



PS International, Incorporated

*Cleaner Water  
for a Better  
Tomorrow*



***Oil-Water Separators***  
***Engineered for Superior Performance***

# An Oil-Water Separator from PSI is Good for the Environment— and Good Business.

## Protecting the Environment

**C**lean water is essential to our well being and should not be taken for granted. We must protect our rivers, lakes, oceans, groundwater, and wastewater treatment systems from harmful pollutants created from surface run-off. The EPA has established NPDES (National Pollutant Discharge Elimination System) permit requirements for protecting our waterways.

PSI International oil-water separators are designed to meet or exceed Federal, State and Local wastewater discharge requirements. The engineers of PSI have over 20 years experience designing high performance and low maintenance oil-water separators. PSI offers a wide range of separator sizes and configurations including cylindrical and rectangular designs for above grade and below grade installations.

## Design Parameters

All PSI models are gravity enhanced separation vessels which are based on Stoke's Law and American Petroleum Institute (API) oil-water separation standards.

Flow rates range from 1 to 5000 gpm with larger flow rates available by installing multiple units in parallel. PSI oil-water separators utilize multiple corrugated parallel plates, which have a proven track record for coalescing oil particles. Separator Models PS and PSR will produce a free oil and grease effluent quality of 15 ppm or less. In addition, PSI can include our polypropylene coalescer. This coalescer is made up of a special matrix of polypropylene fibers designed to remove oil droplets down to 20 microns in size. Separator models PSC and PSRC equipped with the polypropylene media final polishing coalescer can produce a free oil and grease effluent quality of 10 ppm or less.

**See the back of this Brochure for a more detailed description of the separator design.**

## Construction Criteria

PS International cylindrical oil-water separators are designed in accordance with UL-58, UL-142 and UL-1746 construction standards. Steel single wall, double wall, and UL listed fiberglass jacketed secondary containment construction designs are available. For buried installations, PSI can provide UL-1746 listed fiberglass or STI-P3 corrosion protection systems. Both systems include a 30 year warranty against external corrosion failure- guaranteeing a long lasting high quality product.

The PSI rectangular separators can be utilized for above grade applications or below ground installations in a concrete vault.

## Maintenance Requirements

At PSI, we know that providing a separator effluent quality that will meet your discharge requirements is only part of the solution for your wastewater treatment needs. You, the customer, also want a system that is going to be easy to maintain and service. This is why the PSI separator includes corrugated plates inclined upwards at a 45° angle to prevent sludge build-up. The sludge baffle in the separator is located below the round manway for easy and direct access from grade for removing sludge accumulation without entering the vessel.

The polypropylene coalescer is also easy to maintain since it is located as far away from the corrugated plate pack as possible. The location of this coalescer ensures that it has limited oil and solids loading- unlike some of our competitor's designs. The polypropylene coalescer has a design life of over 10 years. It is "self-unloading" of oil and only needs periodic cleaning to remove suspended solids. PSI provides a large coalescer access manway equipped with steel channels which allow the Pack to slide in and out of the vessel.

This design reduces the time required to maintain the coalescer and ensures one person can easily remove and reinstall the coalescer from grade with the Pack lifting rod.

**You should know:** An OSHA approved confined space entry procedure is required for entrance into an oil-water separator. Some separator companies use a small manway for access to their polypropylene coalescers- requiring coalescer removal in pieces. Reinstallation of some multi-piece coalescers may require entrance into the vessel.

**The PSI Separator does not require entrance into the vessel for removal of sludge or for cleaning the polypropylene coalescer.**

## Optional Accessories

PSI International offers a complete line of electrical accessories for control of high oil level alarms, leak detection systems, automatic oil and water pump-out systems, automatic inlet shut-off valves, freeze protection, etc.

The control panels are manufactured in a UL listed panel shop to PSI specifications. Level sensors are intrinsically safe and can detect the oil-water interface as well as detect the air-liquid interface.

PSI can custom design a separator to include inlet solids compartments when high sludge loading is expected, water compartments with simplex or duplex pumped discharge systems, or three phase separation systems.

Contact **PS** International today to discuss how the PSI oil-water separator is the **P**ollution **S**olution to your wastewater treatment needs.

