

TABLE 1
AVERAGE COMPOSITION OF MUNICIPAL SECONDARY EFFLUENT

Component	Average concentration in secondary effluent (mg./l.)	Average increment added during water use†	
		mg./l.	lb./day/1000 pop.
Gross organics	55	52	64
Bio-degradable organics (as BOD)	25	25	31
Methylene blue active substance (MBAS)*	6	6	7
Na ⁺	135	70	86
K ⁺	15	10	12
NH ₄ ⁺	20	20	25
Ca ⁺⁺	60	15	18
Mg ⁺⁺	25	7	9
Cl ⁻	130	75	92
NO ₃ ⁻	15	10	12
NO ₂ ⁻	1	1	1
HCO ₃ ⁻	300	100	120
CO ₃ ⁼	0	0	0
SO ₄ ⁼	100	30	37
SiO ₃ ⁼	50	15	18
PO ₄ ⁼	25	25	31
Hardness (CaCO ₃)	270	70	86
Alkalinity (CaCO ₃)	250	85	100
Total dissolved solids	730	320	390

*Apparent alkyl benzene sulphonate

†Concentration increase from tap water to secondary effluent

The feed must be carefully pretreated to operate electrodialysis stacks in this service successfully. If suspended solids are removed to avoid plugging and dissolved organics are removed to avoid membrane fouling, electrodialysis of waste water is relatively straightforward, although very recent results may indicate some complications from microbiological forms. In tests to date, long-term ion removal has been largely nonselective. The concentration of each ion present is reduced by roughly the same fraction. This is fortunate, because generally uniform removal is what is required to provide water of satisfactory quality for most purposes of reuse. One exception exists. Only a few parts per million of ammonia can be tolerated in municipal water supplies and in many industrial supplies. Since typical municipal waste water may contain 20 mg./l. NH₄⁺, the removal of 90-95 per cent would be required. To