

Abstract

Marine Wastewater Disposal in Latin America

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An overview of the present use of submarine outfalls in Latin America (LA) and the Caribbean is given. An effective submarine outfall with pretreatment (milli-screens) or primary treatment is a more attractive disposal method relative to secondary treatment with near shore disposal in terms of reliability, efficiency, cost and low operational and maintenance requirements without compromising human health and the environment. There are presently more than 140 submarine outfalls constructed or planned in LA and the Caribbean. Their geographical distribution is presented. There has been recent activity in major cities such as Lima, Peru; Buenos Aires, Argentina and Cartagena, Columbia.

However, there have been substantial delays of decades from the proposal to construction phases for some major outfall projects. Examples are given for Mar de Plata (26 years), Cartagena (16 years), Montevideo (13 years), Lima (16 years), and Buenos Aires (1996-?). The major causes for these delays are presented. From the onset of the proposal stage and throughout the process, there is a definitive need to better focus on public acceptance and address the concerns of environmental groups often responsible for these delays that result in the worst possible environmental, health and economic impact scenario of the no action alternative with the continued discharge of raw sewage often on or near public beaches. Also, technical decisions and the financing of projects should supersede changing governments.

In this regard, the main differences between Developed and Developing ("Third World") nations are presented. Of the causes of the delays, some are common to both, whereas others are more characteristic and predominant in LA. Also, a major difference is the financing of major projects via WB and IDB loans rather than auto-financing using national funds and/or private concessions. Chile is an example of the semi privatizing of wastewater disposal that has proved to be very successful. Peru has taken that road with the Taboada Outfall granting a concession to a Spanish consortium having failed with WB financing in the 1990s for a myriad of reasons.

Cost curves for submarine outfalls are presented based on costs of 145 outfalls worldwide over the past 90 years. The availability of plastics of unlimited diameter and modern construction methods have lowered costs that make effective submarine outfalls feasible for both large and small communities and tourist centers.

The WHO Guidelines for Safe Recreational Water Environments (GSRWE) (Volume 1) published in 2003 is presented for marine waters. A total of 22 epidemiological studies were reviewed and consistently showed that gastrointestinal symptoms were significantly related to the count of intestinal enterococcus as an indicator organism in recreational waters in deference to total and fecal coliforms. Also, WHO has concluded that increased

levels of waste water treatment beyond preliminary treatment offers no significant reduction in human health risk with an effective outfall.

An overview of the Annapolis Protocol is presented that proposes an innovative approach to bathing beach classification based on risk evaluation using long term water quality data combined with sanitary inspections and the application of beach management practices to monitor and classify beaches.

Present day bathing beach classification systems are generally based on mandated periodic vigilance monitoring (5 samples per month is common) or single measurements of indicator organisms consistent with water quality standards. Such approaches may or may not capture transient events such as storms and the single measurement systems have the inherent flaw of after-the-fact bathing beach classifications due to the 24 to 48 hour delay of microbiological indicator measurement results. Furthermore, a monitoring program of fixed periodic measurements applied indiscriminately to all beaches would result in the same repeated values and beach classification for those beaches that are either heavily contaminated or pristine and, as such, would be an inefficient use of monitoring resources.