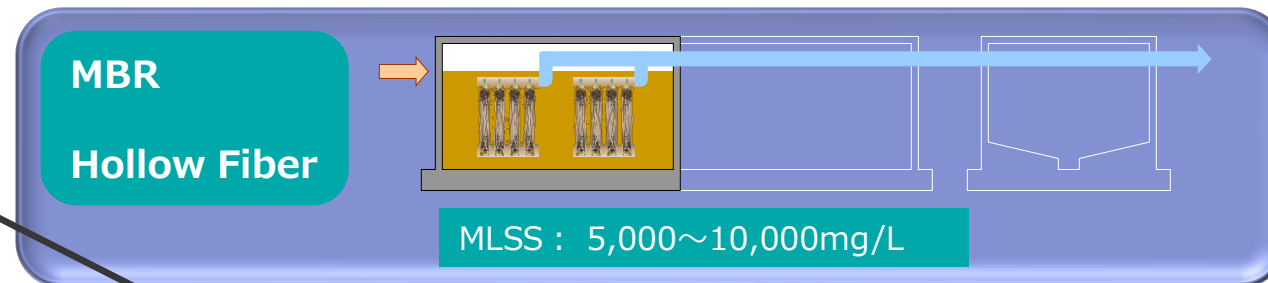
For Earth, For Life  
Kubota

Due to the high MLSS up to 20,000mg/L, the footprint would be reduced that saves your CAPEX and precious land.

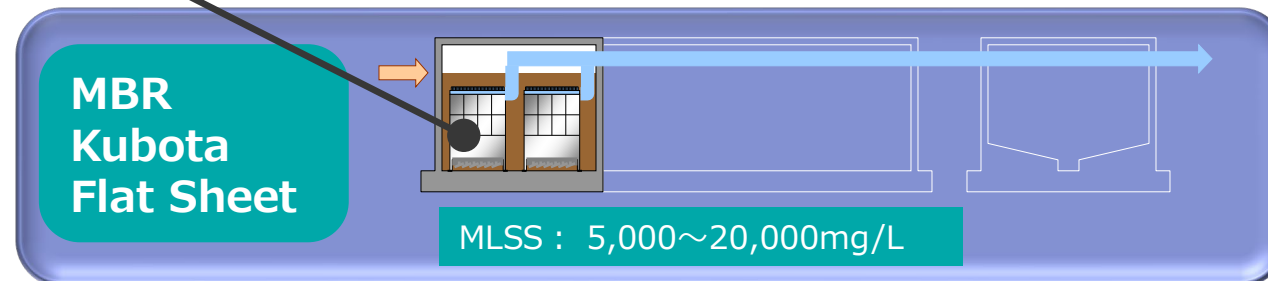


Tank Volume

100%



63%



32%



**Thank you for your attention.  
Please visit our Booth for more Info.**

**For Earth, For Life**  
**Kubota**