Bacau County Annex 10.1 - Sludge Data

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Bacău																												
Capita connected to the WWTP	capita	151,256	159,380	167,504	175,628	175,377	175,126	174,869	174,594	174,296	173,969	173,612	173,225	172,812	172,372	171,912	171,434	170,941	170,434	169,914	169,386	168,850	168,304	167,746	167,174	166,584	165,973	165,339
Non-domestic P.E. connected to the WWTP	p.e.	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total P.E. connected to the WWTP	p.e.	191,256	199,380	207,504	215,628	215,377	215,126	214,869	214,594	214,296	213,969	213,612	213,225	212,812	212,372	211,912	211,434	210,941	210,434	209,914	209,386	208,850	208,304	207,746	207,174	206,584	205,973	205,339
Total urban sludge production	t DS/a	3,002	3,129	3,257	3,384	3,852	3,848	3,843	3,838	3,833	3,827	3,820	3,814	3,806	3,798	3,790	3,781	3,773	3,764	3,754	3,745	3,735	3,726	3,716	3,705	3,695	3,684	3,672
DS content	kg DS/m³	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total urban sludge volume (20 % DS)	m³/a	15,008	15,646	16,284	16,921	19,260	19,238	19,215	19,190	19,163	19,134	19,102	19,068	19,031	18,991	18,950	18,907	18,863	18,818	18,772	18,725	18,676	18,628	18,578	18,527	18,474	18,419	18,362
Total urban sludge weight (20 % DS)	t/y	16,510	17,211	17,912	18,614	21,186	21,161	21,136	21,109	21,080	21,048	21,012	20,974	20,934	20,891	20,845	20,798	20,750	20,700	20,649	20,597	20,544	20,490	20,435	20,379	20,321	20,261	20,198
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total urban sludge volume (35 % DS)	m³/a	8,576	8,941	9,305	9,669	11,006	10,993	10,980	10,966	10,951	10,934	10,916	10,896	10,875	10,852	10,829	10,804	10,779	10,753	10,727	10,700	10,672	10,644	10,616	10,587	10,556	10,525	10,493
Total urban sludge weight (35 % DS)	t/y	9,434	9,835	10,236	10,636	12,106	12,092	12,078	12,062	12,046	12,027	12,007	11,985	11,962	11,937	11,912	11,885	11,857	11,828	11,799	11,770	11,739	11,708	11,677	11,645	11,612	11,578	11,542
Moinești																												
Capita connected to the WWTP	capita	17,364	18,668	19,973	21,277	21,242	21,208	21,172	21,135	21,095	21,052	21,005	20,955	20,901	20,843	20,786	20,725	20,662	20,598	20,533	20,466	20,399	20,330	20,260	20,189	20,116	20,039	19,960
Non-domestic P.E. connected to the WWTP	p.e.	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815	3,815
Total P.E. connected to the WWTP	p.e.	21,179	22,483	23,788	25,092	25,057	25,023	24,987	24,950	24,910	24,867	24,820	24,770	24,716	24,658	24,601	24,540	24,477	24,413	24,348	24,281	24,214	24,145	24,075	24,004	23,930	23,854	23,775
Total urban sludge production	t DS/a	479	509	538	568	640	639	638	637	636	635	634	633	631	630	629	627	625	624	622	620	619	617	615	613	611	609	607
DS content	kg DS/m³	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total urban sludge volume (20 % DS)	m³/a	2,396	2,544	2,692	2,839	3,201	3,197	3,192	3,187	3,182	3,177	3,171	3,164	3,157	3,150	3,143	3,135	3,127	3,119	3,110	3,102	3,093	3,085	3,076	3,068	3,057	3,047	3,037
Total urban sludge weight (20 % DS)	t/y	2,636	2,798	2,961	3,123	3,521	3,516	3,511	3,506	3,500	3,494	3,488	3,481	3,473	3,465	3,457	3,449	3,440	3,431	3,421	3,412	3,403	3,393	3,383	3,373	3,363	3,352	3,341
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total urban sludge volume (35 % DS)	m³/a	1,369	1,454	1,538	1,622	1,829	1,827	1,824	1,821	1,818	1,815	1,812	1,808	1,804	1,800	1,796	1,791	1,787	1,782	1,777	1,773	1,768	1,763	1,757	1,752	1,747	1,741	1,736
Total urban sludge weight (35 % DS)	t/y	1,506	1,599	1,692	1,785	2,012	2,009	2,006	2,003	2,000	1,997	1,993	1,989	1,985	1,980	1,975	1,971	1,966	1,960	1,955	1,950	1,944	1,939	1,933	1,928	1,922	1,915	1,909

Bacau County Annex 10.1 - Sludge Data

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Buhuşi																												
Capita connected to the WWTP	capita	12,397	14,093	15,790	17,486	17,457	17,429	17,400	17,370	17,337	17,300	17,262	17,221	17,177	17,131	17,083	17,032	16,981	16,928	16,875	16,820	16,764	16,708	16,651	16,592	16,531	16,469	16,404
Non-domestic P.E. connected to the WWTP	p.e.	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293	6,293
Total P.E. connected to the WWTP	p.e.	18,690	20,386	22,083	23,779	23,750	23,722	23,693	23,663	23,630	23,593	23,555	23,514	23,470	23,424	23,376	23,325	23,274	23,221	23,168	23,113	23,057	23,001	22,944	22,885	22,824	22,762	22,697
Total urban sludge production	t DS/a	423	461	500	538	607	606	605	605	604	603	602	601	600	598	597	596	595	593	592	591	589	588	586	585	583	582	580
DS content	kg DS/m³	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total urban sludge volume (20 % DS)	m³/a	2,115	2,307	2,499	2,691	3,034	3,030	3,027	3,023	3,019	3,014	3,009	3,004	2,998	2,992	2,986	2,980	2,973	2,966	2,960	2,953	2,946	2,938	2,931	2,924	2,916	2,908	2,900
Total urban sludge weight (20 % DS)	t/y	2,326	2,537	2,749	2,960	3,337	3,334	3,329	3,325	3,321	3,315	3,310	3,304	3,298	3,292	3,285	3,278	3,271	3,263	3,256	3,248	3,240	3,232	3,224	3,216	3,207	3,199	3,190
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total urban sludge volume (35 % DS)	m³/a	1,208	1,318	1,428	1,538	1,734	1,732	1,730	1,727	1,725	1,722	1,720	1,717	1,713	1,710	1,706	1,703	1,699	1,695	1,691	1,687	1,683	1,679	1,675	1,671	1,666	1,662	1,657
Total urban sludge weight (35 % DS)	t/y	1,329	1,450	1,571	1,691	1,907	1,905	1,903	1,900	1,897	1,895	1,892	1,888	1,885	1,881	1,877	1,873	1,869	1,865	1,860	1,856	1,851	1,847	1,842	1,838	1,833	1,828	1,823
Darmanești																												
Capita connected to the WWTP	capita	2,561	5,122	7,683	10,244	10,227	10,211	10,193	10,175	10,156	10,135	10,113	10,089	10,063	10,036	10,008	9,978	9,948	9,917	9,886	9,854	9,821	9,788	9,754	9,720	9,684	9,648	9,610
Non-domestic P.E. connected to the WWTP	p.e.	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160	7,160
Total P.E. connected to the WWTP	p.e.	9,721	12,282	14,843	17,404	17,387	17,371	17,353	17,335	17,316	17,295	17,273	17,249	17,223	17,196	17,168	17,138	17,108	17,077	17,046	17,014	16,981	16,948	16,914	16,880	16,844	16,808	16,770
Total urban sludge production	t DS/a	220	278	336	394	444	444	443	443	442	442	441	441	440	439	439	438	437	436	436	435	434	433	432	431	430	429	428
DS content	kg DS/m³	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total urban sludge volume (20 % DS)	m³/a	1,100	1,390	1,679	1,969	2,221	2,219	2,217	2,215	2,212	2,209	2,207	2,204	2,200	2,197	2,193	2,189	2,186	2,182	2,178	2,174	2,169	2,165	2,161	2,156	2,152	2,147	2,142
Total urban sludge weight (20 % DS)	t/y	1,210	1,529	1,847	2,166	2,443	2,441	2,439	2,436	2,433	2,430	2,427	2,424	2,420	2,416	2,412	2,408	2,404	2,400	2,395	2,391	2,386	2,382	2,377	2,372	2,367	2,362	2,357
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total urban sludge volume (35 % DS)	m³/a	629	794	960	1,125	1,269	1,268	1,267	1,265	1,264	1,263	1,261	1,259	1,257	1,255	1,253	1,251	1,249	1,247	1,244	1,242	1,240	1,237	1,235	1,232	1,230	1,227	1,224
Total urban sludge weight (35 % DS)	t/y	691	874	1,056	1,238	1,396	1,395	1,393	1,392	1,391	1,389	1,387	1,385	1,383	1,381	1,379	1,376	1,374	1,371	1,369	1,366	1,364	1,361	1,358	1,355	1,353	1,350	1,347

Bacau County Annex 10.1 - Sludge Data

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Târgu Ocna																												
Capita connected to the WWTP	capita	7,647	8,693	9,740	10,786	10,769	10,751	10,734	10,714	10,694	10,673	10,649	10,623	10,597	10,567	10,538	10,507	10,475	10,443	10,409	10,376	10,342	10,307	10,271	10,235	10,198	10,159	10,119
Non-domestic P.E. connected to the WWTP	p.e.	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638	1,638
Total P.E. connected to the WWTP	p.e.	9,285	10,331	11,378	12,424	12,407	12,389	12,372	12,352	12,332	12,311	12,287	12,261	12,235	12,205	12,176	12,145	12,113	12,081	12,047	12,014	11,980	11,945	11,909	11,873	11,836	11,797	11,757
Total urban sludge production	t DS/a	210	234	257	281	317	317	316	316	315	315	314	313	313	312	311	310	309	309	308	307	306	305	304	303	302	301	300
DS content	kg DS/m³	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total urban sludge volume (20 % DS)	m³/a	1,051	1,169	1,287	1,406	1,585	1,583	1,580	1,578	1,575	1,573	1,570	1,566	1,563	1,559	1,555	1,552	1,547	1,543	1,539	1,535	1,530	1,526	1,521	1,517	1,512	1,507	1,502
Total urban sludge weight (20 % DS)	t/y	1,156	1,286	1,416	1,546	1,743	1,741	1,739	1,736	1,733	1,730	1,727	1,723	1,719	1,715	1,711	1,707	1,702	1,698	1,693	1,688	1,683	1,679	1,674	1,668	1,663	1,658	1,652
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total urban sludge volume (35 % DS)	m³/a	600	668	736	803	906	904	903	902	900	899	897	895	893	891	889	887	884	882	879	877	875	872	869	867	864	861	858
Total urban sludge weight (35 % DS)	t/y	660	735	809	884	996	995	993	992	990	989	987	985	982	980	978	975	973	970	967	965	962	959	956	953	950	947	944
Total Urban WW Sludge																												
Capita connected to the WWTPs	capita	191,224	205,957	220,689	235,421	235,071	234,725	234,367	233,988	233,579	233,129	232,642	232,113	231,550	230,951	230,326	229,677	229,007	228,320	227,617	226,904	226,175	225,437	224,683	223,909	223,112	222,288	221,433
Non-domestic P.E. connected to the WWTPs	p.e.	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906	58,906
Total P.E. connected to the WWTPs	p.e.	250,130	264,863	279,595	294,327	293,977	293,631	293,273	292,894	292,485	292,035	291,548	291,019	290,456	289,857	289,232	288,583	287,913	287,226	286,523	285,810	285,081	284,343	283,589	282,815	282,018	281,194	280,339
Total urban sludge production	t DS/a	4,334	4,611	4,888	5,165	5,860	5,853	5,846	5,839	5,830	5,821	5,812	5,801	5,790	5,778	5,766	5,753	5,739	5,726	5,712	5,697	5,683	5,668	5,653	5,638	5,622	5,606	5,589
Total urban sludge volume (20 % DS)	m³/a	21,670	23,056	24,441	25,826	29,301	29,267	29,231	29,193	29,152	29,107	29,059	29,006	28,950	28,890	28,828	28,763	28,697	28,628	28,556	28,481	28,415	28,342	28,267	28,190	28,110	28,029	27,944
Total urban sludge weight (20 % DS)	t/y	23,837	25,361	26,885	28,409	32,231	32,193	32,154	32,112	32,067	32,018	31,964	31,906	31,845	31,779	31,711	31,640	31,566	31,491	31,414	31,336	31,256	31,176	31,093	31,009	30,921	30,831	30,738
Total urban sludge volume (35 % DS)	m³/a	12,383	13,175	13,966	14,758	16,744	16,724	16,703	16,682	16,658	16,633	16,605	16,575	16,543	16,509	16,473	16,436	16,398	16,359	16,319	16,279	16,237	16,195	16,152	16,108	16,063	16,015	15,968
Total urban sludge weight (35 % DS)	t/y	13,621	14,492	15,363	16,234	18,418	18,396	18,374	18,350	18,324	18,296	18,265	18,232	18,197	18,159	18,120	18,080	18,038	17,995	17,951	17,906	17,861	17,815	17,768	17,719	17,669	17,618	17,565

Bacau County Annex 10.2 - WTP Sludge

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Cerabosie WTP - CF Facility																												
Total WTP sludge production	t DS/y	1,548	613	654	699	928	982	1,018	1,055	1,092	1,117	1,143	1,168	1,194	1,206	1,215	1,219	1,224	1,228	1,232	1,236	1,240	1,244	1,248	1,252	1,255	1,258	1,254
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total sludge volume (35 % DS)	m³/a	4,424	1,752	1,869	1,996	2,653	2,806	2,909	3,014	3,120	3,192	3,265	3,338	3,412	3,447	3,470	3,484	3,496	3,509	3,521	3,533	3,544	3,555	3,566	3,576	3,586	3,595	3,584
Total sludge weight (35 % DS)	t/y	4,866	1,928	2,056	2,196	2,918	3,086	3,200	3,315	3,431	3,512	3,592	3,672	3,753	3,791	3,817	3,832	3,846	3,860	3,873	3,886	3,899	3,911	3,923	3,934	3,945	3,955	3,942
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total sludge weight (35 % DS)	t Wet Sludge	4,866	1,928	2,056	2,196	2,918	3,086	3,200	3,315	3,431	3,512	3,592	3,672	3,753	3,791	3,817	3,832	3,846	3,860	3,873	3,886	3,899	3,911	3,923	3,934	3,945	3,955	3,942
Baraţi WTP - Non-CF Facility																												
Total WTP sludge production	t DS/y		957	913	878	1,100	1,111	1,122	1,133	1,144	1,155	1,166	1,176	1,187	1,197	1,207	1,212	1,217	1,222	1,226	1,231	1,236	1,240	1,245	1,249	1,254	1,258	1,259
DS content	kg DS/m³	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Total sludge volume (35 % DS)	m³/a		2,735	2,609	2,509	3,143	3,175	3,207	3,238	3,270	3,301	3,331	3,361	3,391	3,421	3,450	3,464	3,477	3,491	3,504	3,517	3,530	3,543	3,556	3,569	3,582	3,594	3,598
Total sludge weight (35 % DS)	t/y		3,009	2,870	2,760	3,457	3,492	3,527	3,562	3,597	3,631	3,664	3,698	3,730	3,763	3,795	3,810	3,825	3,840	3,854	3,869	3,883	3,898	3,912	3,926	3,940	3,954	3,957
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total sludge weight (35 % DS)	t Wet Sludge	0	3,009	2,870	2,760	3,457	3,492	3,527	3,562	3,597	3,631	3,664	3,698	3,730	3,763	3,795	3,810	3,825	3,840	3,854	3,869	3,883	3,898	3,912	3,926	3,940	3,954	3,957
Total WTP sludge production	**t DS/y**	**1,548**	**1,571**	**1,567**	**1,577**	**2,028**	**2,093**	**2,140**	**2,188**	**2,236**	**2,273**	**2,309**	**2,345**	**2,381**	**2,404**	**2,422**	**2,432**	**2,441**	**2,450**	**2,459**	**2,467**	**2,476**	**2,485**	**2,493**	**2,501**	**2,509**	**2,516**	**2,514**
Total WTP sludge weight	**t Wet Sludge**	**4,866**	**4,936**	**4,926**	**4,956**	**6,375**	**6,579**	**6,727**	**6,877**	**7,028**	**7,142**	**7,256**	**7,370**	**7,483**	**7,554**	**7,612**	**7,642**	**7,671**	**7,700**	**7,727**	**7,755**	**7,782**	**7,809**	**7,835**	**7,860**	**7,885**	**7,909**	**7,900**

uip ISPA
uip coeHune

Nr. 19024/04.11.09

CARPATCEMENT
HEIDELBERGCEMENTGroup

Fax Message

Carpatcement Holding SA
Sucursala Bicaz
Str. Piatra Corbului Nr. 80
615100 Bicaz, Jud. Neamț, România
Tel: +40 233 254 221
Fax: +40 233 253 131

To:	**Ing. Ionut-Catalin Dughir,** **Director Proiecte**
Company:	COMPANIA JUDETEANA APA SERV SA Piatra Neamt, jud. Neamt
Fax:	0233 218 937
Copy:	
Date:	04.11.2009
No.of Pages:	1

From:	Ing. Victor Ciubotariu
Phone	0233206343 0730055518
Fax:	0233253751
E-mail	victor.ciubotaru@carpatcement.ro

Subject: **Coincinerare namoluri deshidratate**

Stimate Domnule Director,

Ca urmare a solicitării dumneavoastră din 29.10.2009, referitoare la posibilitatea preluarii in scopul co-incinerarii a namolurilor produse de statiile de epurare, la Carpatcement Holding SA – Sucursala Bicaz, vă facem cunoscute urmatoarele:

- deseurile trebuie sa fie livrate in unitati de ambalare (galeti sau saci de polietilena rezisteni, bine legati al gura) cu dimensiunile de maxim 1200 mm x 350 mm si greutatea de max. 20 kg;
- transportul deseurilor cade in sarcina generatorului de deseuri;
- principale caracteristici ale deseurilor trebuie sa fie: puterea calorifica - minim 2500 Kcal/Kg; cenusa -maxim 30%; umiditate - maxim 50%;
- se percepe o taxă de incinerare pe tona de deseu, functie de categoriile si caracteristicile deseurilor si cantitatile de deseuri;
- primirea deșeurilor se poate face in conditiile in care instalatia de coincinerare este in functiune, numai dupa primirea buletinului de analiza si efectuarea probelor de ardere;
- pentru anul 2010 nu se preconizeaza schimbarea conditiilor de preluare a acestor categorii de deseuri;
- in masura in care vom pune in functiune instaltii de incinerare care sa poata prelua aceste deseuri in vrac, vom putea avea o buna colaborare in vederea eliminarii prin coincinerare a acestora;
- exista si posibilitatea livrarii in vrac a acestor deseuri, in vederea eliminarii prin coincinerare, la Carpatcement Holding SA - sucursala Fieni.

Cu stima,

Director Sucursala,
Ing. Ioan Zelcu

SOCIETATEA COMERCIALĂ CARPATCEMENT HOLDING S.A.
SUCURSALA BICAZ

Analist achizitii,
Ing. Victor Ciubotariu

Translation from Romanian

FAX MESSAGE

CARPAT CEMENT HOLDING
BICAZ SUBSIDIARY
80, Piatra Cotului Street
015100 Bicaz, Neamt County, Romania
Phone: +40 233 254 221
Fax: +40 233 253 131

TO:	Eng. Ionut-Gatalin Dughir Projects Manager
COMPANY:	COMPANIA JUDETEANA APA SERV SA Piatra Neamt, jud. Neamt
FAX:	0233 218 937
DATE:	04.11.2009

From: Eng. Victor Ciubotariu
Phone 0233206343
0730055511
Fax: 0233253751
E-mail victor.ciubotaru(@caroatcement.ro

SUBJECT: Co-incineration of dewatered sludge

Dear Sir,

Following your request, dated October 10th 2009, regarding the possibility to take over sludge produced within Wastewater Treatment Plants for co-incineration purposes within Carpatcement Holding SA – Bicaz Subsidiary, we inform you the followings:

- waste must be supplied in packing units (resistant polyethylene buckets or sacks, well closed), with maximal size of 1200 mm X 350 mm and maximal weight of 20 kg;
- waste transportation is under the responsibility of the entity generating the waste;
- waste main characteristics must be:
    - calorific power – min. 2500 Kcal/kg;
    - ash – max 30%;
    - humidity – max. 50%;
- a co-incineration fee is levied, per tone of waste, based on the waste categories and characteristics and waste quantities;
- waste reception can be performed if the co-incineration installation is in operation, only after obtaining the analysis bulletin and performance of the combustion tests;

- for the year 2010, no modification of the conditions for reception of such waste category is forecasted;
- by commissioning some co-incineration installations capable of receiving this waste as bulk, we shall have the prerequisites required in order to have a good cooperation for the waste elimination by means of co-incineration.
- the opportunity to supply the waste as bulk also exists, for co-incineration purposes, within Carpatcement Holding SA – Fieni subsidiary.

Respectfully yours,

Subsidiary Director
Eng. Ioan Zelcu

Procurement Analyst
Eng. Victor Ciubotariu

Illegible stamp and signature

BU 1164/6.07.2010

09 11937 07 2010

ACORD DE PRINCIPIU

CARPATCEMENT HOLDING S.A., cu sediul in Bucuresti, Bucharest Business Park, Sos. Bucuresti - Ploiesti, nr.1A, intrarea C, Etaj 1, sector 1, avand cod unic de inregistrare nr.RO10640589, nr.de ordine in Registrul Comertului J40/5389/1998, reprezentată prin Director General Mihai Rohan

şi

COMPANIA JUDETEANA APA SERV S.A., având cod unic de inregistrare RO 15346437, nr. de ordine in Registrul Comertului J27/499/2003, reprezentată prin Director General Neculai Ivanov,

au convenit incheierea urmatorului acord de principiu:

CARPATCEMENT HOLDING S.A. va proceda la co-incinerarea namolului rezultat in urma procesului tehnologic de tratare a apelor uzate din Judetul Neamt, operate de **COMPANIA JUDETEANA APA SERV S.A.**., in instalatiile de producere a clincherului de la Sucursala Bicaz a **CARPATCEMENT HOLDING S.A.**,.

Această soluție de utilizare a nămolului este considerată cea mai potrivită din punct de vedere a protecție a mediului si eliminarii ecologice a deseului-namol de epurare, întrucât co-incinerarea are loc la temperaturi foarte înalte iar intregul proces este monitorizat, urmarindu-se in permanenta emisiile la cos.

Transportul pana la **CARPATCEMENT HOLDING S.A.**-Sucursala Bicaz intra in responsabilitatea **COMPANIEI JUDETENE APA SERV S.A** direct sau prin transportatori autorizati, in conditiile prevazute de lege.

Livrarea se va face in loturi, la momente agreate in prealabil de Parti, pentru a se incadra in perioadele de functionare ale cuptorului de clincher.

Nămolul prezentat trebuie sa aiba in mod obligatoriu un conţinut de substanta uscata de minimum 90% si sa se incadreze in parametrii specificatiei tehnice a materialului.

Specificatia tehnica:

- Putere calorifica: min. 11 GJ/to;
- %Cl:< 0.2% in masa;
- %Hg:<2 ppm in masa;
- %S: <3% in masa;
- P2O5: <8% in masa;
- Umiditate:max 10%;
- Dimensiunea particulelor: max 3 mm (2 dimensiuni);
- Temperatura: <45 deg C

Nu se va percepe taxa pentru co-incinerarea nămolului, daca acesta este livrat conform specificatiei tehnice

Nu se accepta la co-incinerare alt namol din statiile de epurare, care nu este in limitele specificatiei tehnice.

Cele două companii îşi vor coordona programele de investiţii astfel incât in termen de circa doi de la data prezentului acord să îşi adapteze fluxurile tehnologice pentru arderea şi respectiv pentru uscarea nămolului la minim 90% SU .

Aceasta activitate se va concretiza prin semnarea unui contract între parteneri.

CARPATCEMENT HOLDING S.A

Presedinte si Director General
Mihai Rohan

COMPANIA JUDETEANA APA SERV S.A

Director General
Neculai Ivanov

Bacau County Annex 10.5 - Disposal Paths

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Bacău																												
Composting (35 %)	%	0%	2%	11%	18%	45%	50%	50%	50%	50%	50%																	
	t Wet Sludge	0	218	1,143	1,936	5,429	6,046	6,039	6,031	6,023	6,014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landfilling Chimei Landfill (35 % DS)	%	100%	98%	89%	82%	55%	50%	50%	50%	50%	50%																	
	t Wet Sludge	9,434	9,617	9,093	8,700	6,677	6,046	6,039	6,031	6,023	6,014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-Incineration	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	1,910	1,907	1,903	1,899	1,895	1,891	1,886	1,882	1,877	1,872	1,868	1,863	1,858	1,853	1,847	1,842	1,836
Reforestation, Land Reclamation	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	1,910	1,907	1,903	1,899	1,895	1,891	1,886	1,882	1,877	1,872	1,868	1,863	1,858	1,853	1,847	1,842	1,836
Total	t DS/y	9,434	9,835	10,236	10,636	12,106	12,092	12,078	12,062	12,046	12,027	3,820	3,814	3,806	3,798	3,790	3,781	3,773	3,764	3,754	3,745	3,735	3,726	3,716	3,705	3,695	3,684	3,672
Moinești																												
Composting (35 %)	%						41%	42%	42%	47%	46%																	
	t Wet Sludge	0	0	0	0	0	826	833	839	932	920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	59%	58%	58%	53%	54%																	
	t Wet Sludge	1,506	1,589	1,692	1,785	2,012	1,184	1,173	1,164	1,069	1,077	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-Incineration	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	317	316	316	315	314	314	313	312	311	310	309	308	308	307	306	305	304
Reforestation, Land Reclamation	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	317	316	316	315	314	314	313	312	311	310	309	308	308	307	306	305	304
Total	t DS/y	1,506	1,589	1,692	1,785	2,012	2,009	2,006	2,003	2,000	1,997	634	633	631	630	629	627	625	624	622	620	619	617	615	613	611	609	607
Buhuși																												
Composting (35 %)	%						43%	44%	44%	49%	48%																	
	t Wet Sludge	0	0	0	0	0	826	833	839	932	920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	57%	56%	56%	51%	51%																	
	t Wet Sludge	1,329	1,450	1,571	1,691	1,907	1,079	1,070	1,061	866	875	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-Incineration	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	301	300	300	299	299	298	297	297	296	295	295	294	293	292	292	291	290
Reforestation, Land Reclamation	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	301	300	300	299	299	298	297	297	296	295	295	294	293	292	292	291	290
Total	t DS/y	1,329	1,450	1,571	1,691	1,907	1,905	1,903	1,900	1,897	1,895	602	601	600	598	597	596	595	593	592	591	589	588	586	585	583	582	580

Bacau County Annex 10.5 - Disposal Paths

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Darmanești																												
Composting (35 %)	%																											
	t Wet Sludge	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	0	0
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%																	
	t Wet Sludge	691	674	1,056	1,238	1,396	1,395	1,393	1,392	1,391	1,389	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-Incineration	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	221	220	220	220	219	219	219	218	218	217	217	217	216	216	215	215	214
Reforestation, Land Reclamation	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	221	220	220	220	219	219	219	218	218	217	217	217	216	216	215	215	214
Total	t DS/y	691	674	1,056	1,238	1,396	1,395	1,393	1,392	1,391	1,389	441	441	440	439	439	438	437	436	436	435	434	433	432	431	430	429	428
Târgu Ocna																												
Composting (35 %)	%																											
	t Wet Sludge	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	0	0
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%																	
	t Wet Sludge	660	735	809	884	996	995	993	992	990	989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-Incineration	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	157	157	156	156	156	155	155	154	154	153	153	153	152	152	151	151	150
Reforestation, Land Reclamation	%											50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	t DS/y	0	0	0	0	0	0	0	0	0	0	157	157	156	156	156	155	155	154	154	153	153	153	152	152	151	151	150
Total	t DS/y	660	735	809	884	996	995	993	992	990	989	314	313	313	312	311	310	309	309	308	307	306	305	304	303	302	301	300

Caraboaia WTP - CF Facility																												
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total sludge weight (35 % DS)	t Wet Sludge	4,866	1,928	2,056	2,196	2,918	3,086	3,200	3,315	3,431	3,512	3,592	3,672	3,753	3,791	3,817	3,832	3,846	3,860	3,873	3,886	3,899	3,911	3,923	3,934	3,945	3,955	3,942
Berești WTP - Non-CF Facility																												
Landfilling Chimei Landfill (35 % DS)	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total sludge weight (35 % DS)	t Wet Sludge	0	3,009	2,870	2,760	3,457	3,492	3,527	3,562	3,597	3,631	3,664	3,698	3,730	3,763	3,795	3,810	3,825	3,840	3,854	3,869	3,883	3,898	3,912	3,926	3,940	3,954	3,957

Bacau County Annex 10.5 - Disposal Paths

Parameter	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Disposal Path		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Landfilling Chimei Landfill (35 % DS)	t Wet Sludge/ y	18,488	19,210	19,146	19,253	19,364	17,278	17,396	17,518	17,466	17,585	7,256	7,370	7,483	7,554	7,612	7,642	7,671	7,700	7,727	7,755	7,782	7,809	7,835	7,860	7,885	7,908	7,900
Capacity 35 % DS	t Wet Sludge/ y	20,599	19,210	19,146	19,253	19,364	17,278	17,396	17,518	17,466	17,585	17,722	17,864	18,011	18,163	18,321	18,484	18,652	18,826	19,004	19,186	7,782	7,809	7,835	7,860	7,885	7,909	7,900
Composting (35 % DS)	t Wet Sludge/ y	0	218	1,143	1,936	5,429	7,697	7,705	7,709	7,886	7,854	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Composting (35 %)	t Wet Sludge/ y		218	1,143	1,936	5,429	7,697	7,705	7,709	7,886	7,853																	
Co-Incineration	t DS/y	0	0	0	0	0	0	0	0	0	0	2,906	2,901	2,895	2,889	2,883	2,876	2,870	2,863	2,856	2,849	2,841	2,834	2,827	2,819	2,811	2,803	2,794
Capacity	t DS/y	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Reforestation, Land Reclamation	t DS/y	0	0	0	0	0	0	0	0	0	0	2,906	2,901	2,895	2,889	2,883	2,876	2,870	2,863	2,856	2,849	2,841	2,834	2,827	2,819	2,811	2,803	2,794
Capacity	t DS/y	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

Chimei Landfill Cells		cell 1				cell 2									cell 3						cell 4
Year		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sludge capacity per year (35 % DS)	t/y	20,599	19,210	19,146	19,253	19,364	17,278	17,396	17,518	17,466	17,585	17,722	17,864	18,011	18,163	18,321	18,484	18,652	18,826	19,004	19,186
Total sludge capacity per cell (35 % DS)	t	78,208				160,204									111,450						20,000
Consumed sludge capacity per year and cell, WWTP and WTP sludge (35 % DS)	t/y	18,488	19,210	19,146	19,253	19,364	17,278	17,396	17,518	17,466	17,585	7,256	7,370	7,483	7,554	7,612	7,642	7,671	7,700	7,727	7,755
Total sludge capacity consumed per cell (35 % DS)	t	76,097				128,716									45,906						19,186

STATE OF ART OF LAND DEGRADATION AND DESERTIFICATION IN ROMANIA – THE STRATEGY TO MITIGATE THEM

Dr. M. Dumitru, Dr. I. Munteanu
Research Institute for Soil Science & Agrochemistry, Bucharest, Romania
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Abstract

The human activities, mainly agriculture, industry and urbanisation along with the global climate changes are the principal factors responsible for the land degradation and desertification in Romania. At the nation-wide level the land degradation as a whole, affects more than 2/3 of the total country area (23,839 sq. km).

According to SOVEUR methodology 29.3 percent of the total country-area is subject to water erosion and landslides, 15.3 percent to soil compaction and crusting, 2.6 percent to salinity & sodicity, 3.8 percent to severe or moderate pollution, 14.1 percent to reduction in humus and nutrients content. Only 35.4 percent appear as stable lands from which 30.2 percent under natural conditions and 5.2 percent under human influence.

Within Romania the land degradation and desertification are going hand in hand.

The areas that experience severe climatic drought (40-65 percent of years) sum up 29 percent of the country area (but 40 percent of the arable land) of which 17 percent present a high risk to desertification (according to CCD rules). Although the land degradation is spread out within the whole country while drought and desertification affects only some regions, a global strategy to mitigate/combat both these phenomena has been worked out.

