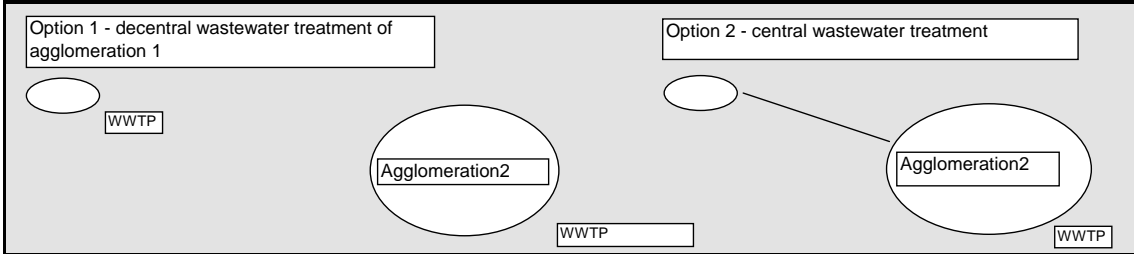


Master Plan, Chapter 5, Option Analysis on Wastewater Agglomerations

County: Mures
 Agglomeration 1: GLODENI
 Agglomeration 2: PACURENI
 Agglomeration 3: PAIGENI
 Agglomeration 4:



		Option 1	Option 2
Data Base			
Size of agglomeration 1	[PE]	2.518	2.518
Size of agglomeration 2	[PE]	265	265
Size of agglomeration 3	[PE]	458	458
Size of agglomeration 4	[PE]		0
Size of agglomeration 1+ 2+3	[PE]		3.241
No. of WTP modules	[items]	3	
Specific wastewater amount	[l/cap x d]	80	80
Specific wastewater amount	[l/cap x d]	110	110
Infiltration rate	[%]	25	25
Wastewater amount of agglomeration 1	[m³/d]	252	
Wastewater amount of agglomeration 2	[m³/d]	27	
Wastewater amount of agglomeration 3	[m³/d]	46	
Wastewater amount of agglomeration 4	[m³/d]	0	
Wastewater amount of agglomeration 1+ 2+3	[m³/d]		324
Connection details			
Lenth of the transportation line	[m]	-	7.500
Kind of connection (g = by gravity, p = by pressure main)	[-]	-	G
Diameter of the transportation line	[mm]	-	250
Maximum difference in height Δh (only in case of pumping station)	[m]	-	0
Costs			
Specific price WWTP agglomeration 1 (according formula)	[€/PE]	250	-
Specific price WWTP agglomeration 2 (according formula)	[€/PE]	250	
Specific price WWTP agglomeration 3 (according formula)	[€/PE]	250	
Specific price WWTP agglomeration 4 (according formula)	[€/PE]	0	
Specific price WWTP agglomeration 1+2+3(according formula)	[€/PE]	-	250
Specific price transportation line (according Unit Price Data Base)	[€/m]	-	171
I. Investment costs			
A. Civil works			
(1.1) WWTP for agglomeration 1 (40 % of total costs)	[€]	266.800	-
(1.2) WWTP for agglomeration 2 (40 % of total costs)	[€]	41.500	
(1.3) WWTP for agglomeration 3 (40 % of total costs)	[€]	60.800	
(1.4) WWTP for agglomeration 4 (40 % of total costs)	[€]	0	
(2) WWTP for agglomeration (40 % of total costs)	[€]		339.100
(3) Pumping station agglomeration 1 (if necessary)	[€]	-	
(4) Transportation line	[€]	-	1.278.750
(5) free	[€]		
(6) free	[€]		
(7) free	[€]		
(8) free	[€]		
(9) free	[€]		
(10) free	[€]		
Total costs civil works	[€]	369.100	1.617.850
Writting-off period	[years]	40	40
Cost of capital, average	[€/a]	9.228	40.446
	[%]	3	3
	[€/a]	11.073	48.536
Annual costs civil works	[€/a]	20.301	88.982

