



SPC

Slant Plate Clarifier

The SPC Series clarifiers are designed for high rate solids settling in a compact footprint.

Pan America Environmental SPC Series, Slant Plate Clarifiers are a high performance, Lamella plate design for removal of settleable solids in a variety of wastestreams.

The SPC's compact, footprint design requires less installation space than conventional or tube type clarifiers. The SPC design incorporates slant plate settling surfaces pitched at a 55° angle from the horizontal with uniform plate spacing.

Due to plate angle the solids slide down the plates into the sludge hopper below the plate pack. The simple, inexpensive design, combined with no moving parts or sludge auger makes the SPC easy to install, operate and maintain.

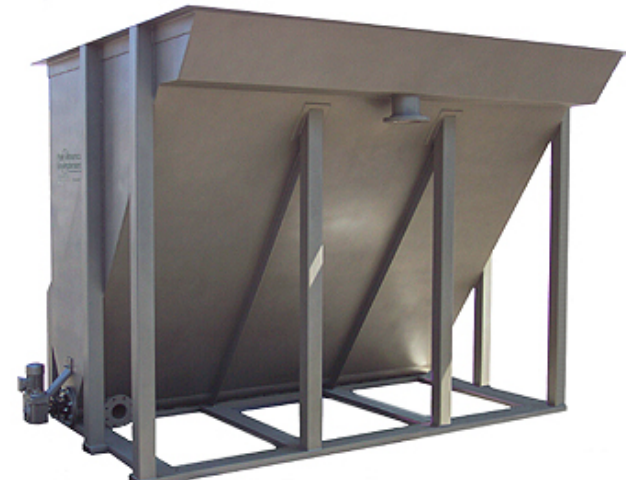
Chemical pretreatment often improves SPC solids removal efficiencies. The use of chemical flocculants with SPCs is based on system efficiency, application (use of SPC) contaminant characteristics and cost. Commonly used chemicals include trivalent metallic salts of iron, such as FeCl₂ or FeSO₄ or aluminum, such as AlSO₄. Organic and inorganic polymers (cationic or anionic) are often used to enhance the settling process. The most commonly used inorganic polymers are the polyacrylamides.

Standard Features:

- A36 carbon steel construction
- Water weir
- Influent chamber
- Effluent trough
- Sludge chamber/hopper
- Sludge auger
- NPT/flanged fittings
- Slant plate pack
- Influent diffuser
- Skid base/lifting lugs

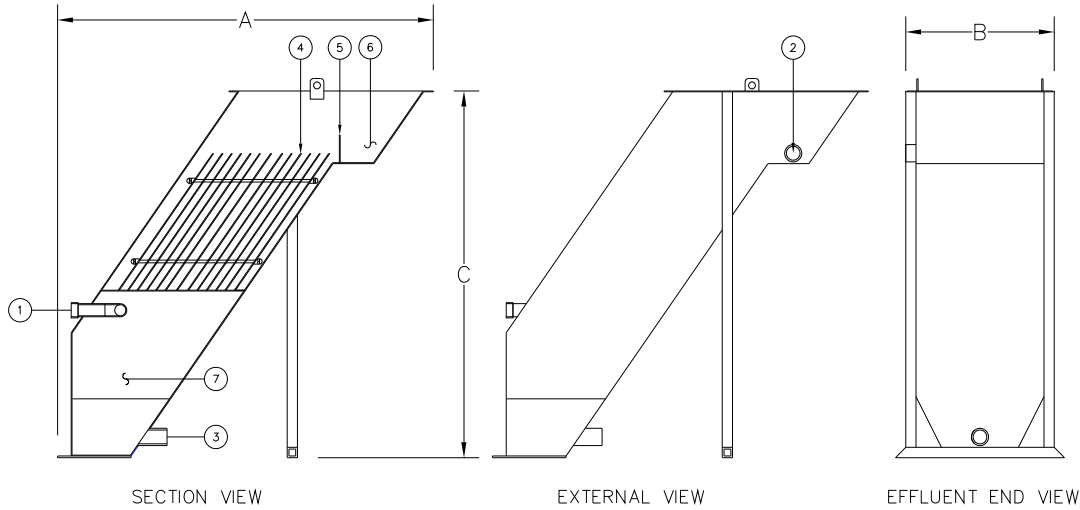
Typical applications:

