SpOILer Controllerless Recovery System

Installation and Operation Manual

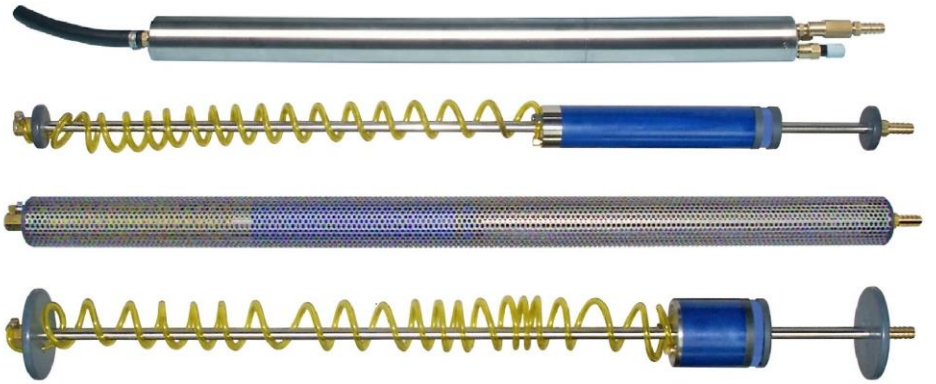

Table of Contents

DOCUMENTATION CONVENTIONS

This uses the following conventions to present information:

WARNING

An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.

CAUTION

A raised hand icon indicates **CAUTION** information that relates to a situation or condition that could lead to equipment malfunction or damage. You should not proceed until you read and thoroughly understand the **CAUTION** message.

NOTE

A note icon indicates **NOTE** information. Notes provide additional or supplementary information about an activity or concept.

Section 1: System Description

Function and Theory

The Geotech SpOILer Controllerless Recovery System (SpOILer) efficiently collects free-floating hydrocarbons in 2” (5 cm) or larger recovery wells. The system consists of an internally regulated stainless steel bladder pump, an attached Skimmer with floating intake cartridge (or buoy), air and discharge lines, and a well cap. Also available is an optional Pneumatic Tankfull Shut-off. In order for the system to operate, an air compressor is required.

The automatic stainless steel bladder pump has a two-phase pumping cycle. During the first phase, or pump “intake phase”, pressurized air is vented from the pump, thus creating a vacuum. This vacuum closes the top discharge check valve and opens the bottom intake check valve, causing product to be drawn through the Skimmer’s product intake assembly and into the pump.

During the second phase, or pump “discharge phase”, pressurized air is directed into the pump bladder, causing it to expand within the pump body. This action closes the bottom intake check valve and opens the top discharge check valve, thus forcing the recovered product from the pump up to the surface.

The SpOILer's unique product intake assembly, or Skimmer, incorporates both a density float and an oleophilic/hydrophobic filter that differentiates between floating hydrocarbons and water. The intake assembly follows the water table fluctuations and places the screen at the water/product interface, skimming light product (such as gasoline or diesel fuel) down to a sheen within the range of the float travel.

As the system cycles, product is drawn through the intake screen and is transferred to the pump through a coiled hose and the Skimmer’s transfer shaft.

Specific Gravity and Viscosity Limitations

The specific gravity of the product to be recovered must be less than 1.0 and its viscosity less than 50 SSU for use with the “light” oil filter, and 400 SSU for use with the “heavy” oil filter cartridge. Consult Geotech for product recovery operations with viscosities outside that range.

This type of filter technology is designed to be used in wells with free product of at least 1/8” (3 mm) thickness.

The presence of surfactants or detergents in the product requires careful application. When handling these contaminants, please consult Geotech.

System Components

Pump

The SpOILer System utilizes an internally regulated, air driven bladder pump. The major pump components consist of a stainless steel outer housing, top and bottom check valves, and a flexible inner bladder. The pump is designed for pumping liquids only; any solids (silt, dirt, etc.) may reduce its performance or cause the pump to malfunction.

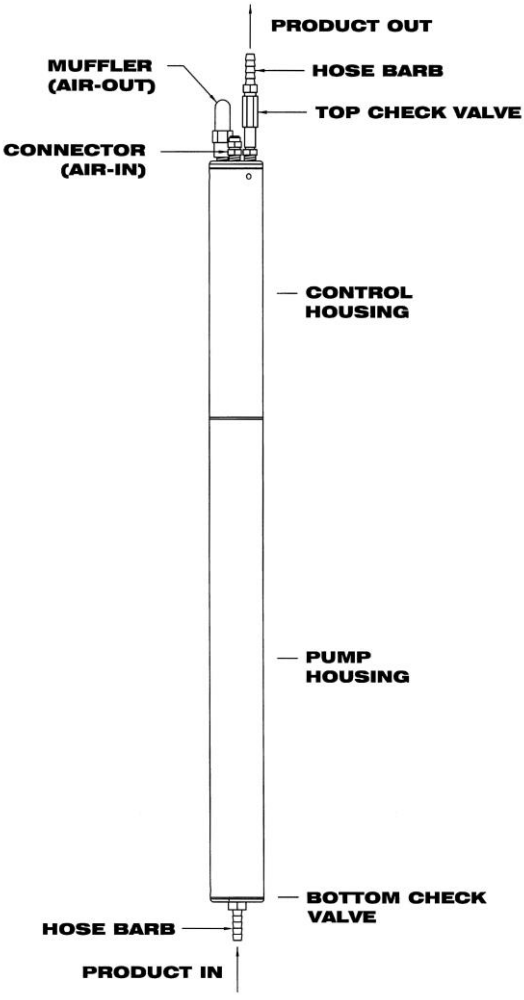

Figure 1-1: Pump

Skimmer Attachments

A standard Skimmer attachment (when connected to the stainless steel pump assembly) is designed for use in either 2” (5 cm) diameter wells or 4” (10 cm) diameter and larger wells. Figure 1-2 shows an example of the two most common Geotech Skimmers. These Skimmers come with a standard 100-mesh intake screen. A 60-mesh intake screen is also available for use with higher viscosity fluids. See Geotech Manual “Hydrocarbon Viscosity Test Kit” for more information on choosing the correct intake cartridge.

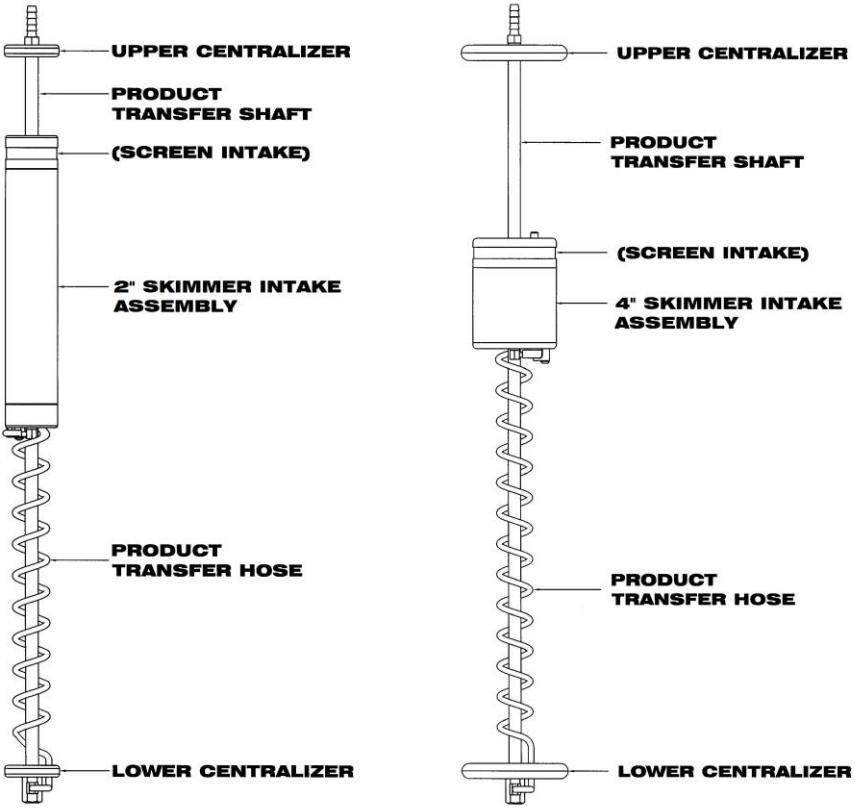

Figure 1-2: Standard 2” and 4” Skimmer Attachments

The Skimmer assembly is connected to the bottom of the stainless steel pump with a 6” (15 cm) piece of durable, fuel grade hose. The Skimmer consists of a product intake float, a coiled product transfer hose, and a transfer shaft. Well centralizers are placed at the top and bottom of the Skimmer shaft to protect the intake float and to allow unobstructed travel within the well. To accommodate water level fluctuations, standard 2” skimmers can provide 12” (30 cm) of intake travel and standard 4” skimmers can provide 16” (40 cm) of intake travel. Geotech provides up to 5’ (1.5 m) of travel (4” Skimmers only) on a custom order basis.

