

**1. INTRODUCTION**

- 1.1. Containment Solutions manufactures Oil/Water Separator (OWS) tanks with internal coalescing plates. These units are available in single or double-wall model tanks constructed to UL standards. The OWS can handle a variety of flow rates and achieve effluent concentration of 10 mg/L or 15 mg/L (ppm).
- 1.2. As with any OWS, proper maintenance is an important factor to ensure optimal performance of the unit. This manual provides the information necessary to maintain the OWS

**1.3. SAFETY**

- 1.3.1. These instructions should not be interpreted in any way to put one's health at risk, or to harm property and/or the environment.
  - 1.3.1.1. Keep this manual available at the installation site and refer to safety procedures as needed.
  - 1.3.1.2. The following definitions will serve as a guide when reading this manual:

**⚠ WARNING**

Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

**⚠ CAUTION**

Indicates a potentially hazardous situation, which if not avoided may result in minor or moderate injury.

**NOTICE**

Indicates a potentially hazardous situation, which if not avoided may result in property damage.

**1.4. Important Information**

- 1.4.1. Proper installation and operation of each tank is essential:
  - 1.4.1.1. To ensure the safety of all the individuals involved in the tank installation, operation and maintenance.
  - 1.4.1.2. To prevent tank damage and/or failure, which could lead to environmental contamination.
  - 1.4.1.3. To prevent the release of higher concentrations of oil than the units designed allowance
  - 1.4.1.4. To validate the tank warranty.

**2. OPERATING INSTRUCTIONS**

**⚠ WARNING**

Liquid oil and vapors may be present. To prevent fire or explosion hazard, keep ignition sources away when removing oil from tank.



**ASPHYXIATION**

**FIRE**

**EXPLOSION**

- 2.1. Waste oils should not be intentionally drained into an OWS tank.

- 2.1.1. Filling the tank with waste oils reduces the capacity of the tank to separate oil from runoff flow.
- 2.1.2. Waste oils may contain chemicals which could damage the tank, piping and/or internal components.
- 2.2. All oil recovered and removed from the tank should be recycled or disposed of in compliance of all applicable Federal, State, Local or Provincial safety and environmental codes and regulations.
- 2.3. Dropout boxes, catch basins or interceptors should be installed prior to the OWS tank to minimize the amount of debris entering the tank.
- 2.4. It is important to frequently clean the dropout boxes, catch basins or interceptors which are installed upstream of the OWS tank.

**3. NORMAL OPERATION**

- 3.1. The OWS tank should be filled with clean water at all times for proper operation.
- 3.2. Oil level should be checked after every rainstorm or in accordance with local codes.
- 3.3. The oil level can be check two ways:
  - 3.3.1. Optional Electronic Interface Sensor - OWS tanks with the electronic interface sensors oil pump-out alarm require oil remove when the alarm is activated.
    - 3.3.1.1. Remove the oil.
    - 3.3.1.2. Refill OWS tank with clean water (see OWS Start-Up Instructions, Pub No. OWS 2013).
  - 3.3.2. Manual stick gauging - OWS tanks without oil pump-out alarm require oil to be checked by using gauge stick with oil/water sensing paste.
    - 3.3.2.1. Determine oil level with gauge stick.
    - 3.3.2.2. Place water finding paste on gauge stick up to OWS tank internal diameter (water finding paste available at Petroleum Distributors offices in most cities).
    - 3.3.2.3. Lower gauge stick through tank access fitting to tank bottom.
    - 3.3.2.4. Remove gauge stick and note level of water in OWS (see Table 3-1)
    - 3.3.2.5. If oil/water interface level is below that shown in the Interface Level Chart for your diameter OWS Tank, oil needs to be removed (see Table 3-1).
    - 3.3.2.6. Remove oil from tank to enure optimal tank performance.
    - 3.3.2.7. Refill OWS tank with clean water (see OWS Start-Up Instructions, Pub No. OWS 2013).

