

A Concept of Rational Water Management at Local Utilities: The Use of RO for Water Supply and Wastewater Treatment/Reuse

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Abstract : Local utilities often face problems of local industrial wastes, storm water disposal due to existing strict regulations. For many local industries, the problem of wastewater treatment and discharge into surface reservoirs can't be solved through the use of conventional biological treatment techniques. Current discharge standards require very strict removal of a number of impurities such as ammonia, nitrates, phosphate, etc. To reach this level of removal, expensive reagents and sorbents are used. The modern concept of rational water resources management requires the development of new efficient techniques that provide wastewater treatment and reuse. As RO membranes simultaneously reject all dissolved impurities such as BOD, TDS, ammonia, phosphates etc., they become very attractive for the direct treatment of wastewater without biological stage. To treat wastewater, specially designed membrane "open channel" modules are used that do not possess "dead areas" that cause fouling or require pretreatment. A solution to RO concentrate disposal problem is presented that consists of reducing of initial wastewater volume by 100 times. Concentrate is withdrawn from membrane unit as sludge moisture. The efficient use of membrane RO techniques is connected with a salt balance in water system. Thus, to provide high ecological efficiency of developed techniques, all components of water supply and wastewater discharge systems should be accounted for.

Keywords : reverse osmosis, stormwater treatment, open-channel module, wastewater reuse

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