A Skimmer assembly will not draw water unless the intake cartridge is forcibly submerged, surfactants are present, or when the “conditioning” of the intake screen has been removed. See *Section 4: System Maintenance* for information on re-conditioning the intake screen.

Heavy Oil Skimmer Attachment

The optional Heavy Oil Skimmer attachment is designed to recover a range of fluids from gasoline to gear oil, skimming the product down to .01’ (3 mm) in 4” (10 cm) diameter and larger wells. This option is best suited when the viscosity of the hydrocarbon is greater than the capability of the filter screen technology (screen can no longer pass the hydrocarbon fluid).

The Heavy Oil Skimmer consists of a polypropylene intake buoy, a coiled product transfer hose, and a transfer shaft with well centralizers placed at the top and bottom. The intake buoy on the Heavy Oil Skimmer is designed to float at the oil/water interface and has a travel range of 24” (61 cm).

The intake buoy can also be “fine-tuned” by adjusting the intake fitting on the top of the buoy. Turning the fitting clockwise will lower the intake fitting relative to the product/water interface. Turning the fitting counter-clockwise will raise the intake fitting away from the interface. Figure 1-3 is an example of a Heavy Oil Skimmer assembly.

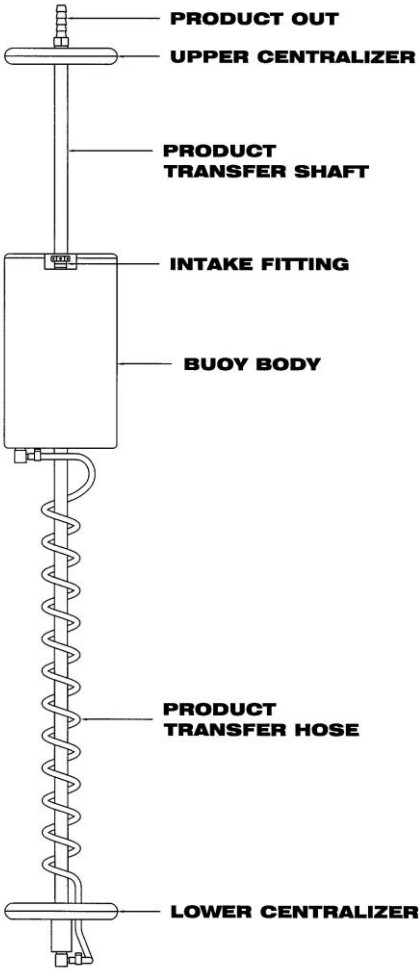

Figure 1-3: Heavy Oil Skimmer Attachment (optional)

Air Line and Discharge Hoses

Typically, conduit or 2" (5 cm) PVC pipe, buried below grade, should be used to protect the air and discharge lines from damage. Failure to safeguard the air and discharge lines may lead to uncontrolled pump discharge and/or compressor failure. The dimensions of the airline and discharge hose are:

Discharge Line	3/8" ID x 100' (30.5 m) L
Air Lines between Pump, Level Control Valve and Sensor Tube	1/4" OD x 50' (15.2 m) L

Tankfull Shut-off (Optional)

The Geotech Pneumatic Tankfull Shut-Off controller is a self-contained system used to turn off the air supply to pneumatic pumps or other pneumatic controllers. It is activated when a high liquid level or pressure increase condition in the recovery tank. The Tankfull Shut-off assembly consists of a sensing tube (made from PVC or stainless steel), control box, and optional 50' (15m) of airline.

The Geotech Tankfull controller uses compressed air to operate the pneumatic components until there is a high fluid level or pressure condition in the recovery tank. A minimum of 45 PSIG (3 bar) of air pressure is required for operation, however, components are rated for a maximum of 120 PSIG (8 bar) of air pressure. The panel can be mounted directly on the stainless steel sensor tube, or up to 50' (15.2m) away from the PVC sensor tube. A Tankfull indicator on the panel will show green when the system is operational and black when the system is off. When the product rises approximately 11" (28 cm) up the side of the Tankfull Shut-off Sensor tube, the valve closes, shutting off compressed air to the system. Once the recovery tank is drained, a manual reset on the control panel is required to resume system operation.

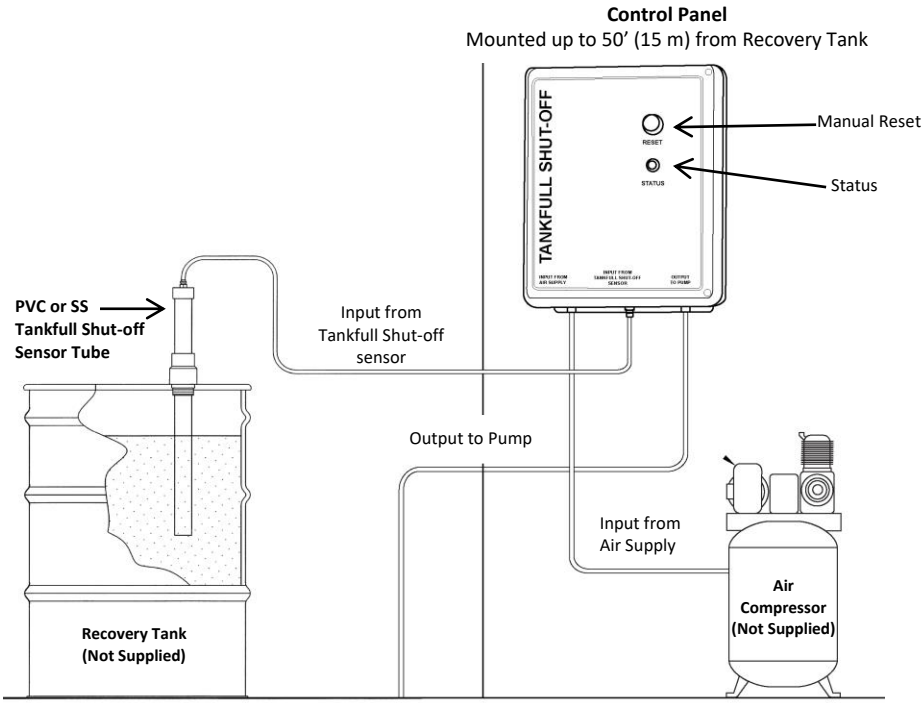

Figure 1-4: Tankfull Shut-Off Wall Mount (up to 50' (15.2 m) away)
**Air regulator not pictured*

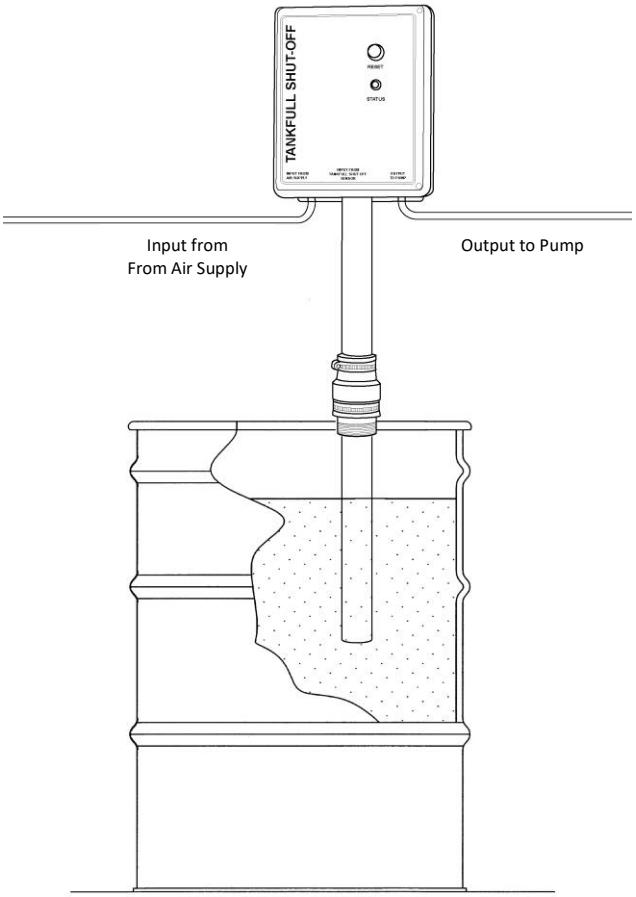

Figure 1-5: Tankfull Shut-Off mounted at recovery tank w/ SS Tankfull Shut-off Sensor

Air Compressor (Purchased Separately)

Refer to instructions provided with the air compressor for installation procedures. An automatic tank drain and an air dryer may be required for the air compressor if the system is operating in humid conditions. Bottled air may be used to operate the SpOILer System if operating an air compressor is not feasible. A high-pressure regulator must be used to reduce the air pressure to the range of 60 PSI (4 bar) to 100 PSI (7 bar). Pressures outside of this range may cause the system to malfunction.

