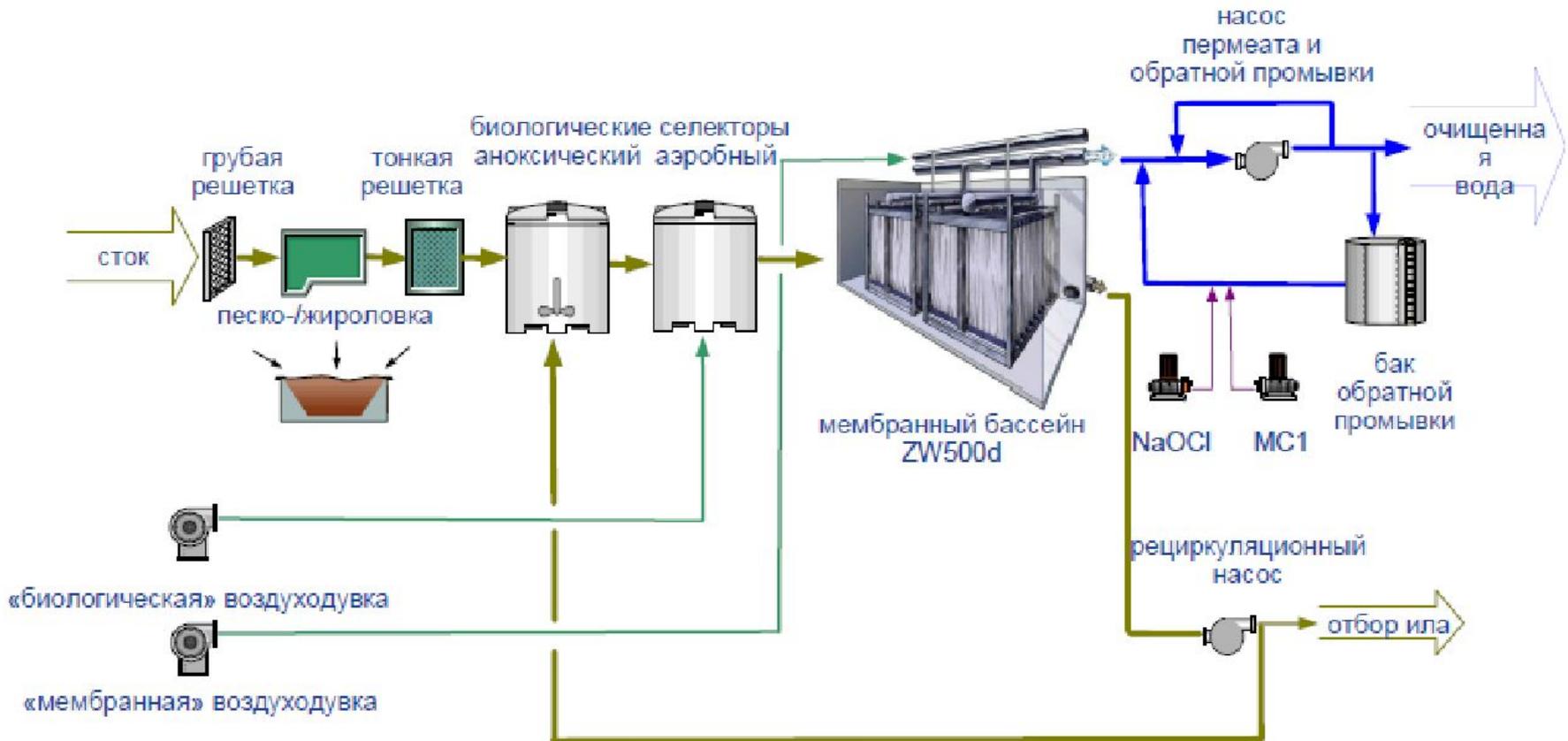