- Groundwater remediation
- Mobile clarifier system
- River water treatment
- Power plant water treatment
- Manufacturing process water
- Aircraft wash racks
- Plating waste
- Mining wastewater
- Air scrubber water treatment
- Membrane Filter pre-treatment
- Snack food processing plants
- Trench water treatment
- Pulp & paper effluent
- Filter backwash



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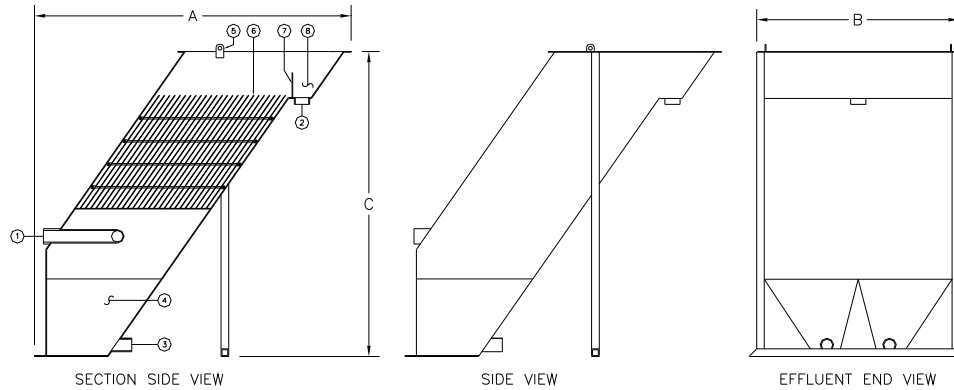
Polypropylene construction

Model	L	W	H	Inlet	Outlet	Sludge Volume Gal.	Inlet Size	Outlet Size	Sludge Outlet Size	Empty Weight	Oper. Weight	Flow Rate GPM
	A	B	C									
SPC-10-Ni	4'-7"	1'-10"	4'-5"	1'-10"	3'-8"	20	1.5"	1.5"	2"	225	590	3.5
SPC-20-Ni	4'-7"	1'-10"	4'-5"	1'-10"	3'-8"	20	1.5"	1.5"	2"	240	805	7
SPC-40-Ni	4'-7"	3'-8"	4'-5"	1'-10"	3'-8"	45	2"	2"	2"	475	1450	14

Item	Qty	Description
1	1	Inlet
2	1	Outlet
3	1	Sludge outlet
4	1+	Slant Plate Pack
5	1	Water weir
6	1	Effluent chamber
7	1	Sludge chamber
8	2	Lifting lug



Dimensions, design and capacities are not for construction and are subject to change without notice.
Flow rate basis: .35 GPM/Ft²