Product Recovery Tank (Purchased Separately)

A product recovery tank with a 2” NPT bung opening for the Tankfull Shut-off Sensor tube, a product inlet opening, and a vent are required for proper operation – typically a 55 gallon (208 liter) drum or other suitable container. Check government regulations regarding fuel storage before selecting a recovery tank.

Section 2: System Installation

Planning Your SpOILer Installation

To successfully plan the installation of the SpOILer System, use the following guidelines to determine a suitable location for the air compressor, recovery tank, and Pneumatic Tankfull Shut-off (also refer to the System Schematics in *Section 7: System Schematics*):

- The standard SpOILer system does not include an air compressor. When installing an air compressor, do not locate the compressor in an area where there may be explosive vapors. Compliance with Section 5 of the U.S. National Electric Code Handbook and any local codes is essential for an electrically safe installation.

- Run all air and discharge lines through pipe or conduit to protect the lines from damage.

- All airline connections must be installed properly for the system to function correctly. When cutting the airline, the cut must be clean and square. When inserting the airlines into the compression fittings, push the airline firmly into the fitting, hand tighten the compression nut, and then tighten one more full turn with a wrench.

SpOILEr Installation

Prior to installation, prime the intake screen with diesel fuel or a similar hydrocarbon. For optimum performance, use the same down well hydrocarbon to be recovered. In order to avoid damage, prime the intake screen using a soft bristle brush.

1. Remove the inner ring of the well cap and secure it to the well casing using the three setscrews located on the perimeter of the ring (for those systems using a well cap).

2. Calculate the tubing lengths required to install the SpOILer.
   - Tubing lengths cannot exceed 180’ (55 m) in well depth, or more than 500’ (152 m) total system length.
   - To calculate the amount of air line and discharge hose required to suspend the pump and Skimmer in the well, first determine the following lengths:
     - Measure the static water depth in the well using a Geotech Interface Probe.
     - Measure the distance between the wellhead and the compressor.
     - Measure the distance between the wellhead and the product recovery tank.
   - See Figure 2-2 for a view of the Skimmer in relation to the well cap and static water level.

Do not make any cuts to the tubing until all measurements, between the compressor and wellhead, and from the wellhead to recovery tank have been made.

3. If needed, attach the Skimmer to the bottom of the stainless steel pump using the 6” (15 cm) piece of rubber fuel hose and hose clamps provided.
   - Ensure both ends of the hose are placed as far as they can go on each hose barb and then tighten the hose clamps in place. Refer to Figure 2-1.

This hose connection is important. An old or brittle piece of fuel hose or a loose hose clamp between the pump and Skimmer could cause the Skimmer to detach and fall into the well. Always inspect this connection prior to use.

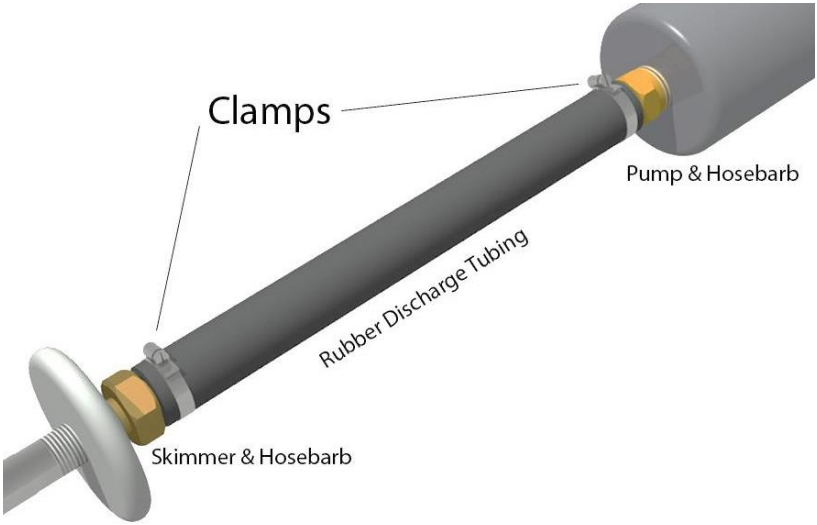

Figure 2-1: Connection between stainless steel pump and intake

4. Pull the measured lengths of airline and discharge hose through the fittings on the well cap (when applicable).

5. Fully tighten the compression fittings around the hose and tubing at the well cap.
   - The well cap is designed to suspend the pump and Skimmer assembly by the sturdier discharge hose.

6. Attach the air and discharge lines to the pump using the provided brass nut and hose clamp respectively.

7. Push the airline into the fitting and tighten the compression fitting with a 7/16" wrench, one turn past hand tight.

8. Put a hose clamp over the discharge line, and push the line onto the barb at the top of the pump and tighten.

9. After attaching the needed lengths of tubing, place the pump and Skimmer assembly into the well so that the midpoint of the intake float travel lies on the static water level measured.
   - The well cap will suspend the pump and Skimmer by the discharge hose.

10. Connect the airline from the pump to an air compressor (or to the output of the Tankfull Shut-off Sensor if used).

11. Connect the product discharge hose from the pump to the product recovery tank.

12. Ensure that both lines are kept level and that there are no kinks or sags in the lines. When possible, enclose the lines within a secondary pipe or conduit to protect them from damage.

Tankfull Shut-off Installation

Install the sensing tube in the 2” NPT bung opening on the discharge tank.

Test Tankfull Shut-off Sensor

1. Test the Tankfull Shut-off Sensor by immersing the sensor tube in a pail of water (at least 12” (30 cm) deep) while the system is cycling.
   - Within one cycle, the sensor will shut off the air supply to the control panel.

2. When the sensing tube has been removed from the water, test to be sure the system remains off until the reset is pressed.
   - If the system does not function as described, check the fittings at both the controller and sensing tube, and check for kinks in the sensor airline.

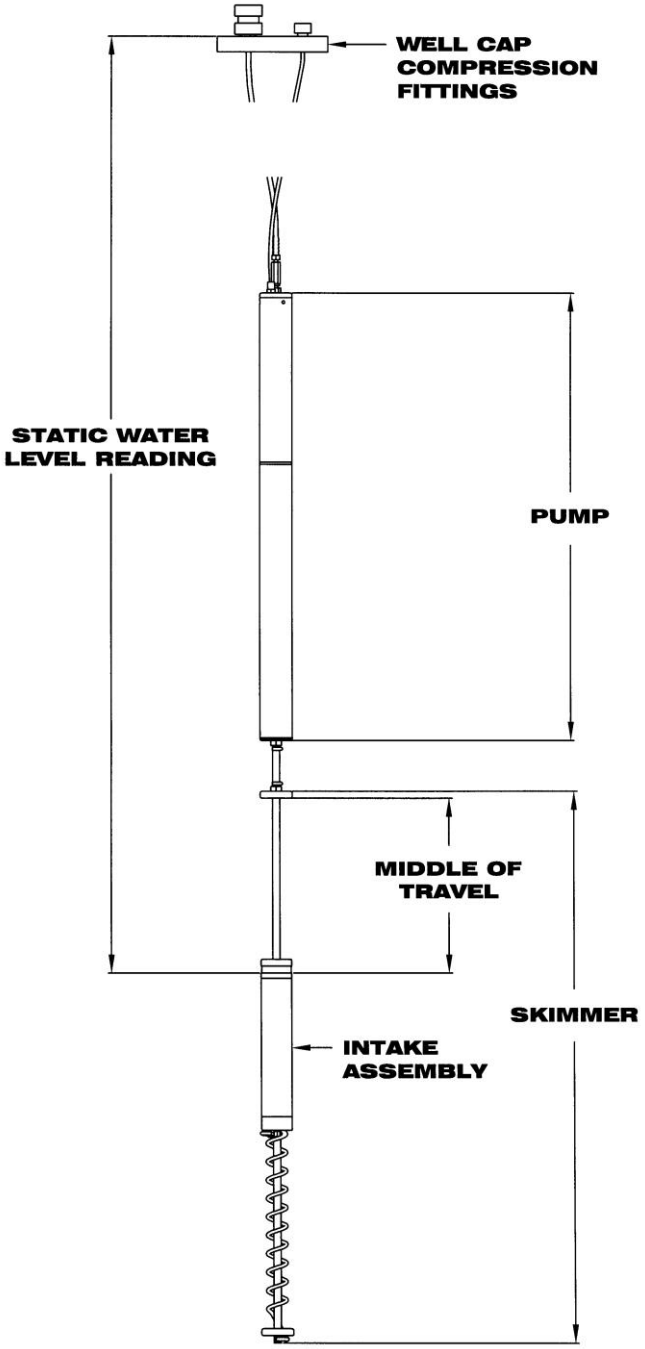

Figure 2-2: Pump and Skimmer Assembly with Well Cap

Section 3: System Operation

1. Start the air compressor. Refer to Air Compressor manual operation instructions.

2. The pump will begin operation when the air supply is turned on.
   - The pumping rate is pre-set and does not need to be adjusted.
   - The pumping rate may be adjusted based on the amount of product in the well.

