



*World Leaders in Oil Spill Control Technology . . . Since 1960*

# SLURP



## *Operations Manual*

18 Beach St., Seymour, CT 06483  
Phone (203) 888-7700 Fax (203) 888-7720  
Email [info@slickbar.com](mailto:info@slickbar.com) Website [www.slickbar.com](http://www.slickbar.com)

## **INTRODUCTION**

SLURP (Self-Leveling Unit for Removing Pollution) is a floating weir-type oil skimmer, originally developed by the Esso Research Centre, Abingdon, England. Its primary application is to remove oil and other floating pollutants from the surface of protected waters.

The SLURP is remotely controlled from the pump; there is nothing to adjust at the skimmer. It works well in long swells and even in short, choppy waves because of its unique design. And unlike most conventional floating weir-type skimmers which become unstable when the weir level is set very close to the surface, the SLURP will adjust to any depth of weir immersion and skim the thinnest of slicks.

No moving parts means low maintenance and easy operations. The SLURP system is easily transportable because of its light weight. In addition, the compact design allows operation in water depths of 5 inches for the aluminum model, 10 inches or less for steel.

## **DESCRIPTION**

### **How it works**

The SLURP is self-stabilizing which allows the depth of weir immersion to be controlled remotely at the pump. Changing the flow rate alters the SLURP's equilibrium position in such a manner that the depth of weir immersion matches the inflow of liquid to the pumping rate.

Figure 1 is a cross-section of the SLURP skimming a thick slick. As the pollutant is collected, the slick becomes thinner, and the depth of weir immersion should be decreased for high collection efficiency. A slower pumping rate causes the level of contained liquid to rise and alters the equilibrium position of the SLURP; it tilts back, reducing the depth of weir immersion until inflow of liquid equals the slower pumping rate (Figure 2).

If the pump is stopped, the liquid level rises further, and the equilibrium position changes such that the weir reaches the surface (Figure 3).

When the SLURP is first deployed, the liquid level inside is the same as out, and the weir is above the surface. Starting the pump will lower the level inside and tilt the SLURP forward until it again reaches equilibrium with the weir at the proper depth for inflow to equal the pumping rate.

The SLURP automatically adjusts to compensate for short, choppy waves which defeat other skimmers. The weir rises to skim only the oil-rich waves crests (Figure 4).

## **Models for various applications**

Slickbar manufactures two SLURP models-aluminum and stainless steel. Each fills a role complementary to the other owing to its own characteristics (see General specifications).

The aluminum SLURP has a moderately high flow rate, light weight, and an extremely shallow draft, all important for emergency situations. Integral hose floats ensure consistently good performance regardless of water depth. Welded aluminum construction means a long, corrosion-free service life.

The stainless steel SLURP finds its best applications where the benefits of very high flow rates justify the increased weight and draft. This model is highly resistant to corrosion, making it attractive to the chemical and food processing industries.

Standard equipment (Figure 5) for all SLURPs includes a debris screen, 33 feet of 1 ½ inch suction hose with fittings, a matching fitting on the SLURP, and a hose float. The aluminum model has in addition the integral hose floats mentioned earlier and a swivel connection at the back of the SLURP.

## **Optional equipment**

**Hose.** Additional sections of standard suction hose complete with fittings are available. They can also be used as discharge hoses.

Slickbar offers custom hose designs to meet special needs. Contact Slickbar for details.