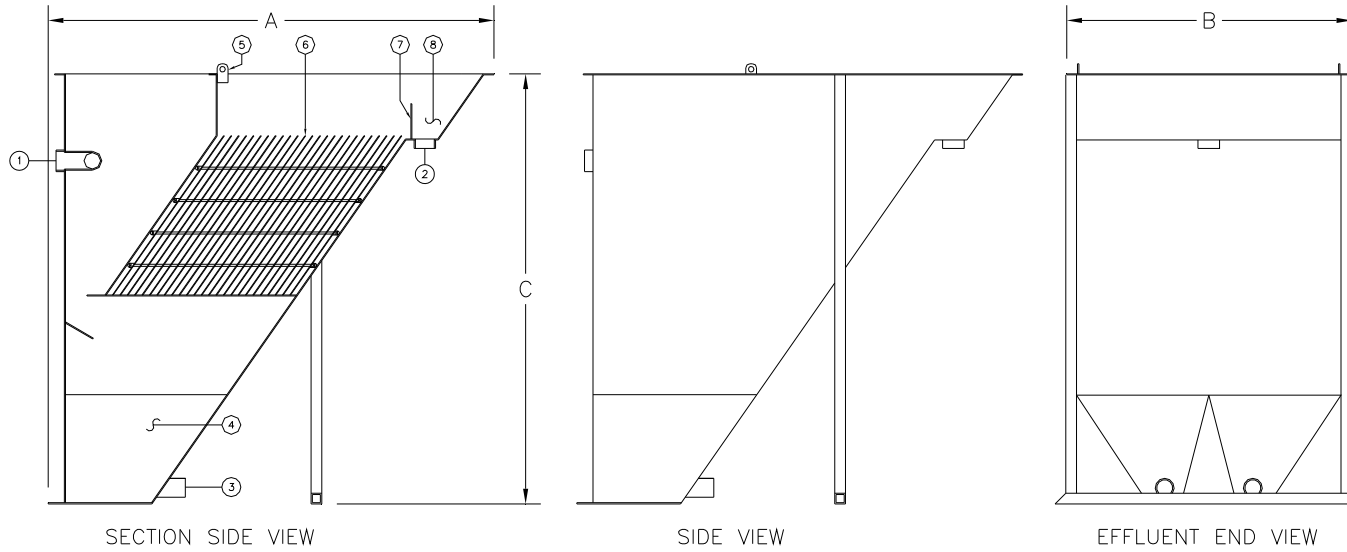
Model	L	W	H	Inlet	Outlet	Sludge Volume Gal.	Inlet Size	Outlet Size	Sludge Outlet Size	Empty Weight	Oper. Weight	Flow Rate GPM
	A	B	C									
SPC-60-Ni	6'-11"	2'-6"	6'-7"	2'-7"	5'-6"	30	2"	2"	3"	690	2765	21
SPC-80-Ni	6'-11"	3'	6'-7"	2'-7"	5'-6"	35	3"	3"	3"	810	3156	28
SPC-120-Ni	6'-11"	3'-5"	6'-7"	2'-7"	5'-6"	50	3"	3"	3"	1175	4415	42
SPC-170-Ni	6'-11"	4'-5"	6'-7"	2'-7"	5'-6"	55	4"	4"	4"	1375	5596	60
SPC-240-Ni	6'-11"	5'-5"	6'-7"	2'-7"	5'-6"	75	4"	4"	4"	1719	7020	84

Item	Qty	Description
1	1	Inlet
2	1	Outlet
3	1	Sludge outlet
4	1+	Slant Plate Pack
5	1	Water weir
6	1	Effluent chamber
7	1	Sludge chamber
8	2	Lifting lug



Dimensions, design and capacities are not for construction and are subject to change without notice.
Flow rate basis: .35 GPM/Ft²





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Model	Length	Width	Height	Inlet	Outlet	Sludge Volume Gal.	Effluent Chamber Gal.	Inlet Size	Outlet Size	Sludge Outlet Size	Empty Weight	Operat. Weight	Flow Rate GPM (Max.)
	A	B	C	D	E								
SPC-20	4'-1"	2'-3"	5'-5"	2'-7"	4'-1"	7	1	2"	2"	2"	315	1041	7
SPC-40	5'-5"	2'-4"	5'-11"	4'-7"	4'-9"	12	1	2"	2"	2"	570	1868	14
SPC-60	5'-9"	3'-5"	6'-4"	5'-0"	5'-1"	26	1	2"	2"	2"	768	3071	21
SPC-80	6'-3"	3'-5"	6'-4"	5'-0"	5'-2"	30	2	3"	3"	3"	900	3507	28
SPC-120	6'-3"	4'-5"	6'-5"	5'-2"	5'-3"	48	4	3"	3"	3"	1305	4905	42
SPC-170	6'-9"	4'-5"	7'-3"	5'-11"	6'-1"	48	4	4"	4"	3"	1526	6218	60
SPC-240	7'-7"	4'-5"	8'-1"	6'-8"	6'-6"	54	4	4"	4"	3"	1910	7800	84