Tankfull Shut-off Sensor

- A minimum of 45 PSIG (3 bar) air pressure is required for operation.

- When liquid level rises 11” (28 cm) up the pressure tube, the valve closes shutting off compressed air to the system.

- When an alarm is triggered, the recovery tank must be emptied. Once the recovery tank is drained, a manual reset on the control panel is required to resume system operation.

Adjusting the Cycle Timer

The Cycle Timer is factory set at “I”.

When adjusting the Cycle Timer, leave the air connected. DO NOT use more than 40PSI of air pressure when adjusting the Cycle Timer. Using air pressures higher than 40PSI will damage the bladder.

1. Remove the stainless steel plug at the center of the top cap using a 5/32 alan wrech.

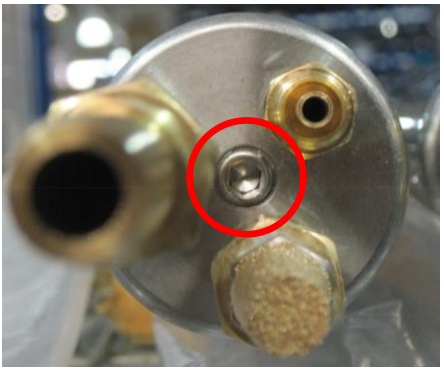

Figure 3-1: Stainless Steel Plug Removal

Do not remove the top cap. Removing the top cap will void the warranty.

2. Using a long flat-head screw driver, locate the Cycle Timer.

3. Turn the timer 1/4 counter clockwise until the pump stops cycling. When the pump stops cycling, the timer is set to “0”.
    - The Cycle Timer will run faster before it stops.

4. Once the timer stops, turn Cycle Timer 1/4 clockwise. This will set the timer to “I”.
    - Each quarter turn will change the Cycle Timer to “II”, “III” and then back to “0”.

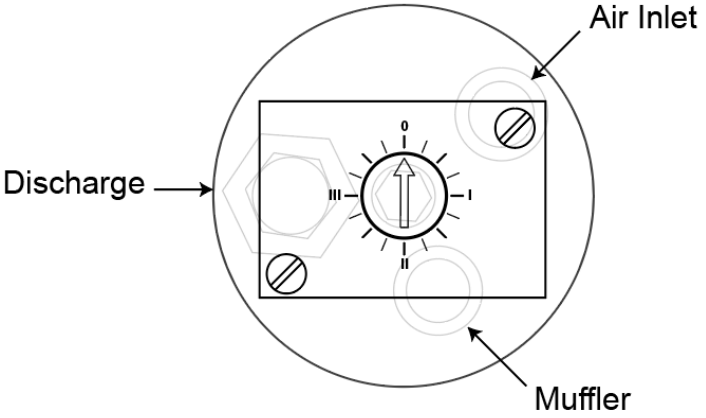

Figure 3-2: Adjusting the Cycle Timer
**NOTE: Position of Cycle Timer relative to the top cap may not match figure*.

5. After setting the Cycle Timer to the desired setting, re-install the Stainless Steel plug.

Use thread tape or thread sealant on the plug when re-installing.

Use the table below to determine preferred Cycle Timer Setting:

Cycle Timer Setting	Cycles per/min	mL per minute
0	0	0
I	15	540
II	5	180
III	1	36

**Every muffler discharge is one cycle.*

Section 4: System Maintenance

Always ensure all hose and tubing fittings at the pump and between the pump and Skimmer are tight prior to deploying the unit into the well.

Weekly Maintenance

- Turn the air compressor off and drain the air tank(s). On air compressors without an optional automatic condensate drain, open the drain fitting on the bottom of the compressor tank(s) and drain any accumulated water. The tank(s) must be drained regularly to avoid compressor malfunction.
- Check and adjust the compressor.
- Inspect the compressor for loose fittings. Over time, vibration may cause bolts to loosen or air leaks to develop. If uncorrected, excess air consumption and shortened compressor life will result.
- Verify pump settings and fluid levels in the well. Make sure that the pump and skimmer are set at the correct interval for collection of free product.

Monthly Maintenance

- Pull the pump and Skimmer from the well.
- Inspect all tubing for cracks, kinks and damage. Replace any old and brittle tubing.
- Inspect the coiled tubing for physical damage or obstructions. Verify the intake assembly moves freely over its travel range.
- Inspect the float (buoy) and intake screen. Clean the intake screen and float using the method described in this section.
- Inspect the Skimmer assembly for signs of physical damage. Scrapes or dents in the screen intake may cause the Skimmer to take on water. If such damage is found, a new 2” or 4” intake assembly may be necessary.
- Clear away any debris collected in the well vault (or above ground casement).
- Measure the well and record product layer thickness and depth to water from top of well casing.
- Place a pump positioning mark or zip tie on the discharge hose (usually black) even with the top of well casing.
- Re-deploy pump, aligning new depth to water mark on discharge hose with top of well casing.
- Check the Tankfull Shut-off Sensor for proper operation.

Quarterly Maintenance

- Pull pump and Skimmer from the well.
- Clean the well screen (site specific, primarily to clear bio growth and keep thick degraded product from impeding conductivity to the well at the product layer. Frequency to be determined by user).

- Place float assembly in water to verify the screen stays out of the water at the top of the traverse range. If it does not, replace the coiled tubing and retest. If it still does not, replace the float assembly.

Yearly Maintenance

- Pull the pump and Skimmer from the well.
- Open pump and clean interior and parts with soapy water.
- Degrease the check disk and check ball seats. Spray with silicone based lubricant or kerosene.
- Clean and prime intake screen using the method described in this section.

Cleaning the Skimmer and Intake Screen

Standard 2" and 4" Skimmers will usually come with a float containing a 100 or 60-mesh intake screen. When required, gently clean the screen with a silicone based lubricant or kerosene using a soft bristle brush to remove emulsified product, bio growth, or other debris. Avoid damaging the screen intake. Rinse the product intake assembly with clean water and make sure it is completely dry before reconditioning the intake screen.

For Heavy Oil Skimmers, first use warm soapy water, followed by silicone based lubricant or kerosene to remove debris or bio growth from the buoy body, then rinse and let dry.

Using warm, soapy water, clean all debris and bio growth from the Skimmer shaft and coiled tubing.

Conditioning the Intake Screen

Prior to initial deployment, and after every cleaning, the intake screen must be conditioned (or primed) with diesel fuel or other similar hydrocarbon. Use a soft bristle brush to saturate the screen portion of the intake thoroughly. Prime the intake screen with diesel fuel or a similar hydrocarbon. For optimum performance, use the same down well hydrocarbon to be recovered. In order to avoid damage, prime the intake screen using a soft bristle brush.

Bladder Replacement

The pump is fitted with a field replaceable bladder for easy repair on the job site (see Figure 8-1).

1. Remove the lower pump housing from the upper control housing by unscrewing the two parts.

2. Slide the lower housing off.

3. Unscrew the old bladder from the upper housing and screw on the new one.
   - The bladder can be tightened snugly by hand.

4. Re-attach the lower housing to the upper pump assembly.

Section 5: System Troubleshooting

Problem: The pump is only discharging water, not product.

Solutions:
The water level has risen above the travel range of the Skimmer.

- Pull the pump and Skimmer out of the well. Purge the water out of the intake and pump by allowing the system to cycle for several minutes, prime the intake cartridge screen.

The pump position has slipped, or the pump was installed below the water level in the well.

- Prime the intake cartridge screen, re-position the pump and Skimmer.

The intake assembly will not slide freely, or the coiled hose is tangled.

- Inspect the Skimmer assembly and repair as necessary.

Loose hose or tubing on fittings below intake level.

- Check all fitting connections.

Problem: The pump discharges air only, no product.

Solutions:
Product has been removed.

The Product layer is below the bottom of the Skimmer's travel range.

- Adjust the position of the Skimmer assembly within the well.

The Skimmer assembly has detached from the pump (due to a cut hose or loose hose clamp.)

- If the Skimmer assembly cannot be removed from the well then a new Skimmer will be needed.

The pump bladder has ruptured.

- Replace the pump bladder. Refer to *Section 8: Replacement Parts List* or contact Geotech for further information.

Problem: The pump cycles but does not discharge product.

Solutions:
One or both of the pump check valves are malfunctioning.

- Remove and clean pump assembly, or replace check valve components.

The viscosity of the product is too thick for the Skimmer.

- Contact Geotech to discuss other Skimmer options for the type of product in the well.

The intake screen is obstructed or the coiled hose is kinked.

- Verify that the intake is clean of debris and bio growth
- Check the condition of the coiled hose.

Problem: The pump does not operate.

Solutions:
The product recovery tank is full.

- Empty the recovery tank. Push reset on the Tankfull Shut-off control box. The system will now resume operation.

The air compressor's air valve is closed.

- Turn the valve on the air outlet of the air compressor to the "ON" setting and re-check the air pressure.

Problem: The compressor is not operating.