The general goals of this strategy are as follows:

a) Improving national land use planning, by:
- *an equilibrated socio-economic development of all country's regions;*
- *improving life quality;*
- *responsible management of natural resources and environment protection;*
- *rational use of the national territory.*

b) Durable management of the Natural Capital. This management refers mainly to the areas with high risk of desertification that has to start with the "agroforestry" concept;

c) Biodiversity conservation;

d) Agriculture and Forestry Sustainable Management;

e) Durable Management of the Water Resources;

f) Regional (international) Co-operation;

g) Socio-economic measures (compensation of losses induced by drought, promoting an insurance system against drought and desertification, improving legislation concerning environment protection in the steppe and forest steppe zones subject to drought and desertification).

Key Words: Soil degradation, Desertification, Romania

Introduction

The land degradation in Romania is a problem of nation-wide interest since the beginning of the 20th century. The first signals have been triggered by agronomists (Gh. Ionescu-Sisesti) as concern water erosion and by silviculturalists (M. Dracea) for wind erosion respectively. Of more recent data (since the middle of the second half of the 20th century) are the so-called "modern" land and soil degradation processes e.g. soil pollution, chemical and physical deterioration. Although the southern and south-eastern part of the country are subjected to frequent and severe droughts until seventies, officially, almost nobody spoke about desertification in Romania. This term has been introduced there only in 1997, when Romanian Government signed (Law 629/1997) the UN Convention to Combat Desertification (CCD). Till then the term "aridisation" has been in use (Munteanu, 1988).

By the end of the year 2000, the Ministry of Water, Forests and Environmental Protection (MWFEP) finished and forwarded to CCD "The National Strategy and Actions Programme to Combating desertification, Land degradation and Drought". This is an official document that analyses the present-day status and outlines the main measures of reducing the environmental and socio-economical effect of desertification, drought and land degradation in Romania.

1. Land degradation

By **land degradation** we understand the deterioration of soil and its environment below natural capacity to sustain in a durable manner the natural and/or man-made ecosystems.

The main factors responsible for the land degradation are human activities: agriculture, industry and urbanisation respectively the role of global climate change is not clear yet, but we suppose of having an increasing importance at least starting from the last decades of the 20^{th} century. The table 1 summarises the main anthropic factors contributing to land degradation in Romania.

Table 1

Causing factors of anthropic induced land degradation in Romania (Munteanu, 2000) (Classification adapted from GLASOD, Oldeman et al., 1991)

Causing factor	Extent	Geographic occurrence	Kind of land degradation induced	Approximate age of start (years)
1. Agricultural activities (e.g. absence of erosion control measures, frequent use of heavy machinery excessive use of fertilizers and biocides, bad management of irrigated lands, etc.	Almost all agricultural lands (62% of the country area)	Plain and hilly regions	- Erosion (water & wind) - Soil compaction and crusting - Loss of organic matter and macronutrients - Pollution by pesticides and heavy metals	$> 1.5 \times 10^3$ $> 0.3 \times 10^2$ $> 1.0 \times 10^2$ $> 0.3 \times 10^2$
2. Deforestation and removal of natural vegetation (e.g. converting forest into agricultural land, wind breaks and hedge-rows removal, large scale commercial forestry, road construction, urban development).	Forest and forest-steppe zone	Plains Hills Mountains	- Erosion (mostly water) - Loss of organic matter and nutrients	$> 1.5 \times 10^3$
3. Overexploitation for domestic use (excessive gathering of fuelwood, fodder, timber)	Locally	Hills Mountains	- Erosion (water & wind)	Unknown
4. Overgrazing and trampling by livestock	Locally	All regions but mostly in hills and mountains	- Vegetal cover destruction - Water & wind erosion - Soil structure destruction & compaction	1.5×10^3
5.Industrial activities (mining, manufacturing, power generation,	Locally	All regions	- Soil wasting - Pollution of different kinds	$> 1.0 \times 10^2$

infrastructure and urbanization, waste handling traffic etc.	(both, either point source or diffuse). - Loss of bioproductive soil functions

1.1 Extent and geographical distribution of the main kinds of degraded lands. At the nation-wide level the land degradation as a whole affects more than 2/3 of the country area. From the data of the National Soil Quality Monitoring System and according to SOVEUR methodology, 29.3 percent of the country area is subject to water erosion and landslides, 15.2 percent to soil compaction and crusting, 2.6 percent to salinity & sodicity, 3.8 percent to severe or moderate pollution, 14.1 percent to reduction in humus and nutrients. Only 35.4 percent appear as stable land from which 5.7 percent under human influence. More details are given in the table 2. The general geographic distribution of the land degradation types is depicted in fig. 1 and 2. A short description is given bellow.

1.2 Water erosion and land slides, both by, extent (7×10^6 ha) and economic and environmental impact are by far the most severe kinds of land degradation. Although in the last four decades some erosion control works have been done over about 2.2 million ha, by deficient application of the Land Law no. 18/1991 (the parcels were oriented down hill-up hill across the soil erosion control terraces) on a large areas, these works were destroyed and the situation became even worse than before.

Water erosion and landslides are present mainly in the hilly and table lands regions, intensively deforested and with general lithology consisting of soft rocks: loess and loess like material, sands, and clays. From fig. 2 it results that these kinds of degraded land are concentrated in five major areas: I. Transilvania table land; II. Getic Piedmont; III. Pericarpathian Hills; IV. Moldavian table lands and V. the Danubian side of Dobroudgea Patches, with eroded soils occur also in Western Piedmonts.

As concern the intensity, the moderate and strong degrees predominate.

1.3 Wind erosion This type of erosion has been recorded on sandy and loamy sandy soils (0.4×10^6 ha). However we have to accept that this process is under-evaluated. No measurement have been done yet in loamy and sandy loamy soils from the steppe and forest steppe zones of the South and South eastern part of the country with long dry period in summer-fall time and often with snowless winters.

1.4 Soil compaction (1.3×10^6 ha) is due mostly to the weight and/or too frequent use of machinery and tillage at unsuitable soil moisture content. It is recorded mainly in clayey loamy, loamy and sandy loamy soils of dry and subhumid regions with flat or slightly undulated relief.

1.5 Soil sealing and crusting (2.3×10^6 ha) occurs especially on silty and loamy soils, with low organic matter content, destroyed top soil structure and weak vegetation cover, allowing maximum splash of raindrops.

1.6 Soil pollution (5.4×10^6 ha) is represented predominantly by polychlorinated biphenyl (PCBs) and is of low to moderate intensity.

1.7 Fertility decline is caused by the negative balance between input and output of organic matter and nutrients ("soil mining"). It affects mainly the soils of dry and dry-submitted areas.

Table 2

Types of land degradation in Romania (Dumitru et al. 2000, Munteanu, 2000)

No	Degradation type	Geographical distribution	Area[1]	
			10^3 ha	%
1.	Water erosion (sheet and gully erosion)	Hilly and table lands regions, pericarpathian hills	6 300 (from which 1376 gullies	26.4
2.	Landslides	Hilly and table lands regions, pericarpathian hills	702	2.9
3.	Wind erosion	Sandy areas from Romanian Danube Plain, Danube Delta	378	1.6
4.	Silting/colmatation	Inland river flood plains, Delta and Danube Flood Plain	950	4.0
5.	Soil compaction	Predominantly in the Plain regions	1 344	5.6
6.	Crusting and sealing	Almost all silty, silty loamy and clayey loamy soils	2 300	9.6
7.	Aridification (by ground water lowering)	Locally within the Danube Flood Plain	362	1.5
8.	Soil removal through surface mining, excavations	Mostly within surface coal mining areas from Oltenia	15	0.1
9.	Pollution with urban and industrial wastes	Peri-urban areas, coal power plants, mining areas	18	0.1
10.	Salinization/sodicificati . (mostly natural)	Eastern Romanian Danube Plain, Western Plain, Moldovian Tableland	614	2.6
11.	Chemical pollution, generally of moderate intensity	Industrial & mining areas, some in agricultural lands	900 (+3641x10^3 ha, weak pollution)	3.8
12.	Loss of soil fertility by organic matter and macronutrients depletion	Romanian Danube Plain, Dobrogea	3 342	14.1
13.	Acidification	Arable lands from the external part of the forestry zone	841	3.5
14.	Stable lands in natural conditions	Forested lands, some grasslands, Danube Delta	7 182	30.2
15.	Stable land under human influence	Some areas of plain and tableland regions, outside irrigated areas	1 240	5.2
16.	Land without natural vegetation (waste lands)	Rocky land, high mountain peaks	141	0.6

2. Desertification

The definition of desertification agreed by World leaders at the 1992 Earth Summit and adopted by the United Nation Convention to Combat Desertification (CCD) is: "Land

[1] Some land degradation types overlap so the values have to be considered individually. The total percent is higher than 100

Figure 3 - ROMANIA - Soil erosion

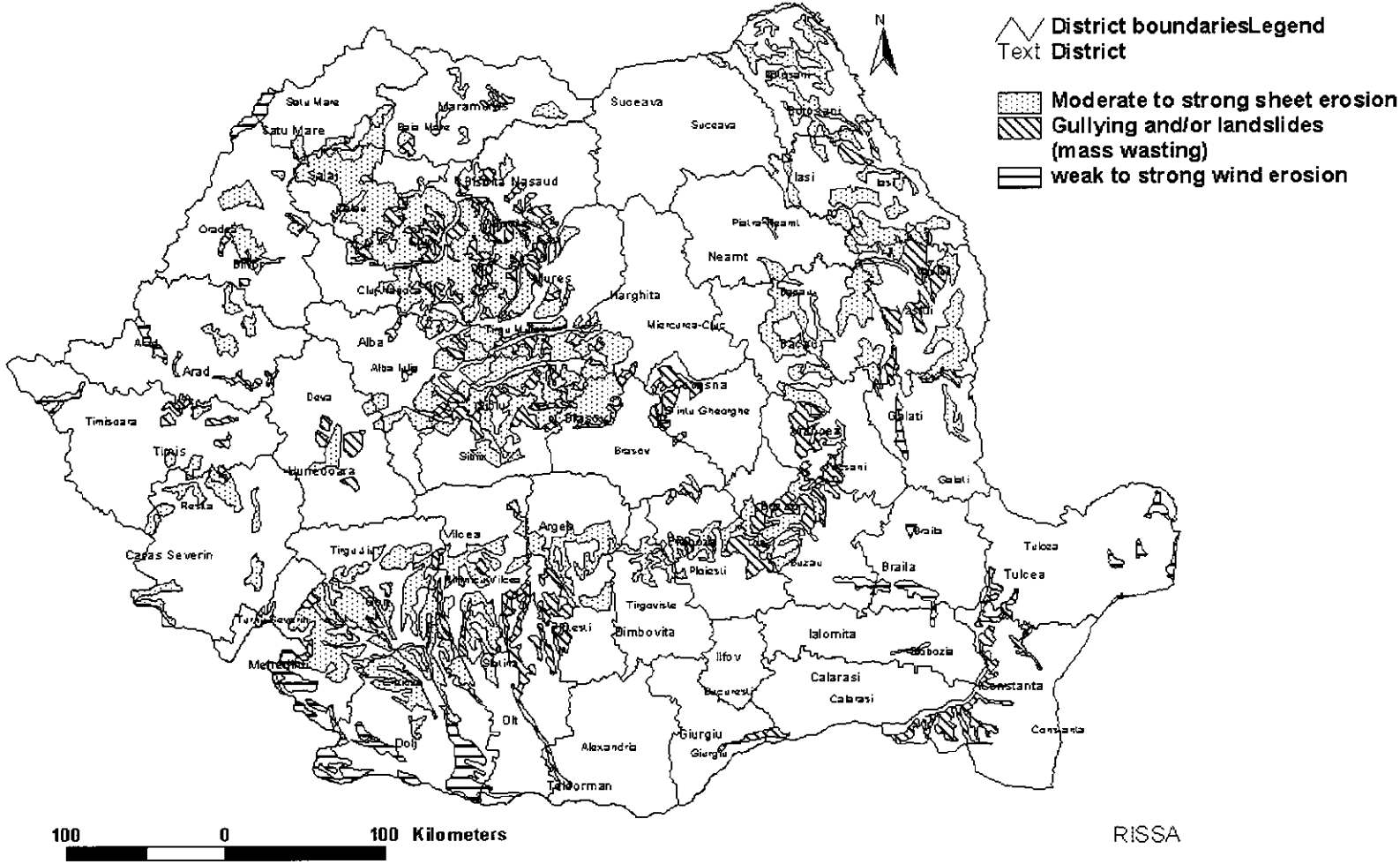
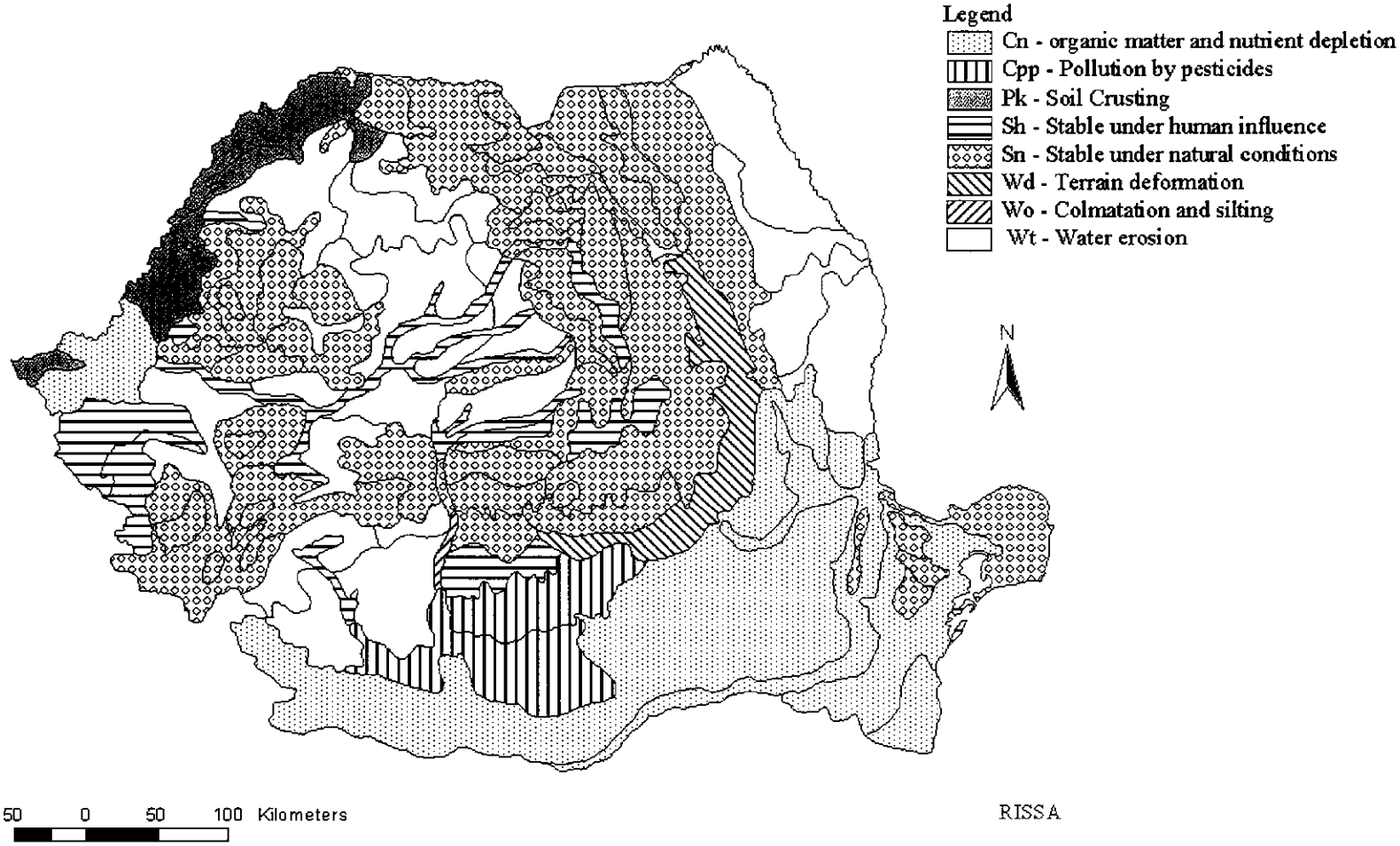


Fig. 2 - Human-induced soil degradation (dominant type) in ROMANIA



Degradation in arid, semiarid and subhumid areas resulting from various factors, including Climate Variations and Human Activity" (CCD, 1994).
As process of land degradation, desertification is inherently associated with intensification of drought, therefore it may occur not only in the desert fringes , but also in moister regions, but affected by prolonged drought and where the agricultural practices induce landscape and soil degradation (Tessier, 1994).

2.1 Causes of desertification in Romania. In Romania desertification is caused by two major factors: climatic anomalies and anthropic intervention on vulnerable ecosystems of the semiarid and dry subhumid zone.

2.2 Climatic anomalies are represented by extension of arid episodes, expressed by decrease of rainfall amount and increase of temperature and wind intensity. The last 100 years evidence almost a general trend of rainfall amount diminishing and of temperature increase respectively. Although these changes manifest on the whole country area, their effect is strongly amplified in the semi-arid and subhumid low-land regions of the South-Eastern and Southern part of the country where drought episodes are by far more frequent. Thus, the 1982-1996 period was the most droughty one of our history, and the most droughty year was 2000. From a frequency of multiannual average of 33.4 per cent of droughty and severely droughty years, a frequency of 80 per cent was recorded in 1982-1996 period.

2.3 Anthropic causes. Among the main anthropic (human) factors considered to be responsible for desertification is the advanced deforestation of the semiarid and dry subhumid zones (less then 8.2 per cent forests as compared with 28 per cent at the nation-wide level). Also locally, an important contribution have water erosion (in Dobrogea and Southern Moldavia) wind erosion (in Southern Oltenia and Central Baragan) and soil salinity (Calmatzui Valley, Braila Plain). The inadequate agricultural practice that leads to soil structure destruction, soil compaction organic matter and macro nutrients depletion may be also included as factors that enhance the desertification risk.
Overgrazing appear as an amplifying factor of the desertification risk in Central and northern Dobrogea on shallow soils developed on bedrock, as well as on large areas with eroded soils from Barlad Tableland.
At last but not least, the huge drainage and embankments works done in the Danube Flood Pain by which ca 0.4 mill. ha of wetlands were converted into agricultural lands, could have a serious contribution to increase the climate aridity and the desertification risk.
Desertification (fig. 3) and drought (fig. 4) occur mainly in the South and South-Eastern part of the country and overlap the steppe and forest steppe bioclimatic belts. Locally they penetrate in the oak forest zone of high plains. In the western part of the country, the lands with desertification risk are by far less extensive. Their delineation have been made by correlating the aridity index R (P/ETP) and the Palfay index, that takes into consideration the drought years frequency. According to CCD rules, the areas with a R value of < 0.65 fall within the incidence of desertification risk, while those with a Palfay index with values of 6-8 (droughty years' frequency of 40-63%) are subject to severe climatic drought. Roughly, the area that experiences severe climatic drought sums up ca 7.1 mill. ha (29 per cent from the country area, but 40 per cent of the arable lands) of which ca 4 mil. ha (ca 17 per cent of the country area) present a high risk of desertification.
In the area with high risk of desertification and severe drought, the climate is warm and dry with a mean annual temperature higher than 10^0C. The sum of average temperature $\geq 0^0$C is between 4000-4300^{0}C, and of those $\geq 10^0$C between 1600-1800. The amount of annual rainfall varies between 300-500 mm, and that of April-October period between 200-350 mm. While the soil water reserve within 100 cm depth, at March 31st is of 950-1500 cubic meters

(ha equivalent of 95-150 mm precipitation). The potential evapotranspiration may reach more than 700 mm/year.
The landforms of area subject to desertification and drought are various: plains, tablelands and low gradient hills.
The soil cover consists of a high variety of genetical soil types (Kastanozems, Chernozems, Arenosols, Vertisols, Fluvisols, Leptosols) whose vulnerability to desertification and drought, differs markedly depending on texture and other soil properties, mainly available water capacity, on some chemical properties, on local land form, parent material, and natural drainage.
The land is mostly agricultural one (table 3)

Table 3

Land use types of the area subject to desertification

Land use type	'000 ha	%	Land use type	'000 ha	%
Arable Land	2448.9	61.7	Forests	327.1	8.2
Pastures	310.5	7.8	Water bodies	506.8	12.8
Meadows	8.4	0.2	Roads&Buildings	179.4	4.5
Vineyards	87.4	2.2	Unproductive	82.6	2.1
Orchards	15.0	0.4			
Total agricultural land	2870.2	72.4		1095.9	27.6
Grand Total				3966.1	100

A large part of the area is equipped with irrigation facilities, but unfortunately due to technical and socio-economic causes, the irrigation is applied on very small areas (less than 5 per cent).

3. The strategy[*)] to mitigate land degradation and desertification.
This strategy outline of main direction of action as follows:
a) Improving Land use planning, by
- An equilibrated socio-economic development of all country's regions
- Improving life quality (especially in the rural regions)
- Responsible management of natural resources and environment protection
- Rational use of the national territory

b) Durable management of the Natural Capital
This goal refers mostly to areas with high risk of desertification, that has to start with the "agroforestry" concept, that is to achieve an equilibrated ratios between the agricultural agroecosystems (including pastoral ones) and forestry ecosystems, and unitary norms for environment protection;
c) Biodiversity conservation
This activity aims mostly to reduce the anthropic impact resulted from sectorial economic activities (soil pollution, excessive use of herbicides and fertilizers, storage of domestic and industrial waste, deforestation and overgrazing);
d) Agriculture and Forestry Sustainable Development
One estimate that agricultural and forestry ecosystems are the basic components of the natural capital. The main envisaged measures are:
Agriculture:
- establishing an ecological type of agricultural management;
- increasing of the agricultural farm size;

[*)] "National strategy and action Programme to Combat Desertification, Land degradation and Drought - 2000", achieved under the auspices of the Ministry of Water and Environment Protection (MWEP)

Fig. 3 – ROMANIA – Map of desertification risk

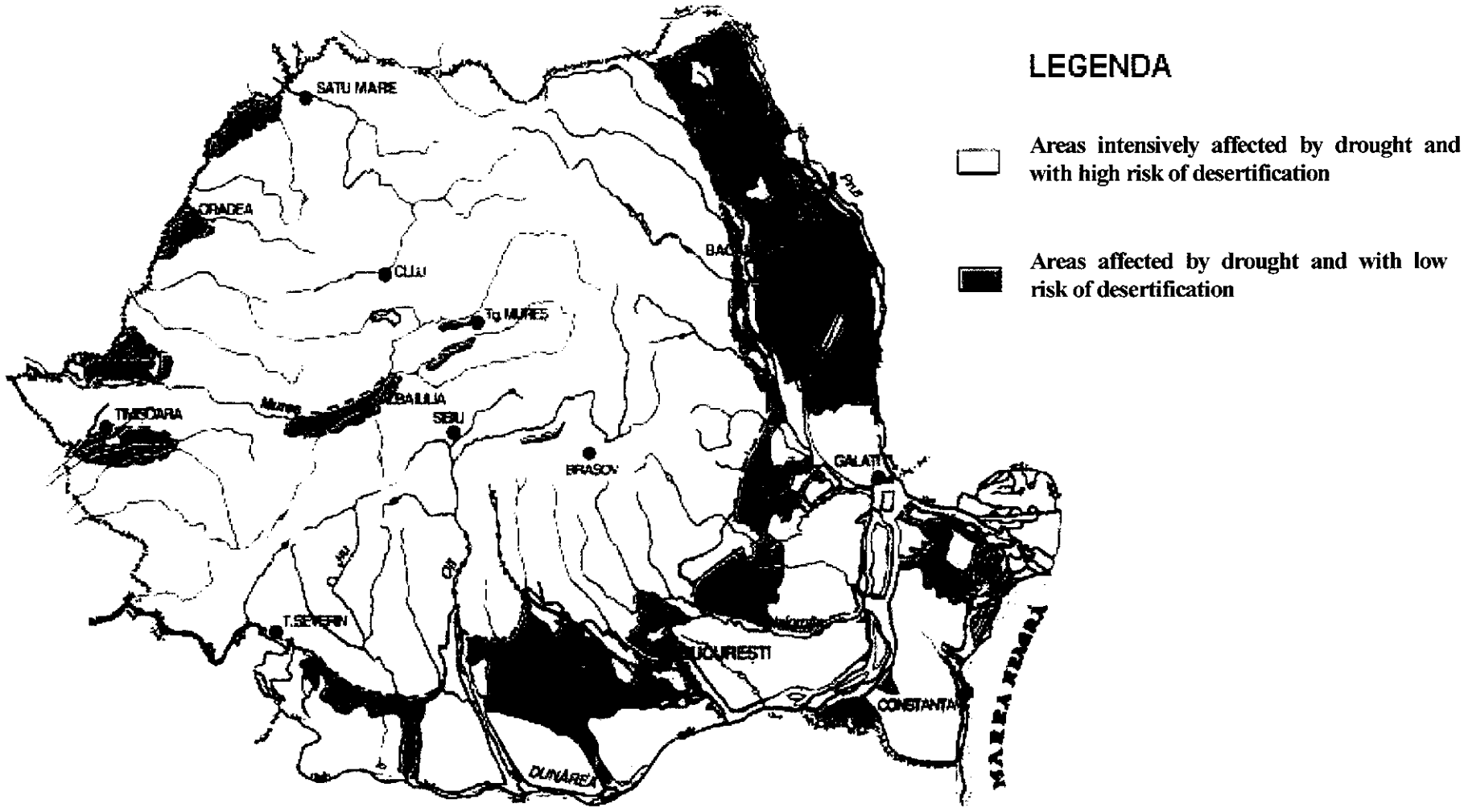
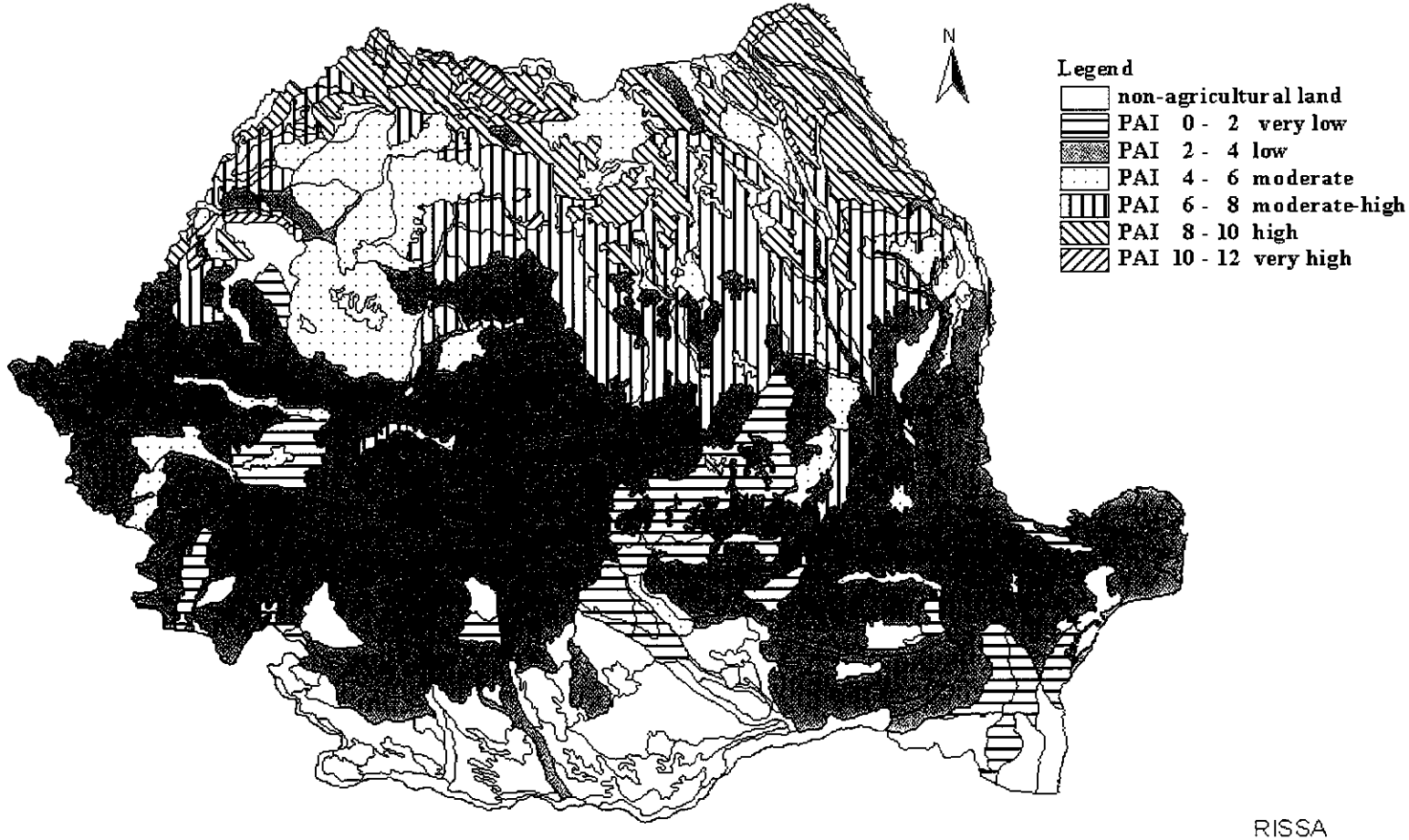


Fig. 4 - ROMANIA - Soil corrected Palfay aridity index



- reducing the annual cropland acreage by excluding from arable land the sloping lands, ≥ 12 per cent, and the severe degraded ones converting them to other kinds of land use (e.g. grasslands, forestry);
- restructuring and development of agricultural systems towards the following directions depending on water supply;
- ecological rehabilitation of degraded lands by industrial activities (surface mining, industrial and / or domestic waste storage, oil and brine etc.) based on the principle that "pollutor pays";
- adequate use of naturally low productive lands (sands, waterlogged soils, saline soils);
- creating cultivars with high resistance to drought;
- planting windbreaks in the drought affected areas.

Silviculture:

- assessing the integrity of the forest resource;
- rehabilitation of forests that are in decline;
- integration of representative forest ecosystem in the national network of protected areas;
- durable management of the hunting and fishing resources.

e) Durable management of water resources

Within the semiarid and dry-subhumid regions the lack of water resources become a chronic phenomenon, with adverse effects of economical nature, on gardening, cattle breeding, fish-breeding and forestry. Serious shortcomings arise in other fields: water supply, transport, industry, electric power production, and human health. These effects become extensive and amplified mostly during drought periods.

To overcome these difficulties a complex set of measures are envisaged:

- assessment of a set of drought indicators (e.g. aridity index, rainfall, ground water level, water stock existing in artificial lakes, water discharge of inland rivers)
- establishing actions and measures for correct assessment of the drought apparition;
- permanent information of people;
- nation-wide institutional organisation of water resources management.

f) Regional (international) co-operation

- regional data gathering and regional data information exchange concerning drought and desertification;
- regional co-operation in monitoring drought and desertification;
- development of joint-programmes of research aiming to establish causes that induce land degradation drought and desertification and the most adequate measures to prevent them and mitigate their effects.

g) Socio-economic measures

- governmental compensation of losses induced by land degradation drought and desertification;
- improving legislation concerning environmental protection in the steppe and forest-steppe zones vulnerable to drought and desertification;
- encouragement of NGO's that have as objectives environment protection pollution, combating and prevention;
- promoting insurance system against drought
- increase the ability of the local administration to manage drought, desertification and land degradation.

h) Special measures to control desertification and drought:

1) Assessing scenarios for drought protection using a medium term hydrogeological forecast programme;

2) Environmental factors protection in droughty conditions, this refers both to the air pollution by decreasing the gaseous (especially CO_2) emissions, and to water resources pollution by reducing and a better control of point source pollutants. Of great importance is the quantitative water resources management that implies;
   - changes in water accumulations exploitation rules; joined exploitation of different kinds of water sources (surface and ground water) and changes in water supplies priorities;
   - measures aiming to improve the efficiency of water use in domestic sector, agriculture, different industries etc.
3) Rehabilitation and development of viable irrigation systems
   Although Romania has a large area (ca 3.2 millions ha) of its agricultural land provided with irrigation schemes, owing to different causes (lack of watering equipment, advanced wear, deterioration, and steal of some automation elements, deterioration of pipes network from irrigation plots, canals damaging, non-accommodation to small parcel size and specific requirements of the present-day private agriculture) the major part of these systems are not used.
   In aim to rehabilitate the irrigation systems the following measures are considered to be necessary:
   - relauching of irrigation use by rehabilitation and modernisation of viable irrigation schemes;
   - efficientization of exploitation and maintenance works
   - providing progressive investments of rehabilitation and modernisation work on ca of 2,0 millions ha irrigated land;
4) Create forestry wind-breaks and forestry belts
   One of the ways to prevent and combat efficiently the drought and desertification phenomena is to plant a network of forestry windbreaks and forestry belts. As a medium term strategic objective one estimate that is necessary to initiate a project only for one million ha agricultural lands, situated in the most exposed area to drought and desertification. At this size, the length of forestry windbreaks amount to 60-70 thousands kilometres.
   The future extension of the windbreaks will be, as follows:
   - along the railways and roads 18000 ha, 6000 km length;
   - along irrigation canals, some water courses and water accumulation - 2000 ha, 4000 km length;
   - around localities, industrial objectives - 9000 ha.

