

Marina Bay on Boston Harbor Water-treatment system by OilTrap Environmental

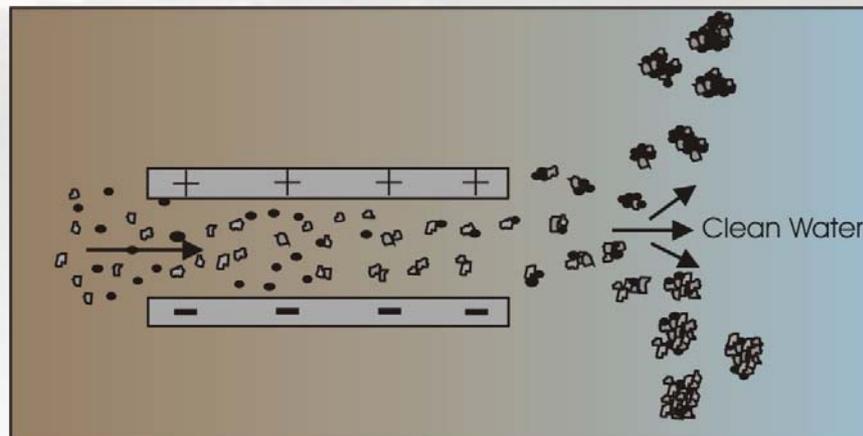


Introduction to Electrocoagulation

Electro--- ---Coagulation

Electro – To cause a pre-determined reaction using a DC electrical current similar to a battery.

Coagulation – The process of changing the particle surface charge, allowing suspended matter to form an agglomeration and subsequent removal from the water solution.



Identify the Challenges

Boat Hull Cleaning

Pressure washing the hull of a boat will remove marine material and paint particles. Most boat paints contain toxic anti-fouling metals such as copper, zinc, arsenic, tin to reduce marine growth and provide corrosion resistance.

Bilge Water

Regulations prohibit the discharge of bilge water and "gray" water that can be contaminated by oil, fuel or other regulated contaminants.

Stormwater Runoff

Rainwater that comes in contact with the work area should be collected for treatment prior to discharge to surface water. Contaminated stormwater may contain metals such as copper, zinc, oil & grease, and even toluene.

Solution

All of these contaminants can be easily separated from the water through the OilTrap ElectroPulse system.

ElectroPulse Description In Laymen's Terms

Cell Plates – DC current is applied to the electrolytic cell plates causing trace amounts of the plate material to be dissolved into the water. The action is similar to adding separation chemicals (polymers) to a chemical treatment system but much less expensive.

Coagulation – As previously defined, the electrical current and trace dissolved metals from the electrolytic cell plates, cause suspended matter to come together, forming larger particles.

