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WATER RESOURCES RESEARCH CENTER

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ESTIMATED WATER USE IN ST. THOMAS, U.S. VIRGIN ISLANDS July 1983 - June 1984

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INTRODUCTION

The population of St. Thomas, U.S.V.I. has risen from 16,000 in 1960 to more than 47,000 in 1984. During this period there has also been an increase in tourism. The demand for water has increased in response to this rise in population and tourism. The need to determine the amount of water used to meet public, commercial and domestic needs, among other uses, is essential where, as in St. Thomas, the available supply is inadequate.

WATER SOURCES AND USES

Sources

The principal sources of water on St. Thomas are sea water, rainfall collected from residential rooftop catchments and stored in cisterns, and groundwater. 93.72 million gallons of sea water are used daily on the island. Rainfall provides 0.65 million gallons a day and groundwater accounts for 0.35 million gallons per day.

Uses

The generation of electric power, the public-water supply, public sewage treatment and self-supplied residential and commercial establishments are the principal users of water. Thermoelectric power generation is the largest single use category in St. Thomas. Over 67 million gallons of sea water are used daily by the Virgin Islands Water and Power Authority (WAPA) to cool its condensers used in electric power generation.

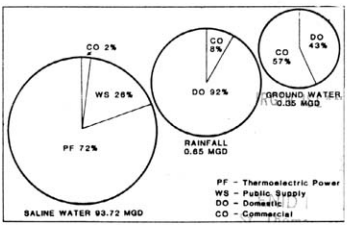

FIGURE 1: Estimated water use by source and major use category in St. Thomas during July 1983 to June 1984.

PUBLIC WATER SUPPLY

Desalinated Water

Waste heat from WAPA's electric generators is used by the sea water desalination plant. Desalinated water is stored in tanks and distributed to the island's main urban center, Charlotte Amalie, by the Virgin Islands Public Works Department (VIPWD). Production of desalinated water averaged 2.4 million gallons per day during the study period. Of this 2.4 million gallons, only 0.9 million gallons were accounted for (revenue from sales) by the VIPWD. The other 1.5 million gallons per day were unaccounted for. This is due mostly to losses from leakages in the distribution system installed in 1949. Other losses are due to unauthorized connections, faulty meters and uncontrolled public faucets. The cost of potable water to WAPA from the desalination plant is about $9.00 per 1000 gallons.

Sea Water Distribution System

Water pumped into the sea water distribution system average about 1 million gallons a day. Approximately 0.35 million gallons of this sea water are accounted for daily at the public sewage treatment plant. The remainder is used to flush storm drains, fight fires or is lost through leaks in the sea water distribution system.

DOMESTIC SELF-SUPPLIED

Rainfall

Nearly two thirds of the population of St. Thomas is not served by the potable water distribution system and these users are classified as domestic self-supplied. Estimated water use in this category was about 0.75 million gallons a day. Of this amount, 0.60 million gallons (80%) was supplied from rainfall.

Virgin Islands' law requires all dwellings, apartments and hotels to have a minimum cistern storage capacity of 10 gallons for each square foot of roof area for one story buildings and fifteen gallons for each square foot of roof area for buildings of two or more stories. Churches and warehouses are not required to conform to this standard.

Groundwater

Groundwater for domestic self-supplied use is around 0.15 million gallons daily. Groundwater for domestic use is available in nearly all parts of the island. However, there are only a few areas where yields to wells are large enough to warrant the development of public supplies. Furthermore, the potential yield and water quality is limited by excessive depth to the water, sea

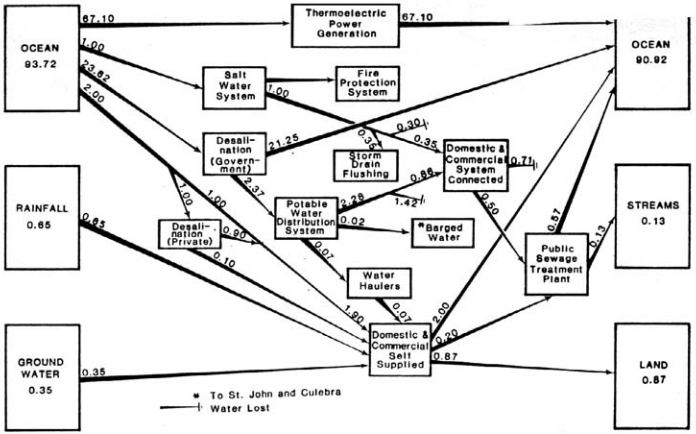

FIGURE 2: Water sources, uses, disposition and amount for each use category in St. Thomas, in million gallons per day.

water intrusion, waste water contamination and contamination from sea water mains.

COMMERCIAL SELF-SUPPLIED

Condominiums and hotels use about 2 million gallons of salt water daily. This water is used primarily for cooling, flushing toilets and for swimming pools. Small desalination plants produce about 0.1 million gallons of fresh water per day.

Around 0.2 million gallons of water used daily by hotels and condominiums is groundwater. Commercial water haulers supply about 0.07 million gallons of desalinated water from the VIPWD standpipes to users in the hotels and condominiums.

PUBLIC WASTE-WATER TREATMENT

There are seven public waste-water treatment facilities on St. Thomas. One serving Charlotte Amalie and the other six serving mostly public housing projects. These public waste-water treatment plants discharge nearly 0.7 million gallons daily into streams and the ocean.

Condensed by Yahaya Bello from: "Estimated Water Use in St. Thomas U.S. Virgin Islands, June 1983-June 1984" by Heriberto Torres-Sierra and Rafael Dacosta, Technical Report No. 21, Water Resources Research Center, Caribbean Research Institute, St. Thomas, September 1984.

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