   The forestry belts are new in Romania. Therefore they will be planted initially experimentally on 1000 ha.
5) Improvement of hydrological regimes within the embanked areas. This work aim to improve the ground water regime to avoid soil salinisation in the embanked areas affected by drought.
6) Terracing to retain water on slopes. This kind of work is recommended only on the lands with high stability to landslides or other mass-movement.
7) Promoting alternative crops resistant to drought
   Within droughty conditions one-recommend alternative crops with high tolerance to water deficit, e.g. Sorghum or winter barley to replace maize, peas as alternative to soybeans etc. Crop rotation and soil tillage will follows to improve water storage in soil. On suitable soil conditions minimum tillage will be promoted. Soil fertility will be maintained mainly by organic fertilization with minimum amount of mineral fertilizers.
8) Ecological reconstruction of forests affected by dryness.

The forests affected by dryness following prolonged drought, but also to some inappropriate human intervention (flood plains endking, ground water exhausting etc.) are located mainly in the low-lying zones, but also in plains, and tablelands usually on sandy soils. The measures to rehabilitate these forests consists of:

- intensifying the protection activity against disease and parasites;
- applying special care techniques;
- adequate solutions to find-out the best structural composition adapted to new condition.

9) Water Resources Management

In the area subjected to prolonged drought, the management of water resources aims to improve the water-use efficiency. In this sense it is necessary to establish a prices system that could regulate the efficiency user of water by adoption of new technologies. The following measures are considered of being of great importance:

- use of incentives and facilities to promote an efficient water-use;
- find-out alternative solutions e.g. designing and execution of new accumulation lakes, extension of storage capacity of the existing accumulation lakes, promoting prospections to identify new ground water sources, diminishing the water losses from irrigation canals and pipes, limiting the irrigation only the crops of high value and economic efficiency.

10) Measures to rehabilitate degraded lands

These measures concern the following main categories of degraded lands:

- eroded soils (6300 millions ha) and landslides (0,7 million ha) - afforestation of ca 1,5 - 2 millions ha of agricultural land;
- salt-affected soils (0,64 mill. ha)
- sandy soils (wind erosion) (0.44 million ha)
- compacted soil (1.3 million ha)
- soil with low organic matter and nutrients content (3.4 millions ha)
- polluted soils (0.9 million ha).

To control desertification and drought in Romania a complex National Strategy was elaborated. This strategy embraces all environmental, social, economical and technical sides of these problems. One of the main difficulties in applying this strategy results from the advanced dispersion of land tenure in agriculture and the advanced poverty of the major part of Romanian farmers.

4. Conclusions

In Romania the Land Degradation, by its size (2/3 of the country area) and its intensity is a serious threat for terrestrial ecosystems stability, environment quality and as well as for food security of the country. Desertification is a direct consequence of both land degradation and global climate changes. The National Strategy to meet these challenges aims to improve the soil and water management and use, stop the land degradation and rehabilitate the most severe degraded land by converting them from agricultural land use to forestry (afforestation) or grasslands.

An important objectives of the strategy is also the rehabilitation and modernisation of viable irrigation schemes (ca. 2 mill. ha).

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Soil degradation processes in the area with desertification risk in Romania

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Abstract

The area subject to desertification, identified by the climatic indices mentioned in the definition given in the Convention to Combat Desertification, covers most of south-eastern Romania. It is one of the main agricultural regions of this country and it represents ca. one fourth of its arable land. The paper includes a short description of the natural conditions affecting agriculture and desertification: climate, relief, soil parent material, hydrology and hydrogeology soils and soil properties. Predominant soil and of other natural conditions are favourable to moderately productive agriculture and relatively resistant to various soil degradation processes and to desertification. The main part of the paper describes in more details the existing soil degradation processes affecting this studied area and the risk of further developing of such processes. Dryness, drought and erosion are the main ones, present and with risk of further development. Aridization, waterlogging, salinity and sodicity, pollution are locally present and may know some extension. Humus and nutrient depletion, structure degradation, compaction and crusting are affecting soil rating and productivity in most of the area.

Keywords: desertification, soil degradation, Romania

Introduction

As known, according to the definition given in the Convention to Combat Desertification taken by the United Nations (1994), desertification is any land degradation in arid, semi-arid and dry sub-humid areas, resulting from various factors, including climatic variations and human activities. Arid, semi-arid and dry subhumid areas are defined as having a Precipitation / Potential Evapotranspiration ratio (P/ETP) ranging between 0.05 and 0.65. According to this definition, the area with risk of desertification covers much of south-eastern Romania, and perhaps some of other areas of the country.

This paper will try to analyse the natural conditions and land degradation processes in this area. This analysis is mainly based on data included in the microzoning of the Romanian territory (Florea et al., 1999). These data were processed using a preliminary procedure (Canarache, 2002).

The area with risk of desertification in Romania

There is not a clear definition of the area in this country with a P/ETP ratio of less than 0.65. A P/ETP ratio under this limit is certainly characteristic for the extreme south-eastern part of the country, namely the Dobrudja Tableland (located between the Danube river and the Black Sea) and a narrow strip on the left side of the Danube in the extreme east of the Danube Plain. Some other data, somehow less certain, appreciably extend the area with such climatic characteristics, including part of the Moldavian Tableland in the east of the country, most of the Danube Plain in the south of the country and the extreme part of the western Tisa Plain.

Taking into consideration this difference in climatic characterization, we are considering in this paper (Figure 1) the two areas described above: the D_1 area with a certain risk of desertification, and the D_2 area with an uncertain such risk.

Natural conditions

The climate is characterized, with some exceptions in the north-eastern part, by an average annual temperature of 10 - 11.5^{0}C, a length of the frost-free season of 170 - 225 days and an average amount of precipitation of 350 - 650 mm. Precipitation are distributed all-over the year, with a relative maximum in May - June. Weather variability is quite important from year to year, with frequent severe drought, but also with some excessive rain and sometimes with winter temperature below -20 - -25^{0}C.

The tableland relief of the D_1 area and of the north-eastern part of the D_2 area is characterized by frequent sloping land, much of it inadequate for cropping. In northern Dobrudja remnants of a Palaeozoic range of mountains (the Macin Mountains) are present, with an altitude up to some 400 m. The Danube Floodplain, mostly reclaimed by damming, is an important relief form of the area with risk of desertification. The Danube Delta, representing almost half a million hectares, is one of the few wetlands still existing in Europe.

The soil parent material is mainly loess in the tablelands and plains, with some exceptions in the Macin Mountain and on a few severe slopes, and alluvia in the Danube Floodplain and Delta, as well as in the floodplains of the Danube tributaries in the D_2 area. The loess layer is generally deep enough not to cause adverse effects on soil properties and soil moisture regime.

From the point of view of hydrology, Dobrudja is a dry area, with almost no river beds except the Danube flowing at its western and northern side. The D_2 area west of the Danube river is crossed by several rivers coming from the Carpathian mountains, with various water fluxes and high variability from year to year and within each year of this flux. A groundwater layer of flux high enough to be of use is deeply located. A groundwater layer less important for its water flux but of interest for the soil water regime is present in most floodplain and delta land, and also in some specific areas of the Danube and Tisa Plains.

Soils in the area with risk of desertification belong mainly to Kastanozems, Chernozems and Phaeozems in the tableland and plain areas and to Fluvisols and Gleysols in the floodplain and delta areas. Some Regosols, Leptosols, Arenosols, Vertisols, Solonchaks, Solonetz, Histosols may be found in limited areas. Most soils have a deep profile, no coarse fragments, are medium textured, have a good available water capacity, are of moderate or high porosity and hydraulic conductivity, have a neutral or slightly alkaline reaction, a moderate humus content, a good available potassium and a low available phosphorus content.

Land use

Table 1 shows the size of the area with risk of desertification. The D_1 area represents some 7 percent of the total area of Romania, and the D_2 area some 22 percent more.

In the same table the distribution of land by different land uses is shown for the area with risk of desertification and, for comparison, on the whole of the country. If the agricultural land use is 62 percent at the level of the whole country, it is 90 percent in the dry-subhumid area. Concerning the main agricultural land uses, cropland is 41 percent at the country level and 75 percent in the area considered as dry-subhumid, while rangeland is 21 and respectively only 15 percent. On the opposite, forest area represents 28 percent of the whole country, but only less than 9 percent of the area with risk of desertification. Wetland is less than 4 percent in Romania, but more than 8 percent in the dry-subhumid area, this being due to the presence here of the Danube Delta. These figures lead to the conclusion that the dry-subhumid area of Romania is, especially if we discard

the wetland of the Danube Delta, mainly an agricultural, more specifically a cropland one. This conclusion is more obvious for the D_1 area, that is the area certainly having such a climate.

Areas affected by various land degradation processes and limitation factors

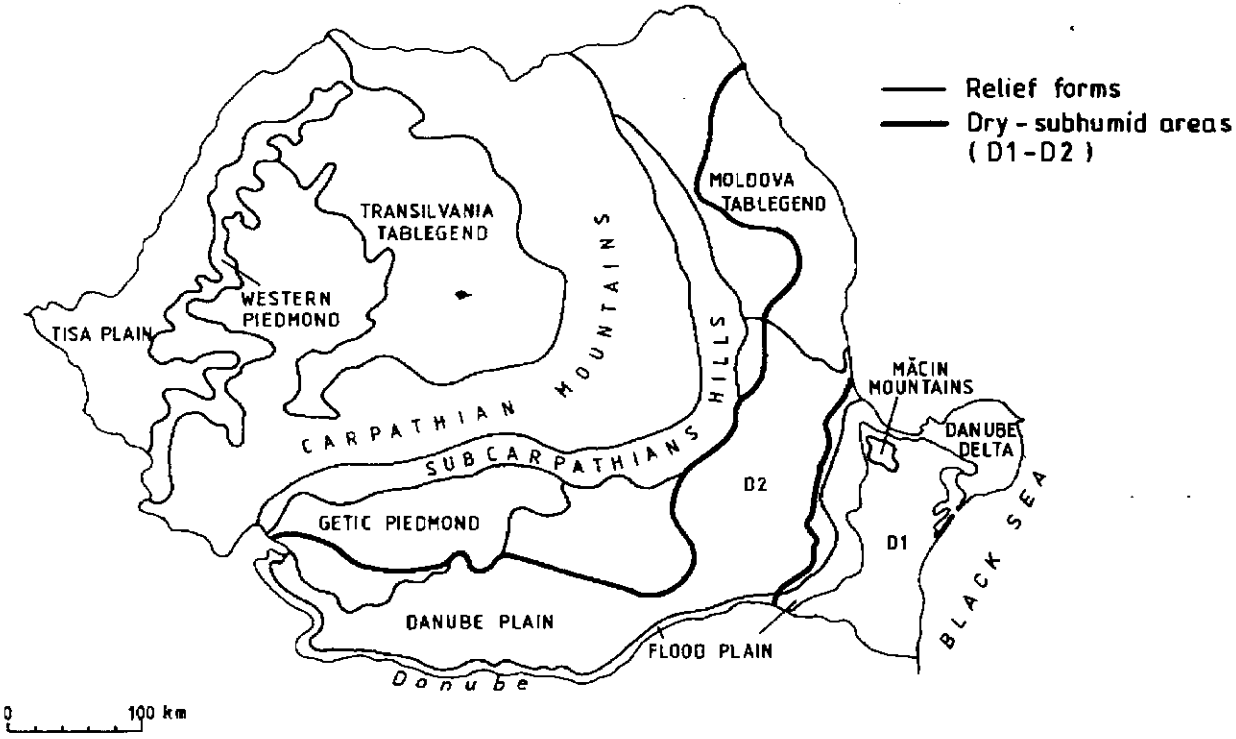
As shown in Table 2, lands in the dry-subhumid area of Romania are seriously affected by a large variety of degradation processes and/or subject to several factors limiting their productivity. This results from both the natural conditions of this area, and from the effect of the large extension of arable land that spread in many cases on marginal land, unsuitable for each use.

Table 1. Land resources in Romania and in its dry-subhumid area

Land use	Total of country area, %	Dry-subhumid area					
		% of dry-subhumid area			% of country land use		
		D_1	D_2	$D_1 + D_2$	D_1	D_2	$D_1 + D_2$
Arable	39.2	59.2	59.8	59.6	13.3	36.8	50.1
Vineyards	1.2	1.8	2.4	2.2	13.3	50.0	63.3
Orchards	1.1	0.4	0.6	0.6	3.2	14.2	17.4
Pastures	14.3	8.3	16.5	14.3	5.1	27.9	33.0
Hayfields	6.3	0.3	1.5	1.2	0.4	5.8	6.2
Total agriculture	62.1	70.0	80.9	78.0	10.2	32.0	42.2
Forests	28.1	7.0	8.8	8.3	2.2	7.6	9.8
Water	3.7	18.1	3.4	7.3	43.4	22.0	65.3
Other	6.2	4.9	6.9	6.4	7.0	27.1	34.1
Total	100.0	100.0	100.0	100.0	7.2	22.3	29.5

The main limiting factor for agriculture is dryness of the climate and frequency of drought specific of course to the kind of land considered here. It affects almost the whole of the D_1 agricultural and arable land and ca. 85 percent of its total area. All of the unaffected land in D_1 is represented by the Danube Delta wetland and by part of the Danube Floodplain with shallow groundwater. In the D_2 area the percentage is lower, close to 60 percent, as part of that area is located in a climate at the edge between dry-subhumid and subhumid. For prevention of further aridization and for improvement of productivity of the land affected by climate dryness and by drought supplementary irrigation is considered, but its development has to take into consideration that most of the irrigation water has to be taken from the Danube river and pumped, sometimes quite high. Consequently, an analysis of the economic efficiency of irrigation is essential. Needed height of pumping is higher in the D_1 area, that is in the area more severely affected by dryness. The second solution to deal with this limiting factor of soil productivity is use of specific dry farming techniques, including a reshaping of the cropping pattern, use of low water-consuming crops and cultivars, conservation tillage, etc.

Figure 1 - AREAS WITH RISK OF DESERTIFICATION IN ROMANIA



The second main degradation process is water erosion. It affects some one third of the D_1 area and some one quarter of the D_2 area, where it is present mainly in its north-eastern part. There is little difference between the agricultural, the arable and the total percentage of land subject to erosion in each of these areas. Erosion is closely related to relief and to extension of agriculture and cropping on sloping land, often on severe slopes. Return to such land to non-cropping uses, including reafforestation has to be considered on one tenth or more of the present cropland. On less steep slopes specific soil conservation techniques, mainly including contour tillage, sometimes even strip cropping, a specific cropping pattern, e.g., based on winter cereals producing a protecting plant cover especially in the season of high intensity rains, conservation tillage, have to be implemented.

Table 2. Soil degradation processes and limiting factors in the dry-subhumid area of Romania (severely and moderately affected)

Degradation or limiting factor	D_1			D_2			$D_1 + D_2$		
	Arable	Agricultural	Total	Arable	Agricultural	Total	Arable	Agricultural	Total
Dryness and Drought	96.4	96.1	84.2	59.7	58.5	59.6	68.3	64.5	62.9
Water erosion	34.1	36.5	31.1	23.2	27.1	27.9	12.0	12.6	12.7
Wind erosion	0.4	0.9	2.1	2.8	2.9	3.5	2.2	2.5	3.2
Salinity	1.3	2.8	6.8	1.4	2.8	6.8	1.3	2.8	6.8
Risk of secondary salinization	5.2	6.1	26.3	16.4	15.4	15.0	14.5	13.7	17.3
Groundwater waterlogging	0.7	1.7	14.8	10.7	10.6	11.0	8.0	8.2	11.7
Surface waterlogging	0.0	0.0	0.0	2.6	2.8	2.9	2.0	2.2	2.1
Flooding hazard	0.1	0.2	11.6*	0.1	0.2	0.2	0.1	0.1	0.2*
Compaction	18.4	17.7	18.0	21.9	21.1	21.6	17.3	16.6	19.7
Crusting	67.9	66.3	63.2	5.2	5.3	5.2	20.6	19.9	17.8
Coarse fragments or shallow rock	3.6	6.5	6.3	0.4	0.5	0.4	1.2	1.9	1.9
Humus storage	25.5	29.2	38.2	7.0	7.2	7.8	11.5	12.4	15.8
Acidity	0.0	0.0	0.0	0.3	0.3	0.3	0.2	0.3	0.2
Alkalinity	2.7	2.5	2.2	0.4	0.5	0.4	1.2	1.9	1.9

* Mainly Danube Delta wetland

The other degradation processes, namely wind erosion, salinity, groundwater and surface waterlogging, flooding hazard, are much less extended, especially in the D_1 area and on agricultural land. There is some risk of secondary salinization following improper use of

irrigation: some 6 percent of the agricultural land in the D_1 area and some 15 percent in the D_2 area. Waterlogging, flooding and secondary salinization refer to more land when considering the total of the D_1 area, but these refer to the Danube Delta wetland and as such is of no practical importance.

Some of the soil degradation processes directly related to current cropping practices are widespread in the dry-subhumid area of Romania. Soil compaction risk covers some 20 percent in both dry-subhumid areas. Crusting risk is present on more than half of the D_1 area and much less in the D_2 area. Risk of humus depletion has been identified on some 30 percent of the D_1 area and on some 10 percent of the D_2 area. Improvement of soil management techniques, better correlation of traffic and tillage with soil moisture content, conservation tillage, proper fertilization are among the measures envisaged to deal with these risks. Coarse fragments and/or shallow rock, with negative consequences on crop rooting and on soil moisture balance, occupy a few of the D_1 land. Areas with soil reaction under or over the optimum one are insignificant.

Concerning further possible development of the degradation processes discussed several questions may be raised. Most of such unfavourable development will follow possible climate changes: aridization, that is increase in temperature and evapotranspiration and decrease in precipitation will directly increase dryness and drought risk, and indirectly will increase erosion as soil protection by vegetation and cops will be less. An increase of land degradation due to human activities is less probable, as the extent of agriculture and arable land is already extremely high. On the contrary, reafforestation of marginal land and improvement of farming will certainly contribute to some decrease in land degradation. Irrigation, where economically efficient, will of course contribute to lowering of dryness and drought risk. If properly managed, increase in erosion and/or other degradation processes, on irrigated land is not foreseen. Secondary salinization on irrigated fields will not be a problem in most cases, as irrigation water is of good quality; in floodplain areas with shallow groundwater, drainage of much irrigated land will be needed. Poldering of the Danube Floodplain proved to be efficient, the quality of the reclaimed agricultural land being high and degradation processes only locally present. Poldering of the Danube Delta wetland is not envisaged for ecological, social and other reasons.

Conclusions

A non-insignificant part of Romania, most of it intensively used in agriculture, has a climate including it in the area with risk of desertification. The main land degradation processes affecting part of this area are dryness and risk of drought, soil erosion, soil compaction and humus depletion. Reafforestation of marginal, steep sloping, land, irrigation where economically efficient, dry farming and conservation tillage are the main techniques to be used for prevention of further degradation and for rehabilitation of already degraded soils.

References

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Florea N., Untaru G., Vespremeanu (1999). *Updated pedo-geoclimatic microzoning of Romanian territory.* St. Solului, vol. 33, nr.1, pp. 86 - 104.

*** *Convention to Combat Desertification (CCD).* Adopted by the United Nations in Paris, June 17, 1994.

Sludge Dewatering to 35 % DS

Sludge Dewatering (35 % DS) and Sludge Disposal to Landfills
General Option analysis, Comparison of Consumables and Disposal Costs
Recesses Plate Filter Press (RPF-Press) versus Belt Filter Press (BF-Press) with Lime Dosing

100 % landfilling until 2020 assumed, from 2021 on 50 % landfilling assumed

exemplary for a WWTP of 80,000 PE

1. Investment Costs

with equipment to reach 35 % DS of Sludge
based on Annex 4.5.3.xx

Item	Performance	Unit	Quantity	Unit Price Euro	Total Price Euro
	Recessed-Plate-Filter-Press equipment to reach 35 % DS				
22	**Sludge Dewatering (without civil constructions)**				
22.1	**Civil Works**				
	n/a			0	0
22.2	**Mechanical Equipment**				
22.2.1	Recessed Plate Filter Press 2 x 7 m³/h incl. Polymer station (20 kg/d)	pieces	2.00	100,000	200,000
22.2.2	Installation of 2 + 1 excenter screw pumps, 7m³/h each, hman 15 m incl. Piping and valves DN 100	pieces	3.00	6,500	19,500
22.2.3	FeCl3-Dosing Station (liquid dosing of acting agent of 0,12 to FeCl3 / to DS) with pumps, piping and in-pipe-mixing	pieces	1.00	40,000	40,000
22.3	**Electrical Equipment**				
22.3.1	Low Voltage Equipment, SCADA, Cabling, for dewatering	lump sum	1.00	34,000	34,000
22.3.2	Low Voltage Equipment, SCADA, Cabling, for FeCl3 dosing	lump sum	1.00	23,000	23,000
	Subtotal	**Sludge Dewatering (without civil construction)**			**316,500**

Item	Performance	Unit	Quantity	Unit Price Euro	Total Price Euro
	Belt-Filter-Press equipment to reach 35 % DS				
22	**Sludge Dewatering (without civil constructions)**				
22.1	**Civil Works**				
22.1.1	n/a			0	0
22.2	**Mechanical Equipment**				
22.2.1	Belt Filter Press 2 x 7 m³/h incl. Polymer station (29 kg/d)	pieces	2.00	91,000	182,000
22.2.2	Installation of 2 + 1 excenter screw pumps, 7m³/h each, hman 10 m incl. Piping and valves DN 100	pieces	3.00	6,500	19,500
22.2.3	Lime (CaO) Silo, 20 to capacity, with dosing screw device	pieces	1.00	40,000	40,000
22.2.4	Static Mixer, CaO to sludge, 0,75 to CaO/to DS	pieces	2.00	9,000	18,000
22.3	**Electrical Equipment**				
22.3.1	Low Voltage Equipment, SCADA, Cabling, for Dewatering	lump sum	1.00	37,000	37,000
22.3.2	Low Voltage Equipment, SCADA, Cabling, for lime dosing	lump sum	1.00	20,000	20,000
	Subtotal	**Sludge Dewatering (without civil construction)**			**316,500**

2. O & M Costs (Consumables) and Sludge Disposal Costs based on CBA

14	**Materials / chemicals (related to measure) Recessed-Plate Filter Press**		**2013**	**2020**	**2021**
15	**Ferric sulphate (P_{elim} + Sludge Dewatering for Landfills)**	Euro/year	99,689	110,248	94,351
16	Pelim-Average dose (from WWTP-Calculations)	g/m3	153.870	153.870	153.870
16a	Dewatering-Average dose (from WWTP-Calculations)	g/m3	49.130	49.130	49.130
17	Unit cost	Euro/g	0.000129	0.000139	0.000140
18	Total treated wastewater	Mil m^3/year	3.799	3.919	3.940
19	**Polymer**	Euro/year	36,575	38,928	46,452
20	Average dose per t DS of Sludge to be dewatered: 35% DS	gPE/tDS	7,000.000	7,000.000	7,000.000
20a	Average dose per t DS of Sludge to be dewatered: 20% DS	gPE/tDS	9,000.000	9,000.000	9,000.000
21	Unit cost	Euro/g	0.00409	0.00439	0.00443
22	Yearly sludge volume to be dewatered (DS, Annex 10.1)	t DS/year	1,276	1,267	1,263
23	Chemicals and reagents for laboratory	Euro/year	9,695	10,394	10,498
24	Consumables (paper, toner, etc.)	Euro/year	539	577	583
25	**Total materials / chemicals costs (related to measure)**	Euro/year	**146,498**	**160,148**	**151,884**
	Dewatered sludge disposal Recessesed-Plate Filter Press				
	Average unit cost of dewatered sludge disposal (wet sludge)	Euro/to DS	47.6	51.0	105.2
	Average yearly quantity of dewatered sludge (35 % DS for LF with FeCl3-Dosage// 20% DS for other disposal, Annex 10.xx for disp. paths)	to DS/year	1,430	1,419	1,316
	Total costs with sludge disposal costs	Euro/year	**68,069**	**72,447**	**138,447**
	Grand Total :	Euro/year	**214,567**	**232,595**	**290,331**

14	**Materials / chemicals (related to measure), Belt-Filter Presses**		**2013**	**2020**	**2021**
15	**$FeCl_3$ + CaO (P_{elim} + Sludge Dewatering for Landfills)**	Euro/year	163,527	180,848	119,445
16	Pelim-Average dose FeCl3 (from WWTP-Calculations)	g/m3	153.870	153.870	153.870
16a	Dewatering-Average dose CaO (from WWTP-Calculations)	g/m3	307.070	307.070	307.070
17	Unit cost , FeCl3 = 120 €/t, CaO = 70 €/t	Euro/g	0.000129	0.000139	0.000140
18	Total treated wastewater	Mil m^3/year	3.799	3.919	3.940
19	**Polymer**	Euro/year	36,575	38,928	46,452
20	Average dose per t DS of Sludge to be dewatered: 35% DS	gPE/tDS	7,000.000	7,000.000	7,000.000
20a	Average dose per t DS of Sludge to be dewatered: 20% DS	gPE/tDS	9,000.000	9,000.000	9,000.000
21	Unit cost	Euro/g	0.00409	0.00439	0.00443

22	Yearly sludge volume to be dewatered (DS, Annex 10.1)	t DS/year	1,276	1,267	1,263
23	Chemicals and reagents for laboratory	Euro/year	9,695	10,394	10,498
24	Consumables (paper, toner, etc.)	Euro/year	539	577	583
25	**Total materials / chemicals costs (related to measure)**	Euro/year	**210,336**	**230,748**	**176,978**
	Dewatered sludge disposal Belt Filter Press				
	Average unit cost of dewatered sludge disposal (wet sludge)	Euro/to DS	47.6	51.0	105.2
	Average yearly quantity of dewatered sludge (35 % DS for LF with CaO-Dosage// 20% DS for other disposal, Annex 10.xx for disposal paths)	to DS/year	2,234	2,217	1,594
	Total costs with sludge disposal costs	Euro/year	**106,357**	**113,199**	**167,744**
	Grand Total :	Euro/year	**316,693**	**343,946**	**344,723**

With following basis data assumptions and calculations

Polymer Dosage for secondary sludge thickening	gPE/tDS	3,000
Polymer Dosage for sludge dewatering (20 % DS), Belt Filter Press and Recessed-Plate Filter Press	gPE/tDS	6,000
Polymer Dosage for sludge dewatering (35 % DS), Recessed-Plate Filter Press	gPE/tDS	4,000
Cost for Polymer (2009)	€/t	3,800
$FeCl_3$ Dosage for Phosphorus Precipitation	g/m³	153.870
$FeCl_3$ Dosage for Dewatering to 35 % DS by Recessed-Plate Filter Press	g/m³	49.130
Cost for $FeCl_3$ (2009)	€/t	120
CaO Dosage for Dewatering to 35 % DS by Belt Filter Press	g/m³	307.070
Cost for CaO (2009)	€/t	70

3. Compilation of Costs

		2013	2020	2021
Materials / chemicals (related to measure) Recessed-Plate Filter Press	Euro/year	**146,498**	**160,148**	**151,884**
Dewatered sludge disposal Recessesed-Plate Filter Press	Euro/year	**68,069**	**72,447**	**138,447**
RPF Press	Euro/year	**214,567**	**232,595**	**290,331**
Materials / chemicals (related to measure), Belt Filter Press	Euro/year	**210,336**	**230,748**	**176,978**
Dewatered sludge disposal Belt Filter Press	Euro/year	**106,357**	**113,199**	**167,744**
BF Press	Euro/year	**316,693**	**343,946**	**344,723**
Advantage RPF-Press	Euro/year	**102,126**	**111,351**	**54,391**
Advantage RPF-Press rel. to BF-Press	%	**32.2%**	**32.4%**	**15.8%**

RECEPTIONAT 02 AUG 2010

AGENŢIA PENTRU PROTECŢIA MEDIULUI BACĂU

Nr.: 7131 /PM/ 30.07. 2010

Către: **ILF Consulting Engineers**

În atenţia: Domnului Adrian IORDACHE

Referitor la: Solicitare informatii generale referitoare la siturile contaminate din judetul Bacau

Stimate domn,

Agentia pentru Protectia Mediului Bacau are intocmita baza de date a siturilor contaminate de pe raza judetului Bacau.

Siturile potential contaminate au fost desemnate pe baza informatiilor referitoare la principalii poluanti prezentati in bilanturile nivel II, pentru care au fost inregistrate depasiri ale valorilor prag de alerta sau de interventie, in conformitate cu Ordinul 756/ 1997.

In prezent sunt luate in evidenta un numar de 73 situri potential contaminate, din care 67 sunt in proprietatea OMV Petrom, 5 sunt reprezentate de depozite municipale si un aflorıment natural de produse petroliere la Dofteana.

Suprafata totala a siturilor potential contaminate este de 48 ha si in cea mai mare parte poluantii sunt reprezentati de produse petroliere, ca urmare a pierderilor istorice, accidentale din rezervoare sau conducte.

Coordonatele in sistem geografic sau Stereo 70 ale siturilor sunt prezentate in bilanturile nivel II.

In conformitate cu HG 1408/ 2007, privind modalitatile de investigare a poluarii solului, art. 19, alin 2: „În cazul în care concentraţia unuia sau a mai multor poluanţi depăşeşte valorile pragului de intervenţie, operatorul economic sau deţinătorul de teren este obligat să realizeze etapa de investigare şi evaluare detaliată, la solicitarea şi în condiţiile stabilite de autoritatea competentă pentru protecţia mediului".

Pana in prezent au fost realizate si depuse la APM Bacau, rapoartele de investigare preliminara pentru o parte din siturile potential contaminate, urmand ca pe baza acestora autoritatea de mediu sa decida programele de investigare si evaluare a riscului, precum si metodele de refacere.

Cu deosebită considerație,

DIRECTOR EXECUTIV
Jrs. Paul TODERICA

Sef Srv. IPM,
Ing. Mariana Micu

Intocmit,
biol. Carla Paragină

AGENȚIA PENTRU PROTECȚIA MEDIULUI BACĂU
Str. Oituz, nr. 23, Bacău, Cod 600266
Tel: 0234524691 Fax: 0234517547, 0234513506
e-mail: office@apmbc.ro

RECEIPT DATE 2nd of August 2010

ENVIRONMENT PROTECTION AGENCY BACĂU

No.: 7131 / PN / 30.07.2010

To: **ILF Consulting Engineers**

ATTN: Mr. Adrian IORDACHE

Ref.: Request for general information regarding the contaminated sites in Bacău

County

Dear Sir,

The Environmental Protection Agency Bacău has drawn the data-base of the contaminated sites located within Bacău County.

The potentially contaminated sites have been identified based on the information on the main pollutants provided in the Environmental Balances level II for which values exceeding the alert or the intervention threshold have been recorded, according to Order 756 / 1997.

A number of 73 potentially contaminated sites are currently identified, out of which 67 being under OMV Petrom's property, 5 being municipal solid waste landfills and a natural oil bearing formations outcrop at Dofteana.

The total surface area of the potentially contaminated sites is 48 ha and the pollutants are mostly represented by petroleum products, resulting from historical, accidental losses from tanks or pipes.

The coordinates in geographic or Stereo 70 system are provided in the Environmental Balances level II.

According to Government Decision 1408 / 2007 concerning the methods of soil pollution investigation, article 19, paragraph 2: "In case the concentration of one or several pollutants exceeds the intervention threshold values, the economic operator or the land owner is required to perform the detailed investigation and evaluation stage at the request of and under the conditions established by the competent authority for environmental protection."

Preliminary investigation reports of a part of the potentially contaminated sites have been so far performed and submitted to the Environmental Protection Agency

(APM) Bacău and, based on these reports, the environmental authority will subsequently decide upon the risk investigation and evaluation programs, as well as upon the restoration methods.

