Experiences in Improving Waste Water Plant Operation

Esa Ovaskainen
LLC Ecovod

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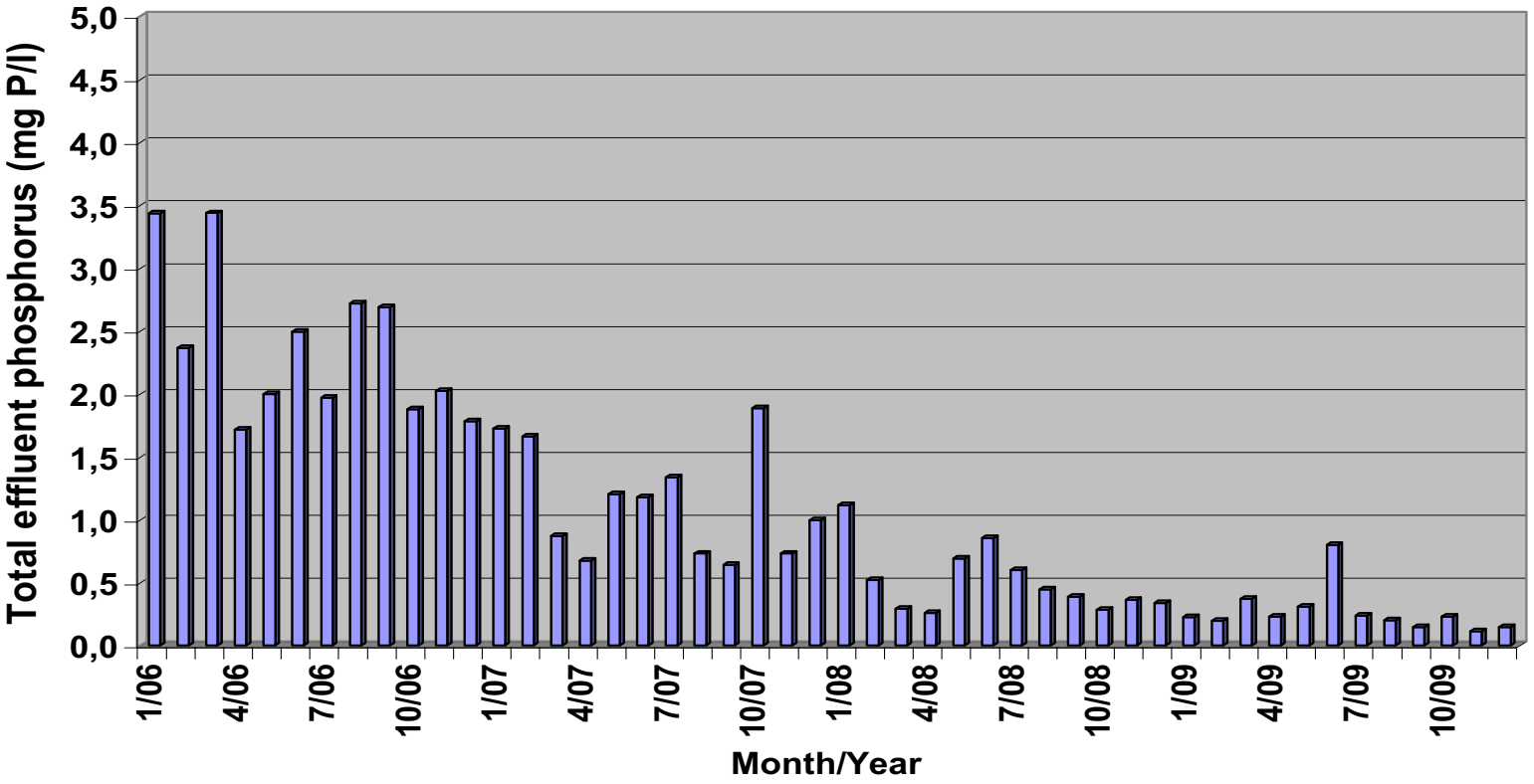
- Ecovod was established in late 2004 to co-operate with St Petersburg Vodokanal to operate the South Western WWT – plant in St. Petersburg.
- Vodokanal owns great majority of the shares of Ecovod and Nefco (Nordic Environmental Financing Corporation) owns a minority.
- Ecovod has good relationship with Helsinki Water

