MAKING PROGRESS ON THE BOSTON HARBOR CLEANUP

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Boston Harbor, the site of much of early American history and the largest seaport in New England, is both a national treasure and a national disgrace. Centuries of abuse have badly polluted the 47 square miles of harbor waters that reach 180 miles of shoreline, home to some of New England’s finest maritime and recreational resources. The $6.1 billion Boston Harbor Project, an undertaking of the five-year-old Massachusetts Water Resources Authority (MWRA), an independent state agency, will address the contamination of Boston Harbor with a new wastewater treatment plant and related pollution control facilities. The challenge is formidable given the current conditions and the complexity of the solution.

Primary treatment did not begin for all of Greater Boston’s dry weather wastewater until 1968. Today, after being treated for about an hour at aging primary treatment plants, nearly 450 million gallons of wastewater and 50 tons of sludge are discharged into the shallow waters of the harbor each day less than a mile from shore. In addition, the area’s system of combined sewer overflows (CSOs) discharges nearly 10 billion gallons of untreated sewage into the area waters annually. The impacts of the pollution are visible and dramatic; 4,700 acres of closed shellfish beds; fouled beaches that must be closed because of high fecal coliform levels; and a layer of sludge several inches thick on the harbor floor that resembles thick black mayonnaise.

Political paralysis caused many years of neglect of the region’s infrastructure, a problem that was still not addressed after passage of the Federal Clean Water Act in 1972, mandating secondary treatment throughout the United States by 1977. A series of lawsuits resulted in a federal court order demanding construction of new primary and secondary wastewater treatment facilities with target dates for various phases of the harbor cleanup. The harbor was also a subject of heated debate during the 1988 U.S. presidential election campaign.

Siting new facilities was a complex and lengthy process. The results of the facilities planning and environmental review processes fill dozens of volumes, and the final site of the new facilities, Boston’s Deer Island, was chosen after a wide-ranging process of public participation. Extensive mitigation efforts bring benefits to host and neighboring communities. The remote locations of the site, and the Authority’s wish to lessen the impacts of construction on neighboring communities, prompted the creation of an elaborate water transportation system to move workers and construction supplies and equipment by ferry and barge from various sites on the mainland to the island work site.
The centerpiece of the 11-year, court-ordered cleanup is a new primary and secondary plant that, with a combined capacity of 1.3 billion gallons a day, will be the second largest wastewater treatment plant in the United States. The new primary facilities will begin operating in 1995, with secondary treatment scheduled for 1996. The project includes the boring of two tunnels: a nine-and-one-half-mile long effluent outfall tunnel stretching from Boston’s Deer Island (site of the new plant) to the deep waters of Massachusetts Bay, and a five-mile tunnel connecting the new plant to the headworks for the southern collection system, on Nut Island in Quincy. Construction on the two tunnels has already begun, and effluent will start being released far off-shore for the first time in 150 years, in 1995.

A sludge management program will stop the discharge of sludge to harbor waters. Instead, sludge will be converted to pellet fertilizer beginning in December, 1991. In addition, the project requires 200,000 square feet of building space for support and operation and maintenance services, and power for construction and permanent operations. Planning and conceptual design continue on a solution to the combined sewer overflow problem.

Construction on the Boston Harbor Project has begun in earnest, with $1 billion worth of engineering and construction under way. The project will bring a significant economic boost to the region, but the costs of the cleanup will largely be borne by the 43 towns and cities that receive sewer services from the MWRA, with only a small amount of state and federal aid. Sewer charges for a family of four in the MWRA service area will be about $500 for 1992, but could reach $1,000 or more by the year 2000.

Significant accomplishments have kept the program ahead of schedule and under budget to date. A skilled and experienced management team combines the best of public sector and private sector skills to plan, design, and build the new facilities.

International technology also plays a role in the Boston Harbor Project. The new plant will employ egg-shaped sludge digesters similar to those pioneered in Germany. Considered more reliable, the oval-shaped digesters also consume less land space, an important consideration on the cramped Deer Island site. The new plant will be among the first in the United States to use stacked clarifiers, a technology popular in Japan but not yet widely used elsewhere. The 24-foot diameter effluent outfall tunnel, which will be bored nine-and-one-half miles to Massachusetts Bay, will be built by a joint venture of a local company and the U.S. subsidiary of a Dutch firm. Companies from France and Germany manufactured and installed a cable that will bring electric power to Deer Island from the mainland. Design firms from England and Australia contributed to the design of the project’s tunnels.

This world-class construction challenge will be completed in nine years and will give Boston a modern, efficient sewerage infrastructure that will allow the harbor to cleanse and restore itself over time. Boston will be in full compliance with federal environmental law and an American landmark will reclaim its reputation as a superb marine resource.