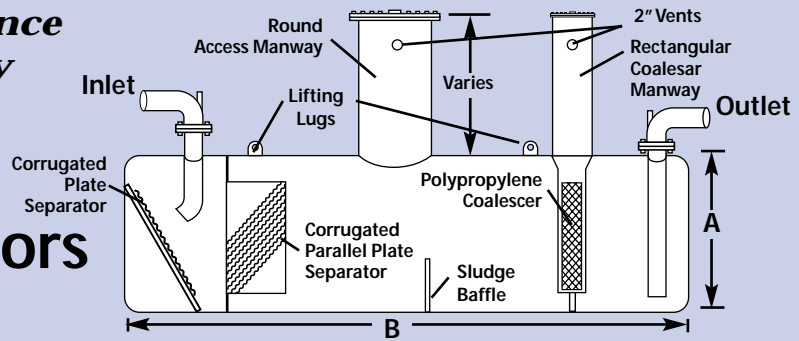
**1-605-332-1885**

**For additional information, including specifications, drawings and pictures, visit us on line at**

**[www.psinternational.com](http://www.psinternational.com)**

**“Over 20 years of experience  
is engineered into every  
separator we build”**

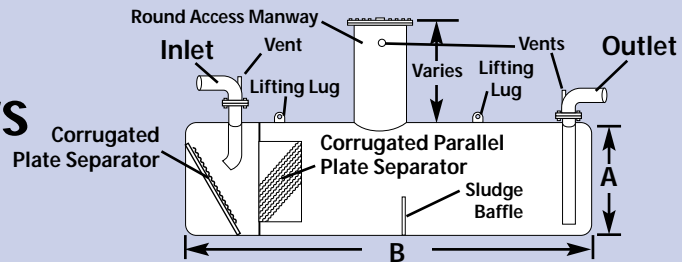
## PSC Model Cylindrical Separators



| MODEL NO. | VOLUME<br>Gallons | FLOW RATES<br>gpm | DIMENSIONS   |            | INLET/OUTLET<br>150 lb Flange |
|-----------|-------------------|-------------------|--------------|------------|-------------------------------|
|           |                   |                   | Diameter (A) | Length (B) |                               |
| PSC-350   | 350               | 55                | 3'-2"        | 6'-0"      | 4"                            |
| PSC-550   | 550               | 80                | 3'-6"        | 8'-0"      | 4"                            |
| PSC-1000  | 1000              | 130               | 4'-0"        | 10'-9"     | 6"                            |
| PSC-2000  | 2000              | 225               | 5'-4"        | 12'-0"     | 6"                            |
| PSC-3000  | 3000              | 325               | 5'-4"        | 18'-0"     | 6"                            |
| PSC-4000  | 4000              | 400               | 5'-4"        | 24'-0"     | 8"                            |
| PSC-5000  | 5000              | 650               | 6'-0"        | 24'-0"     | 8"                            |
| PSC-6000  | 6000              | 900               | 6'-0"        | 28'-8"     | 8"                            |
| PSC-8000  | 8000              | 1100              | 7'-0"        | 28'-0"     | 8"                            |
| PSC-10000 | 10000             | 1450              | 8'-0"        | 26'-8"     | 10"                           |
| PSC-12000 | 12000             | 1800              | 8'-0"        | 32'-0"     | 10"                           |
| PSC-15000 | 15000             | 2150              | 8'-0"        | 40'-0"     | 12"                           |
| PSC-20000 | 20000             | 2850              | 10'-0"       | 34'-0"     | 12"                           |
| PSC-25000 | 25000             | 3300              | 10'-6"       | 38'-9"     | 14"                           |
| PSC-30000 | 30000             | 4300              | 10'-6"       | 46'-6"     | 16"                           |
| PSC-40000 | 40000             | 5400              | 11'-9"       | 49'-6"     | 18"                           |

*PSC Model Separators will process the stated flow rates and produce a free oil effluent quality of 10 ppm or less.*