Target values for P_{tot} in St Petersburg

In 2005 – 2006 Moderate (TP< 1.5 mg/l)
In 2007 the target was set to Low (TP< 1.0 mg/l)
In 2008 the target was set to very low (TP< 0.5 mg/l)
In future extremely low (TP about 0.1 mg/l) ?

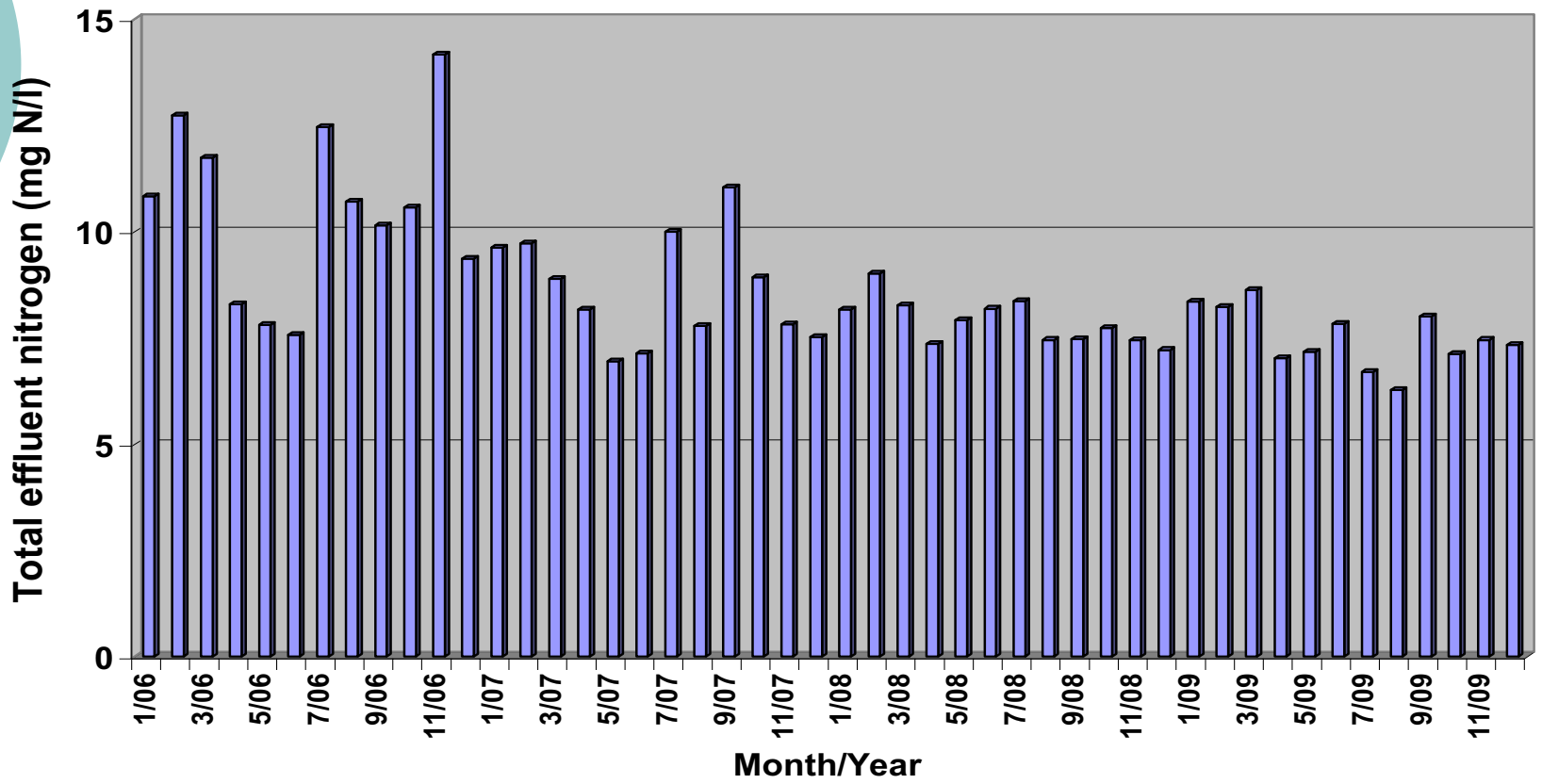
Uzos

The effluent total phosphorus during 2006-09



Uzos

Total effluent nitrogen during 2006-09



	Total/annual 2006	Total/annual 2007	Total/annual 2008	Total/annual 2009
P- load In	495t	482t	462t	411t
P-load Out	209t	97t	43t	22t
Reduction	57,7 %	79,8%	90,7%	94,6%
N-load In	2873t	2798t	2713t	2495t
N-load Out	918t	740t	672t	630t
Reduction	68,0%	73,6%	75,2%	74,8%

Limits on P Removal Technology

Process	Filtration		Chemical Assist		Typical Achievable Phosphorus Limit (mg/l)
	Yes	No	Yes	No	
Chemical Precipitation		+			1 – 2
	+				0.1 - 0.3
Conventional BNR		+		+	1 - 2
		+	+		0,3 – 1.0
	+		+		0.1-0.3
	+		+		0.075-0.2
Membranes			+		<<0.1

