Table AII.7.1 Financial Statements of Galati Financial Plan (Case IA2)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						195,128	205,282	215,946	226,954	238,315	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260
Operation and maintenance						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Leveled lease fee (C)						140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868
Lease fee calculation base						138,115	189,339	233,455	233,455	233,455	233,455	233,455	233,455	233,455	233,455	225,662	195,770	154,241	103,019	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Profit before tax (D = A-B-C)						38,622	48,776	59,339	70,348	81,809	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754
Corporate tax (E = 0.38 * D)						14,676	18,535	22,549	26,732	31,087	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626
Profit after tax (F = D - E)						23,946	30,241	36,790	43,616	50,721	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127
Working capital (G = F)						14,676	33,211	55,760	82,492	113,580	149,208	184,833	220,459	256,085	291,712	327,338	362,965	398,591	434,218	469,844	505,471	541,097	576,724	612,350	647,977	683,603	719,230	754,856	790,482	826,109
Cumulative W.C. (H = Σ G)						23,946	54,187	90,977	134,593	185,314	243,441	301,569	359,696	417,824	475,951	534,078	592,206	650,333	708,461	766,588	824,715	882,843	940,970	999,098	1,057,225	1,115,352	1,173,480	1,231,607	1,289,735	1,347,862

2. Galati City Sewerage Account (million ROL)

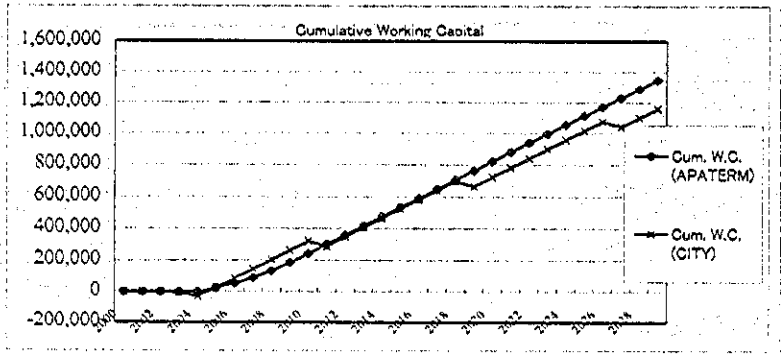
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (I = C)	0	0	0	0	0	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	2,952	14,102	29,003	46,614	60,299	56,114	51,658	46,911	41,856	36,472	30,739	24,633	18,130	11,585	5,962	1,923	0	0	0	0	0	0	0	0	0	0	0
Profit (L = I-J-K)	0	0	0	-2,952	-14,102	52,964	35,353	21,668	25,852	30,309	35,056	40,111	45,494	51,228	57,334	63,837	70,401	76,005	80,044	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967
Loan (M)	37,595	144,171	200,393	247,123	212,837	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	37,595	144,171	200,393	247,123	212,837	-25,386	11,202	42,714	42,714	42,714	42,714	42,714	42,714	42,714	42,714	37,148	15,803	-13,867	-50,455	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967
Depreciation (O = J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	491,294	411,573	86,479	105,456	123,283	127,468	131,925	136,671	141,726	147,110	152,843	158,950	159,867	145,105	121,039	88,490	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	93,000	0	0
Payment of principal (R)	0	0	0	2,614	12,810	27,578	46,555	64,382	68,566	73,023	77,770	82,825	88,208	93,942	100,048	100,985	86,204	62,138	29,589	0	0	0	0	0	0	0	0	0	0	0
Applications (S = Q + R)	75,189	288,341	400,786	496,860	438,484	27,578	46,555	64,382	68,566	73,023	77,770	175,825	88,208	93,942	100,048	100,985	86,204	62,138	29,589	93,000	0	0	0	0	0	0	0	93,000	0	0
Working capital of the year (T =P-S)	0	0	0	-5,566	-26,911	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	-5,566	-32,478	26,424	85,325	144,227	203,128	262,030	320,931	286,833	345,734	404,636	463,537	522,439	581,340	640,242	699,143	665,045	723,946	782,848	841,749	900,651	959,552	1,018,454	1,077,355	1,043,256	1,102,158	1,161,059

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (=V)	360,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W=E)	0	0	0	0	0	14,676	18,535	22,549	26,732	31,087	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626
Revenue from lease fee (X=I)	0	0	0	0	0	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868
Total current revenue (Y=V+W+X)	360,887	371,714	382,865	394,351	406,181	573,912	590,321	607,263	624,761	642,831	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497
Subsidy (Z=K+R-M)	0	0	0	5,566	26,911	-25,386	11,202	42,714	42,714	42,714	42,714	42,714	42,714	42,714	42,714	37,148	15,803	-13,867	-50,455	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	1.4%	6.6%	-4.4%	1.9%	7.0%	6.8%	6.6%	6.5%	6.5%	6.5%	6.5%	6.5%	5.6%	2.4%	-2.1%	-7.6%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%
Criteria for State Guarantee ((K+R)/Y)	0.0%	0.0%	0.0%	1.4%	6.6%	9.9%	15.8%	20.5%	20.0%	19.4%	18.8%	18.8%	18.8%	18.8%	18.8%	18.0%	14.8%	10.3%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.12%
Coverage to Interest (%)	100.0%
Coverage to depreciation (%)	100.0%
Coverage to principal (%)	100.0%

Averaged profit rate	22.1%
Averaged criteria values for guarantee	14.7%
Highest subsidy ratio	7.0%



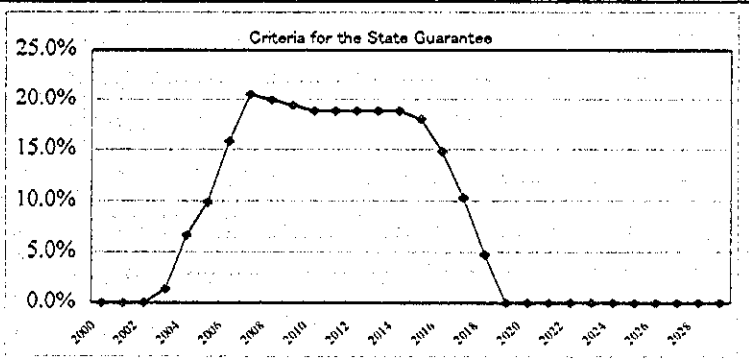


Table AII.7.1 Financial Statements of Galati Financial Plan (Case IA2)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						195,128	205,282	215,846	226,854	238,315	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260
Operation and maintenance						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Leveled lease fee (C)						140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868
Lease fee calculation base						138,115	180,338	233,455	233,455	233,455	233,455	233,455	233,455	233,455	233,455	225,662	195,779	154,241	103,018	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Profit before tax (D = A-B-C)						38,622	48,776	59,339	70,348	81,809	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754	93,754
Corporate tax (E = 0.38 * D)						14,676	18,535	22,549	26,732	31,087	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626
Profit after tax (F = D - E)						23,946	30,241	36,790	43,616	50,721	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127	58,127
Working capital (G = F)						14,676	33,211	55,760	82,492	113,580	149,206	184,833	220,459	256,085	291,712	327,338	362,965	398,591	434,218	469,844	505,471	541,097	576,724	612,350	647,977	683,603	719,230	754,856	790,482	826,109
Cumulative W.C. (H = Σ G)						23,946	54,187	90,977	134,593	185,314	243,441	301,569	359,696	417,824	475,951	534,078	592,206	650,333	708,461	766,588	824,715	882,843	940,970	999,098	1,057,225	1,115,352	1,173,480	1,231,607	1,289,735	1,347,862

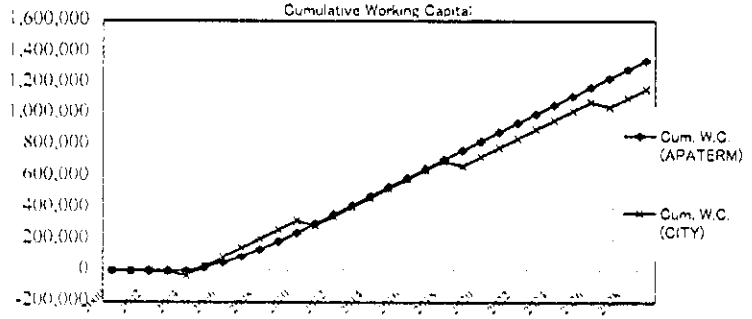
2. Galati City Sewerage Account (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (I = C)	0	0	0	0	0	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	2,952	14,102	29,003	46,614	60,999	56,114	51,658	46,911	41,856	36,472	30,739	24,633	18,130	11,505	5,962	1,923	0	0	0	0	0	0	0	0	0	0	0
Profit (L = I-J-K)	0	0	0	-2,952	-14,102	52,964	35,353	21,668	25,852	30,309	35,056	40,111	45,494	51,228	57,334	63,837	70,401	76,005	80,044	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967	81,967
Loan (M)	37,595	144,171	200,393	247,123	212,837	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	37,595	144,171	200,393	247,123	212,837	-25,386	11,202	42,714	42,714	42,714	42,714	42,714	42,714	42,714	42,714	37,148	15,803	-13,867	-50,455	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967
Depreciation (O = J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	491,294	411,573	88,479	105,456	123,283	127,468	131,925	136,671	141,726	147,110	152,843	158,950	159,887	145,105	121,039	88,490	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	93,000	0	0
Payment of principal (R)	0	0	0	2,614	12,810	27,578	46,555	64,382	68,566	73,023	77,770	82,825	88,208	93,942	100,048	100,985	86,204	62,138	29,589	0	0	0	0	0	0	0	0	0	0	0
Applications (S = Q + R)	75,189	288,341	400,786	496,860	438,484	27,578	46,555	64,382	68,566	73,023	77,770	175,825	88,208	93,942	100,048	100,985	86,204	62,138	29,589	93,000	0	0	0	0	0	0	0	93,000	0	0
Working capital of the year (T =P-S)	0	0	0	-5,566	-26,911	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	-5,566	-32,478	26,424	85,325	144,227	203,128	262,030	320,931	286,833	345,734	404,636	463,537	522,439	581,340	640,242	699,143	665,045	723,946	782,848	841,749	900,651	959,552	1,018,454	1,077,355	1,043,256	1,102,158	1,161,059

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (=V)	360,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W=E)	0	0	0	0	0	14,676	18,535	22,549	26,732	31,087	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626	35,626
Revenue from lease fee (X=I)	0	0	0	0	0	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868	140,868
Total current revenue (Y=V+W+X)	360,887	371,714	382,865	394,351	406,181	573,912	590,321	607,263	624,761	642,831	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497	661,497
Subsidy (Z=I+K+R-M)	0	0	0	5,566	26,911	-25,386	11,202	42,714	42,714	42,714	42,714	42,714	42,714	42,714	42,714	37,148	15,803	-13,867	-50,455	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967	-81,967
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	1.4%	6.6%	-4.4%	1.9%	7.0%	6.8%	6.6%	6.5%	6.5%	6.5%	6.5%	6.5%	5.6%	2.4%	-2.1%	-7.6%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%	-12.4%
Criteria for State Guarantee (-(X+R)/Y)	0.0%	0.0%	0.0%	1.4%	6.6%	9.0%	15.8%	20.5%	20.0%	19.4%	18.8%	18.8%	18.8%	18.8%	18.8%	18.0%	14.8%	10.3%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.2%
Coverage to Interest (%)	100.0%
Coverage to depreciation (%)	100.0%
Coverage to principal (%)	100.0%
Averaged profit rate	22.1%
Averaged criteria values for guarantee	14.7%
Highest subsidy ratio	7.0%



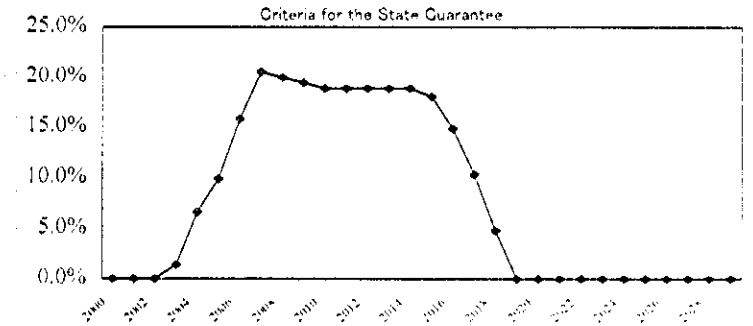


Table All.7.2 Financial Statements of Galati Financial Plan (Case IIA2)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						195,128	205,282	215,846	226,854	238,315	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260
Operation and maintenance (B)						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Levyied lease fee (C)						117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449
Lease for calculation base						13,542	22,045	33,259	43,767	105,228	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173
Profit before tax (D = A-B-C)						62,041	72,195	82,758	93,767	105,228	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173
Corporate tax (E = 0.38 * D)						23,576	27,434	31,448	35,631	39,987	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526
Profit after tax (F = D - E)						38,466	44,761	51,310	58,135	65,241	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647
Working capital (G = F)						23,576	51,010	82,458	118,089	158,076	202,602	247,127	291,653	336,179	380,704	425,230	469,756	514,282	558,807	603,333	647,859	692,384	736,910	781,436	825,962	870,487	915,013	959,539	1,004,064	1,048,590
Cumulative W.C. (H = Σ G)						38,466	83,226	134,537	192,672	257,913	330,560	403,208	475,855	548,502	621,149	693,797	766,444	839,091	911,738	984,385	1,057,033	1,129,680	1,202,327	1,274,974	1,347,622	1,420,269	1,492,916	1,565,563	1,638,210	1,710,858

2. Galati City Sewerage Account (million ROL)

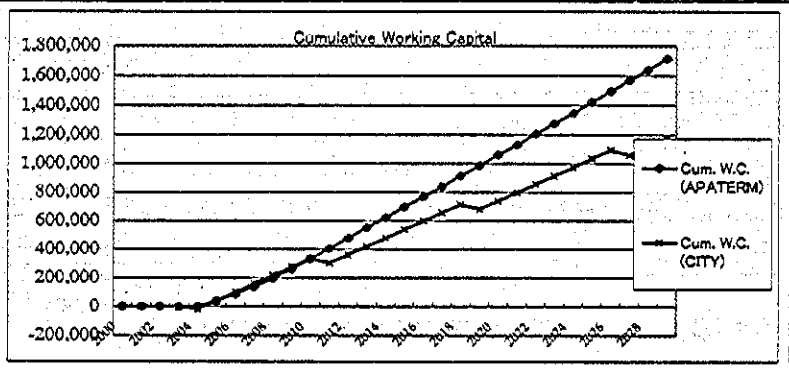
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (I = C)	0	0	0	0	0	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	1,771	8,461	17,402	27,968	36,180	33,669	30,995	28,147	25,114	21,883	18,443	14,780	10,878	6,939	3,577	1,154	0	0	0	0	0	0	0	0	0	0	0
Profit (L = I-J-K)	0	0	0	-1,771	-8,461	41,146	30,579	22,368	24,879	27,553	30,401	33,434	36,664	40,104	43,768	47,670	51,608	54,970	57,394	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548
Loan (M)	22,557	86,502	120,236	148,274	127,702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	52,632	201,839	280,550	345,972	297,972	-24,599	-2,646	16,261	16,261	16,261	16,261	16,261	16,261	16,261	16,261	12,921	114	-17,688	-39,641	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548
Depreciation (O = I)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	492,475	417,213	75,448	86,834	97,530	100,041	102,715	105,563	108,596	111,827	115,267	118,930	119,493	110,624	96,184	76,655	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93,000	0	0
Payment of principal (R)	0	0	0	1,569	7,686	16,547	27,933	38,629	41,140	43,814	46,662	49,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	0	0	0	0	0	0	0	0	0	0	0
Applications (S = Q + R)	75,189	288,341	400,786	495,815	433,360	16,547	27,933	38,629	41,140	43,814	46,662	142,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	93,000	0	0	0	0	0	0	0	93,000	0	0
Working capital of the year (T =P-S)	0	0	0	-3,340	-16,147	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	-3,340	-19,487	39,415	98,316	157,218	216,119	275,021	333,922	299,824	358,725	417,627	476,528	535,430	594,331	653,233	712,134	678,036	736,937	795,839	854,740	913,642	972,543	1,031,445	1,090,346	1,056,248	1,115,149	1,174,050

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (=V)	360,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W=E)	0	0	0	0	0	23,576	27,434	31,448	35,631	39,987	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526
Revenue from lease fee (X=I)	0	0	0	0	0	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449
Total current revenue (Y=V+W+X)	360,887	371,714	382,865	394,351	406,181	559,392	575,801	592,743	610,241	628,311	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977
Subsidy (Z=I+K+R-M)	0	0	0	3,340	16,147	-24,599	-2,646	16,261	16,261	16,261	16,261	16,261	16,261	16,261	16,261	12,921	114	-17,688	-39,641	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	-4.4%	-0.5%	2.7%	2.7%	2.6%	2.5%	2.5%	2.5%	2.5%	2.5%	2.0%	0.0%	-2.7%	-6.1%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%
Criteria for State Guarantee ((K+R)/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	6.1%	9.7%	12.6%	12.3%	11.9%	11.6%	11.6%	11.6%	11.6%	11.6%	11.0%	9.1%	6.3%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.12%
Coverage to Interest (%)	50.0%
Coverage to depreciation (%)	50.0%
Coverage to principal (%)	50.0%

Averaged profit rate	28.1%
Averaged criteria values for guarantee	9.0%
Highest subsidy ratio	4.0%