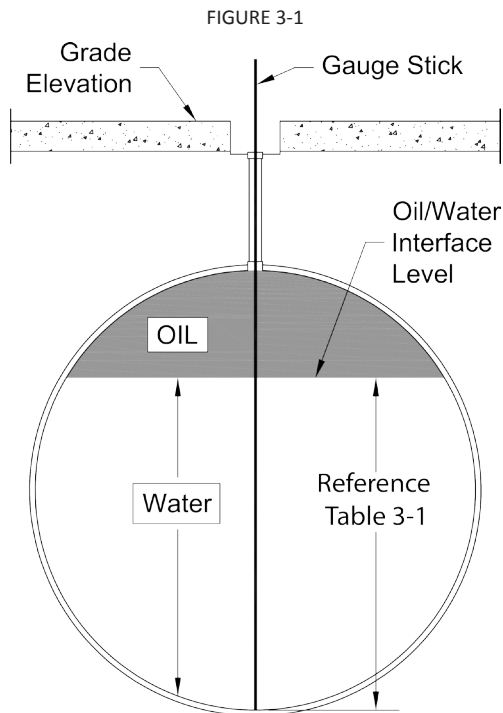


TABLE 3-1

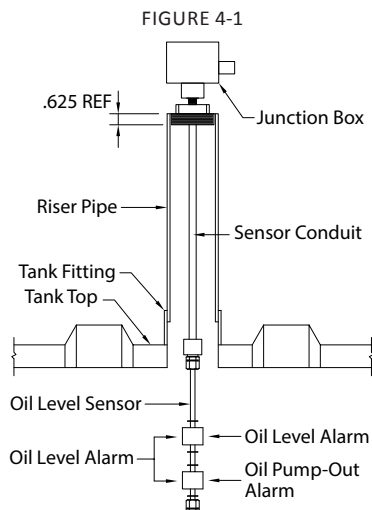
Interface Level Chart	
Tank Diameter (all models)	Oil/Water Interface Pump-Out Level
4'	34"
6'	52"
8'	66"
10'	88"

The oil/water interface is defined as the point where the oil is detected above the water. Oil will always be floating on top of the water.

#### 4. OIL LEVEL SENSORS (OPTIONAL)

4.1. There are three types of sensors: single-float, double-float, and triple-float.

4.1.1. Double-float alarm sensors (see Figure 4-1)



4.1.1.1. Oil level alarm warns that the tank is almost full of the oil storage capacity level and the oil will need to be removed soon.

4.1.1.2. Oil pump out alarm alerts the operator that the oil must be removed immediately.

4.1.2. The single-float alarm has an oil pump out sensor which alerts the operator that the oil must be removed immediately.

4.1.3. The triple-float alarm can be used as a pump shut off when using an automated oil pump out system, or notification of an oil stop valve closure in event of an emergency oil spill.

4.2. Note: If the oil is not pumped out, the effluent concentration may exceed the desired levels if more oily water enters the tank. Oil should only be removed during non flow conditions to insure pure oil draw-off.

4.3. For details and schematics, request tech sheet "Oil Interface Float Switch Models 40U, 50U, and 60U B&S".

#### 5. OIL RECOVERY INSTRUCTIONS

5.1. To minimize water contamination of the oil, insert oil suction hose into the 4" oil draw fitting/coupling.

5.1.1. Note: Oil draw pipe has a cap installed on the bottom to ensure only oil above plate packs is removed.

5.2. Suction out the oil.

5.3. Refill with clean water

5.4. Note: For OWS with Electronic Interface Sensors, the alarms will not deactivate until the tank has be refilled and clean water has caused them to float.

#### 6. MAJOR OIL SPILL RESPONSE INSTRUCTIONS

6.1. Note: If major oil spill exceeds the normal oil storage capacity of the OWS tank.

6.1.1. After a major oil spill the OWS tank should always be emptied and refilled with clean water.

6.1.2. In the event of a major spill, notify proper authorities as required by Federal, State, Provincial, and Local laws.