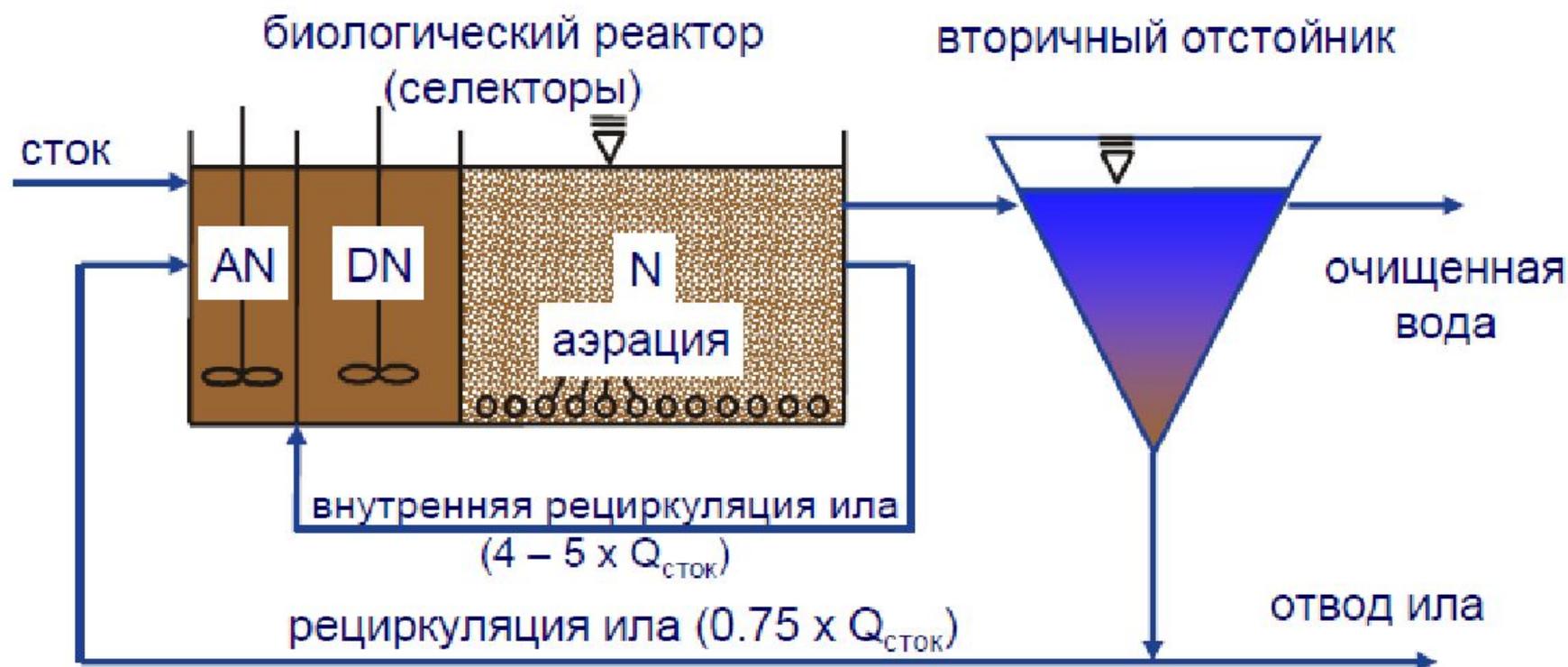