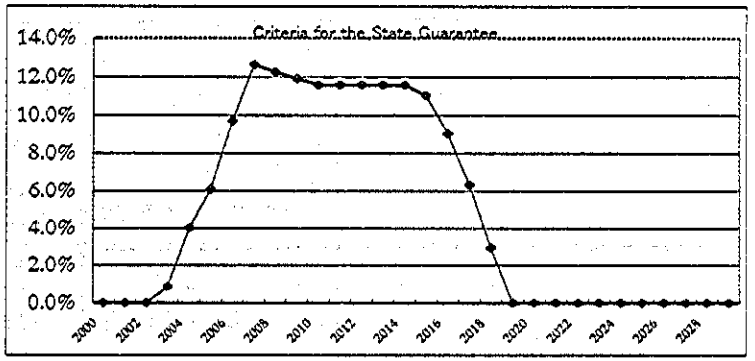


Table AII.7.2 Financial Statements of Galati Financial Plan (Case IIA2)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						195,128	205,282	215,946	226,854	238,315	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260	250,260
Operation and maintenance (B)						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Leveled lease fee (C)						117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449
Lease fee calculation base						135,482	132,970	133,582	133,582	133,582	133,582	133,582	133,582	133,582	133,582	133,582	178,016	354,477	177,001	40,615	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Profit before tax (D = A-B-C)						62,041	72,195	82,758	93,767	105,228	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173	117,173
Corporate tax (E = 0.38 * D)						23,576	27,434	31,448	35,631	39,987	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526
Profit after tax (F = D - E)						38,466	44,761	51,310	58,135	65,241	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647	72,647
Working capital (G = F)						23,576	51,010	82,458	118,089	158,076	202,602	247,127	291,653	336,179	380,704	425,230	469,756	514,282	558,807	603,333	647,859	692,384	736,910	781,436	825,962	870,487	915,013	959,539	1,004,064	1,048,590
Cumulative W.C. (H = Σ G)						38,466	83,226	134,537	192,672	257,913	330,560	403,208	475,855	548,502	621,149	693,797	766,444	839,091	911,738	984,385	1,057,032	1,129,680	1,202,327	1,274,974	1,347,621	1,420,269	1,492,916	1,565,563	1,638,211	1,710,858

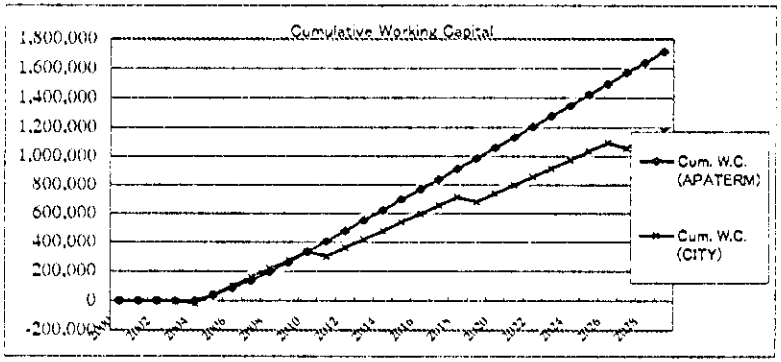
2. Galati City Sewerage Account (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (I = C)	0	0	0	0	0	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	1,771	8,461	17,402	27,968	36,180	33,869	30,965	28,147	25,114	21,883	18,443	14,780	10,878	6,939	3,577	1,154	0	0	0	0	0	0	0	0	0	0	0
Profit (L = I-J-K)	0	0	0	-1,771	-8,461	41,146	30,579	22,368	24,879	27,553	30,401	33,434	36,664	40,104	43,768	47,670	51,608	54,970	57,394	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548	58,548
Loan (M)	22,557	86,502	120,236	148,274	127,702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	52,632	201,839	280,550	345,972	297,972	-24,599	-2,846	16,261	16,261	16,261	16,261	16,261	16,261	16,261	16,261	12,921	114	-17,688	-39,641	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548
Depreciation (O = J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	492,435	417,213	75,448	86,634	97,530	100,041	102,715	105,563	108,596	111,827	115,267	118,930	119,493	110,624	96,184	76,655	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93,000	0	0
Payment of principal (R)	0	0	0	1,569	7,686	16,547	27,933	38,629	41,140	43,814	46,662	49,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	0	0	0	0	0	0	0	0	0	0	0
Applications (S = Q + R)	75,189	288,341	400,786	495,815	433,360	16,547	27,933	38,629	41,140	43,814	46,662	142,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	93,000	0	0	0	0	0	0	0	93,000	0	0
Working capital of the year (T =P-S)	0	0	0	-1,140	-18,147	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	-1,140	-19,287	39,614	98,515	157,416	216,317	275,218	334,119	300,020	358,921	417,822	476,723	535,624	594,525	653,426	712,327	678,228	737,129	796,030	854,931	913,832	972,733	1,031,634	1,090,535	1,056,436	1,115,337	1,174,238

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (=V)	360,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W=E)	0	0	0	0	0	23,576	27,434	31,448	35,631	39,987	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526	44,526
Revenue from lease fee (X=I)	0	0	0	0	0	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449	117,449
Total current revenue (Y=V+W+X)	360,887	371,714	382,865	394,351	406,181	559,392	575,801	592,743	610,241	628,311	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977	646,977
Subsidy (Z=I+K+R=M)	0	0	0	3,340	16,147	-24,599	-2,846	16,261	16,261	16,261	16,261	16,261	16,261	16,261	16,261	12,921	114	-17,688	-39,641	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548	-58,548
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	-4.4%	-0.5%	2.7%	2.7%	2.6%	2.5%	2.5%	2.5%	2.5%	2.5%	2.0%	0.0%	-2.7%	-6.1%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%	-9.0%
Criteria for State Guarantee (-(X+R)/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	6.1%	9.7%	12.6%	12.3%	11.9%	11.6%	11.6%	11.6%	11.6%	11.6%	11.0%	9.1%	6.3%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.12%
Coverage to Interest (%)	50.0%
Coverage to depreciation (%)	50.0%
Coverage to principal (%)	50.0%
Averaged profit rate	28.1%
Averaged criteria values for guarantee	9.0%
Highest subsidy ratio	4.0%



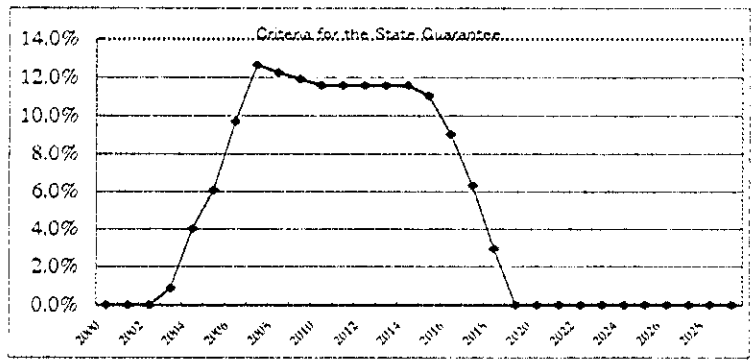


Table AII.7.3 Financial Statements of Galati Financial Plan (Case IIIB1)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						69,889	73,315	77,088	81,019	85,112	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379
Operation and maintenance (B)						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Leveled lease fee (C)						47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015
Lease fee depreciation here						46,426	37,401	30,153	24,315	19,596	15,796	12,736	10,268	8,278	6,675	5,381	4,338	3,497	2,819	2,273	1,832	1,477	1,191	960	774	624	503	406	327	264
Profit before tax (D = A-B-C)						7,036	10,662	14,435	18,366	22,459	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726
Corporate tax (E = 0,38 * D)						2,674	4,052	5,485	6,979	8,535	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156
Profit after tax (F = D - E)						4,362	6,610	8,949	11,387	13,925	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570
Working capital (G = F)						2,674	6,725	12,210	19,189	27,724	37,880	48,035	58,191	68,347	78,503	88,658	98,814	108,970	119,125	129,281	139,437	149,593	159,748	169,904	180,060	190,215	200,371	210,527	220,683	230,838
Cumulative W.C. (H = Σ G)						4,362	10,973	19,922	31,309	45,234	61,804	78,374	94,943	111,513	128,083	144,653	161,223	177,793	194,363	210,932	227,502	244,072	260,642	277,212	293,782	310,352	326,921	343,491	360,061	376,631

2. Galati City Sewerage Account (million ROL)

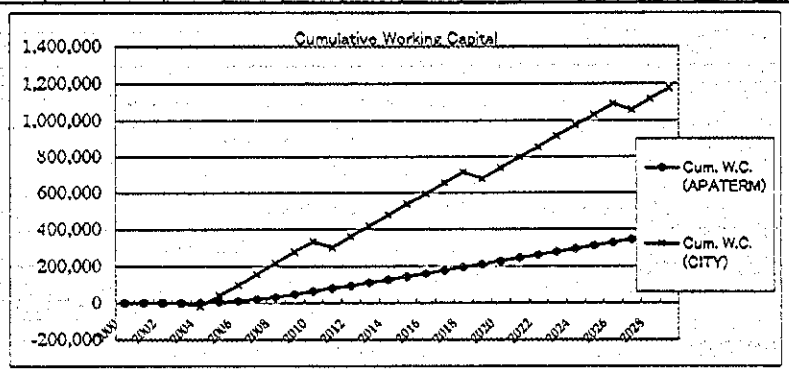
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (I = C)	0	0	0	0	0	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	1,771	8,461	17,402	27,968	36,130	33,669	30,995	28,147	25,114	21,883	18,443	14,780	10,878	6,939	3,577	1,154	0	0	0	0	0	0	0	0	0	0	0
Profit (L = I-J-K)	0	0	0	-1,771	-8,461	-29,288	-39,855	-48,016	-45,555	-42,881	-40,033	-37,000	-33,770	-30,330	-26,666	-22,764	-18,826	-15,464	-13,040	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886
Loan (M)	22,557	86,502	120,236	148,274	127,702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	52,632	201,839	280,550	345,972	297,972	45,835	67,788	86,695	86,695	86,695	86,695	86,695	86,695	86,695	86,695	83,355	70,548	52,746	30,794	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886
Depreciation (O = I)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	492,475	417,213	75,448	86,834	97,530	100,041	102,715	105,563	108,596	111,827	115,267	118,930	119,493	110,624	96,184	76,655	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	93,000	0	0	0	0	0	0	93,000	0	0	0
Payment of principal (R)	0	0	0	1,569	7,686	16,547	27,933	38,629	41,140	43,814	46,662	49,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	0	0	0	0	0	0	0	0	0	0	0
Applications (S = Q + R)	75,189	288,341	400,786	495,815	433,360	16,547	27,933	38,629	41,140	43,814	46,662	142,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	93,000	0	0	0	0	0	0	93,000	0	0	0
Working capital of the year (T =P-S)	0	0	0	-3,340	-16,147	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	-3,340	-19,487	39,415	98,316	157,218	216,119	275,021	333,922	299,824	358,725	417,627	476,528	535,430	594,331	653,233	712,134	678,036	736,937	795,839	854,740	913,642	972,543	1,031,445	1,090,346	1,056,248	1,115,149	1,174,050

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (=V)	360,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W=E)	0	0	0	0	0	2,674	4,052	5,485	6,979	8,535	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156
Revenue from lease fee (X=I)	0	0	0	0	0	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015
Total current revenue (Y=V+W+X)	360,887	371,714	382,865	394,351	406,181	468,056	481,985	496,346	511,155	526,425	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173
Subsidy (Z=I+K+R+M)	0	0	0	3,340	16,147	45,835	67,788	86,695	86,695	86,695	86,695	86,695	86,695	86,695	86,695	83,355	70,548	52,746	30,794	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	9.8%	14.1%	17.5%	17.0%	16.5%	16.0%	16.0%	16.0%	16.0%	16.0%	15.4%	13.0%	9.7%	5.7%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Criteria for State Guarantee ((K+R)/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	7.3%	11.6%	15.1%	14.6%	14.2%	13.8%	13.8%	13.8%	13.8%	13.8%	13.2%	10.8%	7.5%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.12%
Coverage to Interest (%)	50.0%
Coverage to depreciation (%)	50.0%
Coverage to principal (%)	50.0%

Averaged profit rate	17.3%
Averaged criteria values for guarantee	10.7%
Highest subsidy ratio	17.5%



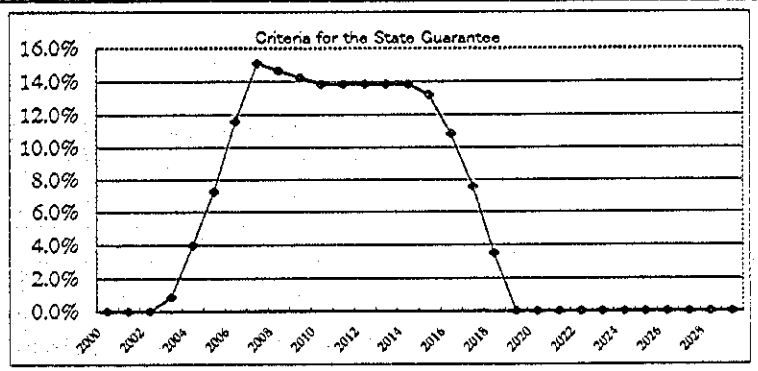


Table AII.7.3 Financial Statements of Galati Financial Plan (Case IIIB1)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						69,689	73,315	77,088	81,019	85,112	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379	89,379
Operation and maintenance (B)						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Leveled lease fee (C)						47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015
Lease fee calculating base						46,425	57,443	69,556	69,556	69,556	69,556	69,556	69,556	69,556	69,556	65,785	58,780	54,883	53,504	29,451	29,451	29,451	29,451	29,451	29,451	29,451	29,451	29,451	29,451	29,451
Profit before tax (D = A-B-C)						7,036	10,662	14,435	18,366	22,459	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726	26,726
Corporate tax (E = 0.38 * D)						2,674	4,052	5,485	6,979	8,535	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156
Profit after tax (F = D - E)						4,362	6,610	8,949	11,387	13,925	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570	16,570
Working capital (G = F)						2,674	6,725	12,210	19,189	27,724	37,880	48,035	58,191	68,347	78,503	88,658	98,814	108,970	119,125	129,281	139,437	149,592	159,748	169,904	180,059	190,215	200,371	210,527	220,682	230,838
Cumulative W.C. (H = Σ G)						4,362	10,973	19,922	31,309	45,234	61,804	78,374	94,943	111,513	128,083	144,653	161,223	177,793	194,362	210,932	227,502	244,072	260,642	277,212	293,781	310,351	326,921	343,491	360,061	376,631

2. Galati City Sewerage Account (million ROL)

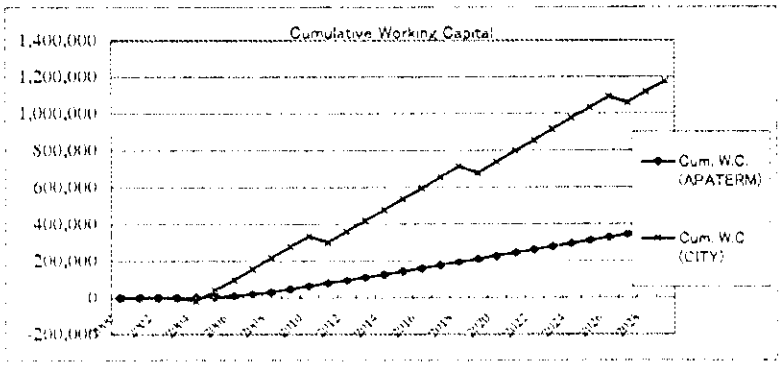
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (L = C)	0	0	0	0	0	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	1,771	8,461	17,402	27,968	38,180	35,669	30,995	28,147	25,114	21,883	18,443	14,780	10,878	6,939	3,577	1,154	0	0	0	0	0	0	0	0	0	0	0
Profit (L = L-J-K)	0	0	0	-1,771	-8,461	-29,288	-39,855	-48,066	-45,555	-42,881	-40,033	-37,000	-33,770	-30,330	-26,666	-22,764	-18,826	-15,464	-13,040	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886
Loan (M)	22,557	86,502	120,236	148,274	127,702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	52,632	201,839	280,550	345,972	297,972	45,835	67,788	86,695	86,695	86,695	86,695	86,695	86,695	86,695	86,695	86,695	83,355	70,548	52,746	30,794	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886
Depreciation (O = J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	492,475	417,213	75,448	86,834	97,530	100,041	102,715	105,563	108,596	111,827	115,267	118,930	119,493	110,524	96,184	78,655	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	93,000	0	0
Payment of principal (R)	0	0	0	1,569	7,686	16,547	27,933	38,629	41,140	43,814	46,662	49,695	52,925	56,365	60,029	60,591	51,722	37,283	17,753	0	0	0	0	0	0	0	0	0	0	0
Applications (S = Q + R)	75,189	288,341	400,786	495,815	433,360	16,547	27,933	38,629	41,140	43,814	46,662	142,895	52,925	56,365	60,029	60,591	51,722	37,283	17,753	93,000	0	0	0	0	0	0	0	93,000	0	0
Working capital of the year (T = P-S)	0	0	0	-3,340	-16,147	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	-34,099	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	-3,340	-19,487	39,415	98,316	157,218	216,119	275,021	333,922	299,824	358,725	417,627	476,528	535,430	594,331	653,233	712,134	678,036	736,937	795,839	854,740	913,642	972,543					

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (EV)	380,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W=E)	0	0	0	0	0	2,674	4,052	5,485	6,979	8,535	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156	10,156
Revenue from lease fee (X=L)	0	0	0	0	0	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015	47,015
Total current revenue (Y=V+W+X)	380,887	371,714	382,865	394,351	406,181	468,056	481,985	496,346	511,155	526,425	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173	542,173
Subsidy (Z=I+K+R=M)	0	0	0	3,340	16,147	45,835	67,788	86,695	86,695	86,695	86,695	86,695	86,695	86,695	86,695	86,695	83,355	70,548	52,746	30,794	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886	11,886
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	0.8%	4.0%	9.8%	14.1%	17.5%	17.0%	16.5%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	15.4%	13.0%	9.7%	5.7%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Criteria for State Guarantee (ZK+R2/Y)	0.0%	0.0%	0.0%	0.8%	4.6%	7.3%	11.6%	15.1%	14.6%	14.2%	13.8%	13.8%	13.8%	13.8%	13.8%	13.2%	10.8%	7.5%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.12%
Coverage to interest (%)	50.0%
Coverage to depreciation (%)	50.0%
Coverage to principal (%)	50.0%

Averaged profit rate	17.3%
Averaged criteria values for guarantee	10.7%
Highest subsidy ratio	17.5%



