

# **Enviro Technologies, Inc.**

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## **Case Study Naval Facilities Engineering Command Point Mugu, CA Storm/Waste Water Treatment**

### **Summary**

This report summarizes the upgrade of the Naval Facilities Engineering Command Storm/Waste Water Treatment System at Point Mugu, California. In 2002, the Naval Air station at Point Mugu required an upgrade to the storm/waste water system at the fuel terminal to ensure regulatory compliance under its discharge permit with the city of Oxnard, California.

At that time, storm water and fuel tank condensate water collected in the fuel storage areas flowed to three wastewater storage tanks arranged in parallel. Water from these storage tanks flowed through two parallel activated carbon vessels and was discharged to the public sewer under permit by the City of Oxnard. The goal of the Navy was to install a treatment system to ensure wastewater regulatory compliance and provide redundant protection.

The Navy issued a Statement of Work and Request for Proposal for an economic, reliable and self-sufficient waste water treatment system that complied with the City of Oxnard discharge permit. Several alternatives were evaluated and the V-Inline Separator was selected as the primary treatment technology for the new waste water treatment system.

A V-Inline 2000 Separator was purchased and installed in the treatment system in 2003. The V-Inline Separator has been operating at the naval facility for three years and Navy personnel are very happy with the operation of the separator. Since installation of the new treatment system with the V-Inline Separator, the Naval Facility has maintained regulatory compliance and has met discharge permit requirements.

### **Client Reference**

Donald Stits, Fuel Division Manager  
Code N31VF – Building 63  
Naval Base Ventura County  
Point Mugu, California  
Phone: 805-989-1594

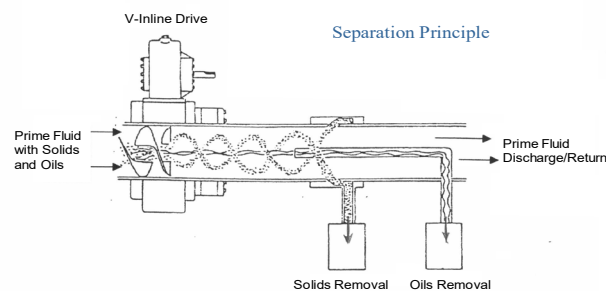
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## V-Inline Description:

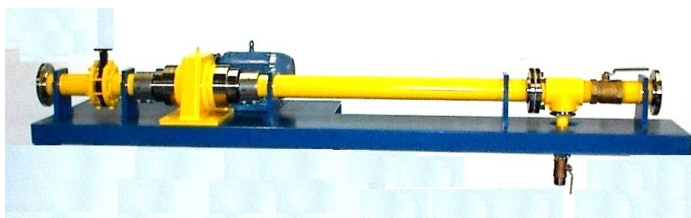
The V-Inline Separator is a compact, light-weight, continuous flow separator that simultaneously separates liquid/liquid, liquid/solid, or liquid/liquid/solid flow streams. The V-Inline is fitted with a low shear, non-clogging impeller designed to create a cyclonic flow. By this action, the heavier materials, i.e. solids, are forced to the outside of the vortex while lighter materials such as oil are drawn to form a central core of the vortex (see figure 1 below). A specially designed manifold at the exit of the separation chamber is utilized to collect the separated streams.

Figure 1



Unlike other separation equipment, the V-Inline does not need a pressure drop to produce a good separation. In fact, the unit actually operates like a pump (axial flow type).

To produce efficient separation, the V-Inline Separator is capable of generating a high "G" force. The V-Inline Separator is scalable and can be fabricated to process virtually any amount of flow. EVTN presently manufactures four (4) models. These models are listed on Table 1 along with nominal flow rates and motor sizes.



Model V-Inline 4000 Separator. As shown on this figure, the separator configuration has a very small footprint (this separation chamber has a 4" diameter), while processing high flow rates.