## PS Model Cylindrical Separators

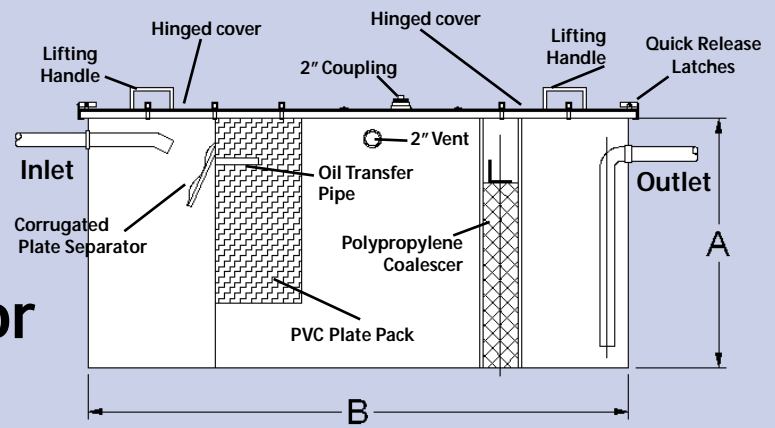


| MODEL NO. | VOLUME<br>Gallons | FLOW RATES<br>gpm | DIMENSIONS   |            | INLET/OUTLET<br>150 lb Flange |
|-----------|-------------------|-------------------|--------------|------------|-------------------------------|
|           |                   |                   | Diameter (A) | Length (B) |                               |
| PS-350    | 350               | 40                | 3'-2"        | 6'-0"      | 4"                            |
| PS-550    | 550               | 65                | 3'-6"        | 8'-0"      | 4"                            |
| PS-1000   | 1000              | 100               | 4'-0"        | 10'-9"     | 6"                            |
| PS-2000   | 2000              | 150               | 5'-4"        | 12'-0"     | 6"                            |
| PS-3000   | 3000              | 225               | 5'-4"        | 18'-0"     | 6"                            |
| PS-4000   | 4000              | 300               | 5'-4"        | 24'-0"     | 8"                            |
| PS-5000   | 5000              | 500               | 6'-0"        | 24'-0"     | 8"                            |
| PS-6000   | 6000              | 650               | 6'-0"        | 28'-8"     | 8"                            |
| PS-8000   | 8000              | 850               | 7'-0"        | 28'-0"     | 8"                            |
| PS-10000  | 10000             | 1175              | 8'-0"        | 26'-8"     | 10"                           |
| PS-12000  | 12000             | 1500              | 8'-0"        | 32'-0"     | 10"                           |
| PS-15000  | 15000             | 1900              | 8'-0"        | 40'-0"     | 12"                           |
| PS-20000  | 20000             | 2500              | 10'-0"       | 34'-0"     | 12"                           |
| PS-25000  | 25000             | 3100              | 10'-6"       | 38'-9"     | 14"                           |
| PS-30000  | 30000             | 4000              | 10'-6"       | 46'-6"     | 16"                           |
| PS-40000  | 40000             | 5000              | 11'-9"       | 49'-6"     | 18"                           |

*PS Model Separators will process the stated flow rates and produce a free oil effluent quality of 15 ppm or less.*

**“Over 25 years of experience  
is engineered into every  
separator we build”**

## PSRC Model Rectangular Separator

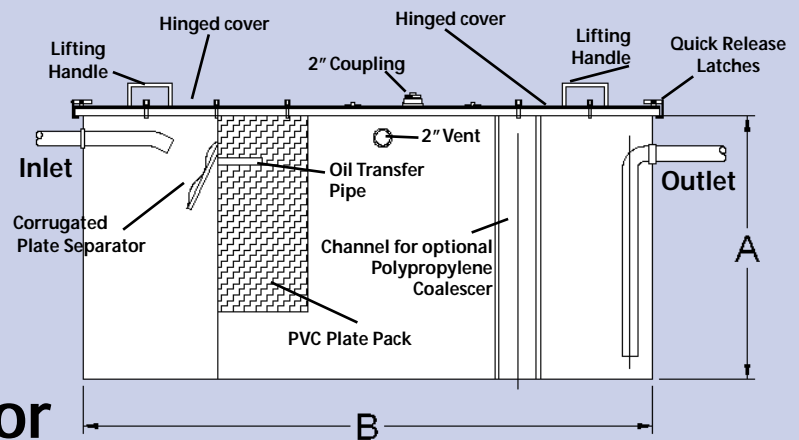


| MODEL NO. | VOLUME<br>Gallons | FLOW RATES<br>gpm | DIMENSIONS |            |       | INLET/OUTLET |
|-----------|-------------------|-------------------|------------|------------|-------|--------------|
|           |                   |                   | Height (A) | Length (B) | Width |              |
| 100       | 135               | 20                | 3'         | 4'         | 1'-6" | 3" N.P.T.    |
| 200       | 270               | 40                | 3'         | 8'         | 1'-6" | 3" N.P.T.    |
| 300       | 340               | 60                | 3'         | 10'        | 1'-6" | 4" Flange    |
| 500       | 540               | 80                | 3'         | 8'         | 3'    | 4" Flange    |
| 900       | 900               | 120               | 4'         | 10'        | 3'    | 6" Flange    |
| 1500      | 1440              | 160               | 4'         | 12'        | 4'    | 6" Flange    |
| 2000      | 2000              | 200               | 4'         | 16'        | 4'    | 6" Flange    |
| 3000      | 3350              | 300               | 5'         | 18'        | 5'    | 8" Flange    |