6.2. Oil spill recovery instructions with optional oil level sensors.

6.2.1. To minimize water contamination of the oil, insert the oil suction hose to the 4" oil out fitting/coupling.

6.2.2. Suction out the oil.

6.2.3. Refill tank with clean water (see OWS Start-Up Instructions, Pub No. OWS 2013).

6.2.4. Note: be sure the pump-out alarm is not activated due to a full oil condition.

6.2.5. If the pump-out alarm is still on, suction out a second oil load and refill with clean water.

6.2.6. Continue this sequence until alarms deactivate.

6.3. Oil spill recovery instructions without oil level sensors (see Section 3.3.2).

6.3.1. To minimize water contamination of the oil, insert the oil suction hose to the 4" oil out fitting coupling.

6.3.2. Suction out the oil.

6.3.3. Refill tank with clean water (see OWS Start-Up Instructions, Pub No. OWS 2013).

6.3.4. Apply water sensing paste to a gauge stick.

6.3.5. Place gauge stick into the tank through the 4" gauge fitting to determine the oil/water interface location.

6.3.5.1. If the oil/water interface level is below that shown in the Interface Level Chart for your model tank, more oil needs to be removed (see Table 3-1).

6.3.6. Suction out second load of oil.

6.3.7. Refill tank with clean water (see OWS Start-Up Instructions, Pub No. OWS 2013).

6.3.8. Continue this sequence until oil/water interface is higher or above that shown in the Interface Level Chart for your model tank.

## 7. MIXED OIL & WATER RECOVERY INSTRUCTIONS

7.1. Place a 2" or smaller suction hose inside the tank through either the 4" gauge fitting or through the manway.

7.1.1. The suction hose nozzle should be 24" above the tank bottom or higher.

7.2. If nozzle extends closer to the bottom, sludge may be inadvertently removed and oil carry over into the tank effluent water may occur upon startup.

7.2.1. Refill with clean water (see OWS Start-Up Instructions, Pub No. OWS 2013).

## 8. MAINTENANCE INSTRUCTIONS

### ⚠ WARNING

Liquid oil and vapors may be present. To prevent fire or explosion hazard, keep ignition sources away when removing oil from tank. Do not enter tank unless following OSHA guidelines for confined space entry. Failure to follow OSHA guidelines could result in death or serious injury



ASPHYXIATION

FIRE

EXPLOSION

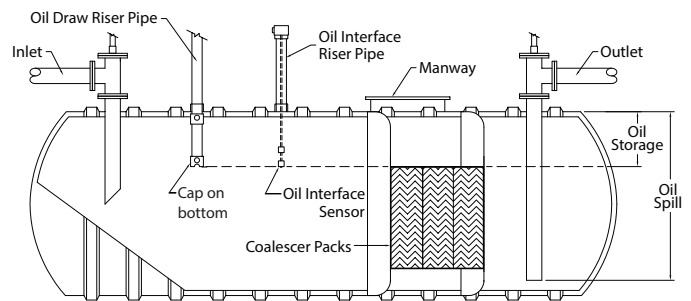
8.1. Entering a tank without the use of a self-contained oxygen supply may result in headache, dizziness, nausea, loss of consciousness and death. Proper methods must be used to ventilate all enclosed spaces prior to entry to avoid ignition of flammable materials or vapors.

8.2. Close inlet and outlet valves before entering tank.

8.3. Disconnect/disable all power sources including air source to any pump(s) and power to any accessories.

8.4. Note: All oil recovered and removed from the tank should be recycled or disposed of in accordance with Federal, State, Local, or Provincial, safety and environmental codes and regulations.

FIGURE 8-1



### ⚠ CAUTION

All interior surfaces of the tank will be slippery. Do not use picks, axes, hammers or other heavy objects to break the sludge apart.

8.5. Important reminders:

8.5.1. Be sure to inspect and replace gaskets as necessary when the tank is shut down

8.5.2. Coalescer plate pack removal is optional under normal operating conditions. Plate pack may be cleaned in place or removed from the separator for cleaning.