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**Table 1**  
**V-Inline<sup>®</sup> Separator Models**

Model	Separation Chamber Diameter (Inches)	Nominal Flow (GPM)	Motor Size (Hp)
V-Inline 1000	1	3 – 5	3
V-Inline 2000	2	25 – 60	10
V-Inline 4000	4	100 – 500	50
V-Inline 8000	8	1000 - 3500	100

The flow rates listed on Table 1 are nominal rates for typical conditions encountered. The units can operate outside these ranges, depending on the V-Inline<sup>®</sup> Separator operating speed, and inlet and outlet flow conditions.

## Storm/Waste Water Treatment

The Naval Air station at Point Mugu required an upgrade in 2002 to the storm/waste water system at the Building 63 fuel terminal to ensure regulatory compliance under its discharge permit. The waste water treatment system employed at that time is shown schematically in Figure 2.

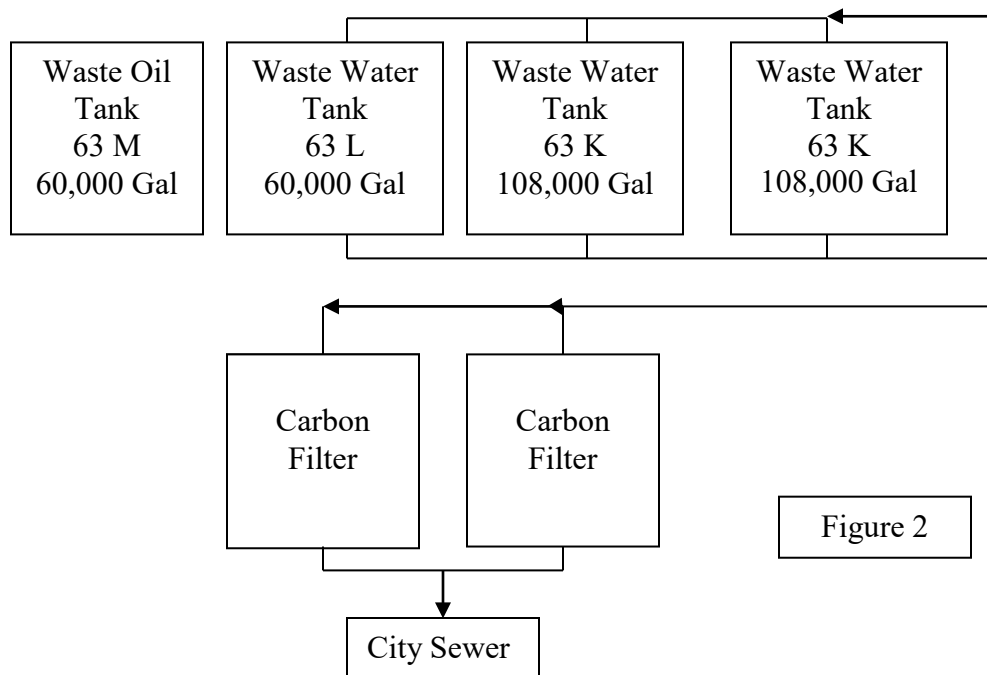


Figure 2

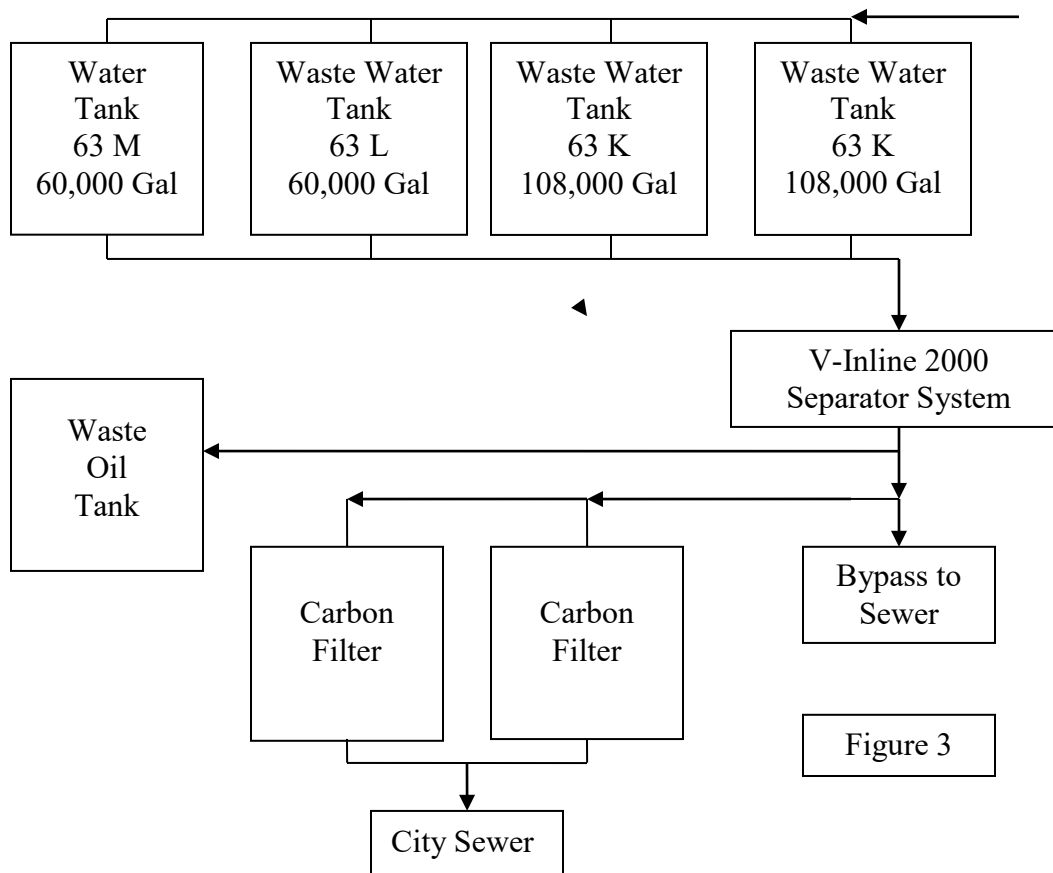
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The storm water and fuel tank condensate water collected in the fuel storage areas flowed to three wastewater storage tanks (63J, 63K, 63L) that are arranged in parallel. Water from these storage tanks flowed through two parallel activated carbon vessels and was discharged to the public sewer under permit by the City of Oxnard.