Yours sincerely,

EXECUTIVE MANAGER
Paul TODERICA
Illegible signature

Head of IPM Department,
Mariana Micu
Illegible signature

Drafted by,
Carla Paragină
Illegible signature

From: legislatie.orizontala <legislatie.orizontala@apmbc.ro>
To: hergheaa@yahoo.com
Sent: Wed, September 1, 2010 9:38:37 AM
Subject: Situri contaminate Bacau

La solicitarea dumneavostră , referitoare la informații suplimentare referitoare la siturile contaminate din județul Bacău, din 26.08.2010, va precizam următoarele:

In judetul Bacau sunt 103 situri contaminate:

- 75 situri SC OMV PETROM SA
- 2 situri SN Industria Sării-Tg. Ocna
- 4 situri SN Carbunelui -Comanesti
- 7 depozite de deseuri IPPC (Chimcomplex Onesti, CAROM Onesti, Letea Bacau, Petrochemical Darmaneşti, RAFO Onesti, Aerostar Bacau, Sofert Bacau)
- 1 sit SN CFR -CF Borzeşti
- 7 depozite de deseuri municipale
- 3 depozite de deseuri rurale Letea Veche, Dealu Morii, Racaciuni
- Solont-poluare cu produse petroliere
- Pasune Furnicari
- Afloriment Dofteana

Cu stima
APM Bacau

A COHESION FUND CONSULTANTS EAST ROMANIA (CFCE)

JOINT VENTURE OF:

ILF CONSULTING ENGINEERS

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Planungsgesellschaft für Siedlungswasserwirtschaft mbH
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Către: **Direc□ia Silvică Bacău**
În atenţia: **Domnului Director Gheorghe MĂNĂILĂ**

Din partea: **Adrian IORDACHE- ILF Consulting Engineers**
Fax: 0234/543130, email: adrian@iordache.name

Ref.: **Solicitare informaţii**
Data: **11.08.2010**

Stimate Domnule Director ,

Pentru elaborarea în bune condiţii a Studiului de Fezabilitate pentru Bacău, în cadrul proiectului de investiţii pe apă şi apă uzată din Fondurile de Coeziune (ISPA 2005/RO/16/P/PA/001-2), vă rugăm să ne furniza□i următoarele informa□ii:

1. Suprafa□a actuală a pădurilor la nivelul jude□ului Bacău (diferen□iat suprafa□a proprietate publică- suprafa□a proprietate privată);
2. Suprafa□a de pădure tăiată anual (ha);
3. Suprafa□a reîmpădurită anual (ha).

Vă rugăm să transmite□i informa□iile la numărul de fax 0234/543130 sau la adresa de e-mail: hergheaa@yahoo.com.

Vă mul□umim pentru colaborare.

Cu stimă,

Adrian IORDACHE

Regional Deputy Team Leader

A COHESION FUND CONSULTANTS EAST ROMANIA (CFCE)

JOINT VENTURE OF:

ILF CONSULTING ENGINEERS

Hydro Ingenieure
Planungsgesellschaft für Siedlungswasserwirtschaft mbH
Beratende Ingenieure

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To: **National Forestry Administration (Romsilva)- Bacău**
Attn: **General Manager Gheorghe MĂNĂILĂ**

From: **Adrian IORDACHE- ILF Consulting Engineers**
Fax: 0234/543130, email: adrian@iordache.name

Ref.: **Asking for information**
Date: **11.08.2010**

Dear Sir,

In order to elaborate properly the Feasibility Study for Bacau County, within the CF investment project for water and waste water sector - ISPA 2005/RO/16/P/PA/001-2, we would like to ask you to provide us the next information:

1. The present forest area for Bacau County (public property and private property);
2. The total forest area which is cut annually (ha);
3. The annual reforestation area (ha).

Please provide the requested information to the fax number 0234/543130 or to the next email address: hergheaa@yahoo.com.

Thank you for your support.

Sincerely yours,

Adrian IORDACHE

Regional Deputy Team Leader

Regia Naţională a Pădurilor - Romsilva

Direcţia Silvică Bacău

Str. N. Titulescu, nr.14, Jud. Bacău cod 600267 tel.: 0234/588959;
fax: 0234/571905; NRC: J04/284/1991 Cod fiscal: R 1590120;
Cont IBAN: RO 20 BRDE 040S V184 0115 0400 deschis la BRD Bacău
E-mail: fond.forestier@bacau.rosilva.ro

Nr. 8045 din 24.08.2010

CĂTRE,

ILF Consulting Engineers
Dlui Adrian Iordache

La solicitarea dumneavoastră, vă transmitem următoarele date:

- Suprafaţa actuală a pădurilor la nivelul judeţului Bacău: 267915 ha din care:
  - Păduri proprietate publică a statului: 170937 ha
  - Păduri proprietate privată: 96978 ha
- Suprafaţa de pădure tăiată anual: 606 ha
- Suprafaţa reîmpădurită anual: 784 ha

Director

ing. Gheorghe Mănăilă

Şef birou
fond forestier – paza pădurilor

dr. ing. Ionel Dumitru

The Regional Agency for Environment Protection

No.933/ 12.10.2010
To: ILF CONSULTING ENGINEERS
Attn: Adrian Iordache
Ref. request on sludge use

Dear Sir,

Following your address referring to the issue of using sludge coming from the existing WWTPs and WTPs from Bacau County, address sent by fax and registered at our Agency under the number 933/ 12.10.2010, we inform you that, in principle, we have no objections on the short term strategy that you have proposed – to use sludge for the temporary closure of the City's non-compliant landfill, under the obligation that sludge must respect the physical- chemical characteristics imposed for the closure layers by the *Normativul tehnic privind depozitarea deseurilor aprobat prin Ordinul MMGA nr. 757/2004* and also to have the approval of the owner and the landfill operator on the quantity necessary to finalize the closure works.

Sincerely yours,

Executive Director
Iulian Ionel Movila

Chief IPM Department ..... Chief ACC Department .....

Drafted by
.....

A COHESION FUND CONSULTANTS EAST ROMANIA (CFCE)

JOINT VENTURE OF:

ILF CONSULTING ENGINEERS

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Internet www.ilf.com

Către: **Primăria Bacău**
În atenția: **Domnului Primar Romeo STAVARACHE**

Cc: **Domnului Leonard PĂDUREANU – Pre□edinte ADIB**

Cc: **Agen□ia Regională pentru Protec□ia Mediului Bacău**
Director Executiv: Dr. ing. Iulian Ionel MOVILĂ

Cc: **Fichtner Environment**
Doamnei Cristina DUMITRESCU

Din partea: **Adrian IORDACHE- ILF CONSULTING ENGINEERS**
Tel.0722/25548, fax: 0234/543130, email: adrian@iordache.name
Ref.: **Solicitare utilizare nămol**
Data: **06.10.2010**

Stimate Domnule Primar,

În cadrul proiectului în cadrul proiectului de investiții pe apă şi apă uzată din Fondurile de Coeziune (ISPA 2005/RO/16/P/PA/001-2), vă solicităm prin prezenta aprobarea utilizării nămolului provenit de la sta□ia de epurare Bacău pentru închiderea depozitului de de□euri neconform al municipiului Bacău. Această utilizare a nămolului provenit de la sta□ia de epurare este absolut necesară în vederea ob□inerii aprobării din partea Ministerul Mediului □i a UE a *Strategiei de Evacuare a Nămolului pentru jude□ul Bacău* inclusă în acest proiect. Fără acestă solu□ie de evacuare a nămolului, pe care v-am propus-o mai sus, cu aplicare începând din anul 2011, nu va putea fi evacuată cantitatea de nămol produsă la nivelului întregului jude□, în condi□iile în care aceasta este prea mare pentru a putea fi toată depozitată în perioada 2011-2014 în noul depozit central conform situat pe strada Chimiei.
Conform Ordinului nr.757/26.11.2004 pentru aprobarea Normativului tehnic privind depozitarea de□eurilor, Anexă Normativ tehnic privind depozitarea de□eurilor, nămolul poate fi depozitat doar într-un depozit conform în propor□ie de 1:10 cu de□eurile solide menajere. Conform Sistemului de Management Integrat al De□eurilor prevăzut pentru jude□ul Bacău, în perioada 2011-2014, va exista spa□iu în Celula 1 a depozitului de pe strada Chimiei doar pentru 72.000 t nămol nedeshidratat, dacă □inem cont de propor□ia cerută de 1:10.
Necesitatea de a folosi nămolul pentru închiderea depozitului municipal neconform Bacău este demonstrată □i de calculele următoare:

Pentru perioada 2011-2014:
Cantitate totală de nămol produsă de sta□iile de epurare din jude□: 93,000 t- nămol nedeshidratat= 84,500 m^3
Cantitatea totală de nămol produsă de sta□iile de tratare din jude□: 17,000 t-nămol nedeshidratat = 15,500 m^3
Cantitate totală nămol:110,000 t- nedeshidratat = 100,000 m^3

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Închiderea depozitului neconform Bacău:

8 ha * 0.5 m adâncime nămol *10^4 m^2/ha = 4 10^4 m^3 nămol

4 10^4 m^3 nămol * 1.1 t-nămol nedeshidratat /m^3 = 44,000 t-nămol nedeshidratat pentru închidere.

Cantitate totală nămol pentru depozitare în locația de pe strada Chimiei în perioada 2011 - 2014:

110,000 t-nămol nedeshidratat – 44,000 t- nămol nedeshidratat = 66,000 t- nămol nedeshidratat < 72,000 t- limita nămol nedeshidratat

Singura altă soluție posibilă ar fi exportarea nămolului în exces în alt județ unde încă mai există depozite neconforme deschise, dar, mai mult ca sigur, UE și Ministerul Mediului nu vor accepta această procedură.

Utilizarea nămolului pentru închiderea temporară a depozitelor neconforme este permisă, conform paragrafului 3.7.2. din Normativul tehnic privind depozitarea deșeurilor. În funcție de acordat dat de Agenția de Protecție a Mediului, s-ar putea să fie necesară amestecarea nămolului cu deșeuri provenite de la demolarea construcțiilor. Ca un exemplu, în prezent, depozitul neconform al orașului Buzău este închis temporar doar cu nămol provenit de la stația de epurare Buzău.

Pe baza argumentelor expuse prin prezenta adresă vă rugăm să ne acordați acceptul dumneavoastră pentru această soluție- utilizarea nămolului provenit de la stația de epurare Bacău pentru închiderea depozitului neconform al municipiului Bacău.

Cu stimă,

Adrian IORDACHE

Regional Deputy Team Leader

AGENŢIA REGIONALĂ PENTRU PROTECŢIA MEDIULUI BACĂU

Nr.: 933 / 12.10.2010
Către: ILF CONSULTING ENGINEERS,
În atenţia: Domnului Adrian IORDACHE
Referitor la: Solicitare utilizare nămol

Stimate Domn,

Ca urmare a adresei dumneavoastră referitoare la problema utilizării nămolului rezultat de la staţiile de epurare şi cele de tratare a apei, existente în judeţul Bacău, transmisă prin fax şi înregistrată la Agenţia Regională pentru Protecţia Mediului Bacău cu nr. 933/12.10.2010, vă informăm că, în principiu nu avem obiecţiuni privind strategia pe termen scurt propusă de dumneavoastră privind folosirea nămolului la închiderea temporară a depozitului neconform Bacău, cu condiţia ca nămolul să respecte caracteristicile fizico-chimice impuse pentru straturile de închidere de *Normativul tehnic privind depozitarea deşeurilor, aprobat prin Ordinul MMGA nr. 757/2004* şi să existe acceptul proprietarului şi al operatorului depozitului cu privire la cantitatea necesară pentru finalizarea lucrărilor de închidere.

Cu deosebită consideraţie,

DIRECTOR EXECUTIV,
Iulian Ionel MOVILĂ

ŞEF SERVICIU IPM,
Daniela FLOREA

ŞEF SERVICIU ACC,
Mihaela MUNTEANU

Întocmit:
Mihaela AMBĂRUŞ - Compartiment GDC

Carmen JALBĂ – Compartiment ACC

AGENŢIA REGIONALĂ PENTRU PROTECŢIA MEDIULUI BACĂU
Str. Ionită Sandu Sturdza, nr. 78, Bacău, Cod 600269
Tel : 0234 512750, Fax : 0234 571056
e-mail : office@arpmbc.ro

ASOCIAȚIA DE DEZVOLTARE INTERCOMUNITARĂ PENTRU SALUBRIZARE, BACĂU

Calea Mărășești, Nr.2, 600017, Bacău
CIF: 26601020
adisbacau@yahoo.com
Tel:0740877712

NR. 335/08.12.2010 Nr. 2234/08.12.2010

ACORD DE PRINCIPIU

Prin prezenta, ASOCIATIA DE DEZVOLTARE INTERCOMUNITARA PENTRU SALUBRIZARE BACAU, reprezentata prin Presedinte Dragos BENEA, CIF 26601020 si S.C. Compania Regionala de Apa Bacau S.A. RC J04/789/2010, C.U.I. RO 27429315 reprezentata prin Director General ing. RAZVAN-GRIGORE GAINA, suntem de acord ca S.C. Compania Regionala de Apa Bacau S.A. sa transporte namolul deshidratat rezultat in urma epurarii apelor uzate menajere de la statiile de epurare operate pentru ca acesta sa fie procesat si depozitat in depozitul ecologic conform.

Namolul ce va fi transportat si depozitat in depozitul ecologic trebuie sa indeplineasca conditiile specifice de mediu, conform reglementarilor legale in vigoare.

Aceasta activitate se va concretiza prin semnarea unui contract intre parteneri.

Semnat in dublu exemplar, cate unul pentru fiecare parte.

ASOCIATIA DE DEZVOLTARE INTERCOMUNITARA PENTRU SALUBRIZARE BACAU

PRESEDINTE

DRAGOS BENEA

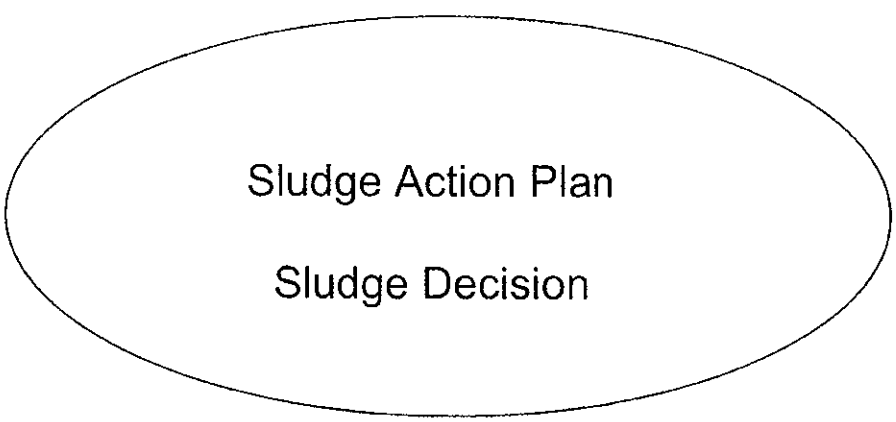
S.C. COMPANIA REGIONALA DE APA BACAU S.A.

DIRECTOR GENERAL

RAZVAN GRIGORE GAINA

S.C. COMPANIA REGIONALĂ DE APĂ BACĂU S.A. NR. 2

Annex 10-15 and 10-16



PLAN DE ACTIUNE
PENTRU GESTIONAREA NĂMOLULUI DIN STATIILE DE EPURARE

În judetul Bacau sunt preluate în operare statiile de tratare a apelor uzate orăsenesti din municipiul Bacau, orasul Moinesti, orasul Darmanesti, orasul Tg.Ocna si orasul Buhusi.
Prin POS Mediu AP1 sunt prevăzute extinderi la statiile de epurare din Bacau si Moinesti Nord si realizarea unor statii de epurare noi la Moinesti Sud, Darmanesti, Tg.Ocna si Buhusi care vor asigura tratarea apelor uzate care vor proveni din aglomerarile Bacau, Moinesti-Comanesti, Darmanesti, Tg.Ocna si Buhusi.
În Studiul de Fezabilitate pentru proiectul cu finantare prin POS Mediu "Extinderea si reabilitarea infrastructurii de apă si apă uzată în judetul Bacau" (Anexa 10.1) sunt estimate a se produce în următorii ani cantitătile de nămol (exprimate in tone substantă uscată) din tabelul următor.

Parametru	Unitate	2010	2013	2015	2018	2021	2024	2030	2037
Bacău									
Greutate totala namol urban (35 % SU)	t/a	9.033	10.236	12.106	12.052	12.007	11.937	11.770	11.542
Moineşti									
Greutate totala namol urban (35 % SU)	t/a	1.414	1.692	2.012	2.003	1.993	1.980	1.950	1.909
Buhuşi									
Greutate totala namol urban (35 % SU)	t/a	1.209	1.571	1.907	1.900	1.892	1.881	1.856	1.823
Darmaneşti									
Greutate totala namol urban (35 % SU)	t/a	8	1.056	1.396	1.392	1.387	1.381	1.366	1.347
Târgu Ocna									
Greutate totala namol urban (35 % SU)	t/a	586	809	996	992	987	980	965	944
Total Namol AU									
Greutate totala namol urban (35 % SU)	t/a	12.250	15.363	18.418	18.350	18.265	18.159	17.906	17.565

Tabel 1: Estimare productie namol urban pe aglomerare, jud. Bacau

Parametru	Unitate	2010	2013	2015	2018	2021	2024	2030	2037
STA Caraboaia – Facilitate FC									
Greutate totala namol (35 % SU)	t namol ud		2.056	2.918	3.315	3.592	3.791	3,886	3.942
STA Barati – Facilitate Non-FC									
Greutate totala namol (35 % SU)	t namol ud		2.870	3.457	3.562	3.664	3.763	3,869	3.957
Greutate totala namol STA	**t namol ud**		**4.926**	**6.375**	**6.877**	**7.256**	**7,554**	**7,755**	**7.900**

Tabel 2: Estimare productie namol din STA, jud.Bacau

În Studiul de Fezabilitate au fost identificate mai multe posibilităti de dispunere a nămolului, respectiv umplerea depozitelor de deseuri ecologice, producerea de compost, utilizarea în agricultură, co-incinerarea, producerea de biogaz, utilizarea în reîmpăduriri, producerea de compost, reabilitarea terenurilor degradate.

S-au facut investigatii pentru solutiile identificate:

- Dispunerea în depozite pentru deseuri (în depozite conforme) se va aplica pentru nămolurile provenite de la SEAU din tot judetul Bacau, cu o capacitate suficientă pentru depozitarea unei mari parti din nămolul care se va produce în stagiile de epurare din judet
- Producerea de compost este aplicabila in municipiul Bacau, in cadrul depozitului ecologic, la statia de compost. Piata de compost este nesigura pe termen lung, dar cantitatea propusa a fi eliminata prin acest procedeu este relativ mica si nu ridica probleme de desfacere.
- Utilizarea în agricultură este reglementată de Ordinul 344/2004 si conditionată de încadrarea în anumite limite a substantelor periculoase continute de nămol. Responsabilitatea privind aplicarea nămolului revine producătorului, motiv pentru care trebuie făcute analize ale terenurilor pe care se va face aplicarea, analize ale nămolului, trebuie monitorizate culturile agricole (ce tipuri de plante se cultivă). Pe o suprafată de teren nămolul poate fi aplicat cel mult o dată la zece ani, după care trebuie făcută reevaluarea terenului. Toată evidenta suprafetelor de teren pe care se aplică nămolul trebuie tinută de producătorul nămolului
- Co-incinerarea în fabrica de ciment de la Bicaz pare să fie o optiune pe termen lung, mai ales că pana la acest moment societatea Carpatcement Holding SA a emis acorduri de principiu pentru co-incinerarea namolului de acest tip. Desi nu se vor percepe costuri de intrare, este important că totusi Carpatcement Holding SA conditionează preluarea nămolului de îndeplinirea unor conditii privind în special umiditatea (mai mică de 10%) si puterea calorică a nămolului. Îndeplinirea conditiilor de putere calorică necesită un control bun al procesului tehnologic din SEAU, iar îndeplinirea conditiilor de umiditate necesită investitii în instalatii de uscare avansată a nămolului si costuri de operare pentru aceste instalatii. Această solutie are un avantaj major fată de celelalte prin aceea că toate substantele considerate periculoase din compozitia nămolului sunt distruse sau legate chimic definitiv în structura cimentului si nu mai rezultă alte deseuri care să creeze probleme, fapt ce face ca în viitor să fie solutia cu cele mai putine bariere legislative previzibile (spre deosebire de celelalte solutii la care pot apărea noi limitări)
- Reabilitare terenuri degradate, reîmpăduriri. Pentru această utilizare a nămolului se aplică tot prevederile din Ordinul 344/2004. S-au solicitat informatii de la toate primăriile din judet despre existenta unor terenuri degradate si foarte multe si-au manifestat interesul de a reabilita aceste terenuri prin plantarea de arbori nefructiferi (reîmpădurire) si de a folosi nămoluri din SEAU în această activitate. Este luata in calcul ca si solutie pe termen lung.

Estimarea costurilor (corelate cu Studiul de Fezabilitate):

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Agricultura	0	9	75	0	40	124
Reimpaduriri	0	11	60	0	40	111
Imbunatatiri funciare	0	11	60	0	40	111
Compostare	0	4	0	37	0	41
Co-incinerare	200	5	0	0	0	205
Depozitare	0	4	0	37	0	41

Tabel 3: Costuri eliminare namol – SEAU Bacău

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Agricultura	0	9	75	0	40	124
Reimpadurri	0	11	60	0	40	111
Imbunatatiri funciare	0	11	60	0	40	111
Compostare	0	8	0	37	0	45
Co-incinerare	200	4	0	0	0	204
Depozitare	0	8	0	37	0	45

Tabel 4: Costuri eliminare namol – SEAU Buhusi

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Agricultura	0	21	75	0	40	136
Reimpadurri	0	9	60	0	40	109
Imbunatatiri funciare	0	9	60	0	40	109
Compostare	0	11	0	37	0	48
Co-incinerare	200	7	0	0	0	207
Depozitare	0	11	0	37	0	48

Table 5: Costuri eliminare namol – SEAU Moineşti

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Agricultura	0	24	75	0	40	139
Reimpadurri	0	9	60	0	40	109
Imbunatatiri funciare	0	9	60	0	40	109
Compostare	0	13	0	37	0	50
Co-incinerare	200	8	0	0	0	208
Depozitare	0	13	0	37	0	50

Table 6: Costuri eliminare namol – SEAU Dărmăneşti

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Agricultura	0	24	75	0	40	139
Reimpadurri	0	9	60	0	40	109
Imbunatatiri funciare	0	9	60	0	40	109
Compostare	0	12	0	37	0	50
Co-incinerare	200	9	0	0	0	209
Depozitare	0	12	0	37	0	50

Table 7: Costuri eliminare namol – SEAU Târgu Ocna

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Depozitare	0	13	0	37	0	50

Table 8: Costuri eliminare namol – STA Caraboaia

Varianta de eliminare	Uscare €/t SU	Transport €/t SU	Analize laborator €/t SU	Fara taxa intrare €/t DS	Costuri aplicatie €/t SU	Costuri totale €/t SU
Depozitare	0	5	0	37	0	42

Table 9: Costuri eliminare namol – STA Barați

Prin prisma acestor costuri:

- pe termen scurt (din 2011 pana in 2014): 81-99% din cantitatea totala de namol se va depozita pe depozit ecologic iar un procent de 1-9% va fi compostat, urmat de depozitare la depozit ecologic, asigurata de catre Contractor.
  Nămolul din statiile de epurare din mun.Bacau, orasul Buhusi, orasul Moinesti (SEAU Nord) si orasul Tg.Ocna se va dispune în depozitul judetean central din municipiul Bacau, str.Chimiei, pe baza unui contract de preluare ce se va semna cu viitorul operator al acestui depozit. Până la semnarea contractului, nămolul va fi stocat pe platformele din statiile de epurare. La productia actuală există capacitate de stocare pentru cel putin 6 luni.
- pe termen mediu (din 2015 până în 2020) nămolul din statiile de epurare din jud.Bacau se va dispune în depozitul ecologic din municipiul Bacau, varianta de eliminare selectata provizoriu (69-78% din totalul cantitatii de namol); compostarea plus depozitarea finala, in procent de 22-31%, este garantata de catre Contractor: co-incinerarea este o alta optiune, depinzand de succesul negocierilor; producerea de biogaz, cu depozitare ulterioara, depinzand de succesul negocierilor.
- pe termen lung (din 2021)- varianta de eliminare selectata provizoriu: 50% din nămolul din statiile de epurare din judet va fi co-incinerat în Fabrica de ciment de la Bicaz, întrucât se preconizează că depozitarea nămolului va fi tot mai restrictionată. Se va avea în vedere ca un procent de 25% din totalul namolului produs in judetul Bacau sa fie utilizat pentru reimpaduriri, diferenta de 25% fiind utilizata pentru imbunatatiri funciare; toate sunt variante de eliminare selectate provizoriu. Alte variante de eliminare a namolului: utilizarea in agricultura si producerea de biogaz cu depozitare ulterioara, depinzand de succesul negocierilor.
  Pentru deshidratarea namolului se va alege uscarea folosind energia solară si echipamente de uscare la care să fie posibilă utilizarea biogazului care se va produce în SEAU, astfel încât sa se reducă semnificativ costurile pentru uscare.
- dacă vor apărea tehnologii noi de utilizare a nămolului si/sau dacă vor apărea noi operatori interesati de preluarea si utilizarea nămolului (producători agricoli mari sau operatori deținători de incineratoare speciale pentru deseuri), dacă aceste noi solutii vor deveni competitive ca si costuri, optiunile vor fi reanalizate si eventual ajustate, atât in ceea ce priveste prioritățile cât si în ceea ce priveste calendarul investitiilor necesare, pentru a se asigura pe de o parte efectele cele mai favorabile posibil asupra mediului inconjurător si pe de altă parte costuri cât mai mici.

S.C. COMPANIA REGIONALA DE APA BACAU S.A.
Director General
Ing. Razvan-Grigore Gaina

ASOCIATIA DE DEZVOLTARE INTERCOMUNITARĂ BACAU
Presedinte
Ec. Leonard Stelian Padureanu

SC COMPANIA REGIONALA DE APA BACAU SA

ASOCIATIA DE DEZVOLTARE INTERCOMUNITARĂ BACAU

DECIZIE
Referitoare la gestionarea nămolului din statiile de epurare

În conformitate cu prevederile Studiului de Fezabilitate pentru proiectul cu finantare prin POS Mediu **"Extinderea si reabilitarea infrastructurii de apă si apă uzată în Judetul Bacau"** sunt prevăzute extinderi la statiile de epurare din Bacau si Moinesti Nord si realizarea unor statii de epurare noi la Moinesti Sud, Darmanesti, Buhusi si Tg.Ocna care vor asigura tratarea apelor uzate care vor proveni din Aglomerarile Bacau, Moinesti-Comanesti, Darmanesti, Buhusi si Tg.Ocna .

Estimările din Studiul de Fezabilitate (Anexa 10.1) prevăd a fi produse în judet cantităti de nămol (exprimate in tone substantă uscată) ca în tabelul următor:

Parametru	Unitate	2010	2013	2015	2018	2021	2024	2030	2037
Bacău									
Greutate totala namol urban (35 % SU)	t/a	9,033	10,236	12,106	12,062	12,007	11,937	11,770	11,542
Moineşti									
Greutate totala namol urban (35 % SU)	t/a	1,414	1,692	2,012	2,003	1,993	1,980	1,950	1,909
Buhuşi									
Greutate totala namol urban (35 % SU)	t/a	1,209	1,571	1,907	1,900	1,892	1,881	1,856	1,823
Darmaneşti									
Greutate totala namol urban (35 % SU)	t/a	8	1,056	1,396	1,392	1,387	1,381	1,366	1,347
Târgu Ocna									
Greutate totala namol urban (35 % SU)	t/a	586	809	996	992	987	980	965	944
Total Namol AU									
Greutate totala namol urban (35 % SU)	t/a	12,250	15,363	18,418	18,350	18,265	18,159	17,906	17,565

Tabel: Estimare productie namol urban pe aglomerare, jud. Bacau

Parametru	Unitate	2010	2013	2015	2018	2021	2024	2030	2037
STA Caraboala – Facilitate FC									
Greutate totala namol (35 % SU)	t namol ud		2,056	2,918	3,315	3,592	3,791	3,886	3,942
STA Barati – Facilitate Non-FC									
Greutate totala namol (35 % SU)	t namol ud		2,870	3,457	3,562	3,664	3,763	3,869	3,957
Greutate totala namol STA	**t namol ud**		**4,926**	**6,375**	**6,877**	**7,256**	**7,554**	**7,755**	**7,900**

Tabel 2: Estimare productie namol din STA, jud.Bacau

În Studiul de Fezabilitate au fost identificate mai multe posibilităti de dispunere a nămolului, respectiv umplerea depozitelor de deseuri ecologice, producerea de compost, utilizarea în agricultură, co-incinerarea, producerea de biogaz, utilizarea în reîmpăduriri, reabilitarea terenurilor degradate.

Prin analizarea solutiilor identificate, din punctul de vedere al costurilor de operare, SC Compania Regionala de Apa Bacau SA impreună cu Asociatia de Dezvoltare Intercomunitară Bacau au decis că solutiile optime privind gestionarea nămolului sunt:

- pe termen scurt (din 2011 pana in 2014): 81-99% din cantitatea totala de namol se va depozita pe depozit ecologic iar un procent de 1-9% va fi compostat, urmat de depozitare la depozit ecologic, asigurata de catre Contractor.
  Nămolul din statiile de epurare din mun.Bacau, orasul Buhusi, orasul Moinesti (SEAU Nord) si orasul Tg.Ocna se va dispune în depozitul judetean central din municipiul Bacau, str.Chimiei, pe baza unui contract de preluare ce se va semna cu viitorul operator al acestui depozit. Până la semnarea contractului, nămolul va fi stocat pe platformele din statiile de epurare. La productia actuală există capacitate de stocare pentru cel putin 6 luni.
- pe termen mediu (din 2015 până în 2020) nămolul din statiile de epurare din jud.Bacau se va dispune în depozitul ecologic din municipiul Bacau, varianta de eliminare selectata provizoriu (69-78% din totalul cantitatii de namol); compostarea plus depozitarea finala, in procent de 22-31%, este garantata de catre Contractor; co-incinerarea este o alta optiune, depinzand de succesul negocierilor: producerea de biogaz, cu depozitare ulterioara, depinzand de succesul negocierilor.
- pe termen lung (din 2021)- varianta de eliminare selectata provizoriu: 50% din nămolul din statiile de epurare din judet va fi co-incinerat în Fabrica de ciment de la Bicaz, întrucât se preconizează că depozitarea nămolului va fi tot mai restrictionată. Se va avea în vedere ca un procent de 25% din totalul namolului produs in judetul Bacau sa fie utilizat pentru reimpaduriri, diferenta de 25% fiind utilizata pentru imbunatatiri funciare; toate sunt variante de eliminare selectate provizoriu. Alte variante de eliminare a namolului: utilizarea in agricultura si producerea de biogaz cu depozitare ulterioara, depinzand de succesul negocierilor.
  Pentru deshidratarea namolului se va alege uscarea folosind energia solară si echipamente de uscare la care să fie posibilă utilizarea biogazului care se va produce în SEAU, astfel încât sa se reducă semnificativ costurile pentru uscare.
- dacă vor apărea tehnologii noi de utilizare a nămolului si/sau dacă vor apărea noi operatori interesati de preluarea si utilizarea nămolului (producători agricoli mari sau operatori detinători de incineratoare speciale pentru deseuri), dacă aceste noi solutii vor deveni competitive ca si costuri, optiunile vor fi reanalizate si eventual ajustate, atât in ceea ce priveste prioritătile cât si în ceea ce priveste calendarul investitiilor necesare, pentru a se asigura pe de o parte efectele cele mai favorabile posibil asupra mediului inconjurător si pe de altă parte costuri cât mai mici.

În sprijinul acestei decizii S.C. COMPANIA REGIONALA DE APA BACAU S.A. va semna contracte cu operatorii depozitelor de deseuri din judetul Bacau, va încheia un contract de preluare a nămolului cu viitorul operator al Depozitului Ecologic Jude ean de la Bacau. De asemeni S.C. COMPANIA REGIONALA DE APA BACAU S.A. va semna un Acord de Principiu cu CARPATCEMENT HOLDING SA, detinătorul Fabricii de ciment de la Bicaz în vederea incinerării nămolului provenit din statiile de epurare din Judetul Bacau.

Atât S.C. COMPANIA REGIONALA DE APA BACAU S.A. cât si ASOCIATIA DE DEZVOLTARE INTERCOMUNITARA BACAU vor depune eforturile necesare pentru gestionarea nămolurilor din statiile de epurare conform acestei decizii.

S.C. COMPANIA REGIONALA DE APA BACAU S.A.