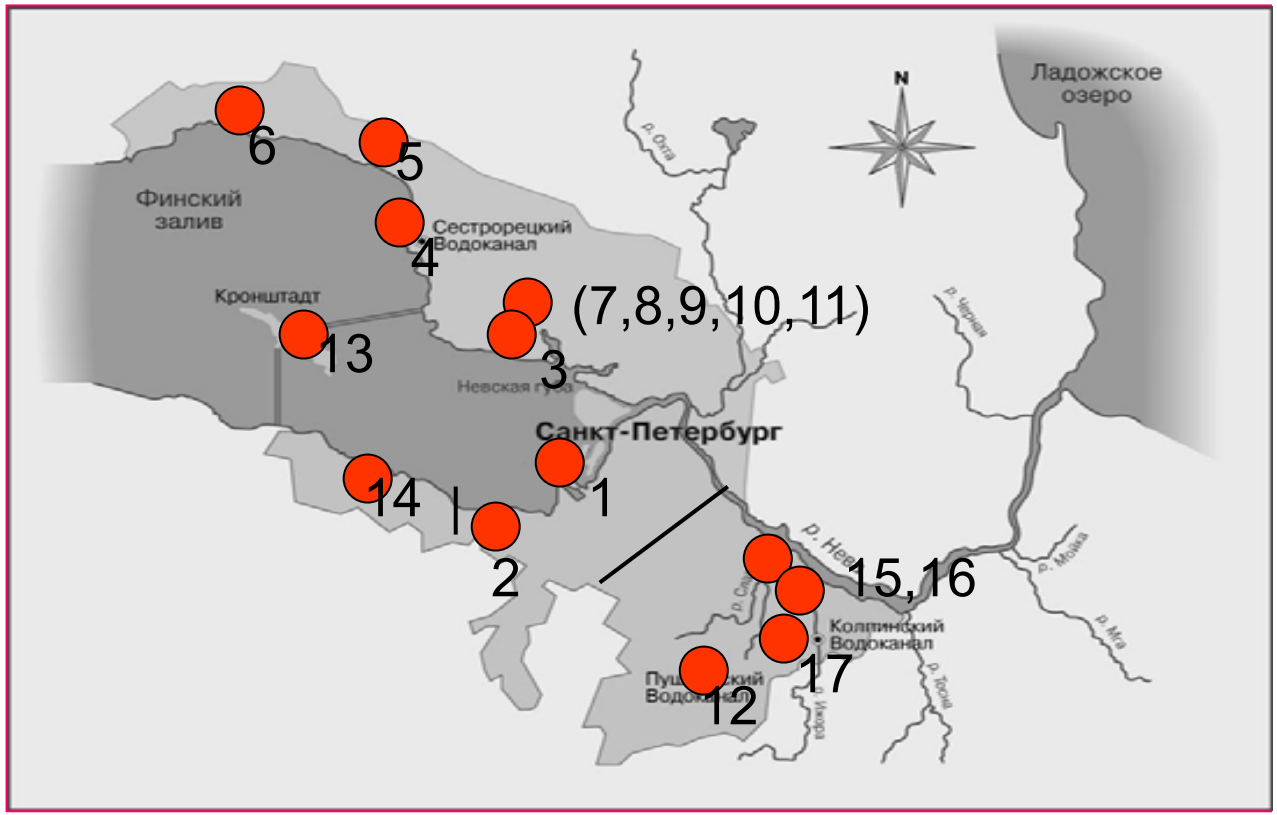
Main recommendations

- Introduction of strategy for enhanced phosphorus and nitrogen removal
- Introduction of pre-fermentation in primary sedimentation tanks or in the thickeners
- Introduction of chemical phosphorus removal before the primary sedimentation units
- Optimizing of operation of the zones in the aeration units, anairobic, anoxic and oxic

Since the beginning of 2008 the company works with 17 WWT Plants of St Petersburg.

ЭКОВОД

1. CAS (Central Aeration Station)
2. S - W WWTP
3. NAS (Olgino)
4. Sestroretsk
5. Repino
6. Zelenogorsk
7. Pargolovskie
8. Prigorodnie
9. Torfianie
10. Zavodskie
11. Osinovaja Roscha
12. Pushkin
13. Kronstadt
14. Petrodvorets
15. Pontonniy
16. Metallostroy
17. Kolpino



Targets of the assignment

1. Audit the plants
2. Introduce the lessons learned from the South West Wastewater Treatment Plant to other Plants
3. Make recommendations for achieving the set targets, make work plans and contribute their implementation
4. Train operators

