



WATER  
SOLUTIONS  
LTD.



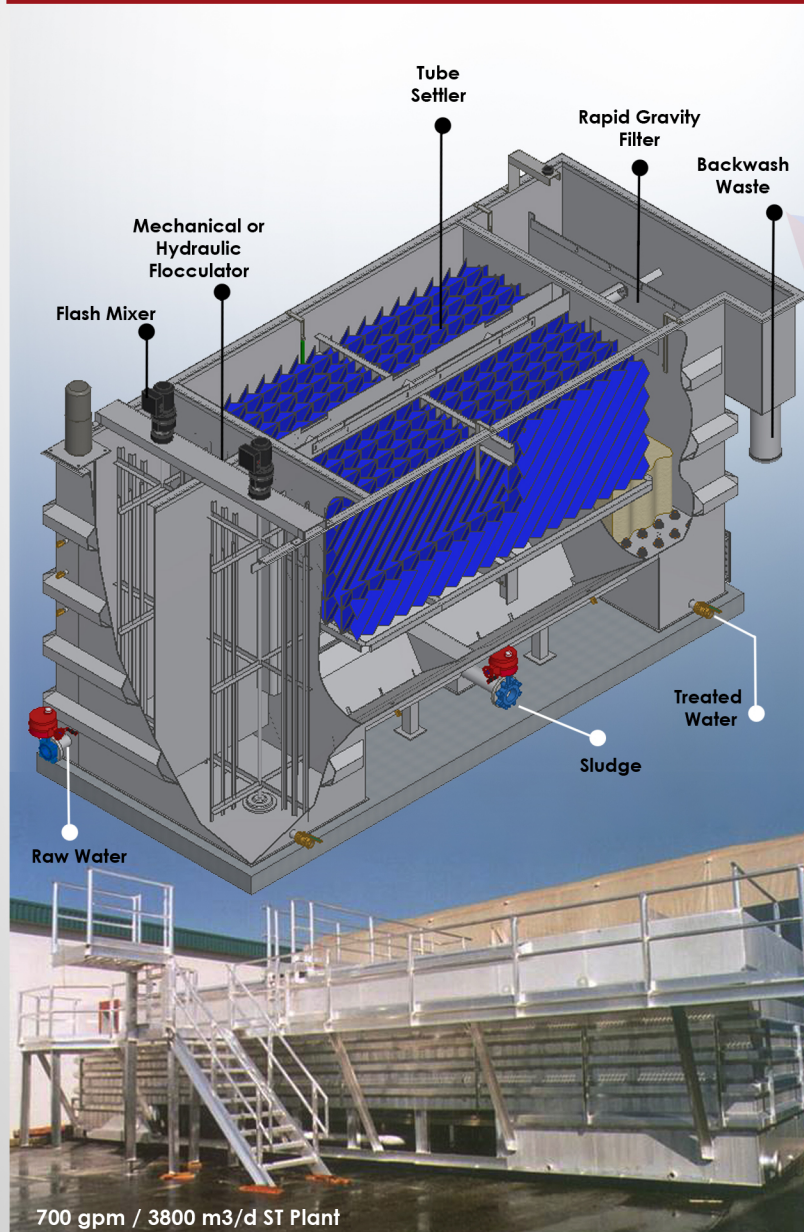
# TUBE SETTLER (ST) WATER TREATMENT PLANTS

AWC Water Solutions offers packaged and modular water and wastewater treatment plants including the Tube Settler (ST) process. ST plants are a conventional clarifier based water treatment plant designed with a tube settler clarifier to reduce footprint and increase capacity. It excels at treating very turbid waters typical of rivers with spring run-off conditions or high rain fall events. Capable of purifying the most difficult types of raw water, our ST plants are particularly suited for surface waters with high and variable contaminant loadings including color and organics and excel in treating cold water and very high levels of turbidity, iron and manganese.

AWC ST plants are custom designed to meet our clients' particular challenges. They can treat capacities up to 800 gpm (4,400 m<sup>3</sup>/d) per train (multiple trains can be combined for higher flows) and reliably achieve less than 0.1 NTU turbidity and 2.5-log, multi-barrier protection against Giardia and Cryptosporidium with the integrated high rate gravity filter. Systems are used for community and potable water supplies as well as pretreatment for industrial processes and NF and RO membranes.



## HOW IT WORKS



### FLASH MIXING

A coagulant added to the raw water precipitates dissolved contaminants and encourages particles to form "flocs".

- Multi-chemical injection ports for coagulant, polymer, pH adjustment, etc. provides process flexibility
- Optional static or powered mixers

### FLOCCULATION

Gentle agitation in the flocculation zone encourages the flocs to grow and they are then removed by settling within the clarification zone.

- Multi-stage hydraulic or mechanical flocculation
- Carefully designed to minimize short circuiting
- Hydraulic flocculation has variable nozzles for site adjustable energy input
- Mechanical flocculators are fitted with variable speed drives

### CLARIFICATION

The accumulated solids are removed hydraulically without complex mechanical or electrical systems from the clarifier bottom and the clarified water passes on to the filter for final polishing.

- Proprietary Inlet/outlet manifolds for even flow distribution with less than 5% rise rate maldistribution improves turbidity
- 60°, rigid plastic, settling tube modules, UV and chemical resistant
- "V" hopper bottom for sludge thickening and hydraulic sludge removal
- Sludge blanket sample and location ports
- Flat bottom, mechanical sludge removal option available

### FILTRATION

Clarified water passes to the high-rate filter for final polishing and the filter is periodically cleaned by water or air/water backwashing.