B. Mechanical and electrical equipment			
(1.1) WWTP for agglomeration 1 (60 % of total costs)	[€]	392.700	-
(1.2) WWTP for agglomeration 2 (60 % of total costs)	[€]	54.750	
(1.3) WWTP for agglomeration 3 (60 % of total costs)	[€]	83.700	
(1.4) WWTP for agglomeration 4 (60 % of total costs)	[€]	0	
(2) WWTP for agglomeration (60% of total costs)	[€]	-	501.150
(3) Pumping station agglomeration 1 (if necessary)	[€]	-	
(4) free	[€]		
(5) free	[€]		
(6) free	[€]		
(7) free	[€]		
(8) free	[€]		
(9) free	[€]		
(10) free	[€]		
Total costs mechanical and electrical equipment	[€]	531.150	501.150
Writting-off period	[years]	12	12
	[€/a]	44.263	41.763
Cost of capital, average	[%]	3	3
	[€/a]	15.935	15.035
Annual costs mechanical and electrical equipment	[€/a]	60.197	56.797
Annual costs I. (Investment)	[€/a]	80.498	145.779
II. Maintenance / Repairs			
in % of the mechanical and electrical equipment installed	[%/a]	4	4
Annual costs II. (Maintenance / Repairs)	[€/a]	21.246	20.046
III. Labour costs			
specific labour costs	[€/h]	5	5
annual expenses option 1 (2 full-time workers/module)	[h/a]	26.280	-
annual expenses option 2 (2 full-time workers)	[h/a]	-	8.760
Annual costs III. (labour)	[€/a]	131.400	43.800
IV. Operation costs consumption			
A. Energy consumption			
A 1 - Option 1			
A 1.1 WWTP agglomeration 1			
Wastewater amount of agglomeration 1	[m³/d]	252	-
Specific energy consumption WWTP agglomeration 1 (acc. formula)	[kWh/m³]	0,94	-
Daily energy consumption WWTP agglomeration 1	[kWh/d]	238	-
A 1.2 WWTP agglomeration 2			
Wastewater amount of agglomeration 2	[m³/d]	27	-
Specific energy consumption WWTP agglomeration 1 (acc. formula)	[kWh/m³]	1,99	-
Daily energy consumption WWTP agglomeration 2	[kWh/d]	53	-
A 1.3 WWTP agglomeration 3			
Wastewater amount of agglomeration 3	[m³/d]	46	-
Specific energy consumption WWTP agglomeration 1 (acc. formula)	[kWh/m³]	1,83	-
Daily energy consumption WWTP agglomeration 3	[kWh/d]	84	-
A 1.4 WWTP agglomeration 4			
Wastewater amount of agglomeration 4	[m³/d]	0	-
Specific energy consumption WWTP agglomeration 1 (acc. formula)	[kWh/m³]	0,00	-
Daily energy consumption WWTP agglomeration 4	[kWh/d]	0	-
Total A 1	[kWh/d]	375	
A 2 - Option 2			
A 2.1 Pumping station agglomeration 1 (if necessary)			
Wastewater amount of agglomeration 1	[m³/d]	-	72
Maximum difference in height Dh (only in case of pumping station)	[m]	-	0
Daily energy consumption pumping station agglomeration 1	[kWh/d]	-	0
A 2.2 WWTP agglomeration 1+2+3			
Specific price WWTP agglomeration 2 (according formula)	[m³/d]		324
Specific energy consumption WWTP agglomeration 1 (acc. formula)	[kWh/m³]		1,36
Daily energy consumption WWTP agglomeration 2	[kWh/d]		440
Total A 1 - A 2	[kWh/d]	375	440
Specific energy price	[netto €/kWh]	0,15	0,15
Energy costs	[€/d]	56	66

B. Chemicals consumption

The difference in the consumption of chemicals is neglectable.

C. Sludge disposal

The sludge amounts produced in both options is almost the same.

The difference in the sludge disposal costs is neglectable.

Total IV.	[€/d]	56	66
Annual costs IV. (consumption)	[€/a]	20.510	24.089
Summary			
Annual costs I. (Investment)	[€/a]	80.498	145.779
Annual costs II. (Maintenance / Repairs)	[€/a]	21.246	20.046
Annual costs III. (labour)	[€/a]	131.400	43.800
Annual costs IV. (consumption)	[€/a]	20.510	24.089
Total annual costs	[€/a]	253.654	233.714

Conclusion : according to the option analysis the Consultant proposed centralized solution to be followed.