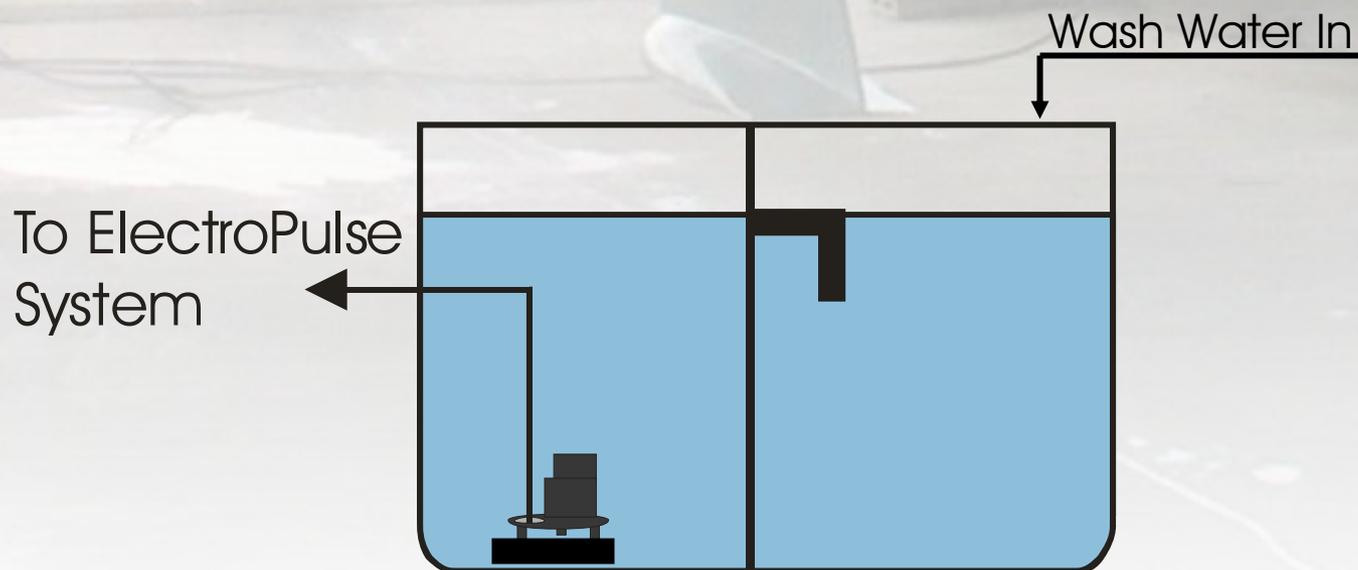
Flotation – During the reaction in the cell housing, oxygen bubbles are formed and attached to the coagulated matter, causing it to rise to the surface in the separation tank where it is removed and transferred to the sludge holding tank. After a short period of time, the air off-gasses allowing the