8.5.3. Mechanical lifting equipment is required to remove the coalescer packs.

8.5.4. All liquid must be removed from the tank prior to entry.

8.5.5. If emulsifying detergent is used in separator cleaning, removal of all remaining detergent is required and flushing with clean water is recommended. The use of a quick break detergent cleaner is recommended for this procedure.

8.6. Although the tank is designed for long-term trouble free operation, it still requires the following clean-out maintenance:

8.6.1. Periodic inspection of any inlet strainers or dropout boxes.

8.6.2. Periodic internal inspection to check for sand, trash, sludge and oil buildup.

8.6.3. Effluent water inspection during or immediately after a heavy rainfall to check for oils or other contaminants.

8.7. Important: Inspection and maintenance is recommended at the following times (whichever occurs first):

8.7.1. Once per year.

8.7.2. When the tank bottom sludge is 12" deep.

8.7.3. When the water contains high contaminant levels.

## 9. LIQUID REMOVAL - OIL RECOVERY INSTRUCTIONS (WITH OPTIONAL OIL LEVEL SENSORS)

9.1. Minimize water contamination of the oil by inserting the oil suction hose to the tank 4" oil out fitting.

9.2. Suction out the oil.

9.3. Note: Be sure the pump-out alarm is activated due to a full oil condition or an oily-water mix will be removed.

## 10. OIL RECOVERY INSTRUCTIONS (WITHOUT OPTIONAL OIL LEVEL SENSORS)

- 10.1. Determine where the oil/water interface is located using a gauge stick and water sensing paste.
  - 10.1.1. If the oil/water interface is below the published level in the Interface Level Chart (see Table 3-1) for your diameter tank, relatively clean oil will be removed first (following the instructions detailed above).
  - 10.1.2. If the oil/water interface is above the published level in the Interface Level Chart (see Table 3-1), only an oily-water mix will be removed (following the instructions detailed above).
- 10.2. Suction the oil by connecting the oil suction hose to the 4" oil out fitting.

## 11. FOR INLET CHAMBER CLEANING

### ⚠ WARNING

Liquid oil and vapors may be present. To prevent fire or explosion hazard, keep ignition sources away when removing oil from tank. Do not enter tank unless following OSHA guidelines for confined space entry. Failure to follow OSHA guidelines could result in death or serious injury



ASPHYXIATION

FIRE

EXPLOSION

- 11.1. Entering a tank without the use of a self-contained oxygen supply may result in headache, dizziness, nausea, loss of consciousness and death. Proper methods must be used to ventilate all enclosed spaces prior to entry to avoid ignition of flammable materials or vapors.
- 11.2. Suction or squeegee out the sludge and debris across the entire tank bottom.
- 11.3. Using a standard garden hose at normal pressure (40-70 psig), or a pressure washer with or without spray nozzle, loosen any caked oily solids.
- 11.4. Direct the water stream to the tank wall side, top and bottom (use of hot water is helpful).
- 11.5. Suction or squeegee out the resultant slurry.
- 11.6. Repeat as necessary until water appears relatively clean.
- 11.7. Note: Check the (optional) oil/water sensor for movement freedom. If the floats do not slide on the stem easily or have sludge on them, remove and clean the sensor.

## 12. COALESCER PACK CLEANING

- 12.1. Important: The coalescer packs may be removed for cleaning. Mechanical lifting equipment should be used to remove the coalescer packs.
- 12.2. Undo manway lid bolts.
- 12.3. Remove the manway lid.
  - 12.3.1. If your tank has a steel manway lid, use mechanical lifter equipment to remove lid.
- 12.4. Remove compression panels by sliding them out (cross flow models only). Disconnect take up turnbuckle assembly, tilt pack back away from bulkhead and lift (straight flow models).