*PSRC Model Separators will process the stated flow rates and produce a free oil effluent quality of 10 ppm or less.*



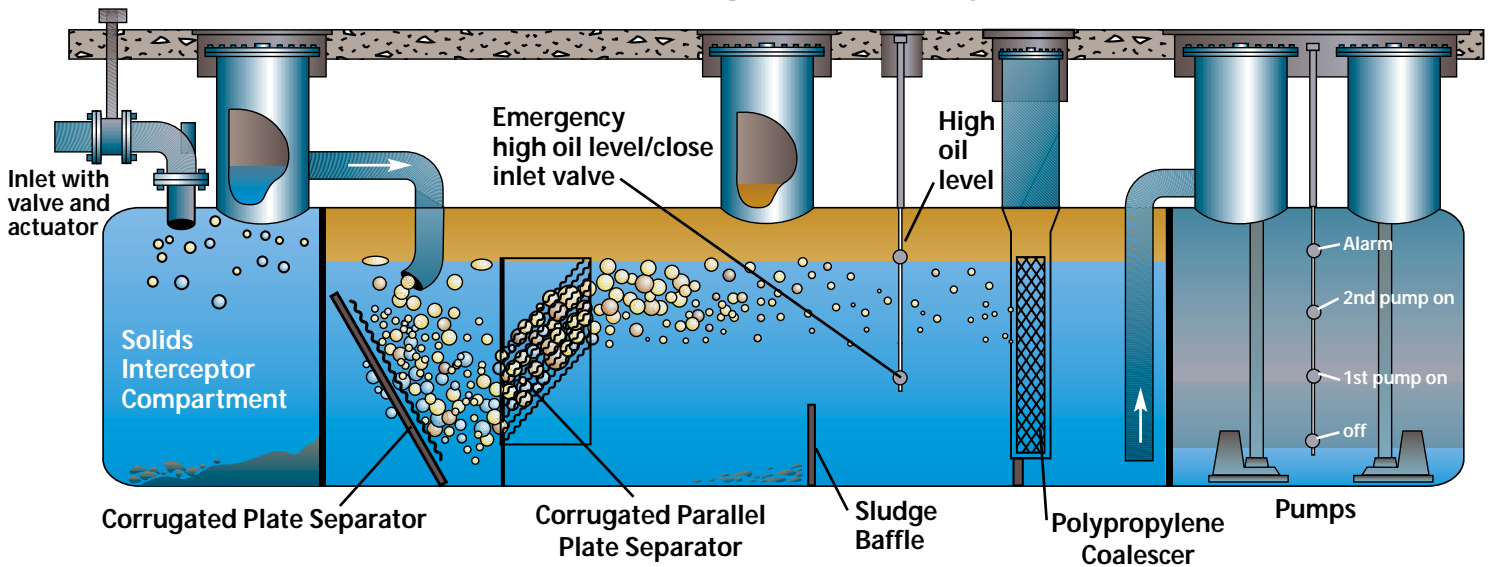
## PSR Model Rectangular Separator



| MODEL NO. | VOLUME<br>Gallons | FLOW RATES<br>gpm | DIMENSIONS |            |       | INLET/OUTLET |
|-----------|-------------------|-------------------|------------|------------|-------|--------------|
|           |                   |                   | Height (A) | Length (B) | Width |              |
| 100       | 135               | 15                | 3'         | 4'         | 1'-6" | 3" NPT       |
| 200       | 270               | 30                | 3'         | 8'         | 1'-6" | 3" NPT       |
| 300       | 340               | 40                | 3'         | 10'        | 1'-6" | 4" Flange    |
| 500       | 540               | 60                | 3'         | 8'         | 3'    | 4" Flange    |
| 900       | 900               | 100               | 4'         | 10'        | 3'    | 6" Flange    |
| 1500      | 1440              | 140               | 4'         | 12'        | 4'    | 6" Flange    |
| 2000      | 2000              | 180               | 4'         | 16'        | 4'    | 6" Flange    |
| 3000      | 3350              | 300               | 5'         | 18'        | 5'    | 8" Flange    |

