

## Template for I/A Tech Comparison

<b>Category</b>	JDL Global Submission 01-06-22
<b>SFR</b> - Single Family Residence (330 permitted gpd, 165 gpd flow for cost effectiveness calculations)	
<b>Influent</b> - Assume septic tank discharges at 65 mg/L TN and drainfield takes out another 25%, so 50 mg/L TN is reasonable baseline for comparisons.	
<b>Basics</b>	
Manufacturer / Parent Company	JDL Global (New York, NY)
Model / Technology Name	JDL FMBR Models: JDL-FMBR-A, JDL-FMBR-B, JDL-FMBR-C, JDL-FMBR-D
<b>Background</b>	
Patent Year	2006
Years in production	Thirteen (13) years
<b>Approach</b>	
Category (Media filter, ATU, Membrane, sequencing batch reactors, drainfield, etc.)	Biological simultaneous removal of C, N, P in single MBR system
<b>Positioning</b>	
Ideal applications	Applicable to clusters of residences (more than 4 households) and commercial establishments
Capacity Range	1350 gpd to 34 million gpd or more (gpd = gallons per day)
<b>Performance</b>	
TN concentration output range category (<5 / <10 / <15 / <19 mg/L)	Less than 5 mg/l
TP concentration output range category (<0.5 / <1.0 mg/L)	Less than 0.5 mg/l without any added feature
kg N removed/year beyond Ref'd 50 mg/L	692 lb/yr (315 kg/yr) based on <b>Case History</b> below
<b>Approvals</b>	
Residential Permits	
MA	
General/ Provisional (<50)/Pilot (<10)	
RI	
Other States	
Commercial Permits	MA DEP and Plymouth pilot permit in Massachusetts

<b>Testing</b>	
Internal performance testing data - how many years / data points / sampling frequency?	13 years as of Jan 2022
Internal performance testing data - Range, mean, median BOD/TSS/TN values	BOD(2-10 mg/L), TSS(2-10 mg/L), TN(0.3-10 mg/L)
3rd party testing data - how many years / data points / sampling frequency?	13 years as of Jan 2022
3rd party testing data - Range, mean, median BOD/TSS/TN/TP values	<b>Case History</b> - JDL-FMBR-C Model (Average of 18 Months Sampling): Flow Rate 5,000 gallons per day Nitrogen In 54 mg/L Nitrogen Out 4.46 mg/L BOD <sub>5</sub> In 376 mg/L BOD <sub>5</sub> Out <4 mg/L TSS Out <4 mg/L Nitrogen Removed 753 lb/yr
3rd party testing source/organization (s)	Plymouth Town Analytical Balance Corporation
<b>Cost</b>	
NEW SFR Construction (design+permit+equipment supply+install)	\$120,000 (5,000 GPD for 15 households) excluding unusual site conditions and landscaping
Monthly operating costs (electricity etc.)	15 households JDL-FMBR-C Model: If not on solar panel, <u>electricity cost</u> is approximately \$284 per month at \$0.22 per kwh; adjust for other costs per kwh
Yearly O&M requirements	
Yearly O&M costs (without sampling)	15 households JDL-FMBR-C Model: Approximately \$12,000 per year in 2021 dollars including electricity, remote sensing and periodic repairs with replacement of parts and materials averaged over 20 years
Yearly O&M costs (with sampling)	For sampling add \$300 per sampling event as required by locality (2021 dollars)
Expected system lifespan (range)	30 years
Total Cost of system over over 20 years (design + install + operation + maintenance + repairs)	15 households JDL-FMBR-C Model: Approximate present value of \$360,000 discounted at 5% over 20 years
Beyond 20 years	_____
<b>Cost Effectiveness</b>	
Cost per kg N removed beyond ref'd 50mg/L - 20 year	Approximately \$26 per pound (\$12 per kg) removed based on <u>Case History</u> above at 15 households JDL-FMBR-C Model. <b>I think we use Equivalent Annual Cost = \$12,000 + \$9,629 = \$21,629 / 311 Kg TN removed per year = \$69.5/Kg TN removed</b>
Beyond 20 years	_____
<b>Retrofits</b>	
Ability to use tech in retrofit applications	
Expected capital cost of a retrofit for SFR	
<b>Phosphorus Removal</b>	
Commentary	The FMBR can biologically remove phosphorus to less than 0.5 mg/L without any added feature.

<b>Pitch</b>	
Unique aspects/advantages	<p>High-quality treated wastewater</p> <p>Automatic</p> <p>Out of sight integrated with landscaping; quiet without odors</p> <p>Remote sensing for real time monitoring of operation</p> <p>Phosphorus removal without any added feature</p> <p>Affordable</p>
Why us?	High-quality treated wastewater with low O&M cost
<b>Clusters</b>	
Cluster potential?	4 households or more cluster system
Range (gal/day)	Up to 1 million gallons per day or more
<b>Contact Point</b>	<b>John Tillotson <a href="mailto:john@watertrust.com">john@watertrust.com</a> 630-310-9353</b>
Local Representatives MA & NY	<a href="mailto:info@jdlglobalinc.com">info@jdlglobalinc.com</a> and (917)-970-7438