- 12.5. Remove the coalescer pack directly below the manway.
  - 12.5.1. Important: Pay particular attention as to how the packs are installed / removed as they must be re-installed the same way.
- 12.6. Slide the next coalescer pack over and remove. This may require tank entry.
- 12.7. Continue until all coalescer packs have been removed and are above grade.
  - 12.7.1. Important: Do not disassemble coalescer packs.
  - 12.7.2. In some cases, cleaning may be performed with coalescer packs in place using a spray wand.
- 12.8. Using a standard garden hose at normal pressure (40-70 psig), or pressure washer with or without a spray nozzle, loosen any caked oily solids.
- 12.9. Flush the coalescer packs from both sides.
- 12.10. Attach a ¼" to ½" diameter, 8' long spray wand nozzle to the hose and insert in coalescer pack vertical holes and flush out any sludge.
- 12.11. Note: The coalescer packs must be cleaned of all sludge. A coating of oil does not affect their performance.
- 12.12. Should coalescer packs be damaged during servicing, replacement packs can be ordered by contacting CSI at 1-800-537-4730

## 13. EFFLUENT CHAMBER

- 13.1. Suction or squeegee out sludge and debris across entire tank bottom.
- 13.2. Using a standard garden hose at normal pressure (40-70 psig), or pressure washer with or without a spray nozzle, loosen any caked oily solids.
- 13.3. Direct the water stream to the tank wall, side, top and bottom. Use of hot water is helpful.
- 13.4. Suction or shovel out the resultant slurry. The use of steel/ sharp objects inside tanks should be done with care not to damage the tank interior.
- 13.5. Visually inspect the tank interior, walls and components, inlet, separation and effluent chambers for any damage.
  - 13.5.1. Note: If any visual damage exists, contact Containment Solutions Field Service at (800) 822-1997 for further instruction.
- 13.6. Reinstall the coalescer packs.
- 13.7. The coalescer packs must be installed sitting on top of the bottom supports.
  - 13.7.1. Note: Failure to properly install the coalescer packs may result in discharge water contamination.
- 13.8. Make sure all corrugated fiberglass expansion panels, flow bypass prevention tubing, and plate pack take up turnbuckles are installed properly.
- 13.9. Reattach the manway lid(s). Ensure the gasket(s) is damage free. Replacement gaskets are available by contacting CSI at 1-800-537-4730.
- 13.10. Refer to OWS Start-Up Instructions Pub. No. OWS 2013 for proper techniques for refilling and restarting the tank.

# TROUBLE SHOOTING GUIDE

Poor effluent quality or operating problems can be the result of many factors. The following is a guide to the most common problems, their possible causes and the suggested remedies.

PROBLEM	POSSIBLE CAUSE	REMEDY
Excessive oil concentration in discharge (effluent).	Inlet flow pumped with centrifugal pump.	Change to gravity flow or positive displacement type pump.
	Flow rates exceeding rated gallons per minute (causing oil droplets to emulsify more into the clean water).	Decrease flow to no greater than rated gpm.
	Presence of detergents or surfactants (causing chemical emulsification).	Clean and flush OWS, remove source of detergents. Use quick break detergents only.
	Oil levels are greater than the rated storage capacity, allowing separated oil to carry over.	Remove oil. Refill with clean fresh water. Consider adding oil level sensor system to OWS.
	Excessive fluid turbulence into OWS tank (causing more mechanical emulsifications).	Check for trash in inlet piping. Completely open inlet piping valves.
	Presence of dissolved hydrocarbons.	Remove source of dissolved hydrocarbon . Install secondary treatment.
	Presence of excessive solids into OWS tank, inside OWS tank or in effluent.	Remove source of solids from storm water drainage area and clean OWS tank.
	Higher specific gravity oils than OWS tanks was specified for , preventing oil droplets from coalescing in the plates.	Decrease flow rate and/or remove source of high specific gravity oil.
pH of clean water greater than 10 or less than 4 (causing chemical emulsifications).	Remove sources of materials with pH under 4 or over 10.	
High suspended solids content in clean water effluent.	Excessive sludge or debris buildup.	Clean out separator.
Inlet piping vapor lock/inadequate system venting.	Closed inlet or effluent piping valves.	Open piping valves completely. Check to ensure inlet tee vent is properly vented.
Storm water back-up in drainage area.	Excessive solids in storm water drainage area.	Clean drop-out box inlet piping and water effluent piping.