Item	Qty	Description
1	1	Inlet
2	1	Outlet
3	1	Sludge outlet
4	-	Plate pack
5	1	Weir
6	1	Sludge hopper
7	1	Effluent chamber
8	4	Hold down
9	2-4	Lift lug
10	1	Auger drive
11	1	Auger
12	1-2	Access hatch

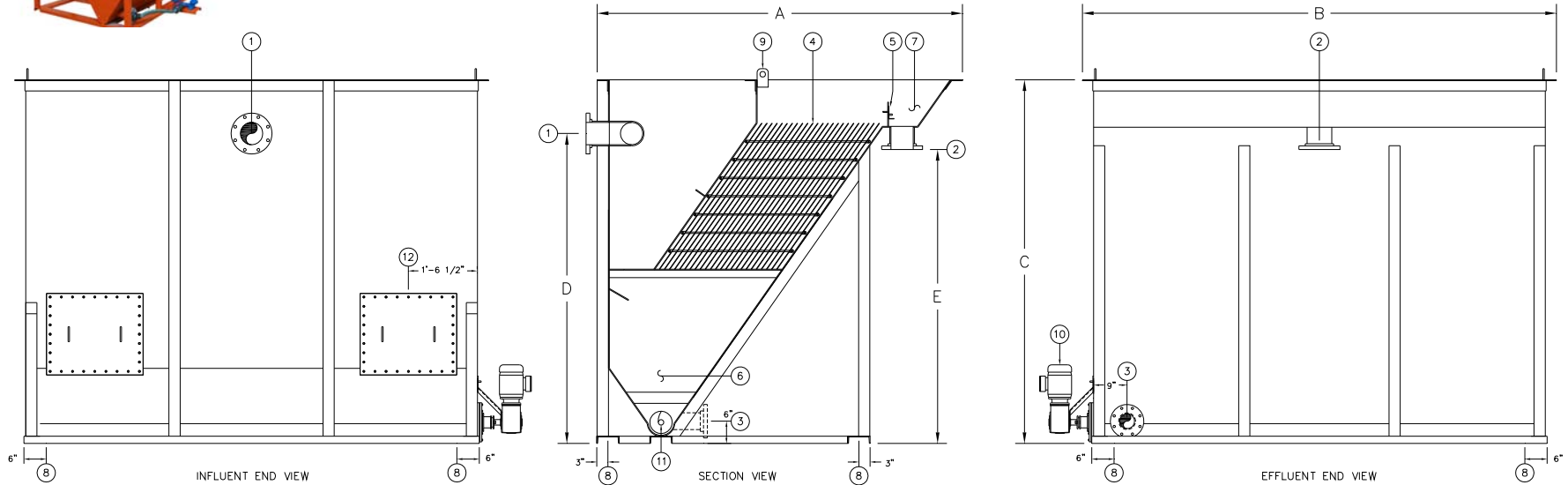
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Model	Length	Width	Height	Inlet	Outlet	Sludge Volume Gal.	Effluent Chamber Gal.	Inlet Size	Outlet Size	Sludge Outlet Size	Empty Weight	Operat. Weight	Flow Rate GPM (Max.)
	A	B	C	D	E								
SPC-330	8'-2"	6'-5"	8'-2"	6'-11"	6'-7"	83	15	4"	4"	4"	2870	11,088	115
SPC-440	8'-2"	8'-5"	8'-2"	6'-11"	6'-7"	112	17	4"	4"	4"	3766	16,400	154
SPC-550	8'-2"	10'-7"	8'-2"	6'-11"	6'-7"	140	20	6"	6"	4"	5651	21,380	192
SPC-660	8'-2"	12'-7"	8'-2"	6'-11"	6'-7"	165	27	6"	6"	4"	6622	25,567	231
SPC-770	8'-2"	14'-7"	8'-2"	6'-11"	6'-7"	194	30	6"	6"	4"	7740	29,750	269
SPC-880	8'-2"	16'-7"	8'-2"	6'-11"	6'-7"	220	36	6"	6"	4"	8686	33,825	308
SPC-990	8'-2"	18'-7"	8'-2"	6'-11"	6'-7"	250	40	6"	6"	4"	9712	38,000	346
SPC-1100	8'-2"	20'-9"	8'-2"	6'-11"	6'-7"	275	47	6"	6"	4"	10710	42,100	385
SPC-1320	9'-10"	12'-9"	11'-9"	10'-7"	9'-7"	165	50	8"	8"	4"	11,086	49,200	462
SPC-1540	9'-10"	14'-9"	11'-9"	10'-7"	9'-7"	195	70	8"	8"	4"	13,450	57,900	540
SPC-1760	9'-10"	16'-9"	11'-9"	10'-7"	9'-7"	215	90	8"	8"	4"	14,817	65,552	616
SPC-1980	9'-10"	18'-9"	11'-9"	10'-7"	9'-7"	238	100	8"	8"	4"	16,860	73,900	695
SPC-2200	9'-10"	20'-9"	11'-9"	10'-7"	9'-7"	265	120	8"	8"	4"	18,350	81,700	770
SPC-2420	9'-10"	22'-9"	11'-9"	10'-7"	9'-7"	292	130	8"	8"	4"	20,400	90,100	850
SPC-2620	9'-10"	24'-9"	11'-9"	10'-7"	9'-7"	320	140	10"	10"	4"	21,900	97,900	917
SPC-2860	9'-10"	26'-9"	11'-9"	10'-7"	9'-7"	246	150	10"	10"	4"	23,175	105,500	1000
SPC-3080	9'-10"	28'-9"	11'-9"	10'-7"	9'-7"	375	160	10"	10"	4"	24,560	114,000	1080
SPC-3300	9'-10"	30'-9"	11'-9"	10'-7"	9'-7"	400	170	10"	10"	4"	26,600	122,000	1155