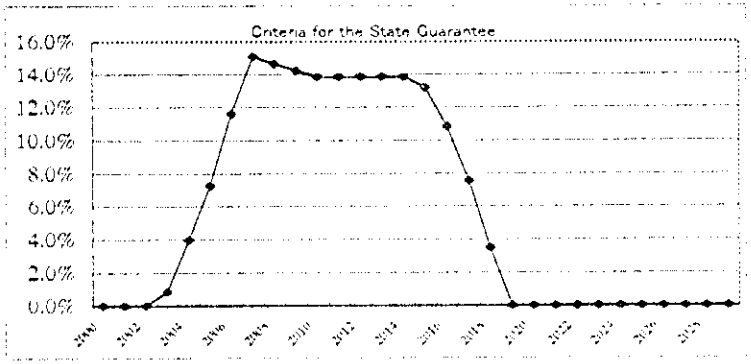


Table AII.7.4 Financial Statements of Galati Financial Plan (Case IVB1)

1. Financial Statements of S.C. APATERM S.A. (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (A)						69,889	75,128	80,901	87,030	93,532	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431	100,431
Operation and maintenance						15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638	15,638
Lease fee (C)						29,451	29,451	29,451	29,451	29,451	31,696	40,307	52,275	67,034	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745
Profit before tax (D = A−B−C)						24,800	30,039	35,812	41,942	48,443	53,097	44,486	32,518	17,759	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047	5,047
Corporate tax (E = 0.38 × D)						9,348	11,415	13,609	15,938	18,409	20,177	16,905	12,357	6,748	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918
Profit after tax (F = D − E)						15,252	18,624	22,203	26,004	30,035	32,920	27,582	20,161	11,010	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129	3,129
Working capital (G = F)						9,348	20,763	34,371	50,309	66,718	86,895	105,799	118,156	124,905	126,823	128,741	130,659	132,577	134,495	136,413	138,330	140,248	142,166	144,084	146,002	147,920	149,838	151,756	153,674	155,592
Cumulative W.C. (H = Σ G)						15,252	33,876	56,080	82,084	112,119	145,039	172,620	192,781	203,792	206,921	210,050	213,180	216,309	219,438	222,568	225,697	228,826	231,956	235,085	238,214	241,344	244,473	247,602	250,732	253,861

2. Galati City Sewerage Account (million ROL)

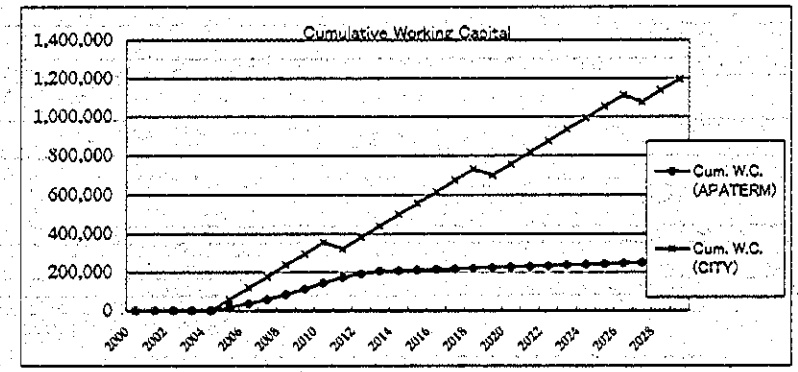
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Revenue from lease fee (I = C)	0	0	0	0		29,451	29,451	29,451	29,451	29,451	31,696	40,307	52,275	67,034	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745
Depreciation (J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Payment of interest (K)	0	0	0	0	0	0	0	0	0	0	1,855	8,897	18,438	29,897	39,176	37,518	35,815	34,066	32,270	30,425	28,530	26,585	24,587	22,535	20,427	18,263	16,040	13,757	11,413	9,005
Profit (L = I−J−K)	0	0	0	0	0	−29,451	−29,451	−29,451	−29,451	−29,451	−29,060	−27,492	−25,065	−21,764	−18,302	−16,674	−14,971	−13,222	−11,426	−9,581	−7,686	−5,741	−3,743	−1,691	417	2,581	4,804	7,087	9,431	11,839
Loan (M)	52,632	201,839	280,550	345,972	297,972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy from city/state budget (N)	22,557	86,502	120,236	148,274	127,702	29,451	29,451	29,451	29,451	29,451	31,696	40,307	52,275	67,034	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745
Depreciation (O = J)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901	58,901
Sources (P = L+M+N+O)	75,189	288,341	400,786	494,246	425,674	58,901	58,901	58,901	58,901	58,901	61,537	71,716	86,111	104,171	120,315	121,973	123,676	125,425	127,221	129,066	130,960	132,906	134,904	136,956	139,064	141,228	143,451	145,734	148,078	150,486
Investment cost (Q)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	0	93,000	0	0	0	0	0	0	0	0	93,000	0	0	0	0	0	0	93,000	0	0
Payment of principal (R)	0	0	0	0	0	0	0	0	0	0	2,636	12,814	27,210	45,270	61,414	63,072	64,775	66,524	68,320	70,165	72,059	74,005	76,003	78,055	80,162	82,327	84,549	86,832	89,177	91,585
Applications (S = Q + R)	75,189	288,341	400,786	494,246	425,674	0	0	0	0	0	2,636	105,814	27,210	45,270	61,414	63,072	64,775	66,524	68,320	163,165	72,059	74,005	76,003	78,055	80,162	82,327	84,549	179,832	89,177	91,585
Working capital of the year (T =P−S)	0	0	0	0	0	58,901	58,901	58,901	58,901	58,901	58,901	−34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	−34,099	58,901	58,901	58,901	58,901	58,901	58,901	58,901	−34,099	58,901	58,901
Cumulative working capital (U = Σ T)	0	0	0	0	0	58,901	117,803	176,704	235,606	294,507	353,409	319,310	378,212	437,113	496,015	554,916	613,818	672,719	731,621	697,522	756,424	815,325	874,227	933,128	992,030	1,050,931	1,109,833	1,075,734	1,134,636	1,193,537

3. Criteria for State Guarantee (million ROL)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Revenue (≡V)	360,887	371,714	382,865	394,351	406,181	418,367	430,918	443,845	457,161	470,876	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002	485,002
Corporate tax from S.C. APATERM S.A. (W≡E)	0	0	0	0	0	9,348	11,415	13,609	15,938	18,409	20,177	16,905	12,357	6,748	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918
Revenue from lease fee (X≡I)	0	0	0	0	0	29,451	29,451	29,451	29,451	29,451	31,696	40,307	52,275	67,034	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745
Total current revenue (Y=V+W+X)	360,887	371,714	382,865	394,351	406,181	457,166	471,784	486,905	502,549	518,735	536,875	542,213	549,634	558,784	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665	566,665
Subsidy (Z=I+K+R−M)	0	0	0	0	0	29,451	29,451	29,451	29,451	29,451	31,696	40,307	52,275	67,034	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745	79,745
Criteria for subsidy level (Z/Y)	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	6.2%	6.0%	5.9%	5.7%	5.9%	7.4%	9.5%	12.0%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%
Criteria for State Guarantee ((K+R)/Y)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	4.0%	8.3%	13.5%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%

Parameter Input Section	
Ratio of Sewerage Charge to Income (%)	1.12%
Coverage to Interest (%)	50.0%
Coverage to depreciation (%)	50.0%
Coverage to principal (%)	50.0%

Averaged profit rate	10.5%
Averaged criteria values for guarantee	15.5%
Highest subsidy ratio	14.1%



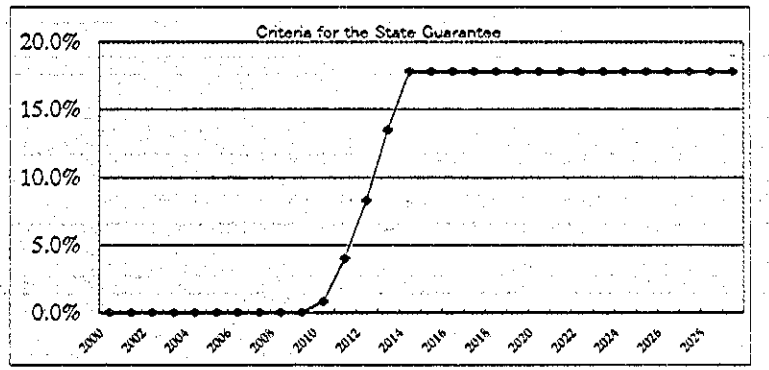


Table AII.7.5 Cost Benefit Stream for Galati WWTP Project

(Unit: million ROL)

Year	Project cost		Economic benefit (C)	Benefit - Cost (C-A-B)	Discounted cash flow**	
	Investment cost* (A)	O&M cost (B)			Cost	Benefit
2000	73,986	0		-73,986	73,986	0
2001	283,728	0		-283,728	257,935	0
2002	394,374	0		-394,374	325,929	0
2003	486,338	0		-486,338	365,393	0
2004	418,863	0		-418,863	286,089	0
2005	0	15,638	665,212	649,574	9,710	413,044
2006	0	15,638	665,212	649,574	8,827	375,495
2007	0	15,638	665,212	649,574	8,025	341,359
2008	0	15,638	665,212	649,574	7,295	310,326
2009	0	15,638	665,212	649,574	6,632	282,115
2010	0	15,638		-15,638	6,029	0
2011	0	15,638		-15,638	5,481	0
2012	380,808	15,638		-396,446	126,320	0
2013	0	15,638		-15,638	4,530	0
2014	0	15,638		-15,638	4,118	0
2015	0	15,638		-15,638	3,744	0
2016	0	15,638		-15,638	3,403	0
2017	0	15,638		-15,638	3,094	0
2018	0	15,638		-15,638	2,813	0
2019	0	15,638		-15,638	2,557	0
2020	380,808	15,638		-396,446	58,929	0
2021	0	15,638		-15,638	2,113	0
2022	0	15,638		-15,638	1,921	0
2023	0	15,638		-15,638	1,746	0
2024	0	15,638		-15,638	1,588	0
2025	0	15,638		-15,638	1,443	0
2026	0	15,638		-15,638	1,312	0
2027	0	15,638		-15,638	1,193	0
2028	380,808	15,638		-396,446	27,491	0
2029	0	15,638		-15,638	986	0
Total	2,799,713	390,950	3,326,060	135,397	1,610,631	1,722,339

* Conversion factor = 0.984

** Discount rate = 10.0 %

EIRR=	13.1%
NPV =	111,708 million ROL
B/C =	1.07

APPENDIX 8
ENVIRONMENTAL IMPACT ASSESSMENT SURVEY

1. INTRODUCTION

1.1 THE OBJECTIVE AND SCOPE OF THE STUDY

According to "Scope of Work for the Feasibility Study on Wastewater Treatment Along the Danube River Downstream Reach in Romanian" agreed upon between Ministry of Public Works and Territorial Planning (hereafter called as MPWTP) and Japan International Cooperation Agency (hereafter called as JICA), Environmental Impact Assessment (hereafter called as EIA) would be carried out based on the Romanian regulations as a part of the Feasibility Study on Wastewater Treatment along the Danube River Downstream Reach in Romanian. The objectives of the EIA are as follows:

(1) To review the existing environmental conditions in EIA study area;
(2) To assess environmental impacts of the proposed projects, and
(3) To propose countermeasures for mitigating impacts and environmental monitoring plan.

The Environmental Impact Assessment areas cover three cities, which are Braila, Galati and Tulcea.

1.2 EIA SITUATION IN ROMANIA

The methodology for EIA is outlined in "Official Order of Romania, No. 125/1996," issued by MWFEP. The application procedures for EIA are prescribed under "Permitting Procedures for Economic and Social Activities Having an Environmental Impact According to the Environmental Protection Law No.137/1995, April 11th, 1996," by MWFEP.

The Order No.125 sets out the typical contents of an environmental assessment as follows:

(1) Introduction, methodology and goals;
(2) Engineering baseline including function of the project;
(3) Environmental baseline, including;

- geology
- soils
- water resources
- climatic data
- aquatic and terrestrial ecology, including flora, fauna, aquatic habitats and deltas
- socio-economic and cultural issues including the protection of historic buildings
- health, pollution and microclimatic issues, and
- noise, transport and affected population

(4) Pollution issues, including water pollution/water quality, air pollution, noise and vibration, radiation, waste management, and toxic/dangerous substance management;
(5) Environmental impact. This comprises two categories, initial study and monitoring study, which address, water impact, air impact, flora and fauna, soil and subsoil

(6) Mitigation/reduction or elimination of impact, and
(7) Evaluation of final impact and conclusion.

According to the Law, the wastewater treatment plant development and improvement program is required to submit the EIA to the local regulatory agencies for review and public debate. The comments made thereon are then incorporated in the EIA report, which is submitted to MWFEP for final approval.

Two steps are generally taken for the assessment; Initial Environmental Examination (IEE) and EIA. Although there are no IEE national guidelines at present, the IEE is basically designed as a means of reviewing the environmental integrity of projects to determine whether EIA-level studies must be performed. In this sense the IEE is used for project screening to determine which environmental impact items require a full-scale EIA.

In accordance with Law 137/1995 and other relevant regulations, EIA shall be carried out only be certified Natural or Legal Persons. The analysis of samples for EIA shall be completed only by specialized laboratories using adequate equipment and methodologies in conformity with the existing norms and regulations.

1.3 THE REGULATIONS USED IN EIA STUDY

The regulations used in EIA study are showed as follows:

(1) Environmental Protection Law, No. 137/1995;
(2) The Order of Ministry of Water, Forests and Environmental Protection (MWFEP), No. 125/1996 – EIA;
(3) The Water Law, No. 107/1996;
(4) NTPA 001 – Load Limits of Pollutants in Waste Water Discharged in Water Resources;
(5) NTPA 002 – Quality Indicators of Waste Water Discharged into Sewage Systems;
(6) STAS 4706/1988 – Surface Waters (Categories and Quality Condition);
(7) STAS 1342/1991 – Standard for Drinking Water Quality;
(8) The Order of MWFEP, No. 756/1997 – Environmental Protection for Soil Pollution;
(9) The Order of MWFEP, No. 462/1993 – Maximum Concentrations of Effluents Pollutants Emitted into the Atmosphere Given for Emissions Levels;
(10) STAS 12574/1987 – Maximum Allowable Concentrations for Air Pollutants in Human Settlements;
(11) The Governmental Decree, No. 71/1996 – Fire Precaution;
(12) The Order of Health Ministry, No. 1935/1996 – Hygiene at Working Places;
(13) The Work Protection Law, No. 90/1996;
(14) The Order of Health Ministry, No. 536/1997 – Noise Admissible Level at the Limit of the Developed Location;
(15) STAS 12025/2-81 – Vibration Standard, and
(16) STAS 10009/1988 – Urban Noise Standard.

1.4 EIA IMPLEMENTING ORGANIZATION AND SPECIALISTS

Research and Development National Institute for Environmental Protection (hereafter called as ICIM Bucharest) which is selected as the implementing organization for EIA is certified by MWFEP for performing EIA with the certificate R-EIM-1-764 (be valid from Jan. 28, 1999 to

Jan. 28, 2001) for transportation, power supply, civil and hydrotechnics constructions, waste management, tourism, industrial activities, water and wastewater treatment.

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The EIA survey works is performed by the following specialists:

- Team Leader for all the three projects – Dr. Alexei Atudorei
- Team Leader for each city

  Tulcea – Mr. Gabriela Pietrareanu
  Galati – Mr. Mihaela Chiarescu
  Braila – Dr. Vasile Calin

- Five experts for each city (sewerage, hydrologist, geologist, ecologist and sociologist)

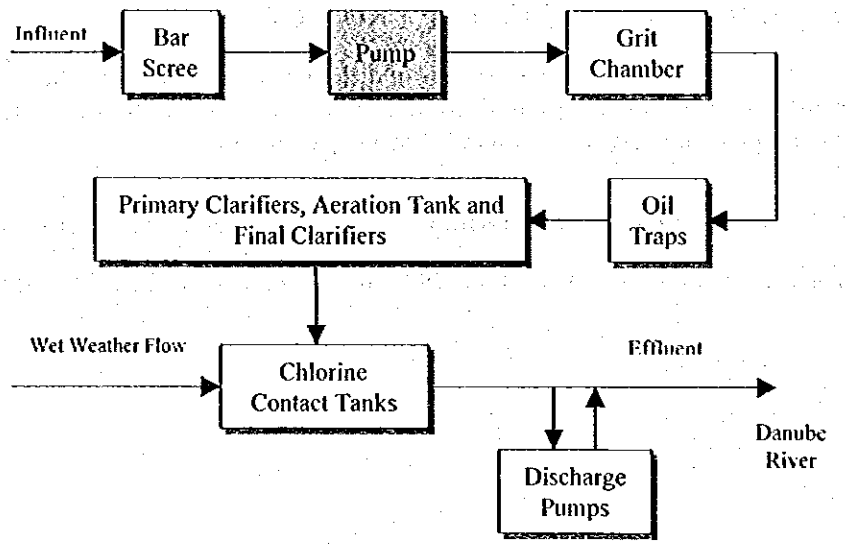
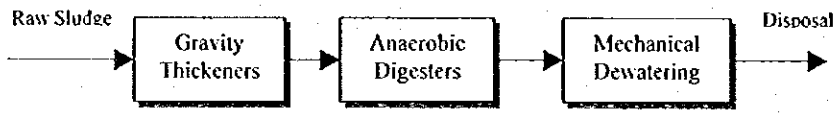
2. EIA FOR GALATI WWTP PROJECT

The present environmental situations and the potential impacts on the environment after the construction of WWTP are defined and the results and possibilities to reduce or remove the environment impacts are shown in following paragraphs.

2.1 DESCRIPTION OF PROPOSED PROJECTS IN THE FEASIBILITY STUDY (F/S)

The details of proposed WWTP in F/S Study are summarized in Table AII.8.1.