The Navy wanted to install an upgraded treatment system to ensure wastewater regulatory compliance and to provide redundant protection. The Navy issued a Statement of Work and Request for Proposal for an economic, reliable and self-sufficient waste water treatment system that complied with the City of Oxnard discharge permit. Several alternatives were evaluated and the V-Inline<sup>®</sup> Separator was selected as the primary treatment technology for the new waste water treatment system.

A schematic of the selected system is shown on Figure 3.



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The new system was installed in 2003 with the V-Inline 2000 as the primary treatment technology for removal of fuel oil. Waste Oil Tank 63M was added to the system. As part of the upgrade, a bypass of the existing treatment system (carbon Filters) was installed to discharge treated water from the V-Inline Separator System directly to the City Sewer. The existing system was maintained only as a backup.

The V-Inline 2000 Separator installed at the Point Mugu Naval Facility in California is shown in Figure 4. The V-Inline Separator is shown on the upper part of the figure.



Figure 4  
V-Inline 2000 Separator at Pt. Mugu

The V-Inline Separator has been operating at the Pt. Mugu facility for three years. The installation and operation of the V-Inline Separator System has been very successful. The system has been operated in the bypass mode (bypassing the carbon filters), with direct discharge from the separator system directly to the City sewer.

Since installation of the new treatment system with the V-Inline Separator, the Naval Facility has maintained regulatory compliance and has met discharge permit requirements.