Item	Qty	Description
1	1	Inlet
2	1	Outlet
3	1	Sludge outlet
4	-	Plate pack
5	1	Weir
6	1	Sludge hopper
7	1	Effluent chamber
8	4	Hold down
9	2-4	Lift lug
10	1	Auger drive
11	1	Auger
12	1-3	Access hatch



SPC Series Slant Plate Clarifier Engineering Specification Model SPC-20 thru SPC-3300

Performance

The Pan America Environmental SPC Series Slant Plate Clarifiers are designed to settle readily settleable and suspended solids.

Section 1.0 Equipment

1.01 Design

The SPC Slant Plate Clarifier will be designed and fabricated per the following specifications. The tank shall be a rectangular steel design with features as described.

1.02 Surface Area

Useful effective surface area shall be 100% of the total projected surface area.

1.03 Influent Chamber

The influent chamber provides a velocity decreasing surface area and influent diffuser that minimizes turbulence. A slotted exit is provided at the bottom of this chamber to allow unimpeded, uniform flow of water and solids into the sludge/clarification chamber. The slotting will prevent bridging of solids over the exit in the influent chamber.

1.04 Solids/Clarification Chamber

Once the flow exits the influent chamber the diversion plate located below the slotted exit of the chamber redirects it. The flow is diverted from its vertical, downward path to a horizontal path to the solids/clarifying chambers. This is performed to prevent settled solids from being re-entrained into the flow. The readily settleable solids drop out in this chamber while the finer solids continue in an upward flow through the SPC plates. PVC plates are bound together via a 304 stainless steel support structure that facilitates removal and installation of all plates simultaneously. The effective plate angle of inclination will be 55° with a standard plate spacing of 1". The plate material provides a slippery surface that assists in solids removal. The SPC240 and smaller will be provided with an inverted pyramid type sludge chamber. The optional sludge auger system may be provided in the solids chamber to convey solids to the sludge outlet. A sludge auger system is provided as a standard feature for the SPC-330 and larger. The adjustable water weir in the effluent chamber will determine the clarification chamber water level.