Director General
Ing. Razvan-Grigore Gaina

ASOCIATIA DE DEZVOLTARE INTERCOMUNITARĂ BACAU

Presedinte
Ec. Leonard Stelian Padureanu

Annex 10 -17

Pre-Contract between

ROC and

UNI - Recycling

S.C. COMPANIA REGIONALĂ DE APĂ BACĂU S.A. Nr. 2593 din 17.12.10

PRECONTACT DE PRESTARI SERVICII

Intre **SC UNI – RECYCLING S.R.L** cu sediul în mun. Bucureşti, B–dul. Ion Ionescu de la Brad, nr.2B, sector 1, având amplasamentul punctului de lucru în jud. Prahova, comuna Draganesti, sat Meri, societate înregistrată la Registrul Comerţului sub numărul **J40/19726/2005** şi cod unic de înregistrare **C.U.I. 18156682**, societate comercială având cont virament **COD IBAN RO20BTRL04401202P27431XX**, deschis la **Banca Transilvania**. şi *autorizata prin Autorizaţia de Mediu* ***nr.PH608/12.12.2008*** emisă de Agenţia pentru Protecţia Mediului Prahova reprezentată legal prin dl. Cornel Varvara deţinând funcţia de administrator, in calitate de Prestator de Servicii si denumita in continuare Prestator,

Şi

S.C. COMPANIA REGIONALA DE APA BACAU S.A. cu sediul în str. Narciselor nr. 14, Bacau, judetul Bacau, inmatriculata in Registrul Comertului cu nr. J 04 / 789 / 2010, cod fiscal RO 27429315, cont bancar RO66RNCB0026118227670001, reprezentată prin ing. Găină Răzvan – Grigore având funcţia de director general, denumita in continuare Beneficiar,

se incheie urmatorul preprecontract de prestari servicii.

Preambul

Intrucat:

Valorificarea namolului clasificat ca nepericulos conform HG 856/2005 pentru a intruni conditiile valorificarii prin amendarea solurilor agricole, reconstructii de soluri etc. trebuie sa indeplineasca cerintele OUG 756/2002 si alte acte normative,

Prin valorificarea deseurilor de tip namol orasenesc sau comunal caracterizate ca nepericuloase in vederea contribuirii la dezvoltarii durabile prin utilizarea acestuia in procesele de compostare,

Prin valorificarea namolului de tip orasanesc clasificat ca periculos prin uscare acesta se poate valorifica prin co-incinerare in conditii sigure de mediu in instalatii termice autorizate sau se poate utiliza ca si combustibil alternativ in cuptoare autorizate in vederea diminuarii cantitatilor de deseuri depozitate,

Valorificarea prin compostare este insotita de Certificate de Valorificare care elibereaza beneficiarul in calitatea sa de generator al deseului de responsabilitatea gestionarii deseului,

Valorificarea prin producere de combustibil alternativ asigura trasabilitatea deseului generat asigurand beneficiarul si societatea ca acesta a fost valorificat in conditii sigure de mediu.

1. Obiectul precontractului

1.1 Obiectul prezentului precontract îl constituie prestarea de către Prestator a activităţilor de colectare, reciclare şi/sau valorificare a cantităţilor minime lunare şi anuale furnizate sau preluate de la Prestator, de **deşeuri conform** specificaţiilor, caracteristicilor şi cantitatilor.

2. Valoarea precontractului

2.1 Pretul de preluare al deseurilor este stabilit în funcţie de sortimentele, tipurile, caracteristicile şi cantităţile exprimate în Euro/kilogram sau Euro/tonă, exclusiv TVA din momentul în care deşeurile sunt recepţionate, cântărite, verificate şi declarate ca si corespunzătoare de către Prestator prin semnarea de către reprezentanţii imputerniciti ai acestuia a **procesului verbal de recepţie şi a notei de cântar .**

2.2 Pretul de preluare pentru fiecare tip de deseu, in functie de sortiment, carasteristici, cantitate va fi similar cu tarifele practicate de Depozitul ecologic de deseuri Bacau.

3. Obligatiile partilor

3.1 Beneficiarul se obligă:

3.1.1 **să livreze** deseurile prevăzute în prezentul precontract, in cazul in care transportul nu este efectuat de catre Prestator, în concordanţă cu condiţiile, cantităţiile, tipurile şi sortimentele, specificaţiile şi caracteristicile şi la preţul stabilit prin prezentul precontract, în conformitate cu normele metodologice interne şi internaţionale în vigoare la momentul încheierii prezentului precontract.

3.1.2 **să consulte** Prestatorul asupra utilităţii şi oportunităţii soluţiilor propuse pe parcursul desfăşurării acestui precontract cu privire la colectarea, stocarea şi transportul deşeurilor prevăzute în prezentul precontract.

3.1.3 **să păstreze confidenţialitatea** asupra informaţiilor prevăzute în prezentul preprecontract să nu divulge informaţii cu privire la preţ, condiţii de livrare, cantitate, tip şi calitate a deşeurilor partenerilor de afaceri sau unor terţe persoane care şi-ar manifesta interesul în vederea obţinerii de informaţii ce ar putea aduce prejudicii cumpărătorului.

3.1.4 **sa plateasca contravaloarea transportului** efectuat de catre Prestatorul cu mijloace de transport proprii in baza unei comenzi scrise pentru fiecare cursa in parte tur/retur.

3.1.5 **sa notifice in scris** Prestatorul in termen de 45 de zile anterioare preluarii deseurilor cu specificarea exacta a tipurilor de deseuri ce urmeaza a fi preluate, cantitatile exacte, locatia unde se va face preluarea precum si modul exact de ambalare a deseurilor.

3.1.6 **in cazul depasirii** cantitatii totale de 2.500 tone/an de deseuri generate se obliga sa accepte solutia tehnica transmisa de catre Prestator,

3.2 Prestatorul se obligă:

3.2.1 **să preia** toate deşeurile prevăzute în prezentul precontract de la Beneficiar.

3.2.2 **să respecte** clauzele existente în prezentul precontract.

3.2.3 **să asigure transportul** deseurilor prevăzute în prezentul precontract cu mijloace de transport proprii sau inchiriate, până la punctele de lucru deschise de catre Prestator

3.2.4. **sa ofere certificat de valorificare** pentru deseurile provenite si preluate de la statiile de epurare in cel mai scurt timp posibil. Metoda de valorificare utilizata va fi cea de compostare.

3.2.5 **sa notifice in scris** Beneficiarul asupra faptului ca in cazul depasirii cantitatii anuale de 2.500 tone de deseuri generate ca nu va mai prelua aceste deseuri incepand cu data exacta, pana la solutionarea aspectului prezentat la articolul 3.1.6.

4. Rezilierea precontractului

4.1 Prezentul precontract este valabil pina la data la care se va semna un contract de prestari servicii ce va avea ca obiect colectare, reciclare şi/sau valorificarea superioara a deseurilor.

5. Limba care guverneaza contractul

Limba care guvernează prezentul precontract este limba română.

6. Clauze speciale

a. Prezentul precontract poate fi modificat numai cu acordul scris al părţilor.
b. Prezentul precontract se consideră bun şi aprobat intrând totodată în vigoare la data semnării sale.

7. Alte clauze

7.1 Prezentul contract reprezinta acordul de vointa a partilor de a stabili o relatie contractuala in vederea valorificarii superioare a deseurilor rezultate in urma proceselor tehnologice ale Beneficiarului.

7.2 Prestatorul garantează legalitatea obţinerii autorizaţiilor/avizelor/ licenţelor şi valabilitatea acestora pe toată perioada derulării prezentului precontract, inclusiv prelungirea valabilităţii acestora la expirarea termenului pentru care au fost emise. Prestatorul se obligă să comunice, în cel mai scurt timp posibil, orice modificare intervenită cu privire la autorizaţiile şi licenţele prezentate răspunzând patrimonial pentru orice prejudiciu cauzat prin orice întârziere sau omisiune de a comunica o astfel de modificare.

7.3 Părţile declară şi garantează că obligaţiile stabilite în sarcina lor sau izvorâte din acest precontract sunt deplin valabile şi pot fi puse în executare în conformitate cu prevederile prezentului precontract iar încheierea sa nu încalcă în vreun fel legea şi/sau actul constitutiv, obţinându-se în acest sens toate aprobările interne necesare.

7.4 La redactarea prezentului precontract s-a ţinut cont de următoarele acte normative:

a) Ordonanţa de Urgenţă a Guvernului nr.61/2006 privind gestionarea deşeurilor industriale reciclabile, aprobată cu modificările şi completările ulterioare;

b) Hotărârea Guvernului nr.621/2005 privind gestionarea ambalajelor şi deşeurilor de ambalaje;

c) Hotărârea Guvernului nr. 856/2002 privind evidenţa gestiunii deşeurilor şi pentru aprobarea listei cuprinzând deşeurile, inclusiv deşeurile periculoase;

d) Hotararea Guvernului nr. 1061/2008 privind transportul deseurilor periculoase si a deseurilor nepericuloase pe teritoriul Romaniei.

d) Codul Comercial;

e) Codul Civil.

f) Legea 469 din 9 iulie 2002 cu modificările şi completările ulterioare privind întărirea disciplinei precontractuale.

8. Legea aplicabila prezentului inscris

Prezentul precontract va fi interpretat conform legilor în vigoare din România.

Prezentul precontract este încheiat astăzi 17.12.2010 în două exemplare, câte un exemplar pentru fiecare parte şi conţine un număr de 4 pagini. Prezentul precontract este valabil numai în cazul când toate paginile acestuia sunt semnate şi stampilate de ambele parti.

Prestator

Director Executiv,

Ing. George PASCAL

Beneficiar

Director General,

Ing. Găină Răzvan - Grigore

Director Economic,

Ec. Ivasciuc Adriana

Serviciul Juridic,

cons. jr. Nacu Sorin

Government of Romania

European Union

Technical Assistance for Project Preparation in the Wastewater and Drinking Water Sector, Romania

Prahova, Buzau, Neamt, Iasi and Bacau Counties

Europe Aid 123050 / D / SV / RO /
ISPA Measure 2005/RO/16/P/PA/001-2

Extension and rehabilitation of Water and Wastewater Infrastructure in BACAU County

CCI Nr. 2009/RO/161/PR015

FEASIBILITY STUDY – Annex 11-1 INSTITUTIONAL ANALYSIS

FINAL VERSION

CONSULTING ENGINEERS

Hydro Ingenieure
Planungsgesellschaft für Siedlungswasserwirtschaft mbH
Beratende Ingenieure

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Abreviations

AMP – Asset Management Plan

CF – Cohesion Fund

DSMC – Delegation of Services' Management Contract

DWTP – Drinking Water Treatment Plant

EBRD – European Bank for Reconstruction and Development

EU – European Union

FOPIP – Financial and Operational Performance Improvement Programme

FOPIP I – Technical Assistance for Institutional Capacity Strengthening of ISPA Final Beneficiaries in the Water and Wastewater Sector (ISPA Measure 2003 RO 16 P PA 012)

FOPIP II – Technical Assistance for Institutional Capacity Strengthening of ISPA Final Beneficiaries in the Water and Wastewater Sector (ISPA Measure 2005 RO 16 P PA 001)

IB's – Intermediary Bodies

ICI – Institutional, Commercial and Industrial Customers

IFI – International Financing Institutions

ISPA – Instrument for Structural Policies for pre - Accession

LOS – Level of Services

MESD – Ministry of Environment and Sustainable Development

MIS – Management Informational System

MRD – Maintenance, Replacement and Development

PA 001 – ISPA Measure 2005 RO 16 P PA 001 Technical Assistance for Project Preparation in the Environmental Sector – in Romania

PA 012 – ISPA Measure: 2003 RO 16 P PA 012 - Technical Assistance for Institutional Capacity Strengthening of ISPA Final Beneficiaries in the Water and Waste Water Sector

PA 013 – ISPA Measure 2003 RO 16 P PA 013 - Technical Assistance for Project Preparation in the Environmental Sector – in Romania

PCU – Project Co-ordination Unit for this TA contract, within the Ministry of Environment and Water Management

PIU – Project Implementation Unit at local beneficiary level

PPP – Public Private Partnership

PR – Public Relations

PRAG – Practical Guide for PHARE, ISPA and SAPARD

Pre-FOPIP – Component within PA 012, covering 9 areas; total length of this component is around 1.5 years, out of the 3 years covered in total by PA 012

ROC – Regional Operating Company

ARA (RWA) – Romanian Water Association

SAMTID – Small and Medium Towns Infrastructure Development Programme

SOP Environment – Sectoral Operational Programme Environment 2007-2013

SOS – Standards of Services

TA – Technical Assistance

ToR – Terms of Reference

WWTP – Waste Water Treatment Plant

CHAPTER 1

Executive Summary

1 EXECUTIVE SUMMARY

General Overview

The purpose of this Institutional Analysis is to present the existing institutional arrangements in Bacau County required for an appropriate operation and maintenance of water and waste water system in the project area and based on the SOP requirements.

The beneficiary of the project is SC Compania Regionala de Apa Bacau SA which is the Regional Operator Company (ROC) of the Bacau County.

The proposed project area is covering the Bacau County including municipalities, towns and communes all members of IDA.

Regionalization Process

According to Romania's policy reflected in the SOP Environment the achievement of the objectives for the water and wastewater sector is realized through a process of regionalization, meaning the implementation of an institutional framework within the Project area, suitable to combine the water supply and wastewater services related to the development areas in that region, within a common operating process. The regionalization is a key element in improving the quality and cost efficiency of local water infrastructure and services in order to fulfil environmental targets, but also to assure sustainability of investments, of operations, of a long term water sector development strategy and of regional balanced growth.

The Regionalization process in Bacau County was a very difficult one due to the specific situation within this County. The implementation of all the institutional requirements in Bacau County was finalized in November 2010.

Unfortunately the political decision makers decided only in the second part of last year (2009) about the necessity to create a Regional Operator in Bacau County. During this period a set of decisions were made at the level of County Council Bacau, Local Council Bacau and other LCs from different municipalities, towns and communes.

This Institutional arrangement represented the first phase of a complex process to create and strengthen the capacity of the regional operators in the water and wastewater field, in order to provide public services at the quality level required by EU Directives. The legislation in force at that moment was amended during the last

years in order to fulfil with the SOP Environment requirements and the necessary institutional arrangements (which are implemented in Bacau County), comprising:

- The Intercommunity Development Association (IDA);
- The Regional Operating Company (ROC);
- The Delegation Contract (DMSC) between IDA and ROC.

Based on the new legislation in force, in Bacau County the main steps to adapt the existing institutional arrangements in order to fulfil the SOP requirements were finalized in November 2010. In this respect the IDA was established having 85 members where the ROC is and/or will operate, the Incorporation Act of the ROC was approved with each Local Council as shareholder of the ROC in order to be approved and registered with the Chamber of Commerce and the Delegation Contract (DMSC) between IDA and ROC was Signed in November 2010. It is important to mention that based on the legislation in force, the IDA is mandated by each municipality member of IDA to administrate on their name the public assets part of the water and wastewater system within the County.

The Operator SC Compania Regionala Apa Bacau SA benefits of a relevant experience in managing complex investment projects based on the background of one of the two companies from the merger process: SC Compania Apa Bacau SA.
"SC Compania de Apa Bacau" implemented an ISPA Project, programme proving the capability and having the proper staff to deal with the challenges brought by the implementation of a large scale Cohesion Funded. The existing PIU staff developed during the last years the necessary knowledge and skills to be able to cope with the major responsibilities involved by the implementation of the Cohesion Fund investments. They are well trained and they have the skills and knowledge for a successful implementation of the project.
The existing managerial capabilities together with the previous experience already mentioned are the key success factors for a sound implementation of the Cohesion Fund Application.

Conclusion

Based on the existing capabilities and strong previous experience proved by the Company's staff in managing complex investments projects together with the local commitment to fulfil all SOP Environment requirements in the next quarter, it is considered that the institutional arrangements in Bacau County is adequate to ensure a sound implementation of the proposed investment project and a sustainable development of the Regional Operator (SC Compania Regionala Apa – Bacau SA).

CHAPTER 2

Institutional and Legal Framework

2 INSTITUTIONAL AND LEGAL FRAMEWORK

After a period of more than four decades of centralised management, Romania decided to return to the local autonomy principle through decentralisation, in this way transferring major and concrete responsibilities to the local public administration, principle reflected in the National Constitution. One of these specific responsibilities mentioned in Law of the local public administration, No 215/2001 republished, refers to the obligation of local administrations to organise their operation efficiently and adequately in order to provide public services. According to this Law, local public administrations have the right to associate with the aim to develop efficient public services of common/regional[1] interest.

Nevertheless, efficient public services can only be in place if supported by adequate investment programmes. However, only 32 major municipalities (of more than 100,000 inhabitants each) have benefited from capital investment programmes for rehabilitation of their water and wastewater infrastructure after 1990.

Nevertheless, only a small minority of the 276 towns in Romania (at the end of 2003) have benefited from these programmes. Around 230 considered small and medium-sized towns, have not been able to attract financing from either international financial institutions or private operators. Due to lack of funds, these towns have made very little investments over the past 15 years to maintain and develop their water and wastewater infrastructure. As a consequence, the condition of their systems is very poor. Some of the major problems linked to water services in smaller agglomerations include:

- Inappropriate maintenance and operating services;
- High volume of unpaid water caused by network leakages and low level of payment collection from the consumers;
- Lack of investments for rehabilitation / extension of water / wastewater infrastructure;
- Lack of experienced staff for promoting, management and implementation of large scale investments;
- Inefficient management of the operating, maintenance and personnel costs;
- Unclear role and responsibilities of institutions / authorities involved in management of public utilities;
- Inappropriate institutional framework.

[1] *In this context, regions are large areas that include more human agglomerations; they should not be regarded as development regions (NUTS II) of Romania.*

In Romania, only 52% of the population is connected both to water and sewage services and more than 71% of the wastewater is untreated or insufficiently treated. Until recently water and wastewater services were mostly operated by (often small) municipal utilities resulting in inefficient operations carried out at a sub-optimal scale, without access to financial means and limited technical and managerial capability to further develop the level of services.

Now that Romania has become a member country of the EU, it must comply with the European Directive 98/83/EC on drinking water quality by 2015 and the Directive 91/271/EC on urban wastewater treatment by the end of 2018. For this reason, Romania intends for the period 2010 -2015 to make the necessary investments to comply with the European drinking water indicators for e.g. turbidity, ammonia, aluminium, pesticides, nitrates etc and for urban wastewater collection, treatment and discharge. Also by 2015 waste water collection and treatment is planned to be realized for a number of 263 agglomerations of more than 10,000 population equivalent (p.e.) and by 2018 in 2,346 agglomerations of between 2,000 and 10,000 p.e.

Having these ambitious objectives, the Ministry of Environment and Sustainable Development (MESD) has requested financial assistance from pre-accession programmes (PHARE, ISPA) to support local authorities in creating strong and viable regional operators in the water sector, to ensure an adequate implementation of internationally financed projects and efficient operation of the utilities constructed with European funds.

2.1 Romanian Relevant Legislation

The relevant Romanian Legislation related to the institutional and legal framework for SOP implementation in the water and waste water sector is as follows:

2.1.1 Primary legislation

- Law no. 215/2001 of the local public administration, republished after its amendment made by Law no 286/2006;
- Law no. 213/1998 regarding the public property and its legal status;
- Law no. 51/2006 of the local public services (entered into force on 21st March 2007) – general law;
- Law no. 241/2006 of the water and wastewater service (entered into force on 21st March 2007) – specific law;
- Law no. 273/2006 regarding the local public finance.

2.1.2 Secondary legislation

- The frame-regulations of the water and wastewater service, approved by the ANRSC President's Order no. 88/2007;
- The frame terms of reference for the water and wastewater service, approved by the ANRSC President's Order no. 89/2007;
- The frame contract for providing the water and wastewater service, approved by the ANRSC President's Order no. 90/2007;
- At present no applicable procedures for water and wastewater service management delegation have been adopted.

2.1.3 The Incidental Legislation

- Law no 31/ 1990 on the trade companies, as amended;
- The Government Ordinance no. 26/2000 on the associations and foundations, as amended;
- The Govenmental Decision 855/2008 regarding the approval of template constitutive act and statute for the Intercommunity Development Associations.

2.1.4 Specific Analysis

i. Law 51/2006 on Local Public Service

Law 51/2006 defines and specifies Local Public Services, "as the assembly of activities of general public utility and interest", performed at commune, town, municipality or county level under the lead and coordination and responsibility of the local public authorities. The aim is to satisfy the needs of local communities, one of which is the provision of water and wastewater service.

ii. Law 241/2006 on Water Supply and Wastewater Service Provision

The "Water Supply and Wastewater Public Service" is specified as the assembly of activities of public utility and general economic and social interest, performed for the purpose of catchment, treatment, transport, storage and distribution of drinking or industrial water to all users within a locality's territory, respectively for the collection, transport, treatment, and discharge of the wastewater, rain water and surface water within the urban area of the locality.

The public service regarding water supply has as its main components:

- the water catchment activity, from surface or ground sources;
- the treatment of raw water;
- the transport of drinking and/or industrial water;
- the storage of water;
- the distribution of drinking and/or industrial water.

The public service regarding wastewater has as its main components:

- the collection, transport and discharge of wastewater from the users to the treatment plants;
- the treatment of wastewater and discharge of treated wastewater to the emissary;
- the collection, discharge and appropriate treatment of the waste from the rainwater drains and the insurance of their functionality;
- the discharge, treatment, and storage of sludge and other similar waste materials resulting from the above mentioned activities;
- the discharge of rain and surface water from the urban areas of the municipalities.

iii. Law 213/1998 regarding the public property and its legal system

According to this law, the infrastructure related to the water and wastewater services (water supply and wastewater networks, treatment and ancillary plants, with the corresponding installations, buildings and land) belongs to the public patrimony. The existing infrastructure as at the date of the signing of the Delegation Contract and the assets resulting from the investments carried out during the performance of the Delegation Contract, are thus public assets and are owned by the administrative-territorial units.

iv. Law 215/2001 on Local Public Administration

This law sets out that the local authorities have full and exclusive competencies to the set up, organization, management, monitoring and control of the functioning of the public services of water supply and wastewater.

In some instances counties and not municipalities may have the exclusive competence and responsibility regarding the water supply and wastewater public services. If this is the case, the county will (co)own water and wastewater infrastructure and should therefore participate as a shareholder in the regionalisation process. This is due to Ordinance no. 69/1994, limiting and conditioning the number

of local units of management of public utilities, according to the number of inhabitants of the locality.

2.2 Institutional Framework for water/wastewater sector

2.2.1 Regionalization of the Water Systems in Romania

There is a continuing need to ensure that all towns can maintain and upgrade their infrastructure in order to be able to provide good services, suited to meet EU standards. This requires adoption and implementation of adequately designed development policies, focused on meeting the real needs of the population, if services are to be affordable to everybody.

In line with this background, since 2001, Romanian authorities have designed programmes to support local authorities in order to:

- Access international financing in small and medium agglomerations with the purpose of rehabilitating and modernizing local water infrastructure; and
- Promote self sustainable regional utilities by introducing principles of cost recovery and efficiency into their operations.

Regionalisation is a key element not only in improving the quality and cost efficiency of local water infrastructure and services in order to fulfil environmental targets, but also in assuring sustainability of investments and operations, a long term water sector development strategy and regional balanced growth.

The regionalisation process consists of the concentration of the operation of the services provided to a group of municipalities within a geographical area defined with respect to a river basin and / or to administrative boundaries (municipalities, county). The regionalization of services aims to provide that 2,600 localities of more than 2,000 inhabitants meet 2018-performance targets established by the SOP, by concentrating the management of water and wastewater services in around 50 stronger operators, set up and developed by merging the existing local utilities into Regional Operating Companies (ROC).

Regionalisation of the water services, planned to overcome excessive sector fragmentation and to achieve economies of scale, is an ongoing process. Programmes are supported by pre-accession programmes (ISPA, PHARE and state budget) and include all 42 counties in Romania.

The capacity-strengthening scheme is designed to provide links to investment programmes supporting the rehabilitation, modernisation and up-grading of local water and wastewater infrastructure. To this end, investments are identified and prioritized to include components that reduce costs, improve efficiency and basic

services. New meter installation programmes, pressure and flow monitoring, reduction of unaccounted for water, reduction of infiltrations in the sewerage systems, etc. represent components of every investment project as part of demand management programmes.

The capacity building programmes also include training for the local authorities to use external loans (co-financing) as a financial source for their investment and improve their capacity to plan their investment in municipal infrastructure on sustainable basis, by introduction of financial and operational discipline.

Summing up, the purpose of the process of regionalization of water services, initiated by Romanian Authorities and supported largely by pre-accession programmes (PHARE, ISPA), is to assist the local authorities in the creation of efficient regionalised water and wastewater service operators and in strengthening the capacity of local authorities to control effectively their activities via Intercommunity Development Association (IDA).

From the institutional point of view, the regionalisation is achieved by reorganisation of existing public services owned by municipalities. This is based on three key institutional elements:

- The Intercommunity Development Association (IDA);
- The Regional Operating Company (ROC);
- The Contract of Delegation of Services' Management.

The delegation of services' management is the core of the operational and institutional organization of the regionalized water and wastewater service management and it is designed to:

- Provide a balanced relationship between the local authorities and the regional operator.
- Focus the contract on the preparation, financing and execution of the investment plan as a basis for utility performance strengthening,
- Rule the key aspects that drive to an efficient, dynamic and sustainable water and wastewater management, in particular as regards to:
    - Asset management and financial provision system;
    - Tariff adjustment system;
    - Reporting and control processes.

The delegation contract establishes the specific obligations and rights of each party with regard to the development of investment programs and the achievement of subsequent levels of service performance. The ROC is appointed to manage,

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operate, maintain, upgrade, renew and expand, where appropriate, all of the public assets designated in the contract at its sole risk and peril in consideration of payment (tariff) made by customers, subject to and in accordance with the provisions of the contract.

The ownership of public assets and the responsibility for the supply of adequate water and wastewater services at affordable cost remain with the Local Authorities. The regionalization requires groups of Local Authorities located in a specific region to coordinate their efforts with a view to implement integrated service development programmes aiming to meet performance objectives established by the SOP, and to proceed with the territorial reorganization of the services by delegating the implementation of the regional development plans and the management of services to a ROC.

Fixed assets remain in the public property and must be taken back by the public owner (administrative territorial unit) on termination of the contract.

The delegation contract is a long-term commitment, depending on the period of time of depreciation of investments carried out by the ROC. The tariff policy is aimed at full cost recovery and set by the ROC in compliance with applicable regulations set by the National Authority for Regulation of Community Services (ANRSC), under control and acceptance of the administrative territorial unit. Financing and commercial risks are undertaken by the ROC.

2.2.2 SOP Objectives and the Regionalization Policy

One of the SOP Environment's specific objectives is the improvement of water and wastewater quality and access to water and wastewater infrastructure, by providing water supply and wastewater services in line with EU practices and policies, in most urban areas by 2015 (and 2018 respectively). For this, efficient regionalized water and wastewater management structures must be developed. The objectives of the Priority Axis 1 of SOP "Extension and modernization of water and wastewater systems" are:

- Provide adequate water and sewerage services at affordable tariffs;
- Provide adequate drinking water quality in all urban agglomerations;
- Improve the quality of water courses through adequate wastewater treatment;
- Improve the level of WWTP sludge management;
- Create innovative and efficient water management structures.

Romania's policy reflected in the SOP Environment for securing the achievement of the objectives is to encourage and lead the regionalization process, by combining

the water supply and wastewater services under an institutional umbrella, covering geographical areas as required by EU legislation. The regionalization is a key concept in improving the quality and cost efficiency of local water and wastewater infrastructure and services in order to fulfil environmental targets.

2.2.3 Main Institutional Elements

i. The Inter Community Development Association (IDA)

One of the amendments made by law no. 215/2001 on the local public administration was to define and allow for efficient cooperation between the local municipalities through a juridical organization called IDA.

According to Law 215/2001, the Intercommunity Development Associations are cooperation structures having legal personality, organized under the private law (created following the provisions of the Government Ordinance no.26/2000 on associations and foundations), having a statute of public utility. Also, according to the foreseen amendments of Law 51/2006 IDA is assimilated to the public authorities according to art. 2 letter b) from the Law of the administrative litigation no. 554/2004.

In accordance with Law 215/2001, the IDA represents juridical cooperation structures organized through individual laws (the Government Ordinance on the associations and foundations, no. 26/2000) with public utility statute. Thus, the IDA is being set up by the municipalities and counties according to the laws 215/2001, 51/2006, 241/2006 and the Government Ordinance no. 26/2000 with the purpose of jointly achieving the general interest, to develop projects and to provide public services.

The IDA is acting as the sole (controlling) partner over the ROC. It is the unique coordination body representing the common interests of the participating municipalities on the water and wastewater supply services and on the general strategy regarding the tariff and investment policy.

The IDA is acting in the name and on behalf of its members (the municipalities) thus, assuming the delegated competencies. The IDA statutes stipulate, in more detail, important conditions for joining the IDA and stipulates restrictive conditions for leaving the IDA.

The Governmental Decision 855/2008 regarding the approval of template constitutive act and statute for the Intercommunity Development Associations imposes to IDA's the use of the template constitutive documents in order to assure

the implementation of the in-house rules. The compliance with the requirements of this legal provision is an eligibility criterion for the Cohesion Funds Application.

ii. The Regional Operating Company (ROC)

The ROC is a commercial company, owned by all or a part of the IDA member municipalities, to which the management of the water and wastewater service is delegated, through the Delegation Contract.

The regionalization process, that provides the basis for the establishment of the ROC, represents an essential element towards achieving the ambitious investment objectives set for the renewal, extension, operation and maintenance of the country's water and wastewater sector assets in order to comply with the targets for water and wastewater set for 2015, respectively 2018. It initiates the development of an institutional and legal framework at regional level, suitable to replace the existing smaller operators and autonomous regias with a stronger and larger new single regional operator intended to be more effective in operating the services and in this way to acquire sufficient managerial and financial credibility to apply for and obtain EU Cohesion Fund financing.

Under the provisions in force of Law 31/1990 regarding the commercial companies and Law 215/2001 of the local public administration, such a common regional operator is set up as a commercial company having as shareholders administrative-territorial units that are simultaneously also IDA members.

iii. The Delegation Contract

Background

The Delegation Contract for the water and wastewater service's management is a contract agreed between ROC on the one hand (as operator), and IDA in the name and on behalf of its member municipalities (these municipalities are, collectively, the granting authority). It is a unique contract for the entire area of the Project, corresponding to the territorial competency area of all the administrative-territorial units that delegate the management of the water and wastewater services to the ROC.

According to the new Law no 241/2006 on water supply and wastewater services, in case of delegated management for the service's functioning, the local public administration authorities transfer to the regional operator the tasks and the responsibilities regarding the public utilities services' supply, as well as the management and the operation of the related water supply and wastewater

systems, on the grounds of a management delegation contract, approved by decision of the granting authority.

According to the strategy approved by SOP Environment, the Delegation Contract is granted directly to the Regional Operator, by the application of the exception to the tendering rule, in compliance with Law 241/2006. The direct granting of the delegation contract is achieved in compliance with the EU "in-house" rules as an exception to the tendering procedures. The foreseen amendments to Laws 51 and 241 also include the provisions regarding the "in-house" rules in those laws.

The Direct Granting of the Delegation Contract - "The in-house rules"

According to the European Court of Justice (ECJ – Teckel and Coname case laws), European tendering regulations do not apply when the following conditions are simultaneously observed:

- The administrative-territorial units exercise, via IDA, a direct control over the ROC, similar to the control they exercise over their own department with a dominant influence on all the strategic and/or significant decisions of the ROC (the "similar control" criterion);
- ROC carries out, exclusively, activities in order to provide water and wastewater services for those administrative-territorial units that delegated the management of such service to the ROC (the "exclusive activity" criterion);
- The registered capital of the ROC is entirely owned by administrative-territorial units that are members of IDA, the participation of private capital being excluded.

(1) The "similar control" criterion

The key lines of the direct management according to the requests of the similar control criterion are:

- it is carried out on the grounds of terms of reference and services' regulation;
- the municipality appoints and repeals the management of the operator;
- the municipality approves the Internal Organization and Functioning Regulations (ROF) of the operator;
- the municipality approves the annual budget of the operator.

The control over ROC is exercised jointly by several municipalities, via IDA, on the grounds of an institutional frame set by the ROC Incorporation Act (regarding the institutional control over ROC) and the Delegation Contract having as appendices

the terms of reference and the service's regulations (regarding the control over the performance of the contractual obligations related to the water and wastewater service management).

In respect of such control, IDA:

- Receives by its Statute, a power of attorney from its member municipalities to exercise in their name and on their behalf, their competencies related to the water and wastewater service, provided in Laws 51/2006 and 241/2006. Such power of attorney shall be formalized especially in the signing of the Delegation Contract and the monitoring of its performance.
- IDA's power of attorney, for exercising in the name and on behalf of its members, their prerogatives regarding the water and wastewater service, is detailed in the Statute of the Association.
- Receives through the ROC Incorporation Act certain specific rights, in order to allow IDA to control the ROC. Such specific rights are:
- The members of the Board of the ROC shall be appointed by the shareholders assembly among the persons proposed by the IDA, and shall be revoked only upon proposal of the IDA;
- IDA agrees upon the Internal Organization and Functioning Regulations (that includes the organisational chart) of the ROC before its approval/ modification by the Board of the ROC;
- The annual budget of the ROC shall be established in accordance with the Business Plan agreed by IDA;
- The ROC has to inform IDA regarding its activity so that IDA can perform its control attributes.