*PSR Model Separators will process the stated flow rates and produce a free oil effluent quality of 15 ppm or less.*

# At PS International, the engineers can custom design an oil-water separator package to suit your application.



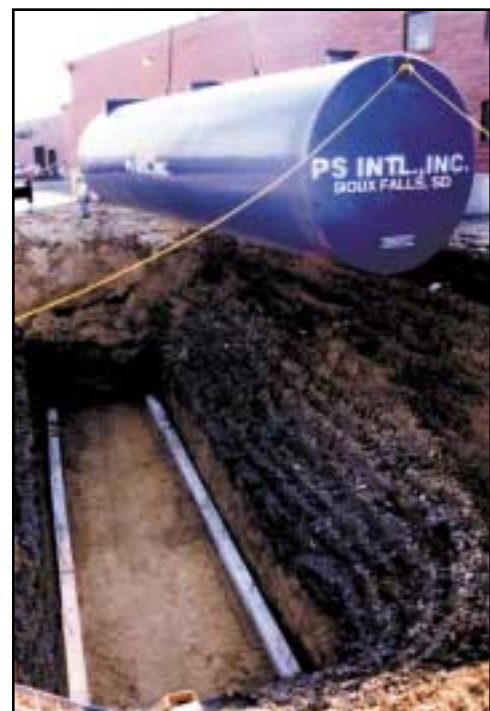
If there is potential for a high solids loading, such as vehicle wash racks, PSI can supply an integral solids interceptor on the front end of the vessel. The PSI design will not allow oil to accumulate in the solids collection chamber and will decrease the frequency required for maintenance of the separator.

On installations where the flow can not gravity discharge from the separator, PS International can design and supply automatic water pump-out systems. These separators are equipped with an integral compartment and either a simplex or duplex pump package. PSI recommends pumps installed with a guide cable system allowing easy removal and reinstallation of the pump from grade. PSI has a UL listed panel shop that manufactures custom control panels specifically designed for lead-lag and/or alternating pump operation with high water level alarms.

Some oil-water separators are installed in locations where there is a potential for a large oil spill. For these applications, a popular option supplied by PS International is an automatic inlet shut-off valve. A high performance butterfly valve and electronic actuator operate in conjunction with a PSI control panel and stainless steel oil interface probe to ensure that large oil spills will not pass through the separator and cause harm to the environment. This system is superior to mechanical float type stop valves that are mounted inside the separator on the outlet pipe. If the outlet pipe is closed, flow coming to the separator can pressurize the vessel and/or push oil up the manways and out the separator vents.