1.05 Sludge Auger System

(optional for SPC20 – SPC-240) The solids chamber is

provided with a rotating, sludge auger. The auger consists of stainless steel shafts with an epoxy coated steel screw auger driven by a slow speed, heavy-duty, oil filled, TEFC gear motor drive assembly with an adjustable packing gland and anti-torque bracket. Self-lubricating, submersible HDPE bearings are provided. The auger extends the full length of the solids chamber and conveys solids to the sludge outlet. The hopper bottom angle facilitates movement of sludge toward the auger. All wetted hardware shall be 304 stainless steel. Power required: 230/460V/3ph/60Hz. Motor controls are by others.

1.06 Lifting Lugs and Skid

The tank shall be provided with lifting lugs and skid base. The skid will provide bolt -holes for hold down to the installation surface.

1.07 Slant Plate Pack Chamber

A chamber is provided directly above the solids chamber for location of our SPC, Slant Plate Clarifier plate pack assembly. This chamber allows easy removal and installation of the plate pack. The water overweir is located at the top of this chamber and provides an even water distribution across the width and length of the chamber. The water flows up from the bottom of the plate pack through all the plates for 100% flow exposure to the entire plate surface area. Lifting lugs are provided.

1.08 Effluent Chamber

The water flows up through the plate pack and uniformly crests over the fixed water weir and into the effluent chamber. A flanged outlet is provided. The effluent chamber will be provided spanning the entire width of the SPC tank.

1.09 Fittings

All fittings shall be ANSI, B16.5, 150# Flat Faced flange (SPC330 and larger). All fittings shall be FNPT couplings (SPC12 through SPC240).

1.10 Access Hatch

One (1) or more 20" X 24" bolted, gasketed flat plate hatch(es) will be provided in the sludge hopper for access to the auger zone for maintenance purposes. This feature is standard for SPC-330 and larger only.

1.11 Drawings and Documentation

Two (2) hardcopy Approval or Record drawing sets are to be provided prior to fabrication being started. Two (2) Installation Operation Manuals (IOM) are provided prior to shipment.

Section 2.0 Materials of Construction

2.01 Steel Construction

Tank shell, baffles, cover and external structural members shall be constructed of ASTM A-36 carbon steel. Welded joints are continuous double welded and dye penetrant tested.

2.02 Surface Preparation

Interior surfaces shall be prepared to an SSPC-SP10 near white metal blast. Exterior surfaces shall be prepared to an SSPC-SP6 commercial blast.

2.03 Coatings

Interior coating shall be a self-priming, coal tar epoxy (1416 mils DFT). Exterior coating shall be primer coat followed by industrial polyurethane enamel coat (6 mils DFT). Color is Green.

2.04 Piping

Internal piping shall be ASTM, A-53 black steel.

2.05 SPC Plate Pack

Plate packs will be constructed of stress relieved PVC. The plate support structure shall be constructed of 304 stainless steel and schedule 80 PVC.

2.06 Manufacturer

The manufacturer of preference shall be: Pan America Environmental, Inc.

2.07 Warranty

Pan America Environmental warrants its products to be free of defect in materials and workmanship for a period of one year from the date of shipment.



Slant Plate Clarifier Options Descriptions

Influent Feed System Air operated, diaphragm or centrifugal pump with air controls, sump level switches & Nema 4 control panel, base mounted, 115/230/460V power offered. Electric diaphragm pumps available.

