

John Jones Water Treatment Plant Expansion

HIGHLIGHTS

30-mgd UV facility for *Cryptosporidium* control.

Unique evaluated bid approach to select preferred UV system.

Selection of UV manufacturers based on life-cycle costs, validation experience, and installation/operating history.

The City of Tracy John Jones Water Treatment Plant Expansion includes several new process upgrades to increase plant capacity from 15 mgd to 30 mgd. Carollo completed a preliminary design that recommended process upgrades including new flocculation/sedimentation basins, washwater basins, and chemical addition facilities. Carollo recommended that UV disinfection be implemented to address current and pending regulatory requirements for the inactivation of *Cryptosporidium*. UV disinfection is a preferred technology for cyst-type pathogen inactivation. For Tracy, UV could be implemented with fewer hydraulic impacts and capital and O&M costs than other technologies, such as ozone.

Carollo also completed final design for the expansion project. As part of the UV design, Carollo conducted a pre-qualification/evaluated bid. The benefit of this unique evaluated bid approach is threefold:

- ▶ Selection of the most cost-effective system is based on life-cycle costs, not low-bid capital costs.
- ▶ UV system selection considers operations and validation expenses, key elements in the selection of this technology.
- ▶ Pre-selection of a single vendor allows the efficient, cost-effective design of a specific system, rather than a "one size fits all" approach.

Cost Summary	A	B	C
Capital Cost, \$			
Equipment	\$713,600	\$805,100	\$608,900
Structural/Mechanical	\$581,400	\$542,000	\$776,600
Total Capital Cost, \$	\$1,295,000	\$1,347,100	\$1,385,500
Annual O&M Cost, \$/year			
Power	\$24,400	\$35,200	\$10,500
Replacement	\$10,700	\$19,500	\$14,600
Labor	\$700	\$600	\$1,700
Total Annual O&M Cost, \$/year	\$35,800	\$55,300	\$26,800
Patent, \$/year	\$93,100	\$93,100	\$93,100
Total O&M (w/patent), \$/year	\$128,900	\$148,400	\$119,900
O&M NPV, \$	\$1,478,500	\$1,702,100	\$1,375,200
<b>Total NPV of UV System</b>	<b>\$2,770,000</b>	<b>\$3,050,000</b>	<b>\$2,760,000</b>
Cost (percent) higher than lowest	0.4	10.5	0.0

(1) Net present value calculated at 6% interest over 20 years.

Carollo evaluated three UV systems manufacturers on the basis of life-cycle cost (capital and O&M costs), reactor validation experience, and installation and operating history. These factors provided a basis for selecting the most preferred UV system.

*Carollo used an evaluated bid approach which included capital costs, life-cycle costs, and non-monetary factors to help select the preferred UV system for the City of Tracy.*