(2) The "exclusive activity" criterion

This condition is included in the Incorporation Act of the ROC regarding the scope of activity of the company, on one hand, and in the Delegation Contract regarding the delegated services that constitute the exclusive activity of the Operator, on the other hand.

The Delegation Contract also stipulates the possibility for the ROC to sub-delegate a part of the management of the delegated services, if needed for economical efficiency reasons, to a third party, but solely by a tendering procedure.

(3) The public capital of the ROC

The Incorporation Act of the ROC stipulates the obligation undertaken by the shareholder municipalities that the registered capital of ROC is entirely public capital and shall remain entirely public for the whole duration of the Delegation Contract.

CHAPTER 3

Institutional Framework for Water / wastewater services in Bacau County

3 INSTITUTIONAL FRAMEWORK FOR WATER/WASTEWATER SERVICES IN BACAU COUNTY

The Regional Operator from Bacau County is the result of a merger process between the two main companies from the County Bacau: the most important and with strong experience is SC Compania de Apa Bacau and this is the reason of a comprehensive analysis of it before the merger process taking into account that the new ROC will be based mainly on this company; at the same time an analysis of the other company subjects of the merger process, SC Apa Serv SA Bacau is completing the image of the new company created as a Regional Operator in Bacau County.

3.1 Description of the institutional set-up before regionalisation process

A) SC Compania de Apa Bacau SA

Address: Bacau, str. Narciselor, nr. 14, 600310

Commercial Register: RO 954851

Registration certificate: J 04/244/1991

SC Compania de Apa Bacau SA represents a Romanian legal entity, set up by the Decision no 34/ 1991 issued by Bacau County Municipality in accordance with provisions of Law no 15/1990 – on reorganizing the state economical unities as independent regias and commercial companies. Since 1995, RAGC Bacau has been under the authority of the Local Council of Bacau Municipality by Decision no 8/17.02.1995.

SC Compania de Apa Bacau SA has been set up and operates according to its own internal regulation approved by the Local Council of Bacau Municipality by Decision no 26/05.02.2007.

SC Compania de Apa Bacau SA was established as stock society, upon the structure of the former autonomous administration of communal services which maintained the public service of water and sewerage supplies in Bacau County.

The company operates upon an administrative delegation contract.

B) SC Apa Serv SA

Address: BACAU, Str. H. COANDA, NR. 2

Registration certificate: RO 17820510

Commercial Register: J04/1391/2005

S.C Apa Serv S.A. was a company owned by the County Council and other 52 shareholders as it is mentioned in the following table and established in accordance with Law 31/1990.

Shareholder	RON	Ratio %
Bacau County Council	10.918.698,60	93,34%
Moinesti Municipality Local Council	19.742,70	0,17%
Darmanesti Town Local Council	38.321,60	0,33%
Agas Local Council	18.370,80	0,16%
Balcani Local Council	21.409,90	0,18%
Beresti Tazlau Local Council	15.510,60	0,13%
Berzunti Local Council	14.250,60	0,12%
Brusturoasa Local Council	9.340,40	0,08%
Casin Local Council	10.645,40	0,09%
Colonesti Local Council	5.560,20	0,05%
Corbasca Local Council	14.200,60	0,12%
Cotofanesti Local Council	8.590,30	0,07%
Damienesti Local Council	4.370,20	0,04%
Dealu Morii Local Council	8.477,30	0,07%
Dofteana Local Council	29.671,20	0,25%
Faraoani Local Council	15.525,60	0,13%
Filipesti Local Council	12.710,50	0,11%
Gaiceanca Local Council	8.442,30	0,07%
Hemeiusi Local Council	10.039,40	0,09%
Izvoru Berheciului Local Council	4.939,20	0,04%
Letea Veche Local Council	13.409,60	0,11%
Lipova Local Council	7.845,30	0,07%
Manastirea Casin Local Council	14.945,60	0,13%
Motoseni Local Council	10.698,40	0,09%
Nicolae Balcescu Local Council	24.776	0,21%
Palanca Local Council	10.013,40	0,09%
Parincea Local Council	10.560,40	0,09%
Pirgaresti Local Council	12.870,50	0,11%
Plopana Local Council	8.640,30	0,07%
Poduri Local Council	21.995,90	0,19%
Racaciuni Local Council	21.310,90	0,18%
Rachitoasa Local Council	14.170,60	0,12%
Sarata Local Council	5.660,20	0,05%
Sanduleni Local Council	11.449,50	0,10%
Scorteni Local Council	8.519,30	0,07%
Secuieni Local Council	7.695,30	0,07%
Solont Local Council	10.675,40	0,09%
Stanisesti Local Council	12.735,50	0,11%
Stefan cel Mare Local Council	11.420,50	0,10%
Strugari Local Council	7.050,30	0,06%

Shareholder	RON	Ratio %
Tatarasti Local Council	5.610,20	0,05%
Targu Trotus Local Council	14.282,60	0,12%
Traian Local Council	7.008,30	0,06%
Ungureni Local Council	9.930,40	0,09%
Vultureni Local Council	6.255,30	0,05%
Tg. Ocna Local Council	36.056,50	0,30%
Ardeoani Local Council	7.010,30	0,06%
Magiresti Local Council	12.790,50	0,11%
Margineni Local Council	24.031,00	0,21%
Prajesti Local Council	6.510,30	0,06%
Buciumi Local Council	7.849,30	0,07%
Buhusi Local Council	21.743,00	0,19%
Onesti Municipality Local Council	102.832	0,88%
Total	**11.697.170**	**100%%**

3.2 Regional institutional framework

The regionalization process in Bacau County was finalized in November 2010. As mentioned in the previous chapters, the key institutional elements of this regionalization process are:

- The Intercommunity Development Association (IDA);
- The Regional Operating Company (ROC);
- The Delegation Contract.

The following chapters present in details all these piles of the institutional set up.

3.3 The new IDA „ADI Bacau"

In accordance with SOP environmental institutional requirements, the Intercommunity Development Association "ADI Bacau" has been established, registered and made operational.

The registration of "ADI Bacau" was based on the County Council Bacau and Local Councils Decisions from 3 municipalities, 4 towns and 78 communes to join the Association. In 2010, the Local Council from Onesti Municipality decided to withdraw from IDA Bacau and from the shareholders Assembly of the operator SC Apa Serv SA through the LC Decision 7/2010 and 8/2010.

3.3.1 Participating Members

The following councils have issued their decision to participate in the regionalisation process and to join the IDA "ADI Bacau", including the delegation of their management competencies of water and wastewater services to the IDA and to the ROC via the DMSC.

As per 15th of May 2010, the IDA Bacau members comprise the following members:

Council	Decision/Date reference	Decision/date to update based on GD 855/2008
Bacau County Council	46/23.04.2008	10/30.01.2009
Bacau Municipality Local Council	133/09.04.2008	20/13.02.2009
Moinesti Municipality Local Council	26/11.04.2008	24.03.2009
Buhusi town Local Council	33/10.04.2008	22/26.02.2009
Darmanesti town Local Council	28/28.03.2008	10/27.02.2009
Slanic Moldova town Local Council	35/07.04.2008	15/04.03.2009
Targu Ocna town Local Council	18/10.04.2008	24/12.03.2009
Agas Local Council	7/18.04.2008	25.02.2009
Ardeoani Local Council	10/10.04.2008	9/08.04.2009
Asau Local Council	46/28.08.2008	8/26.02.2009
Balcani Local Council	11/03.04.2008	11/26.02.2009
Beresti-Tazlau Local Council	8/08.04.2008	5/26.02.2009
Berzunti Local Council	17/10.04.2008	4/26.02.2009
Birsanesti Local Council	24/08.04.2008	9/27.02.2009
Blagesti Local Council	12/11.04.2008	9/19.03.2009
Bogdanesti Local Council	15/10.04.2008	14/19.03.2009
Brusturoasa Local Council	6/10.04.2008	6/26.03.2009
Buciumi Local Council	21/10.04.2008	6/20.03.2009
Casin Local Council	18/09.04.2008	16/13.03.2009
Caiuti Local Council	17/10.04.2008	9/27.02.2009
Colonesti Local Council	23.09.04.2008	7/27.02.2009
Corbasca Local Council	10/31.03.2008	4/26.02.2009
Cotofanesti Local Council	9/31.03.2008	4 bis/27.02.2009
Damienesti Local Council	20/07.04.2008	6/25.02.2009
Dealu Morii Local Council	3/11.04.2008	9/10.04.2009
Dofteana Local Council	32/10.04.2008	36/25.03.2009
Faraoani Local Council	29.08.2008	26.03.2009
Filipeni Local Council	8/31.03.2008	6/26.02.2009
Filipesti Local Council	26/11.04.2008	16/05.03.2009
Gaiceanca Local Council	12/14.04.2008	7/9.04.2009
Ghimeş Făget Local Council	16/08.04.2008	11/16.04.2009
Gioseni Local Council	21/24.04.2008	5/26.02.2009
Gîrleni Local Council	15/11.04.2008	5/27.03.2009
Glăvăneşti Local Council	9/10.04.2008	7/23.03.2009

Council	Decision/Date reference	Decision/date to update based on GD 855/2008
Gura Văii Local Council	14/14.04.2008	7/16.03.2009
Helegiu Local Council	17/07.04.2008	11/31.03.2009
Hemeiuşi Local Council	64/29.08.2008	9/27.02.2009
Horgeşti Local Council	12/30.04.2008	3/27.02.2009
Iteşti Local Council	11/18.04.2008	8/28.02.2009
Izvoru Berheciului Local Council	13/31.03.2008	4/26.02.2009
Letea Veche Local Council	22/11.04.2008	16/08.04.2009
Lipova Local Council	9/04.04.2008	5/27.02.2009
Livezi Local Council	9/10.04.2008	6/27.02.2009
Luizi Călugăra Local Council	16/07.04.2008	11/08.04.2009
Măgireşti Local Council	17/10.04.2008	14/20.03.2009
Măgura Local Council	17/11.04.2008	12/08.04.2009
Mănăstirea Caşin Local Council	14/23.04.2008	19/31.03.2009
Mărgineni Local Council	11/02.04.2008	22/07.04.2009
Motoşeni Local Council	16/11.04.2008	7/08.04.2009
Negri Local Council	16/14.04.2008	3/26.02.2009
Nicolae Bălcescu Local Council	59/20.08.2008	28/08.04.2009
Odobeşti Local Council	9/10.04.2008	7/26.02.2009
Oituz Local Council	29/07.04.2008	22/19.03.2009
Onceşti Local Council	10/10.04.2008	4/26.02.2009
Orbeni Local Council	11/10.04.2008	9/27.02.2009
Palanca Local Council	10/15.04.2008	15/31.03.2009
Parava Local Council	11/10.04.2008	19/31.03.2009
Parincea Local Council	18/21.04.2008	5/26.02.2009
Pânceşti Local Council	16/11.04.2008	10/27.03.2009
Pârgăreşti Local Council	15/10.04.2008	12/26.02.2009
Plopana Local Council	11/11.04.2008	5/27.03.2009
Podu Turcului Local Council	11/14.04.2008	5/27.02.2009
Poduri Local Council	7/29.04.2008	9/25.03.2009
Prăjeşti Local Council	12/11.04.2008	12/06.04.2009
Racova Local Council	3/11.04.2008	1/27.02.2009
Răcăciuni Local Council	40/28.08.2008	29/31.03.2009
Răchitoasa Local Council	8/08.04.2008	2/27.02.2009
Sascut Local Council	16/10.04.2008	22/23.03.2009
Sănduleni Local Council	18/29.04.2008	6/27.02.2009
Sărata Local Council	35/22.08.2008	18/08.04.2009
Săuceşti Local Council	13/07.04.2008	10/26.02.2009
Scorţeni Local Council	6/10.04.2008	4/26.02.2009
Secuieni Local Council	14/14.04.2008	6/26.02.2009
Solonţ Local Council	16/10.04.2008	13/27.03.2009
Stănişeşti Local Council	11/07.05.2008	11/09.03.2009
Strugari Local Council	9/28.03.2008	3/27.02.2009
Ştefan cel Mare Local Council	27/04.04.2008	13/25.03.2009

Council	Decision/Date reference	Decision/date to update based on GD 855/2008
Tătărăşti Local Council	10/29.04.2008	4/28.02.2009
Târgu Trotuş Local Council	18/11.04.2008	3/28.02.2009
Traian Local Council	17/09.04.2008	3/27.02.2009
Ungureni Local Council	26/29.08.2008	16/31.03.2009
Urecheşti Local Council	22/13.04.2008	23/31.03.2009
Valea Seacă Local Council	21/14.04.2008	4/27.03.2009
Vultureni Local Council	13/16.04.2008	5/26.02.2009
Zemeşi Local Council	34/10.04.2008	51/25.03.2009

The local Councils decisions were issued after the enactment of the Law 286/2006 amending the Laws 215/2001 (see chapter 1.1). All decisions fulfil the slightly elaborated requirements for the decision making and convey the competencies to manage and delegate the water and wastewater services in line with the provisions of the Law 51/2006 amended by Ordinance no 13 from February 2008.

The new IDA "Apa Bacau" was first established on 06 December 2007 and comprehensively updated on 15 February 2009 and now officially presents itself as follows:

- Name: Intercommunity Development Association „Apa Bacau";
- Address: Bacau, Tricolorului street no.1, floor.3, ap.78 B, Bacau County;
- Association Registration Number: 1/I/A/2008;
- Public Financial Administration register: 23134486.

3.3.2 Voting Requirements

According to Article 20 of the IDA statute all members of the Association have equal voting rights.

3.3.3 Specific SOP Requirements

The SOP requirements relate to requirements established by the EU and by the Romanian authorities. In relation to the IDA, the following must be demonstrated to indicate SOP requirements compliance:

i. Delegation of the Management of Water and Wastewater Services

The Local Councils have transferred their competence of management of water and wastewater services to the IDA.

ii. Regional Interest

IDA acts in the regional interest to develop water and wastewater services and related infrastructure.

iii. Executive Management of the IDA

The political representatives and the senior management of the Operator have agreed that any management position will be assumed by qualified experts. Therefore none of IDA's executive and technical positions, except the President of IDA, are not and will be not filled by politicians. An Executive Board has been established and sourced by the following individuals:

- President: Padureanu Leonard
- Member: Gireada Cornelia;
- Member: Pricope Corneliu.

iv. Unique Tariff

The unique tariff will be adopted according with DMSC till 2014.

v. Restrictive Leaving Restrictions

Restrictive conditions for municipalities to leave IDA are in Article 12.5 of the Statute. These stipulate:

"Any member that leaves the Association must refund:

- the equivalent of the reimbursements that the Operator paid for the contracted loans needed to fund the infrastructure development plan (modernization, rehabilitation, new assets either through extension or replacement) afferent to the Services provided to that respective member, from which he benefited on the duration of its Association member status, plus the expenses afferent to these loans;
- the equivalent of the investments that the respective member benefited of, during the membership, others that were mentioned above;
- the equivalent of the sum implied by the buy-back provision in the Delegation Contract."

vi. IDA Control over ROC (The Similar Control Criterion)

The IDA is the granting authority to the ROC. It concludes the DMSC with the ROC. The IDA has statutory rights and contractual ones. The contractual rights and obligations are analysed further down in the chapter 3.5 on the DMSC. The statutory rights are reflected in the incorporation documents and are:

- Performance Monitoring Powers over ROC Performance;
- Exercises Shareholding rights in the ROC;
- Veto for strategic and significant business decisions;
- Appointment of ROC board members;
- Approval of ROC business plan;
- Approval of ROC functional regulations.

3.3.4 Conclusions regarding the IDA

There is an IDA established in accordance with the SOP requirements and the executive and technical apparatus are operational. Therefore, the IDA, SOP and regionalisation requirements are fulfilled.

3.4 The Regional Operating Company (ROC) "SC Compania Regionala de Apa Bacau SA"

The ROC SC Compania Regionala de Apa - Bacau SA underwent a continuous and comprehensive merging process aimed at full compliance with the regionalisation requirements. This process was finalized in **October 2010** as far as the formal requirements are concerned (other efforts are ongoing, those aimed at organisational optimisation, efficiency, etc). The strategic objectives of the company are:

- Ensuring the sustainable development and flexibility of the company by extending the operations area and the services portfolio;
- Optimising the operational and logistical expenditure so that the Level of Service is achieved at minimum cost;
- Prioritising the rehabilitation and modernisation works aiming for operation of a reliable infrastructure;

- Increasing the quality of life by supplying water and wastewater services according to EU and other relevant standards;
- Increasing the customers' satisfaction levels;
- Maximising the human resources potential;
- Ensuring the health and safety of all the employees and other stakeholders;
- Eliminating the aspects having significant adverse impact on the environment and on public health.

Based on these strategic objectives (and a SWOT analysis), the directions for the period ending in 2010 are as follows:

- Extension the service area;
- Identify, prepare and implement internationally funded infrastructure projects;
- Ensure client satisfaction.

As a result of the extension of the services area and in the perspective of the implementation of the cohesion funds infrastructure projects, "SC Compania de Apa– Bacau SA" fully appreciates the following additional areas of intervention, supported by specific objectives and action plans:

- ROC consolidation;
- Improvement of revenues and tariff unification in the entire service area;
- Improvement in receivables collection and control;
- Compliance with environment and public health standards in the entire service area;
- Establishment and further development of the HR Department;
- Establishment and further development of the IT Department;
- Establishment and further development of the Commercial and PR Departments.

These elements together with those already included in the Business Plan should lead to a substantial improvement of the financial and operational performances of the operator.

Name	Compania Regionala de Apa Bacau
Address	Bacau Municipality, Narciselor street, no 14, Bacau County
Type of services	Water and waste water

3.4.1 Participating Members

The shareholders decided to register the ROC as "SC Compania Regionala de Apa - Bacau SA (CRAB)", having the next shareholders' structure:

Shareholder	Share in %	RON
Bacau Municipality Local Council	1.235.000	51.35739
Bacau County Council	1.102.153	45.83296
Moinesti Municipality Local Council	1.974	0.08209
Darmanesti Town Local Council	3.832	0.15935
Agas Local Council	1.837	0.07639
Balcani Local Council	2.141	0.08903
Beresti Tazlau Local Council	1.551	0.06450
Berzunti Local Council	1.425	0.05926
Brusturoasa Local Council	934	0.03884
Casin Local Council	1.065	0.04429
Colonesti Local Council	556	0.02312
Corbasca Local Council	1.420	0.05905
Cotofanesti Local Council	859	0.03572
Damienesti Local Council	437	0.01817
Dealu Morii Local Council	848	0.03526
Dofteana Local Council	2.967	0.12338
Faraoani Local Council	1.553	0.06458
Filipesti Local Council	1.271	0.05285
Gaiceanca Local Council	844	0.03510
Hemeiusi Local Council	1.004	0.04175
Izvoru Berheciului Local Council	494	0.02054
Letea Veche Local Council	1.341	0.05577
Lipova Local Council	785	0.03264
Manastirea Casin Local Council	1.495	0.06217
Motoseni Local Council	1.070	0.04450
Nicolae Balcescu Local Council	2.478	0.10305
Palanca Local Council	1.001	0.04163
Parincea Local Council	1.056	0.04391
Pirgaresti Local Council	1.287	0.05352
Plopana Local Council	864	0.3593
Poduri Local Council	2.200	0.09149

Shareholder	Share in %	RON
Racaciuni Local Council	2.131	0.08862
Rachitoasa Local Council	1.417	0.05893
Sarata Local Council	566	0.02354
Sanduleni Local Council	1.145	0.04761
Scorteni Local Council	852	0.03202
Secuieni Local Council	770	0.03202
Solont Local Council	1.067	0.04437
Stanisesti Local Council	1.273	0.05294
Stefan cel Mare Local Council	1.142	0.04749
Strugari Local Council	705	0.02932
Tatarasti Local Council	561	0.02333
Targu Trotus Local Council	1.428	0.05938
Traian Local Council	701	0.02915
Ungureni Local Council	993	0.04129
Vultureni Local Council	625	0.02599
Tg. Ocna Local Council	3.606	0.14996
Ardeoani Local Council	701	0.02915
Magiresti Local Council	1.279	0.05319
Margineni Local Council	2.403	0.09993
Prajesti Local Council	651	0.02707
Buciumi Local Council	785	0.03264
Buhusi Local Council	2.174	0.09041
Total	**2.404.717**	**100**

3.4.2 Specific SOP Requirements

The ROC is a joint stock company, established for the management of water and wastewater services for its members. It concludes the DMSC with the IDA. The mandatory SOP and Romanian legal requirements are:

i. Exclusive Activities (the Exclusive Criterion)

Article 5 (1) of the Incorporation Act states the ROC's exclusive activities are the management of the provision of water and wastewater services and directly related activities (CAEN Code 3600). There are also some activities related with power energy production due to the specific local conditions; the power energy produced is used only to cover the own needs for power. Therefore, the exclusivity criterion is fulfilled.

ii. Private Ownership (the Public Capital Criterion)

According to Articles 6 (6) of the Incorporation Act, private shareholding in the ROC is specifically excluded. The ROC has no private shareholders, nor is any of the ROC shareholders privately owned. Therefore, the private ownership criterion is fulfilled.

iii. Establishments of a PIU

The PIU for Chesion fund was created in October 2010 and is currently formed of 3 persons. The PIU for cohession funds took over the experience of the PIU for ISPA. The process of PIU consolidation as structure, procedures manual and jobs description is the subject of a TA for Project Management, the first phase of the implementation of the CFA.

The existing staff represents a very experienced technical and economic team. According to the SOP, there should be at least one department for contract and procurement and one department for technical and operational matters.

The existing PIU has the required technical competencies and no doubt very experienced staff (economists and engineers), but no legal department, or lawyer. It is anticipated that the PIU makes initially use of the Legal / Shareholding Department under the General Director and the human resources located in this department.

For the immediate future, once the Cohesion Fund Application has been approved, the PIU is aware of the need of hiring a legal resource and has a shortlist of potential candidates. Those will be hired on a when-the-need-arises basis, so save costs for relatively expensive human resources such as lawyers.

iv. IDA Control (the Similar Control Criterion)

In reply to the IDA's powers and competencies, the ROC, fulfilling the SOP requirements, is subjected to the control of the IDA, similar as if the ROC was in internal department of the IDA. This control can be demonstrated by the following:

The ROC:

- refers all important and significant business decisions to the IDA (Article 9^1);
- keeps the IDA informed (Article 9^1h);
- accepts nomination of the Board Members as appointed by the IDA (Article 9^1a);
- submits the Annual Budget to the IDA for approval (Article 9^1f).

3.5 Delegation of Services' Management (DMSC)

3.5.1 Parties to the Contract

The DMSC "Contract de Delegare a Gestiunii Serviciilor Publice de Alimentare cu Apa si Canalizare" was signed on **November 29, 2010**.

3.5.2 Description of the Main Features of the DMSC

The DMSC is according to SOP requirements and states from the beginning the unique tariff for the area serviced by the ROC; each Local Council member of the IDA endorsed through respective Local Council decisions.

The main provisions of DSMC are according to the current legal provisions and compliant with the framework contract supplied by the Ministry of Environment.

The contract is made of the following main components:

- A Main Agreement
- Three sets of "Special Conditions" regarding the investment plan and indicators of quality and performance:
  - i- Special Conditions - Common part.
  - ii- Special Conditions -Water part.
  - iii- Special Conditions-Wastewater part.

DMSC should be approved by each Local Council part of IDA when the ROC is operating and will be signed by IDA President in the name of its members and by the ROC General Director.

The Granting Authority has a general power of economical, financial and technical control over the Operator activities and performances.

The Granting Authority, in compliance with applicable legislative and regulatory provisions, sets the terms and conditions for the exercise of its control over the management and operation by the Operator of Granted Services.

The DMSC regulates the delegation of the provision of managing the water and wastewater services:

- For the entire project area;

- Allowing non-core water and wastewater services to be delegated to the private sector. Any such outsourcing attempts are justified by economic efficiency and are carried out under the applicable procurement rules;
- Such that the Granting Authority has controlling and monitoring powers over the Operator.

3.6 Stakeholders

SC Compania Regionala de Apa - Bacau SA (CRAB) coordinates its efforts with central and local authorities among which the most relevant are:

- National Regulatory Authority for Public Services (ANRSC);
- Local Authorities;
- Environmental Protection Agency;
- National Environmental Guard;
- Romanian Waters National Administration;
- Public Finance Directorate;
- County Labour Agency;
- Territorial Labour Inspectorate;
- Public Health Directorate (Sanitary Inspections).

The ROC cooperates very efficiently with these public stakeholders. It employs a continuous information exchange and discussion process with most of these public stakeholders.

CHAPTER 4

Assessment of the Institutional Capacity

4 ASSESSMENT OF THE INSTITUTIONAL CAPACITY

4.1 Intercommunity Development Assopciation (IDA)

4.1.1 Organisational Structure

According to the Statute of the IDA "Bacau" the organisational structure is as follows:

According to the Statute the main bodies and their responsibilities are as follows:

General Assembly – GA represents the leading body of the Association (Article 14.1).

Each LC member of the Association will designate its representative in the GA (Article 14.1 - 14.2). At the moment of the registration all LCs have designated their nominees in the General Assembly.

The GA elects the Presidents of the Association among nominees of each LC (Article 15).

The elected President of the Association is Mr. Padureanu Leonard the City Manager of Bacau Municipality.

Main responsibilities of GA:

- Approves any modifications of the Statutes and Incorporation Act;
- Approves the Activity Report of the Executive Board;
- Nominates and recalls the members of the Executive Board;
- Approves the organisational structure and the personnel policies of the Association;
- Approves the adhering of new members to the Association;

- Approves the liquidation of the Association.

The LCs delegate to the General Assembly to monitor and manage in their name all issues related to water and waste water services.

The General Assembly decides in the best interest of the Association, according to the objectives of the Association, in particular regarding:

- The performance of the Regional Operator;
- The Delegation of Services' Management Contract;
- Master plan;
- Tariff Policies.

Executive Board (EB) - is composed by a President and 6 (six) members nominated by the General Assembly. EB represents the executive management body of the Association (article 22). The president of the Association is also the President of the EB.

Main responsibilities of the Executive Board:

- Reports to General Assembly on annual activity;
- Signs in the name of the Association contracts up to 100 000 Euro;
- Designs and implements the strategy regarding the development of the services;
- Submits for the approval of the General Assembly the TOR and the Integrated sets of rules and procedures for the entire area of operation.

The Technical Apparatus has as main competency to ensure the Association achieves its objectives. It is headed by an Executive Director, who is appointed by the Executive Board, a secretary, an accountant, a legal advisor, and two technical specialists for monitoring the execution of the DMSC. It was decide by the Executive Board the executive staff will be employed in the third quarter of 2010.

The censors ensure the Association's financial control, having a mandate of 3 years, with the possibility of extension. At least one of the censors must be an authorized accountant or accounting expert.

4.2 Regional Operating Company (ROC)

The ROC SC Compania Regionala de Apa - Bacau SA underwent a continuous and comprehensive merging process aimed at full compliance with the regionalisation requirements. This process was finalised in October 2010 as far as the formal

requirements are concerned (other efforts are ongoing, those aimed at organisational optimisation, efficiency, etc). The strategic objectives of the company are:

- Ensuring the sustainable development and flexibility of the company by extending the operations area and the services portfolio;
- Optimising the operational and logistical expenditure so that the Level of Service is achieved at minimum cost;
- Prioritising the rehabilitation and modernisation works aiming for operation of a reliable infrastructure;
- Increasing the quality of life by supplying water and wastewater services according to EU and other relevant standards;
- Increasing the customers' satisfaction levels;
- Maximising the human resources potential;
- Ensuring the health and safety of all the employees and other stakeholders;
- Eliminating the aspects having significant adverse impact on the environment and on public health.

Based on these strategic objectives (and a SWOT analysis), the directions for the period ending in 2010 are as follows:

- Extension the service area;
- Identify, prepare and implement internationally funded infrastructure projects;
- Ensure client satisfaction.

As a result of the extension of the services area and in the perspective of the implementation of the cohesion funds infrastructure projects, "SC Compania de Apa– Bacau SA" fully appreciates the following additional areas of intervention, supported by specific objectives and action plans:

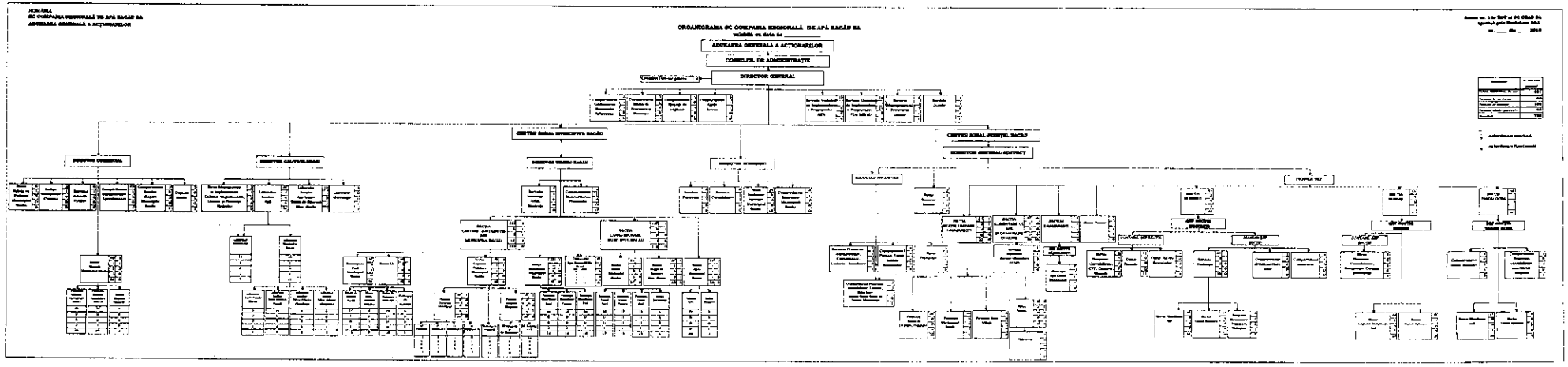
- ROC consolidation;
- Improvement of revenues and tariff unification in the entire service area;
- Improvement in receivables collection and control;
- Compliance with environment and public health standards in the entire service area;
- Establishment and further development of the HR Department;
- Establishment and further development of the IT Department;

- Establishment and further development of the Commercial and PR Departments.

These elements together with those already included in the Business Plan should lead to a substantial improvement of the financial and operational performances of the operator.

4.2.1 Organisational Structure

The organizational chart of the ROC is presented in the following figure (also refer to Annex 11-3) :



4.2.2 Project Implementation Unit (PIU)

The PIU for Chesion fund was created in October 2010 and is currently formed of 3 persons:

- Adam Olimpia Iuliana, Engineer;
- Postolica Danut, Engineer;
- Imbrea Maria, Economist.

The PIU for cohession funds took over the experience of the PIU for ISPA. The process of PIU consolidation as structure, procedures manual and jobs description is the subject of a TA for Project Management, the first phase of the implementation of the CFA.

The existing staff represents a very experienced technical and economic team. The existing PIU has the required technical competencies and no doubt very experienced staff (economists and engineers), but no legal department, or lawyer. It is anticipated that the PIU makes initially use of the Legal / Shareholding Department under the General Director and the human resources located in this department.

In the near future as the company starts to implement the projects financed by cohesion funds, human resources from the PIU – ISPA will be transffered to deal with the increasing work volume. The new employees will have relevant experience with the contracting and procurement due to their previous involvment in the same kind of activities for the ISPA project.

The main functions of the departments in the above mentioned order are:

- Laying down, in accordance with the OUG 34/2006, tenders for works and services and keeps the records;
- Consulting team support for the Cohesion Fund Application and implementation;
- Monitor works development.

The individuals working for the PIU have been and / or are exposed to ongoing capacity building efforts. For this purpose they have attended the following (and more) training sessions:

- Project Management;
- FIDIC Contract Types: Red and Yellow Book;

- Support for the Project Management – public acquisitions and works;
- Training session on technical, institutional and financial issue delivred by FOPIP II Technical Assistance.

4.2.3 Previous Experience in Investments and Technical Assistance Projects

This chapter demonstrates the capability of the ROC senior management to implement Cohesion Fund projects by analyzing:

- the regional operator's capability to implement the future investment project;
- the capability to operate the water and wastewater systems in a sustainable way.

i. Investment Implementation Capability

Starting with 2003, SC Compania de Apa Bacau SA (the operator from Bacau Municipality) has been involved in EU funded projects (implementation of ISPA Project). The management team and the senior staff are experienced in implementing EU investment projects. In the past years both managers and specialized staff had the opportunity to increase their experience levels in areas such as:

- Contract management and management of the relations with the contractors;
- Project management and work supervision;
- Financial management related to the investment projects;
- Management of the relation with all the stakeholders most important ones being:
    - Ministry of Administration and Interior;
    - Ministry of Environment;
    - Ministry of Finance;
    - EU Commission.

