WATER AND SANITATION IN CUBA: SUMMARY

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Water and sanitation are two important service industries for the future of Cuba.

We have now:

Aqueducts on working conditions: 15%

Others only give a few hours of water per day, 2 to 4 hours: 60%

Aqueducts that just that just carry water to collection tanks: 25%

The bulk of water and sewer facilities in the urban areas are over 75 years old. The useful life of water distribution and sewer line is universally accepted at 50 years. This figure is only as reliable as the maintenance provided. Non-maintained lines will fail much more rapidly.

The contamination of water leakage and the flow of raw sewage in the streets of urban Cuba is a deadly one. When the pumps are turned off and the pressure in the lines drop to zero and especially in those cases where a negative pressure is created, sewage is introduced into the water system by percolating through the soils surrounding the mains and then being sucked in by zero and negative pressures in the lines.

WATER DISTRIBUTION SYSTEMS

Water distribution systems represent an emergency and should be planned and handled in two stages:

a. Emergency tasks

b. Permanent facilities

Emergency Tasks (E.T.)

Emergency Tasks shall be considered as the level of work required to provide the minimum essential volume of water consumption and still maintain an acceptable degree of health protection. The e.T. is a planned transition from the existing situation to the construction of permanent facilities and based on the following assumptions:

1. Per capita consumption: 20 gallon per day (GPD0
2. Utilize existing water supply sources
3. Citizens to carry water in their own containers from a community tap
4. No charges at the community tap
5. Supply shall be hydrostatic pressure 24 hours a day

6. Water supply shall be chlorinated

E.T. is a temporary solution to serve water with minimum waste. New water lines shall be spaced to a maximum of 400 meter (1300Ft0 and a community tap installed at each block corner where these lines are laid. These lines are not connected to houses or buildings until the Permanent Facilities (P.F.) are placed in operation. Pipes should be of minimum size of 8" diameter.

SURFACE WATER SUPPLY

If the source of the water is surface water, then the following are a few of the components of the supply system:

1. Impoundment area
2. Pumping system
3. Conveyance system

The use of surface water will, in most cases, be from existing impoundment systems.

Reservoir pumping system cost: $0.35 per gallon

Water treatment costs are mainly aeration, lime softening and filtration. The average cost is:

Aeration: $0.007 per gallon

Lime softening: $1.50 per gallon

Filtration: $0.45 per gallon

Transmission Main Costs

Diameter, inches	urban
12	$45
20	$90
30	$ 125
48	$ 205

PUMPING SYSTEM COST

FACILTY SIZE	COST
3 mgd	$0.20 per gallon per day
10mgd	$0.17
20 mgd	$0.15

Groundwater supply costs depend on wells and well pumps

Conclusions

We must assist the Cuban people to reach a minimum safe level of public health, in the shortest period of time and in a way that minimizes the need for public capital. There should be an agency to regulate the private sector companies from an engineering and public resources point of view.

This is an infrastructure that is very difficult to have an accurate estimate of the capital needed to rebuild the entire system. However, it can be estimated, as an approximation, to be $1,500 millions in the first five years, including aqueducts, transmission and distribution systems, water treatment plants, sewer lines.

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