Solutions:
The fuse or circuit breaker trips continuously when used with an extension cord.

- Replace the fuse or reset the circuit breaker. Avoid using an extension cord, or use a larger gauge extension cord.

Electrical circuit not rated for compressor operation.

- Use a circuit with larger amperage rating.

The air compressor has an electrical problem.

- Contact the air compressor manufacturer directly or contact Geotech for further information.

Problem: The air compressor runs constantly.

Solutions:
There is an air leak in the air compressor or airline.

- Inspect the air compressor and airlines, and tighten fittings or replace the airline as needed.

The air compressor has a mechanical problem.

- Contact the air compressor manufacturer directly or contact Geotech for further information.

Section 6: System Specifications

General Specifications

Application:	2” (5 cm) or larger recovery wells
Maximum Depth	180’ (55 m)
Oil/Water Separation:	Oleophilic/hydrophobic mesh screen
Maximum Pressure:	120 PSI (8.3 bar)
Operating Pressure:	60 PSI (4 bar) min, 80 PSI (5.5 bar) -100 PSI (6.9 bar) recommended
Discharge Line:	.375” ID x .5” OD (Polyethylene or fuel grade Synthetic Rubber)
Air Lines:	.170” x .25” OD x 50’ (15 m)

Stainless Steel Pump

Size:	30.75" L x 1.75" OD (78 cm L x 4.5 cm OD)
Weight:	5.8 lbs. (2.6 kg)
Materials:	Stainless steel and engineered plastics
Air Line:	.170” ID x .25” OD (Polyethylene)
Discharge Line:	.375” ID x .5” OD (Polyethylene or fuel grade)

2” Skimmer Assembly

Size:	35.5” L x1.75” OD (90 cm L x 4.5 cm OD)
Weight:	1.75 lbs. (0.8 kg)
Materials:	304 SS, Polyethylene, PVC, PP, and Brass Fittings
Effective Travel:	12” (30.5 cm) Standard Travel
Operating Temperature:	32º to 100º F (0° to 38° C)

Minimum fluid level to activate Skimmer = 15” (38 cm)

4” Skimmer Assembly

Size:	35.5” L x 3.75” OD (90 cm L x 9.5 cm OD)
Weight:	2.25 lbs. (1 kg)
Materials:	304 SS, Polyethylene, PVC, PP, and Brass Fittings
Effective Travel:	16” (40 cm) Standard Travel, up to 5’ (1.5 m) available
Operating Temperature:	32º to 100º F (0° to 38° C)

Minimum fluid level to activate Skimmer = 9” (23 cm)

4” Heavy Oil Skimmer Assembly

Size:	40” L x 3.75” OD (102 cm L x 9.5 cm OD)
Weight:	2.5 lbs. (1.1 kg)
Materials:	304 SS, PP, and Brass Fittings
Effective Travel:	24” (61 cm) Standard Travel
Operating Temperature:	32º to 100º F (0° to 38° C)

Minimum fluid level to activate Skimmer = 15” (38 cm)

Tankfull Shut-Off

Control Box Size:	11.5” H x 9.5” W x 5.5” D (29 cm H x 24 cm W x 14 cm D)
Overall Size:	36.5” H x 9.5” W x 5.5” D (93 cm H x 24 cm W x 13 cm D
Weight:	9.6 lbs. (4.3 kg)
Process Connections:	1/4" NPT air tubing 2” (5 cm) NPT sensing tube
Min. Operating Temperature:	34°F (1°C)
Flow Capacity:	10 SCFM @ 90 PSIG (6 bar)
Pressure Range:	45-120 PSIG (3-8 bar)

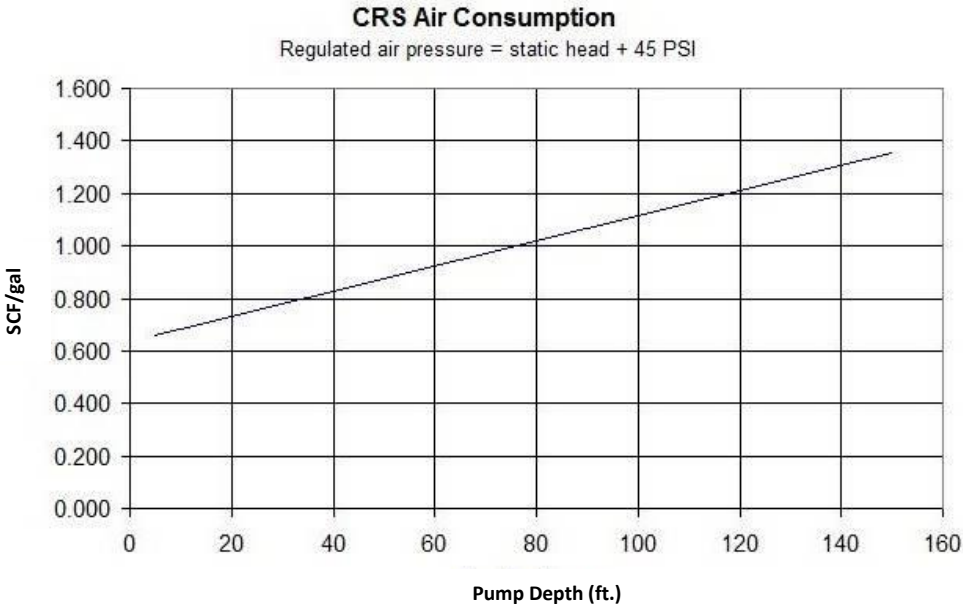

Figure 6-1: CRS Air Consumption

Section 7: System Schematics

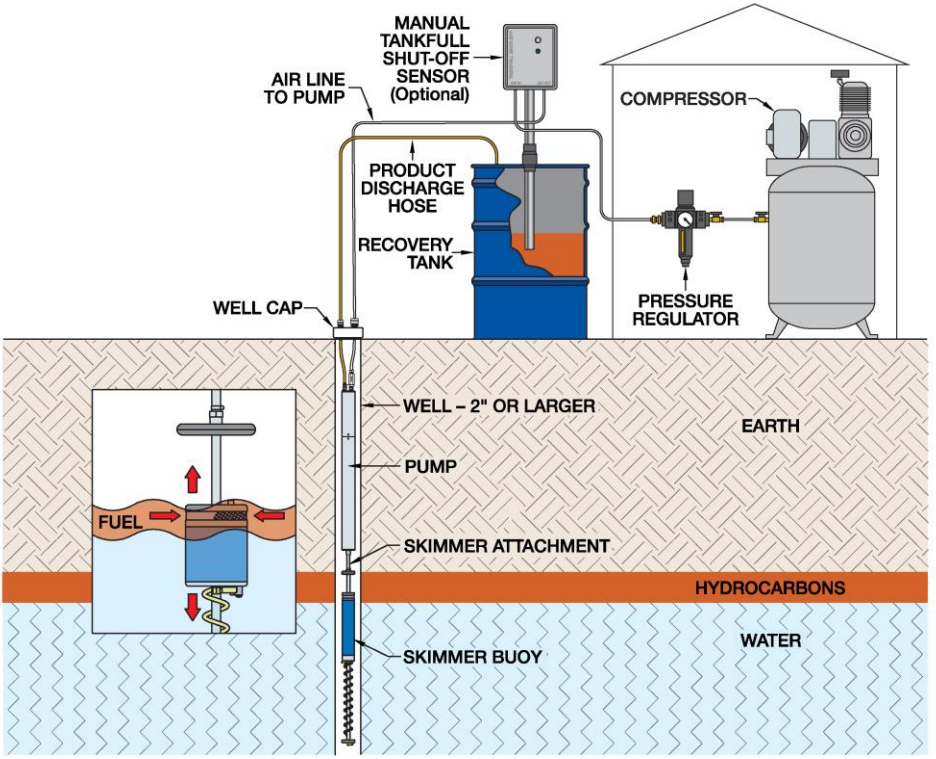

Figure 7-1: Typical Site Installation with optional Tankfull Shut-off with Manual Restart