Working with the ILF consultants exposed the senior management to the designing of a comprehensive master plan.

ii. Management and Operation Capabilities

SC Compania de Apa Bacau SA has recorded good financial performances in the last years summarized in the following elements:

- Efficient financial management illustrated by the good level of gross profit margin;
- Efficient management of the cash flow on short and medium term illustrated by the good level of current ratio;
- Efficient collection system illustrated by the low level of Days Receivables;

iii. PIU capabilities

The PIU is currently a distinct organisational unit directly subordinated to the General Manager of the company. The existing PIU was established together with the start of the MUDP II project implementation and developed within the implementation of the ISPA Project, having the following main tasks:

- Representing and acting on behalf of the Beneficiary in the relations with all the actors involved (Consultant/Employer/Financing Institutions) and in any matter related to the Program;
- Securing the overall co-ordination and management of the different contracts and contract components included in the ISPA Program, on behalf of the Beneficiary;
- Insuring the input data for the Tender Documents (in particular the technical Volumes and the Special Conditions, part of the Tender Documents);
- Participation in the tender evaluation;
- Participation in the contract negotiations;
- Working together with the Engineer for the supervision of the contracts;
- Giving consent or approval to the different contract decisions where such actions are required from the Beneficiary;
- Reporting to the Employer and to the financing institutions;

In order to implement a much more complex project as a CFA it is required more specialised competencies than those present in the "core" PIU, but for limited periods of time; PIU will work closely with other specialists from different other departments of the company, in a project management (matrix) structure. Availability of the employees is ensured by good communication at horizontal level between the Head of the PIU and the Head of the various departments of the company. Although it might seem more

complicated to work in such a structure, the following advantages have to be mentioned:

- The responsibility for the project implementation is concentrated at the PIU;
- The PIU is responsible and focused only for project implementation;
- The Head of the PIU is the main decision factor regarding project implementation;
- The PIU has increased authority due to the direct subordination to the General Manager;
- Increased efficiency due to a better use of the highly specialised personnel through matrix structure;
- Better communication with the departments providing the specialised personnel.

iv. IDA Capabilities

IDA recorded significant progresses in the last period in developing an organizational set up that could assure the fulfillment of their role. The IDA has an organizational chart, executive personnale and a budget.

However, IDA still need to increase the number of personnel in order to be able to perform its activities. The IDA is planning to complete its personnel structure in the near future based on needs.

4.2.4 Assessment of the Financial Capacity

i. Income Generation

After the regionalization process the Regional Operator has implemented and consolidated economies of scale which helped it develop a strong financial position that represents the basis for a sustainable operating activity. The following table shows the operating performances from the last 2 years consolidated at central level:

	RAGC - Bacau				Apa Serv			
Operating activity	**2008**	**2009**	**2008**	**2009**	**2008**	**2009**	**2008**	**2009**
	RON	**RON**	**%**	**%**	**RON**	**RON**	**%**	**%**

	RAGC - Bacau				Apa Serv			
Operating activity	**2008**	**2009**	**2008**	**2009**	**2008**	**2009**	**2008**	**2009**
	RON	**RON**	**%**	**%**	**RON**	**RON**	**%**	**%**
Revenues from water activity	22,747,027	21,326,673	68.0%	66.9%	7,768,775	7,468,091	77.6%	75.1%
Revenues from sewerage activity	8,887,390	8,524,652	26.5%	26.8%	2,138	5,207	0.0%	0.1%
Revenues from penalties	640,456	462,685	1.9%	1.5%	897,783	1,344,379	9.0%	13.5%
Sales of fixed assets	-	-	-	-	-	-	-	-
Other revenues	-	283,600	-	0.9%	305,376	-	3.0%	-
Other operating revenues	1,201,152	1,262,904	3.6%	4.0%	1,040,510	1,130,445	10.4%	11.4%
Total revenues	**33,476,025**	**31,860,514**	**100.0%**	**100.0%**	**10,014,582**	**9,948,122**	**100.0%**	**100.0%**
Operating costs								
Water activity	**20,236,181**	**20,462,414**	**100.0%**	**100.0%**	**8,793,722**	**9,989,445**	**100.0%**	**100.0%**
Raw water	2,675,217	2,846,025	13.2%	13.9%	1,488,976	1,853,665	16.9%	18.6%
Materials	1,075,091	883,731	5.3%	4.3%	631,323	798,371	7.2%	8.0%
Electric Energy	2,121,052	2,368,313	10.5%	11.6%	1,514,049	1,608,582	17.2%	16.1%
Gross Salaries	7,380,544	7,135,599	36.5%	34.9%	2,578,583	2,523,067	29.3%	25.3%
Salary contributions	1,924,672	2,160,659	9.5%	10.6%	739,151	762,366	8.4%	7.6%
Depreciation	1,185,062	1,274,049	5.9%	6.2%	434,910	443,584	4.9%	4.4%
Maintenance and repairs	764,101	632,630	3.8%	3.1%	-	517,615	-	5.2%
Concession fee	-	100,517	-	0.5%	52,938	108,133	0.6%	1.1%
Other costs	3,110,442	3,060,891	15.4%	15.0%	1,353,792	1,374,062	15.4%	13.8%
Sewerage activity	**9,609,049**	**9,862,285**	**100.0%**	**100.0%**	**0**	**0**	**0**	**0**
Materials	604,738	681,750	6.3%	6.9%	-	-	-	-
Electric Energy	908,676	484,980	9.5%	4.9%	-	-	-	-
Gross Salaries	4,201,824	4,170,024	43.7%	42.3%	-	-	-	
Salary contributions	1,097,474	1,262,683	11.4%	12.8%	-	-	-	
Depreciation	666,597	708,986	6.9%	7.2%	-	-	-	-
Maintenance and repairs	330,309	250,133	3.4%	2.5%	-	-	-	-
Concession fee		52,787	0.0%	0.5%	-	-	-	-
Other costs	1,799,431	2,250,942	18.7%	22.8%	-	-	-	-
Operating result	**3,630,795**	**1,535,815**	**10.8%**	**4.8%**	**1,220,860**	**(41,323)**	**12.2%**	**-0.4%**

The main conclusions are the following:

- No important change in the weight of revenues from water tariffs took place in the activity of either one of the companies in the reference period: For RAGC it decreased from 68% to 67% and the weight of revenues from wastewater treatment tariff increased only by 0.3% to 26.8%. In the same period, for Apaserv it was noticed a small increase of 4% in revenues from penalties.
- The main categories of operating costs for the water activity are:

  For RAGC:

- The personnel costs (salaries and taxes) which weight on average 46% of water costs;
- Other costs which represent 15% of the total water costs.
- The raw water costs (14%) and electric energy costs which weight around 12% in total water costs;

For Apa Serv:

- Other costs which represent over 33% of the total water costs.
- The raw water costs which weight around 19% and the electric energy costs which represent 16% of the total water costs.

- The main categories of operating costs for the sewerage activity are:

  For RAGC:

  - The personnel costs (salaries and taxes) which weight on average 55% of sewerage costs.
  - Other costs which represent on average 23% of the sewerage costs;

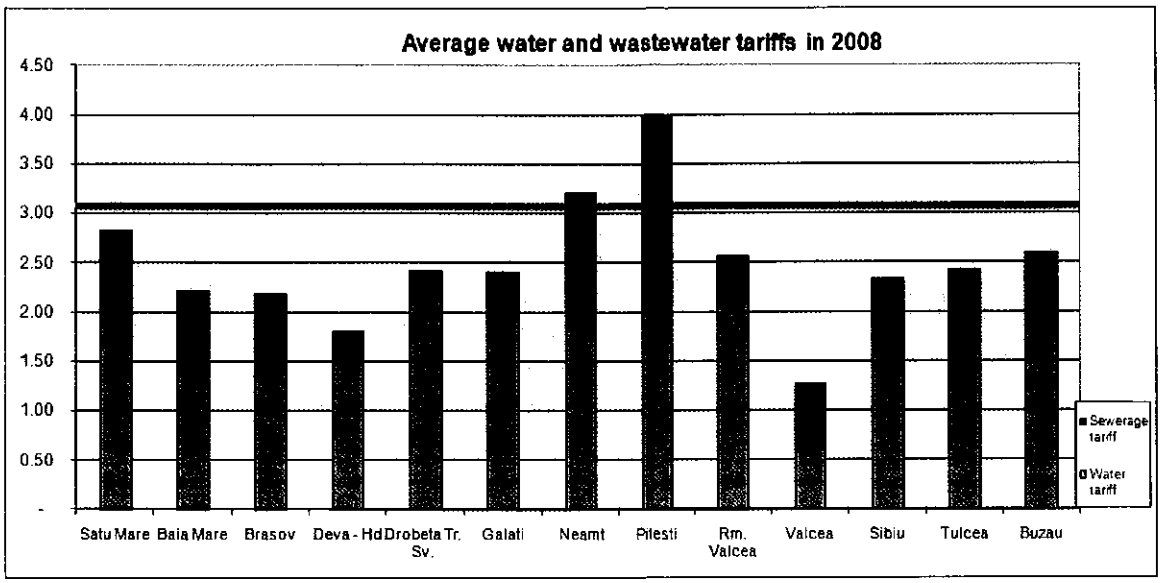
  Apa Serv does not provide wastewater services in the area it operates.
- The operating profit margin decreased by 6% for RAGC Bacau and by 12% for Apa Serv in 2009 (Apa Serv recorded operating loss).

ii. Present Tariff Levels

At present, the operators in the assessed localities charge the following tariffs (excluding VAT):

Town	Water	Sewerage	Cumulated
	RON/m3	RON/m3	RON/m3
Bacau	2.21	0.84	3.05
Buhusi	2.20	0.63	2.83
Moinesti	2.16	0.65	2.81
Darmanesti	0.89	0.36	1.25
Targu Ocna	1.72	0.73	2.45

The actual tariffs levels are above the industry average. In the following charts is presented the comparison of the average water and wastewater tariffs for Bacau with the tariffs recorded by the FOPIP I beneficiaries in 2008.



iii. Debt Carrying Level of the ROC / Shareholders of ROC

The Regional Operator Compania Regionala de Apa Bacau SA has no historical debts. One component member of Compania Regionala de Apa Bacau SA (RAGC Bacau) has contracted a loan for co-financing the ISPA project which will be repaid from the revenues generated by the water activity. This loan will be taken into consideration in performing the CBA analysis.

iv. Incorporation of Rural Communities

As it is already completed a majority of the members of IDA Bacau are among the shareholders of the ROC – CRAB. It is expected that till end of 2010 the new ROC to operate within all these localities; for the rest of the communes it is expected from IDA and ROC to establish a calendar for 2011

CHAPTER 5

Conclusions and Recommendations

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Institutional Strengthening

The Bacau County ROC has many capabilities, operating on a regional basis after being for many years a local company is a challenge. In this respect, SC Compania Regionala de Apa Bacau SA needs to continue to be a financially sound company and implement and re-invent if case its procedures from the main headquarters in Bacau Municipality in the whole services area, in order to deliver the same services quality for all the customers.
The following aspects are recommended for SC Compania Regionala de Apa Bacau SA institutional strengthening:

- ROC consolidation at regional level: processes and procedures, corporate culture etc;
- Improvement of revenues in the whole area of supply;
- Improvement in receivable collection and control;
- Compliance with environment and public health standards in the whole service area;
- Finalisation of the Asset Management Plan for the operated and the future infrastructure and extension of the GIS system at regional level;
- HR further development and improve the age structure of the staff and organisational structure of the company.

For the near future there are some crucial steps regarding the consolidation of the ROC SC Compania Regionala de Apa Bacau SA Sfantu which are part of the Action Plan agreed between the top management and the Fopip II consultant and consists in the integration of the following systems:

- Institutional;
- Operational;
- Marketing;
- Financial;
- IT;
- HRM.

The main aspects of the restructuring of the company are subject of the Action Plan with the TA Fopip II; this TA will focus mainly with the HR improvement in order to ensure the necessary skilled staff for a sound implementation of the CFA and for an improved performance of the company.
The actions envisaged are addressed to the top management of the company, to the relevant staff involved in the implementation of the CFA (PIU) and to the HRM Department for the implementation of the necessary methodologies.

5.2 Recommendations to the Local Councils involved and the County Council

As members of IDA the LCs and CC are the shareholders of the ROC. The ROC performance must be supported by:

- a constant monitoring of the performance of the service levels stipulated by the DSMC;
- a consistent and responsible attitude of the LCs within their communes and towns supporting the education of their population regarding their role in the prosperity of their communities and the development of the water and waste water services; and
- maintaining the communication and actions with respect to the necessity of introducing the principle of cost recovery in the setting of tariffs.

The common interest of the region and the local communities must be the backbone of the collaboration between IDA and ROC.

5.3 Recommendation on Long Term Action Plans

On long term, for local authorities and ROC, the following actions are recommended in order to secure an improvement in the level of services at regional level:

- Access and implementation of a cohesion fund funded project as per priority list from the Master Plan.
- Access and implementation of other EU funds for projects included in Master Plan but not subject of the cohesion fund application (ROP, 3.2.2 measure etc.) for water and wastewater infrastructure; the Applications for ROP, Measure 3.2.2., should be in line with the approved Master Plan and should be endorsed by the ROC for all the localities members of IDA.

It can be concluded that the regionalisation process in Bacau County is almost finalised in accordance with SOP requirements. The new ROC will expand its operation and due

to its present performances, this will be in the benefit of the customers in the present and future services area.

CHAPTER 6

Risks Assessment

6 RISKS ASSESSMENT

6.1 Risks Identified and Mitigation:

The followings were identified as major risks in order to implement the proposed institutional framework and the EU funded projects.
The involved parties should take into account the possibilities to manage and/ or to prevent the impact of the identified risks. Some of the proposed measures are included in the table below:

	Risk	Action	Responsibility
1	No skilled personnel will be employed to the IDA	Well conceived Job descriptions Professional recruitment process Test period for the recruited staff Periodical performance appraisal	IDA
2	The ROC will not be able to collect bills from the consumers having cash-flow problems	Improve bills collection activity Awareness campaign to persuade the consumers	ROC
3	The ROC will not be able to hire the O&M personnel for the extended area	Restructuring the ROC On the job training programmes implemented External training Improved staff motivation schemes	ROC
4	The proposed level of tariffs will not be achieved	Awareness communication plans implemented Political lobby O&M Cost reduction measures	IDA, ROC,
5	Unexpected changes in water demand	close follow up the water sales (on monthly basis) review the tariffs if water demand decreases project proposal prepared to extend production/ distribution capacities if water demand increases	ROC, IDA
6	The Contractors will fail to execute the construction works	Well conceived Employer Requirements Professional tendering processes Rigorous work supervision	ROC
7	No funding will be available for the proposed investments	Involving new financing instruments Review and increase tariffs	ROC, IDA, Local Authorities
8	Unexpected increase of prices	O&M Cost reduction measures Review and increase tariffs	ROC, IDA

	Risk	Action	Responsibility
9	Danger of not meeting the deadlines for accessing the Cohesion Funds (n+3 rule)	Ongoing monitoring of progress Raising awareness amongst public stakeholders Efficient implementation planning Identification of alternative funding sources	ROC

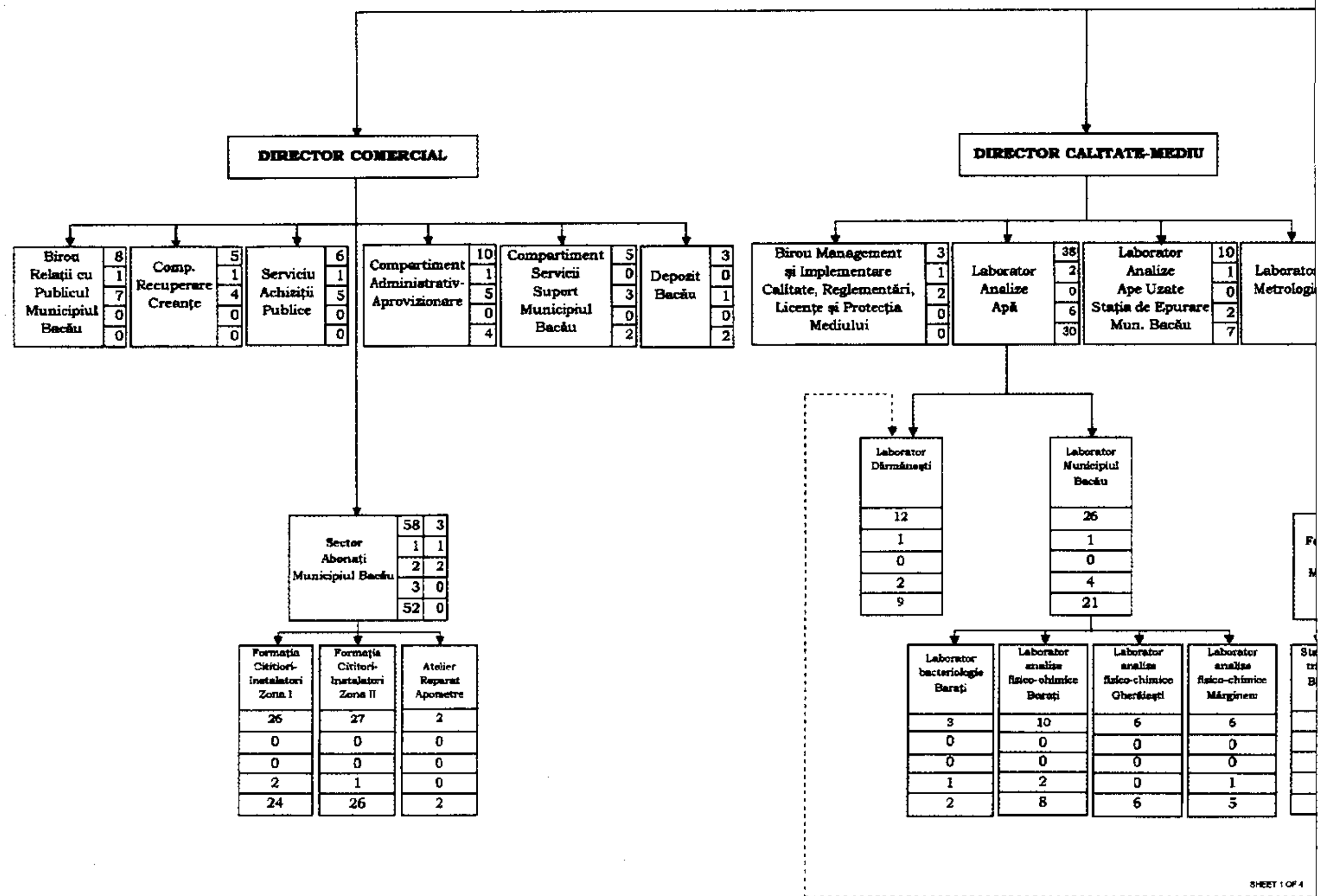
Annex 11-3

Organigram SC Compania Regionala de Apa Bacau SA

ROMÂNIA

SC COMPANIA REGIONALĂ DE APĂ BACĂU SA

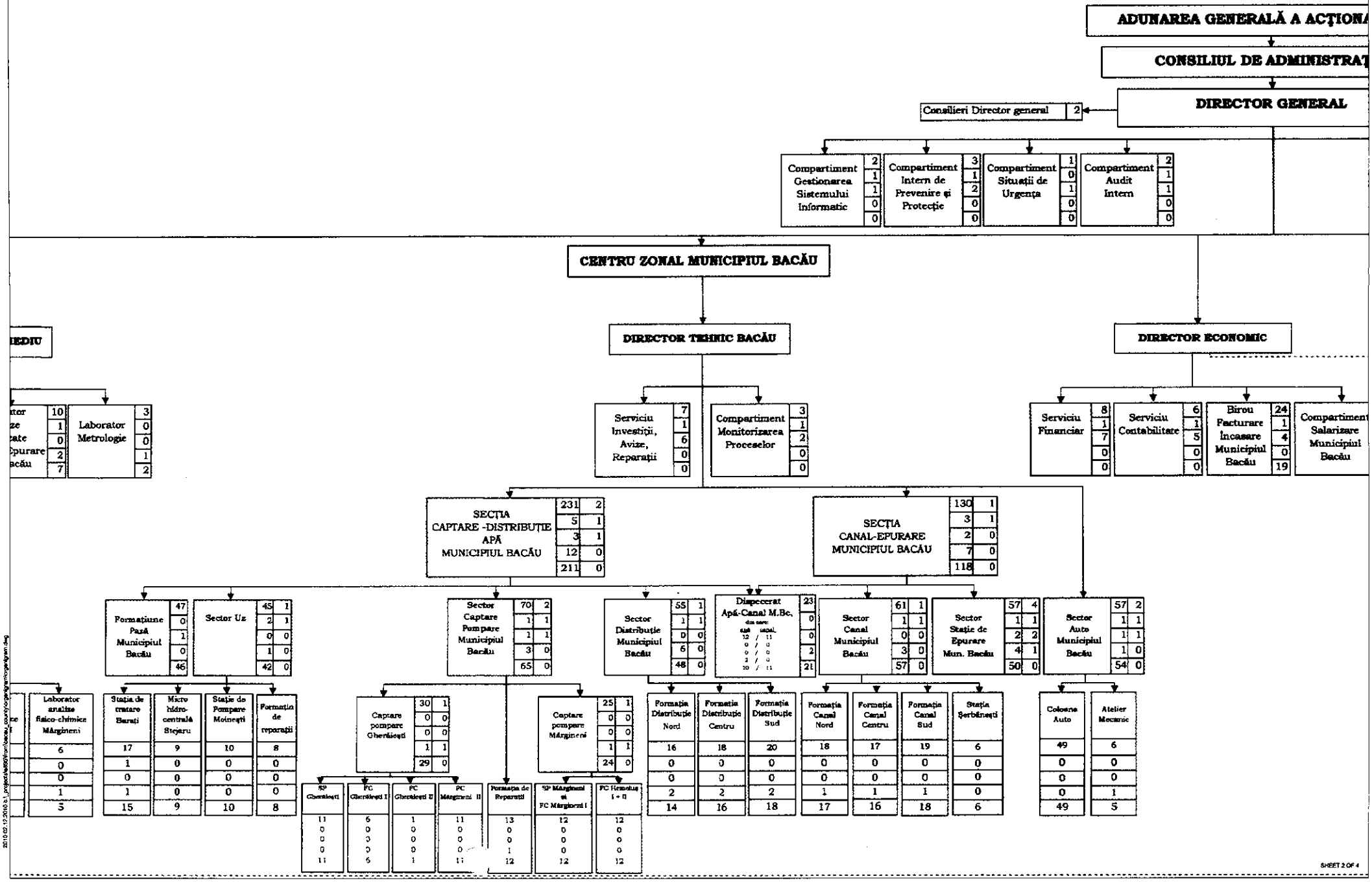
ADUNAREA GENERALĂ A ACŢIONARILOR



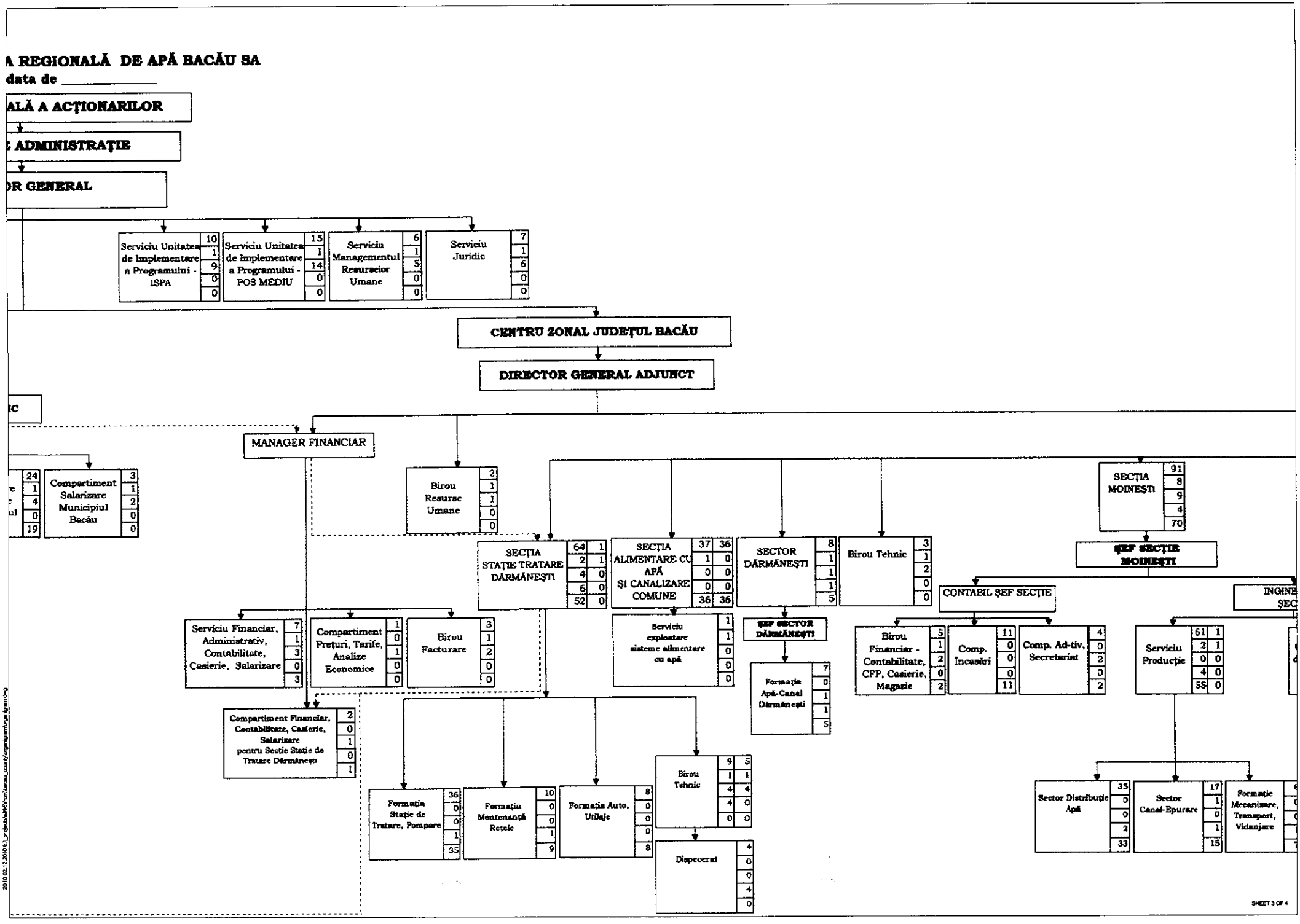
2010 02.12 2010 b:_projects\a995\from\bacau_county\organigram\organigram.dwg

ORGANIGRAMA SC COMPANIA REGIONALĂ

valabilă cu data de _____



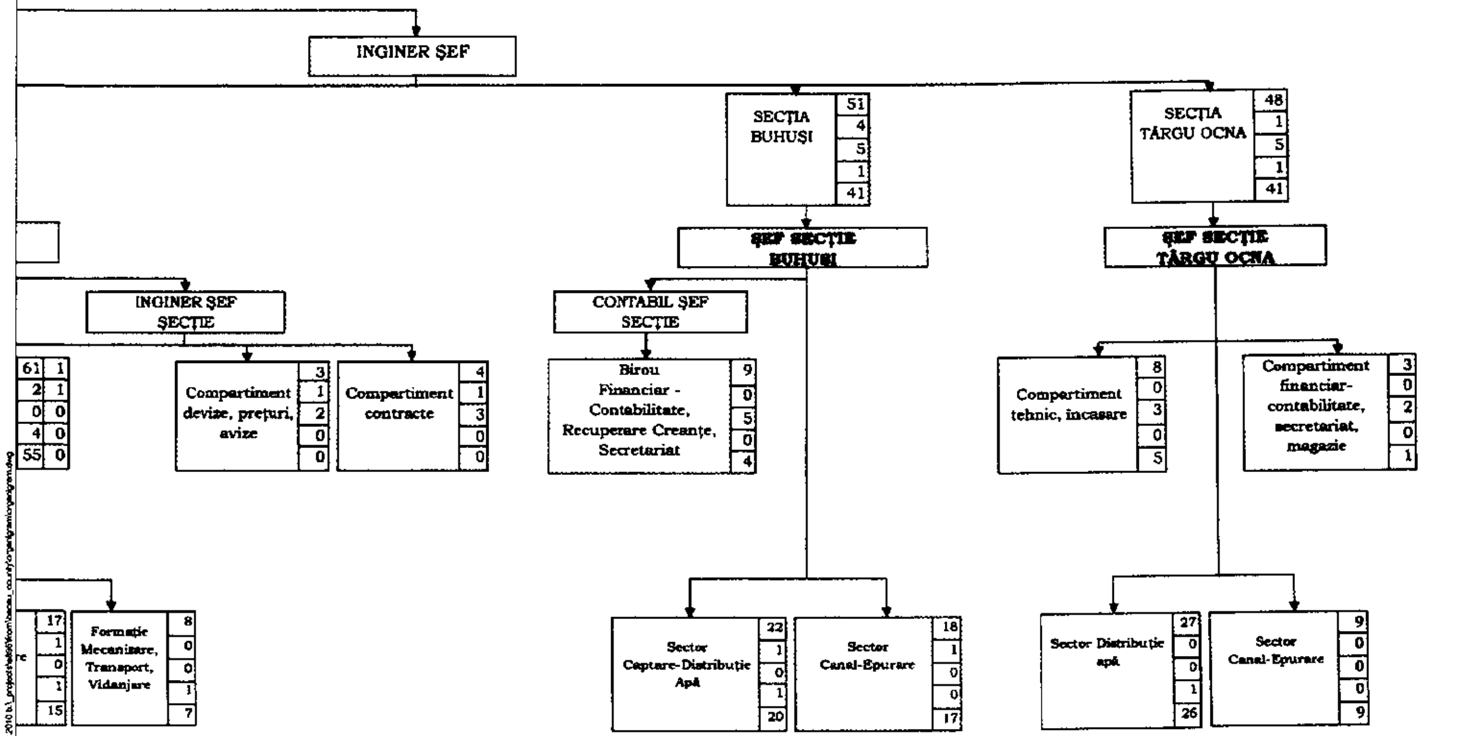
SHEET 2 OF 4


A REGIONALĂ DE APĂ BACĂU SA
data de
ALĂ A ACŢIONARILOR
ADMINISTRAŢIE
OR GENERAL
Serviciu Unitatea de Implementare a Programului - ISPA
Serviciu Unitatea de Implementare a Programului - POS MEDIU
Serviciu Managementul Resurselor Umane
Serviciu Juridic
CENTRU ZONAL JUDEŢUL BACĂU
DIRECTOR GENERAL ADJUNCT
MANAGER FINANCIAR
Compartiment Salarizare Municipiul Bacău
Birou Resurse Umane
SECŢIA STAŢIE TRATARE DĂRMĂNEŞTI
SECŢIA ALIMENTARE CU APĂ ŞI CANALIZARE COMUNE
SECTOR DĂRMĂNEŞTI
Birou Tehnic
SECŢIA MOINEŞTI
ŞEF SECŢIE MOINEŞTI
CONTABIL ŞEF SECŢIE
Serviciu Financiar, Administrativ, Contabilitate, Casierie, Salarizare
Compartiment Preţuri, Tarife, Analize Economice
Birou Facturare
Serviciu exploatare sisteme alimentare cu apă
ŞEF SECTOR DĂRMĂNEŞTI
Formaţia Apă-Canal Dărmăneşti
Birou Financiar - Contabilitate, CFP, Casierie, Magazie
Comp. Încasări
Comp. Ad-tiv, Secretariat
Serviciu Producţie
Compartiment Financiar, Contabilitate, Casierie, Salarizare pentru Secţie Staţie de Tratare Dărmăneşti
Formaţia Staţie de Tratare, Pompare
Formaţia Mentenanţă Reţele
Formaţia Auto, Utilaje
Birou Tehnic
Dispecerat
Sector Distribuţie Apă
Sector Canal-Epurare
Formaţie Mecanizare, Transport, Vidanjare
SHEET 3 OF 4

Anexa nr. 1 la ROF al SC CRAB SA
aprobat prin Hotărârea AGA
nr. _____ din _____ 2010

Specificație	Număr total personal
TOTAL PERSONAL, din care:	991
Personal de conducere	60
Personal de execuție	136
Personal tehnic- productiv	45
Muncitori	750

- subordonare ierarhică
- subordonare funcțională



Annex 11-4

Decision of Administration Board

SC COMPANIA REGIONALĂ DE APĂ BACĂU S.A.