Table AII.8.1 Summary of proposed WWTP in Galati City

Item	Description of Proposed WWTP
1. Location	The proposed WWTP site with about 25 hectares is located on the north side of the railway lines at the northern-eastern part of the City about 4 km downstream from the center of the City (Figure AII.8.1).
2. Capacity etc.	Service population in the year 2010: 377,000 (Total population: 400,000) Design average daily flow: 200,000 m^3/d Design maximum daily flow: 235,000 m^3/d Design maximum hourly flow: 285,000 m^3/d
3. Wastewater Characteristics	Design influent quality / Design effluent quality / Standard of NTPA 001 BOD_5: 130 mg/l / 18 mg/l / 20 mg/l SS: 150 mg/l / 22 mg/l / 60 mg/l T-N: 20 mg/l / 10 mg/l T-P: 3 mg/l / 1 mg/l
4. Treatment Method	Treatment method: Conventional activated sludge process Treatment-process flow diagram: Wastewater Flow  Sludge Flow 
5. Sludge Production and Disposal	Dewatered sludge production: 108 m^3/d (39,420 m^3/year) or: 21.6 ton/d (7,884 ton/year) Disposal method: landfill at Galati Solid Waste Disposal Site
6. Life of Facilities	The lift of facilities: Machinery and equipment – 30 years Civil facilities – 50 years

2.2 DESCRIPTION OF THE ENVIRONMENT

2.2.1 CLIMATE, AIR QUALITY (ODOR), NOISE AND VIBRATIONS

(1) Climate

The climate characteristics are summarized in Table AII.8.2.

Table AII.8.2 Summary of climate characteristics in Galati

Item	Description	
1. Climate	The climate of Galati city belongs to the continental climate sector.	
2. Temperature	The average annual temperature in Galati City:	10.5℃
	The average monthly temperature in July (the hottest month):	22.6℃
	The average monthly temperature in Jan. (the coldest month):	- 3.1℃
3. Freezing Day	The average number of freezing day	91.3 days
	The average number of snowing day: days	41.3
4. Precipitation	The average annual precipitation:	426 mm
	The average monthly precipitation in June (the max. month): mm	62.1
	The average monthly precipitation in Feb. (the min. month): mm	23.1
5. Wind	The average annual frequency:	NE - 19.8% N - 16.1% SW - 14.7% S - 10.0%
	The average annual velocity:	2.4 - 5.3 m/s

Source: Galati City and ICIM

(2) Air Pollution (Odor)

The most important sources of air pollution are: the transportation equipment (road traffic) which issues 66% of the air pollutants (out of which 98% belongs to SIDEX SA), electrical and heat power plants with a total of 23% and SIDEX SA with a pollutant issue of about 11%.

Regarding odor, the results of measurements in/around proposed WWTP site are presented in Table AII.8.3. The locations of sampling points are shown in Fig. AII.8.1, and the samples are taken at 2.5 m above the ground level.

Table AII.8.3 Some results of air pollution measurements in the WWTP site (July 1999)

Parameter	Boundary fence	50m from boundary fence	150 m from boundary fence	Limits for 30 minutes sampling period according to RS 12574/1987
H_2S (mg/m^3)	0.0006	0.0004	0.0003	0.015
NH_3 (mg/m^3)	0.018	0.012	0.010	0.3
Odor Level	1	1	1	5

Source: ICIM

The results of survey show that hydrogen sulfide and ammonia concentrations as well as the odor level in/around proposed WWTP site are keeping at a relatively low level.

(3) Traffic, Noise and Vibration

As the proposed plant land is located in the sparsely developed area, therefore, no severe traffic congestion, noise and vibration problems are expected during the plant construction.

2.2.2 GEOLOGY AND TOPOGRAPHY

(1) Geology and Topography

Galati City is located in the eastern extremity of the country, on Covurlui plain, on the left bank of the Danube River, 7 km downstream of Danube-Siret junction and 150 km upstream the Danube discharging into Black Sea. The topography of the area is dominated by plains (69%) which belong to Romanian Plain (the City is located at a joint point of five geographical units: the Danube floodplain, the old Macin Mountains, the Baraganu Plain, the Low Siret Plain and the Covurlui Plain).

WWTP is planned to be located to the northern-eastern zone of Galati town in the close vicinity of pump station, on the north side of the railway lines. Presently available land for the Galati WWTP is a farmland of about 25 ha area. This land area is considered sufficient to provide all the facilities required for the preliminary, primary and secondary treatment. There will be a space for any future plant expansion facilities.

The surrounding areas of the plant site are agricultural lands and presently neither residences nor major structure exists within 300 m from the site.

(2) Seismology

Galati town belongs to a seismic macro-zone of VIII degree according to the Romanian standard STAS 11100/1 -- 77. According to the calculation Normative P100-1992, Galati town territory correspond to the calculation seismic zone "C" with a coefficient K_S=0.2. The corner period is T_C=1.5s.

(3) Soil

There are a few types of soil in the area: carbonated chernozem is dominant but there are also eolic sands and lacustrine sand depots in the area located between the rivers. There are alluvial soils associated with hidromorphe soils on an important area in the city location, on river meadows. As a rule these soils are frequently subject to gleization being situated in the valleys that are periodically flooded and have the phreatic layer at low depth. Interruption of their solidification process due to the continuous disposal of new sediments at each flood event is another characteristic of these soils. Also they are usually relatively fertile being well supplied with nutrients from the sediments that primary are soil material from the catchment area. The alternatively stratification is the reason for erosion processes probability.

2.2.3 FLORA AND FAUNA

(1) Terrestrial and Aquatic Vegetation

The Galati city area is located in the steppe zone which is characterized by secondary lawns with *Botriochloa ischaemum* or *Andropogon ischaemum, Poa bulbosa, Artemisia austriaca, Eophobria stepposa, Stipa copillata, Festuca valesiaca.* These vegetation types are living only

on small areas, the dominant flora consisting of agricultural vegetation. In the rivers' meadows there are hygrophilias grass associations (*Agrostis stolonifera, Agropyron repens, Alopecurus pratensis*), poplar trees and willow trees.

The wild *graminaceae* are predominant species on the natural meadows. Some other floral species such as *shepherd's purse, knot grass, whirlwind, bristle grass, dandelion, wormwood* etc. could be also found.

Wood vegetation species like *sole tree bushes, small wild cherry, small almond tree,* and *black nut tree* could more rarely be met.

Tree vegetation is less represented in this area. There are although some meadow river forests formed primary by *willow* and *poplar* and secondary by *oak* and other species.

Psamophyte vegetation species like *camomile* and *sand willow* grow spontaneously on the sand dunes.

Halophyte vegetation well developed in Galati southern zone is the only one capable to grow in the salty soil. It is disposed in circular zones or patches according with the salinization degree and is represented by some small plants with a thick red.

The aquatic vegetation is represented mainly by a large number of floating and submerse species from hydrophyte group as well as by plankton and macrophyte. Along pools and irrigation canals banks grow bulrush, reed, sedge, Dutch rush and so on.

(2) Terrestrial and Aquatic Fauna

Both sedentary and migratory animals live in the area. The human actions like steppe upturning and realization of irrigation system have been followed by fauna changes:

- some species disappeared;
- individual number of other species decreased: wolf, wild turkey, pelican;
- some species have migrated to other places;
- other species accommodated to life conditions on irrigation canals or cultivated fields: for instance wild ducks feed with sunflower seeds.

The most numerous mammals are the steppe type ones: ground squirrel, steppe polecat, striped mouse, dear, pheasant, enot dog, scolopendra, field mouse, steppe mouse, rabbit, hamster. Of hunting interest are muskrats that can be found in large number.

Dears, foxes and rabbits could be hunt in the forests. Many water and forest species of birds both sedentary and migratory populate Galati zone.

Around the waters live duck, big geese, seagull, heron, lapwing, white-fronted goose, snipe, moor hen, woodcock, eastern flossy ibis, etc. Swans nestle on the Insula Mica (Small Island) and even on some lakes. Many starlings live in steppe and in some villages. A large part of them migrate in the autumn.

One can meet also quail, partridge, bee eater, sparrow hawk, turtle dove, buzzard, fisher eagle and little owl individuals but not so many of them. Wild cock, crow, magpie, skylark, nightingale, tit and so on live in forests.

The aquatic fauna is dominated by carp and migratory fish in the Danube River (great sturgeon,

mackerel). Local fishes are carp, crucian carp, sheatfish, pike perch, barbel, tench, pike, lake herring, bleak, roach, pope. Among the migratory ones some are of economic importance: sterlet, sturgeon and herring. Population individual number of some fish species like pike, sturgeon, sheatfish and zander has decreased during the last two decades.

2.2.4 WATER RESOURCES

(1) Ground Water

Two aquifer layers could be identified.

- The phreatic layer taking refuge in the sandy level placed at the basis of loessial level. The natural water supply source of this layer is the precipitation water infiltrated through the loess grains and stored in here due to the impermeable clay layer found underneath at a depth around 20 m.

- The aquifer layer of average depth, of ascending type, in the lower sand and gravel level. Its water supply source is the Danube River that influences the underground water regime of the entire Galati town platform zone.

An important general raising of the phreatic layer level from 10 – 11 m to 3 – 4 m under the terrain surface has been registered in this area in the last 10 – 15 years. The phreatic layer contained initially in the sandy level has gradually raised up immersing the lower part of the loessial level.

The cupola hydrostatic level reaches a maximum value during spring and a minimum one in autumn especially in October.

The main causes of hydrostatic level increasing in Galati town area are as it follows:

1) raised hydrostatic level in the Low Siret Plain area;

2) geological formations of the first aquifer layer are fine and dusty sands the minimum value of their thickness being of 1 m in the Danube flood plain area; these formations reduce very much the hydraulic section of water discharge into the Danube;

3) the permeability coefficient of the same layer is 10^{-5} m/s which indicates a medium that permits only a slow water movement;

4) the highest values of the hydraulic gradients are 1:100 having direct implications on the water retention;

5) underground water retention in cupola form is a phenomenon specific to the large urban settlements located on loessial platform as it is also the case of Galati town;

6) leakage from the urban water supply and sewage system;

7) existence of buildings and asphalt cover of the streets that hinder the evapo-perspiration process;

8) permeability coefficient of the clay dusts that cover the Galati platform area has a small value of 10^{-5} m/s which does not permit a rapid drainage of the leakage to the underneath sand level.

It is thought that causes 6) and 7) are the main ones of the raising of hydrostatic level in Galati town area.

The Danube River influences mainly the cupola found in the flood plain zone. Other level increases are not expected but a supplementary water contribution could expand the cupola surface.

Underground water quality in the site as resulting from ICIM measurements performed for this study purpose area is presented in the Annex 3. As it can be seen the parameters analyzed respect the Romanian Standard 1342/91 – "Drinking Water", except: turbidity, color, iron, manganese, aluminum, lead, ammonia, organic substances and all bacteriological parameters.

(2) Surface Water

Rivers

The surface water sources are dominated by three big collectors: Siret, Prut and the most important Danube. The Danube River is bounding the county on 20 km, between the junctions with Siret River and Prut River. The multi-yearly medium flow is about 6100 m^3/s. The maximum volume (34% from yearly volume) in reached on spring and the minimum (18% from yearly volume) on autumn. Considering the necessities the river quality should be in the I category, but because the registered pollutants concentrations the river quality is in the II category.

Siret River is discharging into Danube River just upstream the Galati City, with a multi-yearly medium flow about 230 m^3/s in that section. The maximum volume (48% from yearly volume) is reached on spring and the minimum (12% from yearly volume) on autumn. Because the registered pollutants concentrations, the river quality is in the II category.

Prut River is discharging into Danube River downstream the Galati City, with a multi-yearly medium flow about 110 m^3/s in that section. The maximum volume (45% from yearly volume) in reached on spring and the minimum (12% from yearly volume) on autumn. Because the registered pollutants concentrations, the river quality is in the II category.

Lakes

Brates Lake is the biggest and the most important lake in the area with a surface of about 24 km^2, between Galati City and Prut river. It is used for fishing and recreational purposes.

2.3 IMPACTS ON ENVIRONMENT

2.3.1 IMPACTS ON SOCIOECONOMIC CONDITIONS

(1) Water Rights and Rights of Common

As mentioned in previous section, at present all the wastewater used to be discharged directly into the Danube River through seven wastewater outfalls without any treatment. According to the F/S Study after WWTP being put into operation the existing outfalls will be closed and all of the wastewater will be collected and treated at WWTP, and the pollution load discharged to the Danube River will be reduced obviously. Therefore, the project implementation will not create the impact on the fishing rights.

Before and after the project implementation, there are no changes about the volume of wastewater discharged to the Danube River. Besides this, the intake for water supply system of Galati City is located in the upstream of 8 km from the center of the City, and the nearest intake in the downstream of Galati City is far from WWTP outfall. Therefore, it could be considered that the effect of wastewater on water rights is negligible.

In Galati there is one swimming pool which is located on the left side of the Danube River bank between the sewer outfall No. 4 and No.5, and there is only one unauthorized swimming area on the right side of the Danube River bank in the ferry-boat area. In addition, the inhabitants usually swim along the Danube River bank where are unauthorized areas by the local health authorities. However, as mentioned above in the future the existing outfalls will be closed and all of the wastewater will be collected and treated at WWTP, then discharged at the downstream of the City. It is estimated that the rights of common will be improved by the project implementation.

(2) Public Health Condition

Treated Wastewater

The results of wastewater characteristics survey at existing outfalls along the Danube River reach of Galati City revealed that the number of total Coliform Group in raw wastewater, which now is discharged directly into The Danube River, is about 1×10^6 no./100ml to 1×10^8 no./100ml. While the number of total Coliform Group in The Danube River (1 km downstream from the outfall of proposed WWTP, Aug. 1999) is 4.3×10^3 no./100ml to 4.9×10^3 no./100ml, which has exceeded the standard (1×10^2 no./100ml, STAS 12585/1987) of water for swimming purposes.

According to the F/S Study after WWTP being put into operation all of the existing outfalls will be closed and all of the wastewater will be collected and treated at WWTP. The number of total Coliform Group in WWTP effluent will be meet the standard (1×10^6 no./100ml, NTPA 001) of wastewater discharged in water resources. Hence, during WWTP operation stage the public health condition will be improved certainly.

Sludge

The excess sludge generated from WWTP will be transported and disposed at the Solid Waste Disposal Site (SWDS) located in the southwest of the City about 4 km from the center of the City constructed in 1998. The impacts of excess sludge will be discussed in following paragraph.

(3) Waste

The area of existing SWDS in Galati is about 2 ha. And the capacity is estimated to be about 200,000 m^3. In addition, the results of wastewater characteristics of leachate from SWDS in Galati indicated that the concentrations of the organic substances (BOD_5: 4,135 mg/l, COD_{Mn}: 8,780 mg/l), NH_4-N (635 mg/l) and oil (580 mg/l) have exceeded the standard (NTPA 002/1997) of wastewater discharged into municipal sewage system substantially. Meanwhile, the number of total Coliform Group in the leachate is also relative high (3.5×10^8 no./100ml). All of these may contribute a negative impact on groundwater. Therefore, a new SDWS plan properly designed and managed from the environmental viewpoint, or searching for other disposal routes such as agricultural use or incineration etc. are considered to be necessary, taking into account the groundwater pollution problem and the volume of excess sludge (108

m^3/d or 21.6 t/d) generated from WWTP.

(4) Hazards

The results of geological survey indicated that the surface (0 to 1m) at WWTP site is vegetable soil and the bottom (1 to 10 m) is soft plastic black and grey clay, and N-value of WWTP site ranges from 15 to 50. Taking into consideration the WWTP site locates in the seismic region, a careful aseismatic structure design will be considered in the planning and design of the wastewater treatment facilities.

Biogas resulting from sludge digester is a potential explosive fuel. So in some conditions there exists the possibility of producing accidents with major effects both on facility operation and maintenance staff (such as burning, different physical or mental injuries sometimes even lethal) and on technological objectives. Receiver water and/or soil and subsoil in the area might be affected by spillage of liquids following the breaking or destruction of technological objectives.

These events may appear in case of the incorrect operation and maintenance of sludge fermentation tanks and/or of biogas tanks.

In addition, the chlorination process is to be carefully controlled, avoiding overdosing of chlorine and by respecting the operation and maintenance instructions.

2.3.2 Impacts on Natural Conditions

(1) Topography and Geology

No significant changing of the existing topographic condition in/around the WWTP site is identified. Based on the results of geological survey, soil in the WWTP site may be considered to be soft at some extent for supporting the structures, thus appropriate types of foundation should be considered for the structural plan.

(2) Groundwater

As shown in Table AII.8.4, the results of groundwater survey at/around the SWDS indicated that the number of Coliform Group ranged from 9.2×10^2 no./100ml (upstream) to 1.6×10^4 no./100ml (downstream), which already exceeded the standard (under 10 no./100ml, STAS 1342/1991) for drinking water, and the groundwater around the SWDS has been polluted at some extent, especially for the Coliform Group. Hence some countermeasures for protecting groundwater from pollution should be considered.

Table AII.8.4 Quality parameters of the groundwater in the Galati solid waste disposal site

Parameters	Max. Desirable-Max. Permissible	Upstream Of SWDS	Downstream 1 Of SWDS	Downstream 2 Of SWDS
Color	2-2	2.0	2.4	2.9
pH	6.5~7.4-8.5	7.72	7.90	7.70
SS (mg/l)	-	12.05	18.30	16.20
Ammonia (mg/l)	0-0.5	0.01	0.01	0.38
Magnesium (mg/l)	50-80	80.15	80.20	87.50

Turbidity	5-10	9.7	28.5	9.4
Total number of bacteria at 37°C UFC/cm^3	Under 300	Over 300	Over 300	Over 300
Coliform bacteria/100 cm^3	Under 10	920	16,090	1,609
Fecal Coliforms/100 cm^3	Under 2	94	1,609	240
Fecal streptococcus/100 cm^3	Under 2	26	79	33

(3) Hydrological Situation

According to F/S Study the flow rate (3.3 m^3/s, maximum hourly flow) of effluent from WWTP is insignificant comparing with the flow rate of the Danube River (1,380 m^3/s, drought-period flow). The effects of treated wastewater on hydrological situation of Danube River are negligible.