- Mono, dual and multi-media options
- Options for iron, manganese and arsenic removal
- Options for water backwash and surface wash and air scour or water backwash for reduced water consumption and improved cleaning.
- Nozzle and plenum-type underdrain

700 gpm / 3800 m<sup>3</sup>/d ST Plant



## PLANT FEATURES

### CORROSION-RESISTANT CONSTRUCTION

AWC constructs its tanks out of highly corrosion-resistant marine-grade, 5086 aluminum alloy achieving an EPA tank life rating of 100 years. This construction eliminates the need for corrosion-protection coatings and future recoating maintenance and prevents premature failures, which can occur with poor surface preparation or coating application. Sacrificial anodes are used to further increase protection. All fasteners in contact with the aluminum are 316 stainless steel to minimize galvanic corrosion. Stainless steel, epoxy coated steel or composite tanks are also available upon request.

### ELECTRICAL SYSTEMS AND CONTROL PANELS

AWC designs, builds, programs and commissions fully integrated, automated control and electrical systems. Our systems feature:

- Integrated UL and CSA approved MCC's, drives and control panels
- Fully automatic operation with advanced instruments and controls
- Remote monitoring via SCADA, or PC/Tablet or smart phone options are available
- Industry standard PLC options for reduced training and technical support

### CHEMICAL AND PUMPING SYSTEMS

AWC offers a full range of chemical mixing and dosing systems, including solution tanks, mixers, dosing pumps, spill containment and safety equipment. Well pumps, feed and distribution pump skids are completely integrated with plant controls providing a seamless operation and control environment.

### TECH SUPPORT AND REMOTE MONITORING

Full technical support services including telephone & emergency support, remote system monitoring and diagnostics, pilot programs & process optimization, performance audits, training, and upgrade planning are available.

## ADVANTAGES OF AWC ST PLANTS

### HIGH CAPACITY TREATMENT AND RETROFITS

Our process equipment components can also be supplied for installation into site-constructed concrete tanks or retrofitted into existing tankage. Capacities ranging to 100,000 m<sup>3</sup>/d (25 MGD) can be achieved in this manner. AWC can provide tank dimensions and other civil and building criteria to assist clients construct a complete plant.

### COST-EFFECTIVE

Our packaged ST plants are pre-assembled and tested in our facility, often saving 50% or more over in-situ construction costs and schedule. The plant can also be integrated into pre-engineered building systems and shipped to site for increased savings. The small DAF footprint reduces building costs.

### SIMPLICITY

Our ST plants are quiet, simple and easy-to-operate with minimal operator input. They adjust quickly to rapidly changing process conditions. They are also supplied complete with chemical dosing, water quality instrumentation, automatic controls and monitoring systems customized to meet local needs. System start-up, commissioning and onsite customization by our PLC/process technicians assures performance objectives are achieved.



CAPACITY		20 MINUTES FLOCCULATION 30 MINUTES SETTLING TIME			20 MINUTES FLOCCULATION 60 MINUTES SETTLING TIME			20 MINUTES FLOCCULATION 90 MINUTES SETTLING TIME		
(gpm)	(m3)	FILTER RATE (3.6 gpm/ft2) (9m/hr)			FILTER RATE (3.6 gpm/ft2) (9m/hr)			FILTER RATE (3.6 gpm/ft2) (9m/hr)		
		(ft) W (mm)	(ft) H (mm)	(ft) L (mm)	(ft) W (mm)	(ft) H (mm)	(ft) L (mm)	(ft) W (mm)	(ft) H (mm)	(ft) L (mm)
50	250	4'6" 1370	7'9" 2360	17'3" 5260	4'6" 1370	7'9" 2360	23'3" 7090	4'0" 1220	9'6" 2900	30'6" 9290
100	500	6'0" 1830	7'9" 2360	22'6" 6860	6'0" 1830	9'6" 2900	27'9" 8460	6'0" 1830	9'6" 2900	29'6" 8990
150	750	8'0" 2440	7'9" 2360	25'3" 7700	7'0" 2130	9'6" 2900	35'6" 10820	8'0" 2440	9'6" 2900	43'6" 13260
200	1000	8'0" 2440	7'9" 2360	33'9" 10290	10'0" 3050	9'6" 2900	33'6" 10210	10'0" 3050	9'6" 2900	46'6" 14170
300	1500	8'0" 2440	9'6" 2900	41'6" 12650	10'0" 3050	10'6" 3200	44'9" 13640	12'0" 3660	11'0" 3350	50'3" 15320
400	2000	10'0" 3050	9'6" 2900	44'0" 13400	12'0" 3660	11'6" 3500	45'3" 13790	<div>IMPERIAL / METRIC</div> <div>DIMENSIONAL TABLE</div>		
500	2500	12'0" 3660	9'6" 2900	46'0" 14020	<div>MULTIPLE TRAINS AVAILABLE</div>					
600	3000	12'0" 3660	11'0" 3350	48'0" 14630						

### ABOUT AWC WATER SOLUTIONS

AWC Water specializes in providing innovative packaged and modular water and wastewater treatment solutions for municipal and industrial applications. With more than 500 plants delivered around the world, we offer unmatched expertise and a reputation for delivering reliable, high quality water and wastewater solutions.

**Contact AWC today to discuss your project needs.**



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