contaminant it to sink to the bottom of the sludge holding tank where it stays until it is properly disposed.

ELECTROPULSE - THE NEW GENERATION OF WATER TREATMENT

Pretreatment

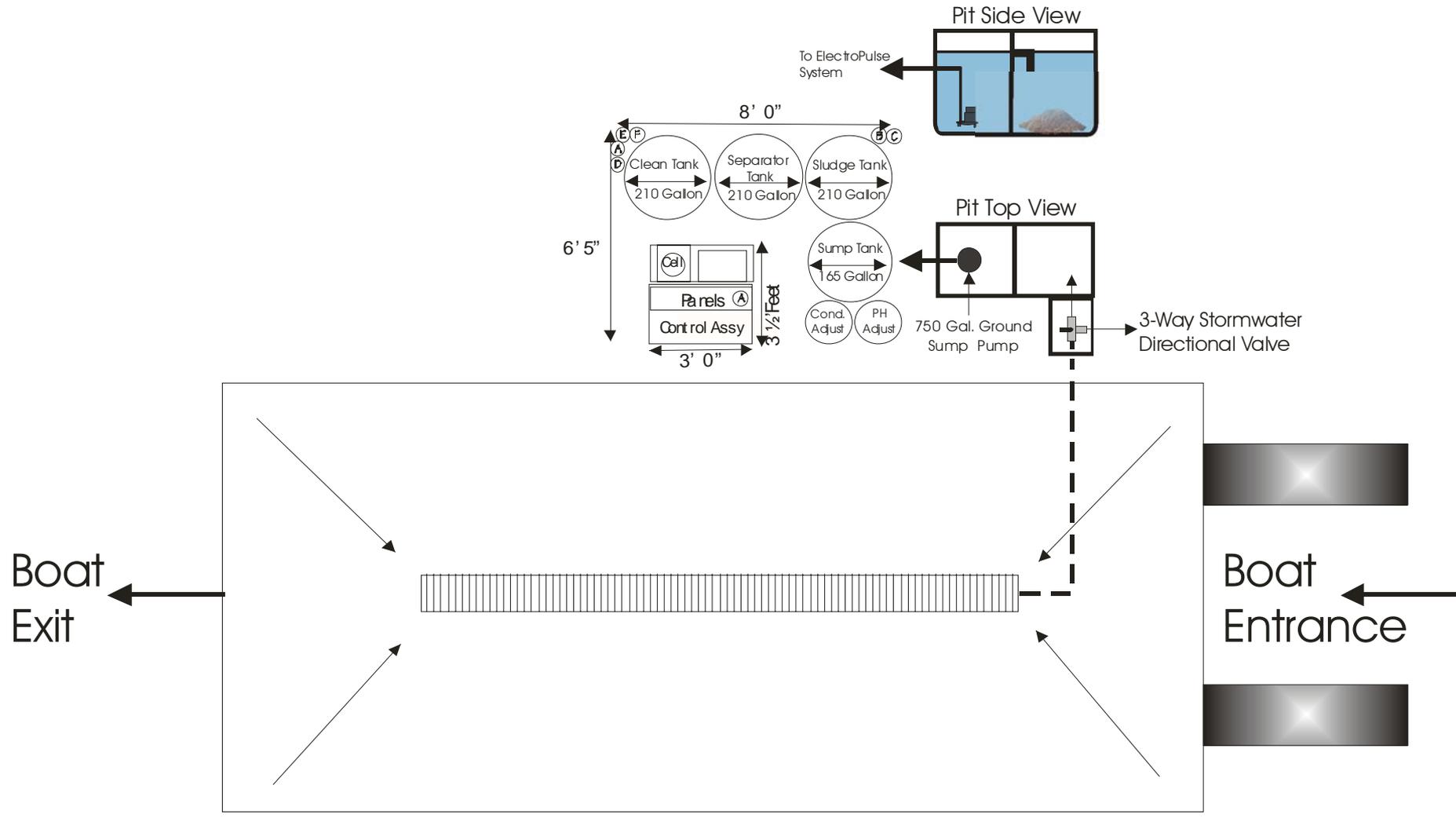
Proper pretreatment ensures effective treatment of the water. A simple 2-stage baffled pit provides separation and containment of:

- Floating oil & grease
- Heavy marine debris separation

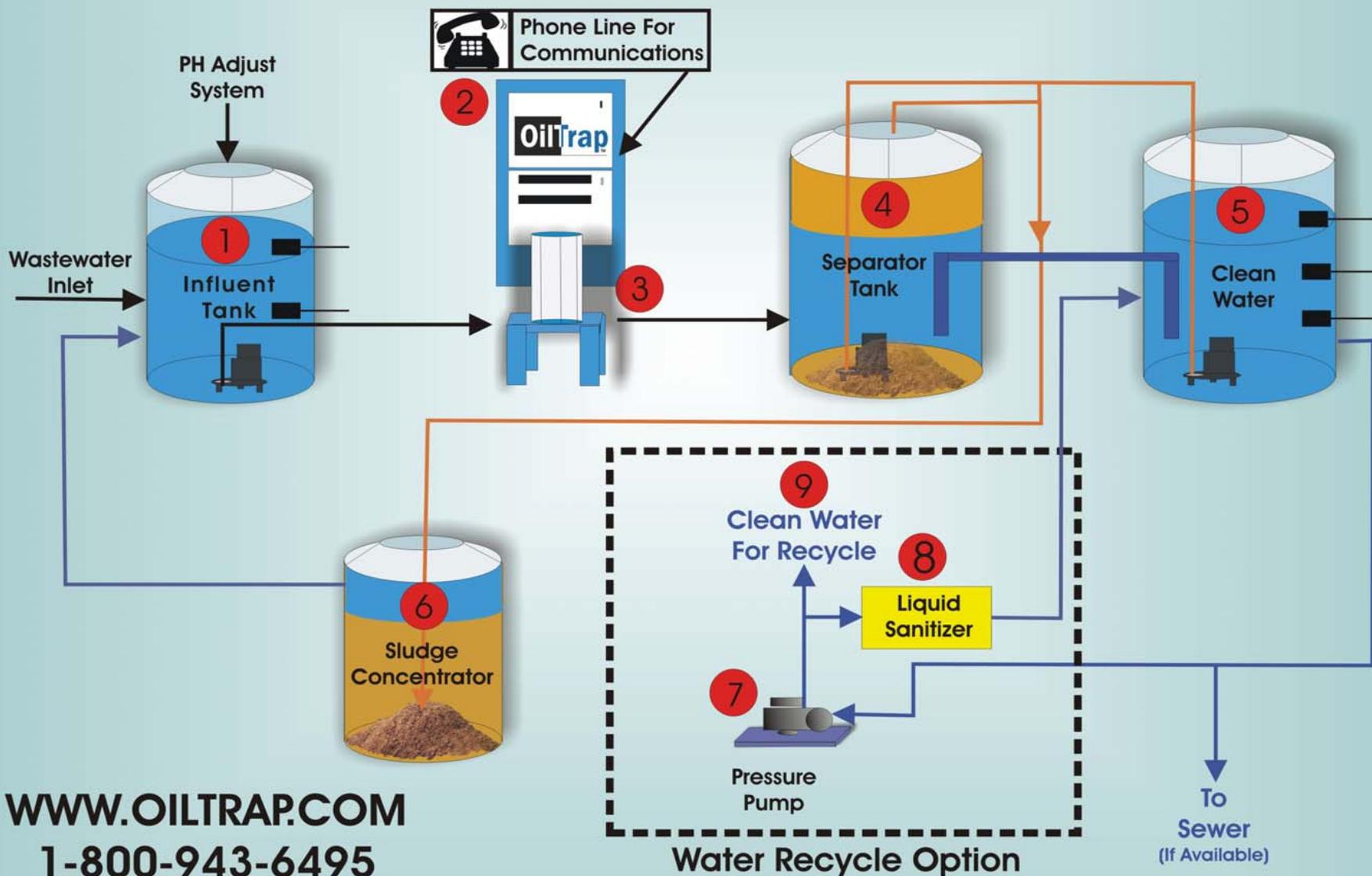


2-Stage Baffled Concrete or Fiberglass Pit

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ElectroPulse Flow Diagram



Benefits of System

No Daily Maintenance

Since there are no filters separation chemicals required on the system, there is no daily maintenance required on the system.

Treats Multiple Types of Contaminants Simultaneously

Multiple types of contaminants such as emulsified oil & grease, heavy metals and suspended solids are easily and simultaneously removed from water.

Stabilizes Heavy Metals

Heavy metals are removed and reduced to hydroxides which generally pass a TCLP test. This will significantly reduce disposal costs.

Totally Automated

The system is operated using an on-board computer system (PLC), automatically controlling the treatment process. An inexpensive communication package can be added, providing an OilTrap technician the ability to monitor and assist in troubleshooting the system from the factory.

Sludge Dewatering

OilTrap is currently designing a simple yet very effective sludge dewatering system that provides the ability capture and dewater collected sludge quarterly.

Cost Savings

Treatment costs, including utilities and consumables, averages 1/3¢ per gallon.

Comparing Water Treatment Technologies

Mechanical Filtration

Mechanical filtration removes particles larger than 20 microns and free oil & grease from water. It is ineffective at removing small colloidal material (less than 20 microns), emulsified oil & grease or heavy metals.



Chemical Treatment

Chemical treatment has the ability to remove emulsified oil & grease, small colloidal material and heavy metals, but it may require multiple pH adjustments and multiple chemical additions. Chemical costs can be very high.



Micro-Filtration

Ultra-filtration and reverse osmosis has the ability to remove light emulsified oil & grease and heavy metals but is susceptible to abrasion from suspended solids.

Most membranes are in-tolerant to the presence of organics, which could damage them beyond repair. Maintenance and membrane replacement costs can be very high and labor intensive.