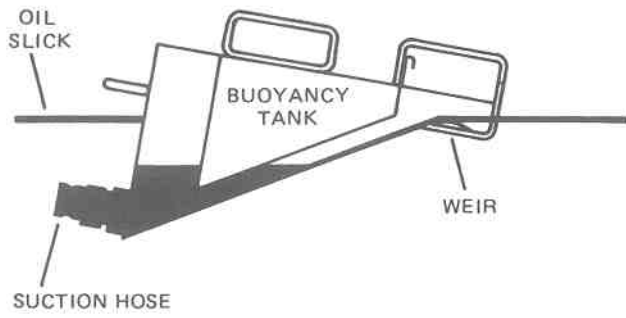


Figure 1. Thick oil slick – fast pumping

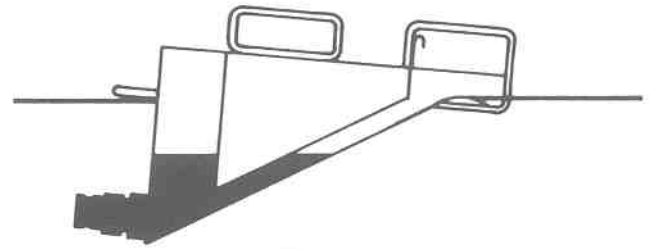


Figure 2. Thin oil slick – slow pumping

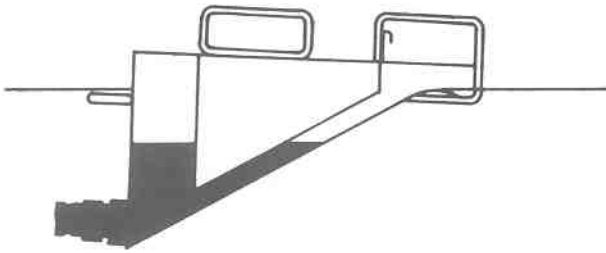


Figure 3. Pump stopped

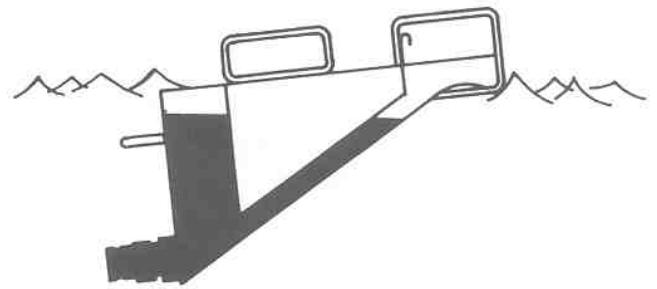


Figure 4. Choppy water – slow pumping

**Hose floats.** (Figure 5) These support the hose in deep water and keep it near the surface where it can be seen.

**Debris Fence.** (Figure 6) When the area to be skimmed has a large amount of associated debris, the Debris Fence is invaluable for reducing clogging of the SLURP intake. It is four feet square and extends 8 inches above and below the surface.

**Other accessories.** Slickbar offers a positioning wand, a floating oil-water separator, collapsible oil storage containers, and a wide range of pumps ideally suited to the SLURP. Contact Slickbar for details.

**General specifications**

SLURP	Aluminum	Stainless Steel
Length (in)	36.8	36.8
Width (in)	24.5	24.5
Height (in)	10.5	15.0
Weight (lb)	36	57
Discharge connection	2" female NPT, nylon reducing bushing, 1 ½" adapter for hose coupling	
Maximum capacity (gpm)	30	44
Minimum water depth (in)	5	10

**HOSE**

ID	1.5 in
OD	1.9 in
Working pressure @68°F	40 psig
Vacuum rating @68°F	28 in/Hg
Minimum bend radius	3 in
Weight per foot	.38 lb
Fittings	1 ½" cam-action coupling on each end

**OPERATING INSTRUCTIONS**

**Preparation**

**Pumps.** SLURPs can be used with any self-priming pump which is not sensitive to solids and which is capable of handling water, pollutant, and air separately or in combination. Various types of pumps have their own uses, but in any case there must be a means of control to vary the flow rate.

Diaphragm pumps are the least susceptible to clogging by solids, but they cause the hose and SLURP to surge, which may limit the flow rate. There are two ways to control the flow through this or any type of positive displacement pump. One

is to regulate the speed of the pump's motor, the other is to place a bypass line and throttling valve between the pump's inlet and discharge.

Vacuum trucks and eductors have also been successfully used to provide suction. With a vacuum truck, install a throttling valve in the suction line since the standard control on the inlet is usually not sensitive enough for flow regulation.

### **Suction hose.**

Connect the standard suction hose to both the SLURP and the pump. It can be connected with either end at the SLURP since the fittings (and hose floats for the aluminum model) are the same for both ends of the hose. Extension hose sections may be installed between the standard suction hose and the pump. Extension hose sections have one male coupling and one female coupling.

Place at least 10 feet of hose in the water with the SLURP. The hose should be slack and free of twists for best performance.