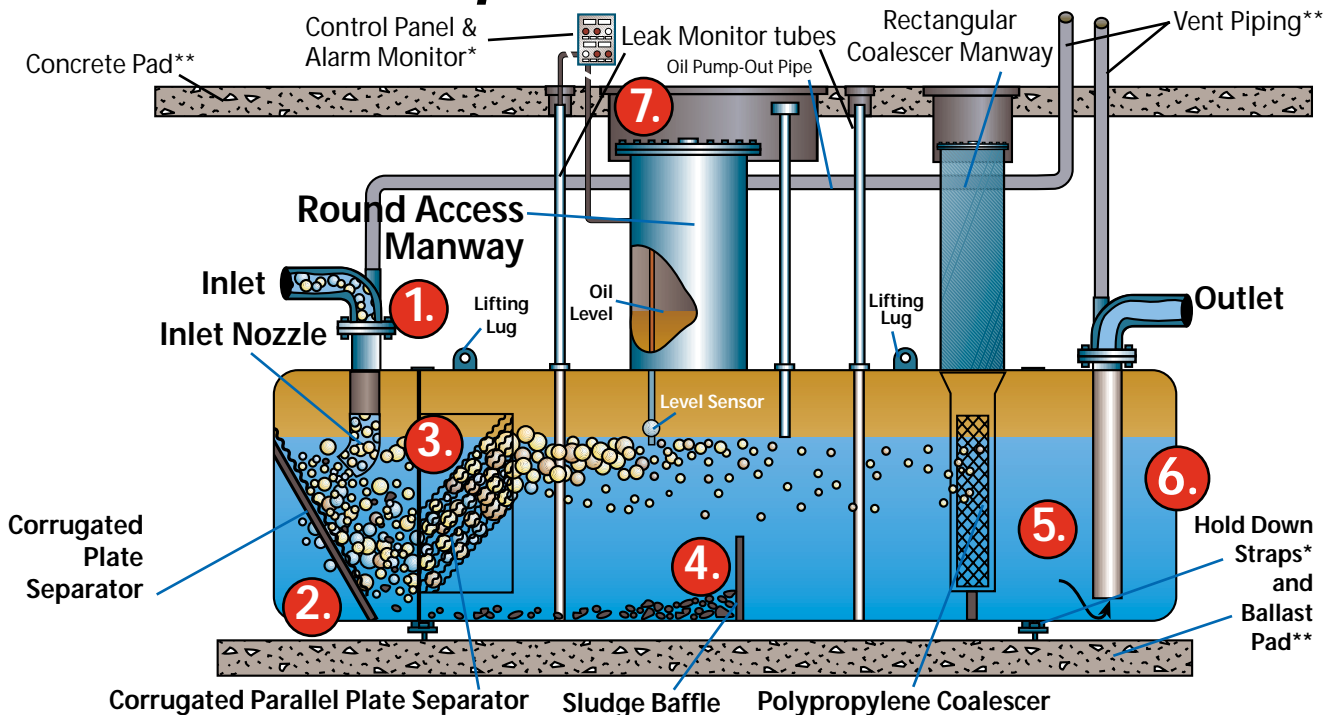


**PS International, Inc.** provides rectangular and cylindrical separators for above grade installations. Heavy-duty quick release latches provide quick and easy access to interior of all PSI separators. Pumps, valves, sensors and control panels can be provided with separators, if required.



**A PS International Model PSC-40,000 double wall separator** being installed to treat storm water run-off.

# How The PSI Separator Works...



\* Optional equipment available from PS International  
 \*\* Installer supplied equipment

**1.** Inlet and outlet piping enters the vessel through the top centerline of the separator per UL-58 requirements. This assures that the separator always operates full of liquid, thus utilizing the total volume of the vessel.

**2.** Flow is directed towards a single corrugated plate at an angle perpendicular to the entrance pipe. This method of separation, known as the Buffalo-Morse Principle, serves multiple functions.

- It reduces the velocity head of the incoming stream.
- It spreads the flow out over the entire cross sectional area of the separator and prevents channeling of the flow.
- The plate corrugations create sinusoidal flow patterns, which cause solids to break out of the flow stream and oil droplets to collide and coalesce.

**3.** The second stage of separation in the PSI separator is based upon the proven Royal Dutch Shell Principle of using multiple corrugated parallel plates. The parallel plate pack in the PSI oil-water separator consists of a special arrangement of heavy gauge removable corrugated steel plates. The plates are inclined at a 45 degree angle to prevent the accumulation of solids and the plate spacing is large enough to prevent plugging from debris and trash. An open area is located directly below the plate frame to prevent the accumulation of solids in front of the plate pack.

The plate pack provides a crucial role in separation so it is vital that this pack is located in the front end of the vessel in order to maximize the effective separation chamber of the separator. This is the case in the PSI design.

**4.** The internal sludge baffle in the PSI separator serves two primary functions. First, solids are carried downstream in the separator by the internal hydraulics of the vessel where they collect in front of the sludge baffle. The baffle is located directly below the access manway for easy sludge removal from grade. Second, the sludge baffle directs the flow from the bottom quadrant of the separator towards the top of the vessel aiding in the floatation of small oil particles in the flow stream.

**5.** PSI can provide, as an option, an additional polypropylene coalescer. This consists of a special matrix of polypropylene fibers designed to coalesce oil droplets down to 20 microns in size. An important addition to the PSI separator design is the use of a large coalescer access manway that spans the entire cross section of the coalescer and includes dedicated tracks for the coalescer. This ensures easy removal and reinstallation of the coalescer from grade. Other separators require maintenance personnel to "fish" their polypropylene coalescer out in pieces through a small access manway. These designs make it difficult if not impossible to reinstall the coalescers without draining and entering the vessel.

**6.** The outlet pipe is located at the end of the separator and draws clean water from the most quiescent section of the vessel. The effluent will contain a free oil and grease discharge of **no more than 15 ppm** in PS and PSR model separators and **no more than 10 ppm** in PSC and PSRC model separators.

**7.** PSI has the experience to provide solid state control systems to meet a wide variety of fluid level monitoring and flow control requirements including intrinsically safe liquid level sensors and custom-built control panels. Installing a high performance PSI separator to meet your discharge requirements along with a maintenance warning system will alleviate your wastewater treatment worries.



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