In addition, based on the design effluent flow in F/S Study, the pollutant diffusion and dilution characteristics are analyzed by using "MIKE 11" model, created by Danish Hydraulic Institute-November 1992, Version 3.01. The calculation results indicated that complete mixing is achieved at a distance of 3 km downstream of WWTP outfall in all cases studied here.

(4) Fauna and Flora

Galati town WWTP is provided to be located on a site used now for agricultural purposes. Obviously the type of land use will be changed so the crop plants and the associated little fauna will disappear.

The disturbance of the biological equilibrium in an aquatic ecosystem depends on the polluting substances nature and their discharged quantities, the frequency they are discharged, their mode to go into the emissary, the way the effluent and the emissary water are mixed, the dilution process, and so on. These factors are determined by a few conditions, some of them concerning the effluent and the others concerning the emissary.

According to the reports about the control sections of Danube River, elaborated by Regia Autonoma Apele Romane on the basis of the performed biological analysis, results that the Danube water quality in these sections is within the β- mesosaprobic category, by the degree of saprobity. The presence of the β- mesosaprobic category biocenosis indicates that the water self-purification process is normal.

From the biological point of view, this area is characterized by a high plants and animals diversity, the number of species being high and the individual number being generally low; the "water blooming" is rarely observed.

In that area there are many species of chlorophyll a, represented by algae, diatoms and macrophyte. The best developing protozoa are the ones sensitive to the organic matters loading (some species of Heliozoa and Suctoria). There are Sponges, Bryozoa, Coelenterata and most of the Gasteropada, Lamellibranchiata, Crustaceans and Insects larvae species, too. Vertebrated species are represented by most of the amphibians and fishes.

The biological indicators in this area belong to Cyanophyta (species of *Microcystis, Gloetrichia, Oscillatoria, Nostoc, Aphanizomenon*), Diatoms (species of *Melosira, Diatoma, Fragilaria, Synedra, Pinnularia, Nitzschia, Surirella,* aso.), Rhizopoda (species of *Amoeba*), Flagellata (*Synura uvella* and *Uroglena volvox*), Ciliates (*Paramaecium bursaria, Didinium nasutum,*

Coleps hirtus, Aspidisca costata, Vorticella campanula aso.), Rotatoria (*Brahionus urceus, Monostyla lunaris*).

Specific macroinvertebrates are: worms (*Stylaria lacustris, Dendrocoellum lacteum*), mollusks (*Ancylus fluviatilis, Pisidium cinereum*) and insects (*Cloeon dipterum, Habrophlebia lauta, Hydropsyche lepida, Potamanthus luteus*).

There is an abundant periphyton with many diatoms (*Navicula rhynchocephala, Synedra acus, S. ulna, Pinnularia viridis)* on the *Elodea, Lemna, Ceratophyllum* stalks and leaves; there are green algae (*Ulothrix zonata, Cladophora crispata,* species of *Closterium*), on different objects and plants.

The "water blooming" process is sometimes developed due to the excessive growing of some Cyanophyta species: *Oscillatoria agardhii, O. redekei, Microcystis aeruginosa, M. flos-aquae, Aphanizomenon flos-aquae.*

A general feature of the organisms that belong to the β - mesosaprobic category is a higher sensitivity to the decrease of the dissolved oxygen concentration, to the pH variation and to the toxic substances generated by the decomposition processes.

Since the WWTP will ensure the effluent quality required by the Romanian Standards it could be appreciate that no negative consequences on the aquatic flora and fauna within Danube River and/or Danube Delta area are to be expected.

2.3.3 Environmental Pollution

(1) Water Pollution

In the period of July 1999 ICIM carried out an industrial wastewater survey and analyzed for the wastewater discharged from more than 13 representatives industrial units. The results (Annex 6 and Annex 7) revealed that the concentrations of toxic materials, which may effect biological process for wastewater treatment, are under the standard of NTPA 002/1997. This can leads the conclusion that industrial wastewater will don't contribute a significant impact on WWTP influent characteristics.

Environmental Impact during Construction Period

During construction period the sanitary wastewater generated from site administration house may affect environment temporarily. Therefore, this part of wastewater should be collected and treated by some appropriate.

During the construction stage, every precaution shall be taken to prevent the spillage of waste form construction sites to the nearby waterways. There will be no major facility applied during construction that may affect the surface or the ground water. Routes, directions and hydraulic conditions of the streams and stormwater drains, presently discharging water to the Danube River, need not to be changed due to the construction works. The construction of all the different elements of the interceptor sewers has no direct impact on the quality of the surface water. There will be no major construction activities in streams or drains, except outfall structures. Although the works in the streams or drains could be minimized to the extent practicable, unavoidable activity may take place in the riverbed during the low-flow season.

The effluent outfall structure should be of such that can divert and disperse surface water flows to prevent erosion and to protect slopes of the riverbank. The structure should be lined and provided with energy dissipaters at discharge points to avoid erosion.

Storm water runoffs from the construction site should be collected and drained through properly designed drainage ditches to the nearby streams or other waterways.

Overall, during the construction period no appreciable adverse impacts to the surface water or ground water in/around the construction site are identified.

Environmental Impact during Operation Period

The quantities of pollutant load reduction by the project implementation are estimated in Table AII.8.5 based on the F/S Study. From this table, 8,176 tons of BOD_5 and 9,344 tons of SS per year (in target year, 2010) will be no more discharged into Danube River, so the impacts on the water quality during WWTP operation will be a positive one.

Table AII.8.5 Estimated pollutant load generation and reduction (2010)

Effluent Characteristics	Without Project	With Project	Reduction
Average Flow Rate (m^3/d)	200,000	200,000	0
BOD Concentration (mg/l)	130	18	112
BOD Load (ton/year)	9,490	1,314	8,176
SS Concentration (mg/l)	150	22	128
SS Load (ton/year)	10,950	1,606	9,344

Moreover, 1,314 tons of BOD_5 and 1,606 tons of SS per year (2010) will be discharged into the Danube River with WWTP effluent. In order to assess the impacts of effluent on the receiving water – the Danube River, pollutant concentrations in the mixture formed by the Danube River and WWTP Effluent have been simulated, taking into account river self-purification process and especially phenomena like pollutant diffusion, dilution and dispersion that contribute to this process. The results of simulation are presented in the Table AII.8.6, which shown that the maximum concentrations of BOD_5 and SS at downstream of complete mixing section (about 3 km downstream from the outfall of proposed WWTP) will be under the Maximum Allowable Concentration (MAC) of second quality category in STAS 4706/1998 (surface water quality).

Table AII.8.6 Maximum concentration of pollutant in the mixture

Receive Flow (m^3/s)		Q_{min}=1,380		Q_{avg}=6,400	
Effluent Flow (m^3/s)		$Q_{d\ avg}$=2.31	$Q_{h\ max}$=3.30	$Q_{d\ avg}$=2.31	$Q_{h\ max}$=3.30
Item	MAC for II - Category	Maximum concentration on the complete mixing section (3 km downstream from the outfall of WWTP)			
BOD (mg/l)	7	6.84	6.85	6.80	6.81
SS (mg/l)	60	60	60	60	60
NH_4 (mg/l)	3	2.75	2.79	2.22	2.25

It should be pointed that the total nitrogen and phosphorous concentrations of the effluent exceed the MAVs mentioned in NTPA 001 as shown in Table AII.8.1. There are three aspects which must be considered:

1) The Danube River has a high capacity of uptaking these elements by dilution (in drought-period the dilution factor is more then 500:1), so the change of water quality is an out of the question issue.

2) Dilution principle is accepted in special courses (GD 730/1997, Art.4, para.7)

3) Providing denitrification and phosphorous removal unit operations in the treatment process appears to be unrealistic to the following reasons:

- The investment cost will be almost doubled for achieving negligible results as for as environmental protection is concerned;
- Risks to get bad effects on environmental due to complicated operation of denitrification process, and
- The implementation of denitrification and phosphorous removal processes looks too ambitious for not stringent requirements (there is no denitrification process applied in any WWTP in the country, nor in the other riparian countries).

Nevertheless, these steps of treatment are to be considered in the next stage of design.

In conclusion the impact on the water environmental during WWTP operation will be a positive one, if the plant will operate on the designed conditions.

(2) Soil Pollution

To estimate the concentrations of typical heavy metals in excess sludge from proposed WWTP and to evaluate the concentrations of heavy metals in the soil in/around the WWTP site and sludge disposal site, a survey on soil and sludge from existing WWTP of Roman and Constanta is carried out. The results are summarized in Table AII.8.7.

Table AII.8.7 Summary of heavy metals in soil (Galati) and sludge (Roman and Constanta)

Item	Soil (Galati)				Sludge in existing WWTP			
	WWTP	Sludge Disposal site (Inside)	Sludge Disposal site (outside)	Max. Desirable - Max. Permissible	Min.	Max.	Average	Max. Permissible Values of Standard
C_d (mg/l)	0	3.25	0	1-5	0	0	0	10
C_r (mg/l)	12.5	140	6	30-300	0	0	0	500
C_u (mg/l)	3.5	134.25	3	20-250	28	137	66	500
M_n (mg/l)	210	280	155	900-2,000	-	-	-	-
N_i (mg/l)	11.5	34.25	16.5	20-200	0	0	0	100
P_b (mg/l)	29.5	180	7.9	20-250	8	102	53	300
Z_n (mg/l)	415	580	290	100-700	243	1,600	645	2,000

The analysis results indicated that the concentrations of heavy metals in the soil (WWTP site, solid waste disposal site and agricultural field) and sludge generated in existing WWTP of Roman and Constanta are under the Romania Standard. This creates a possibility to utilize digested and dewatered sludge in agriculture. In present there are not standards concerning the quality of the sludge that could be deposited on the agricultural field as fertilizer, but there is a proposal that will be approved in the near future. The proposal has been taken into

consideration the present study, and all the results obtained from the sludge analysis are compared with the values from the proposal (the proposal is based on EU regulations).

(3) Offensive Odor

According to the results of measurements for odor in/around the WWTP site as shown in Table AII.8.3, the concentrations of H_2S (0.0006 mg/m^3), NH_3 (0.018 mg/m^3) and odor level (Level 1) on the WWTP boundary fence are under Romania Standard 12574/1987 (H_2S: 0.015 mg/m^3, NH_3: 0.3 mg/m^3 and odor level: Level 5). These results show that hydrogen sulfide and ammonia concentrations as well as the odor level in/around the WWTP site are keeping at a relatively low level.

In WWTP the odor may be emitted from wastewater treatment units, but the majority of it comes from the sludge handling system such as digesters, sludge gas facilities and dewatering equipment. At this stage it is difficult to predict exactly the odor levels in/around Galati WWTP site, however, the survey of odor levels from existing WWTP site in other cities may deserve reference. Table AII.8.8 presented the results of measurements for odor in/around existing WWTP site.

Table AII.8.8 Analysis results of odor in existing WWTP site (July 1999)

City	Parameter	Boundary fence	50m from boundary fence	150 m from boundary fence	Limits for 30 minutes sampling period according to RS 12574/1987
Roman	H_2S (mg/m^3)	0.45	0.48	0.42	0.015
	NH_3 (mg/m^3)	0.33	0.35	0.35	0.3
	Odor Level	4	4	4	5
Constant a	H_2S (mg/m^3)	0.35	0.05	0.033	0.015
	NH_3 (mg/m^3)	0.3	0.11	0.10	0.3
	Odor Level	4	3	3	5

Source: ICIM

The values in Roman WWTP exceed the Romania Standard and that not only due to the sludge treatment in the plant but also to the activity of a carcass animal disposal factory (animal feeding meal) located near the plant. While there are not other odor sources around Constanta WWTP. Therefore, it is feasible to assess and predict the impacts of odor in Galati WWTP using the results of Constanta WWTP.

According to Table AII.8.8, although the concentrations of H_2S (0.35 mg/m^3), NH_3 (0.3 mg/m^3) and odor level (Level 4) on Constanta WWTP boundary fence exceed the Romania Standard, the odor levels at 150 m from boundary fence would generally be within acceptable levels. In addition, considering the facts that the distance from Galati WWTP site to the housing areas is more than 300 m, there are no inhabitants on the leeward of WWTP site, and following countermeasures will be taken, therefore no serious impacts are identified.

1) A particular attention will be given to prevent emission of such odors from dewatering

equipment rooms by providing efficient forced ventilation system, and to ensure against the escape of sludge gas from digesters.

2) Appropriate type of scrubbers will be provided for the removal of hydrogen sulfide from the digester gas. In addition, a waste gas burner for the digester gas control system will prevent any direct emission of sludge gas into the atmosphere. All the waste gas will be burned.

2.4 RECOMMENDATIONS FOR MITIGATING ACTIONS AND MONITORING PLAN

2.4.1 GROUNDWATER AND WASTE

1) It is necessary to plan and construct a new solid waste disposal site, considering the groundwater pollution problem and the capacity of existing SWDS as well as the volume of excess sludge generated from Galati WWTP.

2) Groundwater insulation-type landfill disposal plant is recommended to protect groundwater from polluting. In this case it is recommended to install the leachate collecting system and to discharge leachate after to be treated, especially disinfection treatment.

3) The groundwater quality (at least Cl^-, COD_{Mn}, Coliform Group and typical heavy metals) should be checked 2 to 4 times per year in order to understand the change of groundwater quality.

4) With the background that an increase in agricultural utilization and incineration and a reduction of landfill for sewage sludge is forecast, it will be recommended to consider incineration or the utilization of sewage sludge in agriculture. In this case the load limiting values of EU Sewage Sludge Directive can be applied as alternative to sewage sludge limiting values in order to maintain the soil limiting values of heavy metals.

5) The characteristics (Cd, Cr, Cu, Pb, Hg, Ni and Zn) of dewatered sludge from WWTP should be checked at least 4 times per year.

2.4.2 WATER POLLUTION AND PUBLIC HEALTH CONDITION

1) It is recommended to establish a monitoring system to check the water quality of Danube River at main swimming area, intake for water supply as well as the downstream and upstream reaches of WWTP outfall.

2) The detail plan (such as monitoring point, analysis items and sampling frequency etc.) should be made in cooperation with the Galati Municipality.

3. ANNEXES

3.1 REFERENCIES

[1] - EPA Tulcea, Report on the State of Environment in the County of Tulcea, 1995

[2] – SETA, Geological Survey of the location of WWTP of Tulcea, 1999

[3] – CNAR, Water Quality Synthesis, 1995

[4] - DSP of the County of Tulcea, Analysis Bulletins in 1997, 1998, 1999

[5] – CNAR, Water Quality Synthesis, 1996

[6] – ICIM, The State of Environment in Romania, 1993

[7] -- CNAR, Water Users of the Danube River, vol.III, 1995

[8] – JICA Study Team, Planning Basis for WWTP Tulcea, August 1999

[9] – Jorgensen, S.E, "Lake Management", Pergamon Press, 1980

[10] – Babitt, H.E., Baumann, E.R., "Sewerage and Sewage Treatment", New York John Wiley and Sons Inc., 1958

[11] – EEA, CORINAIR "Default Emissions Factors Handbook", 1998

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[13] – Voinescu, V at all "Indrumatorul Instalatorului", Ed.Tehnica, 1964

[14] – Romanian Academy, "Geographical Encyclopedia", 1974

3.2 ABBERVIATIONS

AF	= Average Flow
APM	= Agentia de Protectia Mediului
BOD	= Biochemical Oxygen Demand
CNAR	= Compania Nationala "Apele Romane" (National Company "Romania Waters")
DAF	= Daily Average Flow
DMF	= Daily Maximum Flow
DSP	= Directia de Sanatate Publica (Public Health Directorate)
EEA	= European Environment Agency
EPA	= Environmental Protection Agency
GD	= Government Decision
ICIM	= Institutul National de Cercetare Dezvoltare pentru Protectia Mediului Bucuresti (Research and Development National Institute for Environmental Protection)
JICA	= Japan International Cooperation Agency
MAC	= Maximum Allowable Concentration
MAF	= Multi-annual Average Flow
MAV	= Maximum Allowable Value
MO	= Ministerial Order
MWFEP	= Ministry of Water Forest and Environmental Protection
NCS	= National Commission for Statistics
NMVOC	= NON Methane Volatile Organic Compound
NTPA	= Norme tehnice pentru protectia apei
SA	= Societate pe Actiuni (Economic Unit by Shares)

SC	= Societate Comerciala (Commercial Unit)
SC ACET SA	= Societatea Comerciala Apa Canal Tulcea
SS	= Suspended Solids
STP	= Standard Temperature Pressure
SWDS	= Solid Waste Disposal Site
T-N	= Total Nitrogen
TNWP	= Technical works for Water Protection)
T-P	= Total Phosphorous
VOC	= Volatile Organic Compound
WWTP	= Wastewater Treatment Plant

3.3 RESULTS OF SURVEY

Results of EIA survey, such as soil, sludge, groundwater, leachate from existing solid disposal site, industrial wastewater and air, are summarized in Table AII.8.9 to AII.8.15.

