



SERVICE & MAINTENANCE PROFESSIONALS

2121 W. Imperial Hwy., #E442, La Habra, CA 90631  
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EXPERIENCE • RELIABLE • COST-EFFECTIVE

“Delivering solutions to your pool & spa equipment problems!”

### Recommended Procedures for Fecal Contamination in Swimming Pools and Spas

#### **Solid Fecal (formed stool) Contamination:**

- \* Clear the pool of bathers and prepare to close the pool, or affected area of a large pool, for at least one hour.
- \* Remove fecal material and dispose of properly. Do not use the pool vacuum system to remove the material.
- \* “Shock” chlorinate the pool, or the affected area of a large pool.
- \* Check and record the free chlorine residual. Maintain a **minimum** of 1.0 parts per million (ppm or mg/L) for at least one hour or 2.0 ppm for at least 30 minutes.
- \* Check and record pH, and maintain between 7.2 and 7.5 for the entire period of treatment.
- \* If the pH and free chlorine levels are maintained as above, the pool may be reopened

#### **Disinfect for Giardia**

For example, to determine the length of time needed to disinfect a pool after a stool accident at 15 ppm, use the following formula:

$$C \times T = 45$$

Solve for time:  $T = 45 \div 3 \text{ ppm} = 15 \sim 20$  minutes. It would take 15~20 minutes to inactivate Giardia at 3 ppm.

<b>CHLORINE LEVEL (ppm)</b>	<b>DISINFECTION TIME</b>
1.0 -----	60 min
2.0 -----	30 min
3.0 -----	20 min

#### **NOTES:**

Based on water being pH 7.5, 77°F without Stabilizer/Conditioner in water. Modify times if these conditions are not met.

Many conventional test kits cannot measure free chlorine levels this high. Use chlorine test strips that can measure free chlorine in a range that includes 20 ppm (such as those used in the food industry) or make dilutions with chlorine-free water when using a standard DPD test kit.

- \* VACUUM NG STOOL FROM THE POOL S NOT RECOMMENDED, net only and sanitize net afterwards.
- \* Filter(s) should be backwashed after the disinfection period has completed.
- \* Pool/spa can be reopened after chlorine falls back below 5.0 ppm



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**Unformed Fecal (diarrhea) Contamination:**

Unformed or diarrhea material is an indication that a person with an infectious disease of the digestive tract has used the pool. Some parasites such as *Cryptosporidium* or *Giardia* can be resistant to lower concentrations of free chlorine. As such, higher levels should be used to ensure that these infectious agents are neutralized.

- \* Clear the pool of bathers and prepare to close the pool.
- \* Remove any visible fecal material, including from skimmers and gutters. Do not use the vacuum system to remove the material.
- \* Chlorinate the pool to at least 10 ppm for at least 16 hours.
- \* A different free chlorine level and time period may be used according to Table 1 below, so long as the

Concentration Time

- \* Factor (CT) is 15,300. Examples of other residual levels and time periods are given in Table below.

**Disinfect for Crypto:**

For example, to determine the length of time needed to disinfect a pool after a diarrheal accident at 15 ppm, use the following formula:  $C \times T = 15,300$ .

Solve for time:  $T = 15,300 \div 15 \text{ ppm} = 1020 \text{ minutes}$  or 17 hours. It would take 17 hours to inactivate Crypto at 15 ppm.

<b>CHLORINE LEVEL (ppm)</b>	<b>DISINFECTION TIME</b>
1.0 -----	15,300 min (255 hours / 10.63 days)
10.0 -----	1,530 min (25.5 hours / 1.06 days)
20.0 -----	765 min (12.75 hours / 0.53 days)

**NOTES:**

Based on water being pH 7.5, 77°F without Stabilizer/Conditioner in water. Modify times if these conditions are not met

- \* Check and record the free chlorine residual throughout the enhanced treatment period.
- \* Check and record pH, and maintain between 7.2 and 7.5 throughout the enhanced treatment period.
- \* If *Cryptosporidium* contamination is a concern, backwash the filters and disinfect them with a solution of at least 20 ppm of chlorine.
- \* Before putting the pool back into use, verify that the free chlorine residual does not exceed 5 ppm.

**Fecal Contamination of Spas and Hot Tubs**

- \* Clear the spa or hot tub of bathers.
- \* Drain the tub.
- \* Sanitize the basin with a disinfectant.
- \* Backwash the filters to the sewer and disinfect them with a solution of at least 20 ppm of chlorine.
- \* Refill the tub and reopen.



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### **Vomit**

In the event of a patron vomiting the full contents of their stomach into the pool, the pool operator should follow the recommended procedures for Solid Fecal Contamination.

### **Blood**

The Centers for Disease Control and Prevention (CDC) has not found any indication of blood borne diseases such as Hepatitis B or HIV being transmitted to swimmers from a blood spill in a swimming pool. In a properly chlorinated pool, these germs do not survive long. There is no public health recommendation to close a pool after a blood spill. However, some pool operators may choose to do so temporarily to satisfy their patrons.

### **Dead Animal**

In the event of finding a dead animal on a swimming body of water, it is best to take precautions and follow the recommended procedures for Unformed Fecal Contamination.

*\* CT is determined by multiplying the time period in minutes times the concentration of the free chlorine residual.  
For example, maintaining 10 ppm of free chlorine for 16 hours (960 minutes) yields a  $CT = (10 \text{ ppm}) \times (960 \text{ minutes}) = 9600$ .*

Ver: Jan 1, 2009