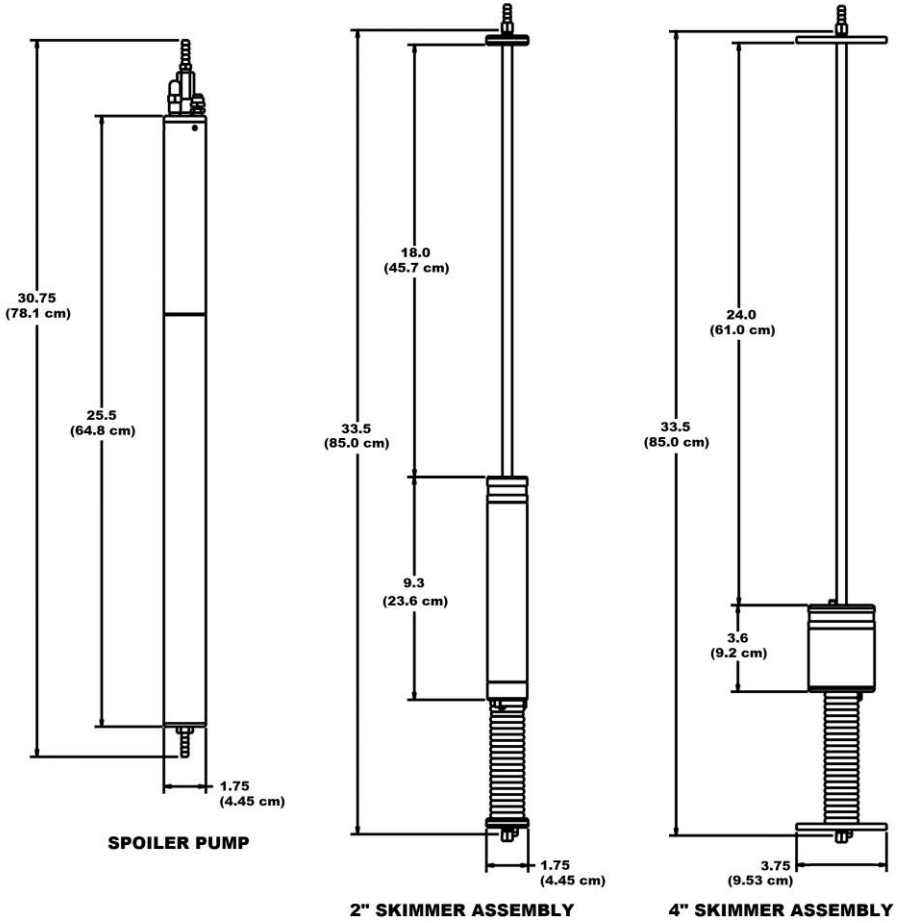

Figure 7-2: SpOILer and Skimmer Dimensions

Section 8: Replacement Parts List

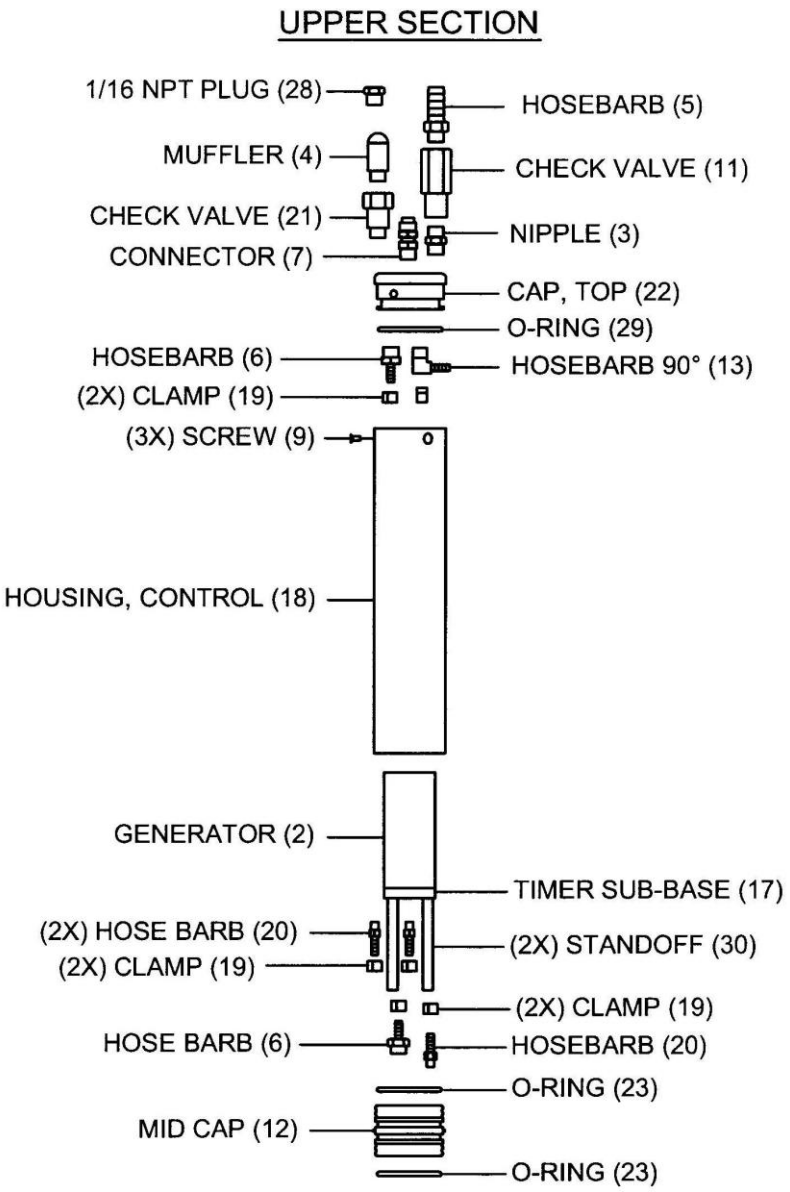

Figure 8-1: Upper Half of SpOILer Pump Assembly

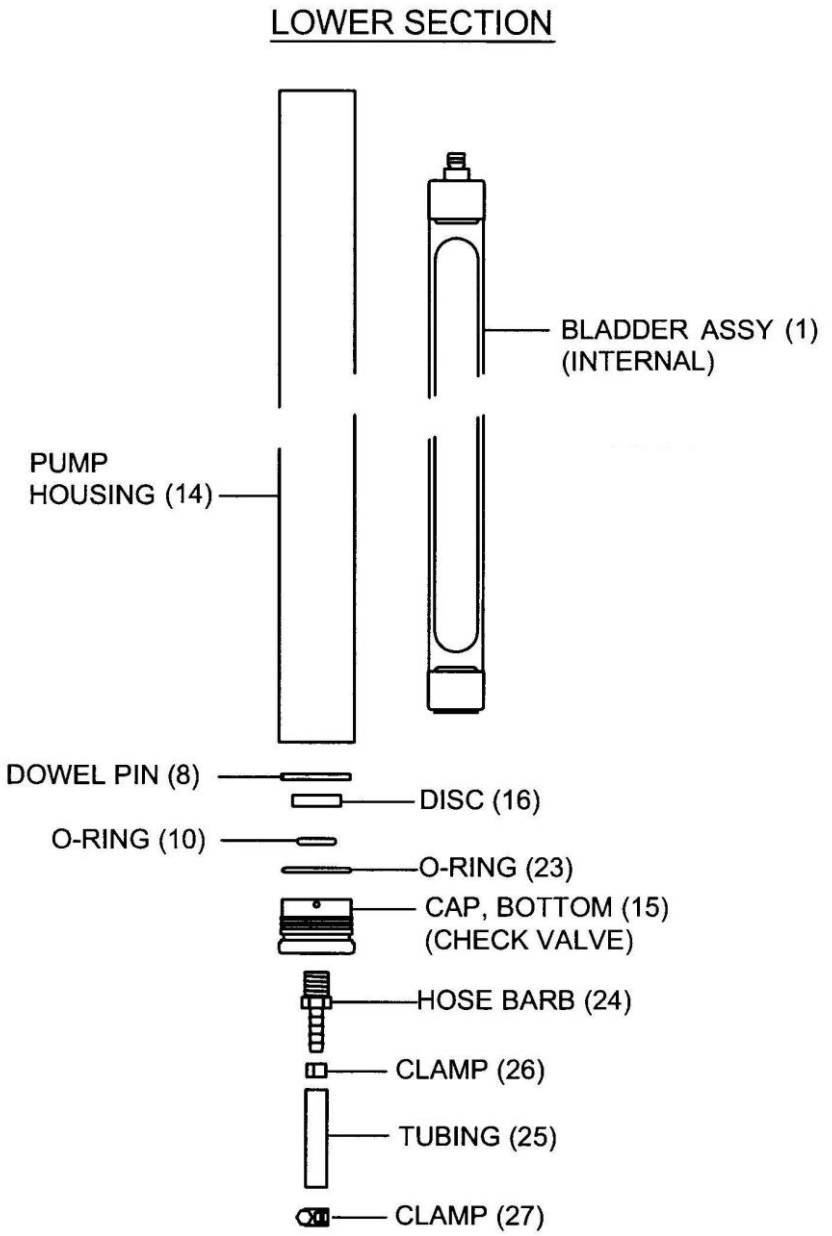

Figure 8-2: Lower Half of SpOILer Pump Assembly

Upper Section Stainless Steel Pump Assembly (56600010)