Table AII.8.9 Summary of Analysis Results for Soil

Parameters	Analysis Method	Braila			Galati				Tulcea			Min.	Max.	Average	Max. Desirable (MD) - Max. Permissible (MP)
		Braila WWTP	Braila Sludge Disposal Site (Inside)	Braila Sludge Disposal Site (Outside)	Galati WWTP No.1 (Free Zone)	Galati WWTP Pumping Station No.3 Area	Galati Sludge Disposal Site (Inside)	Galati Sludge Disposal Site (Outside)	Tulcea WWTP	Tulcea Sludge Disposal Site (Inside)	Tulcea Sludge Disposal Site (Outside)				
pH	R.S. 7184/13-79	8.26	8.49	8.01	7.42	8.02	8.42	8.18	7.94	7.89	7.8	7.42	8.49	8.04	-
Electrical Conductivity (µS/cm)	R.S. 7184/7-87	246	480	170	190	208	1500	230	143	548	355	143	1,500	407	-
Cadmium - Cd (ppm)	AAS Method	0	1.5	0	0	0	3.25	0	0	1.75	0	0	3.25	0.65	1 - 5
Chromium - Cr (ppm)	AAS Method	0	6.8	0	12.5	13.8	140	6	13	65	12.5	0	140	27	30 - 300
Copper - Cu (ppm)	AAS Method	5.75	40.75	7.4	3.5	2.8	134.25	3	0	40.25	3.5	0	134.25	24	20 - 250
Manganese - Mn (ppm)	AAS Method	435	475	380	210	254	280	155	365	400	280	155	475	323	900 - 2,000
Nickel - Ni (ppm)	AAS Method	17	24.75	4.5	11.5	14.25	34.25	16.5	8.25	21.75	15.25	4.5	34.25	17	20 - 200
Lead - Pb (ppm)	AAS Method	8.2	44.6	7.5	29.5	17.5	180	7.9	21.25	79	20.95	7.5	180	42	20 - 250
Zinc - Zn (ppm)	AAS Method	270	420	210	415	380	580	290	205	465	312	205	580	355	100 - 700
Total hydrocarbons in oil (ppm)	R.S. 7877/87	21.18	82.6	10.4	11.48	10.21	429.2	16.4	31	168.8	46	10	429.20	83	100 - 1,000

Table AII.8.10 Summary of Analysis Results for Sludge from Existing WWTPs

Parameters	Roman Wastewater Treatment Plant				Constanta Wastewater Treatment Plant				Min.	Max.	Average	Max. Permissible Values Proposed in Romania Standard 1988 (MP)
	Crude Sludge from Mechanical System	Crude Sludge from Biological System (Activited Sludge)	Digested Sludge	Dewatered Sludge	Crude Sludge from Mechanical System	Crude Sludge from Biological System (Activited Sludge)	Digested Sludge	Dewatered Sludge				
pH	6.22	6.41	6.67	6.75	6.8	6.5	7.5	6.99	6.22	7.5	6.73	-
Total Nitrogen (% of weight rel. to TS)	2.68	2.41	1.71	1.52	5.73	4.93	2.29	2.18	1.52	5.73	2.93	-
Total Phosphorus (% of weight rel. to TS)	1.08	1.06	0.51	0.36	2.03	1.33	0.67	0.58	0.36	2.03	0.95	-
Water content (105 C) (% of weight)	91.25	99.55	95.24	74.24	89.2	95.53	99.89	58.48	58.48	99.89	87.92	-
Solids – TS (% of weight)	8.75	0.45	4.76	25.76	10.8	4.47	0.11	41.52	0.11	41.52	12.08	-
Organic Substances (550 C) (% of weight rel. to TS)	64.96	65.27	55.96	25.73	72.47	70.52	48.66	21.26	21.26	72.47	53.10	-
Mineral Substances (550 C) (% of weight rel. to TS)	35.04	34.73	44.04	74.27	27.53	29.48	51.34	78.74	27.53	78.74	46.90	-
Cadmium - Cd (mg/kg TS)	0	0	0	0	0	0	0	0	0	0	0	10
Chromium - Cr (mg/kg TS)	0	0	0	0	0	0	0	0	0	0	0	500
Copper - Cu (mg/kg TS)	60.37	28.09	32.24	88.05	137.41	58.34	48.18	71.42	28	137	66	500
Nickel - Ni (mg/kg TS)	0	0	0	0	0	0	0	0	0	0	0	100
Lead - Pb (mg/kg TS)	48.45	12.7	8.45	80.82	93.31	43.31	38.54	101.52	8	102	53	300
Zinc - Zn (mg/kg TS)	666.75	243.4	247.2	1,157.23	1007.64	307.69	294.64	1,600.35	243	1,600	645	2,000
Calorific Value (kJ/g TS)	17.2	16.8	16.2	-	18.7	19.2	17.3	-	16	19	18	-

Table AII.8.11 Summary of Analysis Results for Groundwater

Parameters	Braila					Galati					Constanta		
	WWTP Upstream	WWTP Downstream	Sludge Disposal site Upstream	Sludge Disposal site Downstream 1	Sludge Disposal site Downstream 2	WWTP Upstream	WWTP Downstream	Sludge Disposal site Upstream	Sludge Disposal site Downstream 1	Sludge Disposal site Downstream 2	Controlled Landfill Upstream	Controlled Landfill Downstream	Max. Desirable (MD) - Max. Permissible (MP)
Aspect	Clear supernatant, high quantity of sediment	Clear supernatant, high quantity of sediment	Clear supernatant	Clear supernatant	Clear supernatant	Turbid supernatant, yellow -red	Turbid supernatant, yellow -red	Clear supernatant	Opalescent	Opalescent	Clear supernatant	Clear supernatant; yellow -red sediment	
Colour	9.1	8.9	1.2	9.1	8.5	45.25	45.07	1.95	2.62	2.86	0.9	3.2	2 - 2
Turbidity (grade SiO_2)	-	-	15.3	19	25.3	71.05	72	9.7	28.48	9.4	-	-	2 - 2
Suspended solids (mg/dm³)	151.560	11.580	34.55	97	115.15	118.55	121	12.05	18.3	16.2	32	332	
pH at 20°C (units)	6.93	7.28	7.34	7.8	7.28	7.42	7.53	7.72	7.9	7.7	7.68	7.75	6.5÷7.4÷8.5
Conductivity (μ S/cm)	2,306	1,802	886.6	1,369.50	1,250.10	1207.14	1,225.36	805.6	814.5	1,253	741	778	1000 - 3000
Total sulphides – agitated sample (as H_2S) (mg/dm³)	136.32 / 0 *	1.24	-	-	-	0.04	0.05	-	-	-	-	0.34	0 - 0.1
Carbon Dioxide (mg/dm³)	23.6	10.25	2.45	3.6	2.64	17.32	17.6	2.24	2.2	1.76	3.6	2.95	
Temperature (°C)	16	16	17	16	17	18	18	17	16	16	17		22/normal
CATIONS													
Calcium – Ca (mg/dm³)	212.42	157.11	46.1	76.15	79.61	85.26	88.17	47.45	48.1	60.12	20.04	100.2	100 - 180
Magnesium – Mg(mg/dm³)	147	123	54.68	76.27	84.3	65.25	65.6	30.35	80.2	87.5	10.23	26.73	50 - 80
Sodium and Potassium – Na + K (mg/dm³)	262.1	209.12	169.2	202.8	169.7	149.3	149.3	67.2	68	239	165.2	170.46	
Iron – Fe (mg/dm³)	1,304.10 / 0.59 *	500 / 0.51 *	0.28	0.33	1.05	0.55	7.90	0.08	0.09	0.08	0.85	192	0.1 - 0.3
Manganese – Mn (mg/dm³)	24.00 / 0.32 *	1.792 / 0.144 *	0.105	0.176	0.144	0.36	0.375	0.025	0.036	0.026	0.048	1.2	0.05 - 0.3
Aluminium – Al (mg/dm³)	1.072 / 0.04 *	0.792 / 0.152 *	0.064	0.096	0.096	0.232	0.292	0.08	0.12	0.08	0.084	0.76	0.05 - 0.2
Copper – Cu (mg/dm³)	1.759 / 0 *	0.325 / 0 *	0	0.003	0	0	0	0	0	0	0	0.142	0.05 - 0.1
Chromium – Cr (mg/dm³)	0.148 / 0 *	0.045 / 0 *	0	0.005	0.006	0.001	0.002	0.002	0.002	0.009	0	0.135	0.05
Zinc – Zn (mg/dm³)	0.320 / 0.192 *	0.256 / 0.154 *	0.352	0.488	0.8	0.457	0.469	0.5	0.52	0.67	0.084	0.712	5 - 7
Nickel – Ni (mg/dm³)	0.764 / 0.032 *	0.724 / 0 *	0	0.022	0	0	0	0.003	0.003	0.004	0	0.252	0.1
Cadmium – Cd (mg/dm³)	0.057 / 0.006 *	0.019 / 0.004 *	0	0.004	0.003	0.002	0.004	0.002	0.002	0.0008	0	0.042	0.005
Lead – Pb (mg/dm³)	0.155 / 0.091 *	0.451 / 0 *	0.02	0.025	0.035	0.037	0.062	0.024	0.046	0.014	0	0.309	0.05
Ammonia – NH_4 (mg/dm³)	0.07	0.2	0.07	0.13	0.16	5.52	7.75	0.01	0.01	0.38	0.45	1.65	0 - 0.5
ANIONS and OTHER ITEMS													
Nitrites - NO_2 (mg/dm³)	0.008	0.1	0.04	0.1	0.04	0	0	0.005	0.008	0.05	0.03	0.037	0 - 0.3
Nitrates - NO_3 (mg/dm³)	5.37	0	1.72	5.3	1.74	1.44	1.84	4.15	3.07	31.16	1.32	1.36	45
Chlorides - Cl^- (mg/dm³)	205.6	150.7	58.5	166.62	58.5	163	163.07	76.83	78	110	76.2	76.22	250 - 400
Bicarbonates - HCO_3^- (mg/dm³)	1,586.50	793.26	625.45	707.8	628.5	738.34	744.44	512.57	518.67	549.18	417.99	427.14	
Carbonates - CO_3^{2-} (mg/dm³)	0	0	0	0	0	0	0	0	0	0	0	0	
Sulphates - SO_4^{2-} (mg/dm³)	116.25	480.05	108.35	161.43	109.1	9.25	9	57.75	57.8	385	90.05	90.05	200 - 400
Total phosphates - PO_4^{3-} (mg/dm³)	0.34 / 0.005 *	3.14 / 0.46 *	0.03	0.185	0.04	0.08	0.098	0.08	0.08	0.098	0.005	0.18	0.1 - 0.5
Cyanide - CN (mg/dm³)	0	0	0	0	0	0	0	0	0	0	0	0	0.01*
Organic Substances - $KMnO_4$ (mg/dm³)	7.192 / 42.00 *	308 / 22.12 *	10.12	12.52	20.54	4.1	4.12	3.05	4.12	6.22	3.8	37.92	10 - 12
Oil and grease (mg/dm³)	4.87	4.05	1.05	1.2	1.9	1.93	2.93	1.72	8.84	2.08	0.67	10.3	-
Phenols (mg/dm³)	1.5	0.25	0	0	0	0	0	0	0	0	0	0.015	0.001*
Alkalinity- permanent "p" (mval/dm³)	0	0	0	0	0	0	0	0	0	0	0	0	
Alkalinity - total "m" (mval/dm³)	550 / 26 *	13	10.25	11.6	10.3	12.1	12.2	8.4	8.5	9	6.85	7	
Acidity (mval/dm³)	0	0	0	0	0	0	0	0	0	0	0	0	
Dissolved solids at 105 °C (mg/dm³)	1,895.20	1,329.50	761.3	1,056.45	998	861.57	863	600.8	602	1,192.50	590.12	593.16	min. 100/max. 800 - min. 70/max. 1200
Hardness - total (German degrees)	63.6	45.84	19.04	30.5	30.55	26.95	27.44	25.1	25.2	28.6	8.96	18.2	20 - 30
BACTERIA													
Total number of bacteria at 37°C UFC / cm³	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	under 300
Probable number of coliform bacteria /100 cm³	920,000	172	1,600	24,000	5,020	16,000	16,000	920	16,000	1,600	1,000	54,250	under 10
Probable number of coliform-thermotolerabl bacteria (fecal coliforms) / 100 cm³	542,000	7	22	130	27	240	240	94	2,600	240	920	7,300	under 2
Probable number of fecal streptococcus/100 cm³	9,200	34,800	7	70	7	5	5	26	70	35	540	17,250	under 2

*: Agitated Sample/Supernatant of Sample

: means the parameters analysed not respect the Romanian Standard 1342/1991 - "Drinking Water"

Table AII.8.11 Summary of Analysis Results for Groundwater

Parameters	Braila					Galati					Constanta		
	WWTP Upstream	WWTP Downstream	Sludge Disposal site Upstream	Sludge Disposal site Downstream 1	Sludge Disposal site Downstream 2	WWTP Upstream	WWTP Downstream	Sludge Disposal site Upstream	Sludge Disposal site Downstream 1	Sludge Disposal site Downstream 2	Controlled Landfill Upstream	Controlled Landfill Downstream	Max. Desirable (MD) - Max. Permissible (MP)
Aspect	Clear supernatant, high quantity of sediment	Clear supernatant, high quantity of sediment	Clear supernatant	Clear supernatant	Clear supernatant	Turbid supernatant, yellow -red	Turbid supernatant, yellow -red	Clear supernatant	Opalescent	Opalescent	Clear supernatant	Clear supernatant, yellow and sediment	
Colour	9.1	8.9	1.2	9.2	8.5	45.25	45.37	1.95	2.42	2.86	[illegible]	352	2 - 2
Turbidity (grade SiO_2)	-	-	15.3	19	25.3	21.25	73	4.7	28.88	9.4	-	-	2 - 2
Suspended solids (mg/dm^3)	151,560	11,580	34.55	97	115.15	118.55	121	12.05	18.3	16.2	32	552	
pH at 20℃ (units)	6.93	7.28	7.34	7.8	7.28	7.42	7.53	7.72	7.9	7.7	7.68	7.75	6.5 ~ 7.4 - 8.5
Conductivity (μ S/cm)	2,306	1,802	886.6	1,369.50	1,250.10	1207.14	1,225.36	805.6	814.5	1,253	731	778	1000 - 3000
Total sulphides - agitated sample (as H_2S) (mg/dm^3)	136.32 / 0 *	1.92	-	-	-	0.04	0.05	-	-	-	-	8.34	0 - 0.1
Carbon Dioxide (mg/dm^3)	23.6	10.25	2.45	3.6	2.64	17.32	17.6	2.24	2.2	1.76	3.6	2.85	
Temperature (℃)	16	16	17	16	17	18	18	17	16	16	17		22/normal
CATIONS													
Calcium - Ca (mg/dm^3)	212.42	157.11	46.1	76.15	79.61	85.26	88.17	47.45	48.1	60.12	20.04	196.2	100 - 180
Magnesium - Mg(mg/dm^3)	187	121	54.68	86.27	84.3	65.25	65.6	80.35	80.2	82.5	19.23	20.73	50 - 80
Sodium and Potassium - Na + K (mg/dm^3)	262.1	209.12	169.2	202.8	169.7	149.3	149.3	67.2	68	239	165.2	170.16	
Iron - Fe (mg/dm^3)	1,504.10 / 0.59 *	300 / 0.53 *	0.28	0.39	1.48	4.55	7.46	0.08	0.09	0.08	6.85	392	0.1 - 0.3
Manganese - Mn (mg/dm^3)	24.00 / 0.32 *	1.792 / 0.144 *	0.105	0.176	0.144	0.36	0.373	0.025	0.036	0.026	0.048	1.2	0.05 - 0.3
Aluminium - Al (mg/dm^3)	1.072 / 0.04 *	0.792 / 0.152 *	0.064	0.096	0.096	0.233	0.232	0.08	0.12	0.08	0.084	[illegible]	0.05 - 0.2
Copper - Cu (mg/dm^3)	1.759 / 0 *	0.325 / 0 *	0	0.003	0	0	0	0	0	0	0	0.142	0.05 - 0.1
Chromium - Cr (mg/dm^3)	0.148 / 0 *	0.045 / 0 *	0	0.005	0.006	0.001	0.002	0.002	0.002	0.009	0	0.335	0.05
Zinc - Zn (mg/dm^3)	0.320 / 0.192 *	0.256 / 0.154 *	0.352	0.488	0.8	0.457	0.469	0.5	0.52	0.67	0.084	[illegible]	5 - 7
Nickel - Ni (mg/dm^3)	0.764 / 0.032 *	0.724 / 0 *	0	0.022	0	0	0	0.003	0.003	0.004	[illegible]	0.252	0.1
Cadmium - Cd (mg/dm^3)	0.037 / 0.006 *	0.019 / 0.004 *	0	0.004	0.003	0.002	0.004	0.002	0.002	0.0008	[illegible]	0.015	0.005
Lead - Pb (mg/dm^3)	0.259 / 0.091 *	0.451 / 0 *	0.02	0.025	0.035	0.057	0.062	0.024	0.046	0.014	0	0.039	0.05
Ammonia - NH_4 (mg/dm^3)	0.67	5.2	0.07	0.13	0.16	5.52	7.75	0.01	0.01	0.38	0.45	[illegible]	0 - 0.5
ANIONS and OTHER ITEMS													
Nitrites - NO_2 (mg/dm^3)	0.008	0.1	0.04	0.1	0.04	0	0	0.005	0.008	0.05	0.03	[illegible]	0 - 0.3
Nitrates - NO_3 (mg/dm^3)	5.37	0	1.72	5.3	1.74	1.44	1.84	4.15	3.07	31.16	[illegible]	[illegible]	45
Chlorides - Cl^- (mg/dm^3)	205.6	150.7	58.5	160.62	58.5	163	163.07	76.83	78	110	76.2	[illegible]	250 - 400
Bicarbonates - HCO^-_3 (mg/dm^3)	1,586.50	793.26	625.45	707.8	628.5	738.34	744.44	512.57	518.67	549.18	[illegible]	[illegible]	
Carbonates - CO^{2-}_3 (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	
Sulphates - SO^{2-}_4 (mg/dm^3)	116.25	480.05	108.35	161.43	109.1	9.25	9	57.75	57.8	385	90.08	[illegible]	200 - 400
Total phosphates - PO^{3-}_4 (mg/dm^3)	0.34 / 0.005 *	3.14 / 0.46 *	0.03	0.185	0.04	0.08	0.098	0.08	0.08	0.098	0.005	0.18	0.1 - 0.5
Cyanide - CN (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	-	0.01*
Organic Substances - $KMnO_4$ (mg/dm^3)	7,162 / 62.00 *	398 / 22.12 *	10.12	12.32	20.58	41.1	45.12	3.05	4.12	6.23	5.8	32.92	10 - 12
Oil and grease (mg/dm^3)	4.87	4.05	1.05	1.2	1.9	1.93	2.93	1.72	8.84	2.08	0.67	10.3	-
Phenols (mg/dm^3)	1.5	0.33	0	0	0	0	0	0	0	0	0	0.015	0.001*
Alkalinity- permanent "p" (mval/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	
Alkalinity - total "m" (mval/dm^3)	550 / 26 *	13	10.25	11.6	10.3	12.1	12.2	8.4	8.5	9	6.88	-	
Acidity (mval/dm^3)	0	0	0	0	0	0	0	0	0	0	0	-	
Dissolved solids at 105 ℃ (mg/dm^3)	3,495.20	1,529.50	761.3	1,056.45	998	861.57	863	600.8	602	1,192.50	590.12	[illegible]	[illegible]
Hardness - total (German degrees)	63.6	49.84	19.04	30.5	30.55	26.95	27.44	25.1	25.2	28.6	8.96	18.2	20 - 30
BACTERIA													
Total number of bacteria at 37℃ UFC / cm^3	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	over 300	under 300
Probable number of coliform bacteria /100 cm^3	922,000	152	1,609	24,000	5,420	16,090	16,090	920	16,090	1,609	3,000	53,200	under 10
Probable number of coliform-thermotolerabil bacteria (fecal coliforms) / 100 cm^3	542,000	2	22	180	27	240	240	94	1,609	240	922	5,480	under 2
Probable number of fecal streptococcus/100 cm^3	9,200	34,800	7	70	7	5	5	26	70	33	542	47,200	under 2