When skimming viscous pollutants with a steel SKURP, remove the reducing bushing at the back of the slurp, install a two-inch connection, and attach a two-inch suction hose between it and the pump. The standard suction hose should always be used with an aluminum SLURP.

**Discharge hose (optional equipment).** Attach the discharge hose to the pump and to the storage container or separator.

**Hose floats (optional equipment).** No additional floats are necessary for the aluminum model unless extra sections of suction hose are in the water. In this case, attach a hose float near each hose to hose coupling.

Steel SLURPs do not require hose floats in water depths less than five feet. In deeper water, place a float in the middle of the standard suction hose and one near each hose to hose coupling when additional sections of suction hose are in the water.

More floats can always be placed on the suction hose provided that the weir lip is at or just above the surface before pumping has begun. A hose float too near the SLURP will submerge the weir and prevent skimming.

**Debris screen.** Attach the wire mesh to the front of the buoyancy tank to keep floating debris from entering the SLURP. When this screen becomes clogged, remove the debris for effective skimming.



Figure 5

*SLURP standard equipment and optional pump.* Shown are a stainless steel SLURP with the debris screen in place and the standard suction hose and float. With the aluminum model, hose floats are bonded to the hose and a hose swivel is installed between the SLURP and hose. The optional 3-HP gasoline powered pump shown is also available from Slickbar.

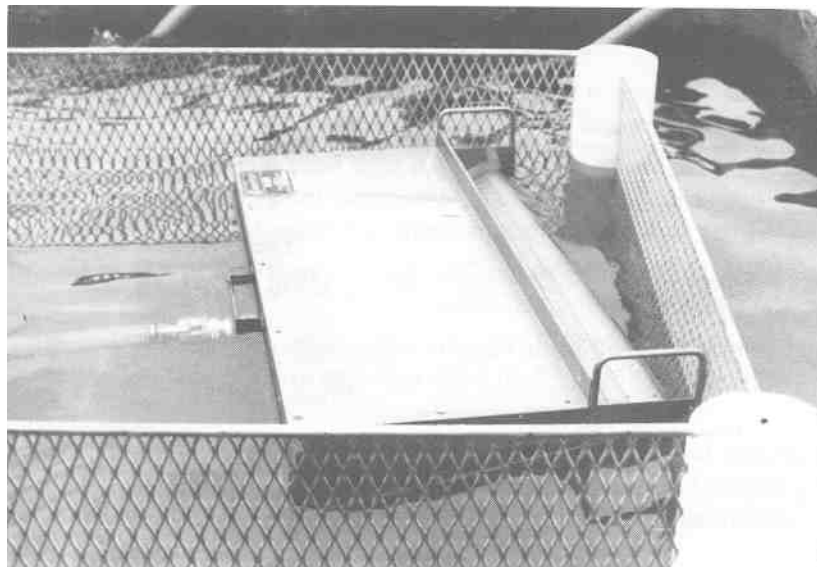


Figure 6

*SLURP Debris Fence.* The Debris Fence protects SLURPs from heavy debris that may be in the area. Light lines (not shown) attached to both the SLURP and the Debris Fence keep the weir near the center, but they should not be taut enough to restrict the SLURP's motions.

When considerable floating debris accompanies the spill, an external debris guard is strongly recommended such as Slickbar's Debris Fence.

**Debris Fence (optional equipment).** Surround the SLURP with the Debris Fence so that the hose passes through the notch. Secure the chain beneath the hose.

To restrain the SLURP in the center, tie tight lines to the fence and the top handles, but be sure to leave slack to permit free motion of the SLURP.

**Deployment.** Place the SLURP in an area where the pollutant has been concentrated to speed up the recovery process. A positioning wand is handy for moving the SLURP about.

When deploying the SLURP, be careful not to strike the weir lip against anything. The weir must be straight for best performance.

### **Operating the system**

**Starting procedure.** In normal water depths, the weir will be above the surface initially. Start the pump and the SLURP will tilt forward to begin skimming.

In shallow water depths, there may not be enough hose weight for the weir to be above the surface. In this case, lift the weir slightly out of the water and release it when the SLURP begins to rise out of the water. Be sure to lift the weir rather than pushing the back down.

SLURPs can also skim in depths so shallow that the unit will not float initially. The starting procedure is identical to the shallow water case above.