Item #	Parts Description	Parts List
1	ASSY,BLADDER,CRS/PRS	56600013
2	GENERATOR,FREQ,.02-8HX,ADJUST	16600066
3	NIPPLE,BRS,HEX,1/8NPT	17500151
4	MUFFLER,1/8",NPT	16600022
5	HOSEBARB,BRS,3/8"X1/8MPT	16650310
6	HOSEBARB,BRS,1/8"X1/8NPT	16600065
7	TUBE,CONN,1/4X1/8MPT,POLYTITE PUMP	16600037
8	PIN,SS,DOWEL,CHK DISK CRS/PRS	26600162
9	SCREW,SS8,4-40x1/4",FLHD,PHLPS	17500161
10	O-RING,VITON,#208	16600023
11	VALVE,CHECK,PRODUCT DISCHARGE CRS/PRS PUMP	26600157
12	MIDCAP,SS,CRS	26600022
13	HOSEBARB,BRS,.170"X1/8MPT,90D	17500148
14	HOUSING,SS,PUMP,CRS/PRS	26600013
15	CAP,SS,BOTTOM,CRS/PRS	26600018
16	DISC,PVC,CHECK	26600017
17	SUB-BASE,AL6,CONTROL,CRS	26600020
18	HOUSING,SS,CONTROL,CRS	26600021
19	CLAMP,SS,STEPLESS EAR,7MM	16600005
20	HOSEBARB,BRS,1/8"X10-32,MALE	17500168
21	CHECK VALVE,1/8MPTX1/8FPT 2.5PSI	16600068
22	CAP,TOP,SS,CRS	26600019
23	O-RING,VITON,#128	16600030
24	HOSEBARB,BRS,3/8"X1/4MPT	16650323
25	TUBING,RBR,3/8x5/8,FT PRODUCT DISHCARGE	16600019
26	CLAMP,SS,STEPLESS EAR,17MM	16600004
27	CLAMP,SS6,WORM,7/32-5/8"	16600063
28	PLUG,SS,1/16NPT,HEX SCKT	17500319
29	O-RING,VITON,#220	11200298
30	STANDOFF,AL6,6-32X2.25 KEYSTONE 1856	12050120

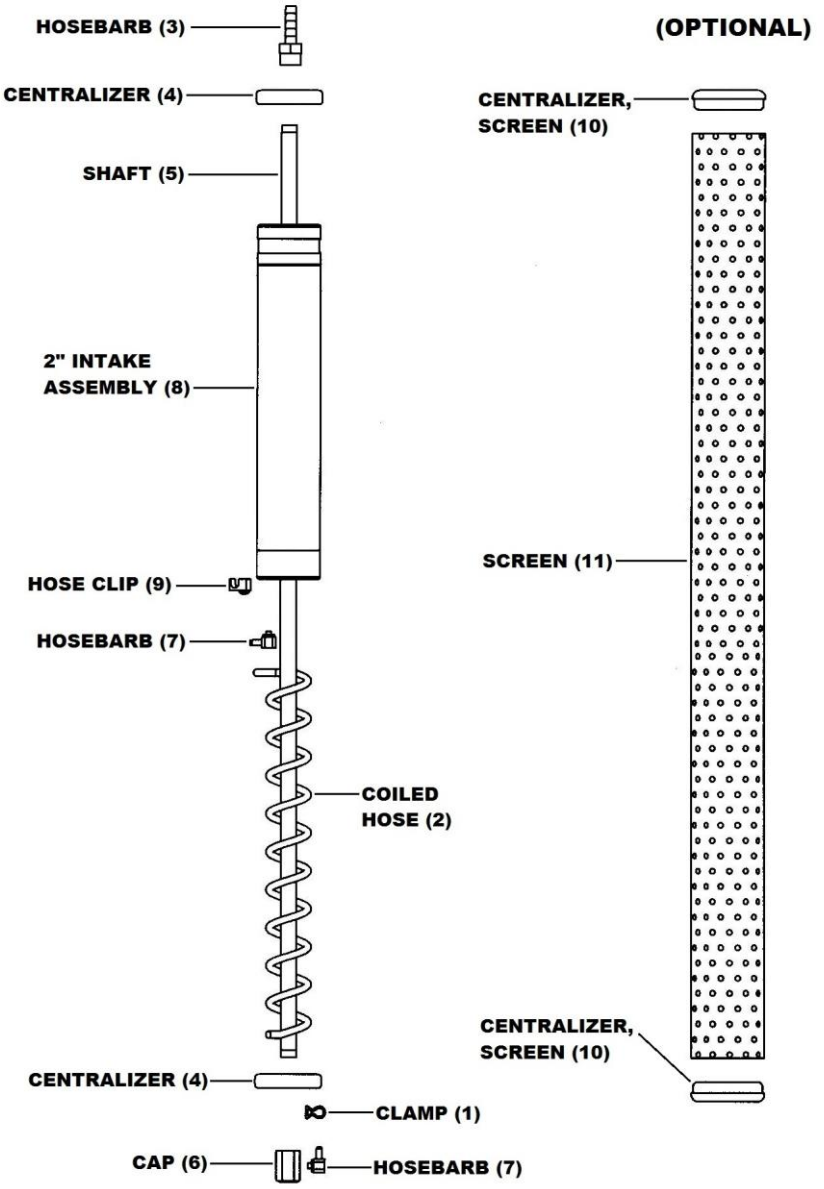

Figure 8-3: Standard 2” Skimmer Assembly

2” Skimmer Assembly 100-mesh (56600003) and 60-mesh (56600069)

Item #	Parts Description	Parts List
1	CLAMP,SS,STEPLESS EAR,7MM	16600005
2	HOSE,COILED,PR2	26650304
3	HOSEBARB,BRS,3/8"X1/8FPT	16650308
4	CENTRALIZER,PVC,SKIMMER,2"	26650306
5	SHAFT,SS,SKIMMER,33.5",PRC	26600002
6	CAP,BRS,1/8FPTx10-32 90 DEG	16600064
7	HOSEBARB,BRS,1/8"X10-32,90DEG	17500149
8	ASSY,BUOY,SKIMMER,2"100MESH	56650309
	ASSY,BUOY,SKIMMER,2" 60 MESH	56650312
9	HOSE CLIP,SKIMMER FLOAT	26650028

2" Skimmer Options

10	CENTRALIZER,PVC,SCREENED PR2	26600186
11	SCREEN,SS,1.88"ODX32.7" STRAIGHT WELD	26600188

Additional 2" Skimmers

	ASSY,SKIMMER 2”,100M W/SCREEN	56600054
	ASSY,SKIMMER,2",60M,W/SCREEN	56600071

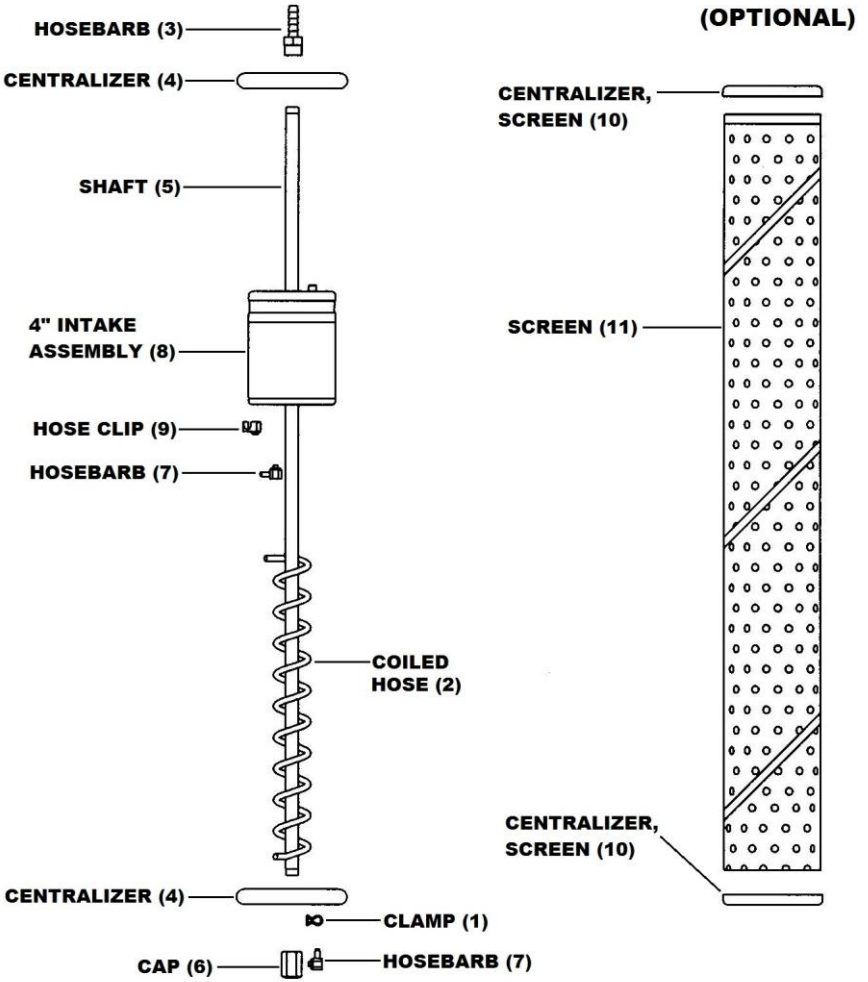

Figure 8-4: Standard 4” Skimmer Assembly

4” Skimmer Assembly 100-mesh (56600004) and 60-mesh (56600070)