*: Agitated Sample/Supernatant of Sample

▒ : means the parameters analysed not respect the Romanian Standard 1342/1991 - "Drinking Water"

Table AII.8.12 Summary of Analysis Results for Leachate from Existing Solid Disposal Site

Parameters	Braila Solid Waste Disposal Site	Galati Solid Waste Disposal Site	Tulcea Solid Waste Disposal Site	Constanta Solid Waste Disposal Site	NTPA 002
pH at 20°C (units)	8.22	8.3	8.18	8.12	6.5 - 8.5
BOD_5 (mg/dm^3)	3.824	4.135	3.465	2.988	300
COD_{Cr} (mg/dm3)	7,742	8.780	7.140	6.770	500
Chlorides (Cl^-) (mg/dm^3)	4,220	4,608	3,162	2,020	-
SS (mg/dm^3)	684	768	625	468	300
(NH_4 – N) (mg/dm^3)	592	635	590	548	30
Total Nitrogen (mg/dm^3)	7.36	756	722	677	-
Total Phosphorus (mg/dm^3)	4.3	5	4.25	3.8	5.0
$H_2S + S^{-2}$ (mg/dm^3)	18.8	22.4	16.3	11.08	0.5
Sulphates (SO_4^{2-}) (mg/dm^3)	20.6	31	28	24	400
Total Coliform Group (no./100 ml)	3.48×10^8	3.48×10^8	5.42×10^8	3.48×10^6	-
Fecal Coliform Bacteria (no./100 ml)	1.41×10^8	1.72×10^8	1.75×10^8	1.61×10^5	-
Fecal Streptococcus Group (no./100 ml)	1.61×10^6	1.75×10^6	1.41×10^6	5.42×10^5	-
Arsenic (As) (mg/dm^3)	0	0	0	0	-
Lead (Pb) (mg/dm^3)	0.265	0.322	0.135	0.085	0.5
Cadmium (Cd) (mg/dm^3)	0.042	0.047	0.042	0.033	0.1
Total Chromium (mg/dm^3)	0	0.075	0	0	Cr^{3+}1.0/Cr^{6+}0.1
Copper (Cu) (mg/dm^3)	0.142	0.185	0.022	0.014	0.1
Nickel (Ni) (mg/dm^3)	0.136	0.149	0.013	0.11	1
Zinc (Zn) (mg/dm^3)	0.41	0.5	0.316	0.225	1
Manganese (Mn) (mg/dm^3)	0.14	0.18	0.08	0.06	1
Cyanide (mg/dm^3)	0	0	0	0	0.5
Oil and Grease (mg/dm3)	528	580	462	278	20
Phenols (mg/dm^3)	1.32	1.48	1.16	0.88	30

: means the parameters analyzed not respect the Romanian Standard NTPA 002/1997- Quality Indicators of Waste Water Discharged into Municipal Sewage Systems

Table AII.8.12 Summary of Analysis Results for Leachate from Existing Solid Disposal Site

Parameters	Braila Solid Waste Disposal Site	Galati Solid Waste Disposal Site	Tulcea Solid Waste Disposal Site	Constanta Solid Waste Disposal Site	NTPA 002
pH at 20 C (units)	8.22	8.3	8.18	8.12	6.5 - 8.5
BOD_5 (mg/dm^3)	3,824	4,135	3,465	2,988	300
COD_{Cr} (mg/dm3)	7,742	8,780	7,140	6,770	500
Chlorides (Cl^-) (mg/dm^3)	4,220	4,608	3,162	2,020	-
SS (mg/dm^3)	681	768	625	468	300
(NH_4 – N) (mg/dm^3)	592	635	590	548	30
Total Nitrogen (mg/dm^3)	7.36	756	722	677	-
Total Phosphorus (mg/dm^3)	4.3	5	4.25	3.8	5.0
$H_2S + S^{-2}$ (mg/dm^3)	18.8	22.4	16.3	11.08	0.5
Sulphates (SO_4^{2-}) (mg/dm^3)	20.6	31	28	24	400
Total Coliform Group (no./100 ml)	3.48×10^8	3.48×10^8	5.42×10^8	3.48×10^6	-
Fecal Coliform Bacteria (no./100 ml)	1.41×10^8	1.72×10^8	1.75×10^8	1.61×10^5	-
Fecal Streptococcus Group (no./100 ml)	1.61×10^6	1.75×10^6	1.41×10^6	5.42×10^5	-
Arsenic (As) (mg/dm^3)	0	0	0	0	-
Lead (Pb) (mg/dm^3)	0.265	0.322	0.135	0.085	0.5
Cadmium (Cd) (mg/dm^3)	0.042	0.047	0.042	0.033	0.1
Total Chromium (mg/dm^3)	0	0.075	0	0	Cr^{3+} 1.0/Cr^{6+} 0.1
Copper (Cu) (mg/dm^3)	0.142	0.185	0.022	0.014	0.1
Nickel (Ni) (mg/dm^3)	0.136	0.149	0.013	0.11	1
Zinc (Zn) (mg/dm^3)	0.41	0.5	0.316	0.225	1
Manganese (Mn) (mg/dm^3)	0.14	0.18	0.08	0.06	1
Cyanide (mg/dm^3)	0	0	0	0	0.5
Oil and Grease (mg/dm3)	528	580	462	278	20
Phenols (mg/dm^3)	1.32	1.48	1.16	0.88	30

: means the parameters analyzed not respect the Romanian Standard NTPA 002/1997- Quality Indicators of Waste Water Discharged into Municipal Sewage Systems

Table AII.8.13 Summary of Analysis Results for Industrial Wastewater in Galati (1)

Parameters	S.C. Coca Cola S.A. (Soft Drinking Factory)			S.C. MARTENS S.A. (Brewery Factory)			S.C. INTFOR S.A. (Plate Iron Factory)						NTPA 002
	99/7/7 9:00	99/7/7 12:00	99/7/7 15:00	99/7/7 9:00	99/7/7 12:00	99/7/7 15:00	99/7/7 9:00	99/7/7 12:00	99/7/7 15:00	Min.	Max.	Average	
Water Temperature (°C)	31.5	29	32	31.5	32	25	29	29	26	25	32	29	40
pH at 20°C (units)	10.72	9.52	10.72	8.07	11.75	7.5	7.67	6.8	7.4	6.8	11.75	8.9	6.5 – 8.5
BOD_5 (mg/dm^3)	180.8	90.6	156.2	22.6	388	588	8.4	10.1	13.4	8.4	588	162	300
COD_{Cr} (mg/dm3)	387.6	271.7	356.4	40	573	1.470	28.1	23.4	35.6	23.4	1.470	365	500
COD_{Mn} (mg/dm3)	220.9	111.9	340	28	416	611.7	11.7	14.4	19.4	11.7	612	197	-
Chlorides (Cl^-) (mg/dm^3)	276.5	78	70.9	89	71	102.8	46.1	46.1	71.9	46.1	277	95	-
SS (mg/dm^3)	42.6	101.6	62.2	12	70	510	24.4	59.6	26.6	11.6	510	101	300
(NH_4 – N) (mg/dm^3)	0.9	2.1	0.5	0.3	4.1	2.88	5.75	2.1	3.25	0.3	5.75	2	30
Total Nitrogen (mg/dm^3)	5.88	19.04	5.88	4.76	5.04	49.73	12.04	6.44	7.84	4.76	49.73	13	-
Total Phosphorus (mg/dm^3)	0.68	3	0.82	0.05	1.77	1.75	0.32	0.34	0.32	0.05	3	1	5
$H_2S + S^{-2}$ (mg/dm^3)	0.05	0	0.04	0	0.01	0.01	0	0	0	0	0.05	0	0.5
Sulphates (SO_4^{2-}) (mg/dm^3)	93.1	75	78	55.5	81	51	50.3	210.2	54	50.3	210.2	83	400
Total Coliform Group (no./100 ml)	1.7×10^1	1.4×10^7	3.3×10^1	9.2×10^3	2.3×10^1	5.4×10^7	5.4×10^3	3.5×10^4	1.6×10^4	1.7×10^1	5.4×10^7	7.6×10^6	-
Fecal Coliform Bacteria (no./100 ml)	0	1.1×10^6	0	1.8×10^2	0	1.6×10^5	3.5×10^4	2.8×10^3	1.4×10^3	0	1.6×10^6	3.0×10^5	-
Fecal Streptococcus Group (no./100 ml)	3.4×10^2	3.5×10^3	1.7×10^4	1.7×10^1	1.1×10^3	3.5×10^5	1.6×10^4	1.1×10^3	1.1×10^3	1.7×10^1	3.5×10^5	4.3×10^4	-
Arsenic (As) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0.00	-
Lead (Pb) (mg/dm^3)	0.013	0.013	0.011	0.008	0.01	0.007	0	0	0	0	0.013	0.01	0.5
Cadmium (Cd) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0.00	0.1
Total Chromium (mg/dm^3)	0	0	0	0	0	0	0	0.055	0	0	0.055	0.01	Cr^{3+}1.0/Cr^{6+}0.1
Copper (Cu) (mg/dm^3)	0.071	0.03	0.06	0.04	0.052	0.03	0.029	0.03	0.022	0.022	0.071	0.0	0.1
Nickel (Ni) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	1
Zinc (Zn) (mg/dm^3)	0.26	0.48	0.32	0.33	0.81	0.46	0.36	0.33	0.36	0.26	0.81	0.41	1
Manganese (Mn) (mg/dm^3)	0.04	0.05	0.03	0.03	0.03	0.03	0.06	0.51	0.12	0.03	0.51	0.10	1
Cyanide (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Phenols (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0.00	30
Oil and Grease (mg/dm^3)	2.6	12.4	16.6	1.2	6.2	8.8	0.8	0.4	0.8	0.4	16.6	5.5	20
Detergents (mg/dm^3)	0.06	0.16	0.06	0.01	0.03	0.12	0	0.01	0	0	0.16	0.1	30

: means the parameters analyzed not respect the Romanian Standard NTPA 002/1997- Quality Indicators of Waste Water Discharged into Municipal Sewage Systems

Table AII.8.13 Summary of Analysis Results for Industrial Wastewater in Galati (1)

Parameters	S.C. Coca Cola S.A. (Soft Drinking Factory)			S.C. MARTENS S.A. (Brewery Factory)			S.C. INTFOR S.A. (Plate Iron Factory)			Min.	Max.	Average	NTPA 002
	99/7/7 9:00	99/7/7 12:00	99/7/7 15:00	99/7/7 9:00	99/7/7 12:00	99/7/7 15:00	99/7/7 9:00	99/7/7 12:00	99/7/7 15:00				
Water Temperature (°C)	31.5	29	32	31.5	32	25	29	29	26	25	32	29	40
pH at 20°C (units)	10.72	9.52	10.72	8.07	11.75	7.5	7.67	6.8	7.4	6.8	11.75	8.9	6.5 - 8.5
BOD_5 (mg/dm^3)	180.8	90.6	156.2	22.6	383	588	8.4	10.1	13.4	8.4	588	162	300
COD_{Cr} (mg/dm3)	387.6	271.7	356.4	40	673	1.470	28.1	23.4	35.6	23.4	1.470	365	500
COD_{Mn} (mg/dm3)	220.9	111.9	340	28	416	611.7	11.7	14.4	19.4	11.7	612	197	-
Chlorides (Cl^-) (mg/dm^3)	276.5	78	70.9	89	71	102.8	46.1	46.1	71.9	46.1	277	95	-
SS (mg/dm^3)	42.6	101.6	62.2	12	70	510	24.4	59.6	26.6	11.6	510	101	300
(NH_4 - N) (mg/dm^3)	0.9	2.1	0.5	0.3	4.1	2.88	5.75	2.1	3.25	0.3	5.75	2	30
Total Nitrogen (mg/dm^3)	5.88	19.04	5.88	4.76	5.04	49.73	12.04	6.44	7.84	4.76	49.73	13	-
Total Phosphorus (mg/dm^3)	0.68	3	0.82	0.05	1.77	1.75	0.32	0.34	0.32	0.05	3	1	5
$H_2S + S^{-2}$ (mg/dm^3)	0.05	0	0.04	0	0.01	0.01	0	0	0	0	0.05	0	0.5
Sulphates (SO_4^{2-}) (mg/dm^3)	93.1	75	78	55.5	81	51	50.3	210.2	54	50.3	210.2	83	400
Total Coliform Group (no./100 ml)	1.7×10^1	1.4×10^7	3.3×10^1	9.2×10^3	2.3×10^1	5.4×10^7	5.4×10^3	3.5×10^4	1.6×10^4	1.7×10^1	5.4×10^7	7.6×10^6	-
Fecal Coliform Bacteria (no./100 ml)	0	1.1×10^6	0	1.8×10^2	0	1.6×10^6	3.5×10^4	2.8×10^3	1.4×10^3	0	1.6×10^6	3.0×10^5	-
Fecal Streptococcus Group (no./100 ml)	3.4×10^2	3.5×10^3	1.7×10^4	1.7×10^1	1.1×10^3	3.5×10^5	1.6×10^4	1.1×10^5	1.1×10^3	1.7×10^1	3.5×10^5	4.3×10^4	-
Arsenic (As) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0.00	-
Lead (Pb) (mg/dm^3)	0.013	0.013	0.011	0.008	0.01	0.007	0	0	0	0	0.013	0.01	0.5
Cadmium (Cd) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0.00	0.1
Total Chromium (mg/dm^3)	0	0	0	0	0	0	0	0.055	0	0	0.055	0.01	Cr^{VI} 1.0 Cr^{tot} 0.1
Copper (Cu) (mg/dm^3)	0.071	0.03	0.06	0.04	0.052	0.03	0.029	0.03	0.022	0.022	0.071	0.0	0.1
Nickel (Ni) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	1
Zinc (Zn) (mg/dm^3)	0.26	0.48	0.32	0.33	0.81	0.46	0.36	0.33	0.36	0.26	0.81	0.41	1
Manganese (Mn) (mg/dm^3)	0.04	0.05	0.03	0.03	0.03	0.03	0.06	0.51	0.12	0.03	0.51	0.10	1
Cyanide (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Phenols (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0.00	30
Oil and Grease (mg/dm^3)	2.6	12.4	16.6	1.2	6.2	8.8	0.8	0.4	0.8	0.4	16.6	5.5	20
Detergents (mg/dm^3)	0.06	0.16	0.06	0.01	0.03	0.12	0	0.01	0	0	0.16	0.1	30

: means the parameters analyzed not respect the Romanian Standard NTPA 002/1997- Quality Indicators of Waste Water Discharged into Municipal Sewage Systems

Table AII.8.14 Summary of Analysis Results for Industrial Wastewater in Galati (2)