Наименование	Единицы измерения	Эффект очистки, %	Качество очищенной воды
Взвешенные вещества	мг/л	>99	<1
ХПК	мг/л	80 - 98	< 50
БПК5	мг/л	>97	<3
N-NH4	мг/л	80 – 90	<1
Общий азот	мг/л	36 – 80	<10
Общий фосфор	мг/л	62 - 90	0,2* - 1
Нефтепродукты	мг/л	>96	0,05 - 1
Общие колиформные	КОЕ/100 мл	>99,9	<100

ТИПИЧНАЯ ТЕХНОЛОГИЧЕСКАЯ СХЕМА



Система с активным илом



AN: анаэробная зона

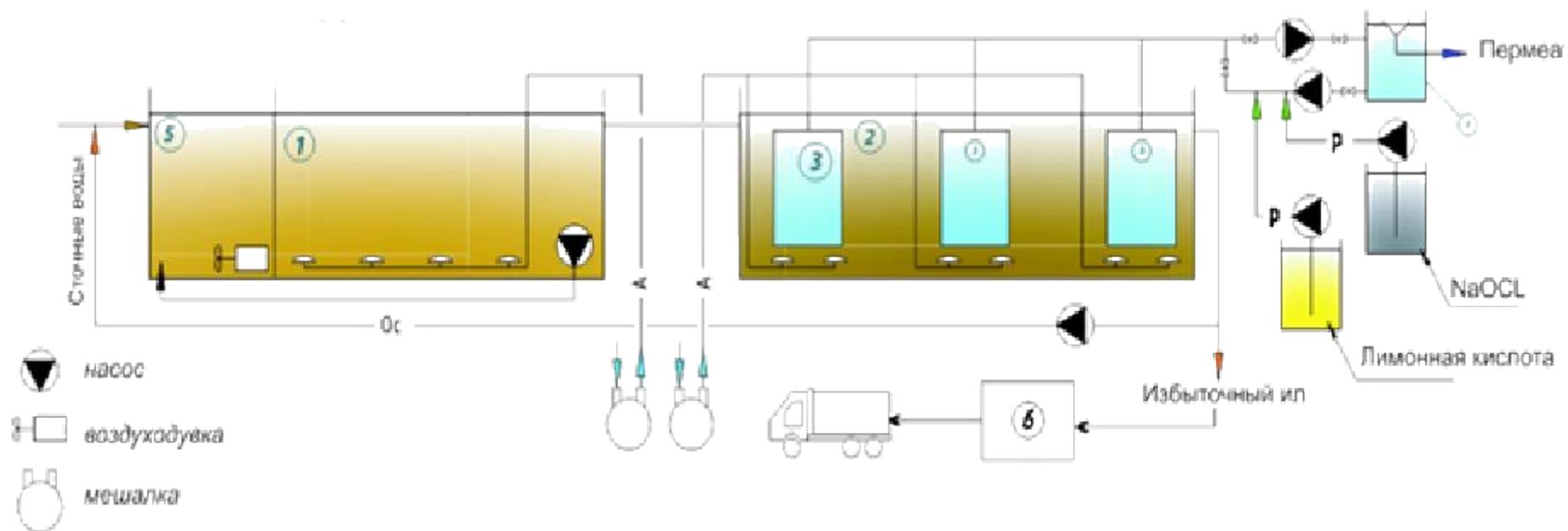
□ Био-P удаление

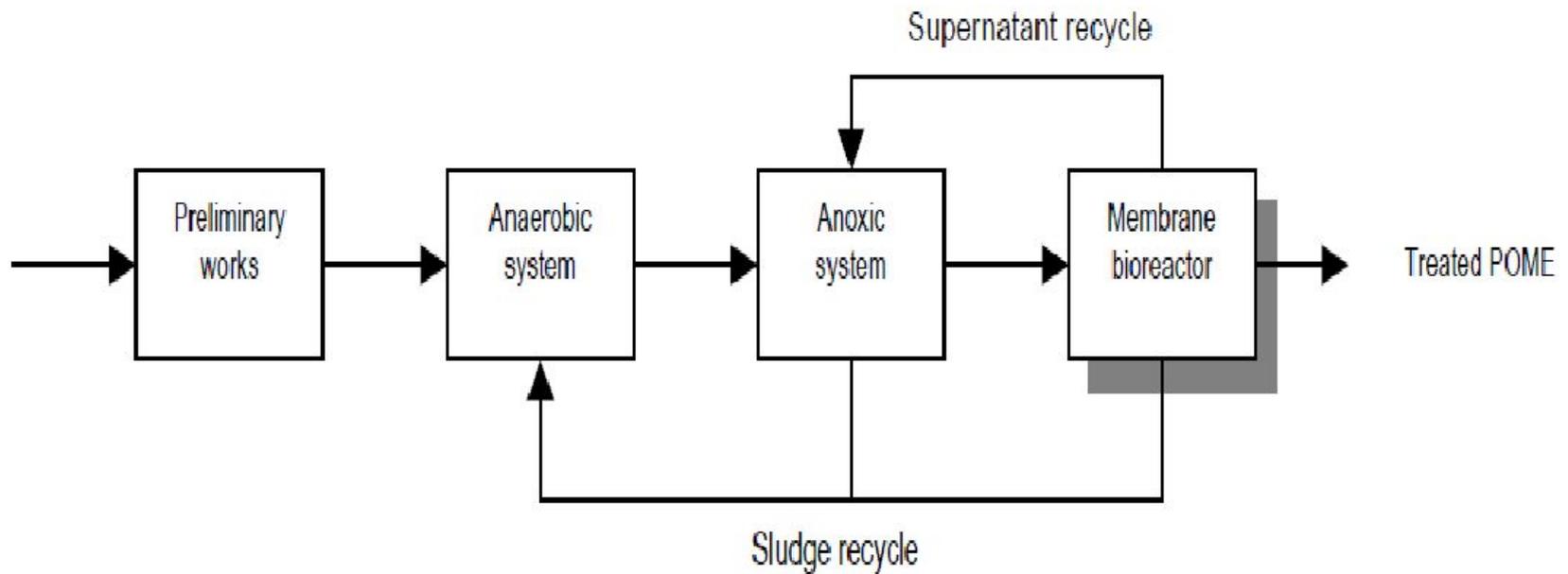
DN: анноксическая зона N: аэробная зона

□ $\text{NO}_3 \rightarrow \text{N}_2$

□ $\text{NH}_4 \rightarrow \text{NO}_3$

удаление органических вещ. ->





Typical and design removal efficiency

Influent	After prelim works	After anaerobic	After anoxic	After MBR
COD	10%	80%	20%	95%
Total N	-	-	80%	20%
Total P	-	40%	-	40%
SS	70%	30%	-	90%