Sludge Pumpout System Air operated, diaphragm pump with air controls & Nema 4 control panel, auto on/off timer, base mounted, 115V/1ph/60Hz power required. Progressive cavity pump system also available. 1 - 100 GPM.

Effluent Pumpout Centrifugal pump with level switches & Nema 4 control panel, base mounted, 115/230/460V power offered. Effluent tank is provided to accommodate pumpout.

Chemical Pretreatment Systems Pretreatment systems to coagulate, flocculate, flash flocculate, pH adjust prior to the SPC. Contact Pan America to determine proper system needs for your application.

pH Adjustment Systems pH adjustment systems can be provided to maintain pH levels prior to or after the SPC. Contact Pan America to determine proper system needs for your application.

Sludge Auger SPC-20 – SPC-240 sludge hopper can be provided with a sludge auger. System consists of stainless steel shafts with coated steel screw auger driven by a slow speed gear motor drive assembly. The auger extends the full length of the solids hopper and conveys solids to the sludge outlet. A Nema 4 on/off control box is provided, power required: 230 or 460V/3ph/60Hz.

Elevation Platform Epoxy coated steel legs are provided to elevate tank to desired level. Full platforms & walkways with ladders or stairways can be provided where required or desired. Designed per OSHA guidelines.

Alternate Media Construction Standard Flopak media is PVC. HPVC, polypropylene, glass-coupled polypropylene and 304/316 stainless media is available. Contact PAE to determine proper media type for your

Sight Glass Two automatic, brass valves with tempered sight glass and protection rods mounted in sludge hopper. If glass is broken check ball stops outflow.

External Storage/Feed Tanks A wide variety of tank volumes can be supplied for your water, product and sludge holding needs. Flat bottom and cone bottom designs constructed in polyethylene, fiberglass, steel & stainless steel can be provided.

Effluent Filter Systems Solids filter systems can be provided to remove filterable solids from the SPC effluent. Contact Pan America to determine proper filtration needs for your application.

Carbon Filtration Systems (GAC) GAC carbon filters can be provided to remove contaminants after the SPC. Contact Pan America to determine proper system needs for your application.

Level Sensors Level sensors can be provided to detect water and other conditions. One or more sensor points can be provided to perform various functions such as high level, low level, pump on/off based on liquid levels and level detection for DCS controls or other functions based on your needs.

High Temperature Design system designed for temperatures up to 200° F.

Tank Construction 304 and 316 stainless steel tank construction can be provided.

Plate Construction Alternative plate materials can be provided in place of the standard PVC construction.

Cover A multi-section, vapor/odor retaining cover with hardware & gasketing can be provided for complete closure of the tank. Inspection hatches can also be provided for localized access/inspection.

Vent Scrubber SPC head space vapors can be extracted and scrubbed prior to discharge to atmosphere to remove VOC and other content.

Class 1 Div 1 & 2 Systems can be designed for use in a class 1 div 1 or 2 environment. Controls, components and wiring are changed to meet the needs of these environments. Intrinsically safe relays are also used for level sensors.

Field Skid Mounting SPCs can be mounted to a mobile skid with leveling for quick field mobilization.

Skid Mounted System SPCs can be combined with our other treatment equipment and options into a fully integrated, custom designed system completely mounted, plumbed and wired to a system skid. To simplify your need to do the wiring and plumbing on site, reducing your time frames and on site costs, we design around your requirements.

System Containerization SPC systems with any options can be installed in a 20 or 40' shipping container(s) to simplify system provision and field implementation. System would include the complete mounting, piping and wiring of the system in one or more container as required by the project.

Trailer Mounting SPCs can be mounted on a trailer for system mobilization. Trailer design generally includes corner leveling jacks, bubble levels, walkway, toolbox, electric or hydraulic brakes, piping and wiring of options.

Freeze Protection Immersion heaters mounted through tank wall. Each heater has an independent thermocouple well, 0-60° F thermostat and Nema 4 housing. 230/460V/3ph/60Hz power required.