Parameters	S.C. TREFO S.A. (Wire Factory)	S.C. TRANSURB S.A. (Repair Trams Unit)	S.C. PAINE S.A (Bread Factory No. 1)	S.C. GALACTA S.A. (Milk Factory)	S.C. PAINE S.A (Bread Factory No. 2)	S.C. SIDEX S.A. (Steel Factory)	S.C. DUNAREANA S.A. (Bakery Factory)	GALATI SHIP YARD	S.C. MENAROM S.A. (Hydraulic Equipment)	S.C. APOLLO S.A. (Detergents Factory)	Min.	Max.	Average	NTPA 002
Water Temperature (°C)	28	26	28	28	32.5	31	28	30	29	32	26	32.5	29	40
pH at 20°C (units)	6.71	7.71	7.7	7.03	7.56	7.97	8.25	7.18	7.68	12.12	6.71	12.12	8.0	6.5 – 8.5
BOD_5 (mg/dm^3)	11.2	151.3	291.7	1,348	133.4	24	58.4	14.6	21	122	11.2	1348	218	300
COD_{Cr} (mg/dm3)	30.6	410.3	724	2,673	250	68	109.4	33.5	40	31,630	30.6	31,630	3,597	500
COD_{Mn} (mg/dm3)	14.5	161.4	353.3	1,758	165	31.8	67.2	17.7	23.4	1,469	14.5	1,758	406	-
Chlorides (Cl^-) (mg/dm^3)	138.3	67.4	102.8	67	89	102.8	127.7	74.5	46.1	9,571	46.1	9,571	1,039	-
SS (mg/dm^3)	101.2	857.6	674	358	164	11	276.4	70.4	108.2	1,243	10.6	1,243	386	300
(NH_4 – N) (mg/dm^3)	4	13.4	10.5	20.6	23.3	8.9	2.45	4	2	1.05	1.05	23.3	9	30
Total Nitrogen (mg/dm^3)	9.07	27.55	20.94	55.44	31.1	15.74	9.07	10.14	6.72	12.32	6.72	55.44	20	-
Total Phosphorus (mg/dm^3)	0.3	1.14	0.58	2.5	1.87	0.27	0.47	0.42	0.38	3.17	0.27	3.17	1	5
$H_2S + S^{-2}$ (mg/dm^3)	0	0.01	0.08	0.028	0.02	0.01	0	0.01	0.01	0.42	0	0.42	0	0.5
Sulphates (SO_4^{2-}) (mg/dm^3)	112.6	53.3	69	61.5	52.5	61.6	64.6	48.8	48	105	48	112.6	68	400
Total Coliform Group (no./100 ml)	9.4×10^3	9.2×10^5	1.6×10^7	5.4×10^4	5.4×10^6	1.4×10^2	9.2×10^6	1.6×10^6	1.6×10^6	0	0	1.6×10^7	3.5×10^6	-
Fecal Coliform Bacteria (no./100 ml)	3.3×10^1	3.5×10^5	3.5×10^6	7.0×10^1	3.5×10^6	0	3.5×10^6	3.5×10^5	5.4×10^4	0	0	3.5×10^6	1.1×10^6	-
Fecal Streptococcus Group (no./100 ml)	5.4×10^3	3.5×10^4	3.4×10^3	2.2×10^4	5.4×10^5	2.8×10^2	3.5×10^2	5.4×10^4	9.2×10^3	0	0	5.4×10^5	6.7×10^4	-
Arsenic (As) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0.00	-
Lead (Pb) (mg/dm^3)	0	0.077	0	0	0.026	0	0	0	0	0	0	0.077	0.01	0.5
Cadmium (Cd) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.1
Total Chromium (mg/dm^3)	0	0	0.022	0	0	0	0	0	0	0	0	0.022	0.00	Cr^{3+}1.0/Cr^{6+}0.1
Copper (Cu) (mg/dm^3)	0.03	0.53	0.092	0.008	0.017	0	0.003	0.017	0.016	0.02	0	0.53	0.1	0.1
Nickel (Ni) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Zinc (Zn) (mg/dm^3)	0.35	0.53	0.31	0.31	0.41	0	0.03	0.17	0.26	0.22	0	0.53	0.26	1
Manganese (Mn) (mg/dm^3)	0.24	0.22	0.17	0.22	0.06	0.04	0.06	0.04	0.06	0.14	0.04	0.24	0.13	1
Cyanide (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Phenols (mg/dm^3)	0.007	0.11	0	0	0.2	0.05	0	0.06	0	0.05	0	0.2	0.05	30
Oil and Grease (mg/dm^3)	12.8	15	12.8	41.2	1.2	0.8	0.6	4.6	1.4	78	0.6	78	16.8	20
Detergents (mg/dm^3)	0.03	0.08	0.44	0.78	0.36	0.29	0.08	0.02	0.02	1.07	0.02	1.07	0.3	30

: means the parameters analyzed not respect the Romanian Standard NTPA 002/1997- Quality Indicators of Waste Water Discharged into Municipal Sewage Systems

Table AII.8.14 Summary of Analysis Results for Industrial Wastewater in Galati (2)

Parameters	S.C. TREFO S.A. (Wire Factory)	S.C. TRANSURB S.A. (Repair Trams Unit)	S.C. PAINE S.A. (Bread Factory No. 1)	S.C. GALACTA S.A. (Milk Factory)	S.C. PAINE S.A. (Bread Factory No. 2)	S.C. SIDEX S.A. (Steel Factory)	S.C. DUNAREANA S.A. (Bakery Factory)	GALATI SHIP YARD	S.C. MENAROM S.A. (Hydraulic Equipment)	S.C. APOLLO S.A. (Detergents Factory)	Min.	Max	Average	NTPA 002
Water Temperature (°C)	28	26	28	28	32.5	31	28	30	29	32	26	32.5	29	40
pH at 20°C (units)	6.71	7.71	7.7	7.03	7.56	7.97	8.25	7.18	7.68	12.12	6.71	12.12	8.0	6.5 - 8.5
BOD_5 (mg/dm^3)	11.2	151.3	291.7	1,348	133.4	24	58.4	14.6	21	122	11.2	1348	218	300
COD_{Cr} (mg/dm3)	30.6	410.3	724	2,673	250	68	109.4	33.5	40	31,630	30.6	31,630	3,597	500
COD_{Mn} (mg/dm3)	14.5	161.4	353.3	1,758	165	31.8	67.2	17.7	23.4	1,469	14.5	1,758	306	-
Chlorides (Cl^-) (mg/dm^3)	138.3	67.4	102.8	67	89	102.8	127.7	74.5	46.1	9,571	46.1	9,571	1,039	-
SS (mg/dm^3)	101.2	857.6	674	358	164	11	276.4	70.4	108.2	3,243	10.6	1,243	386	300
(NH_4 - N) (mg/dm^3)	4	13.4	10.5	20.6	23.3	8.9	2.45	4	2	1.05	1.05	23.3	9	30
Total Nitrogen (mg/dm^3)	9.07	27.55	20.94	55.44	31.1	15.74	9.07	10.14	6.72	12.32	6.72	55.44	20	-
Total Phosphorus (mg/dm^3)	0.3	1.14	0.58	2.5	1.87	0.27	0.47	0.42	0.38	3.17	0.27	3.17	1	5
$H_2S + S^{2-}$ (mg/dm^3)	0	0.01	0.08	0.028	0.02	0.01	0	0.01	0.01	0.42	0	0.42	0	0.5
Sulphates (SO_4^{2-}) (mg/dm^3)	112.6	53.3	69	61.5	52.5	61.6	64.6	48.8	48	105	48	112.6	68	400
Total Coliform Group (no./100 ml)	9.4×10^3	9.2×10^5	1.6×10^7	5.4×10^4	5.4×10^6	1.4×10^2	9.2×10^6	1.6×10^6	1.6×10^6	0	0	1.6×10^7	3.5×10^6	-
Fecal Coliform Bacteria (no./100 ml)	3.3×10^1	3.5×10^5	3.5×10^6	7.0×10^1	3.5×10^6	0	3.5×10^6	3.5×10^5	5.4×10^4	0	0	3.5×10^6	1.1×10^6	-
Fecal Streptococcus Group (no./100 ml)	5.4×10^3	3.5×10^4	3.4×10^3	2.2×10^4	5.4×10^5	2.8×10^2	3.5×10^2	5.4×10^4	9.2×10^3	0	0	5.4×10^5	6.7×10^4	-
Arsenic (As) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0.00	-
Lead (Pb) (mg/dm^3)	0	0.077	0	0	0.026	0	0	0	0	0	0	0.077	0.01	0.5
Cadmium (Cd) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.1
Total Chromium (mg/dm^3)	0	0	0.022	0	0	0	0	0	0	0	0	0.022	0.00	Cr^{3+}1.0/Cr^{6+}0.1
Copper (Cu) (mg/dm^3)	0.03	0.53	0.092	0.008	0.017	0	0.003	0.017	0.016	0.02	0	0.53	0.1	0.1
Nickel (Ni) (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Zinc (Zn) (mg/dm^3)	0.35	0.53	0.31	0.31	0.41	0	0.03	0.17	0.26	0.22	0	0.53	0.26	1
Manganese (Mn) (mg/dm^3)	0.24	0.22	0.17	0.22	0.06	0.04	0.06	0.04	0.06	0.14	0.04	0.24	0.13	1
Cyanide (mg/dm^3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Phenols (mg/dm^3)	0.007	0.11	0	0	0.2	0.05	0	0.06	0	0.05	0	0.2	0.05	30
Oil and Grease (mg/dm^3)	12.8	15	12.8	41.2	1.2	0.8	0.6	4.6	1.4	78	0.6	78	16.8	20
Detergents (mg/dm^3)	0.03	0.08	0.44	0.78	0.36	0.29	0.08	0.02	0.02	1.07	0.02	1.07	0.3	30

: means the parameters analyzed not respect the Romanian Standard NTPA 002/1997- Quality Indicators of Waste Water Discharged into Municipal Sewage Systems

Table AII.8.15 Summary of Analysis Results for the Air in Braila, Galati, Tulcea, Roman and Constanta WWTPs

City	Parameters	0 m from WWTP Boundary	50 m from WWTP Boundary	150 m from WWTP Boundary	Limits for 30 Minutes Sampling Period (R.S. 12574/1987)
Braila	H_2S	0	0	0	0.015 mg/m^3
	NH_3	0.105	0.105	0.105	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Galati Free Zone Area	H_2S	0	0	0	0.015 mg/m^3
	NH_3	0.08	0.05	0.02	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Galati Pumping Station No.3 Area	H_2S	0.0006	0.0004	0.0003	0.015 mg/m^3
	NH_3	0.018	0.012	0.01	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Tulcea	H_2S	0	0	0	0.015 mg/m^3
	NH_3	0.115	0.105	0.095	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Roman	H_2S	0.45	0.48	0.42	0.015 mg/m^3
	NH_3	0.33	0.35	0.35	0.3 mg/m^3
	Odor Level	4	4	4	1 - 5
Constanta	H_2S	0.35	0.05	0.033	0.015 mg/m^3
	NH_3	0.30	0.11	0.10	0.3 mg/m^3
	Odor Level	4	3	3	1 - 5

Table AII.8.15 Summary of Analysis Results for the Air in Braila, Galati, Tulcea, Roman and Constanta WWTPs

City	Parameters	0 m from WWTP Boundary	50 m from WWTP Boundary	150 m from WWTP Boundary	Limits for 30 Minutes Sampling Period (R.S. 12574/1987)
Braila	H_2S	0	0	0	0.015 mg/m^3
	NH_3	0.105	0.105	0.105	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Galati Free Zone Area	H_2S	0	0	0	0.015 mg/m^3
	NH_3	0.08	0.05	0.02	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Galati Pumping Station No.3 Area	H_2S	0.0006	0.0004	0.0003	0.015 mg/m^3
	NH_3	0.018	0.012	0.01	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Tulcea	H_2S	0	0	0	0.015 mg/m^3
	NH_3	0.115	0.105	0.095	0.3 mg/m^3
	Odor Level	1	1	1	1 - 5
Roman	H_2S	0.45	0.48	0.42	0.015 mg/m^3
	NH_3	0.33	0.35	0.35	0.3 mg/m^3
	Odor Level	4	4	4	1 - 5
Constanta	H_2S	0.35	0.05	0.033	0.015 mg/m^3
	NH_3	0.30	0.11	0.10	0.3 mg/m^3
	Odor Level	4	3	3	1 - 5

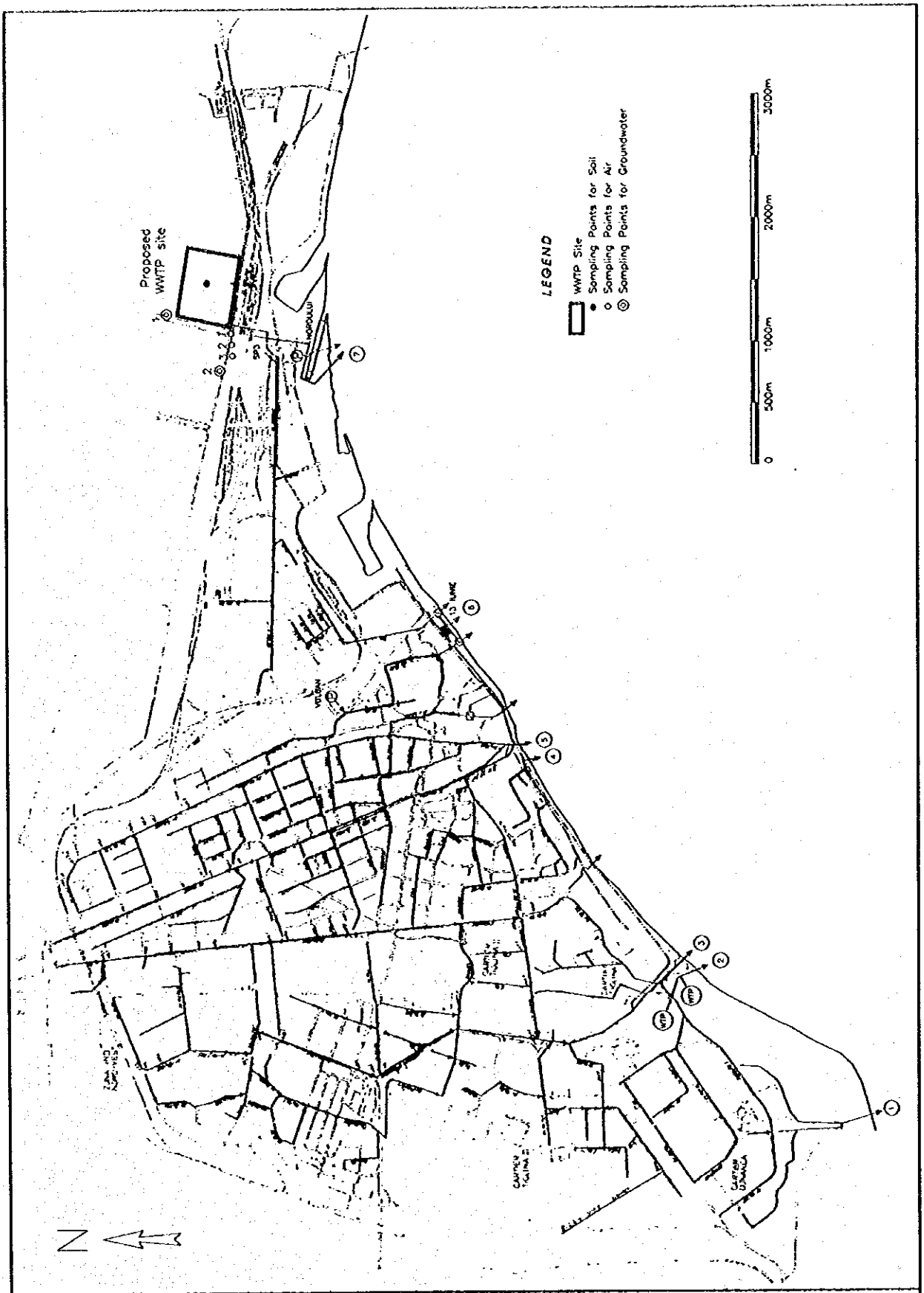
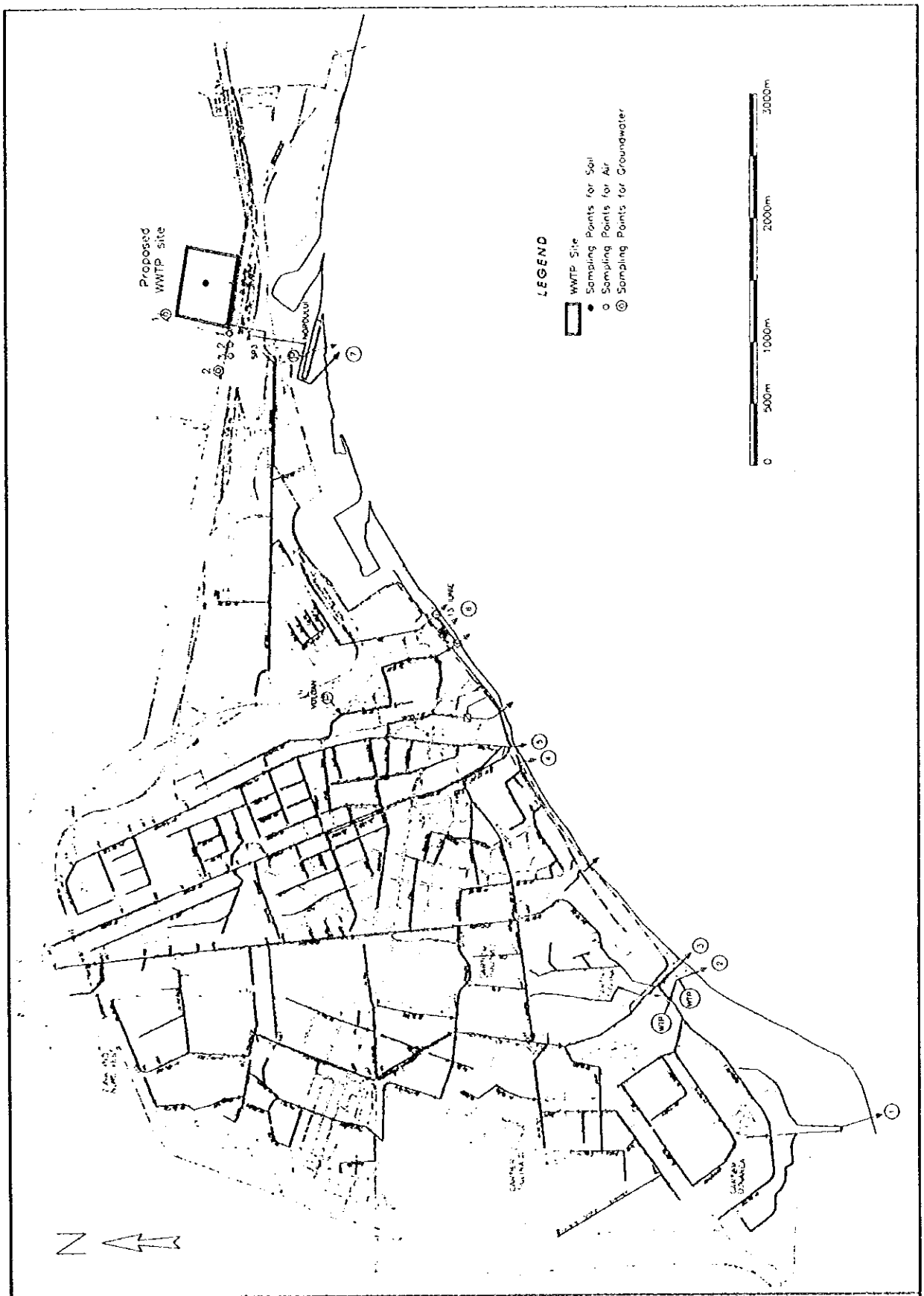


Figure AII.8.1	Location Map of Galati Wastewater Treatment Plant and Sampling Points



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