To restart pumping when skimming viscous oils or other pollutants, push the weir below the oil water interface and displace the contained oil with water to make restarting easier. If this is not practical, drain the pump.

**Adjusting flow rate for maximum oil water ratio.** Weir type skimmers work most efficiently in terms of fraction of pollutant to water collected, when the depth of weir immersion is not greater than one half of the slick thickness. The following recommendations ensure high oil water ratios for any model SLURP.

Slick thickness (in)	Maximum flow rate (GPM)
1/8	2
1/4	5
1/2	13
3/4	25
1	38

**Adjusting flow rate for least recovery time.** If rapid recovery of an accidental spill is more important than the oil water ratio, adjust the flow rate to the SLURPs capacity. Herd the slick to the SLURP with jets of water or air, alone or with diverting booms, to decrease recovery time even more.

Since the percentage of pollutant in the collected liquid is low in this case, a separator such as Slickbar's floating oil water separator is useful in reducing the amount of liquid that must be stored or treated.

**Operating with wind.** Take advantage of the wind's herding action. Place the SLURP on the downwind side of the slick and let the wind help guide the pollutant into the unit.

**Operating in waves.** Floating weir type skimmers work well in long swells. The SLURP, unlike most other weir skimmers, adjusts itself to compensate for short, choppy waves as well; the weir rises to skim only the oil rich wave tops.

You may notice more water than usual in the pumped liquid when operating in wave conditions. This is because waves tend to mix and to emulsify the pollutant and water before it enters the SLURP.

### **After the pollutant is recovered**

**Retrieve the system.** Pull the SLURP back with a wand or the suction hose. Be careful not to run the Debris Fence or weir lip into any submerged objects.

Lift the SLURP out of the water with the suction hose or preferably with the back handle to drain the unit.

**Cleaning.** The SLURP system will have a long, trouble-free service life and will retain its appearance if it is cleaned after every use with hot water and detergent. Avoid using steam on the hose and floats. Be sure to flush the aluminum model's swivel hose fitting well to remove any grit.

Flush the pump with fresh water and then drain it to prevent freezing in cold weather.

## **PREVENTIVE MAINTENANCE**

### **The SLURP**

Before every use, check that both the plug in the inner tank and the hose fittings are tight. If the plug is missing, replace it with a ½ inch NPT plug of steel, nylon, PVC, or any other material that is not affected by the pollutant (never use a brass or bronze plug in an aluminum SLURP).

### **Hoses**

Replace worn seals in the hose fittings with new neoprene or buna-N seals. Avoid storing hoses in direct sunlight.

### **Swivel hose fitting (aluminum model only)**

Do not store the floats in direct sunlight.

### **Pump**

Follow the manufacturer's recommended maintenance procedure.

## TROUBLESHOOTING

### Starting

**No discharge from pump.** Check that all connections are airtight. Check for clogging in the SLURP, hoses, and pump. Make sure pump is properly primed. “Self-Priming” pumps require some water in the pump case itself, in order for the pump to “prime” the suction line.

**Weir remain above the surface.** This indicates a leak if there is discharge from the pump. There are several possibilities:

If the flow rate is low, increase it until the SLURP tilts forward, then decrease it to the desire table.

If the flow rate is high and yet the weir stays above the surface, check for leaks in all the connections in the water.

If the SLURP still does not respond, then either the SLURP or the hose is damaged.

**Weir remains below the surface.** Raise the weir until it just clears the surface. As the liquid level inside drops, the back of the SLURP will rise out of the water. When it starts to rise, release the weir and the SLURP will adjust itself to begin skimming. If this fails, repeat the procedure allowing the SLURP to rise further out of the water. Never push the back of the SLURP down to start skimming since the SLURP would be unable to self adjust.

If all the liquid is drawn out of the SLURP and still it does not skim or if it does skim but only a narrow range of flow rates, then the problem is one of three things: First, the water may be too shallow (10 inches for steel models, 5 inches for aluminum). Second, an accessory hose float may be too close to the SLURP. Or finally, the tank plug may be missing, allowing some water to leak in.

### Operating – the SLURP rocks

This usually occurs when the flow rate is too high, but it may also be due to an accessory hose float too near the SLURP. Slow the flow rate down or move the float back.

Questions?

If you need more information, please contact:



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