Item #	Parts Description	Parts List
1	CLAMP,SS,STEPLESS EAR,7MM	16600005
2	HOSE,COILED,PR4	16650312
3	HOSEBARB,BRS,3/8"X1/8FPT	16650308
4	CENTRALIZER,SKIMMER,PR4	16600048
5	SHAFT,SS,SKIMMER,33.5",PRC	26600002
6	CAP,BRS,1/8FPTx10-32 90 DEG	16600064
7	HOSEBARB,BRS,1/8"X10-32,90DEG	17500149
8	ASSY,BUOY,SKIMMER,4"100 MESH	56650310
	ASSY,BUOY,SKIMMER,4" 60 MESH	56650313
9	HOSE CLIP,SKIMMER FLOAT	26650028

4" Skimmer Options

10	CENTRALIZER,PVC,SCREENED PR4	26600187
11	SCREEN,SS,3.67" DIAM X32.7"	26600189

Additional 4" Skimmers

	ASSY,SKIMMER,4",100M,W/SCREEN	56600055
	ASSY,SKIMMER,4",100 MESH,5 FT EXTENDED TRAVEL	56600008
	ASSY,SKIMMER,4",60M,W/SCREEN	56600072
	ASSY,SKIMMER,4",60 MESH,5 FT EXTENDED TRAVEL	56600073

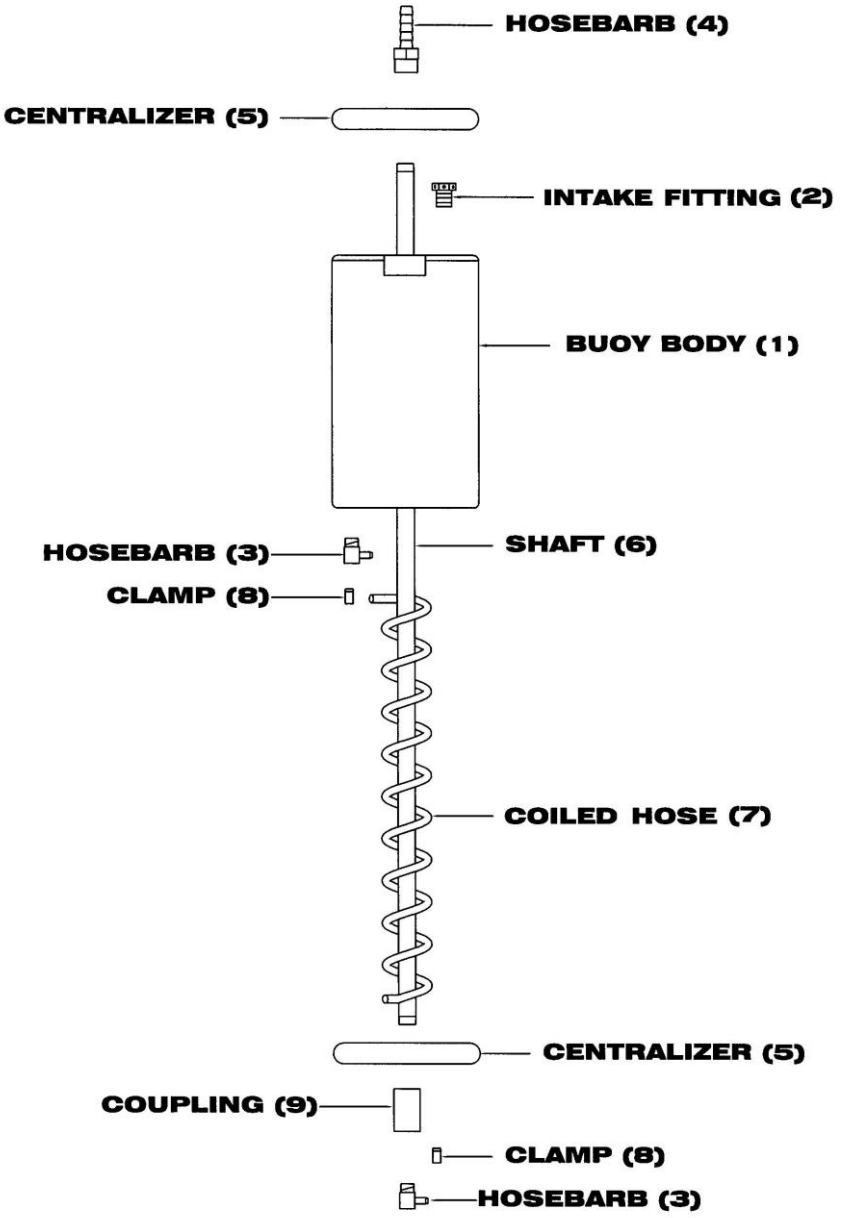

Figure 8-5: 4" Heavy Oil Skimmer Assembly

4” Heavy Oil Skimmer (56600005)

Item #	Parts Description	Parts List
1	BUOY,PP,HEAVY OIL	26600004
2	FTG,INTAKE,OIL BOUY	26600005
3	HOSEBARB,BRS,.170"X1/8MPT,90D	17500148
4	HOSEBARB,BRS,3/8"X1/8FPT	16650308
5	CENTRALIZER,SKIMMER,PR4	16600048
6	SHAFT,SS,OIL SKIMMER,38"	26600006
7	HOSE, COILED, PR4	16650312
8	CLAMP,SS,DBL PINCH,9/32-23/64"	11200273
9	COUPLING,BRS,1/8 NPT	17200176

4" Heavy Oil Skimmer Options

	ASSY,BUOY,OIL SKIMMER,4"	56600060

SpOILer Controllerless Recovery System Accessories

Part Description	Parts List
MANUAL,INSTRUCTION,CRS	26600024
ASSY,PUMP,CRS	56600010
TUBING,RBR,3/8x5/8,100FT RL PRODUCT DISHCARGE	16600072
TUBING,NYL,1/4ODx0.040W,BLK	16600039
CLAMP,SS,STEPLESS EAR,7MM	16600005
CLAMP,SS6,WORM,7/32-5/8"	16600063
MANUAL,TEST KIT,HYDROCARBON VISCOSITY	26030020
TEST KIT,HYDROCARBON VISCOSITY	86020001

Tankfull Shut-off Sensors and Accessories

CONTROL BOX,GEOTFSO,TANKMOUNT	56600066
VALVE,LVL CNTRL,W/ MAN RESET	16600172
VALVE, RESET, PNEUMATIC	16600171
FILTER,1/4NPT,AUTODRAIN	16600014
TUBE,SS,SENSOR,TANKFULL	16600074
COUPLING,PVC,2”X1.5”	16600078
TUBING,NYL,1/4ODX.040”W,BLK	16600039
CONTROL BOX,GEOTFSO,WALL MOUNT`	56600009
VALVE,LVL CNTRL,W/MAN RESET	16600172
VALVE,RESET,PNEUMATIC	16600171
FILTER,1/4NPT,AUTODRAIN	16600014

ASSY,TUBE,TANKFULL SENSORM PVC	56600061
TUBE,PVC,SENSOR,TANKFULL	26600077
COUPLING,PVC,2”X1.5”	16600078
TUBING,NYL,1/4ODX.040”W,BLK	16600039

Project/EDCF #	Description	Date
-	Previous Release	12/11/12
Project 1424	Part number updates, minor edits, Tankful Shut-Off updates, air compressor option updated –StellaR	3/17/17
Project 1630	Added Cycle Timer adjustment instructions – StellaR	7/11/2018

NOTES

NOTES

The Warranty

For a period of one (1) year from date of first sale, product is warranted to be free from defects in materials and workmanship. Geotech agrees to repair or replace, at Geotech's option, the portion proving defective, or at our option to refund the purchase price thereof. Geotech will have no warranty obligation if the product is subjected to abnormal operating conditions, accident, abuse, misuse, unauthorized modification, alteration, repair, or replacement of wear parts. User assumes all other risk, if any, including the risk of injury, loss, or damage, direct or consequential, arising out of the use, misuse, or inability to use this product. User agrees to use, maintain and install product in accordance with recommendations and instructions. User is responsible for transportation charges connected to the repair or replacement of product under this warranty.

Equipment Return Policy

A Return Material Authorization number (RMA #) is required prior to return of any equipment to our facilities, please call our 800 number for appropriate location. An RMA # will be issued upon receipt of your request to return equipment, which should include reasons for the return. Your return shipment to us must have this RMA # clearly marked on the outside of the package. Proof of date of purchase is required for processing of all warranty requests.

This policy applies to both equipment sales and repair orders.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

Equipment Decontamination

Prior to return, all equipment must be thoroughly cleaned and decontaminated. Please make note on RMA form, the use of equipment, contaminants equipment was exposed to, and decontamination solutions/methods used. Geotech reserves the right to refuse any equipment not properly decontaminated. Geotech may also choose to decontaminate the equipment for a fee, which will be applied to the repair order invoice.