Outcome of the auditing

PLANT TYPE 1
Main process units are adequate

PLANT TYPE 2
Main process units are marginal

PLANT TYPE 3
Main process units are inadequate

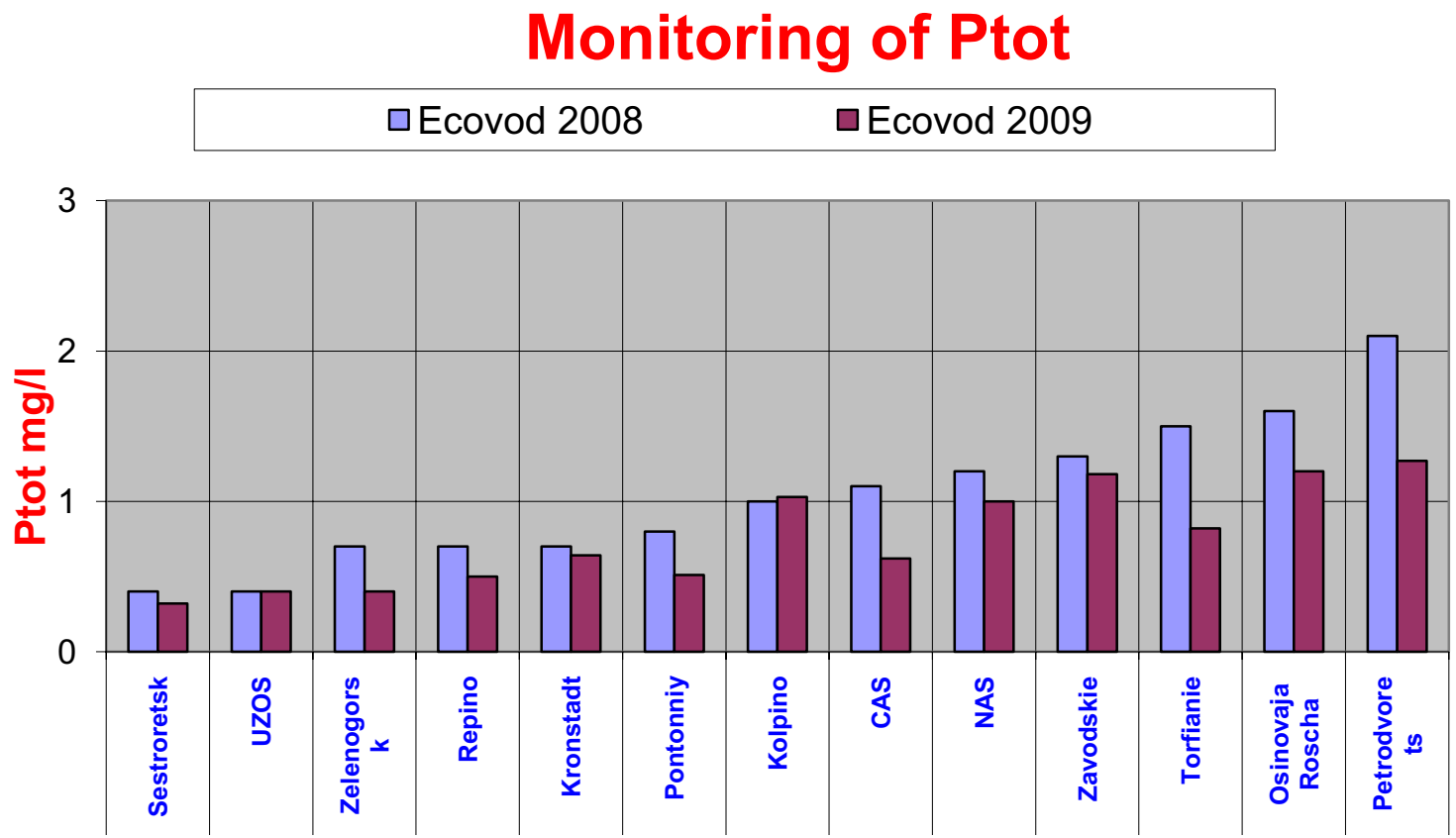
Latest HELCOM Recommendations for Effluent Quality

Plant size	BOD5 recommended concentration or reduction	Ptot recommended concentration or reduction	Ntot recommended concentration or reduction	Plants in this category
	g/m3 - %	g/m3 - %	g/m3 - %	
300 - 2 000	25 - 80	2.0 - 70	35 - 30	Pargalovo, Prigorodnyi, O.R, Torfianoe, Zavodskie
2 001 - 10 000	15 - 80	1.0 - 80	- 30	Pontonnyi, Zelenogorsk
10 001 - 100 000	15 - 80	0.5 - 90	15 – (70 – 80)	Kronstadt, Sestroretsk
> 100 000	15 - 80	0.5 - 90	10 – (70 – 80)	CAS, NAS, SWTP, Kolpino, Pushkin

