The science and engineering of wastewater treatment has evolved signifi- cantly over the last century.With industrialization and scientific advances, chemical and toxic compounds have been detected in municipal wastewater treatment plant influents.Sustainable wastewater engi- neering involves application of the principles of science and engineering for the treatment of wastewater to remove pollutants or reduce them to an acceptable level prior to discharge to a water body or other environment, without compromising the self-purification capacity of that environment.Toward the beginning of the twentieth century, sewage treatment plants mainly used settling tanks (primary treatment) to remove suspended par- ticles from the wastewater before discharge to streams and rivers.An increasing body of scientific knowledge relating waterborne microorgan- isms and constituents to the health of the population and the environment has spurred the development of new engineered technologies for treatment of wastewater and potential reuse.In sev- enteenth century Colonial America, household wastewater management consisted of a privy (toilet) with an outlet constructed at ground level that discharged outside to a cesspool or a sewer.Wastewater may contain high con- centrations of organic and inorganic pollutants, pathogenic microorgan- isms, as well as toxic chemicals.The term wastewater includes liquid wastes and wastes transported in water from households, commercial establishments, and industries, as well as stormwater and other surface runoff.The earlier objectives were mainly to reduce the total suspended solids (TSS), biochemical oxygen demand (BOD), and pathogens.Nuisance caused by odors, outbreak of diseases, e.g. cholera, and other public health concerns prompted the design of a comprehensive sewer system in Chicago in the 1850s.In the early 1900s, the first trickling filter was constructed in Madison, Wisconsin, to provide biological (secondary) treat- ment to wastewater.If we look back in time, wastewater engineering has progressed from collection and open dumping, to collection and disposal without treatment, to collection and treatment before disposal, all the way to collection and treatment prior to reuse.In addition, he showed statistically that cholera victims had drawn their drinking water from a sewage-contaminated part of the river Thames, while those who remained healthy drew water from an uncontaminated part of the river.These find- ings, together with the discoveries by Pasteur and Koch, prompted the British Parliament to pass an act in 1855 to improve London's waste management system.From the mid-1900s to the present time, we have seen development of various types of biologi- cal and biochemical processes for the removal of pollutants from waste- water.Primary and secondary biological treatment was considered sufficient for produc- tion of treated wastewater of acceptable standards.If the wastewater is discharged without treatment to a stream or river, it will result in severe pollution of the aquatic environment.In 1843, the first sewer system, in Hamburg, Germany, was officially designed by a British engineer, Lindley (Anon, 2011).With low population densities, privies and cesspools constructed in this way did not cause many problems (Duffy, 1968).But as the population increased, the need for an engineered system for wastewater management in large cities became more evident.At that time, the sewer system was used to transport the untreated wastewater outside of the residential com- munity to a stream or river.Dilution of the wastewater with the stream water was the primary means of pollutant reduction.A chol- era epidemic struck London in 1848 and again in 1854, causing more than 25,000 deaths (Burian et al., 2000).The first activated sludge process was constructed in San Marcos, Texas, in 1916 (Burian et al., 2000). The decline in water quality will render the stream water unusable for future drinking water purposes. This has shifted our focus toward pollution reduction and control.