BOD ₅	biological oxygen demand (mg BOD ₅ mg/ l)
Ca ²⁺	Calcium (mg/l)
Cl ⁻	Chlorine (mg/l)
COD	chemical oxygen demand (mg COD/l)
LMH	liters per square meter filtration area per hour
MBR	membrane bioreactor
MF	microfiltration
MLSS	mixed liquor suspended solids (mg SS/l)

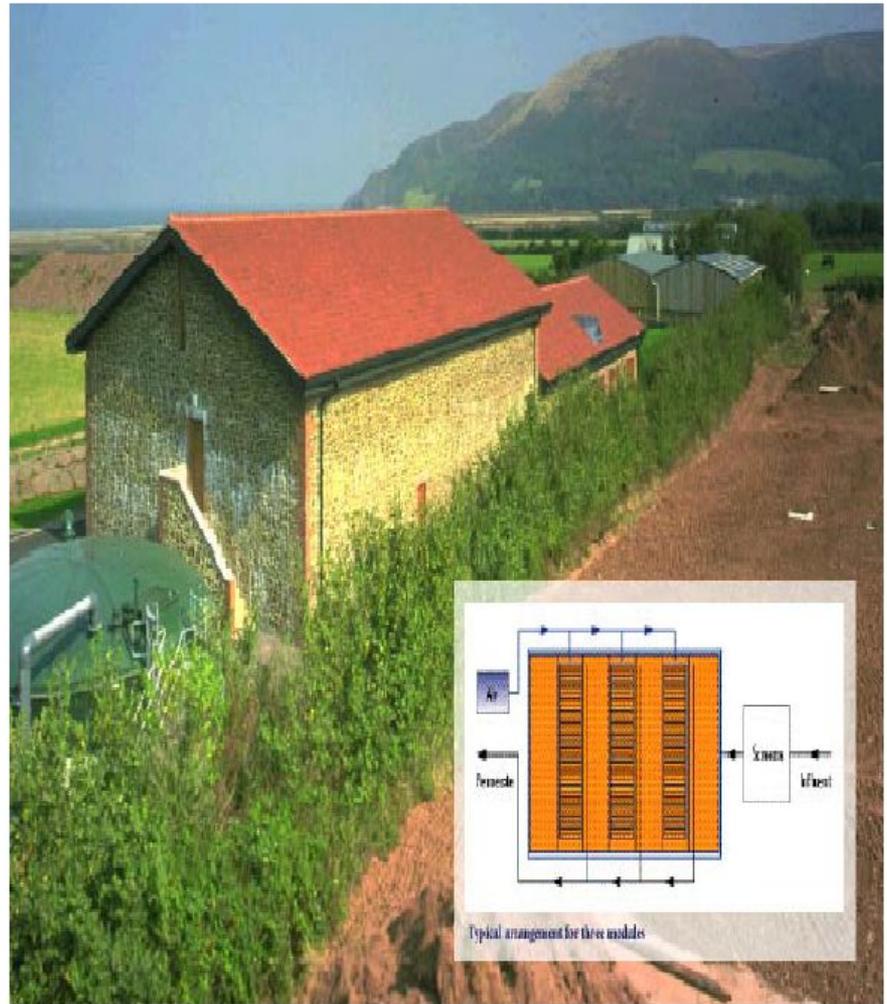
Turbidity /(NTU)	NH ₄ -N	ammonia nitrogen (mg/l)
	NO ₂ -N,	nitrate (mg/l)
	NO ₃ -N	nitrite (mg/l)
	ortho-P	ortho phosphate (mg/l)
	S ²⁻	Sulphides (mg/l)
	SO ₄ ⁻²	Sulphate (mg/l)
	TMP	transmembranal pressure (bar)
	UF	ultrafiltration

Typical design for UASB

Input COD mg/l	Hydraulic retention time, h	Organic loading rate	COD removal, %
5,000-15,000	18-20	0.05-1.0 lbCOD/ft ³ .d	70-85
30,000-50,000	15-25	8-17 kgCOD/m ³ .day	>80%

Typical MBR design for 13,000 m³/day influent

Design Data		Plant Data	
Design Horizon	2,016	Aeration tank volume	1260 m ³
Flow to full treatment	12,700 m ³ /d	MLSS	12000-18000 mg/l
BOD% load	1,524 kg/d	No of membrane units	132xE150
Ammonia load	200 kg/d	Membrane surface area	15840 m ²



Figures 1 and 2: MBR sewage treatment plants designed to blend in with surrounding landuses