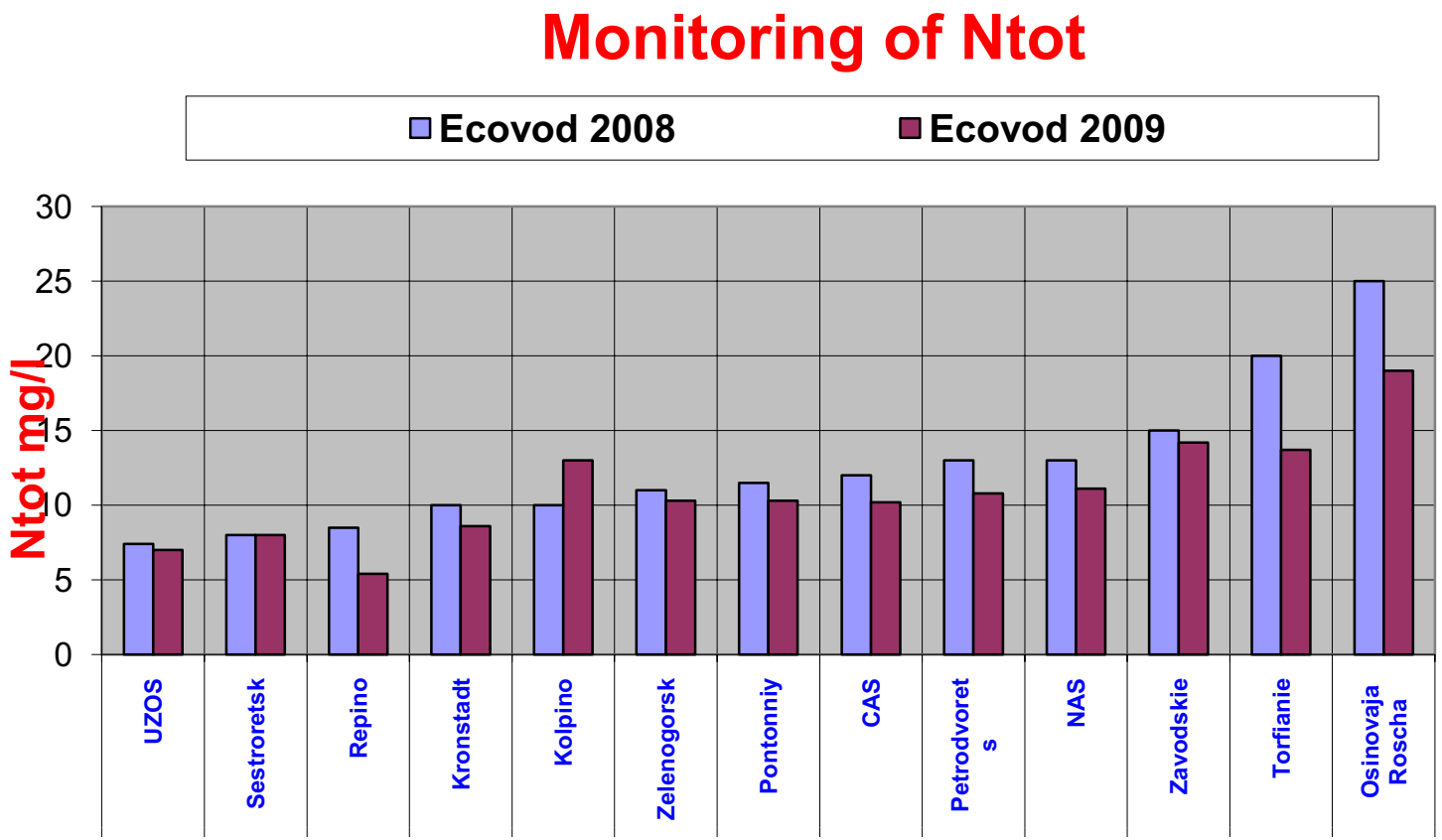
Action plans

- Prepare recommendations for improvements without investments
- Prepare of a list of tasks and implementation time table for non cost recommendations
- Mobilize the existing resources
- Prepare financing plan for small investments and respective action plan
- Mobilize the existing resources and prepare the necessary assignments
- Prepare a more full scale investment plan, mobilize project preparation and other required tasks

Outcome


Monitoring of Ptot
Ecovod 2008
Ecovod 2009
Ptot mg/l
3
2
1
0
Sestroretsk
UZOS
Zelenogorsk
Repino
Kronstadt
Pontonniy
Kolpino
CAS
NAS
Zavodskie
Torfianie
Osinovaja Roscha
Petrodvorets

Outcome


Monitoring of Ntot
Ecovod 2008
Ecovod 2009
Ntot mg/L
30
25
20
15
10
5
0
UZOS
Sestroretsk
Repino
Kronstadt
Kolpino
Zelenogorsk
Pontonniy
CAS
Petrodvoret s
NAS
Zavodskie
Torfianie
Osinovaja Roscha

ЭКОВОД

SOUTH WESTERN WASTEWATER TREATMENT PLANT

THANK YOU!