

A GLOBAL PERSPECTIVE FOR

REDUCING CSOS:

BALANCING TECHNOLOGIES,
COSTS, AND WATER QUALITY

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COST ESTIMATES FOR SELECT CSO TECHNOLOGIES

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INTRODUCTION

Historically, control of Combined Sewer Overflows (CSOs) has proven to be extremely complex for a number of reasons. First, CSOs exhibit extreme variability in the volume, frequency and characteristics of the discharge. Second, compared to other wastewater treatment technologies, the efficiency of CSO controls has not been demonstrated. Third, while we know that CSOs can have significant impacts on water quality, there has been difficulty in distinguishing from other sources, such as non-point sources, contributions to water quality impacts by CSOs during wet weather events. Last, and probably most important, the implementation of CSO control measures can be a financial burden for CSO communities.

In an effort to resolve these challenges, EPA's Office of Water issued a National CSO Strategy on August 1989. The strategy reaffirmed that CSOs are point sources subject to NPDES permit and other CWA requirements. Among others, the strategy recommended to bring all wet weather CSO discharge points into compliance with the technology and water-quality based requirements.

While the 1989 strategy was successful in focusing increased attention on CSOs, it fell short in resolving many fundamental issues, such as the site specific nature of CSOs and their impacts, the need for flexibility, cost-effective solutions, and consideration of the timing and costs of CSO controls.

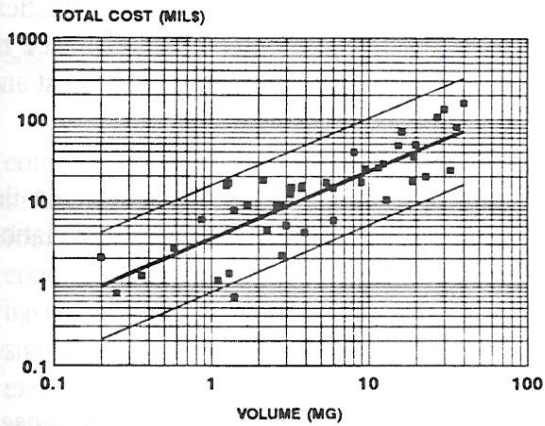
In the Summer of 1992, EPA conducted a negotiated dialogue with key stake holders including municipal groups, states, environmental groups, and other interested parties. As a result, in December

Table I - Cost Equations for CSO Control Technologies

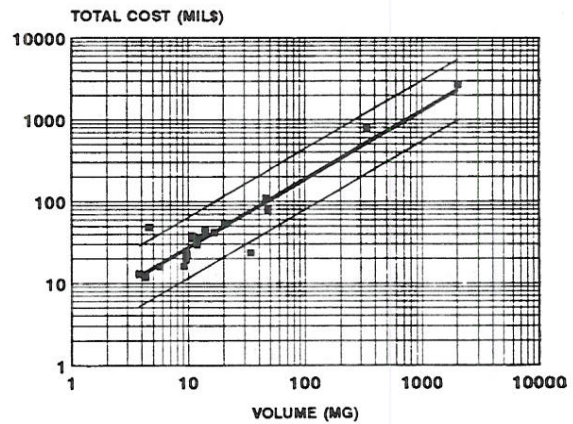
CSO Control Technologies	Cost Equation*	Applicable Design Range	R ² Value
Storage Basins	$3.497V^{0.821}$	0.2 to 40 mg	69.3
Deep Tunnels	$3.987V^{0.836}$	3.8 to 2,000 mg	89.7
Swirl Concentrators	$0.086Q^{0.765}$	3.0 to 220 mgd	70.3
Screens	$0.054Q^{0.930}$	0.8 to 20 mgd	79.4

* V = Volume (mg); Q = Flow Rate (mgd); cost in Million Dollars

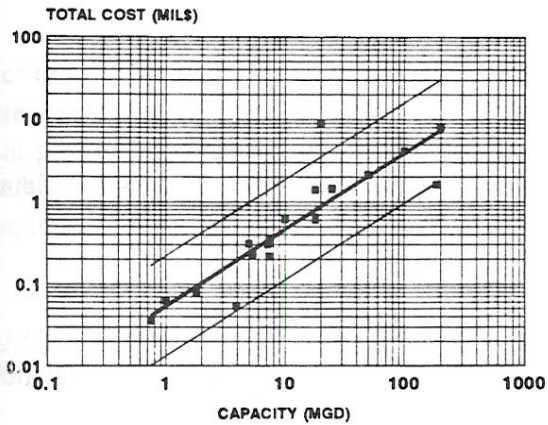
Storage Basin



Deep Tunnel



Screens



Swirl Concentrator

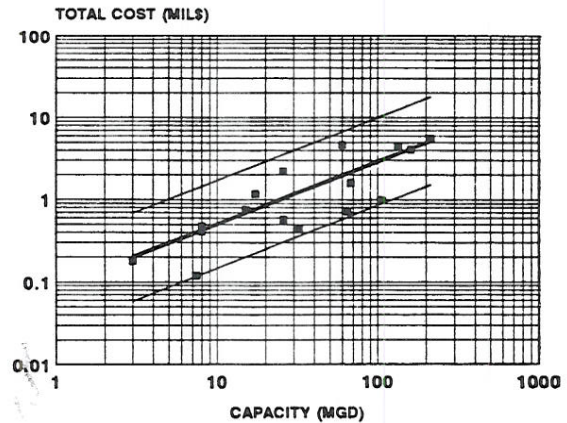


Figure 2 - Cost Capacity Curves