Str. Narciselor, nr.14 – Bacau
CUI:RO 27429315
J04/789/2010
Capital social: 24.047.170 lei
COD CAEN: 3600

Tel:0334-401.796
Fax:0234-55.11.75
www.apabacau.ro
e-mail: ragc_juridic@yahoo.com
Banca : BCR Bacau
Cont:RO66RNCB0026118227670001

CONSILIUL DE ADMINISTRATIE

HOTARAREA NR. 1
DIN 14.10.2010

Consiliul de Administratie al S.C. COMPANIA REGIONALA DE APA BACAU S.A. , convocat pentru data de 14.10.2010 ,

In temeiul art. 141 alin. 2 din Legea nr. 31 / 1990, privind societatile comerciale , republicata si ale art. 14 alin. 1 , alin. 6 lit. a,g,i,j din Actul Constitutiv al S.C. COMPANIEI REGIONALA DE APA BACAU S.A. ,

Legal constituit ,

HOTARASTE

Art. 1 – Se aproba cu unanimitate de voturi a membrilor prezenti Bugetul de Venituri si Cheltuieli al S.C. COMPANIA REGIONALA DE APA BACAU S.A. pe anul 2010 , propus prin referatul nr. 387 / 13.10.2010 al directorului economic al societatii .

In conformitate cu prevederile art. 11 alin. 2 lit. f din Actul Constitutiv al societatii Bugetul de Venituri si Cheltuieli al S.C. COMPANIA REGIONALA DE APA BACAU S.A. pe anul 2010 se va inainta spre aprobare Adunarii Generale Ordinare a Actionarilor .

De ducerea la indeplinire a acestei prevederi va raspunde Serviciul Juridic al societatii .

Art. 2 - Se aproba cu unanimitate de voturi a membrilor prezenti Planul de Investitii cu finantare din surse proprii al S.C. COMPANIA REGIONALA DE APA BACAU S.A. pe anul 2010 , propus prin referatul nr. 332 / 12.10.2010 al directorului tehnic al societatii .

In conformitate cu prevederile art. 11 alin. 2 lit. a din Actul Constitutiv al societatii Planul de Investitii cu finantare din surse proprii al S.C. COMPANIA REGIONALA DE APA BACAU S.A. pe anul 2010 se va inainta spre aprobare Adunarii Generale Ordinare a Actionarilor .

De ducerea la indeplinire a acestei prevederi va raspunde Serviciul Juridic al societatii .

Art. 3 - Se aproba cu unanimitate de voturi a membrilor prezenti Planul de Reparatii Curente si Capitale al S.C. COMPANIA REGIONALA DE APA BACAU S.A. pe anul 2010 , propus prin referatul nr. 333 / 12.10.2010 al directorului tehnic al societatii .

In conformitate cu prevederile art. 11 alin. 2 lit. a din Actul Constitutiv al societatii Planul de Reparatii Curente si Capitale al S.C. COMPANIA REGIONALA DE APA BACAU S.A. pe anul 2010 se va inainta spre aprobare Adunarii Generale Ordinare a Actionarilor .

De ducerea la indeplinire a acestei prevederi va raspunde Serviciul Juridic al societatii .

Art. 4 - Se aproba cu unanimitate de voturi a membrilor prezenti Regulamentul de Organizare si Functionare , Organigrama si Statul de Functii ale S.C. Compania Regionala de Apa Bacau S.A. .

In conformitate cu prevederile art. 11 alin. 2 lit. b din Actul Constitutiv al societatii , Regulamentul de Organizare si Functionare , Organigrama si Statul de Functii ale S.C. Compania Regionala de Apa Bacau S.A. se vor inainta spre aprobare Adunarii Generale Ordinare a Actionarilor .

De ducerea la indeplinire a acestei prevederi va raspunde Serviciul Juridic al societatii .

Art. 5 - Se aproba cu unanimitate de voturi a membrilor prezenti modelul de contract de mandat al directorului general al societatii , conform prevederilor art. 2 alin. 2 din O.U.G. nr. 79/2008 – privind masuri economico-

financiare la nivelul unor operatori economici , cu modificarile si completarile ulterioare .

Se imputerniceste d-l APOSTOL CONSTANTIN , membru in Consiliul de Administratie sa semneze in numele si pe seama tuturor membrilor Consiliului de Administratie contractul de mandat al directorului general .

Art. 6 – Se aproba cu unanimitate de voturi a membrilor prezenti Regulamentul de organizare si functionare al Consiliului de Administratie al S.C. Compania Regionala de Apa Bacau S.A. .

Art. 7 – Membrii Consiliului de Administratie avizeaza favorabil propunerile directorului general cu privire la numirea directorilor executivi , conform prevederilor art. 16 alin. 1 din Actul Constitutiv al societatii , astfel :

1. Hăineală Petre - director general adjunct ;
2. Ivasciuc Adriana – director economic ;
3. Butuc Iulia – director comercial ;
4. Rădulescu Petruş – director tehnic Bacau .

Art. 8 - Se voteaza cu unanimitate de voturi a membrilor prezenti numirea secretarului Consiliului de Administratie in persoana d-nei Luca Monica – Elena – sef Serviciu Juridic .

Secretarul Consiliului de Administratie va beneficia de o indemnizatie egala cu 1% din remuneratia directorului general al S.C. CRAB S.A., conform prevederilor O.U.G. nr. 27/31.03.2010 .

Art. 9 - Se aproba cu unanimitate de voturi a membrilor prezenti scoaterea din functiune si casarea unor obiecte de inventar , aflate intr-o stare avansata de uzura si care nu mai pot fi folosite , propusa prin Nota Interna nr. 7247/16.09.2010 a Comisiei de Casare din Cadrul societatii .

De ducerea la indeplinire a acestei prevederi va raspunde Comisia de Casare din cadrul societatii .

PRESEDINTELE Consiliului de Administratie ,
Director General al S.C. COMPANIA REGIONALA DE APA BACAU S.A. ,
Ingo Gaină Răzvan – Grigore

SECRETAR ,
Sef Serviciu Juridic ,
Cons. Jr. Luca Monica – Elena

(10ex.)

ANNEX : 12-1 Procurement Strategy

BACAU COUNTY - CONTRACTS

Water
Wastewater

WORK CONTRACTS

Contingency 8.05%

WC 1 — WWTP Bacau

Contract	Lot Number	CF Priority	Net Value	Contingency	Total incl Contingency	FIDIC		Description
	BC 1.1	I	13,095,370 €	1,054,177 €	14,149,547 €			Tertiary Treatment Step WWTP Bacau City
			13,095,370 €	1,054,177 €	14,149,547 €			
Total			13,095,370 €	1,054,177 €	14,149,547 €			

WC 2 — WW-Networks Buhusi and Moinesti

Contract	Lot Number	CF Priority	Net Value	Contingency	Total incl Contingency	FIDIC		Description
	BC 2.1	I	5,284,557 €	425,407 €	5,709,964 €			Extension Wastewater Network Moinesti including pressure lines
	BC 2.2	I	176,000 €	14,168 €	190,168 €			WW Pumping Stations Moinesti
	BC 2.3	I	5,259,917 €	423,423 €	5,683,340 €			Extension Wastewater Network Buhusi including pressure lines
	BC 2.4	I	442,000 €	35,581 €	477,581 €			WW Pumping Stations Buhushi
			11,162,474 €	862,998 €	12,061,053 €			
Total			11,162,474 €	862,998 €	12,061,053 €			

WC 3 — WS-Networks Buhusi and Moinesti, Rehabilitation WS AC parts in Bacau, WW networks in Bacau, Darmanesti and Targu Ocna

Contract	Lot Number	CF Priority	Net Value	Contingency	Total incl Contingency	FIDIC		Description
	BC 3.1	II	647,752 €	52,144 €	699,896 €			Extension Water Supply Network Moinesti
	BC 3.2	II	996,672 €	80,232 €	1,076,904 €			Extension Water Supply Network Buhusi
	BC 3.3	II	3,786,704 €	304,830 €	4,091,534 €			Rehabilitation AC - parts in Bacau City (financed by 'Other Funds')
		TOTAL WS	5,431,128 €					
		Other Funds	3,786,704 €					
		CF financed	1,644,424 €					
	BC 3.4	II	9,838,850 €	792,027 €	10,630,877 €			Extension Wastewater Network Bacau including pressure lines
	BC 3.5	II	228,000 €	18,354 €	246,354 €			WW Pumping Stations Bacau (WWPS Magura financed by other funds)
	BC 3.6	II	13,073,348 €	1,052,404 €	14,125,752 €			Extension Wastewater Network Darmanesti including pressure lines
	BC 3.7	II	532,000 €	42,826 €	574,826 €			WW Pumping Stations Darmanesti
	BC 3.8	II	6,687,150 €	538,316 €	7,225,466 €			Extension Wastewater Network Targu Ocna including pressure lines
	BC 3.9	II	342,000 €	27,531 €	369,531 €			WW Pumping Stations Targu Ocna
		Other Funds	38,000 €					WWPS Magura
		TOTAL WW	30,739,348 €					
		CF financed	30,701,348 €					
Total			36,170,476 €					
Other Funds			3,824,704 €					
CF financed			32,345,772 €					

WC 4 — Rehabilitation WTP Caraboaia

Contract	Lot Number	CF Priority	Net Value	Contingency	Total incl Contingency	FIDIC		Description
	BC 4.1	II	3,591,286 €	289,099 €	3,880,385 €			Rehabilitation WTP Caraboaia
			3,591,286 €	289,099 €	3,880,385 €			
Total			3,591,286 €	289,099 €	3,880,385 €			

WC 5 — WWTPs Moinesti and Buhusi

Contract	Lot Number	CF Priority	Net Value	Contingency	Total incl Contingency	FIDIC		Description
	BC 5.1	II	2,280,514 €	183,581 €	2,464,095 €			New WWTP Moinesti South
	BC 5.2	II	5,679,785 €	457,223 €	6,137,008 €			Rehabilitation WWTP Moinesti North
	BC 5.3	II	7,449,590 €	599,692 €	8,049,281 €			Rehabilitation WWTP Buhusi
			15,409,888 €	1,240,496 €	16,650,384 €			
Total			15,409,888 €	1,240,496 €	16,650,384 €			

WC 6 — New WWTP Darmanesti and Rehabilitation WWTP Targu Ocna

Contract	Lot Number	CF Priority	Net Value	Contingency	Total incl Contingency	FIDIC		Description
	BC 6.1	II	5,026,520 €	404,635 €	5,431,155 €			New WWTP Darmanesti
	BC 6.2	II	3,962,130 €	318,951 €	4,281,081 €			Rehabilitation WWTP Targu Ocna
			8,988,650 €	723,586 €	9,712,236 €			
Total			8,988,650 €	723,586 €	9,712,236 €			

	CF Priority			
Total CF I Work Contracts	I	24,257,844 €	1,952,756 €	26,210,600 €
Total CF II Work Contracts	II	60,335,596 €	4,857,015 €	65,192,612 €
Total CF Work Contracts	I + II	84,593,440 €	6,809,772 €	91,403,212 €
Other Funds		3,824,704 €		

SERVICE CONTRACT

SC 7 — Technical Assistance

Contract	Lot Number		Net Value	Contingency	Total incl Contingency			Description
	BC 7.1		1,974,626	158,957 €	2,133,583 €			Design and Engineering incl. Tender CFII
	BC 7.2		1,461,223	117,628 €	1,578,852 €			Technical Assistance - Project Management
	BC 7.3		3,620,148	291,422 €	3,911,569 €			Technical Assistance - Supervision
Total			7,055,997 €	568,008 €	7,624,004 €			

Annex 12-2 Implementation Plan Work Contracts

Water

Wastewater

Actual money spent per year as percentage

CF Priority I

	WC 1: WWTP Bacau	% of whole contracts = 15.48					Provisional date of tender issue	Provisional date of contract award	Provisional date of contract start	Provisional date of contract finish	2010						2012					
	Lot Number	Total incl. 8.05% Contingency	Lot as % of WC1 Budget	FIDIC		Description	1				0% of Lot Budget	0% of SC Budget	0% of CF Budget	0% of Lot Budget	0% of SC Budget	0% of CF Budget	0% of Lot Budget	0% of SC Budget	0% of CF Budget	0% of Lot Budget	0% of SC Budget	0% of CF Budget
	BC 1.1	14,149,547	100.00			Tertiary Treatment Step WWTP Bacau City	Dec/2010	Dec/2010	Dec/2010	Dec/2012	7.00	7.00	1.08	50.00	50.00	7.74	43.00	43.00	6.65		0.00	0.00
		14,149,547											1.08			7.74			6.65			0.00
Total		14,149,547	100.00									7.00			50.00			43.00			0.00	

CF Priority I

	WC 2: WW-Networks Buhusi and Moinesti	% of whole contracts = 13.20																				
Contract	Lot Number	Total incl. 8.05% Contingency	Lot as % of WC2 Budget	FIDIC		Description	2				2010						2012					
	BC 2.1	5,709,964	47.34			Extension Wastewater Network Moinesti including pressure lines	Jan/2011	Apr/2011	Apr/2011	Dec/2013				30.00	14.20	1.87	40.00	18.94	2.50	30.00	14.20	1.87
	BC 2.2	190,166	1.58			WW Pumping Stations Moinesti	Jan/2011	Apr/2011	Apr/2011	Dec/2013				50.00	0.79	0.10	50.00	0.79	0.10	0.00	0.00	0.00
	BC 2.3	5,683,340	47.12			Extension Wastewater Network Buhusi including pressure lines	Jan/2011	Apr/2011	Apr/2011	Dec/2013				30.00	14.14	1.87	40.00	18.85	2.49	30.00	14.14	1.87
	BC 2.4	477,581	3.96			WW Pumping Stations Buhushi	Jan/2011	Apr/2011	Apr/2011	Dec/2013					0.00	0.00	50.00	1.98	0.26	50.00	1.98	0.26
		12,061,053			5.5%	Percentage YELLOW in RED										3.84			5.35			4.09
Total		12,061,053	100.00												29.13			40.55			30.32	

CF Priority II

	[redacted]	[redacted]																				
Contract	Lot Number	Total incl. 8.05% Contingency	Lot as % of WC3 Budget	FIDIC		Description	3				2010						2012					
	BC 3.1	699,896	2.00			Extension Water Supply Network Moinesti	Jan/2011	Apr/2011	Apr/2011	Dec/2013				50.00	1.00	0.38	50.00	1.00	0.38	0.00	0.00	0.00
	BC 3.2	1,078,804	3.08			Extension Water Supply Network Buhusi	Jan/2011	Apr/2011	Apr/2011	Dec/2013				50.00	1.54	0.59	50.00	1.54	0.59	0.00	0.00	0.00
	BC 3.3	4,091,534				Rehabilitation AC - parts in Bacau City (financed by 'Other Funds')	Jan/2011	Apr/2011	Apr/2011	Dec/2013				40.00			30.00			30.00			other funds
	BC 3.4	10,630,877	30.42			Extension Wastewater Network Bacau including pressure lines	Jan/2011	Apr/2011	Apr/2011	Dec/2013				40.00	12.17	4.65	30.00	9.13	3.49	30.00	9.13	3.49
	BC 3.5	246,354	0.70			WW Pumping Stations Bacau (WWPS Magura financed by other funds)	Jan/2011	Apr/2011	Apr/2011	Dec/2013				40.00	0.28	0.11	30.00	0.21	0.08	30.00	0.21	0.08
	BC 3.6	14,125,752	40.42			Extension Wastewater Network Darmanesti including pressure lines	Jan/2011	Apr/2011	Apr/2011	Dec/2013				45.00	18.19	6.95	40.00	16.17	6.18	15.00	6.06	2.32
	BC 3.7	574,826	1.64			WW Pumping Stations Darmanesti	Jan/2011	Apr/2011	Apr/2011	Dec/2013				30.00	0.49	0.19	30.00	0.49	0.19	40.00	0.66	0.25
	BC 3.8	7,225,466	20.67			Extension Wastewater Network Targu Ocna including pressure lines	Jan/2011	Apr/2011	Apr/2011	Dec/2013				45.00	9.30	3.56	35.00	7.24	2.77	20.00	4.13	1.58
	BC 3.9	369,531	1.06			WW Pumping Stations Targu Ocna	Jan/2011	Apr/2011	Apr/2011	Dec/2013				30.00	0.32	0.12	30.00	0.32	0.12	40.00	0.42	0.16
	TOTAL	39,041,140			3.0%	Percentage YELLOW in RED (TOTAL WC)																
	Other Funds	4,132,593			3.4%	Percentage YELLOW in RED (TOTAL WC) CF financed										16.55			13.80			7.88
Total	CF financed	34,849,605	100.00												43.29			36.09			29.52	

CF Priority II

	[redacted]	[redacted]																				
Contract	Lot Number	Total incl. 8.05% Contingency	Lot as % of WC5 Budget	FIDIC		Description	4				2010						2012					
	BC 4.1	3,880,385	100.00			Rehabilitation WTP Caraboaia	Feb/2011	May/2011	May/2011	Dec/2012				50.00	50.00	2.12	50.00	50.00	2.12		0.00	0.00
		3,880,385														2.12			2.12			0.00
Total		3,880,385	100.00												50.00			50.00			0.00	

CF Priority II

	[redacted]	[redacted]																				
Contract	Lot Number	Total incl. 8.05% Contingency	Lot as % of WC6 Budget	FIDIC		Description	5				2010						2012					
	BC 5.1	2,464,095	14.80			New WWTP Moinesti South	Feb/2011	May/2011	May/2011	Dec/2013				45.00	6.65	1.21	35.00	5.18	0.94	20.00	2.96	0.54
	BC 5.2	6,137,008	36.86			Rehabilitation WWTP Moinesti North	Feb/2011	May/2011	May/2011	Dec/2013				30.00	11.06	2.01	50.00	18.43	3.36	20.00	7.37	1.34
	BC 5.3	8,049,281	48.34			Rehabilitation WWTP Buhusi	Feb/2011	May/2011	May/2011	Dec/2013				30.00	14.50	2.64	50.00	24.17	4.40	20.00	9.67	1.76
		16,650,384														5.87			8.70			3.64
Total		16,650,384	100.00												32.22			47.76			20.00	

ANNEX 12-2: IMPLEMENTATION PLAN

CF Priority II

Contract	Lot Number	Total incl. 8.05% Contingency	Lot as % of WC4 Budget	FIDIC			Description	6				2010				2012					
	BC 6.1	5,431,155	55.92				New WWTP Darmanesti	Feb/2011	May/2011	May/2011	Dec/2013				30.00	16.78	1.78	30.00	16.78	1.78	40.00	22.37	2.38
	BC 6.2	4,281,081	44.08				Rehabilitation WWTP Targu Ocna	Feb/2011	May/2011	May/2011	Dec/2013				30.00	13.22	1.41	30.00	13.22	1.41	40.00	17.63	1.87
		9,712,236															3.19			3.19			4.25
Total		9,712,236	100.00													30.00			30.00			40.00	

Total all Work Contracts 91,403,212

Total CF I	26,210,600
Total CF II	[illegible]
Other Funds	4,132,593

Length of Contract	Works Contract Number	Contracts % of CF Funding
3 YEARS	1	15.48
3 YEARS	2	13.26
3 YEARS	3	38.24
	4	
3 YEARS	5	14.22
3 YEARS	6	18.83

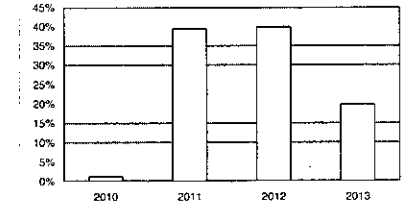
PROPOSED CASE

% Total of CF Funding,- each package,- each year.

	2010	2011	2012	2013	
3 YEARS	1.08	7.74	6.56	0.00	
3 YEARS	0.00	3.84	5.35	4.00	
3 YEARS	0.00	16.55	13.80	7.88	
3 YEARS	0.00	5.67	8.70	3.64	
3 YEARS	0.00	3.19	3.19	4.25	
	1.08	37.19	37.70	19.78	
					TOTAL
ACTUAL (combined all)	[illegible]	[illegible]	[illegible]	[illegible]	100
target:	1	39	40	20	100

Graph 1 Actual rate of expenditure, % of CF funding per year - Bacau County.

2010 A	2011 B	2012 C	2013 D
1%	39%	40%	20%



Service Contract

Contract	Lot Number	Total incl. 8.05% Contingency	Lot as % of SC Budget	FIDIC			Description	Provisional date of tender issue	Provisional date of contract award	Provisional date of contract start	Provisional date of contract finish	0% of Lot Budget	0% of SC Budget	0% of CF Budget	0% of Lot Budget	0% of SC Budget	0% of CF Budget	0% of Lot Budget	0% of SC Budget	0% of CF Budget	0% of Lot Budget	0% of SC Budget	0% of CF Budget
								9				2010						2012					
	BC 7.1	2,133,583 €	27.99				Design and Engineering Incl. Tender CFII	Dec/2010	Dec/2010	Dec/2010	Apr/2013	10.00	2.80	2.80	60.00	16.78	16.78	20.00	5.60	5.60	10.00	2.80	2.80
	BC 7.2	1,578,852 €	20.71				Technical Assistance - Project Management	Dec/2010	Dec/2010	Dec/2010	Dec/2013	5.00	1.04	1.04	35.00	7.25	7.25	30.00	6.21	6.21	30.00	6.21	6.21
	BC 7.3	3,911,569 €	51.31				Technical Assistance - Supervision	Dec/2010	Dec/2010	Dec/2010	Dec/2013	5.00	2.57	2.57	35.00	17.96	17.96	30.00	15.39	15.39	30.00	15.39	15.39
													6.40				42.00			27.20			24.40
Total		7,624,004	100.00										6.40			42.00			27.20			24.40	

Annex 12-3 Notes on Legislation.

Notes on chapter 14.1.2 – Annual Procurement Plan.

Part of the required reporting of the Local Authorities and MoE under EU procurement Directives, and as part of forward planning; is the Annual Procurement Plan. Note: this is a different document to the Procurement Plan as required in the Feasibility Study. The Annual Procurement Plan is completed each year to EU guidelines and provides information on procurement areas for the next financial year, - especially in the areas of Tenders and Contracts, and especially if those Tenders or Contracts exceed EU prior information thresholds.

Notes on chapter 14.1.3 - Legislation. Extrapolation of Chapter 14 notes.

Romanian Law 337/2006

for the approval of G.E.O 34/2006 from 19 April 2006 regarding the award of public procurement contracts, public works concession contracts, and services concession contracts, published in O.J.R. No. 418 from 15 May 2006.

G.E.O No. 34/2006
Government Emergency Ordinance No. 34/2006 on the award of public procurement agreements, public works concession agreements and service concession agreements, approved, with amendments and completions, by Law No. 337/2006, as further amended and completed ("GEO 34/2006");

• Water Supply and Sewerage Service Law No. 241/2006 ("Law 241/2006");

- Local Public Administration Law No. 215/2001, republished ("Law 215/2001").

GEO 13/2008 amends Law 51/2006 and Law 241/2006, considering the need to eliminate the contradictions between the relevant provisions between the two enactments Law 251/2006 and GEO 34/2006.

The main legal instrument governing public procurement, public works concession and services concession contracts is Government Emergency Ordinance No. 34/2006 (GEO No. 34/2006), entered into force on June 30, 2006 approved, modified and supplemented by Law No. 337/2006. GEO No. 34/2006 aims to harmonize the relevant Romanian legislation with several EU directives in the area of public procurement, including Directive 2004/18/EC, Directive 2004/17/EC, Council Directive 89/665/EEC, and Council Directive 92/13/EEC. The contracts falling under the scope of GEO No. 34/2006 are public procurement contracts and concession contracts. With respect to public works and services concessions, GEO No. 34/2006 establishes the general framework for granting such contracts, while the specific provisions regarding the substantiation of the decision to undertake the project, the method of transfer and recovery of the object of the concession, the method of preparation of the granting documentation and application of procedures are regulated through Government Decision No. 925/2006 (GD No. 925/2006) and Government Decision No. 71/2007 (GD No. 71/2007).

Governing public procurement, public works concession and services concession contracts is Government Emergency Ordinance No. 34/2006 (GEO No. 34/2006), June 30, 2006, it was approved, modified and supplemented by Law No. 337/2006. GEO No. 34/2006
It's intent is to harmonize the relevant Romanian legislation with several EU directives in the area of public procurement, including Directive 2004/18/EC, Directive 2004/17/EC, Council Directive 89/665/EEC, and Council Directive 92/13/EEC.

The contracts falling under the scope of GEO No. 34/2006 are public procurement contracts and concession contracts, and with respect to public works and services, GEO No. 34/2006 establishes the general framework for granting contracts,

Romanian Law no. 925/2006;

Specific provisions regarding the substantiations for the decisions to undertake a project, the method of transfer and recovery of the object of the concession, the method of preparation of the granting documentation and application of procedures are regulated through Government Decision No. 925/2006 (GD No. 925/2006) and Government Decision No. 71/2007 (GD No. 71/2007).

Directive 2004/17/EC

Directive of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors (30.04.2004)

9) In order to guarantee the opening up to competition of public procurement contracts awarded by entities operating in the water, energy, transport and postal services sectors, it is advisable to draw up provisions for Community coordination of contracts above a certain value. Such coordination is based on the requirements inferable from Articles 14, 28 and 49 of the EC Treaty and from Article 97 of the Euratom Treaty, namely the principle of equal treatment, of which the principle of non-discrimination is no more than a specific expression, the principle of mutual recognition, the principle of proportionality, as well as the principle of transparency. In view of the nature of the sectors affected by such coordination, the latter should, while safeguarding the application of those principles, establish a framework for

sound commercial practice and should allow maximum flexibility. For public contracts the value of which is lower than that triggering the application of provisions of Community coordination, it is advisable to recall the case-law developed by the Court of Justice according to which the rules and principles of the Treaties referred to above apply.

(10) To ensure a real opening up of the market and a fair balance in the application of procurement rules in the water, energy, transport and postal services sectors it is necessary for the entities covered to be identified on a basis other than their legal status. It should be ensured, therefore, that the equal treatment of contracting entities operating in the public sector and those operating in the private sector is not prejudiced. It is also necessary to ensure, in keeping with Article 295 of the Treaty, that the rules governing the system of property ownership in Member States are not prejudiced.

(11) Member States should ensure that the participation of a body governed by public law as a tenderer in a procedure for the award of a contract does not cause any distortion of competition in relation to private tenderers

Directive 2004/18/EC

New Public Sector Directive (2004/18/EC)

The new Public Sector Directive (2004/18/EC) (also known as the Consolidated Directive), which brings together the three previous Directives on public sector procurement (supplies, works and services) has been adopted by the European Parliament, and was published in OJEU in April 2004.

Regulation 1874/2004/EC amending Directives 2004/17/EC and 2004/18/EC

Application of thresholds, and strengthening the capacity for implementation and enforcement of public procurement.

ANNEX 12-3

Decision 2005/15/EC

Commission decision of 7 January 2005 on the detailed rules for the application of the procedure provided in Article 30 of the Directive 2004/17/EC of the European Parliament and of the Council coordinating the procurement procedures of entities operating in the Water, Energy, Transport and Postal Services Sectors.

Council Regulation (EC) No 1083/2006

Council Regulation (EC) No 1083/2006 – 11 July 2006, laying down general provisions on the European Regional Development Fund, the European Social Fund, and the Cohesion Fund, and repealing Regulation (EC) No.1260/1999.

Directive 92/50/EEC public service contracts;

Relating to the coordination of procedures for the award of public service contracts

Directive 93/36/EEC

Council (EC) Directive of 14 June 1993 coordinating procedures for the award of public supply contracts.

Directive 93/37/EEC

Guidance on public works contracts, as amended by EC Directive 97/52/EC: guidance 13

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Directive 97/52/EC

Directive 97/52/EC of 13 October 1997 amending directives 92/50/EEC, 93/36/EEC concerning the coordination of procedures for the award of public service / supply / works contracts

Emergency Ordinance 34/2006

Emergency Ordinance 34/2006, - regarding award of public procurement, concession of public works, concession of public services – contracts: approved July 17 2006, provides for transparent process for public procurement and concessions, promotes competition and supports investments in public projects.

ANNEX 2.1 - Population Data

Year:	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Agglomeration Bacau	197,315	197,013	196,708	196,394	196,070	195,741	195,441	195,142	194,863	194,585	194,299	193,993	193,662	193,299	192,902	192,472	192,013
urban part of Bacau	179,442	179,124	178,799	178,468	178,130	177,790	177,478	177,169	176,878	176,591	176,297	175,987	175,655	175,294	174,905	174,487	174,042
Agglomeration Moinesti	23,944	23,902	23,858	23,814	23,769	23,724	23,682	23,641	23,602	23,564	23,524	23,483	23,439	23,391	23,339	23,283	23,223
urban part of Moinesti	23,944	23,902	23,858	23,814	23,769	23,724	23,682	23,641	23,602	23,564	23,524	23,483	23,439	23,391	23,339	23,283	23,223
Agglomeration Buhusi	19,678	19,644	19,607	19,571	19,534	19,497	19,463	19,429	19,397	19,365	19,333	19,299	19,263	19,223	19,180	19,134	19,086
urban part of Buhusi	19,678	19,644	19,607	19,571	19,534	19,497	19,463	19,429	19,397	19,365	19,333	19,299	19,263	19,223	19,180	19,134	19,086
Agglomeration Darmanesti	11,528	11,508	11,487	11,465	11,444	11,422	11,402	11,382	11,364	11,345	11,326	11,306	11,285	11,262	11,237	11,210	11,181
urban part of Darmanesti	11,528	11,508	11,487	11,465	11,444	11,422	11,402	11,382	11,364	11,345	11,326	11,306	11,285	11,262	11,237	11,210	11,181
Agglomeration Targu Ocna	12,139	12,118	12,095	12,073	12,050	12,028	12,006	11,985	11,965	11,946	11,926	11,905	11,883	11,859	11,833	11,804	11,774
urban part of Targu Ocna	12,139	12,118	12,095	12,073	12,050	12,028	12,006	11,985	11,965	11,946	11,926	11,905	11,883	11,859	11,833	11,804	11,774

Year:	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Agglomeration Bacau	191,525	191,013	190,482	189,934	189,371	188,794	188,209	187,611	187,005	186,384	185,749	185,093	184,414	183,710	183,009	182,310
urban part of Bacau	173,573	173,083	172,576	172,054	171,520	170,974	170,421	169,858	169,288	168,705	168,109	167,495	166,861	166,204	165,550	164,898
Agglomeration Moinesti	23,161	23,095	23,028	22,958	22,887	22,814	22,740	22,665	22,589	22,511	22,432	22,350	22,265	22,178	22,091	22,005
urban part of Moinesti	23,161	23,095	23,028	22,958	22,887	22,814	22,740	22,665	22,589	22,511	22,432	22,350	22,265	22,178	22,091	22,005
Agglomeration Buhusi	19,034	18,981	18,925	18,868	18,809	18,750	18,689	18,627	18,564	18,501	18,435	18,367	18,299	18,227	18,155	18,084
urban part of Buhusi	19,034	18,981	18,925	18,868	18,809	18,750	18,689	18,627	18,564	18,501	18,435	18,367	18,299	18,227	18,155	18,084
Agglomeration Darmanesti	11,151	11,120	11,087	11,053	11,019	10,984	10,949	10,913	10,876	10,838	10,800	10,760	10,720	10,678	10,635	10,593
urban part of Darmanesti	11,151	11,120	11,087	11,053	11,019	10,984	10,949	10,913	10,876	10,838	10,800	10,760	10,720	10,678	10,635	10,593
Agglomeration Targu Ocna	11,742	11,709	11,675	11,639	11,603	11,566	11,529	11,491	11,452	11,413	11,372	11,331	11,288	11,244	11,199	11,155
urban part of Targu Ocna	11,742	11,709	11,675	11,639	11,603	11,566	11,529	11,491	11,452	11,413	11,372	11,331	11,288	11,244	11,199	11,155

Year:	2007	2008	2010	2015	2020	2025	2030	2039
Agglomeration Bacau	197,315	197,013	196,394	194,863	193,299	191,013	188,209	182,310
Agglomeration Moinesti	23,944	23,902	23,814	23,602	23,391	23,095	22,740	22,005
Agglomeration Buhusi	19,678	19,644	19,571	19,397	19,223	18,981	18,689	18,084
Agglomeration Darmanesti	11,528	11,508	11,465	11,364	11,262	11,120	10,949	10,593
Agglomeration Targu Ocna	12,139	12,118	12,073	11,965	11,859	11,709	11,529	11,155
Total Inhabitants CF Agglom.	264,604	264,184	263,317	261,191	259,033	255,917	252,115	244,147
Difference [%]	0%	-0.2%	-0.3%	-0.8%	-0.8%	-1.2%	-1.5%	-3.2%
Difference to 2007 [%]	0%	-0.2%	-0.5%	-1.3%	-2.1%	-3.3%	-4.7%	-7.7%